



REFRIGERANT R410A
INVERTER

AIR CONDITIONER
Wall Mounted type

DESIGN & TECHNICAL MANUAL

INDOOR



RIWH09AVSA
RIWH12AVSA

OUTDOOR



ROSH09AVSA
ROSH12AVSA

1.INDOOR UNIT

WALL MOUNTED TYPE :

RIWH09AVSA

RIWH12AVSA

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1. SPECIFICATIONS

Type				WALL MOUNTED INVERTER HEAT PUMP			
Model name				RIWH09AVSA	RIWH12AVSA		
Power source				115V~ 60Hz			
Available voltage range				103.5 - 126.5V~ 60Hz			
Capacity	Cooling	Rated	kW	2.64	3.52		
			Btu/h	9,000	12,000		
		Min-Max	kW	0.5 - 3.1	0.9 - 3.7		
			Btu/h	1,700 - 10,700	3,100 - 12,500		
	Heating	Rated	kW	2.93	4.10		
			Btu/h	10,000	14,000		
		Min-Max	kW	0.5 - 3.5	0.9 - 4.7		
			Btu/h	1,700 - 12,000	3,100 - 16,000		
Input power	Cooling	Rated	kW	0.83	1.20		
				Min - Max	0.24 - 1.44	0.23 - 1.44	
	Heating	Rated	kW	0.77	1.21		
				Min - Max	0.21 - 1.49	0.21 - 1.66	
Current	Cooling	Rated	A	7.5	10.9		
	Heating			7.0	11.0		
EER	Cooling		kW/kW	3.18	2.93		
			Btu/hW	10.85	10.00		
COP	Heating		kW/kW	3.81	3.39		
			Btu/hW	13.00	11.55		
SEER	Cooling		Btu/hW	16.0	16.0		
HSPF	Heating			9.0	9.0		
POWER FACTOR	Cooling		%	96	96		
	Heating			96	96		
Moisture removal			l/h (pints/h)	1.3 (2.7)	1.8 (3.8)		
Maximum operating current *1	Cooling		A	13.0	13.0		
	Heating			13.5	15.0		
Fan	Air flow rate	Cooling	High	424 (720)			
			Med	353 (600)			
			Low	247 (420)	250 (425)		
		Heating	Quiet	191 (325)			
			High	436 (740)			
			Med	353 (600)			
			Low	265 (450)			
			Quiet	191 (325)			
			Type × Q'ty	Cross flow fan × 1			
			Motor output	W	28		
Sound pressure level *2	Cooling	High	dB (A)	43			
		Med		38			
		Low		33			
		Quiet		23			
	Heating	High	dB (A)	43			
		Med		38			
		Low		33			
		Quiet		23			
		Heat exchanger type		Dimensions (H × W × D)	in. (mm)	10 - 3/32 × 24 - 13/16 × 25/32 (256 × 630 × 20)	
				Fin pitch	FPI	23	
Rows Stages			2 × 16				
Pipe type			Copper				
Fin type			Aluminum				
Enclosure	Material		Polystyrene				
	Color		WHITE Approximate color of MUNSELL N 9.25/				
Dimensions (H × W × D)	Net	in.	10 - 5/16 × 32 - 9/32 × 8 - 1/8				
		mm	262 × 820 × 206				
	Gross	in.	10 - 11/32 × 34 - 1/4 × 12 - 29/32				
		mm	263 × 870 × 328				
Weight	Net	lbs. (kg)	16 (7)				
	Gross		20 (9)				
Connection pipe	Size	Liquid	Ø1/4 in (Ø6.35)				
		Gas	Ø3/8 in (Ø9.52)				
	Method		Flare				
Operation range	Cooling	°F (°C)	64 to 90 (18 to 32)				
		%RH	80 or less				
	Heating	°F (°C)	60 to 88 (16 to 30)				
Remote controller type			Wireless				
Drain hose	Material		PP+LLDPE				
	Size	in. (mm)	Ø17/32 (Ø13.8) (I.D.) Ø5/8 to Ø21/32 (Ø15.8 to Ø16.7) (O.D.)				

NOTE :

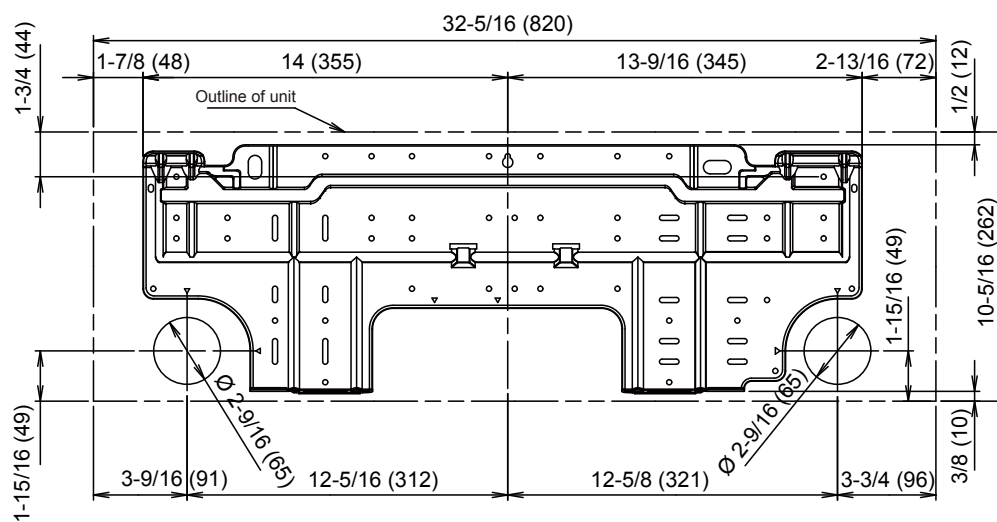
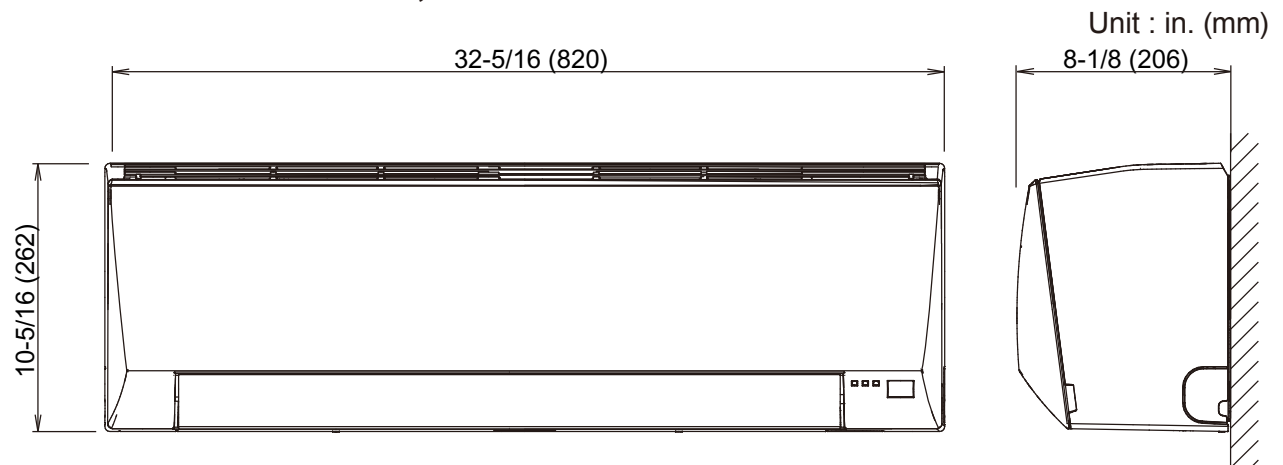
- Specifications are based on the following conditions.
Cooling : Indoor temperature of 80°F (26.67°C) DB / 67°F (19.44°C) WB, and outdoor temperature of 95°F (35°C) DB / 75°F (23.9°C) WB.
Heating : Indoor temperature of 70°F (21.11°C) DB / 59°F (15°C) WB, and outdoor temperature of 47°F (8.33°C) DB / 43°F (6.11°C) WB.
Pipe length : 24ft.7in (7.5m), Height difference:0 m. (Outdoor unit-Indoor unit)
- The protective function might work when using it outside the operation range.

*1: The maximum current is the maximum value when operated within the operation range.

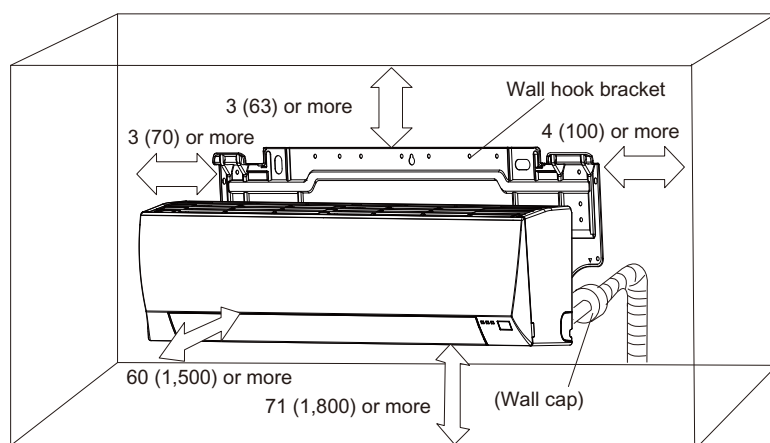
*2: These are the measured values in the manufacturer's anechoic chamber.
Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

