

Residential Inverter Heat Pump R32

HAORI Series

Indoor Units

RAS-B10N4KVRG-E

RAS-B13N4KVRG-E

RAS-B16N4KVRG-E

RAS-10N4KVRG-TR

RAS-13N4KVRG-TR

RAS-16N4KVRG-TR

Outdoor Units

RAS-10J2AVSG-E1

RAS-13J2AVSG-E1

RAS-16J2AVSG-E1

RAS-10J2AVSG-TR1

RAS-13J2AVSG-TR1

RAS-16J2AVSG-TR1




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1. Line up

Outdoor Unit	Indoor Unit	Model Name		Capacity Rank
		CDU	FCU	
		RAS-10J2AVSG-E1 RAS-10J2AVSG-TR1	RAS-B10N4KVRG-E RAS-10N4KVRG-TR	10k
		RAS-13J2AVSG-E1 RAS-13J2AVSG-TR1	RAS-B13N4KVRG-E RAS-13N4KVRG-TR	13k
		RAS-16J2AVSG-E1 RAS-16J2AVSG-TR1	RAS-B16N4KVRG-E RAS-16N4KVRG-TR	16k

Accessories

Appearance	Model Name	Remark
	WH-UA01UE	<p>Remote controller : Power Select, Off Timer , Heating setting 5 - 30°C, Swing, Fix, Hi Power, Eco, Fireplace, Self Cleaning, Quiet FCU, Silence CDU, Manual defrost, Self Diagnosis, Heating only compatibility, HADA Care Flow, Pure</p> <p>(packed with indoor unit)</p>
	RB-RXS33-E	<p>Remote controller : Power Select, Comfort Sleep, On-Off Timer, 8°C, Weekly Timer, Swing, Fix, Hi Power, Eco, Fireplace, Self Cleaning, Quiet FCU, Silence CDU, Manual defrost, Self Diagnosis, Heating only compatibility, HADA Care Flow, Pure, and wired connection</p> <p>(optional remote controller)</p>
	Toshiba Home AC Controller Application	<p>Adapter built-in</p> <p>Application : temperature monitoring, Power Select ,On-Off Timer , 8°C, Swing, fix, Hi Power, Eco, Fireplace, Quiet FCU, Pure, Silence CDU, Error code, Weekly schedule, all ACs and group control, Energy monitoring, Smart speaker Google assistant and Alexa Amazon compatible.</p>

2. Specifications

System	Size	10k	13k	16k
	Indoor	RAS-B10N4KVRG-E RAS-10N4KVRG-TR	RAS-B13N4KVRG-E RAS-13N4KVRG-TR	RAS-B16N4KVRG-E RAS-16N4KVRG-TR
	Outdoor	RAS-10J2AVSG-E1 / TR1	RAS-13J2AVSG-E1 / TR1	RAS-16J2AVSG-E1 / TR1
	Power supply (V/Ph/Hz)	220 - 240 / 1 / 50		
Cooling	Capacity (kW)	2.5	3.5	4.6
	Power Consumption (kW)	0.54	0.80	1.35
	EER	4.63	4.38	3.41
	PdesignC (kW)	2.50	3.50	4.60
	SEER	8.60	8.60	7.80
	Indoor Noise (H/L/Q) (dB)	41/22/19	43/23/19	45/25/21
	Outdoor Noise (dB)	44	46	48
	Indoor Air Flow m ³ /min	10	11.2	10.8
Heating	Capacity (kW)	3.2	4.2	5.5
	Power Consumption (kW)	0.74	1.08	1.52
	COP	4.32	3.89	3.62
	PdesignH (Tbiv -10°C) (kW)	2.50	3.20	4.00
	SCOP	5.10	5.10	4.60
	Indoor Noise (H/L/Q) (dB)	41/22/19	43/23/19	45/26/22
	Outdoor Noise (dB)	46	48	50
	Indoor Air Flow m ³ /min	10.2	11.2	11.2
FCU	Dimensions	H x W x D (mm)	300 x 987 x 210	
		Net Weight (kg)	11	11
CDU	Dimensions	H x W x D (mm)	550 x 780 x 290	
		Net Weight (kg)	26	30
Pipe	Chargeless (m)	15	15	15
	Maximum Length (m)	20	20	20
	Maximum Height (m)	12	12	12
	Refrigerant	R32		
	Refrigerant amount (kg)	0.55	0.8	0.8
Energy Label	Cooling / Heating	A+++ / A+++	A+++ / A+++	A++ / A++
Useble Range Temperature	Cooling (°C)	Indoor: 21 ~ 32 °C , Outdoor: (-15) ~ 46 °C		
	Heating (°C)	Indoor: 0 ~ 28 °C , Outdoor: (-15) ~ 24 °C		

For performance when each indoor unit is combined with other unit, refer to the separate table.

