TOSHIBA

Carrier

E08-361-6

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-SP180AT2-UL
RAV-SP240AT2-UL
RAV-SP300AT2-UL
RAV-SP360AT2-UL
RAV-SP420AT2-UL

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1. LINE UP. 3

1. LINE UP

Outdoor unit line-up

Size	018	024	030	036	042
Model name	RAV-SP404AT-E	RAV-SP454AT-E	RAV-SP564AT-E	RAV-SP804AT-E	RAV-SP1104AT-E

Indoor unit line-up

Size		018	024	030	036	042
4-way Cassette	RAV-SM**4UT-E					
Under Ceiling	RAV-SM**2CT-E					
High Wall	RAV-SM**4CT-E					

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2. 4-WAY CASSETTE TYPE

2-1. Specifications

4-way cassette USA

System	Size		018	024	030	036	042
	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
Performance	Cooling Rated Capacity (Btu/h) *1		19000	25000	32000	36400	40500
	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) *1		18800	26000	33400	36000	46000
	HSPF		11.5	9.5	11.0	11.9	10.3
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) *2	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" 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)*3		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
	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

*1 : 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

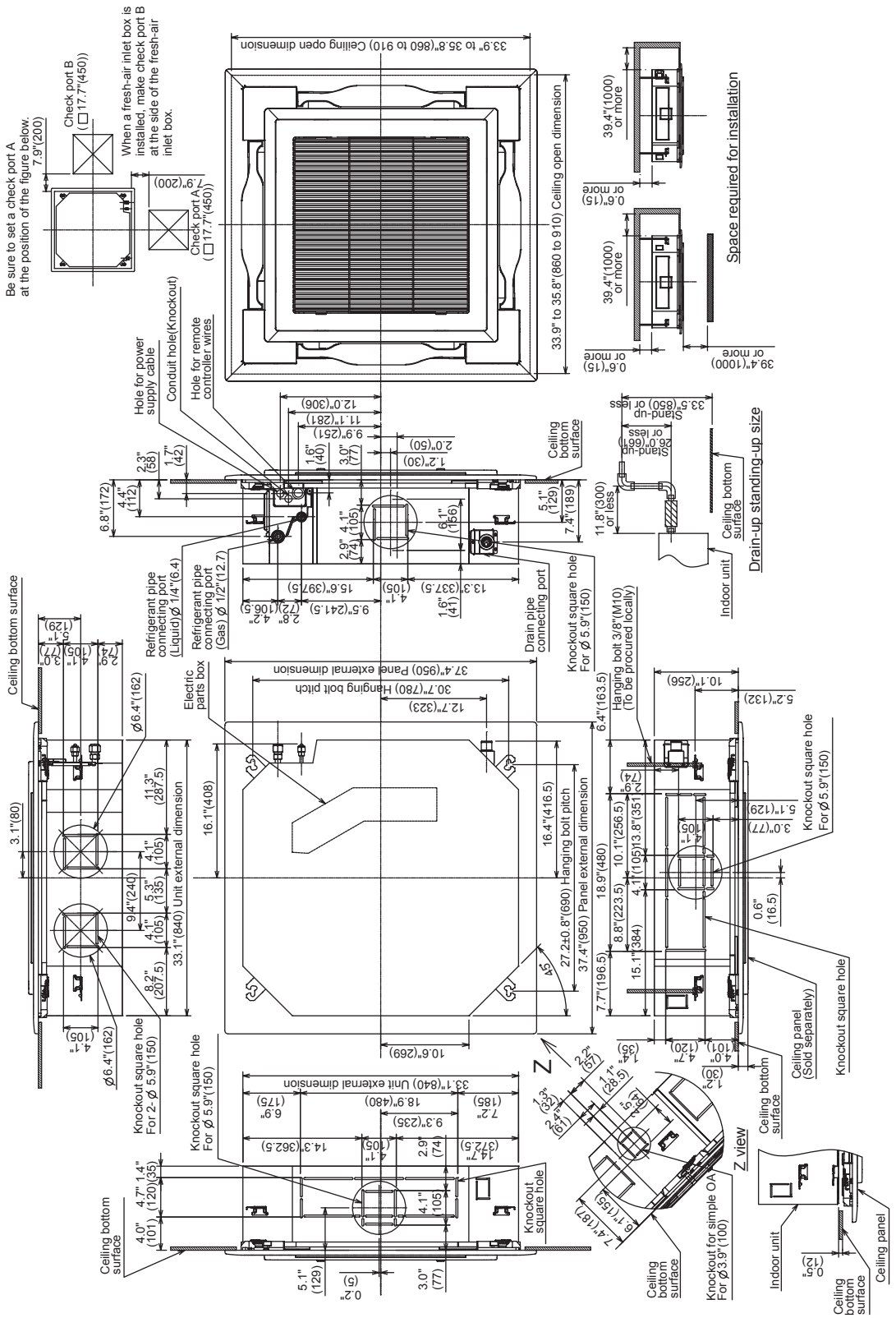
*2 : When field fabricated wind baffles are installed
The minimum outside air temperature for sizes 18 & 24 is 5°F (-15°C) and for sizes 30, 36 & 42 is -13°F (-25°C) on units starting with serial number 611***** starting with production from November 2016.

*3 : UL value

2-2. Dimension

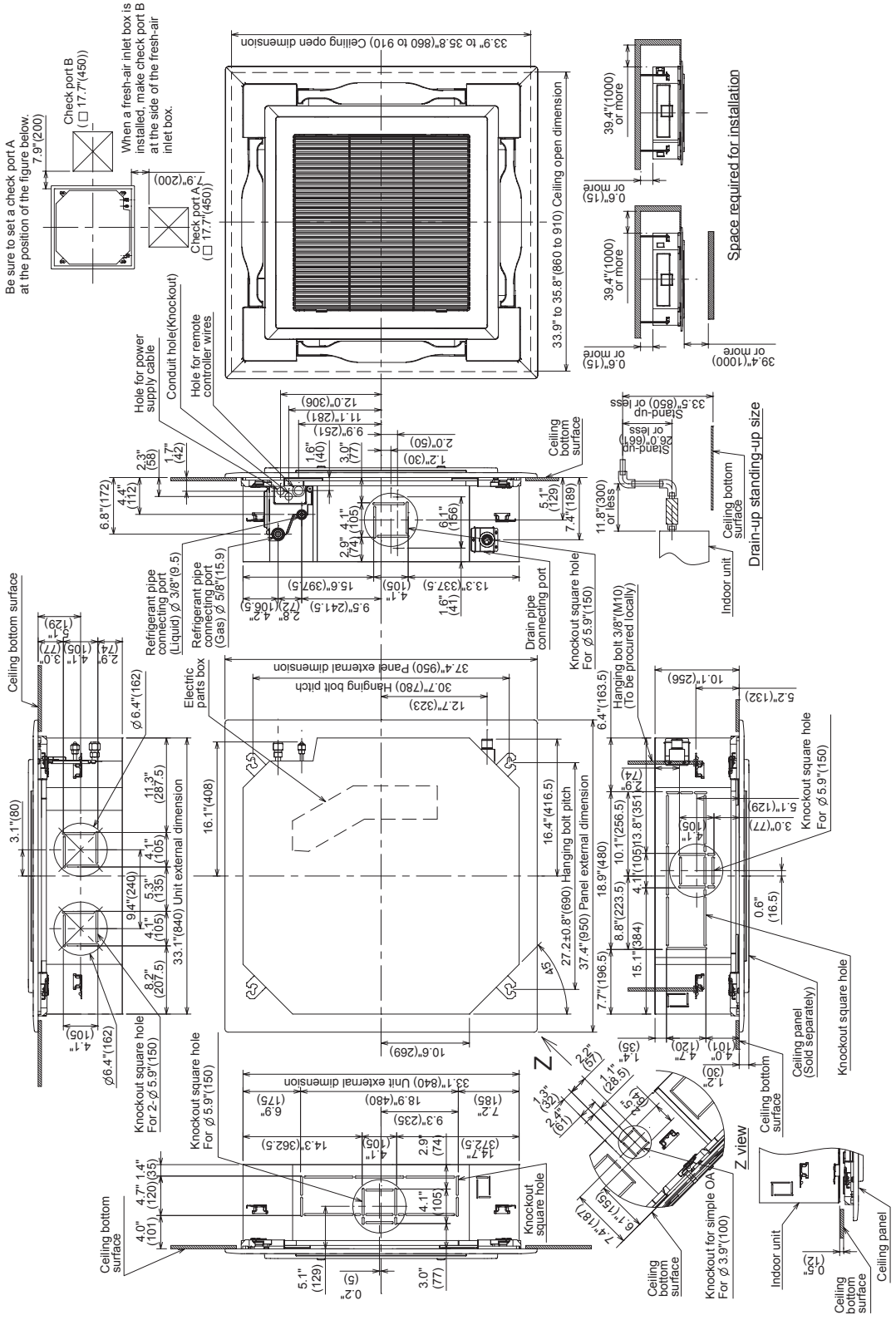
RAV-SP180UT-UL

Unit:in(mm)



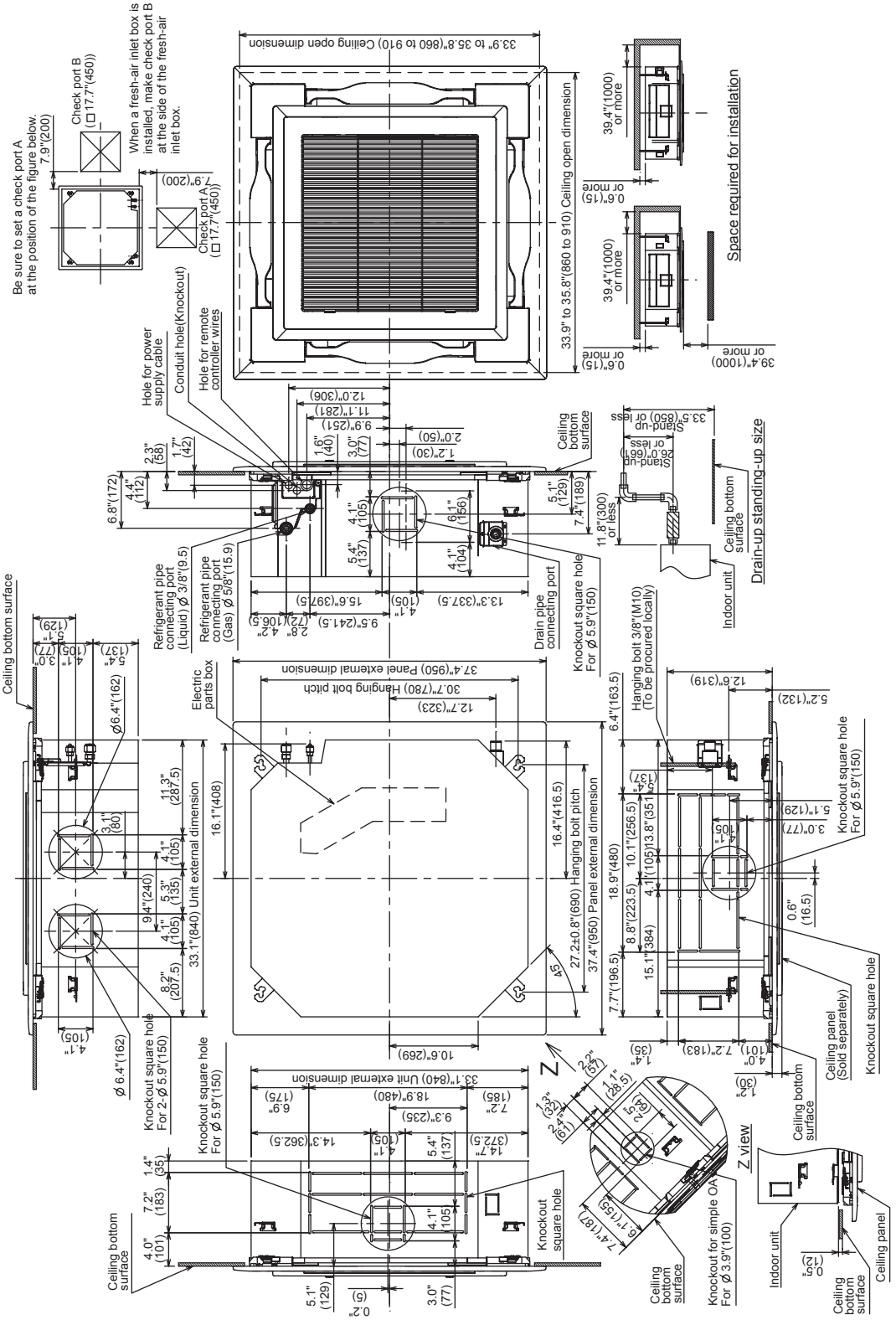
RAV-SP240UT-UL

Unit:in(mm)

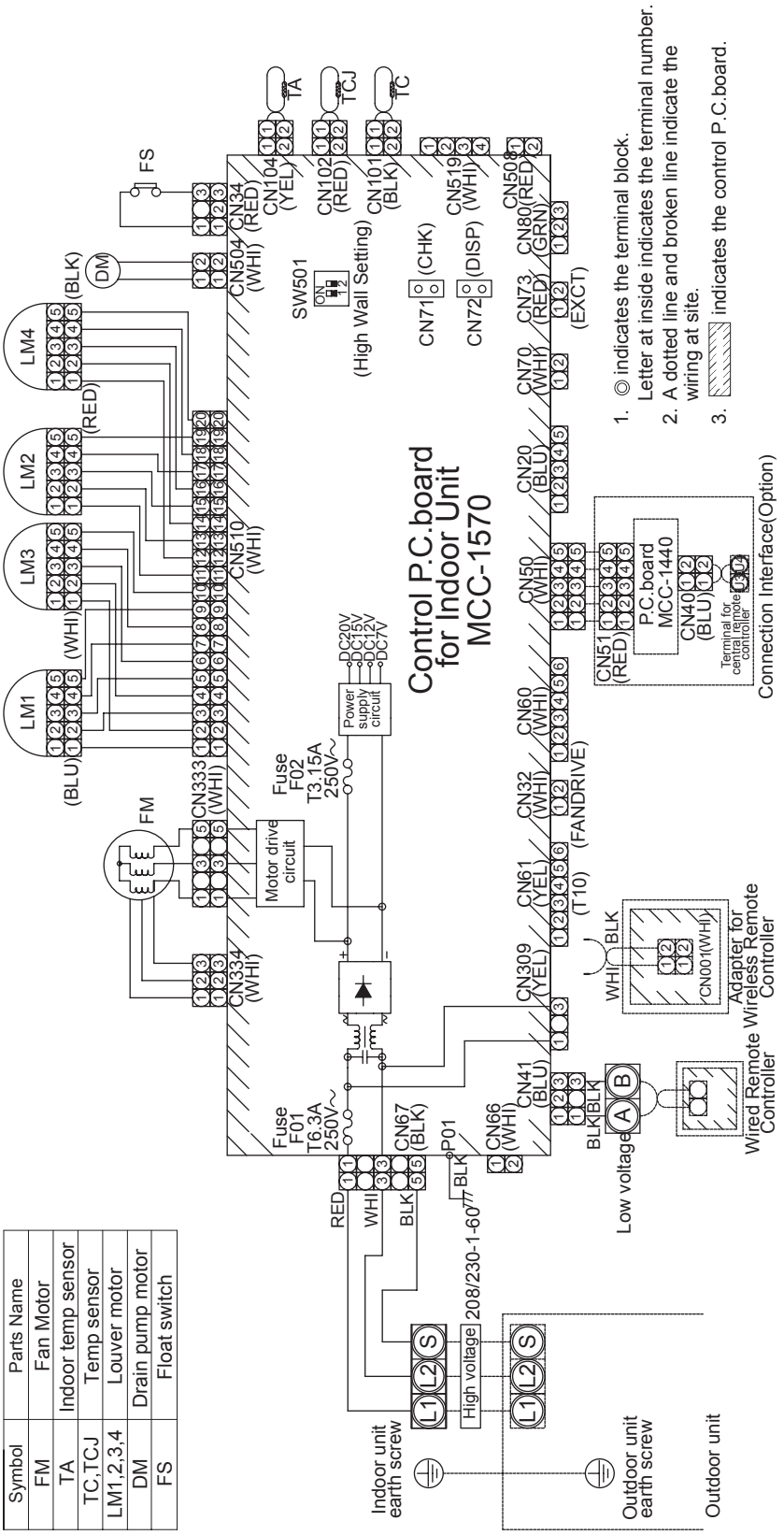


RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

Unit:in(mm)



2-3. Wiring Diagram



2-4. 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	17800	12500	18800	13200	19700	13800	20400	14300	21100	14800	21700	15200	22300	15600	23600	16500	24700	17300
	54.0	17700	12400	18700	13100	19600	13700	20300	14200	21000	14700	21600	15100	22200	15500	23500	16500	24600	17200
	57.0	17700	12400	18600	13000	19500	13700	20200	14100	20900	14600	21500	15100	22100	15500	23400	16400	24500	17200
	61.0	17500	12300	18400	12900	19300	13500	20000	14000	20700	14500	21300	14900	21900	15300	23200	16200	24300	17000
	64.0	17300	12100	18200	12700	19100	13400	19800	13900	20500	14400	21100	14800	21700	15200	23000	16100	24000	16800
	68.0	17200	12000	18100	12700	19000	13300	19700	13800	20400	14300	21000	14700	21600	15100	22900	16000	23900	16700
	70.0	17200	12000	18100	12700	19000	13300	19600	13700	20300	14200	20900	14600	21500	15100	22800	16000	23800	16700
	73.0	17000	11900	17900	12500	18800	13200	19400	13600	20100	14100	20700	14500	21300	14900	22500	15800	23600	16500
	77.0	16800	11800	17600	12300	18500	13000	19200	13400	19800	13900	20400	14300	21000	14700	22200	15500	23200	16200
	81.0	16600	11600	17500	12300	18300	12800	19000	13300	19600	13700	20200	14100	20800	14600	22000	15400	23000	16100
	84.0	16300	11400	17200	12000	18100	12700	18700	13100	19300	13500	19900	13900	20500	14400	21700	15200	22700	15900
	88.0	16100	11300	16900	11800	17800	12500	18400	12900	19000	13300	19600	13700	20200	14100	21400	15000	22300	15600
	91.0	15900	11100	16700	11700	17500	12300	18100	12700	18700	13100	19300	13500	19900	13900	21000	14700	22000	15400
	95.0	15600	10900	16400	11500	17200	12000	17800	12500	18500	13000	19000	13300	19500	13700	20700	14500	21600	15100
	99.0	15300	10700	16100	11300	16900	11800	17500	12300	18100	12700	18600	13000	19100	13400	20300	14200	21200	14800
	102.0	15000	10500	15800	11100	16600	11600	17200	12000	17800	12500	18300	12800	18800	13200	19900	13900	20800	14600
	106.0	13100	9200	13800	9700	14500	10200	15000	10500	15500	10900	16000	11200	16500	11600	17400	12200	18200	12700
	109.0	12700	8900	13400	9400	14100	9900	14600	10200	15100	10600	15500	10900	15900	11100	16900	11800	17700	12400