2. DIMENSIONS

■ MODEL : RIWH09AVSA, RIWH12AVSA



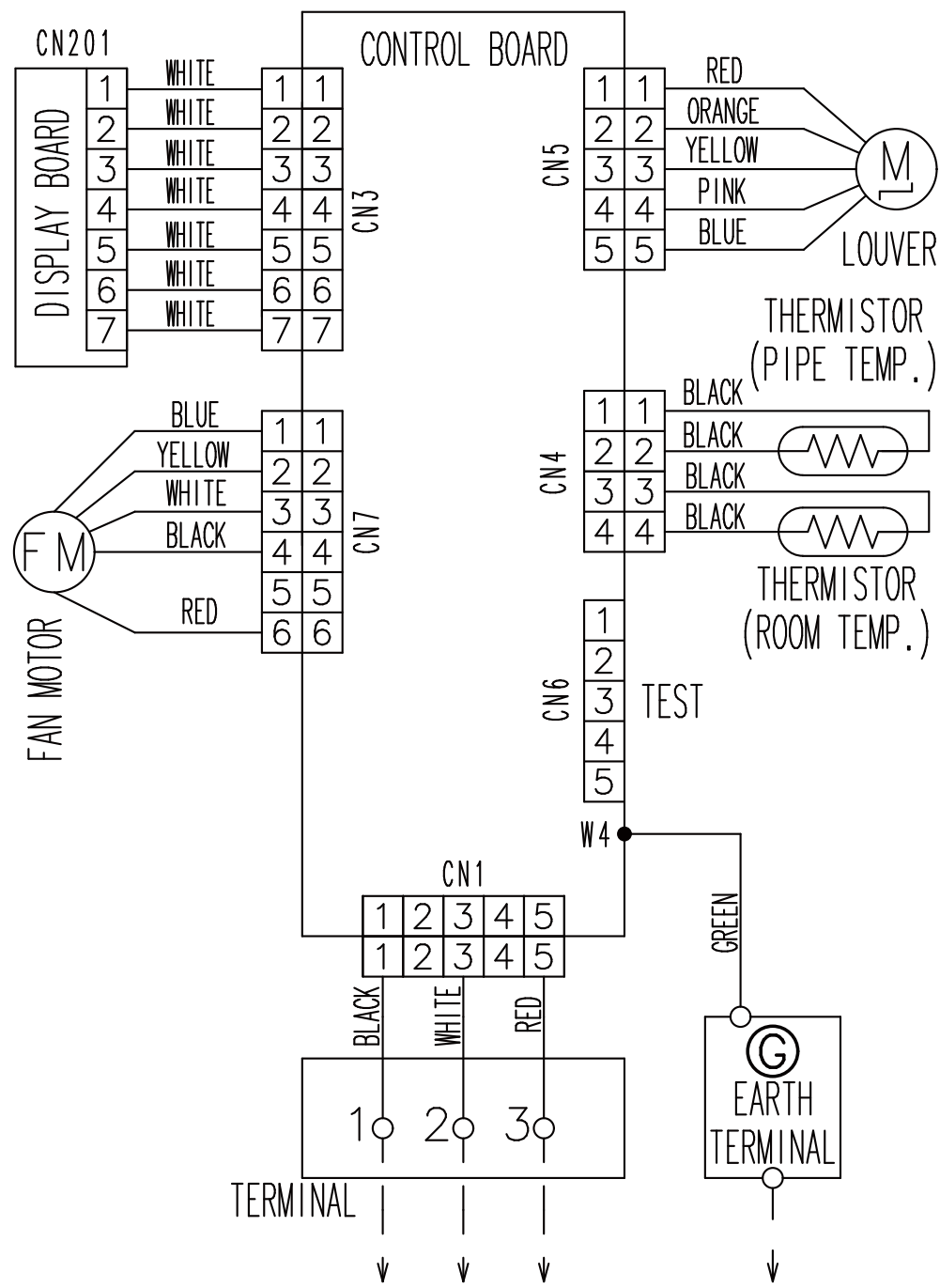
■ INSTALLATION PLACE



		RIWH09AVSA	RIWH12AVSA
Refrigerant pipe flare connection	Liquid	$\varnothing 1/4$ in.(6.35 mm)	
	Gas	$\varnothing 3/8$ in.(9.52 mm)	
Drain hose connection	Drain hose	$\varnothing 9/16$ in. (13.8 mm) (I.D.), $\varnothing 5/8$ to $\varnothing 11/16$ in. (15.8 to 16.7 mm) (O.D.) Drain hose : L=23-5/8 in. (600 mm)	

3. WIRING DIAGRAMS

■ MODEL: RIWH09AVSA, RIWH12AVSA



4. CAPACITY TABLE

4-1. COOLING CAPACITY

■ MODEL: RIWH09AVSA

AFR	424
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	°FDB	Indoor temperature																	
		64			70			75			80			85			90		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
Outdoor temperature	°FWB	54			60			63			67			71			73		
	15	8.48	5.61	0.30	9.44	5.64	0.31	10.41	6.15	0.31	10.73	6.64	0.32	11.38	6.62	0.32	12.02	7.05	0.32
	32	8.50	5.40	0.30	9.46	5.43	0.31	10.43	5.92	0.31	10.75	6.39	0.31	11.40	6.37	0.32	12.04	6.78	0.32
	41	7.80	5.31	0.35	8.69	5.34	0.36	9.58	5.83	0.36	9.88	6.30	0.36	10.47	6.27	0.37	11.06	6.68	0.37
	50	8.14	5.35	0.39	9.07	5.38	0.40	9.99	5.87	0.41	10.30	6.34	0.41	10.92	6.31	0.41	11.54	6.72	0.42
	59	8.18	5.38	0.40	9.11	5.41	0.41	10.04	5.90	0.41	10.35	6.37	0.42	10.98	6.35	0.42	11.60	6.76	0.42
	67	8.61	5.48	0.57	9.59	5.51	0.58	10.57	6.01	0.59	10.89	6.50	0.59	11.55	6.47	0.60	12.20	6.89	0.60
	77	8.08	5.30	0.65	9.00	5.33	0.66	9.92	5.82	0.67	10.23	6.28	0.68	10.84	6.26	0.68	11.46	6.67	0.69
	87	7.54	5.34	0.74	8.40	5.37	0.75	9.26	5.85	0.76	9.54	6.32	0.76	10.12	6.30	0.77	10.69	6.71	0.78
	95	7.12	5.01	0.80	7.93	5.04	0.81	8.74	5.50	0.83	9.01	5.94	0.83	9.55	5.91	0.84	10.09	6.30	0.85
	104	6.62	5.08	0.88	7.37	5.11	0.89	8.12	5.57	0.90	8.38	6.01	0.91	8.88	5.99	0.92	9.38	6.38	0.93
115	5.66	4.34	0.87	6.30	4.36	0.88	6.95	4.76	0.90	7.16	5.14	0.90	7.59	5.12	0.91	8.02	5.45	0.92	

AFR : Air Flow Rate (CFM)
 TC : Total Capacity (kBtu/h)
 SHC : Sensible Heat Capacity (kBtu/h)
 IP : Input Power (kW)

AFR	720
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	°CDB	Indoor temperature																	
		17.8			21.1			23.9			26.7			29.4			32.2		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
Outdoor temperature	°CWB	12.2			15.6			17.2			19.4			21.7			22.8		
	-10	2.48	1.64	0.30	2.77	1.65	0.31	3.05	1.80	0.31	3.15	1.95	0.32	3.33	1.94	0.32	3.52	2.07	0.32
	0	2.49	1.58	0.30	2.77	1.59	0.31	3.06	1.74	0.31	3.15	1.87	0.31	3.34	1.87	0.32	3.53	1.99	0.32
	5	2.29	1.56	0.35	2.55	1.57	0.36	2.81	1.71	0.36	2.89	1.85	0.36	3.07	1.84	0.37	3.24	1.96	0.37
	10	2.39	1.57	0.39	2.66	1.58	0.40	2.93	1.72	0.41	3.02	1.86	0.41	3.20	1.85	0.41	3.38	1.97	0.42
	15	2.40	1.58	0.40	2.67	1.59	0.41	2.94	1.73	0.41	3.03	1.87	0.42	3.22	1.86	0.42	3.40	1.98	0.42
	19.4	2.52	1.61	0.57	2.81	1.62	0.58	3.10	1.76	0.59	3.19	1.90	0.59	3.38	1.90	0.60	3.58	2.02	0.60
	25.0	2.37	1.55	0.65	2.64	1.56	0.66	2.91	1.71	0.67	3.00	1.84	0.68	3.18	1.83	0.68	3.36	1.95	0.69
	30.6	2.21	1.56	0.74	2.46	1.57	0.75	2.71	1.72	0.76	2.80	1.85	0.76	2.96	1.85	0.77	3.13	1.97	0.78
	35.0	2.09	1.47	0.80	2.32	1.48	0.81	2.56	1.63	0.83	2.64	1.74	0.83	2.80	1.73	0.84	2.96	1.85	0.85
	40.0	1.94	1.49	0.88	2.16	1.50	0.89	2.38	1.63	0.90	2.45	1.76	0.91	2.60	1.76	0.92	2.75	1.87	0.93
46.1	1.66	1.27	0.87	1.85	1.28	0.88	2.04	1.40	0.90	2.10	1.51	0.90	2.22	1.50	0.91	2.35	1.60	0.92	

AFR : Air Flow Rate (m³/h)
 TC : Total Capacity (kW)
 SHC : Sensible Heat Capacity (kW)
 IP : Input Power (kW)

MODEL: RIWH12AVSA

AFR	424
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		Indoor temperature																	
		64			70			75			80			85			90		
		54			60			63			67			71			73		
Outdoor temperature	°FDB	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
	15	10.40	7.04	0.51	11.59	7.09	0.52	12.78	7.73	0.52	13.17	8.35	0.53	13.96	8.31	0.53	14.75	8.85	0.54
	32	10.59	7.22	0.50	11.80	7.26	0.51	13.00	7.92	0.52	13.40	8.55	0.52	14.21	8.52	0.53	15.01	9.07	0.53
	41	10.78	7.40	0.50	12.01	7.44	0.51	13.24	8.12	0.52	13.65	8.77	0.52	14.47	8.73	0.53	15.29	9.30	0.53
	50	11.39	7.47	0.58	12.69	7.51	0.59	13.98	8.20	0.60	14.42	8.85	0.60	15.28	8.81	0.60	16.15	9.39	0.61
	59	11.44	7.77	0.57	12.74	7.81	0.58	14.05	8.52	0.59	14.48	9.20	0.59	15.35	9.17	0.60	16.22	9.76	0.61
	67	11.21	7.55	0.82	12.49	7.60	0.83	13.77	8.29	0.84	14.19	8.95	0.85	15.05	8.92	0.86	15.90	9.50	0.86
	77	10.64	7.26	0.94	11.85	7.31	0.95	13.06	7.97	0.97	13.46	8.60	0.97	14.27	8.57	0.98	15.08	9.13	0.99
	87	10.01	6.92	1.06	11.15	6.96	1.08	12.29	7.59	1.09	12.67	8.20	1.10	13.43	8.17	1.11	14.19	8.70	1.12
	95	9.49	6.68	1.16	10.57	6.72	1.18	11.65	7.33	1.19	12.01	7.92	1.20	12.73	7.88	1.21	13.45	8.40	1.22
	104	8.18	6.20	1.09	9.11	6.23	1.10	10.04	6.80	1.12	10.35	7.34	1.13	10.97	7.31	1.14	11.59	7.79	1.15
115	5.91	5.57	0.84	6.59	5.60	0.85	7.26	6.11	0.87	7.49	6.60	0.87	7.94	6.57	0.88	8.39	7.00	0.89	

AFR : Air Flow Rate (CFM)
 TC : Total Capacity (kBtu/h)
 SHC : Sensible Heat Capacity (kBtu/h)
 IP : Input Power (kW)

AFR	720
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		Indoor temperature																	
		17.8			21.1			23.9			26.7			29.4			32.2		
		12.2			15.6			17.2			19.4			21.7			22.8		
Outdoor temperature	°CDB	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
	-10	3.05	2.06	0.51	3.40	2.08	0.52	3.74	2.26	0.52	3.86	2.45	0.53	4.09	2.44	0.53	4.32	2.60	0.54
	0	3.10	2.12	0.50	3.46	2.13	0.51	3.81	2.32	0.52	3.93	2.51	0.52	4.16	2.50	0.53	4.40	2.66	0.53
	5	3.16	2.17	0.50	3.52	2.18	0.51	3.88	2.38	0.52	4.00	2.57	0.52	4.24	2.56	0.53	4.48	2.73	0.53
	10	3.34	2.19	0.58	3.72	2.20	0.59	4.10	2.40	0.60	4.23	2.59	0.60	4.48	2.58	0.60	4.73	2.75	0.61
	15	3.35	2.28	0.57	3.73	2.29	0.58	4.12	2.50	0.59	4.24	2.70	0.59	4.50	2.69	0.60	4.75	2.86	0.61
	19.4	3.29	2.21	0.82	3.66	2.23	0.83	4.04	2.43	0.84	4.16	2.62	0.85	4.41	2.61	0.86	4.66	2.78	0.86
	25.0	3.12	2.13	0.94	3.47	2.14	0.95	3.83	2.34	0.97	3.95	2.52	0.97	4.18	2.51	0.98	4.42	2.68	0.99
	30.6	2.93	2.03	1.06	3.27	2.04	1.08	3.60	2.22	1.09	3.71	2.40	1.10	3.94	2.39	1.11	4.16	2.55	1.12
	35.0	2.78	1.96	1.16	3.10	1.97	1.18	3.41	2.15	1.19	3.52	2.32	1.20	3.73	2.31	1.21	3.94	2.46	1.22
	40.0	2.40	1.82	1.09	2.67	1.83	1.10	2.94	1.99	1.12	3.03	2.15	1.13	3.22	2.14	1.14	3.40	2.28	1.15
46.1	1.73	1.63	0.84	1.93	1.64	0.85	2.13	1.79	0.87	2.19	1.93	0.87	2.33	1.93	0.88	2.46	2.05	0.89	