* The specifications may be subject to change without notice for purpose of improvement.

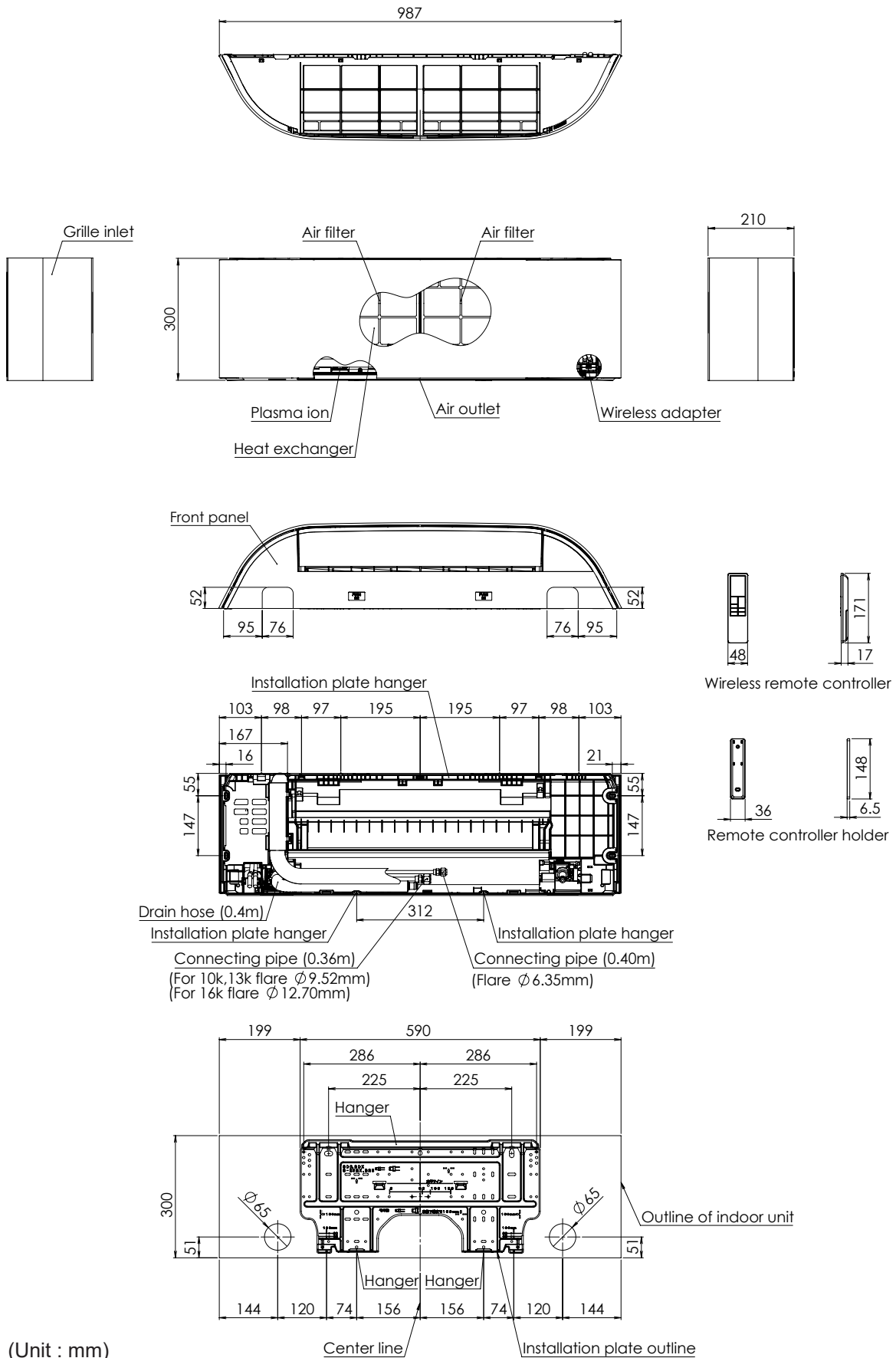
Cooling : Capacity test condition, inside : 27 °C (Db) / 19 °C (Wb), outside : 35 °C (Db) / 24 °C (Wb)

Heating : Capacity test condition, inside : 20 °C (Db), outside : 7 °C (Db) / 6°C (Wb)

Piping length : 5 m per Indoor Unit.