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	15500	24700	16300	25900	17100	26900	17800	27800	18300	28600	18900	29400	19400	31200	20600	32600	21500
	54.0	23300	15400	24500	16200	25800	17000	26700	17600	27600	18200	28400	18700	29200	19300	30900	20400	32400	21400
	57.0	23200	15300	24400	16100	25600	16900	26500	17500	27400	18100	28200	18600	29000	19100	30700	20300	32100	21200
	61.0	23000	15200	24200	16000	25400	16800	26300	17400	27200	18000	28000	18500	28800	19000	30500	20100	31900	21100
	64.0	22800	15000	24000	15800	25200	16600	26100	17200	27000	17800	27800	18300	28600	18900	30300	20000	31700	20900
	68.0	22700	15000	23900	15800	25000	16500	25900	17100	26800	17700	27600	18200	28400	18700	30100	19900	31400	20700
	70.0	22600	14900	23800	15700	24900	16400	25800	17000	26700	17600	27500	18200	28300	18700	30000	19800	31300	20700
	73.0	22300	14700	23500	15500	24700	16300	25500	16800	26400	17400	27200	18000	28000	18500	29600	19500	31000	20500
	77.0	22100	14600	23200	15300	24400	16100	25300	16700	26100	17200	26900	17800	27700	18300	29300	19300	30600	20200
	81.0	21800	14400	23000	15200	24100	15900	25000	16500	25800	17000	26600	17600	27400	18100	29000	19100	30300	20000
	84.0	21500	14200	22600	14900	23800	15700	24600	16200	25500	16800	26200	17300	26900	17800	28500	18800	29800	19700
	88.0	21200	14000	22300	14700	23400	15400	24200	16000	25100	16600	25800	17000	26500	17500	28100	18500	29400	19400
	91.0	20900	13800	22000	14500	23000	15200	23900	15800	24700	16300	25400	16800	26100	17200	27700	18300	28900	19100
	95.0	20500	13500	21600	14300	22700	15000	23500	15500	24300	16000	25000	16500	25700	17000	27200	18000	28500	18800
	99.0	20100	13300	21200	14000	22200	14700	23000	15200	23800	15700	24500	16200	25200	16600	26700	17600	27900	18400
	102.0	19700	13000	20700	13700	21800	14400	22500	14900	23300	15400	24000	15800	24700	16300	26100	17200	27300	18000
	106.0	17200	11400	18100	11900	19000	12500	19700	13000	20400	13500	21000	13900	21600	14300	22900	15100	23900	15800
	109.0	16800	11100	17600	11600	18500	12200	19200	12700	19800	13100	20400	13500	21000	13900	22200	14700	23200	15300

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
30k	50.0	30100	22300	31600	23400	33200	24600	34400	25500	35600	26400	36600	27100	37600	27800	39868	26313	41698	27521
	54.0	29900	22100	31500	23300	33000	24400	34200	25300	35400	26200	36400	27000	37400	27700	39651	26169	41471	27371
	57.0	29700	22000	31200	23100	32700	24200	33900	25100	35100	26000	36100	26700	37100	27500	39324	25954	41129	27145
	61.0	29500	21800	31000	23000	32600	24100	33700	25000	34900	25800	35900	26600	36900	27300	39106	25810	40901	26995
	64.0	29200	21600	30800	22800	32300	23900	33400	24700	34600	25600	35600	26400	36600	27100	38779	25594	40559	26769
	68.0	29000	21500	30500	22600	32000	23700	33200	24600	34300	25400	35300	26100	36300	26900	38452	25379	40217	26543
	70.0	28800	21300	30300	22400	31800	23600	33000	24400	34100	25300	35100	26000	36100	26700	38234	25235	39989	26393
	73.0	28600	21200	30100	22300	31600	23400	32700	24200	33800	25000	34800	25800	35800	26500	37908	25019	39648	26167
	77.0	28300	21000	29700	22000	31200	23100	32300	23900	33400	24700	34400	25500	35400	26200	37472	24731	39192	25867
	81.0	27900	20700	29400	21800	30800	23600	22800	31900	33000	24400	34000	25200	35000	25900	37036	24444	38736	25566
	84.0	27500	20400	29000	21500	30400	22500	31500	23300	32500	24100	33500	24800	34500	25600	36492	24084	38167	25190
	88.0	27200	20100	28600	21200	30000	22200	31100	23000	32200	23800	33100	24500	34000	25200	36056	23797	37711	24889
	91.0	26700	19800	28100	20800	29500	21800	30500	22600	31600	23400	32500	24100	33400	24700	35402	23365	37027	24438
	95.0	26300	19500	27700	20500	29000	21500	30100	22300	31100	23000	32000	23700	32900	24400	34858	23006	36458	24062
	99.0	25800	19100	27100	20100	28500	21100	29500	21800	30500	22600	31400	23300	32300	23900	34204	22575	35774	23611
	102.0	25300	18700	26600	19700	27900	20700	28900	21400	29900	22100	30800	22800	31700	23500	33550	22143	35090	23160
	106.0	22100	16400	23200	17200	24400	18100	25300	18700	26100	19300	26900	19900	27700	20500	29302	19339	30647	20227
	109.0	21400	15800	22600	16700	23700	17600	24500	18100	25400	18800	26100	19300	26800	19800	28431	18764	29736	19626

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	40100	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

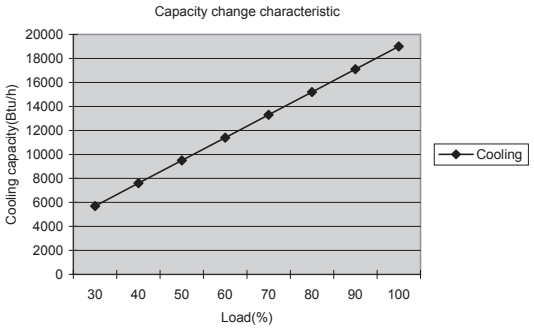
unit size	outdoor air temp. DB	57 WB 68 DB		59 WB 71 DB		61 WB 73 DB		63 WB 76 DB		64 WB 79 DB		66 WB 81 DB		68 WB 82 DB		72 WB 86 DB		75 WB 90 DB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
42k	50.0	38000	26200	40000	27600	42000	28900	43500	30000	45000	31000	46300	31900	47600	32800	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
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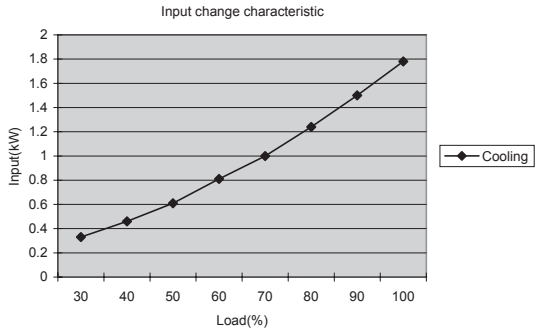
TC:Total Capacity [Btu/h]
SHC:Sensible Heat Capacity [Btu/h]

2-5. Capacity / Input change characteristic

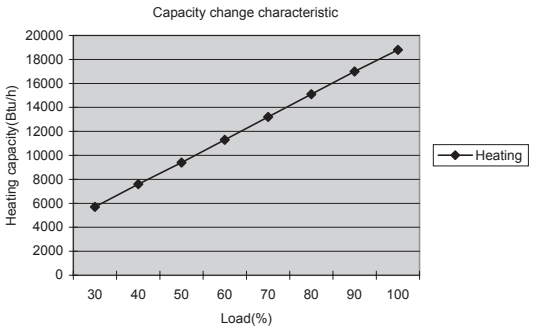
RAV-SP180UT-UL/RAV-SP180AT2-UL

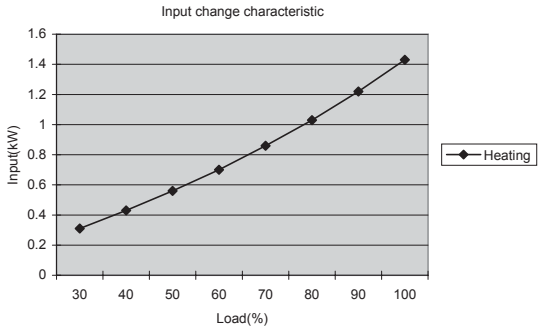
Cooling





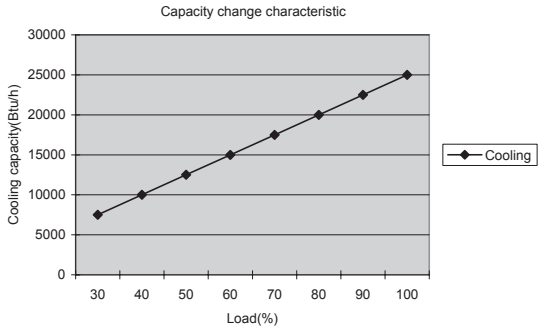
Heating

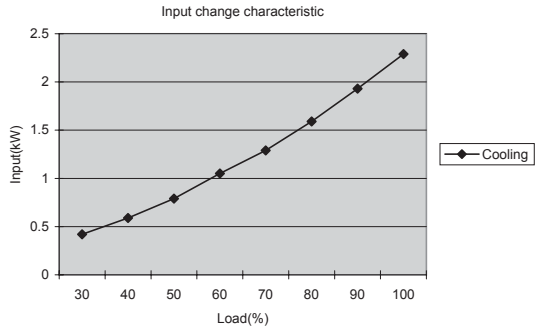




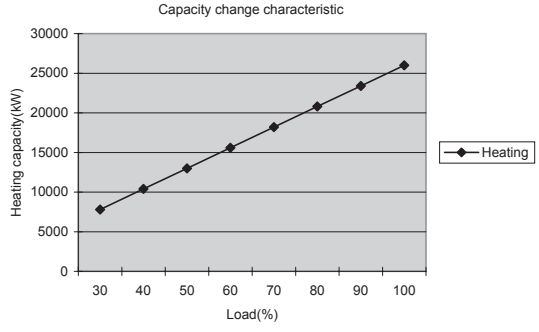
RAV-SP240UT-UL/RAV-SP240AT2-UL

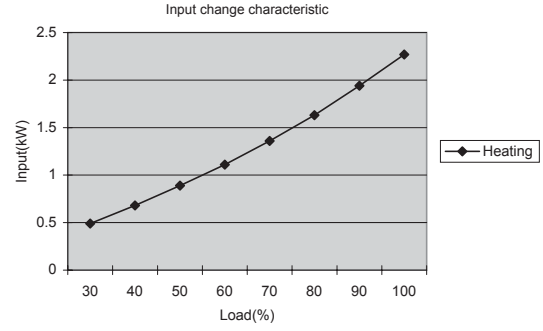
Cooling





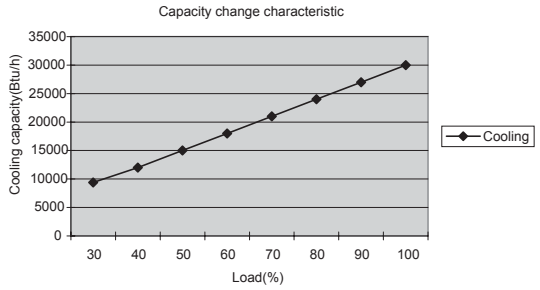
Heating

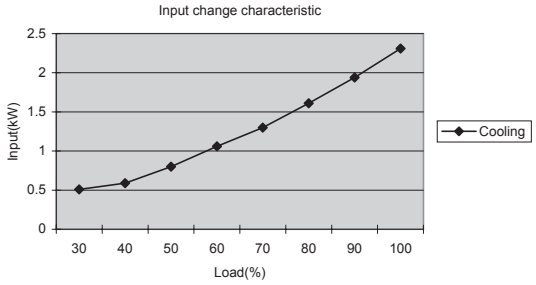




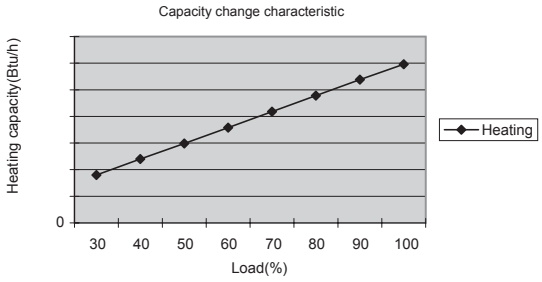
RAV-SP300UT-UL/RAV-SP300AT2-UL

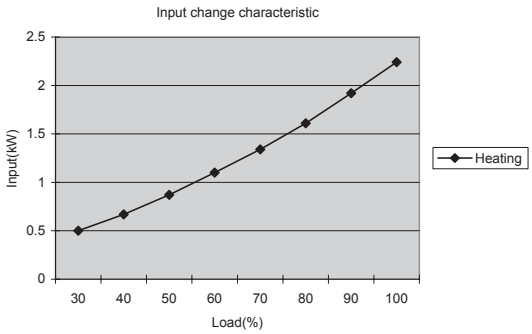
Cooling





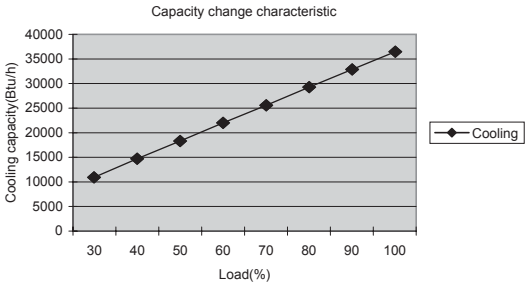
Heating

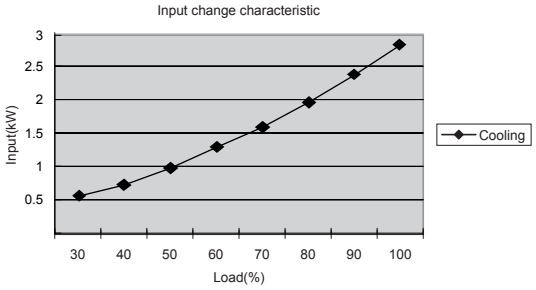




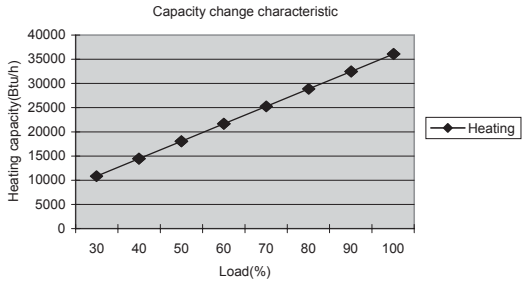
RAV-SP360UT-UL/RAV-SP360AT2-UL

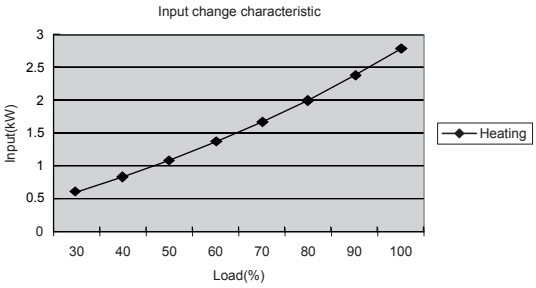
Cooling





Heating

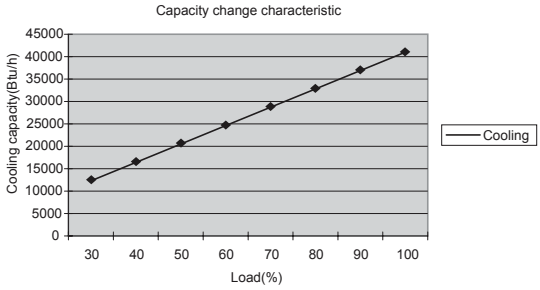


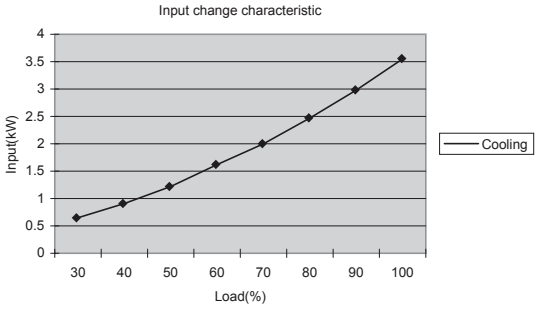


RAV-SP420UT-UL/RAV-SP420AT2-UL

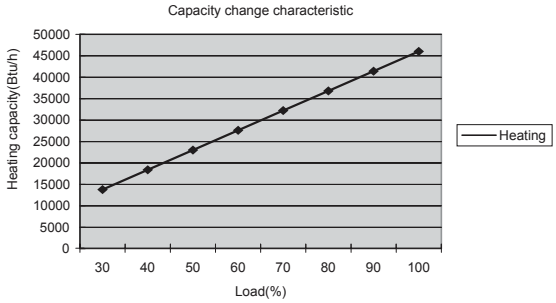
Cooling

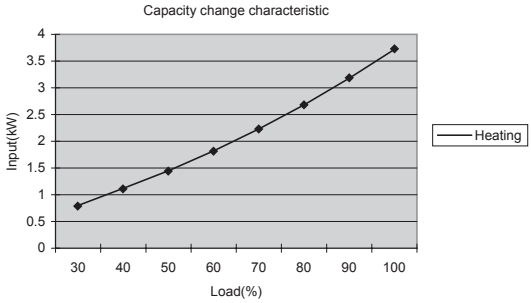
Capacity change characteristic





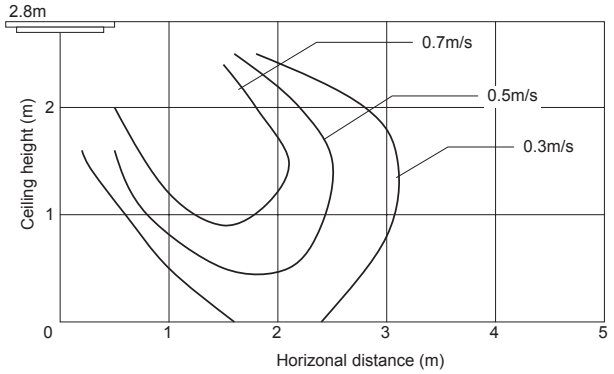
Heating



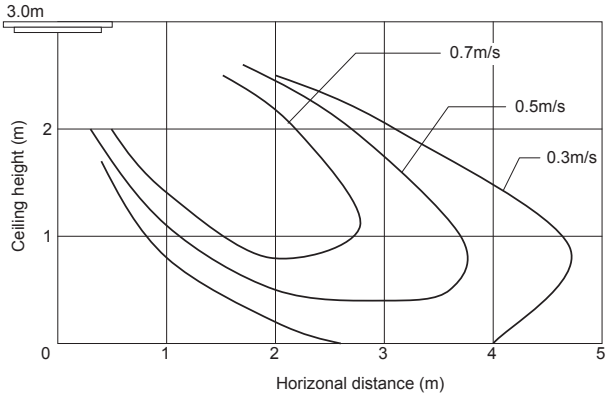


2-6. Air speed characteristics

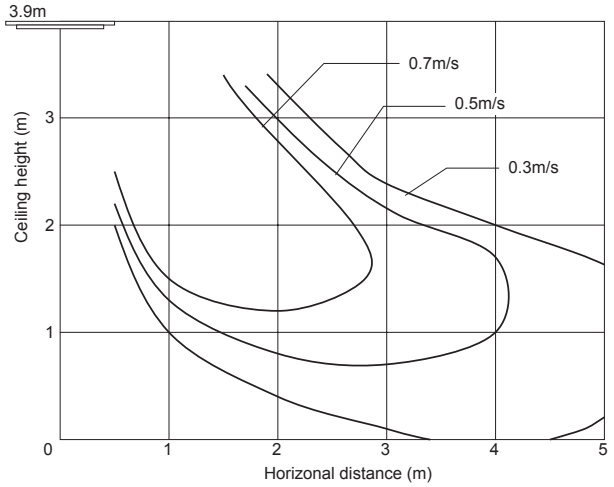
RAV-SP180UT-UL



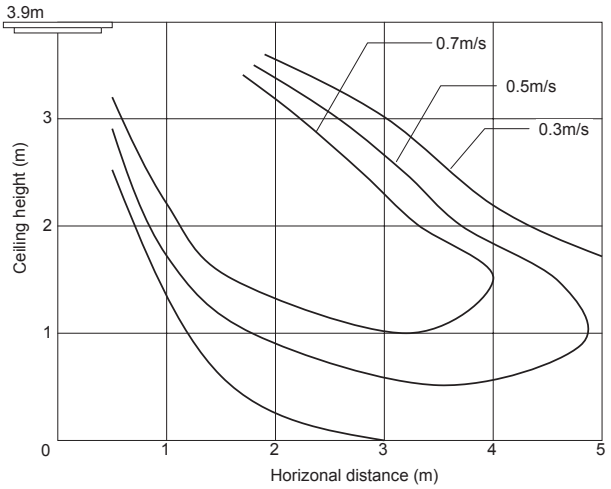
RAV-SP240UT-UL



RAV-SP300UT-UL

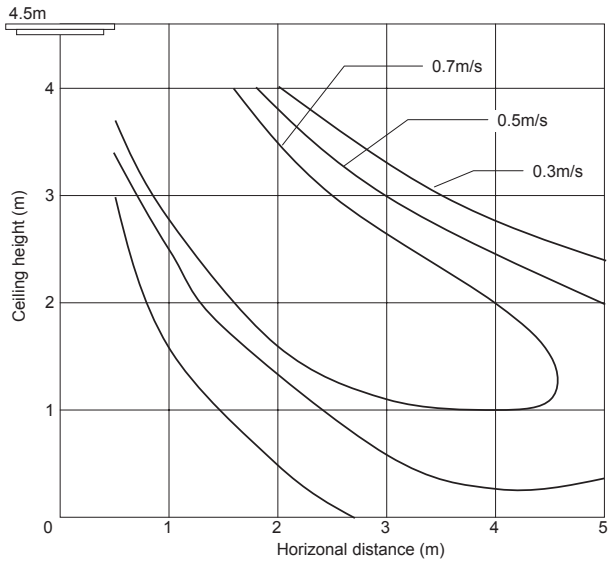


RAV-SP360UT-UL, RAV-SP420UT-UL



RAV-SP360UT-UL, RAV-SP420UT-UL

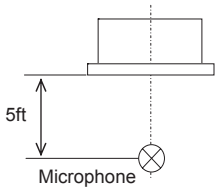
(High Ceiling)