AFR : Air Flow Rate (m³/h)
 TC : Total Capacity (kW)
 SHC : Sensible Heat Capacity (kW)
 IP : Input Power (kW)

4-2. HEATING CAPACITY

MODEL: RIWH09AVSA

AFR	436
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Outdoor temperature		Indoor temperature											
		°FDB		60		65		70		72		75	
		°FDB	°FWB	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
15	11	8.17	0.86	7.97	0.88	7.78	0.89	7.59	0.91	7.39	0.93		
23	19	9.24	0.90	9.02	0.92	8.80	0.94	8.58	0.96	8.36	0.98		
32	28	10.32	0.95	10.07	0.97	9.83	0.99	9.58	1.01	9.34	1.03		
41	37	12.19	1.01	11.90	1.03	11.61	1.05	11.32	1.07	11.03	1.09		
47	43	12.62	1.00	12.32	1.02	12.02	1.04	11.72	1.06	11.42	1.08		
50	47	13.65	1.06	13.33	1.08	13.00	1.10	12.68	1.13	12.35	1.15		
59	50	14.20	1.07	13.86	1.09	13.53	1.12	13.19	1.14	12.85	1.16		
68	59	12.72	1.01	12.41	1.03	12.11	1.05	11.81	1.07	11.50	1.09		
75	65	16.08	1.11	15.69	1.13	15.31	1.15	14.93	1.18	14.55	1.20		

AFR : Air Flow Rate (CFM)
TC : Total Capacity (kBtu/h)
IP : Input Power (kW)

AFR	740
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Outdoor temperature		Indoor temperature											
		°CDB		15.6		18.3		21.1		23.9		25.6	
		°CDB	°CWB	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
-9.4	-11.1	2.39	0.86	2.34	0.88	2.28	0.89	2.22	0.91	2.17	0.93		
-5.0	-7.2	2.71	0.90	2.64	0.92	2.58	0.94	2.51	0.96	2.45	0.98		
0.0	-2.2	3.02	0.95	2.95	0.97	2.88	0.99	2.81	1.01	2.74	1.03		
5.0	2.8	3.57	1.01	3.49	1.03	3.40	1.05	3.32	1.07	3.23	1.09		
8.3	6.1	3.70	1.00	3.61	1.02	3.52	1.04	3.44	1.06	3.35	1.08		
10.0	8.3	4.00	1.06	3.91	1.08	3.81	1.10	3.72	1.13	3.62	1.15		
15.0	10.0	4.16	1.07	4.06	1.09	3.96	1.12	3.87	1.14	3.77	1.16		
20.0	15.0	3.73	1.01	3.64	1.03	3.55	1.05	3.46	1.07	3.37	1.09		
23.9	18.0	4.71	1.11	4.60	1.13	4.49	1.15	4.38	1.18	4.26	1.20		

AFR : Air Flow Rate (m³/h)
TC : Total Capacity (kW)
IP : Input Power (kW)

MODEL: RIWH12AVSA

AFR	436
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Outdoor temperature		Indoor temperature											
		°FDB		60		65		70		72		75	
		°FDB	°FWB	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
15	11	11.02	1.47	10.76	1.50	10.50	1.54	10.23	1.57	9.97	1.60		
23	19	12.29	1.47	11.99	1.50	11.70	1.53	11.41	1.56	11.12	1.59		
32	28	14.15	1.48	13.81	1.51	13.48	1.54	13.14	1.57	12.80	1.60		
41	37	15.85	1.47	15.48	1.50	15.10	1.53	14.72	1.56	14.34	1.59		
47	43	16.80	1.44	16.40	1.47	16.00	1.50	15.60	1.53	15.20	1.56		
50	47	16.64	1.34	16.25	1.36	15.85	1.39	15.45	1.42	15.06	1.45		
59	50	16.36	1.24	15.97	1.26	15.58	1.29	15.19	1.31	14.80	1.34		
68	59	16.12	1.06	15.73	1.09	15.35	1.11	14.96	1.13	14.58	1.15		
75	65	15.83	0.95	15.45	0.97	15.07	0.99	14.70	1.01	14.32	1.03		

AFR : Air Flow Rate (CFM)
TC : Total Capacity (kBtu/h)
IP : Input Power (kW)

AFR	740
-----	-----

Outdoor temperature		Indoor temperature											
		°CDB		15.6		18.3		21.1		23.9		25.6	
		°CDB	°CWB	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
-9.4	-11.1	3.23	1.47	3.15	1.50	3.08	1.54	3.00	1.57	2.92	1.60		
-5.0	-7.2	3.60	1.47	3.52	1.50	3.43	1.53	3.34	1.56	3.26	1.59		
0.0	-2.2	4.15	1.48	4.05	1.51	3.95	1.54	3.85	1.57	3.75	1.60		
5.0	2.8	4.65	1.47	4.54	1.50	4.43	1.53	4.31	1.56	4.20	1.59		
8.3	6.1	4.92	1.44	4.81	1.47	4.69	1.50	4.57	1.53	4.46	1.56		
10.0	8.3	4.88	1.34	4.76	1.36	4.65	1.39	4.53	1.42	4.41	1.45		
15.0	10.0	4.79	1.24	4.68	1.26	4.57	1.29	4.45	1.31	4.34	1.34		
20	15	4.72	1.06	4.61	1.09	4.50	1.11	4.39	1.13	4.27	1.15		
23.9	18	4.64	0.95	4.53	0.97	4.42	0.99	4.31	1.01	4.20	1.03		

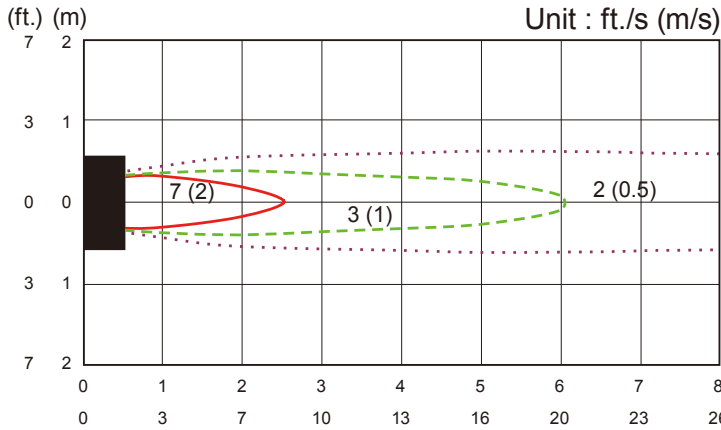
AFR : Air Flow Rate (m³/h)
TC : Total Capacity (kW)
IP : Input Power (kW)

5. FAN PERFORMANCE AND CAPACITY

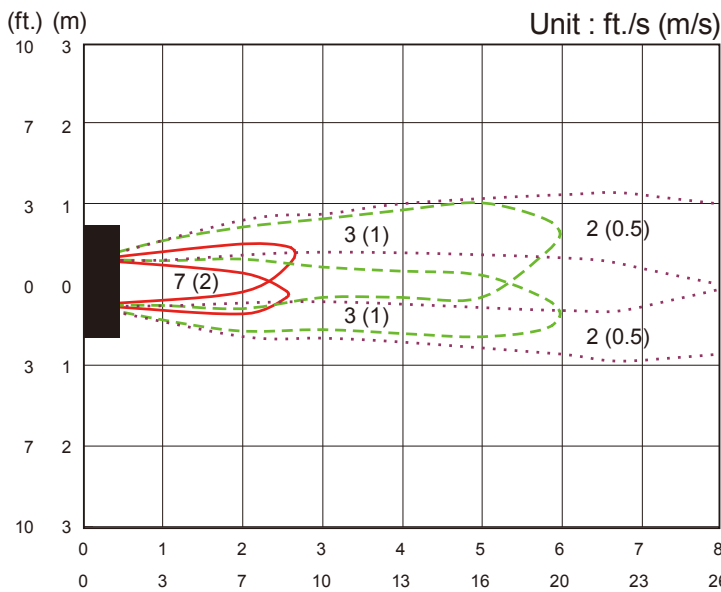
5-1. AIR VELOCITY DISTRIBUTION

■ MODEL: RIWH09AVSA, RIWH12AVSA

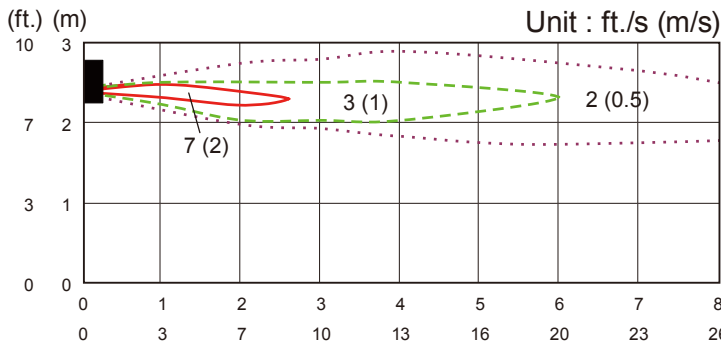
Conditions:
Fan speed: High
Operation mode: Fan



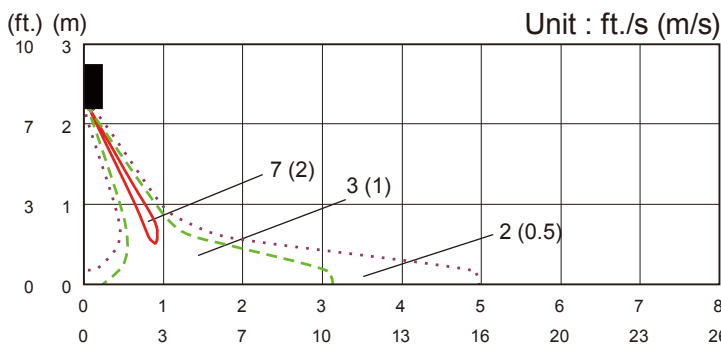
TOP VIEW
Vertical airflow direction louver : Up
Horizontal airflow direction louver : Center



TOP VIEW
Vertical airflow direction louver : Up
Horizontal airflow direction louver : Right & Left



SIDE VIEW
Vertical airflow direction louver : Up
Horizontal airflow direction louver : Center



SIDE VIEW
Vertical airflow direction louver : Down
Horizontal airflow direction louver : Center

5-2. AIR FLOW

■ MODEL: RIWH09AVSA

● Cooling

Fan speed	Number of rotations (r.p.m)	Air flow	
HIGH	1320	720	m ³ /h
		200	l/s
		424	CFM
MED	1120	600	m ³ /h
		167	l/s
		353	CFM
LOW	840	420	m ³ /h
		117	l/s
		247	CFM
QUIET	700	325	m ³ /h
		90	l/s
		191	CFM

● Heating

Fan speed	Number of rotations (r.p.m)	Air flow	
HIGH	1360	740	m ³ /h
		206	l/s
		436	CFM
MED	1120	600	m ³ /h
		167	l/s
		353	CFM
LOW	900	450	m ³ /h
		125	l/s
		265	CFM
QUIET	700	325	m ³ /h
		90	l/s
		191	CFM

■ MODEL: RIWH12AVSA

● Cooling

Fan speed	Number of rotations (r.p.m)	Air flow	
HIGH	1320	720	m ³ /h
		200	l/s
		424	CFM
MED	1120	600	m ³ /h
		167	l/s
		353	CFM
LOW	860	425	m ³ /h
		118	l/s
		250	CFM
QUIET	700	325	m ³ /h
		90	l/s
		191	CFM