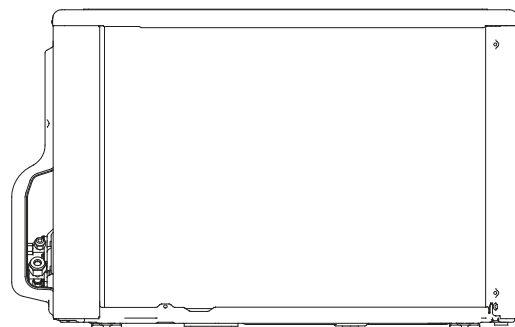
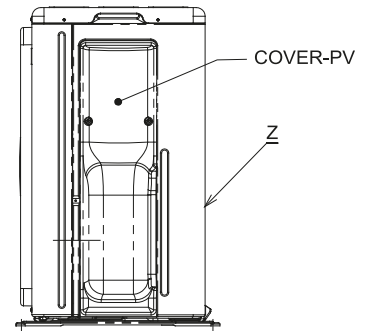
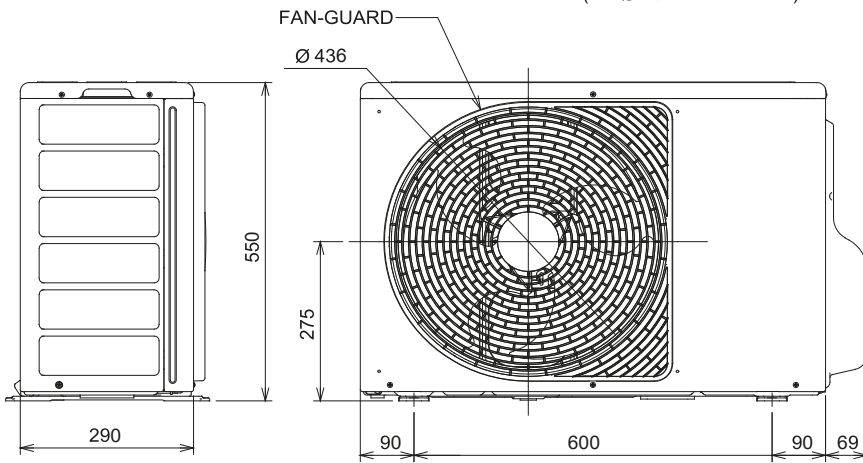
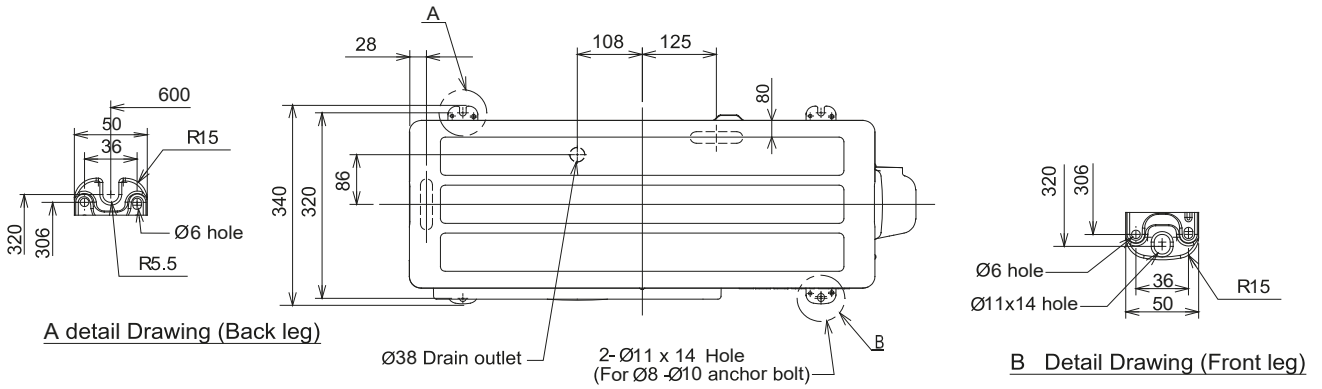
3. Dimension