2-7. Sound characteristics (NC curve)

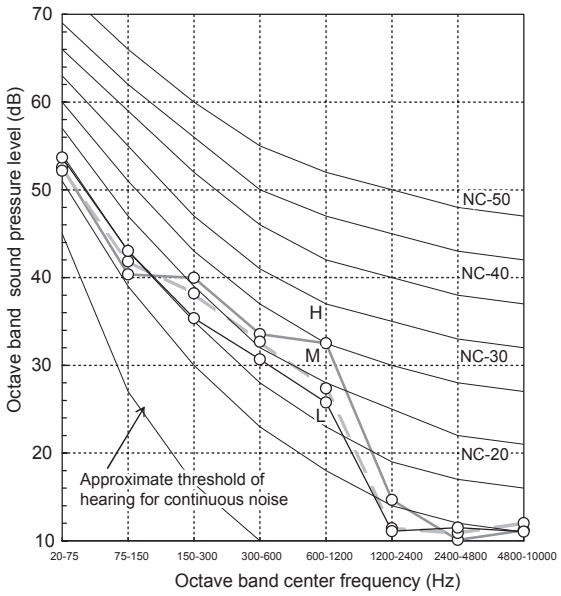
▮4-Way Cassette Type

[Measuring location]



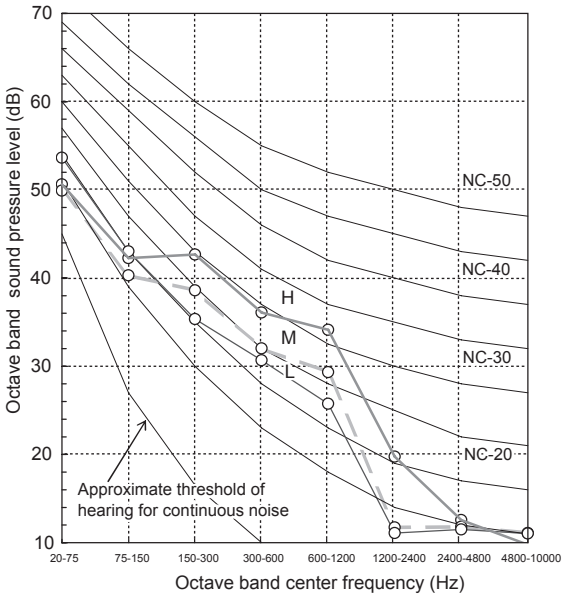
RAV-SP180UT-UL

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



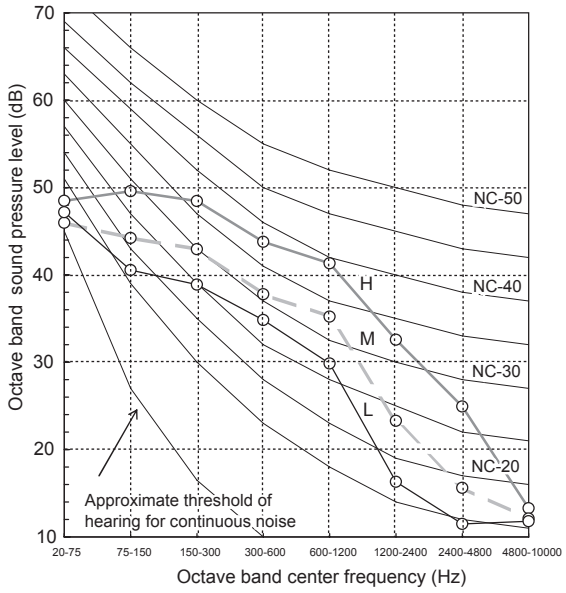
RAV-SP240UT-UL

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



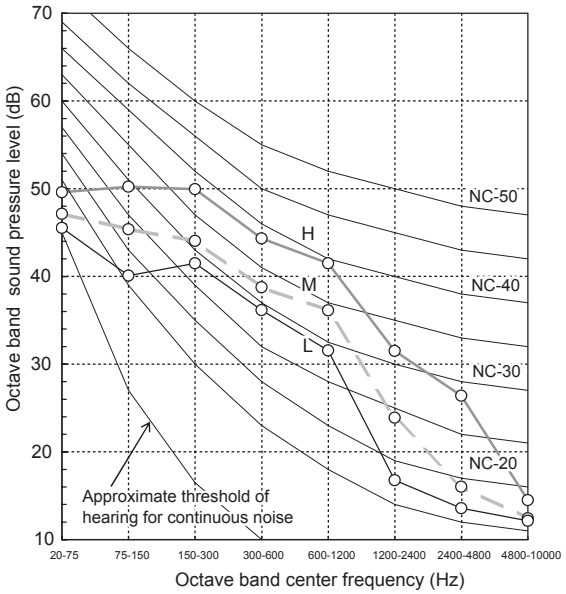
RAV-SP300UT-UL

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



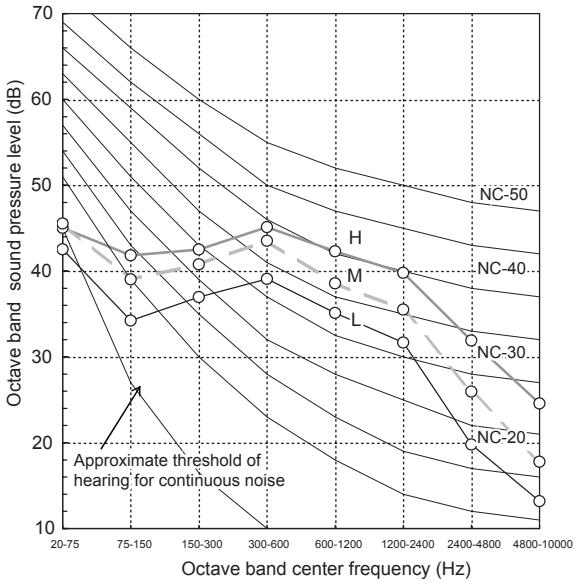
RAV-SP360UT-UL

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



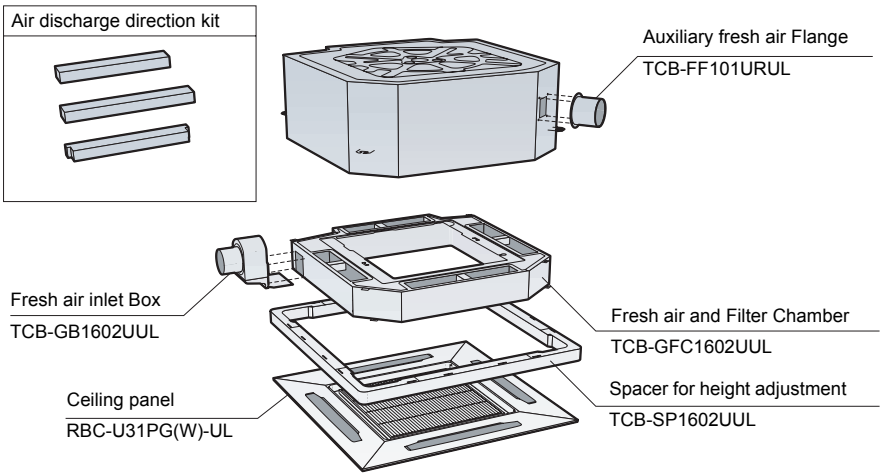
RAV-SP420UT-UL

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



2-8. Accessory

Optional accessories



Name	Model name	Note
Ceiling panel	RBC-U31PG(W)-UL	Required accessory
Fresh Air Inlet Box	TCB-GB1602UUL	For fresh air intake by using the knockout hole of fresh air and filter chamber. (dia=100mm) * Not valid in combination with TCB-FF101UUL Use with TCB-GFC1602UUL
Frech Air and Filter Chamber	TCB-GFC1602UUL	For fresh air intake and installing high efficiency filter or super long filter
Auxiliary Fresh Air Flange	TCB-FF101URUL	For easy fresh air intake by using the knockout hole of indoor unit. (dia=100mm) * Not valid in combination with TCB-GB1602UUL
Spacer for Height Adjustment	TCB-SP1602UUL	Height=500mm
Air Discharge Direction Kit	TCB-BC1602UUL	Air direction charge by cutting off air discharge port (3pcs)

Contents

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3. CEILING TYPE

3-1. Specifications

Ceiling USA

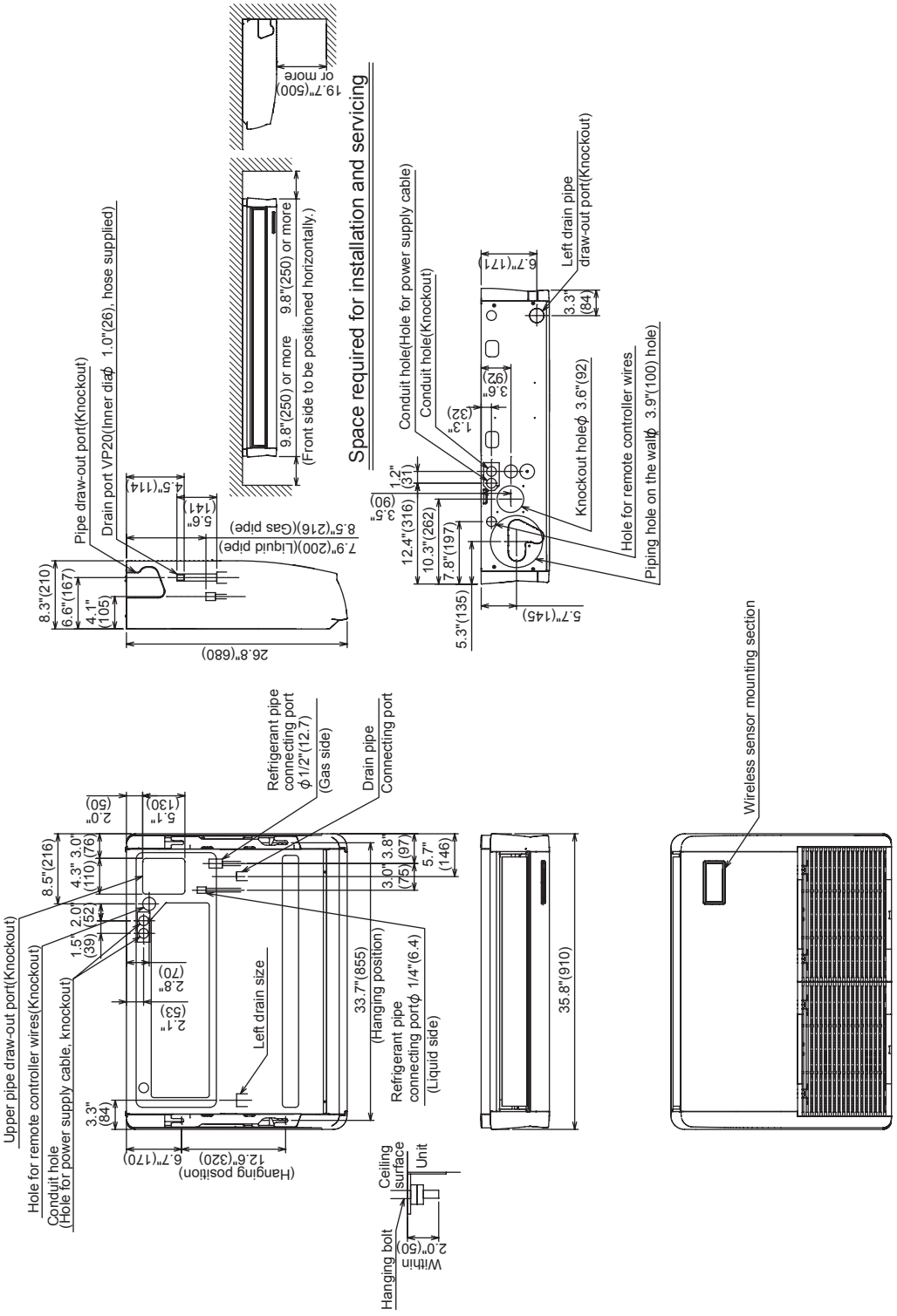
System	Size		018	024	030	036	042
	Outdoor Model		RAV-SP180AT2-UL	RAV-SP240AT2-UL	RAV-SP300AT2-UL	RAV-SP360AT2-UL	RAV-SP420AT2-UL
	Indoor Model		RAV-SP180CT-UL	RAV-SP240CT-UL	RAV-SP300CT-UL	RAV-SP360CT-UL	RAV-SP420CT-UL
Performance	Cooling Rated Capacity (Btu/h) *1		17000	23600	30000	36000	41000
	SEER		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) *1		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) *2	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) *3		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

Note
*1 : 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 : When field fabricated wind baffles are installed
The minimum outside air temperature for sizes 18 & 24 is 5°F (-15°C) and for sizes 30, 36 & 42 is -13°F (-25°C) on units starting with serial number 611***** starting with production from November 2016.
*3 : UL value

3-2. Dimension

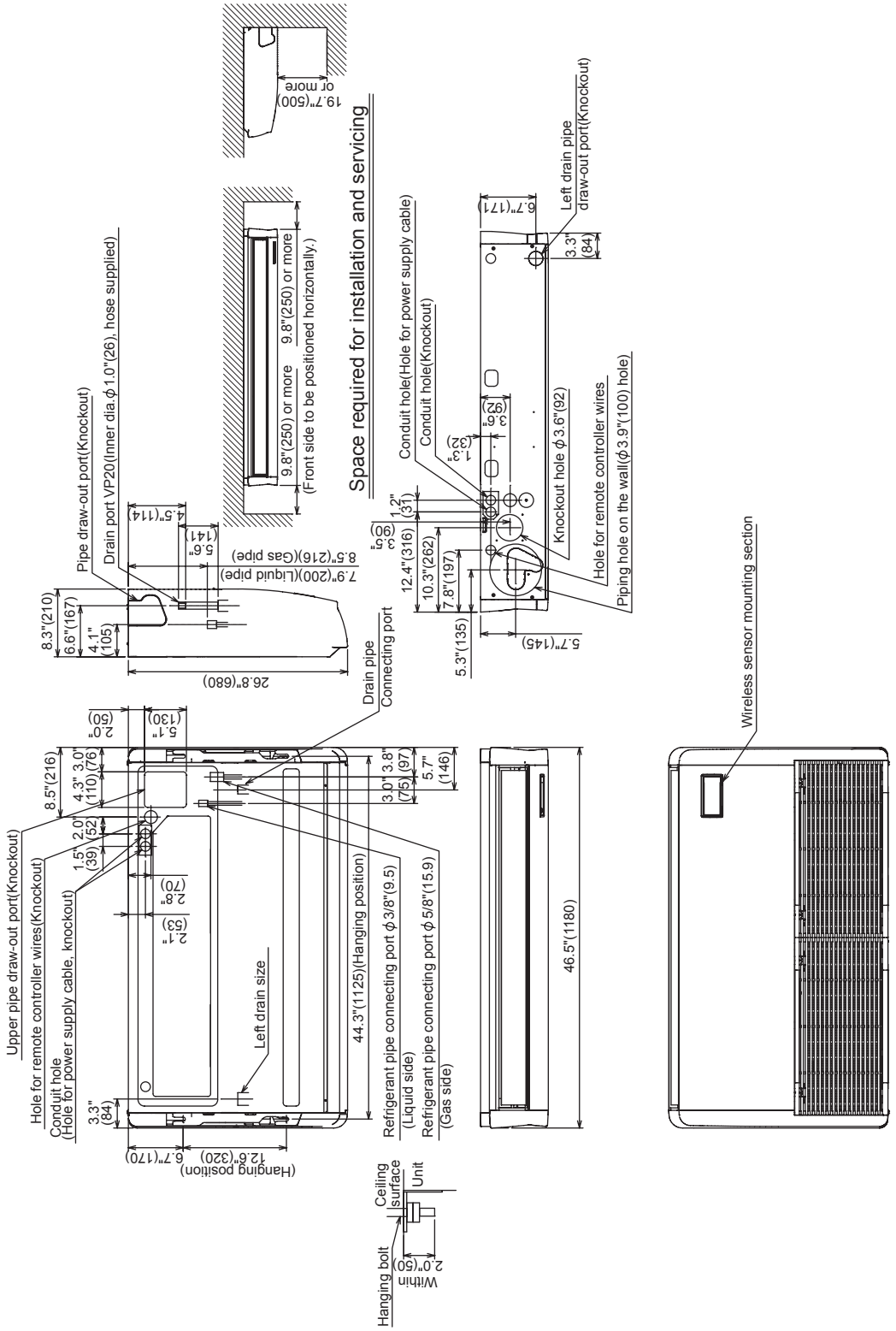
RAV-SP180CT-UL

Unit:in(mm)



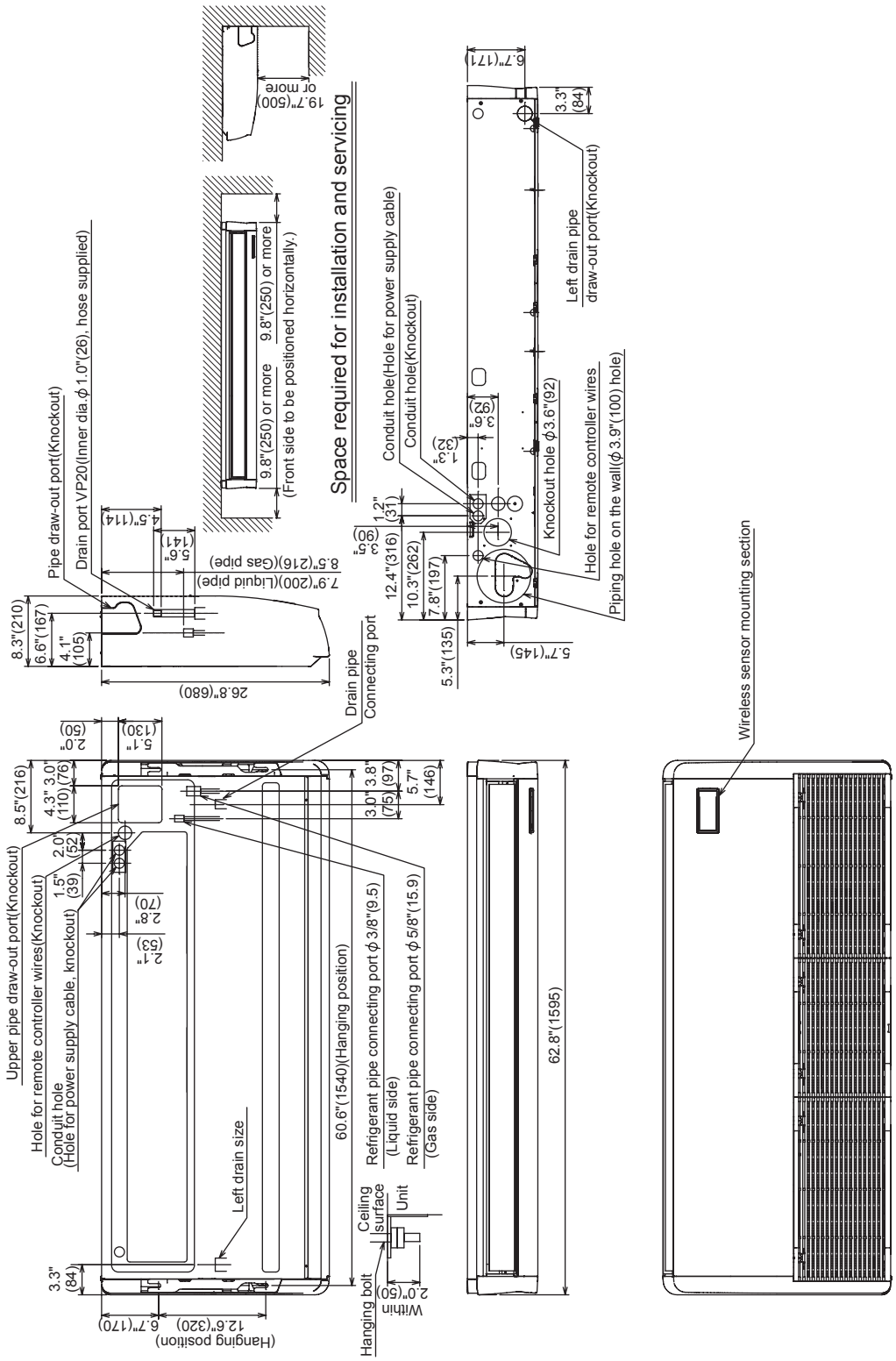
RAV-SP240CT-UL

Unit:in(mm)