● Heating

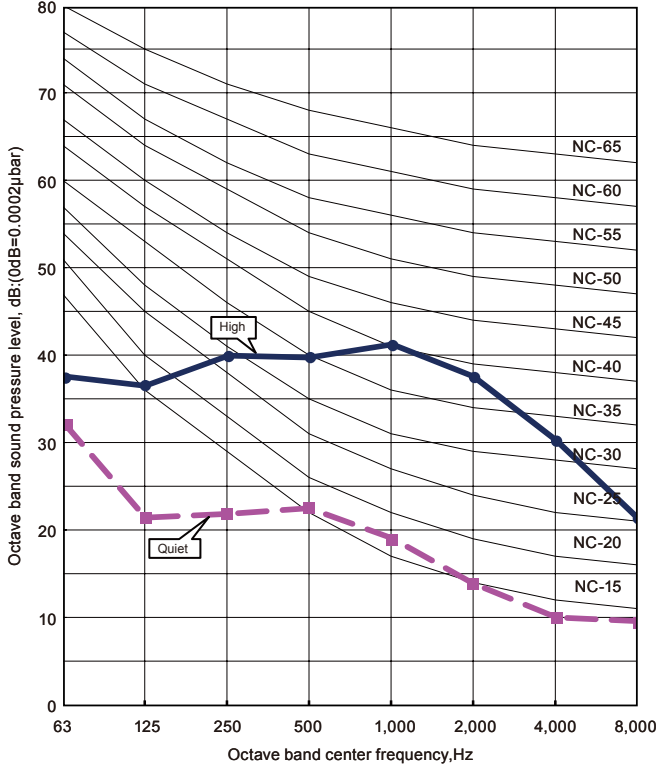
Fan speed	Number of rotations (r.p.m)	Air flow	
HIGH	1360	740	m ³ /h
		206	l/s
		436	CFM
MED	1120	600	m ³ /h
		167	l/s
		353	CFM
LOW	900	450	m ³ /h
		125	l/s
		265	CFM
QUIET	700	325	m ³ /h
		90	l/s
		191	CFM

6. OPERATION NOISE

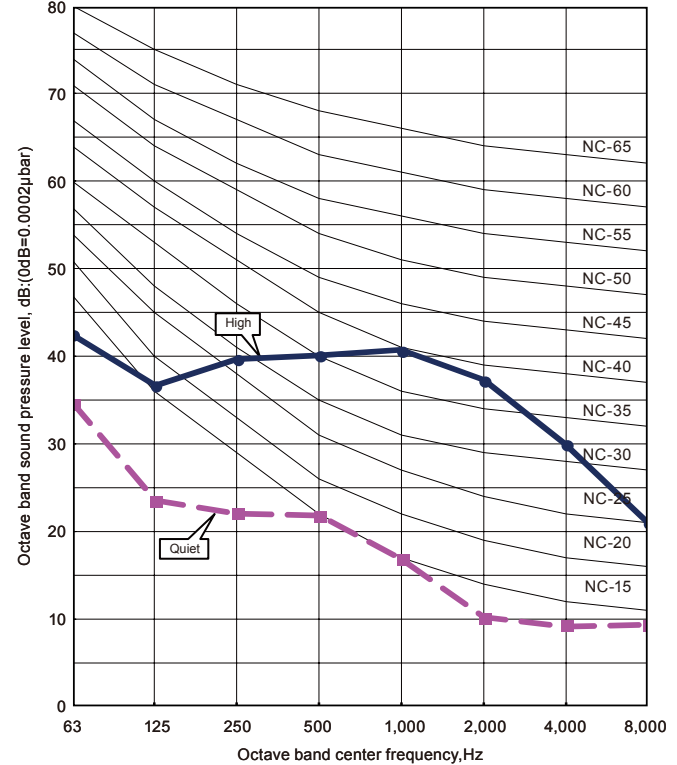
6-1. NOISE LEVEL CURVE

MODEL: RIWH09AVSA

● Cooling

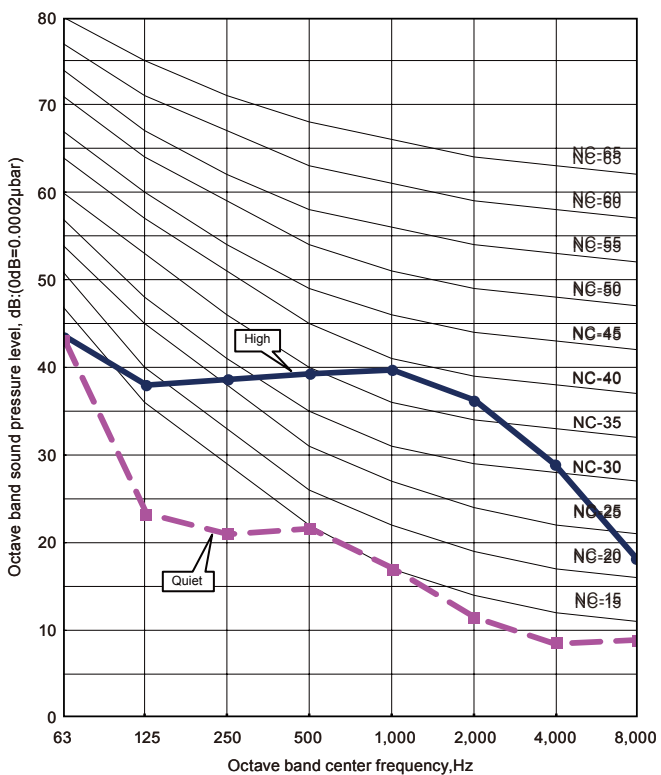


● Heating

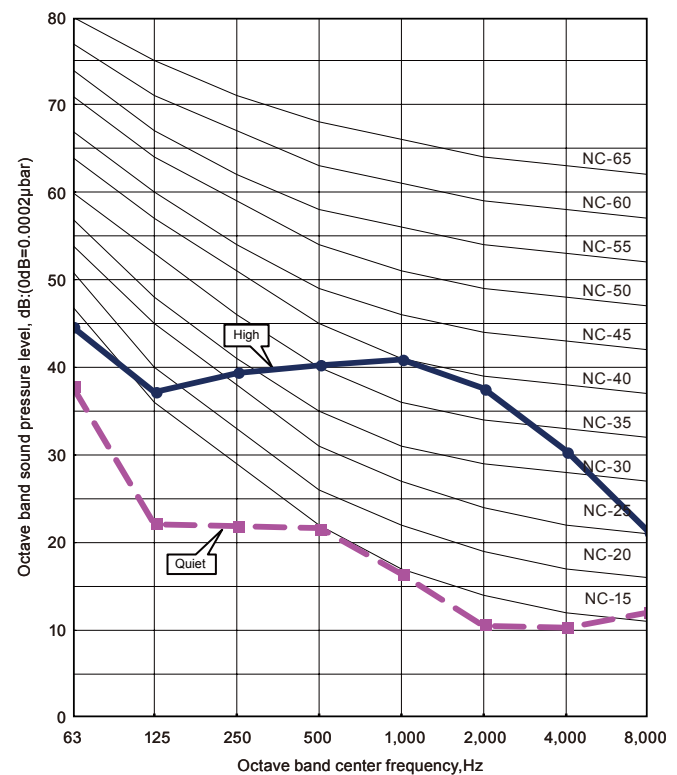


MODEL: RIWH12AVSA

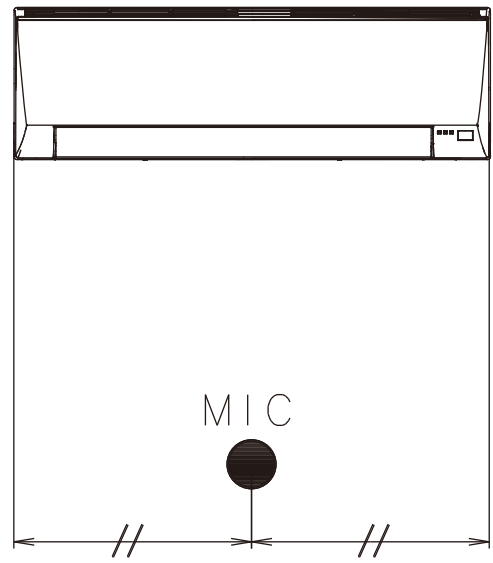
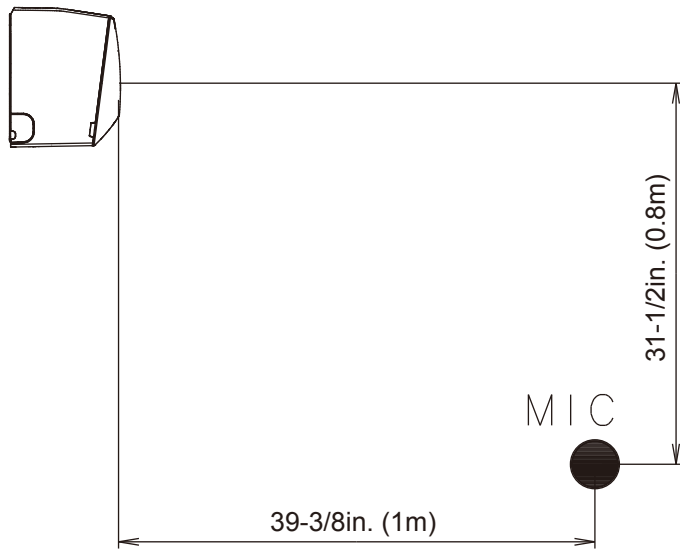
● Cooling



● Heating



6-2. SOUND LEVEL CHECK POINT



7. ELECTRIC CHARACTERISTICS

Model Name			RIWH09AVSA	RIWH12AVSA
Power Supply	Voltage	V	115 ~	
	Frequency	Hz	60	
Max. Operating Current		A	1.0	
*)Wiring Spec	Connection Cable	AWG	14	
	Limited wiring length	ft. (m)	66 (20)	

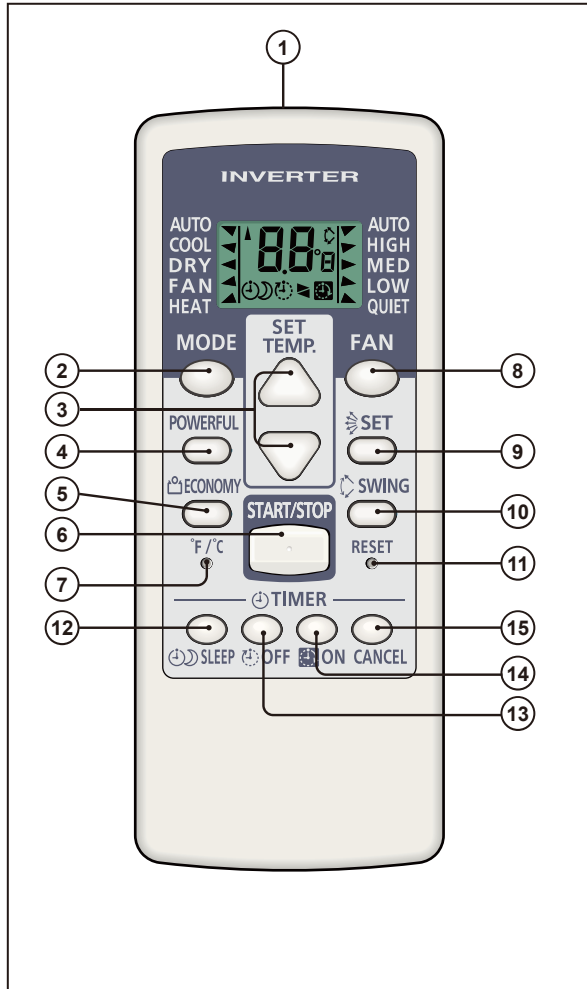
*) Wiring Spec
Selected Sample
(Selected based on Japan Electrotechnical Standard and Codes Committee E0005)