Indoor Unit : RAS-B10N4KVRG-E, RAS-B13N4KVRG-E, RAS-B16N4KVRG-E
 RAS-10N4KVRG-TR, RAS-13N4KVRG-TR, RAS-16N4KVRG-TR

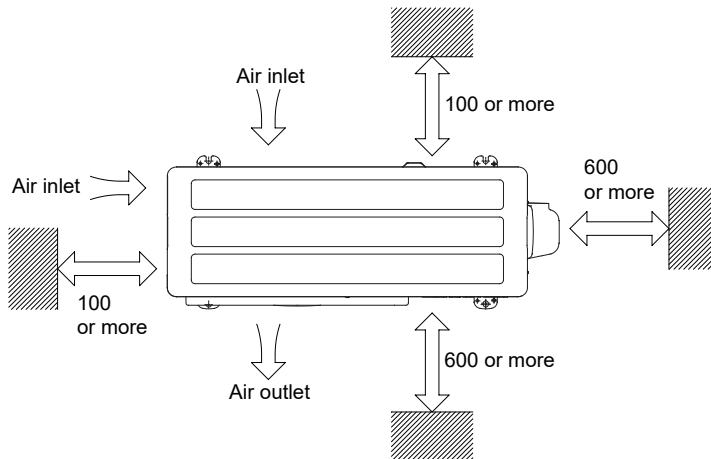
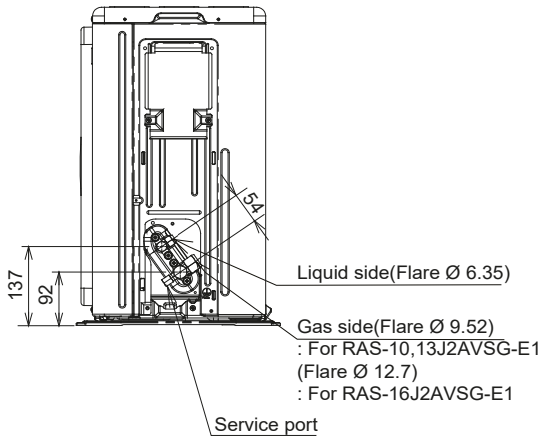


(Unit : mm)