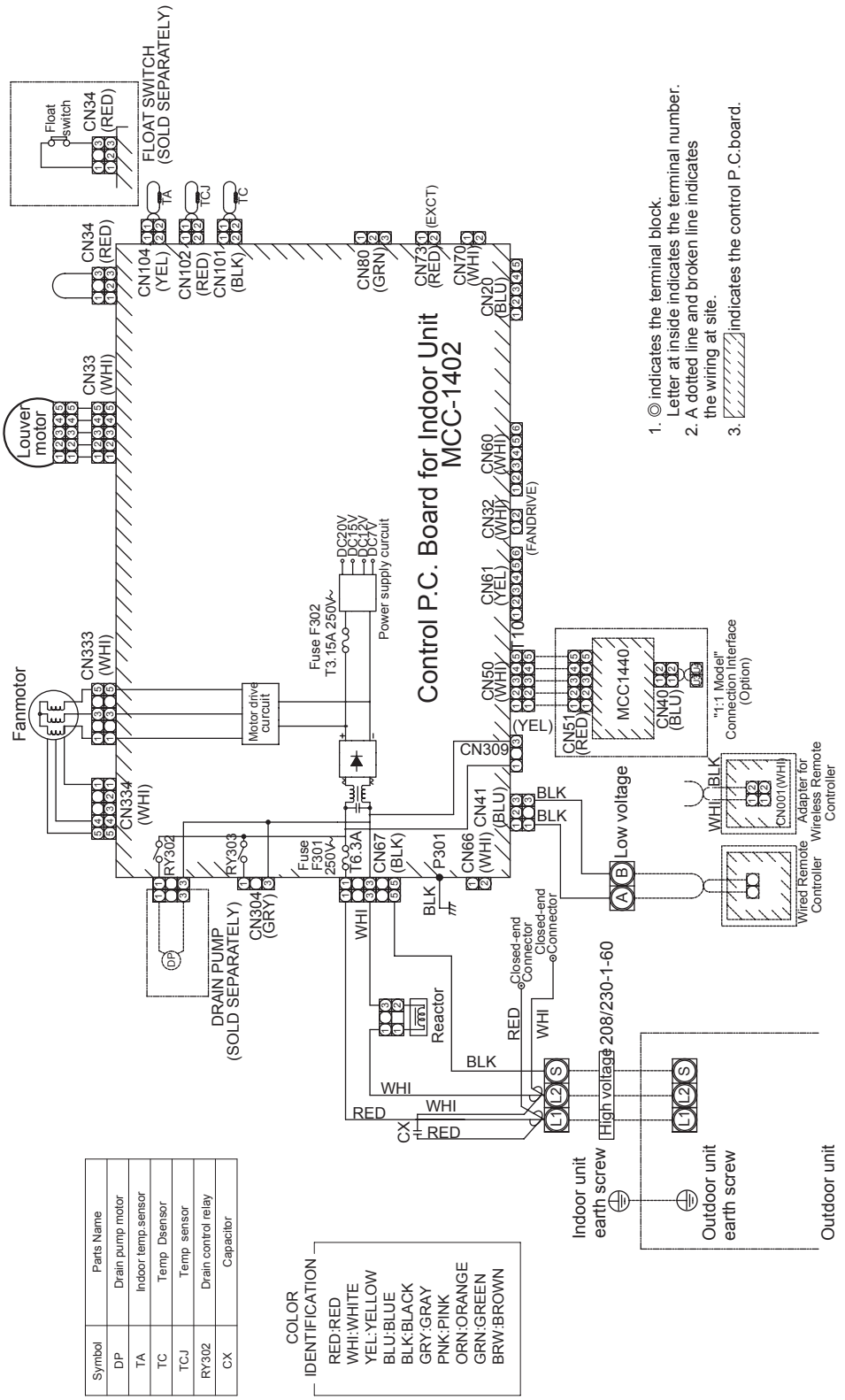


RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

Unit:in(mm)



3-3. Wiring diagram



3-4. 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	15900	9500	16800	10100	17600	10600	18200	10900	18800	11300	19400	11600	20000	12000	21100	12700	22100	13300
	54.0	15900	9500	16700	10000	17500	10500	18100	10900	18700	11200	19300	11600	19900	11900	21000	12600	22000	13200
	57.0	15800	9500	16600	10000	17400	10400	18000	10800	18700	11200	19200	11500	19700	11800	20900	12500	21900	13100
	61.0	15700	9400	16500	9900	17300	10400	17900	10700	18600	11200	19100	11500	19600	11800	20800	12500	21800	13100
	64.0	15500	9300	16300	9800	17100	10300	17800	10700	18400	11000	18900	11300	19400	11600	20600	12400	21500	12900
	68.0	15400	9200	16200	9700	17100	10300	17700	10600	18300	11000	18800	11300	19300	11600	20500	12300	21400	12800
	70.0	15400	9200	16200	9700	17000	10200	17600	10600	18200	10900	18700	11200	19200	11500	20400	12200	21300	12800
	73.0	15200	9100	16000	9600	16800	10100	17400	10400	18000	10800	18500	11100	19000	11400	20200	12100	21100	12700
	77.0	15000	9000	15800	9500	16600	10000	17200	10300	17800	10700	18300	11000	18800	11300	19900	11900	20800	12500
	81.0	14900	8900	15600	9400	16400	9800	17000	10200	17600	10600	18100	10900	18600	11200	19700	11800	20600	12400
	84.0	14600	8800	15400	9200	16100	9700	16700	10000	17300	10400	17800	10700	18300	11000	19400	11600	20300	12200
	88.0	14500	8700	15200	9100	16000	9600	16500	9900	17100	10300	17600	10600	18100	10900	19200	11500	20100	12100
	91.0	14200	8500	15000	9000	15700	9400	16200	9700	16800	10100	17300	10400	17800	10700	18800	11300	19700	11800
	95.0	14000	8400	14700	8800	15400	9200	16000	9600	16500	9900	17000	10200	17500	10500	18500	11100	19400	11600
	99.0	13700	8200	14400	8600	15100	9100	15700	9400	16200	9700	16700	10000	17200	10300	18200	10900	19000	11400
	102.0	13400	8000	14100	8500	14800	8900	15300	9200	15800	9500	16300	9800	16800	10100	17800	10700	18600	11200
	106.0	11700	7000	12400	7400	13000	7800	13400	8000	13900	8300	14300	8600	14700	8800	15600	9400	16300	9800
	109.0	11400	6800	12000	7200	12600	7600	13100	7900	13500	8100	13900	8300	14300	8600	15100	9100	15800	9500

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	22200	13700	23300	14400	24500	15200	25400	15700	26200	16200	27000	16700	27800	17200	29400	18200	30800	19100
	54.0	22000	13600	23200	14400	24300	15000	25200	15600	26000	16100	26800	16600	27600	17100	29200	18100	30500	18900
	57.0	21800	13500	23000	14200	24100	14900	25000	15500	25800	16000	26600	16500	27400	17000	29000	17900	30300	18700
	61.0	21800	13500	22900	14200	24000	14800	24900	15400	25700	15900	26500	16400	27300	16900	28900	17900	30200	18700
	64.0	21500	13300	22600	14000	23800	14700	24600	15200	25500	15800	26200	16200	26900	16600	28500	17600	29800	18400
	68.0	21400	13200	22500	13900	23600	14600	24400	15100	25300	15700	26000	16100	26700	16500	28300	17500	29600	18300
	70.0	21300	13200	22400	13900	23500	14500	24300	15000	25200	15600	25900	16000	26600	16500	28200	17400	29500	18300
	73.0	21100	13100	22200	13700	23300	14400	24100	14900	25000	15500	25700	15900	26400	16300	28000	17300	29300	18100
	77.0	20900	12900	22000	13600	23000	14200	23900	14800	24700	15300	25400	15700	26100	16100	27700	17100	28900	17900
	81.0	20600	12700	21700	13400	22800	14100	23600	14600	24400	15100	25100	15500	25800	16000	27300	16900	28600	17700
	84.0	20300	12600	21300	13200	22400	13900	23200	14400	24000	14800	24700	15300	25400	15700	26900	16600	28100	17400
	88.0	20000	12400	21100	13100	22100	13700	22900	14200	23700	14700	24400	15100	25100	15500	26600	16500	27800	17200
	91.0	19700	12200	20700	12800	21800	13500	22500	13900	23300	14400	24000	14800	24700	15300	26100	16100	27300	16900
	95.0	19400	12000	20400	12600	21400	13200	22200	13700	22900	14200	23600	14600	24300	15000	25700	15900	26900	16600
	99.0	19100	11800	20100	12400	21000	13000	21800	13500	22500	13900	23200	14400	23900	14800	25300	15700	26400	16300
	102.0	18600	11500	19600	12100	20600	12700	21300	13200	22100	13700	22700	14000	23300	14400	24700	15300	25900	16000
	106.0	16300	10100	17100	10600	18000	11100	18600	11500	19200	11900	19800	12200	20400	12600	21600	13400	22600	14000
	109.0	15900	9800	16700	10300	17500	10800	18100	11200	18700	11600	19300	11900	19900	12300	21000	13000	22000	13600

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
30k	50.0	28200	18900	29600	19800	31100	20800	32200	21600	33300	22300	34300	23000	35300	23700	37363	23114	39100	24200
	54.0	28000	18800	29500	19800	30900	20700	32000	21400	33100	22200	34100	22800	35100	23500	37145	22980	38900	24100
	57.0	27800	18600	29300	19600	30800	20600	31800	21300	32900	22000	33900	22700	34900	23400	36927	22845	38600	23900
	61.0	27600	18500	29000	19400	30500	20400	31600	21200	32600	21800	33600	22500	34600	23200	36600	22643	38300	23700
	64.0	27400	18400	28900	19400	30300	20300	31400	21000	32400	21700	33400	22400	34400	23000	36383	22508	38100	23600
	68.0	27200	18200	28600	19200	30000	20100	31100	20800	32200	21600	33100	22200	34000	22800	36056	22306	37700	23300
	70.0	27000	18100	28400	19000	29800	20000	30900	20700	32000	21400	32900	22000	33800	22600	35838	22171	37500	23200
	73.0	26800	18000	28200	18900	29600	19800	30600	20500	31700	21200	32600	21800	33500	22400	35511	21969	37100	23000
	77.0	26500	17800	27900	18700	29300	19600	30300	20300	31400	21000	32300	21600	33200	22200	35184	21767	36800	22800
	81.0	26200	17600	27600	18500	28900	19400	30000	20100	31000	20800	31900	21400	32800	22000	34749	21497	36300	22500
	84.0	25800	17300	27100	18200	28500	19100	29500	19800	30500	20400	31400	21000	32300	21600	34204	21160	35800	22100
	88.0	25500	17100	26800	18000	28100	18800	29100	19500	30100	20200	31000	20800	31900	21400	33768	20891	35300	21800
	91.0	25100	16800	26400	17700	27700	18600	28600	19200	29600	19800	30500	20400	31400	21000	33224	20554	34700	21500
	95.0	24600	16500	25900	17400	27200	18200	28200	18900	29100	19500	30000	20100	30900	20700	32679	20217	34200	21200
	99.0	24100	16100	25400	17000	26700	17900	27600	18500	28600	19200	29400	19700	30200	20200	32025	19812	33500	20700
	102.0	23700	15900	24900	16700	26100	17500	27100	18200	28000	18800	28800	19300	29600	19800	31372	19408	32800	20300
	106.0	20700	13900	21800	14600	22900	15300	23700	15900	24500	16400	25200	16900	25900	17400	27450	16982	28710	17761
	109.0	20100	13500	21200	14200	22200	14900	23000	15400	23800	15900	24500	16400	25200	16900	26688	16510	27913	17268

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	25500	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	22000	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
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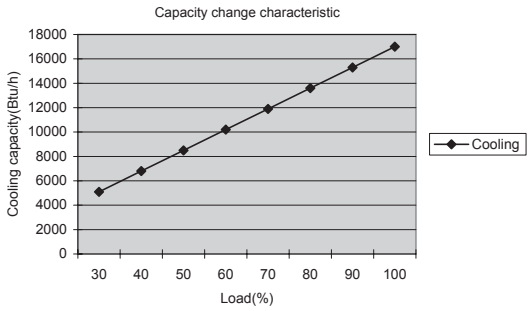
unit size	outdoor air temp. DB	57 WB 68 DB		59 WB 71 DB		61 WB 73 DB		63 WB 76 DB		64 WB 79 DB		66 WB 81 DB		68 WB 82 DB		72 WB 86 DB		75 WB 90 DB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
42k	50.0	38500	25100	40500	26400	42500	27700	44100	28700	45600	29700	46900	30500	48200	31400	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

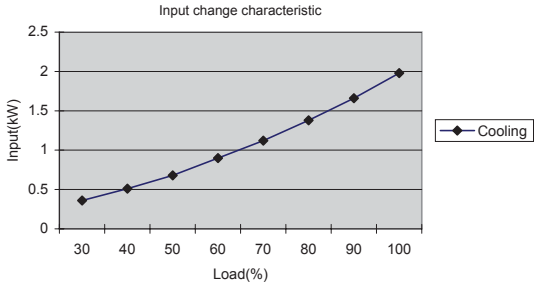
TC:Total Capacity [Btu/h]
SHC:Sensible Heat Capacity [Btu/h]

3-5. Capacity / Input change characteristic

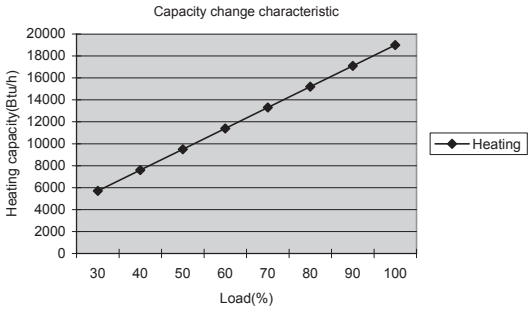
RAV-SP180CT-UL/RAV-SP180AT2-UL

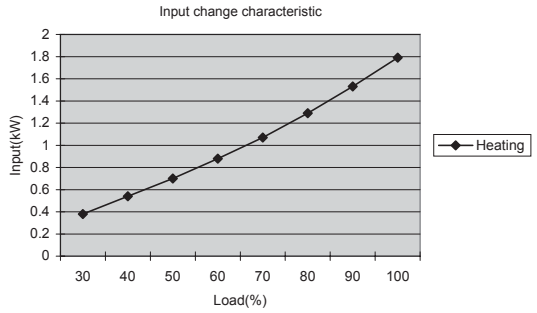
Cooling





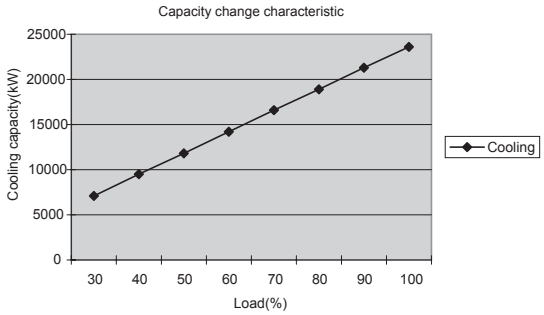
Heating

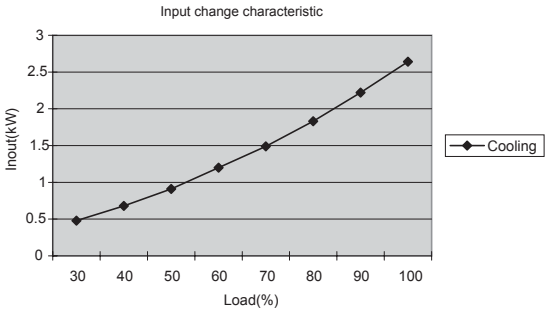




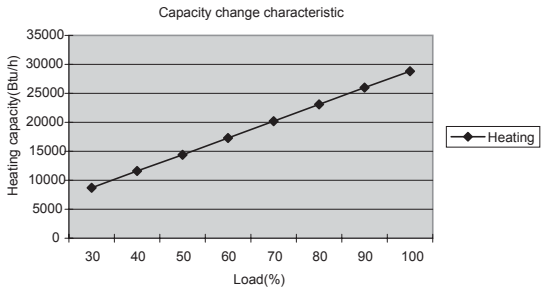
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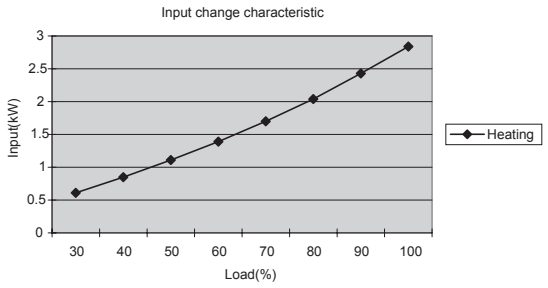
Cooling





Heating

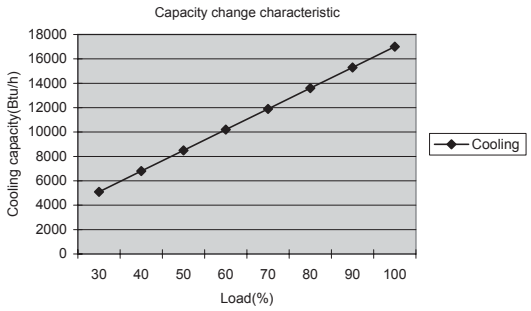


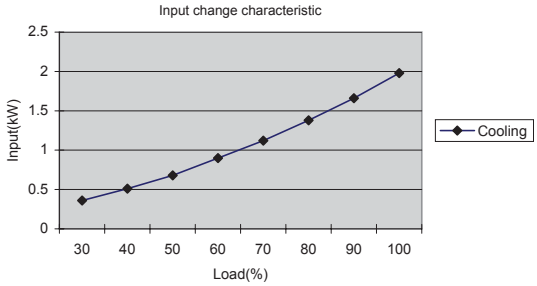


3-5. Capacity / Input change characteristic

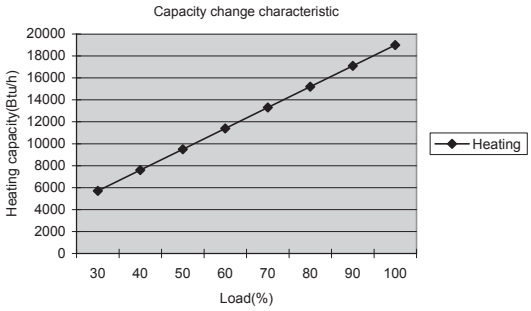
RAV-SP180CT-UL/RAV-SP180AT2-UL

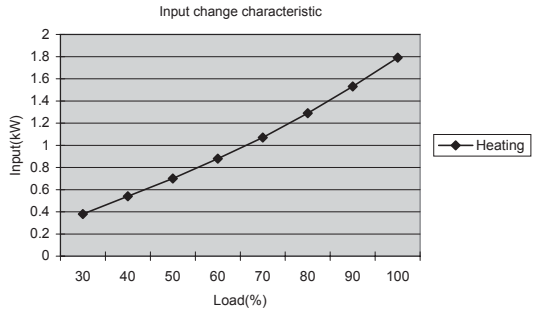
Cooling





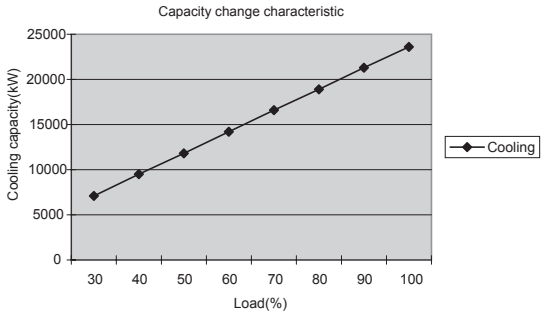
Heating

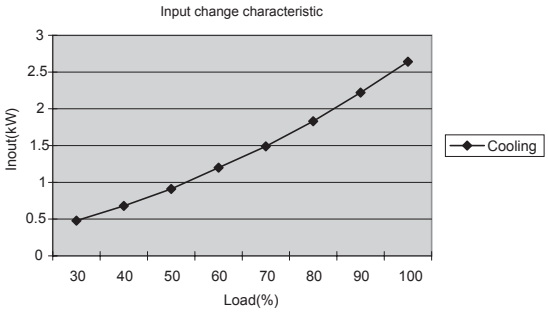




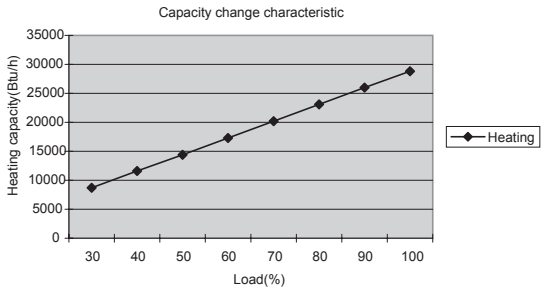
RAV-SP240CT-UL/RAV-SP240AT2-UL

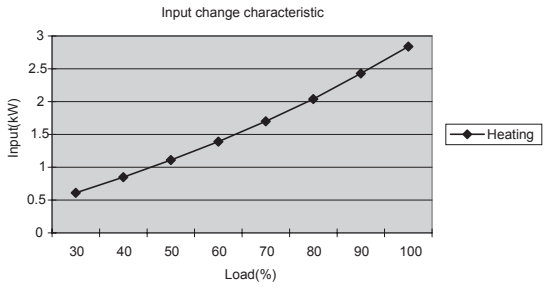
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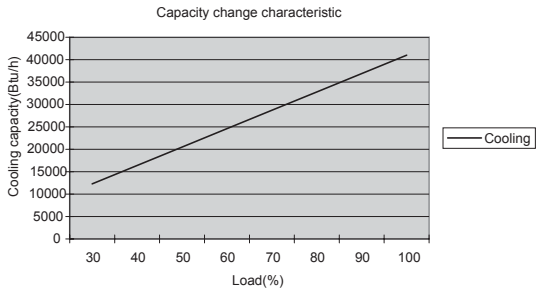
Heating