8. SAFETY DEVICES

	Protection form	Model	
		RIWH09AVSA	RIWH12AVSA
Circuit protection	Current fuse (PCB)	250V 3.15A	
Fan motor protection	Terminal protection program	320 ± 45°F (160 ± 25°C) OFF	

9. WIRELESS REMOTE CONTROLLER

FUNCTIONS



- 1 Signal transmitter
- 2 MODE button
- 3 SET TEMP. button (▲ / ▼)
- 4 POWERFUL button
- 5 ECONOMY button
- 6 START/STOP button
- 7 °F / °C button
- 8 FAN button
- 9 SET button
- 10 SWING button
- 11 RESET button

TIMER

- 12 SLEEP TIMER button
- 13 OFF TIMER button
- 14 ON TIMER button
- 15 TIMER CANCEL button

Remote controller display

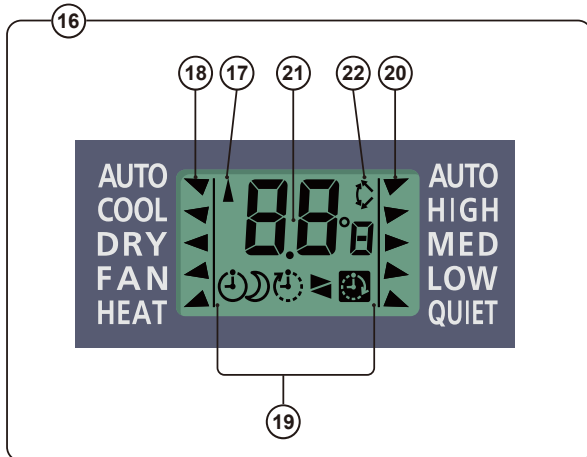
- 16 Remote controller display
- 17 Transmit indicator
- 18 Operation mode indicator
- 19 Timer mode indicator
- SLEEP TIMER mark: ☾
- OFF TIMER mark: ⌚
- OFF-ON TIMER mark: ⌚▶
- ON-OFF TIMER mark: ⌚◀
- ON TIMER Mark: ⌚

20 Fan speed indicator

- 21 Temperature and time indicator
It displays the temperature setting.
However, when making the Timer setting,
it will display the Timer time.
(The temperature setting will reappear
after finishing the timer setting)

22 Swing indicator

Display panel



SPECIFICATION

SIZE	[H x W x D in. (mm)]	5-15/32 x 2-7/32 x 23/32 (139 x 56 x 18)
WEIGHT	oz. (g)	2.5 (70)
ACCESSORY		Holder

10. FUNCTION SETTING

10-1. INDOOR UNIT (Setting by remote controller)

- The function settings of the control of the indoor unit can be changed by this procedure according to the installation conditions. Incorrect settings can cause the indoor unit malfunction.
- After the power is turned on, perform the "FUNCTION SETTING" according to the installation conditions using the remote controller.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

■ PREPARATION

- Turn on the power
- * By turning on the power indoor units, so make sure the piping air-tight test and vacuuming have been conducted before turning on the power.
- * Also check again to make sure no wiring mistakes were made before turning on the power.

■ FUNCTION SETTING METHOD (for Wireless remote controller)

Entering the Function Setting Mode

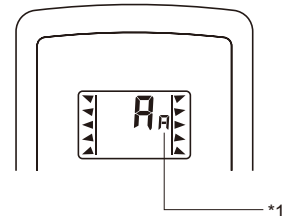
- While pressing the FAN button and SET TEMP. (▲) button simultaneously, press the RESET button to enter the function setting mode.

STEP 1

Setting the Remote controller Custom Code

Use the following steps to select the custom code of the remote controller. (Note that the air conditioner cannot receive a signal if the air conditioner has not been set for the matching custom code.) The custom code that is set through this process are applicable only to the custom in the FUNCTION SETTING. For details on how to set the custom code through the normal process, refer to SELECTING THE REMOTE CONTROLLER CUSTOM CODE.

1. Press the SET TEMP. (▲) (▼) button to change the custom code between $\text{A} \rightarrow \text{b}$ → $\text{c} \rightarrow \text{d}$ Match the code on the display to the air conditioner custom code. (initially set to A)
(If the custom code does not need to be selected, press the MODE button and proceed to STEP 2.)
2. Press the MODE button to accept the custom code, and proceed to STEP 2.



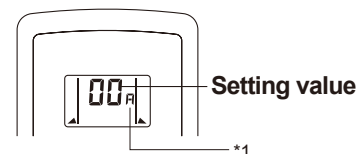
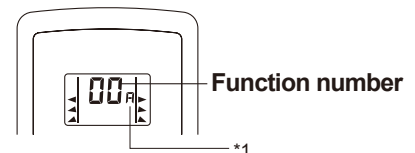
The air conditioner custom code is set to A prior to shipment.
Contact your retailer to change the custom code.

The remote controller resets to custom code A when the batteries in the remote controller are replaced. If you use a custom code other than custom code A , reset the custom code after replacing the batteries.
If you do not know the air conditioner custom code setting, try each of the custom codes ($\text{A} \rightarrow \text{b} \rightarrow \text{c} \rightarrow \text{d}$) until you find the code which operates the air conditioner.

STEP 2

Selecting the Function Number and Setting Value

1. Press the SET TEMP. (▲) (▼) buttons to select the function number.
(Press the MODE button to switch between the left and right digits.)
2. Press the FAN button to proceed to setting the value.
(Press the FAN button again to return to the function number selection.)
3. Press the SET TEMP. (▲) (▼) buttons to select the setting value.
(Press the MODE button to switch between the left and right digits.)
4. Press the SLEEP button, then after you hear the beep emitted from the indoor unit, press the START/STOP button to confirm the settings.
5. Press the RESET button to cancel the function setting mode.
6. After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.



⚠ CAUTION

After turning off the power, wait 30 seconds or more before turning on it again.
The FUNCTION SETTING doesn't become effective if it doesn't do so.

Note :

*1) Small "A" is displayed on the right of the custom code during the FUNCTION SETTING.

FUNCTION DETAILS

Functions	
1)	Filter sign
2)	Room temperature control for indoor unit sensor
3)	Auto restart
4)	Remote controller custom code
5)	Heat Insulation condition (building insulation)

1) Filter sign

Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.

If the indication is not required, select "No indication" (03).

(◆... Factory setting)

Function number	Setting value	Setting description
11	00	Standard (400 hours)
	01	Long interval (1000 hours)
	02	Short interval (200 hours)
	03	No indication



2) Room temperature control for indoor unit sensor

Refer to Function 95, before performing this setting.

Depending on the installed environment, correction of the room temperature sensor may be required. Select the appropriate control setting according to the installed environment. The temperature correction values show the difference from the Standard setting "00" (manufacturer's recommended value).

*When Function 95-01(High insulation) is set, the Standard setting "00" will be the same as No correction "01" [0.0°F (0.0°C)].

(◆... Factory setting)

Function number	Setting value	Setting description	
30 (For cooling)	31 (For heating)	00	Standard setting*
		01	No correction 0.0°F (0.0°C)
		02	-1°F (-0.5°C)
		03	-2°F (-1.0°C)
		04	-3°F (-1.5°C)
		05	-4°F (-2.0°C)
		06	-5°F (-2.5°C)
		07	-6°F (-3.0°C)
		08	-7°F (-3.5°C)
		09	-8°F (-4.0°C)
		10	+1°F (+0.5°C)
		11	+2°F (+1.0°C)
		12	+3°F (+1.5°C)
		13	+4°F (+2.0°C)
		14	+5°F (+2.5°C)
		15	+6°F (+3.0°C)
		16	+7°F (+3.5°C)
		17	+8°F (+4.0°C)



More Cooling
Less Heating

Less Cooling
More Heating

3) Auto restart

Enable or disable automatic restart after a power interruption.

(◆... Factory setting)

Function number	Setting value	Setting description
40	00	Enable
	01	Disable

*Auto restart is an emergency function such as for power outage etc.
Do not attempt to use this function in normal operation.
Be sure to operate the unit by remote controller or external device.

4) Remote controller custom code

(Only for wireless remote controller)

The indoor unit custom code can be changed.

Select the appropriate custom code.

(◆... Factory setting)

Function number	Setting value	Setting description
44	00	A
	01	B
	02	C
	03	D

5) Heat Insulation condition (building insulation)

Heat insulation conditions differ according to the installed environment.

Standard insulation "00" allows system to rapidly respond to the cooling or heating load changes. High insulation "01" is when the heat insulation structure of the building is high and does not require system to rapidly respond to cooling or heating load changes.

When High insulation "01" is selected;

- Overheating (overcooling) is prevented at the start-up.
- All room temp. control settings (Function 30, 31) will reset to No correction [0.0°F (0.0°C)].

(◆... Factory setting)

Function number	Setting value	Setting description
95	00	Standard insulation
	01	High insulation

NOTE:

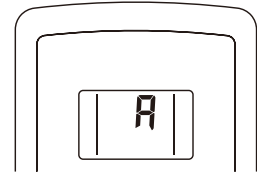
When changing Function 95, perform this setting before other Room temp. control settings (Function 30, 31). If Function 95 is not set first, Room temperature control settings (Function 30, 31) will be reset and you must re-do them again.

■ REMOTE CONTROLLER CUSTOM CODE SETTING

Use the following steps to select the custom code of the remote controller.

(Note that the air conditioner cannot receive a signal if the air conditioner has not been set for the matching custom code.)

1. Press the MODE button for at least five seconds to display the current custom code (initially set to **A**).
2. Press the SET TEMP. (▲) (▼) button to change the custom code between **A** → **b** → **c** → **d**.
Match the code on the display to the air conditioner custom code.
3. Press the MODE button again. The custom code will be changed.



If no buttons are pressed within 30 seconds after the custom code is displayed, the display returns to the original status. In this case, start again from step 1.

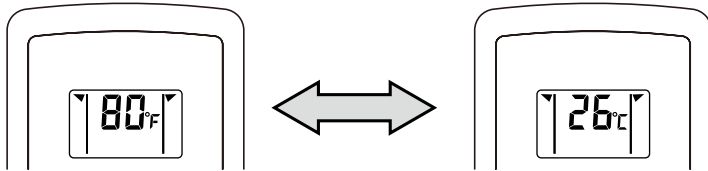
The air conditioner custom code is set to A prior to shipment.
Contact your retailer to change the custom code.

The remote controller resets to custom code A when the batteries in the remote controller are replaced. If you use a custom code other than custom code A, reset the custom code after replacing the batteries. If you do not know the air conditioner custom code setting, try each of the custom codes (**A** → **b** → **c** → **d**) until you find the code which operates the air conditioner.