Outdoor Unit : RAS-10J2AVRG-E1, RAS-13J2AVRG-E1, RAS-16J2AVRG-E1
 RAS-10J2AVRG-TR1, RAS-13J2AVRG-TR1, RAS-16J2AVRG-TR1



Z View

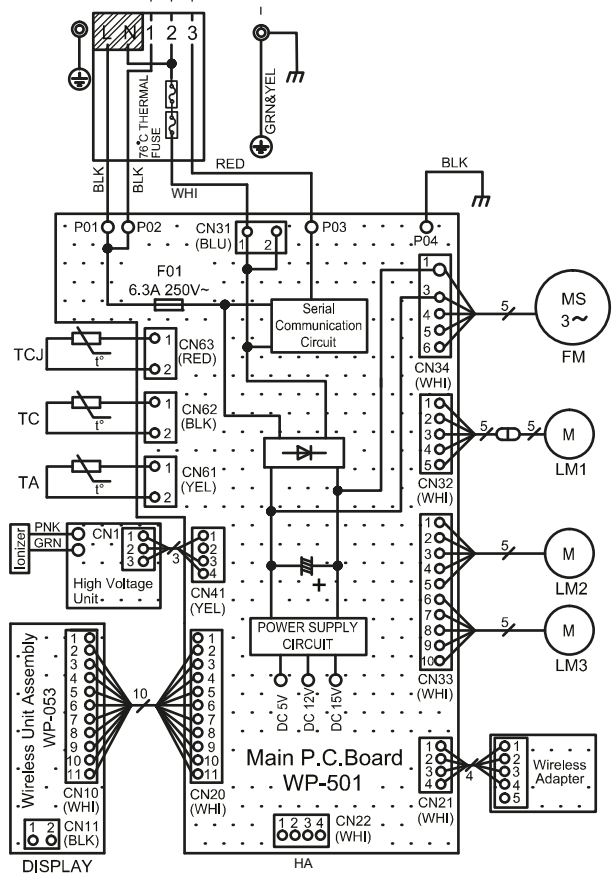
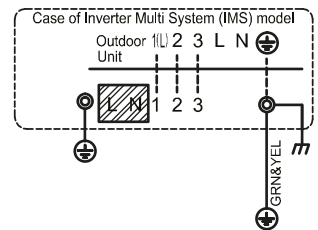
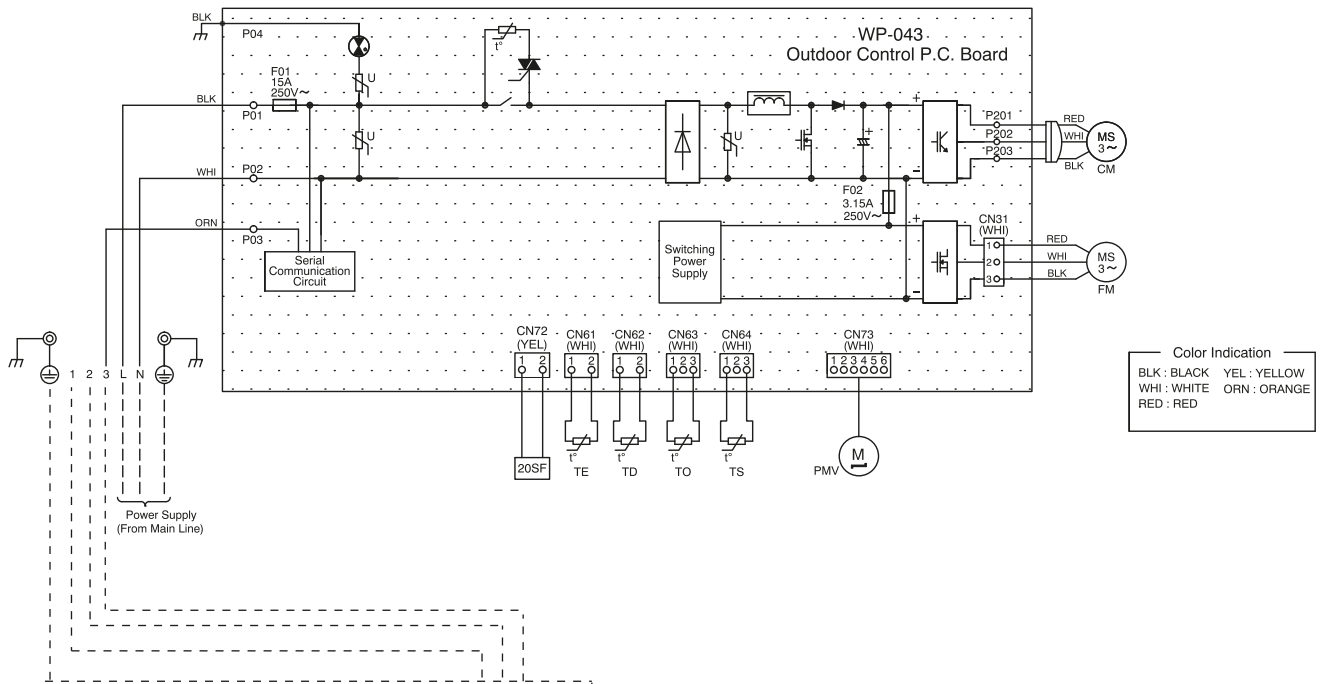


(Unit : mm)