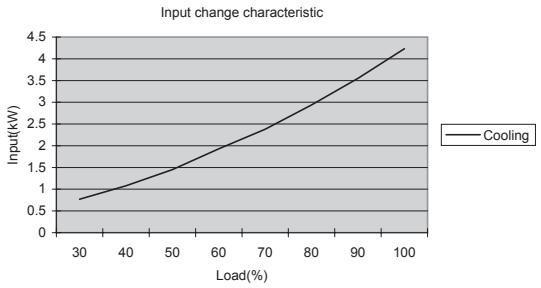




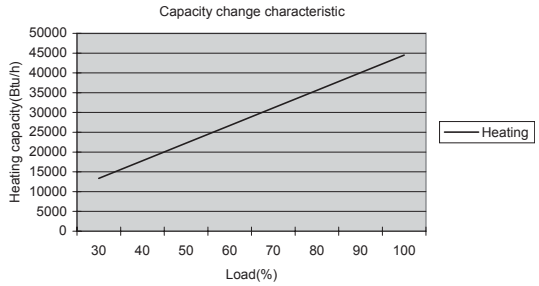
RAV-SP420CT-UL/RAV-SP420AT2-UL

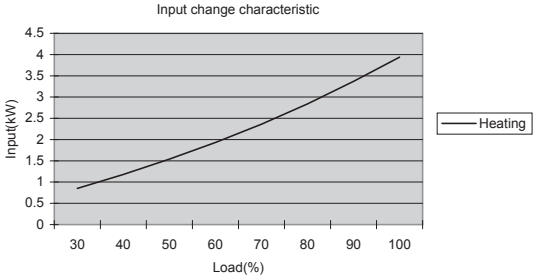
Cooling





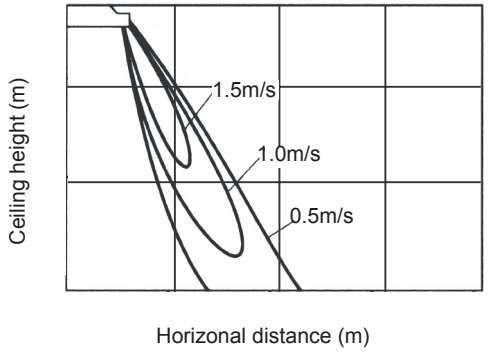
Heating



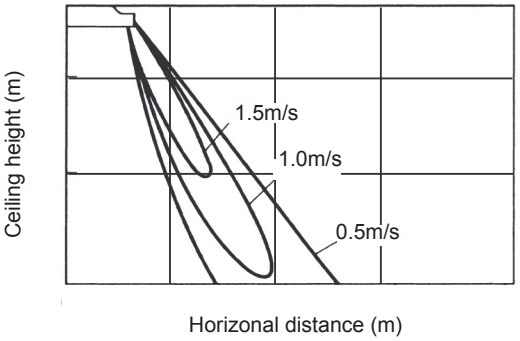


3-6. Air speed characteristics

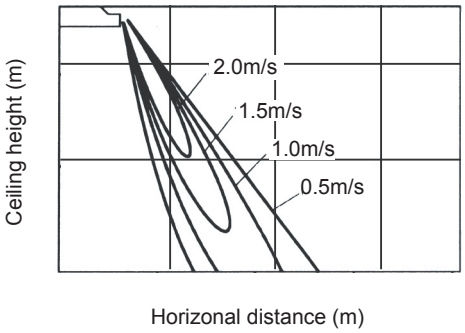
RAV-SP180CT-UL



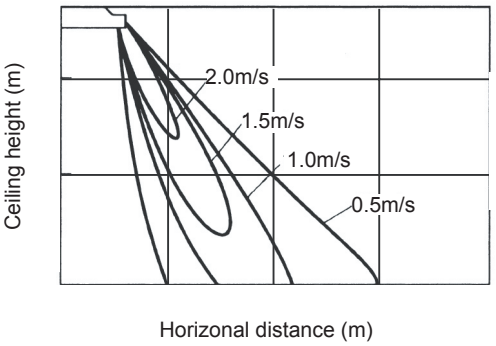
RAV-SP240CT-UL



RAV-SP300CT-UL



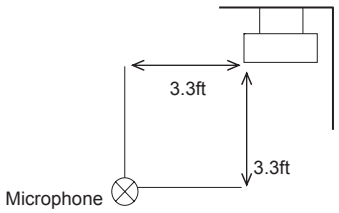
RAV-SP360CT-UL, RAV-SP420CT-UL



3-7. Sound characteristics (NC curve)

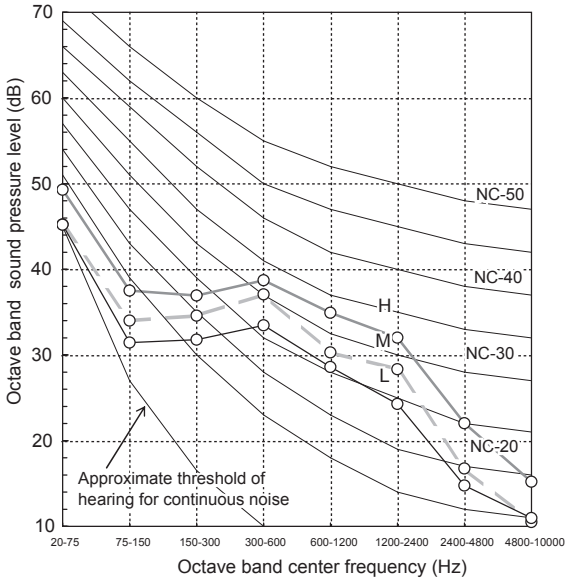
▮ Ceiling Type

[Measuring location]



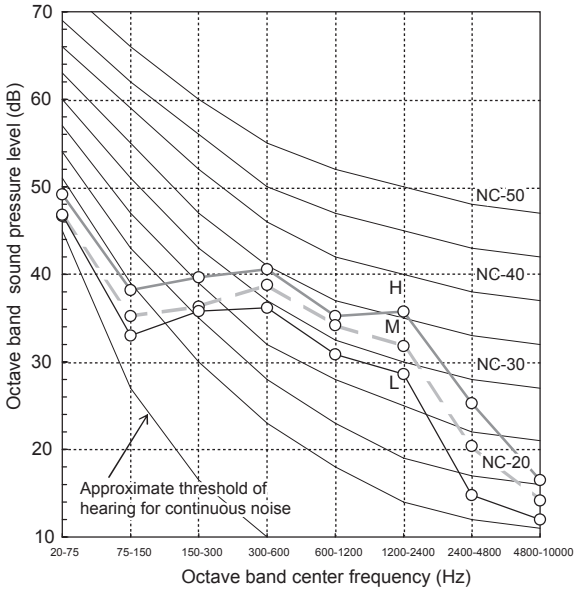
RAV-SP180CT-UL

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



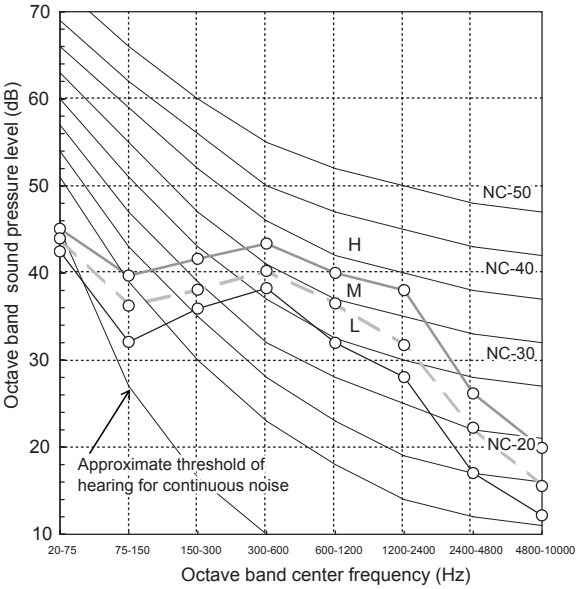
RAV-SP240CT-UL

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



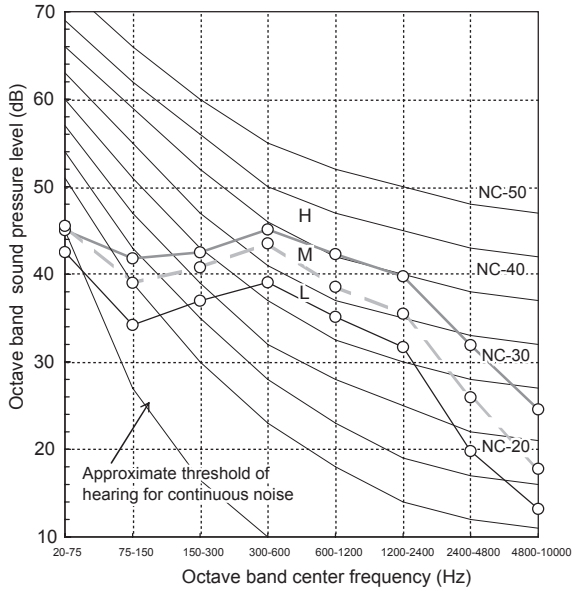
RAV-SP300CT-UL

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



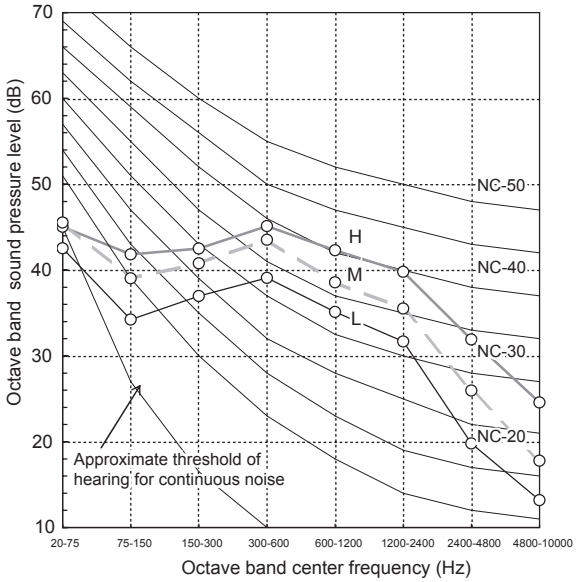
RAV-SP360CT-UL

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



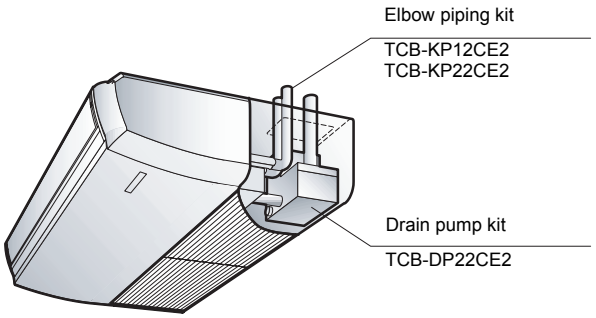
RAV-SP420CT-UL

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



3-8. Accessory

▮ Optional accessories



Name	Model name	Note
Drain Pump Kit	TCB-KP22CUL	Stand-up 600 or less (from bottom face of ceiling) RAV-SP180CT-UL Type (Use with TCB-KP12CUL) RAV-SP0240/300/360/480CT-UL (Use with TCB-KP22CUL)
Elbow Piping Kit	TCB-KP12CUL	Needed when Drain Pump Kid is used
	TCB-DP22CUL	

Contents

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4-6. Air Speed Characteristics 41
4-7. Sound Characteristics (NC curve). 42
4-8. Accessory 43

4. HIGH WALL TYPE

4-1. Specifications

Highwall USA

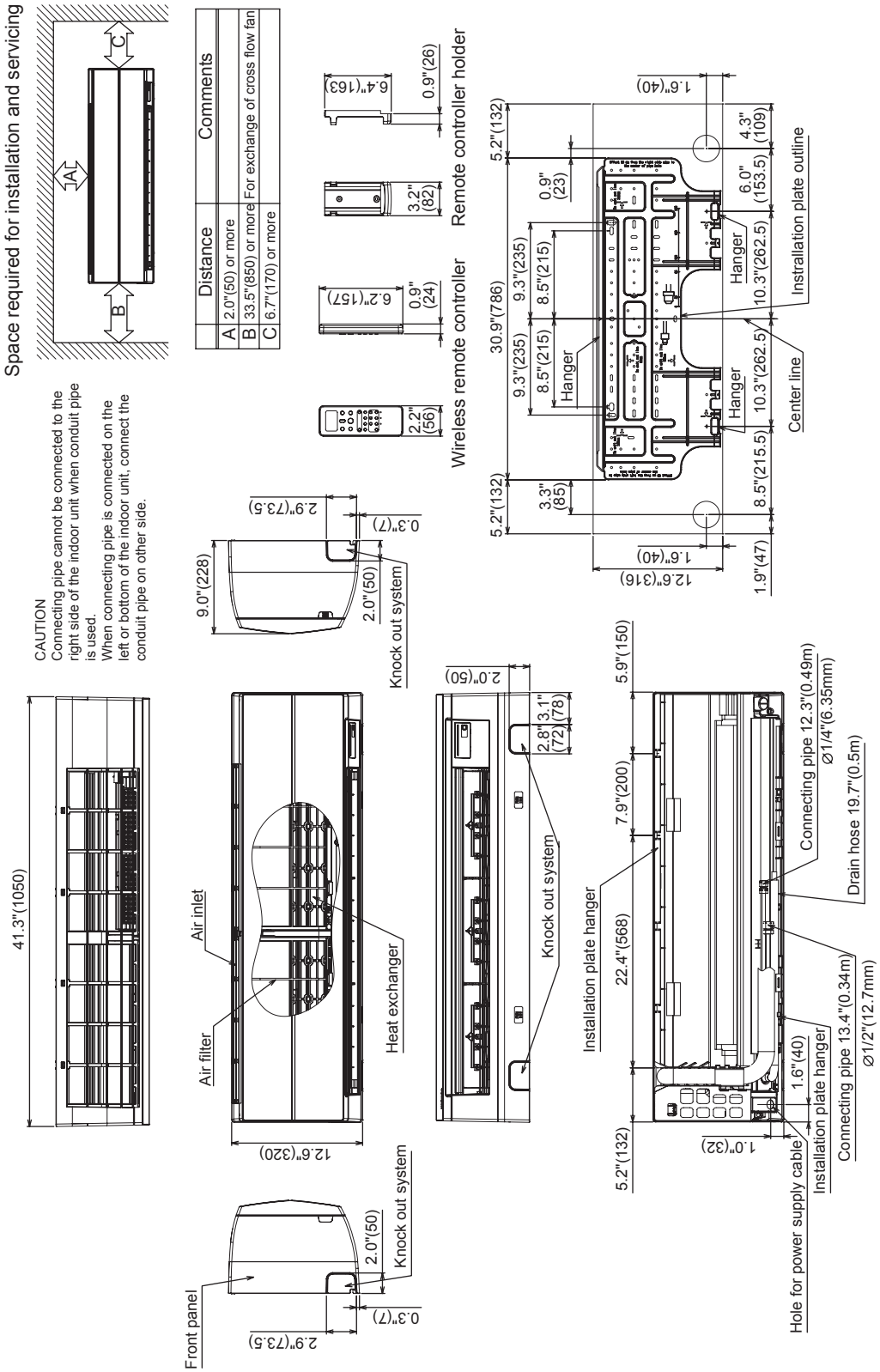
System	Size		018	024
	Outdoor Model		RAV-SP180AT2-UL	RAV-SP240AT2-UL
	Indoor Model		RAV-SP180KRT-UL	RAV-SP240KRT-UL
Performance	Cooling Rated Capacity (Btu/h)		18000	25000
	SEER		19.5	16.7
	EER		10.0	9.1
	Heating Rated Capacity (Btu/h)		19000	26400
	HSPF		11.5	9.8
Controls	Wireless (°C, °F, Convertible)		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	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

Note
*1 : 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 : When field fabricated wind baffles are installed
The minimum outside air temperature for sizes 18 & 24 is 5°F (-15°C) and for sizes 30, 36 & 42 is -13°F (-25°C) on units starting with serial number 611***** starting with production from November 2016.
*3 : UL value