■ REMOTE CONTROLLER TEMPERATURE UNIT

To change the temperature unit:

- Press the °F / °C button to switch the temperature unit. (°F ↔ °C) (Factory setting: °F)



2. OUTDOOR UNIT

SINGLE TYPE :

ROSH09AVSA

ROSH12AVSA

CONTENTS

2. OUTDOOR UNIT

1. SPECIFICATIONS.....	02 - 01
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4. WIRING DIAGRAMS.....	02 - 04
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1. SPECIFICATIONS

OUTDOOR UNIT
ROSH09-12AVSA

OUTDOOR UNIT
ROSH09-12AVSA

Type				INVERTER HEAT PUMP		
Model name		ROSH09AVSA		ROSH12AVSA		
Power source				115V~ 60Hz		
Available voltage range				103.5 - 126.5V~ 60Hz		
Starting current		A	7.5	11.0		
Fan	Airflow rate	Cooling	CFM	1013 (1720)	1078 (1830)	
		Heating	(m ³ /h)	889 (1510)	942 (1600)	
	Type × Q'ty	Propeller fan × 1				
Motor output		W	23	23		
Sound pressure level	Cooling	dB (A)	47	51		
	Heating		48	51		
Heat exchanger type	Dimensions (H × W × D)	in.	19-27/32 × 25-19/32 × 23/32		19-27/32 × 24-3/32 × 23/32 19-27/32 × 25-9/32 × 23/32	
		mm	504 × 650 × 18.2		504 × 612 × 18.2 504 × 642 × 18.2	
	FPI	19		18		
	Rows × Stages	1 × 24		2 × 24		
	Pipe type	Copper				
Fin Type		Aluminum				
Compressor	Type × Q'ty	Rotary × 1				
	Motor output	W	700			
Refrigerant	Type	R410A				
	Charge	lbs.oz.	1lbs. 7oz.	1lbs. 12oz.		
kg		650	800			
Refrigerant oil	Type	VG74				
Enclosure	Material	Steel				
	Color	Beige Approximate color of MUNSELL 10YR7.5/1.0				
Dimensions (H × W × D)	Net	mm	540 × 660 × 290			
		inch	21-1/4 × 26 × 11-11/32			
	Gross	mm	611 × 797 × 401			
		inch	24-1/16 × 31-3/8 × 15-25/32			
Weight	Net	lbs.	64 (29)	69 (31)		
	Gross	(kg)	69 (31)	73 (33)		
Connenction pipe	Size	Liquid	in.	Ø1/4 (Ø6.35)		
		Gas	(mm)	Ø3/8 (Ø9.52)		
	Method		Flare			
	Pre - charge length		ft. (m)	49 (15)		
	Max. length			66 (20)		
Max. height difference		49 (15)				
Operation range	Cooling	°F	15 to 115 (-10 to 46)			
	Heating	(°C)	15 to 75 (-10 to 24)			

Note:

Specifications are based on the following conditions.

Cooling:Indoor temperature of 80°F(26.67°C)DB/67°F(19.44°C)WB,and outdoor temperature of 95°F(35°C)DB/75°F(23.9°C)WB.

Heating:Indoor temperature of 70°F(21.11°C)DB/59°F(15°C)WB,and outdoor temperature of 47°F(8.33°C)DB/43°F(6.11°C)WB.

Pipe length:24ft.7in(7.5m),Height difference:0 m.(Outdoor unit-Indoor unit)

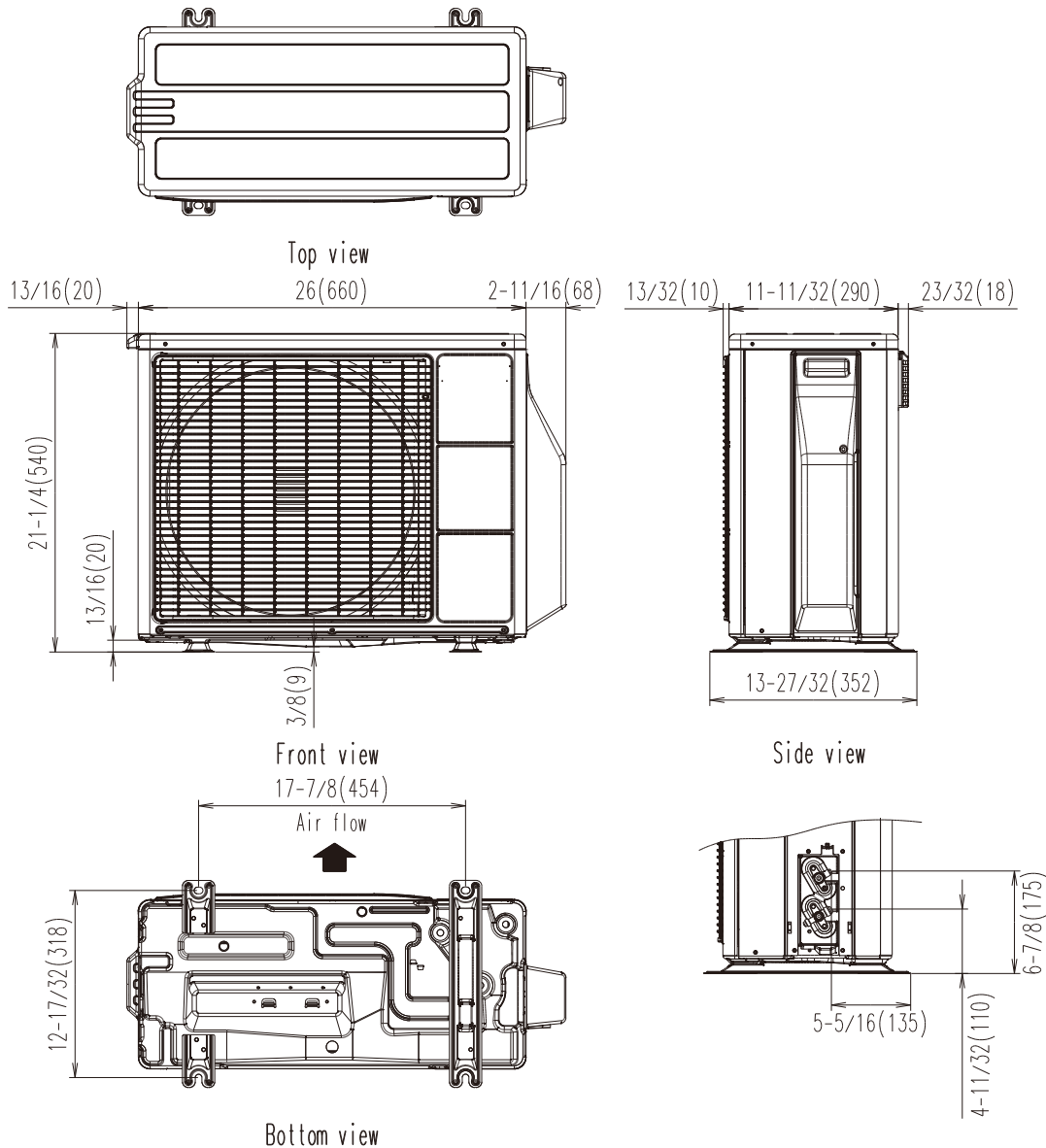
2. DIMENSIONS

MODEL: ROSH09AVSA, ROSH12AVSA

Unit : in.(mm)

OUTDOOR UNIT
ROSH09-12AVSA

OUTDOOR UNIT
ROSH09-12AVSA

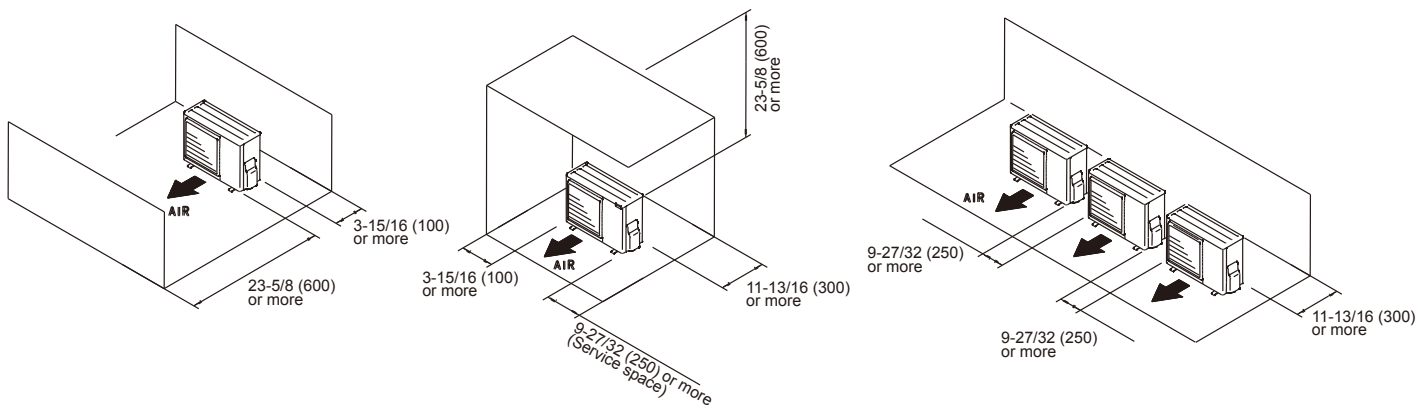


INSTALLATION PLACE

When there are obstacles at the back or front sides.

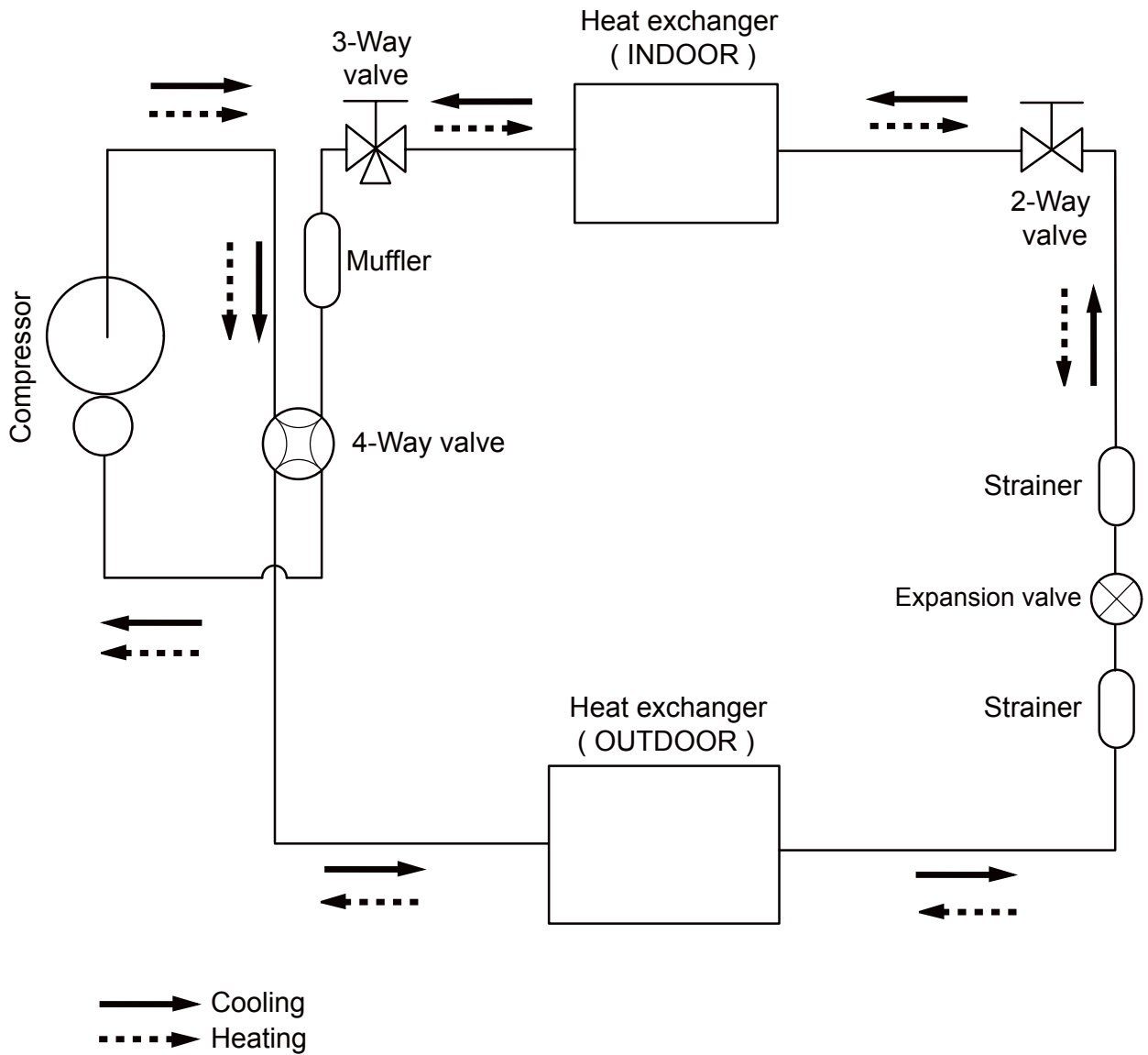
When there are obstacles at the back, side(s), and top.