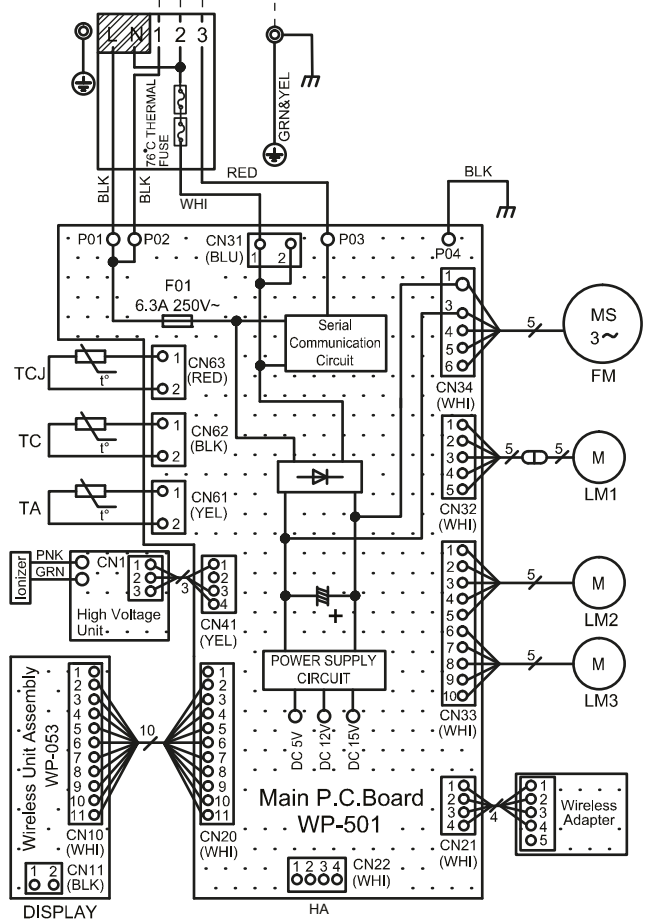
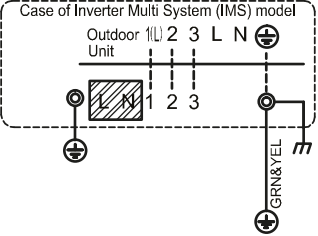
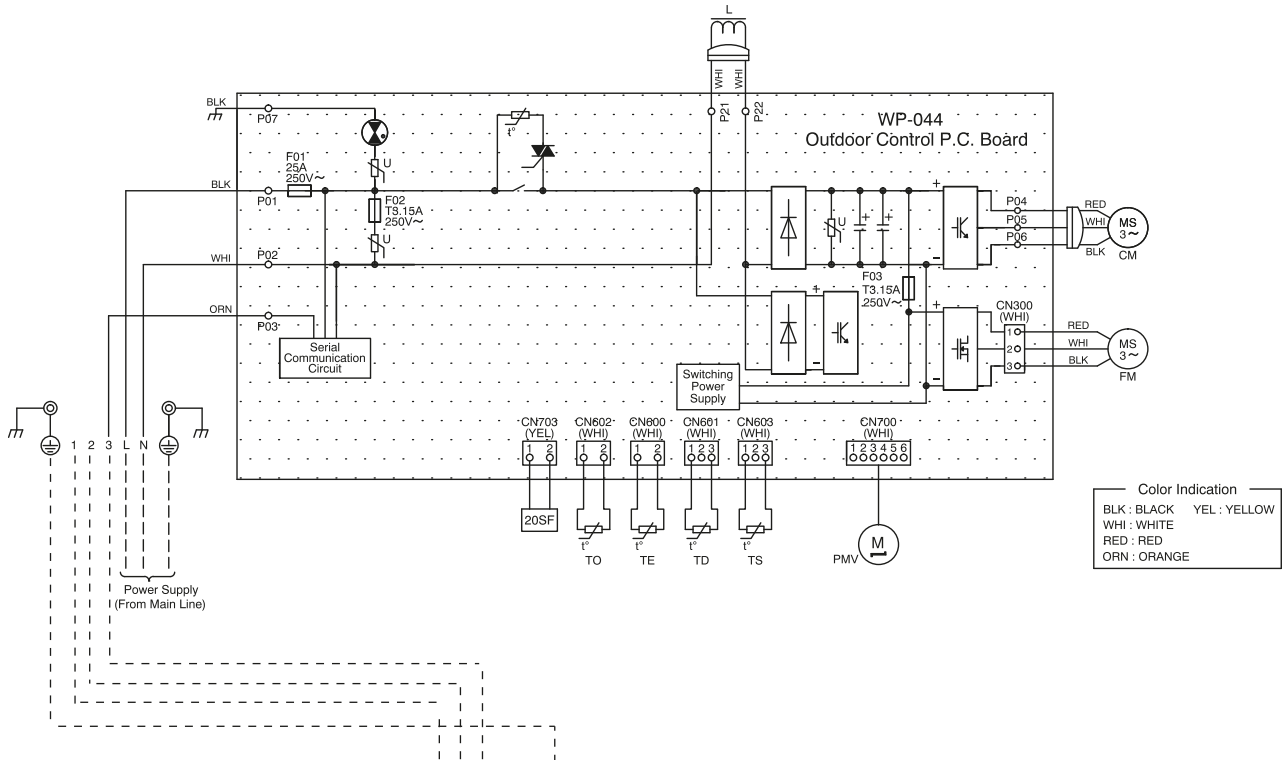
Installation dimension