4-2. Dimension

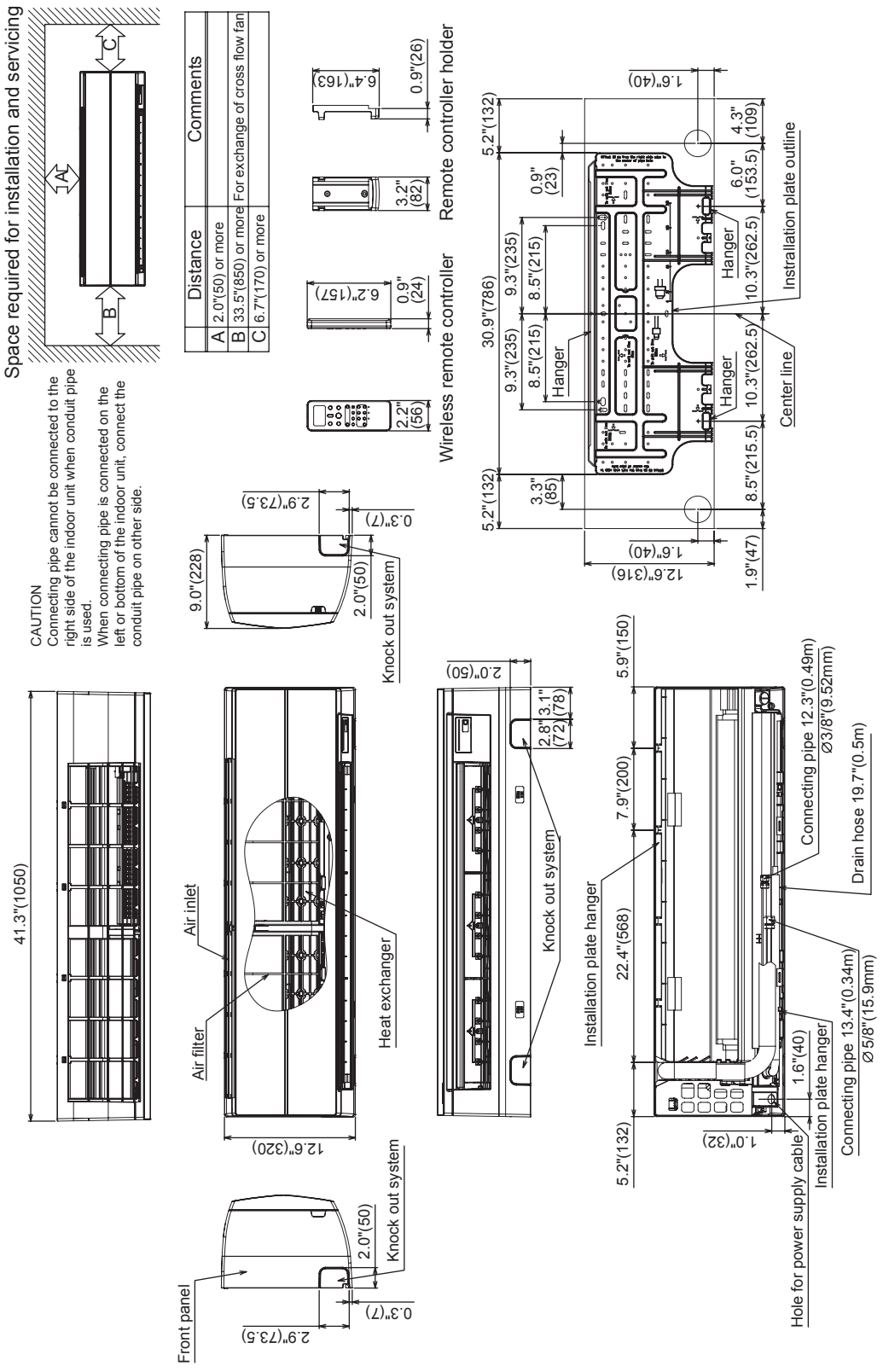
RAV-SP180KRT-UL

Unit:in(mm)

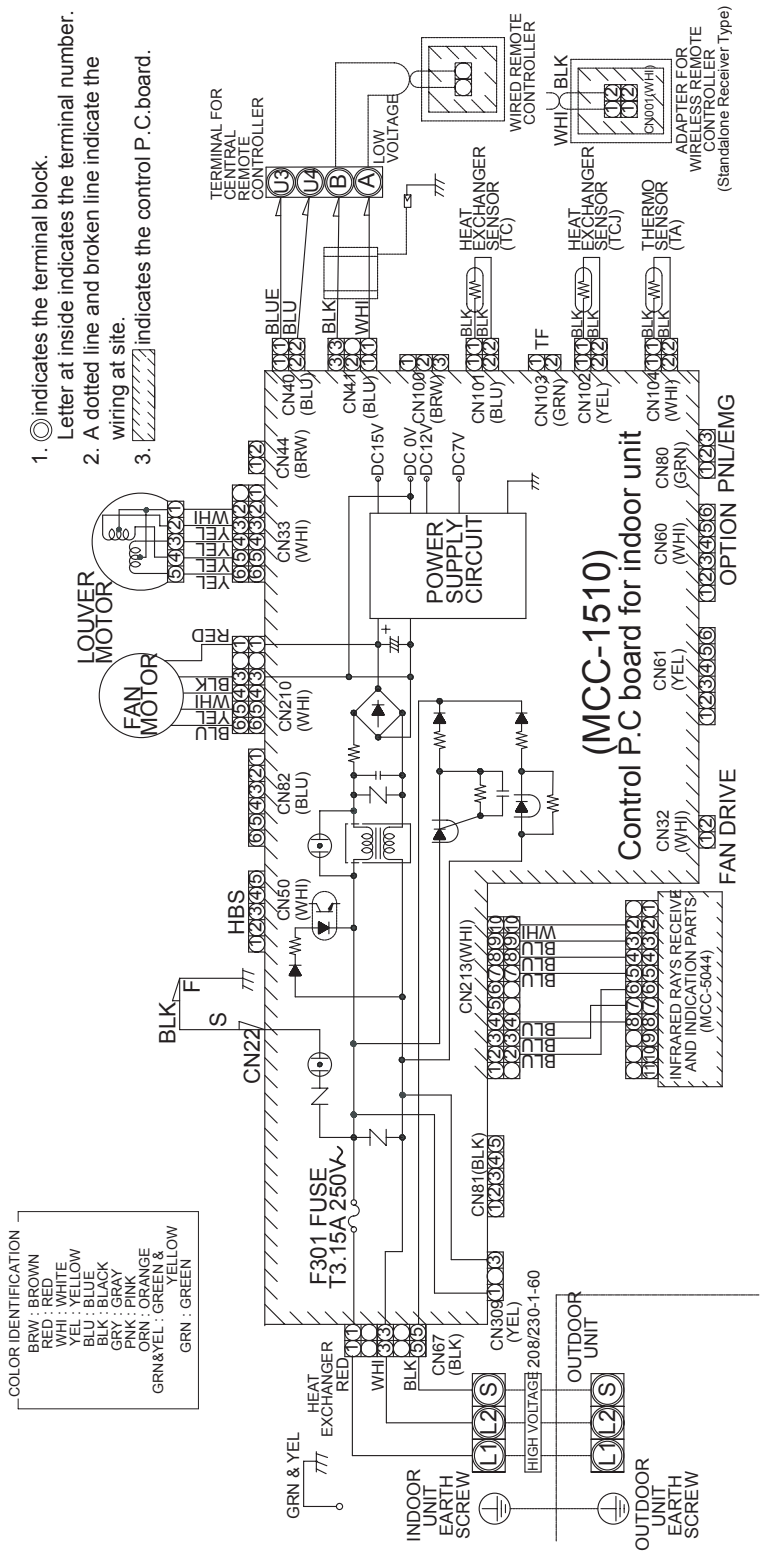


RAV-SP240KRT-UL

Unit:in(mm)



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
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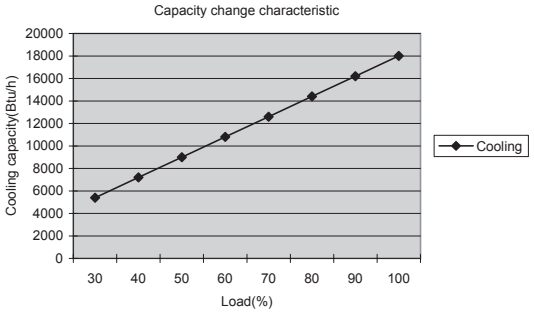
unit size	outdoor air temp. DB	57 WB 68 DB		59 WB 71 DB		61 WB 73 DB		63 WB 76 DB		64 WB 79 DB		66 WB 81 DB		68 WB 82 DB		72 WB 86 DB		75 WB 90 DB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
24k	50.0	23500	14900	24700	15600	25900	16400	26900	17000	27800	17600	28600	18100	29400	18600	31200	19700	32600	20600
	54.0	23300	14700	24500	15500	25800	16300	26700	16900	27600	17400	28400	17900	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	27900	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

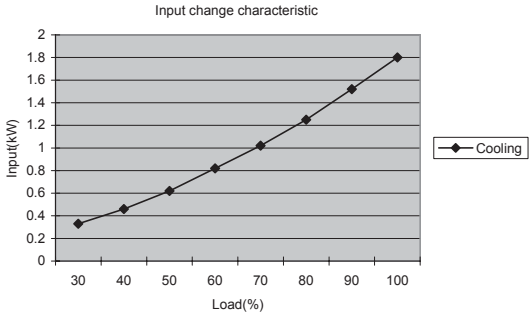
TC:Total Capacity [Btu/h]
SHC:Sensible Heat Capacity [Btu/h]

4-5. Capacity / Input change characteristic

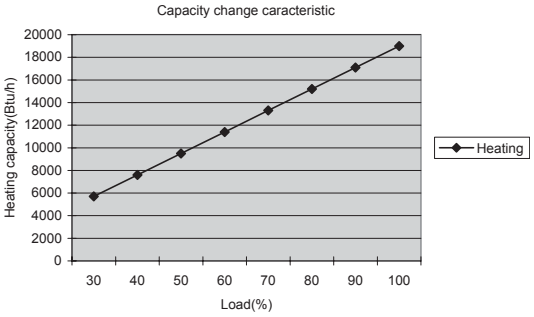
RAV-SP180KRT-UL/RAV-SP180AT2-UL

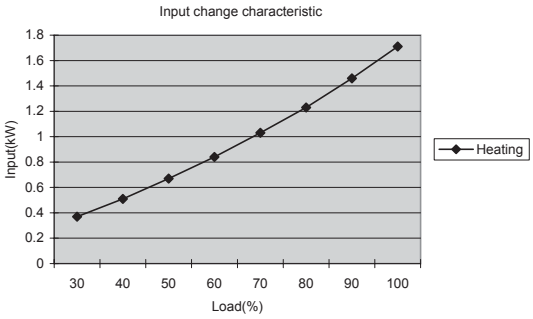
Cooling





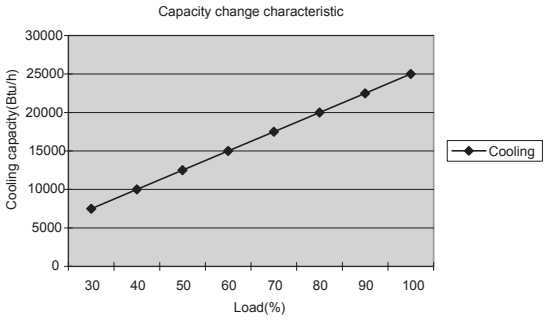
Heating

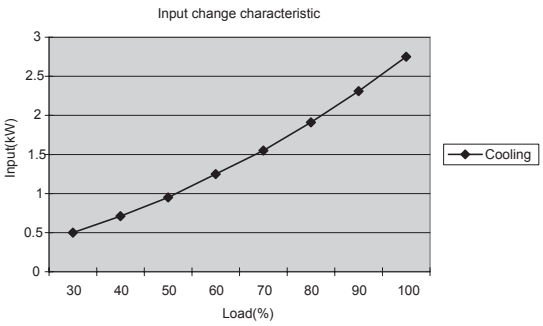




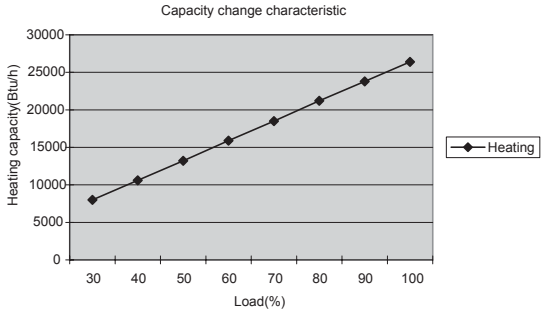
RAV-SP240KRT-UL/RAV-SP240AT2-UL

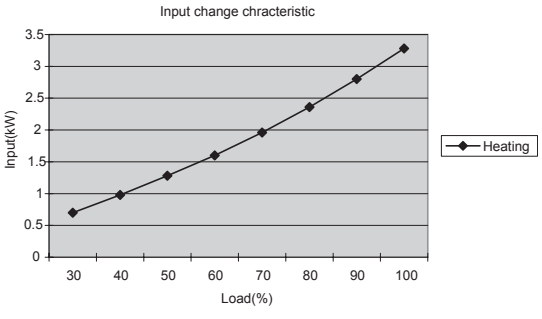
Cooling





Heating



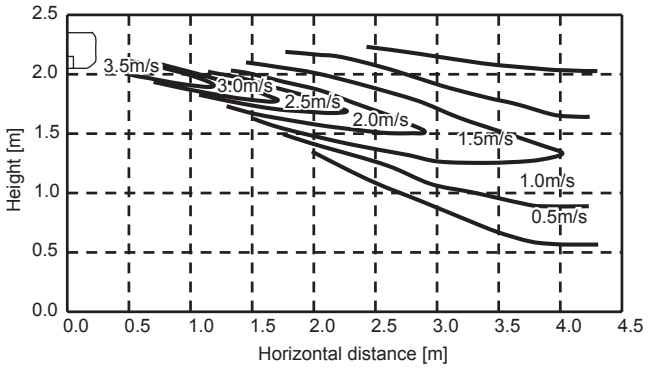


4-6. Air Speed Characteristics

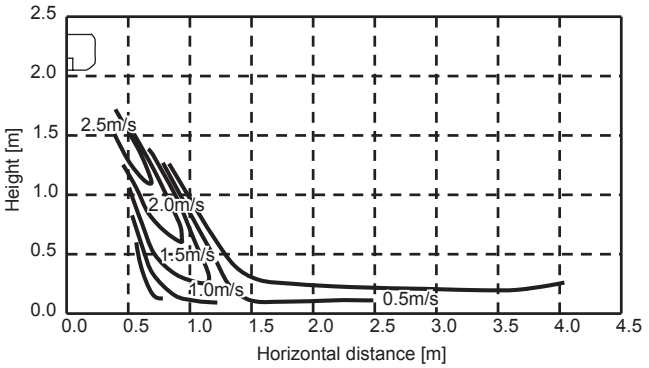
▮ Air Speed Distribution

RAV-SP180KRT-UL

Cooling

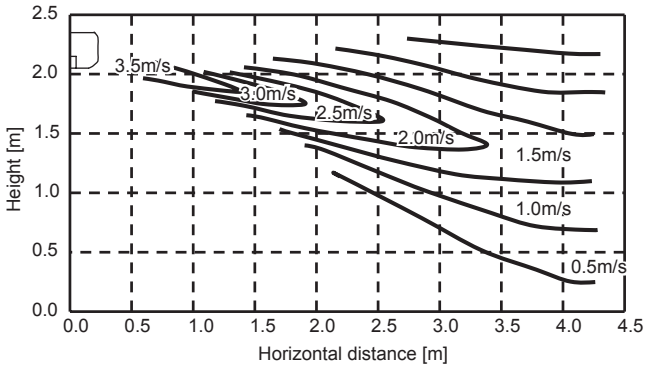


Heating

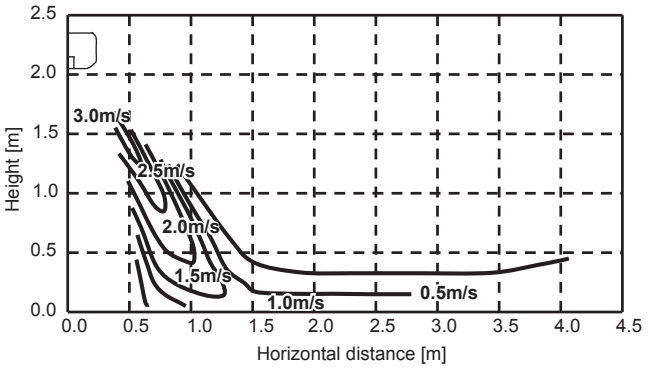


RAV-SP240KRT-UL

Cooling



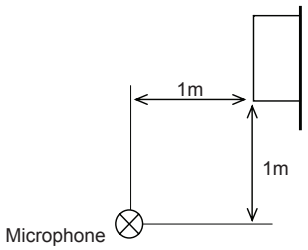
Heating



4-7. Sound Characteristics (NC curve)

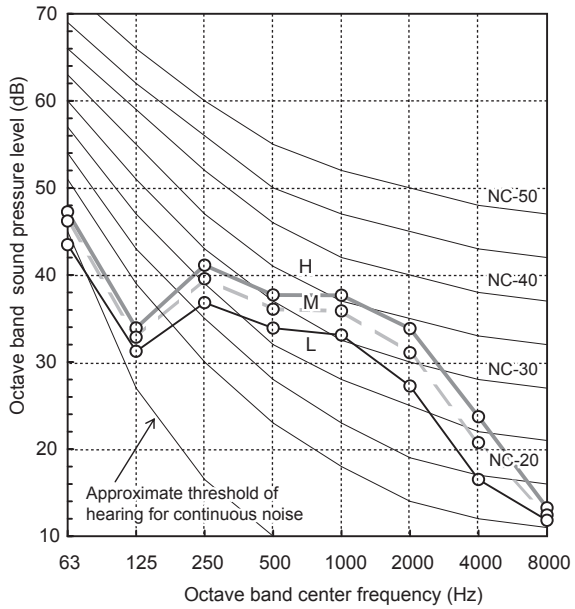
▮ High Wall Type

[Measuring location]



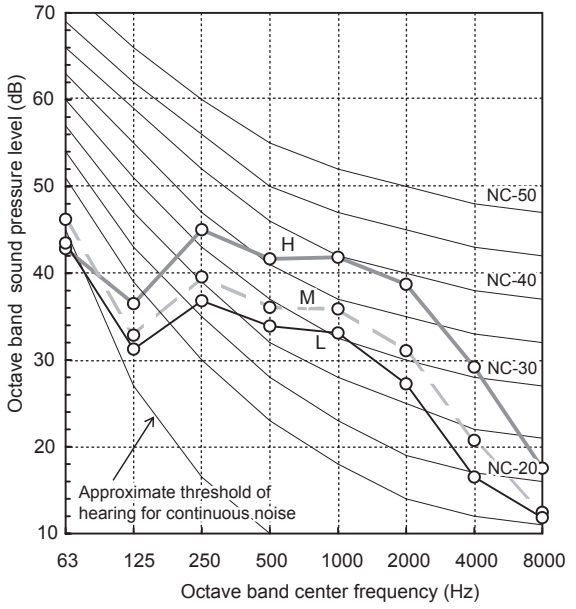
RAV-SP180KRT-UL

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



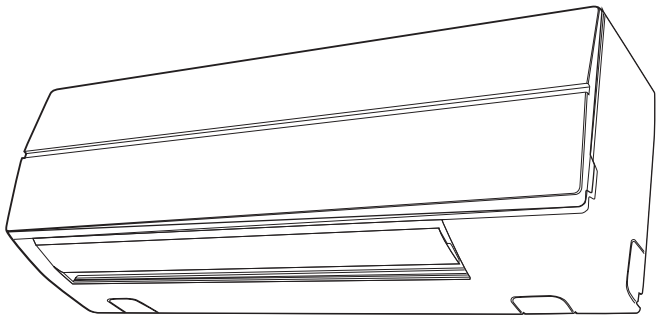
RAV-SP240KRT-UL

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



4-8. Accessory

▮ Apperarance



Contents

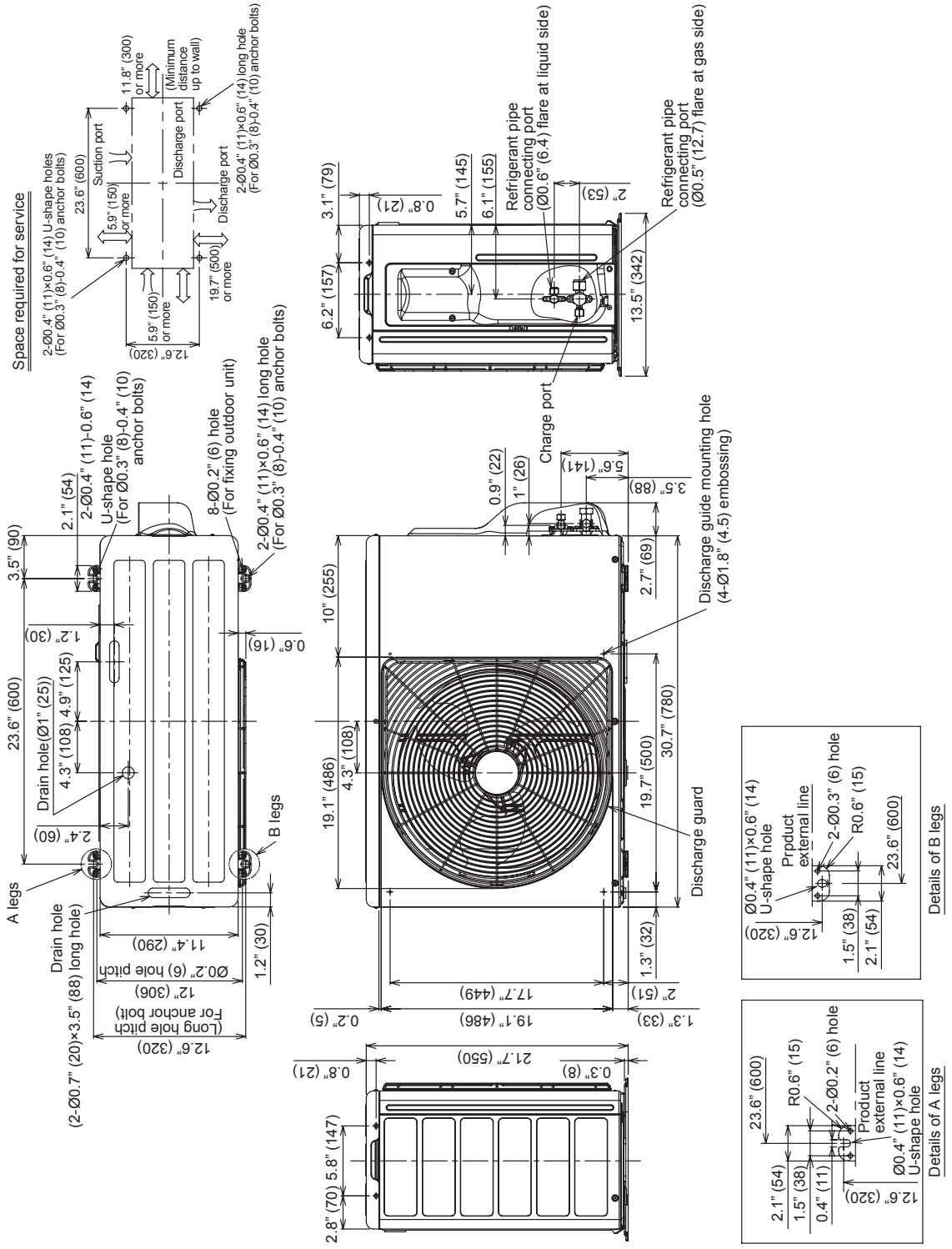
5. OUTDOOR UNIT 45
5-1. Dimension 45
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5-4. Refrigerant Cycle Diagram 52
5-5. Sound Characteristics (NC curve). 56
5-6. Capacity Correction. 57