When there are obstacles at the back, side with the installation of more than one unit.



3. REFRIGERANT CIRCUIT

■ MODEL: ROSH09AVSA, ROSH12AVSA



Refrigerant pipe diameter
Liquid : 1/4" (6.35 mm)
Gas : 3/8" (9.52 mm)

OUTDOOR UNIT
ROSH09-12AVSA

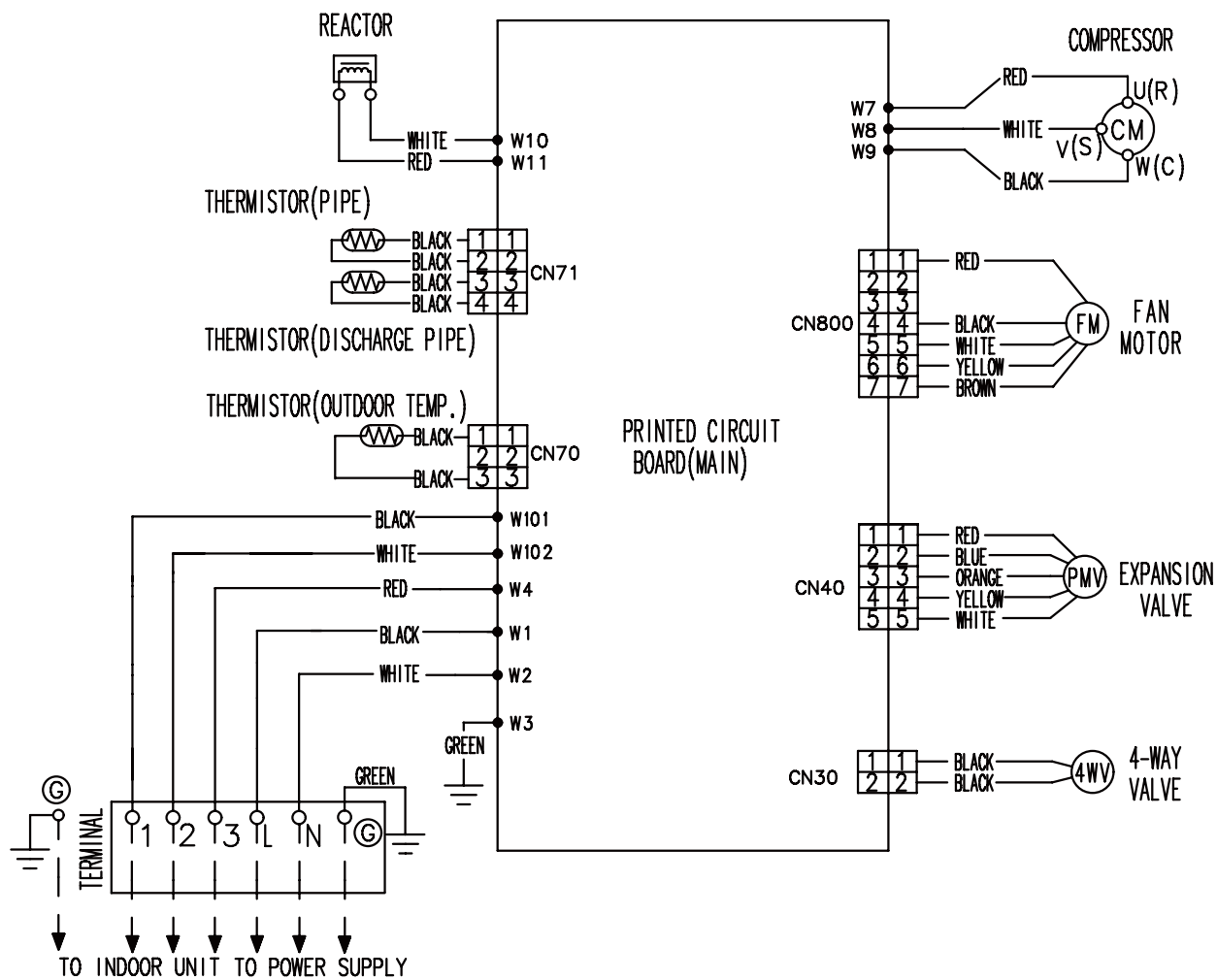
OUTDOOR UNIT
ROSH09-12AVSA

4. WIRING DIAGRAMS

MODEL: ROSH09AVSA, ROSH12AVSA

OUTDOOR UNIT
ROSH09-12AVSA

OUTDOOR UNIT
ROSH09-12AVSA



5. CAPACITY COMPENSATION RATE FOR PIPE LENGTH AND HEIGHT DIFFERENCE

MODEL: ROSH09AVSA

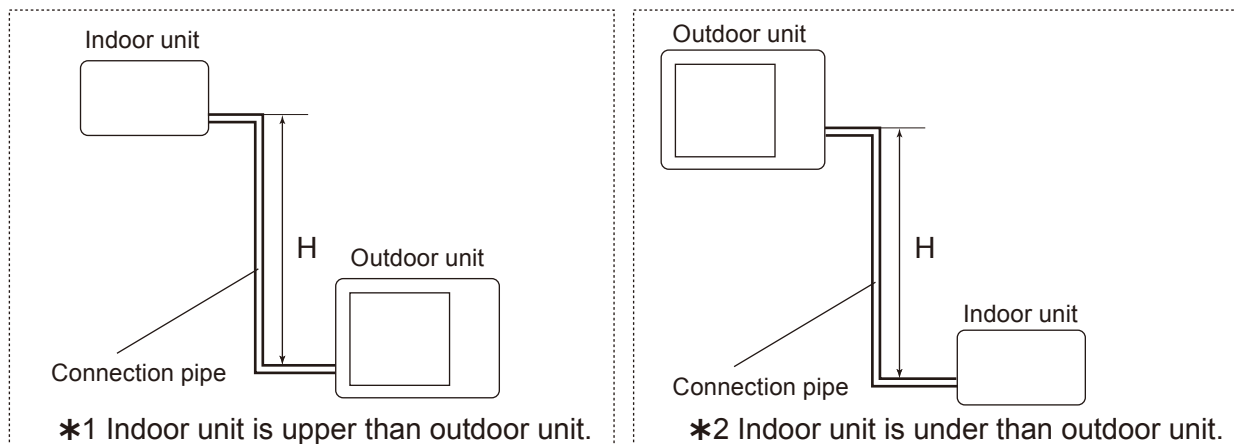
OUTDOOR UNIT
ROSH09-12AVSA

OUTDOOR UNIT
ROSH09-12AVSA

COOLING				Pipe length				
				5m	7.5m	10m	15m	20m
				17ft.	25ft.	33ft.	50ft.	67ft.
Height difference H	*1 Indoor unit is upper than outdoor unit.	15m	50ft.	-	-	-	0.901	0.920
		10m	33ft.	-	-	0.969	0.916	0.936
		7.5m	25ft.	-	0.988	0.973	0.919	0.939
		5m	17ft.	1.003	0.992	0.976	0.923	0.943
	0		0ft.	1.011	1.000	0.984	0.931	0.951
	*2 Indoor unit is under than outdoor unit	-5m	-17ft.	1.011	1.000	0.984	0.931	0.951
		-7.5m	-25ft.	-	1.000	0.984	0.931	0.951
		-10m	-33ft.	-	-	0.984	0.931	0.951
		-15m	-50ft.	-	-	-	0.931	0.951

HEATING				Pipe length				
				5m	7.5m	10m	15m	20m
				17ft.	25ft.	33ft.	50ft.	67ft.
Height difference H	*1 Indoor unit is upper than outdoor unit.	15m	50ft.	-	-	-	0.904	0.898
		10m	33ft.	-	-	0.976	0.904	0.898
		7.5m	25ft.	-	1.000	0.976	0.904	0.898
		5m	17ft.	1.014	1.000	0.976	0.904	0.898
	0		0ft.	1.014	1.000	0.976	0.904	0.898
	*2 Indoor unit is under than outdoor unit	-5m	-17ft.	1.009	0.995	0.971	0.900	0.894
		-7.5m	-25ft.	-	0.993	0.968	0.898	0.892
		-10m	-33ft.	-	-	0.966	0.895	0.889
		-15m	-50ft.	-	-	-	0.886	0.880

Height difference H



MODEL: ROSH12AVSA

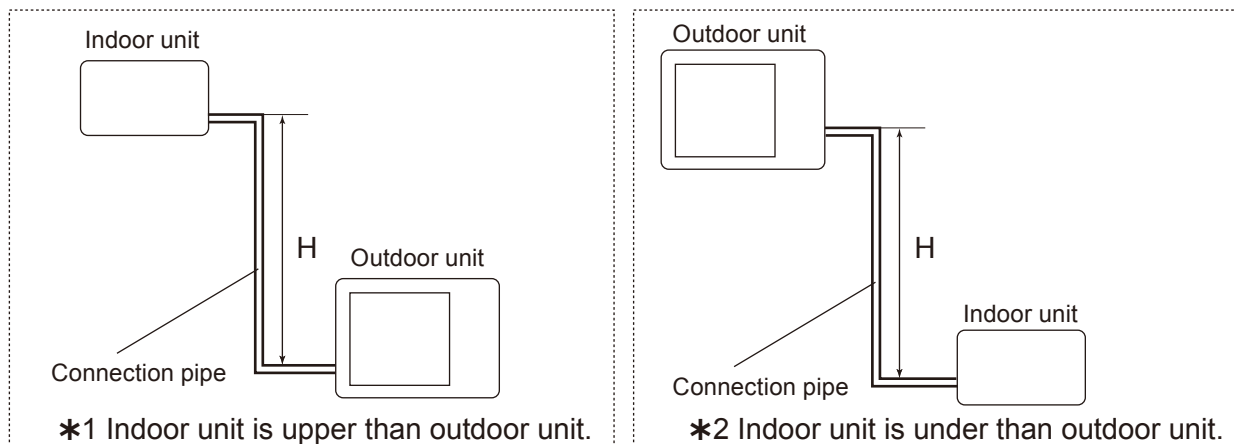
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COOLING				Pipe length				
				5m	7.5m	10m	15m	20m
				17ft.	25ft.	33ft.	50ft.	67ft.
Height difference H	*1 Indoor unit is upper than outdoor unit.	15m	50ft.	-	-	-	0.872	0.882
		10m	33ft.	-	-	0.953	0.887	0.897
		7.5m	25ft.	-	0.988	0.957	0.890	0.900
		5m	17ft.	1.023	0.992	0.961	0.894	0.904
	0	0ft.	1.031	1.000	0.969	0.901	0.911	
	*2 Indoor unit is under than outdoor unit	-5m	-17ft.	1.031	1.000	0.969	0.901	0.911
		-7.5m	-25ft.	-	1.000	0.969	0.901	0.911
		-10m	-33ft.	-	-	0.969	0.901	0.911
		-15m	-50ft.	-	-	-	0.901	0.911

HEATING				Pipe length				
				5m	7.5m	10m	15m	20m
				17ft.	25ft.	33ft.	50ft.	67ft.
Height difference H	*1 Indoor unit is upper than outdoor unit.	15m	50ft.	-	-	-	0.944	0.935
		10m	33ft.	-	-	0.982	0.944	0.935
		7.5m	25ft.	-	1.000	0.982	0.944	0.935
		5m	17ft.	1.014	1.000	0.982	0.944	0.935
	0	0ft.	1.014	1.000	0.982	0.944	0.935	
	*2 Indoor unit is under than outdoor unit	-5m	-17ft.	1.009	0.995	0.977	0.940	0.930
		-7.5m	-25ft.	-	0.993	0.975	0.937	0.928
		-10m	-33ft.	-	-	0.972	0.935	0.925
		-15m	-50ft.	-	-	-	0.926	0.916

Height difference H



6. ADDITIONAL CHARGE CALCULATION

■ MODEL: ROSH09AVSA

Refrigerant type		R410A
Refrigerant amount	lbs. oz.	1lbs. 7oz.
	g	650

● REFRIGERANT CHARGE

Pipe length	ft.	49 or less	66 (MAX)	0.22oz./ft. (20g/m)
	m	15 or less	20 (MAX)	
Additional charge	oz.	0	+3.5	
	g	0	+100	

■ MODEL: ROSH12AVSA

Refrigerant type		R410A
Refrigerant amount	lbs. oz.	1lbs. 12oz.
	g	800

● REFRIGERANT CHARGE

Pipe length	ft.	49 or less	66 (MAX)	0.22oz./ft. (20g/m)
	m	15 or less	20 (MAX)	
Additional charge	oz.	0	+3.5	
	g	0	+100	

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7. AIR FLOW

■ MODEL: ROSH09AVSA

● Cooling

Number of rotations (r.p.m.)	Air flow	
	730	1720
478		l/s
1013		CFM

● Heating

Number of rotations (r.p.m.)	Air flow	
	650	1510
419		l/s
889		CFM

■ MODEL: ROSH12AVSA

● Cooling

Number of rotations (r.p.m.)	Air flow	
	860	1830
508		l/s
1078		CFM

● Heating

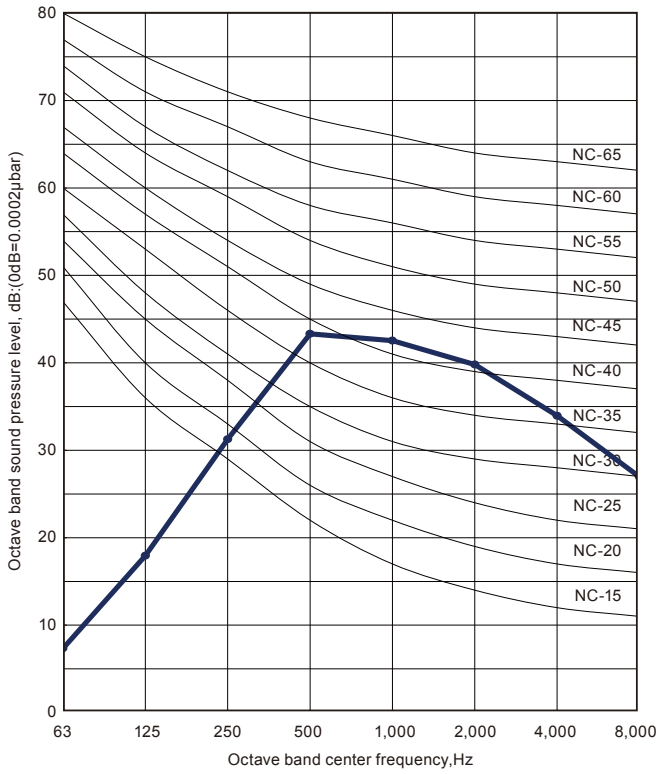
Number of rotations (r.p.m.)	Air flow	
	760	1600
444		l/s
942		CFM

8. OPERATION NOISE

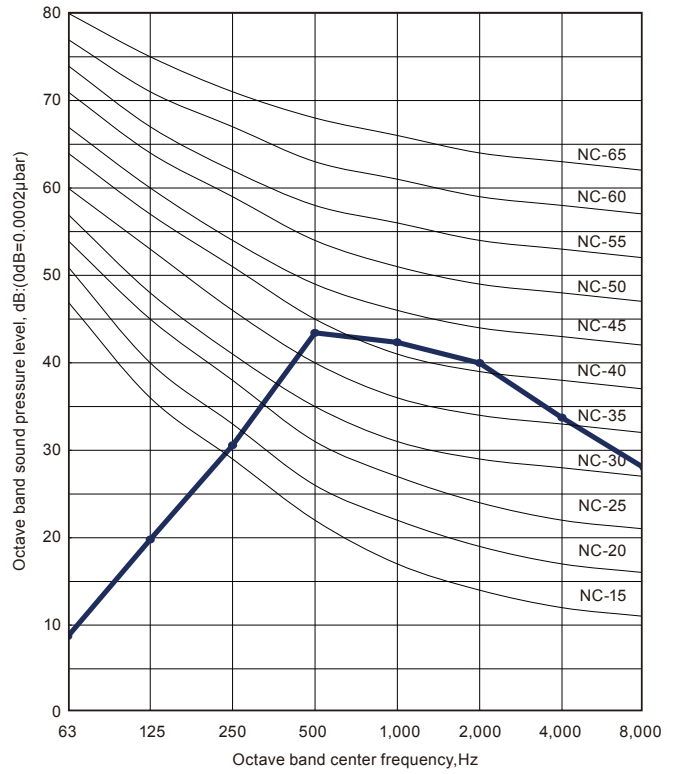
8-1. NOISE LEVEL CURVE

MODEL: ROSH09AVSA

● Cooling

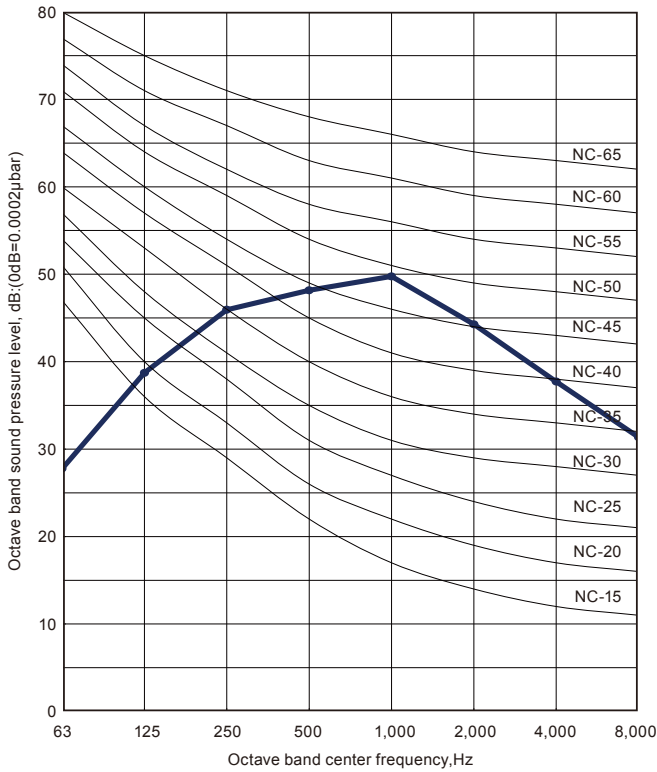


● Heating

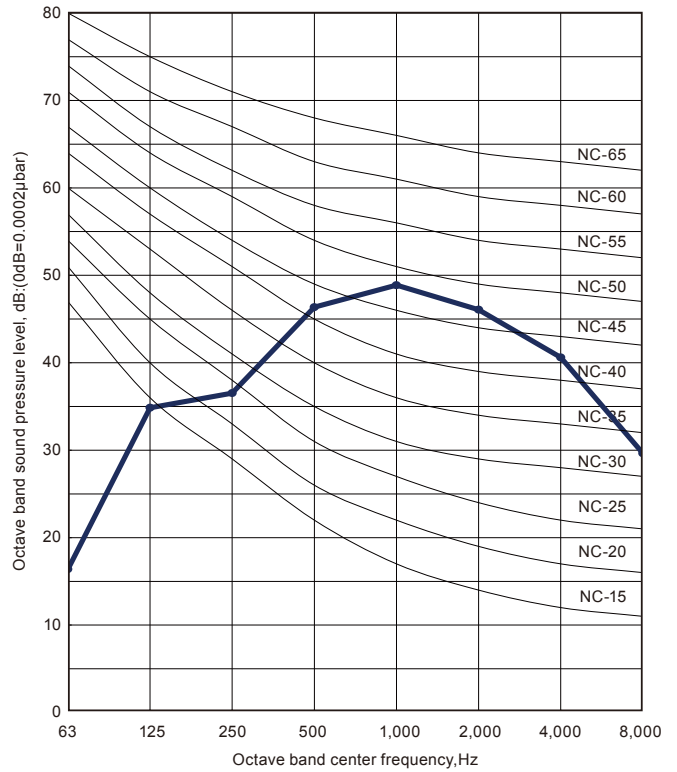


MODEL: ROSH12AVSA

● Cooling



● Heating

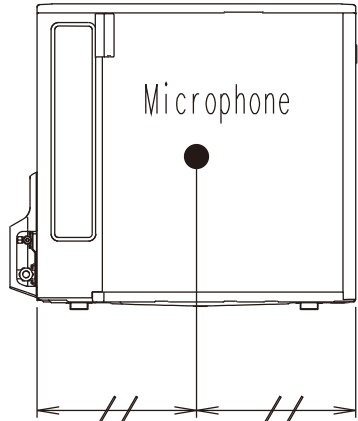
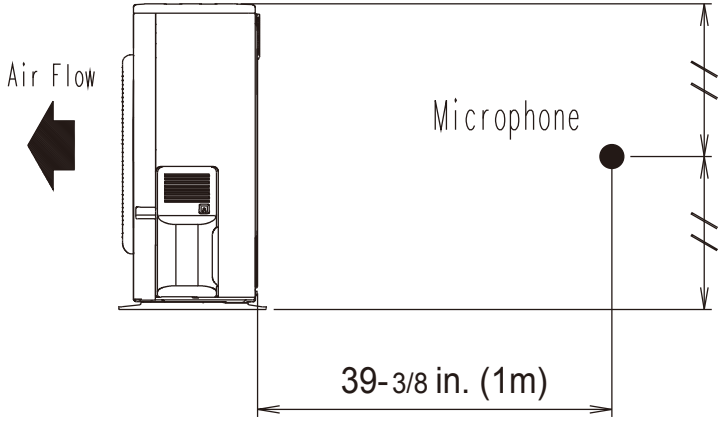


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8-2. SOUND LEVEL CHECK POINT

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9. ELECTRIC CHARACTERISTICS

Model Name			ROSH09AVSA	ROSH12AVSA
Power Supply	Voltage	V	115 ~	
	Frequency	Hz	60	
*1) Max. Operating Current		A	13.5	15.0
Starting Current		A	7.5	11.0
*2) Wiring Spec.	Main Fuse (Circuit breaker) Current	A	15	20
	Power Cable	AWG	14	
	*3) Limited wiring length	ft. (m)	66 (20)	

*1) The maximum current is the total current of indoor unit and outdoor unit.

*2) Wiring Spec.

Selected Sample

(Selected based on Japan Electrotechnical Standard and Codes Committee E00005)

*3) Limited Wiring Length:

This is the wiring length in case voltage descent is less than 2%.

When the wiring length becomes long, please select the wiring of a more larger diameter.

10. SAFETY DEVICES

	Protection form	Model
		ROSH09AVSA ROSH12AVSA
Circuit protection	Current fuse (IN THE INVERTER CASE)	—
	Current fuse (MAIN PRINTED CIRCUIT BOARD)	25A/250V 3.15A/250V 3.15A/250V
Fan motor protection	Terminal protection program	OFF: 302°F (150°C) ON: 248°F (120°C)
Compressor protection	Terminal protection program COMPRESSOR TEMP.	OFF: 230°F (110°C) ON: After 7 minutes

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