5. OUTDOOR UNIT

5-1. Dimension

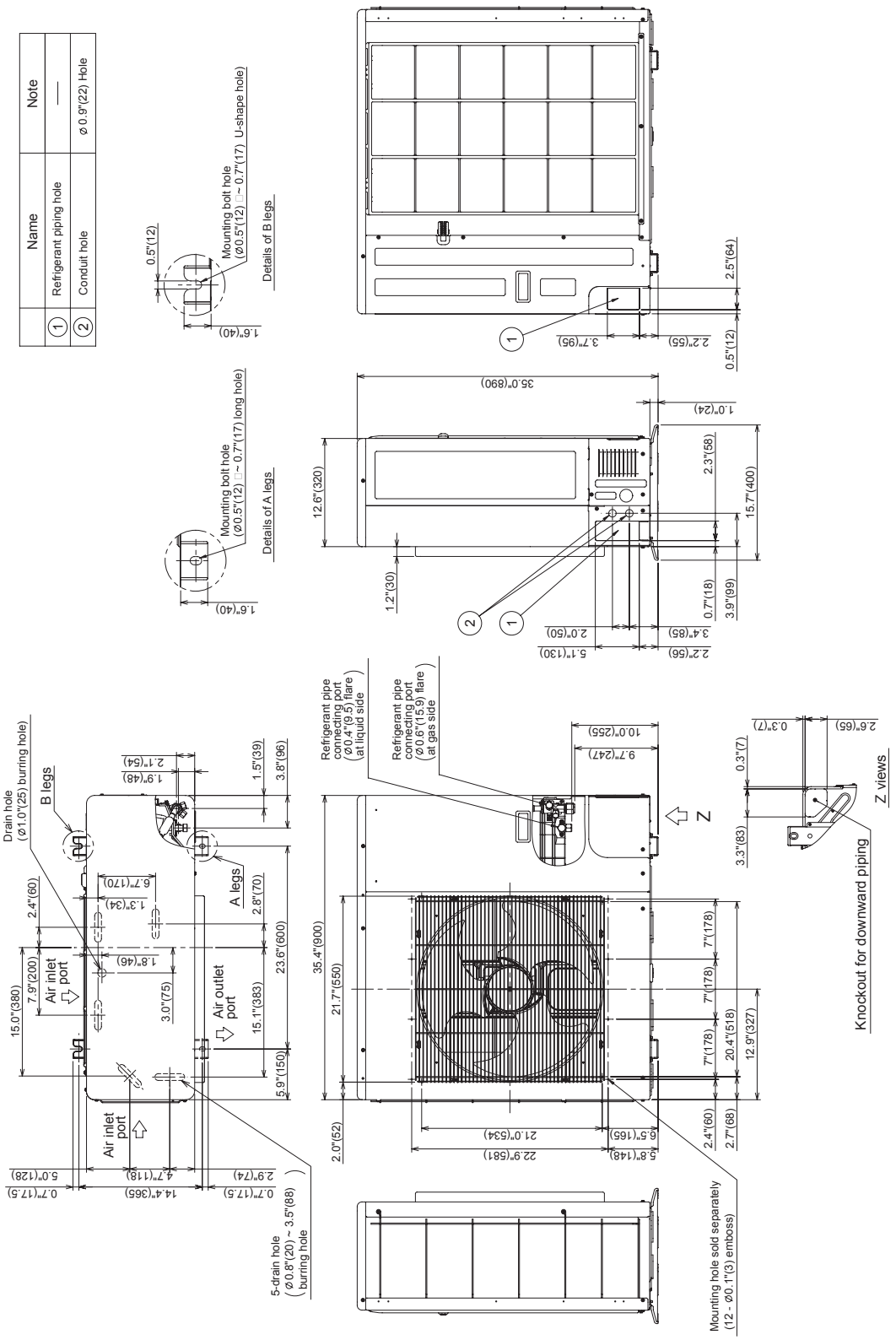
RAV-SP180AT2-UL

Unit:in(mm)



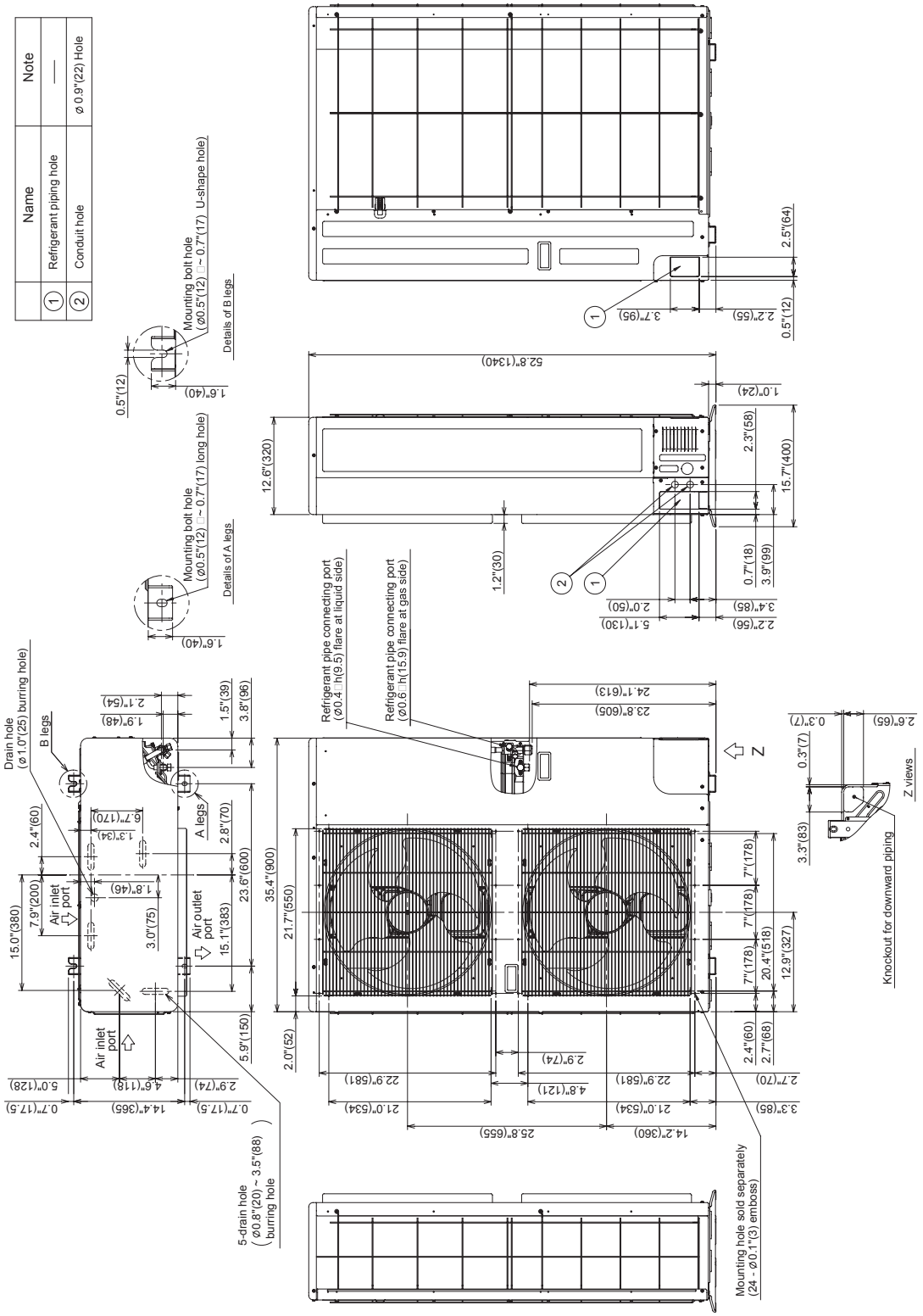
RAV-SP240AT2-UL

Unit:in(mm)



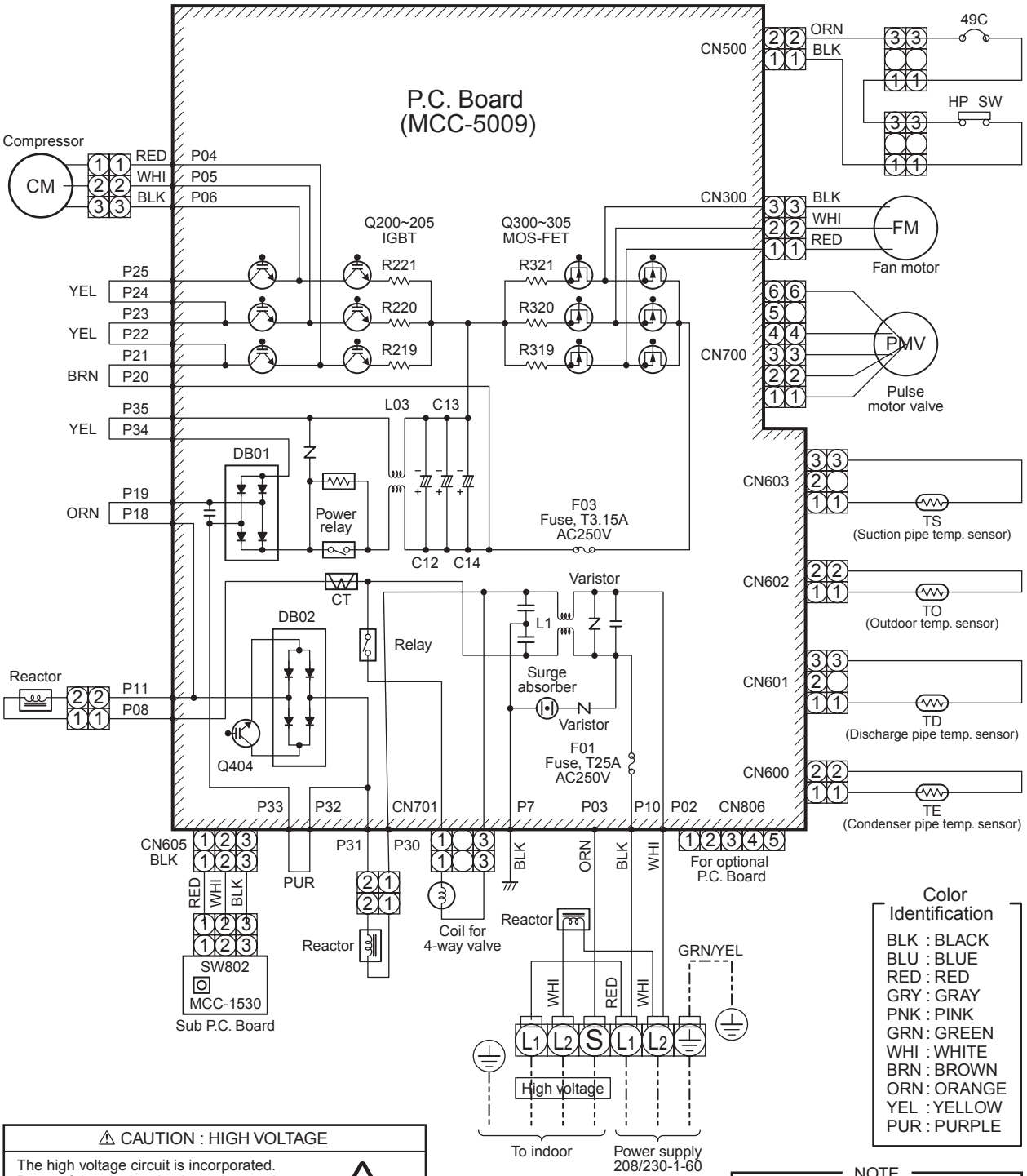
RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL

Unit:in(mm)



5-2. Wiring Diagram

RAV-SP180AT2-UL



Color Identification

BLK	: BLACK
BLU	: BLUE
RED	: RED
GRY	: GRAY
PNK	: PINK
GRN	: GREEN
WHI	: WHITE
BRN	: BROWN
ORN	: ORANGE
YEL	: YELLOW
PUR	: PURPLE

⚠ 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.

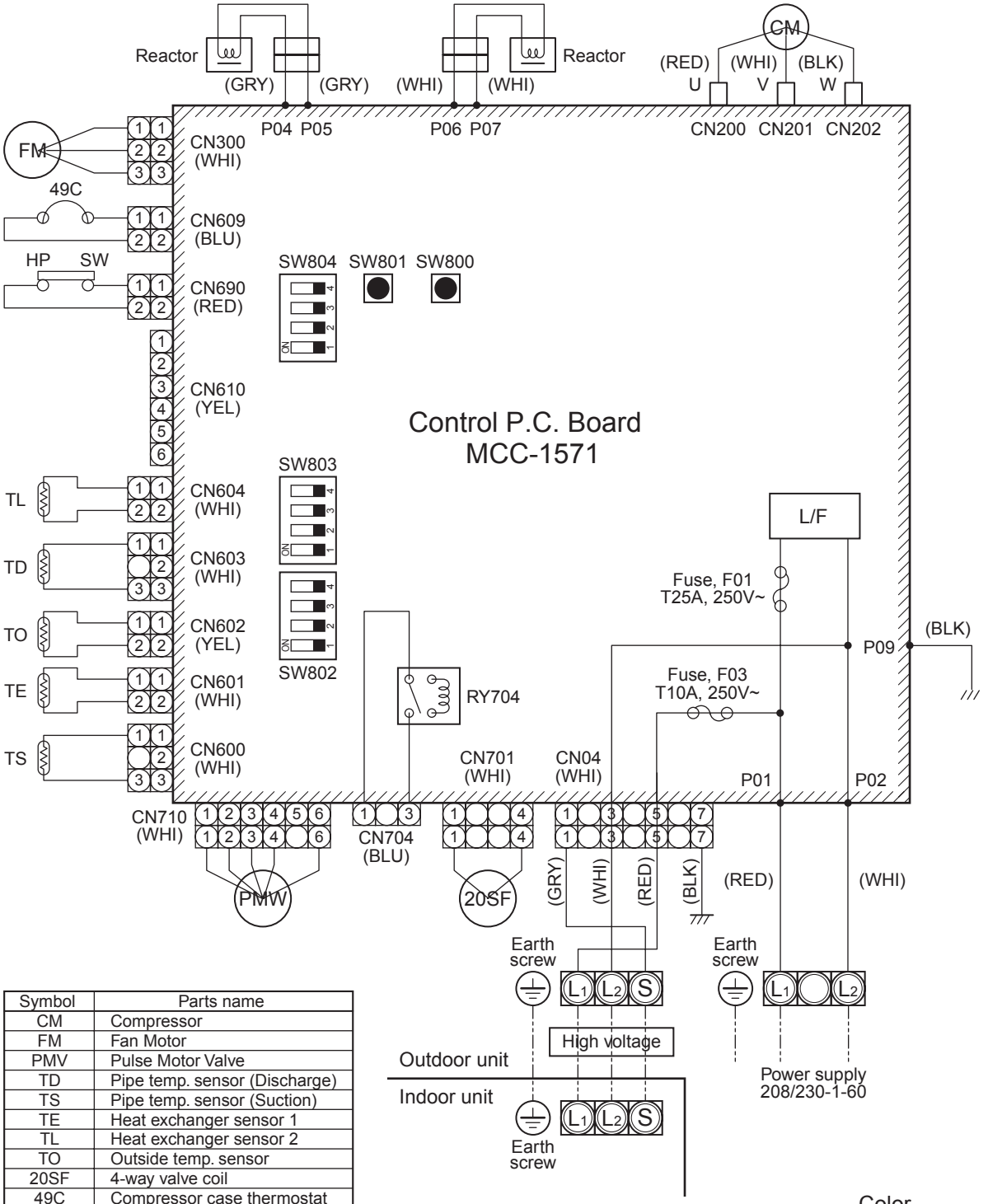
The 4-way valve coil is turned on while the cooling operation

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	: Curreut Transformer
49C	: Compressor Case Thermostat
HP SW	: High pressure switch

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.

RAV-SP240AT2-UL



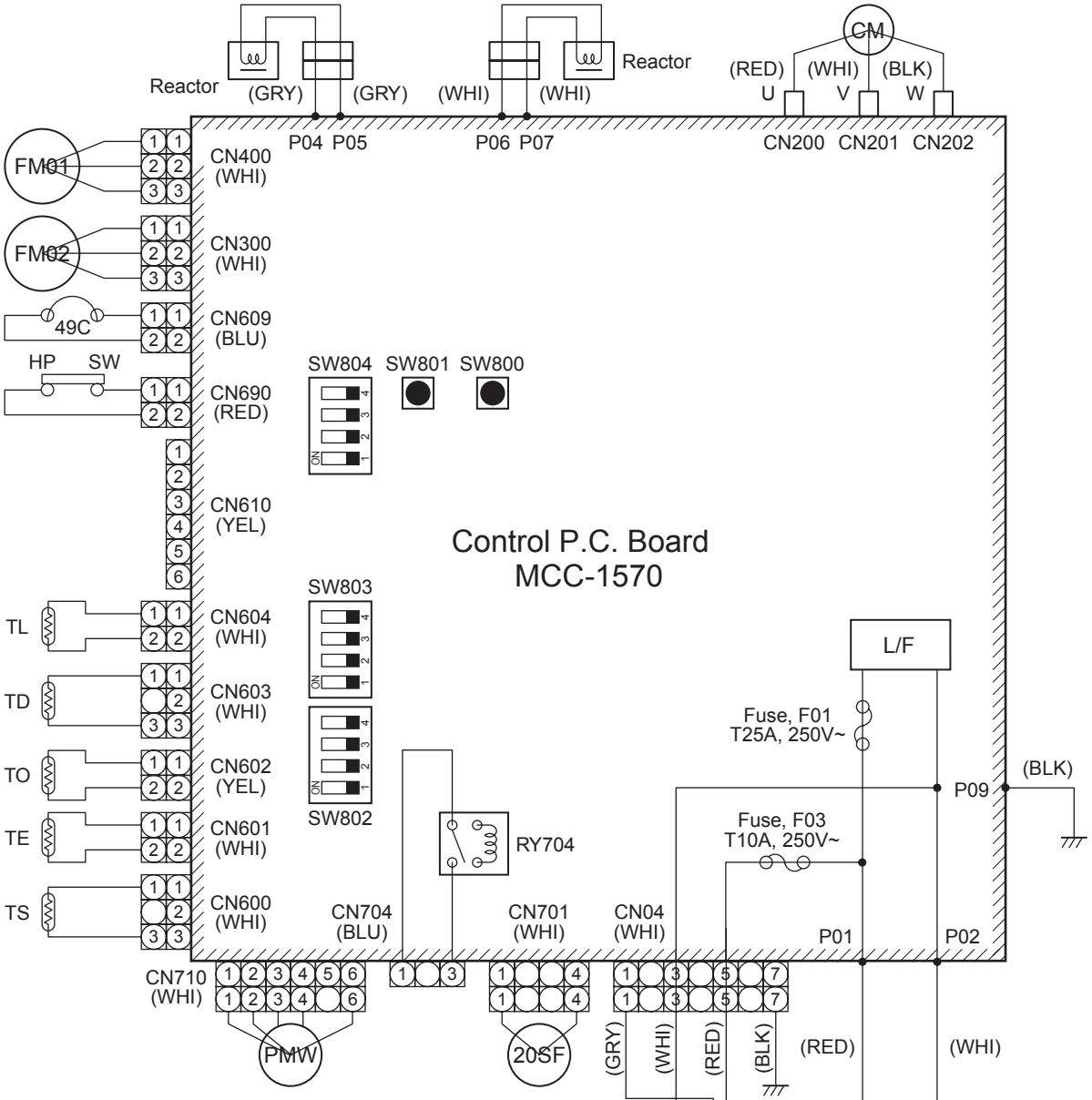
Symbol	Parts name
CM	Compressor
FM	Fan Motor
PMV	Pulse Motor Valve
TD	Pipe temp. sensor (Discharge)
TS	Pipe temp. sensor (Suction)
TE	Heat exchanger sensor 1
TL	Heat exchanger sensor 2
TO	Outside temp. sensor
20SF	4-way valve coil
49C	Compressor case thermostat
HP SW	High pressure switch
RY	Relay
L/F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



Symbol	Parts name
CM	Compressor
FM01, 02	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

Color Identification

BLK	:	BLACK
BLU	:	BLUE
RED	:	RED
GRY	:	GRAY
WHI	:	WHITE
YEL	:	YELLOW

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.

5-3. Wiring Design

Connecting power and control cables (Field supplied)

- The main power is supplied to the outdoor unit. The field supplied connecting cables from the outdoor unit to the indoor unit consist for 4 wires and provides the power for the indoor unit as well as the communication signal between the outdoor and Indoor unit.
- Consult local building codes, NEC (National Electrical Code) or CEC (Canadian Electrical Code) for special requirements.
- The following are the electrical requirements.

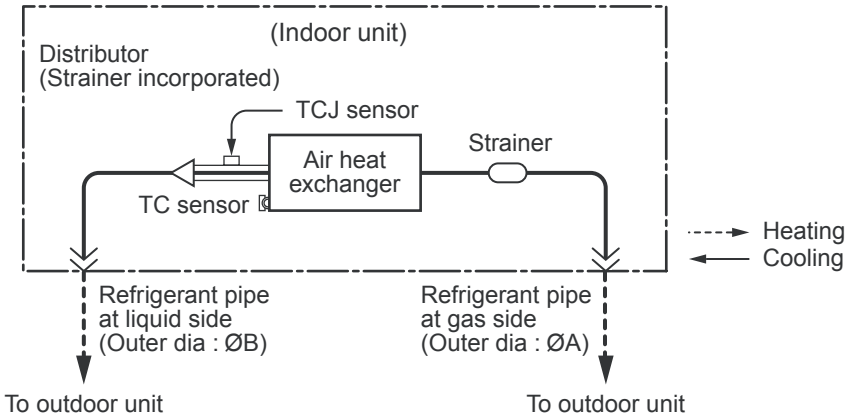
Model RAV-	SP180	SP240	SP300/360/420
Power supply	208/230 V~, 60 Hz	208/230 V~, 60 Hz	208/230 V~, 60 Hz
MCA	17 A	24 A	24 A
MOCP (MAX Fuse/CB)	30 A	40 A	40 A
System interconnection wires	4 x AWG14	AWG14	AWG14

MCA = Minimum Circuit Amps
MOCP = Maximum Over Protection Device Amps.

5-4. Refrigerant Cycle Diagram

Indoor Unit

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

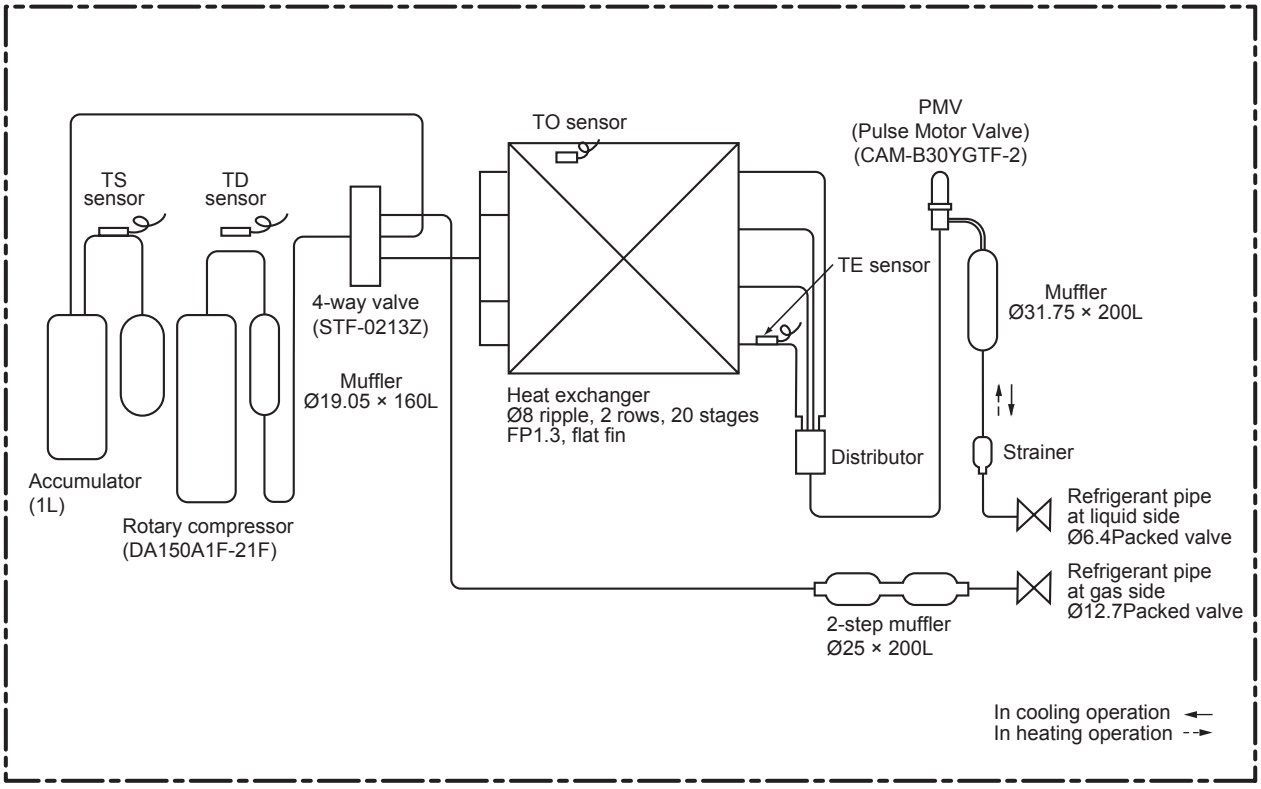


Dimension table

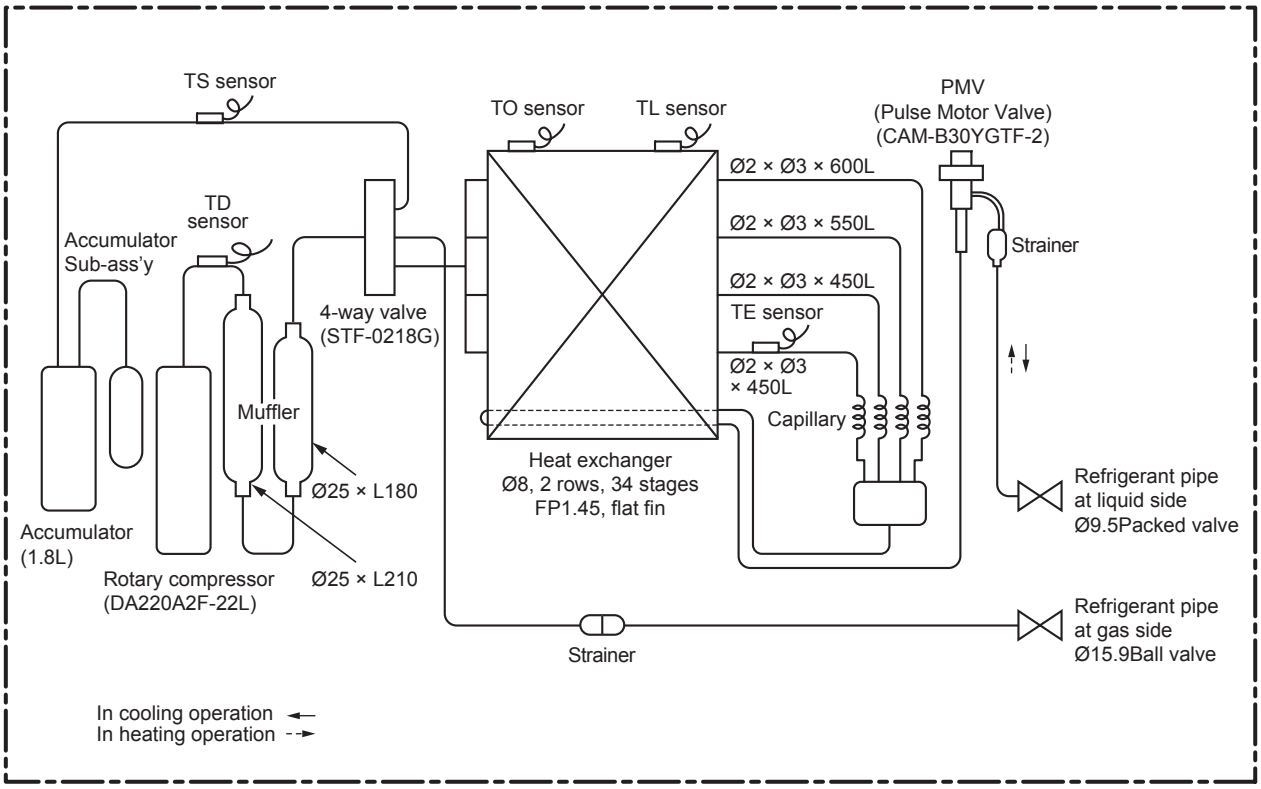
Indoor unit	Outer diameter of refrigerant pipe	
	Gas side ØA	Liquid side ØB
RAV-SP180AT2-UL	1/2" (12.7)	1/4" (6.4)
RAV-SP240, 300, 360, 420AT2-UL	5/8" (15.9)	3/8" (9.5)

Outdoor Unit

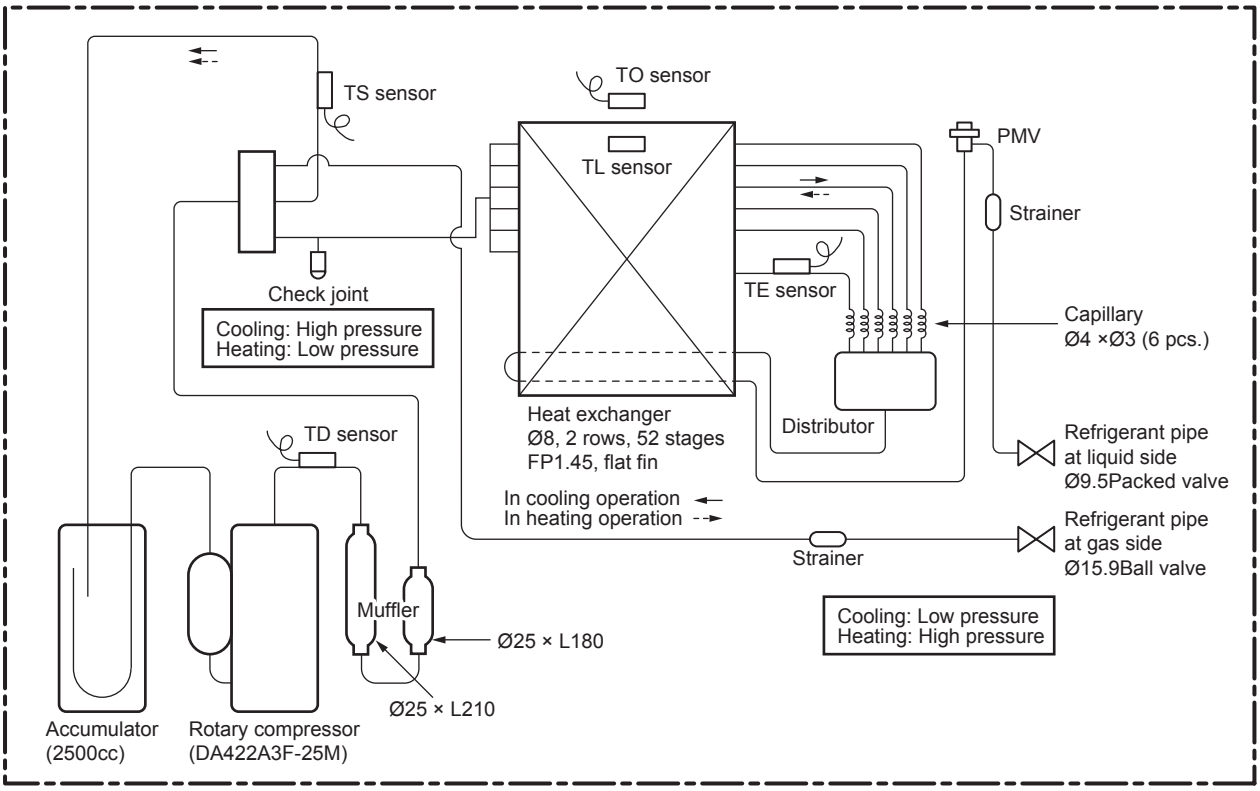
RAV-SP180AT2-UL



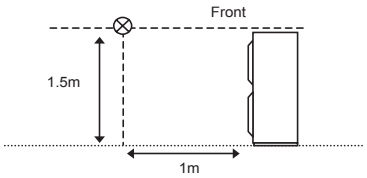
RAV-SP240AT2-UL



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

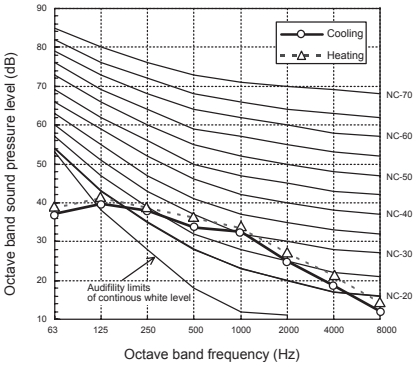


5-5. Sound Characteristics (NC curve)



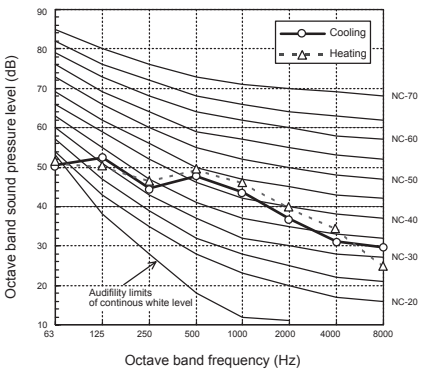
RAV-SP180AT2-UL

Sound pressure level (dB(A))	Cooling	Heating
	46	48



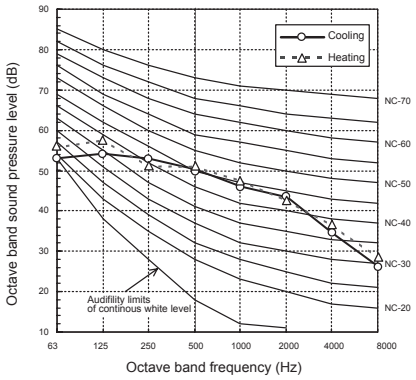
RAV-SP240AT2-UL

Sound pressure level (dB(A))	Cooling	Heating
	48	50



RAV-SP360AT2-UL, RAV-SP420AT2-UL

Sound pressure level (dB(A))	Cooling	Heating
	52	52

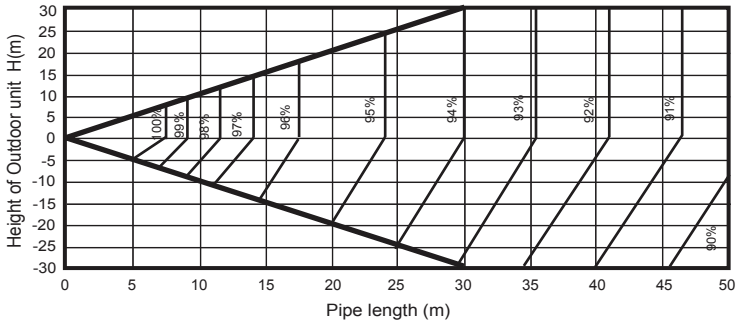


5-6. Capacity Correction

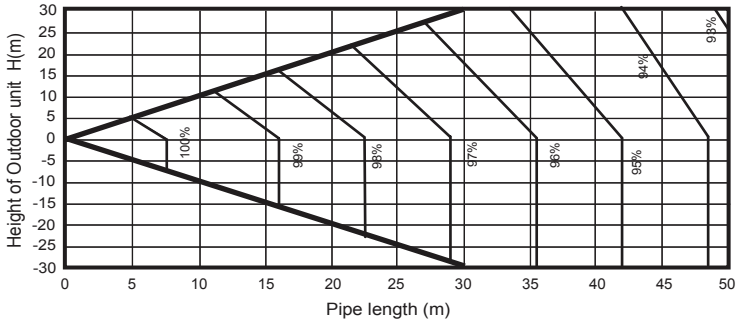
Connecting pipe length and lift difference between indoor units vs. capacity correction value

RAV-SP180AT2-UL, RAV-SP240AT2-UL

[Cooling]

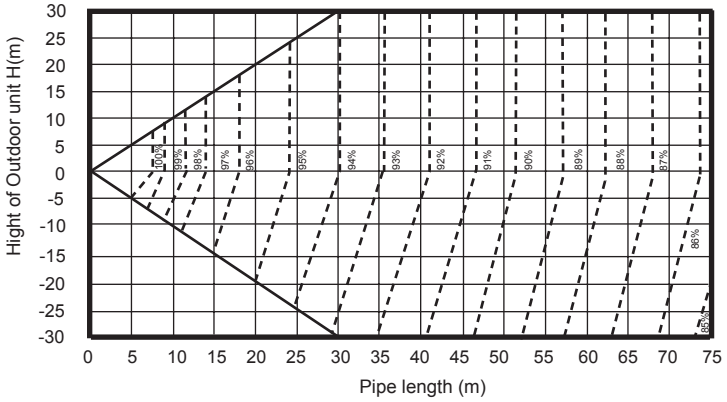


[Heating]

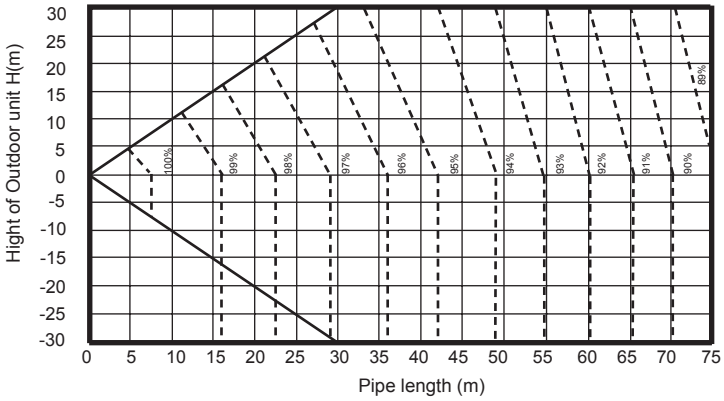


RAV-SP300AT2-UL, RAV-SP360AT2-UL, RAV-SP420AT2-UL

[Cooling]



[Heating]



Contents

6. CONTROLLER 60

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 timert 	×	×	×

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

TOSHIBA CARRIER CORPORATION