4. Wiring diagrams

RAS-B10N4KVRG-E ; RAS-10J2AVRG-E1 / RAS-B13N4KVRG-E ; RAS-13J2AVRG-E1
 RAS-10N4KVRG-TR ; RAS-10J2AVRG-TR1 / RAS-13N4KVRG-TR ; RAS-13J2AVRG-TR1

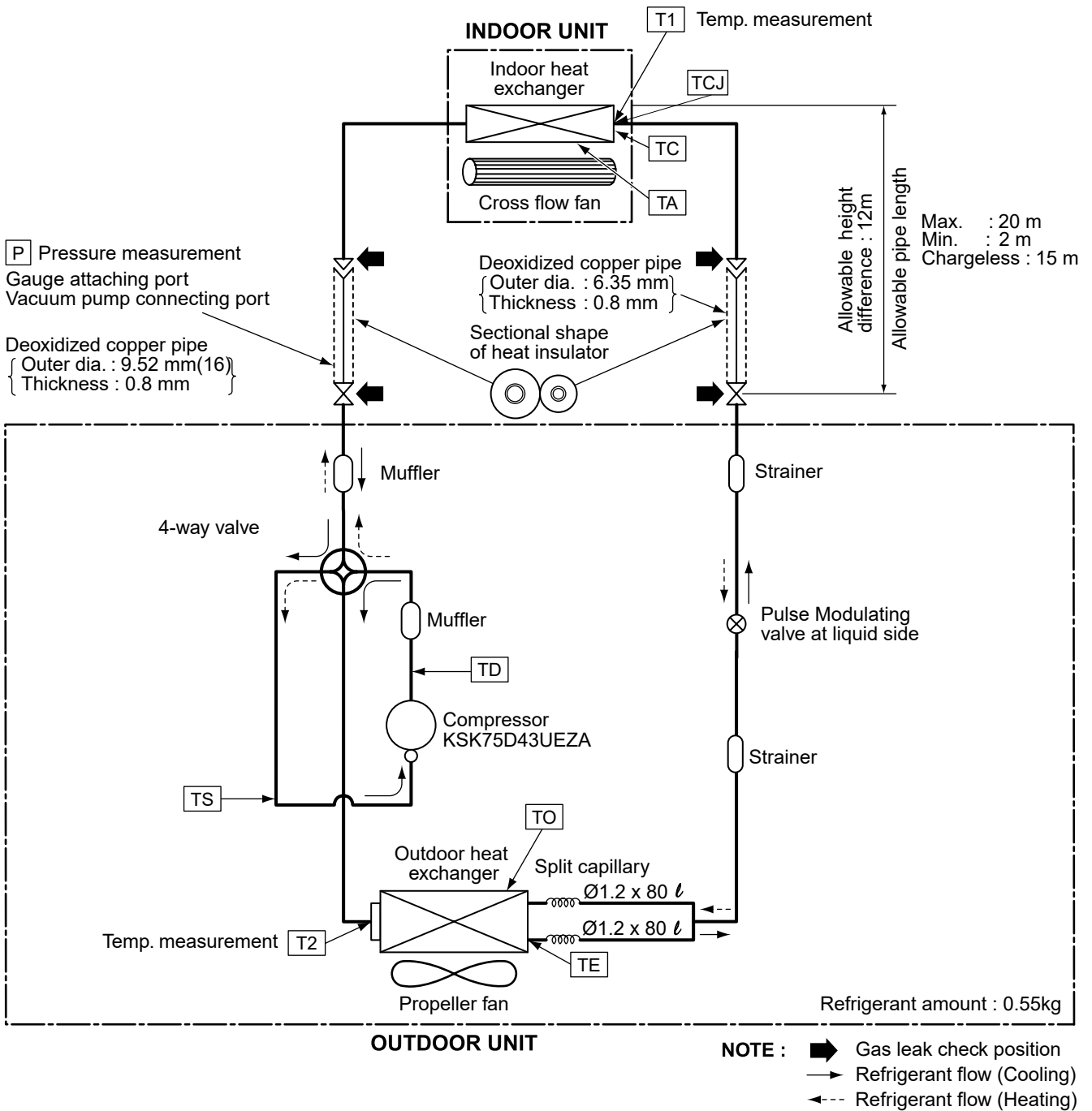


RAS-B16N4KVRG-E ; RAS-16J2AVRG-E1
 RAS-16N4KVRG-TR ; RAS-16J2AVRG-TR1



5. Refrigerant cycle diagrams

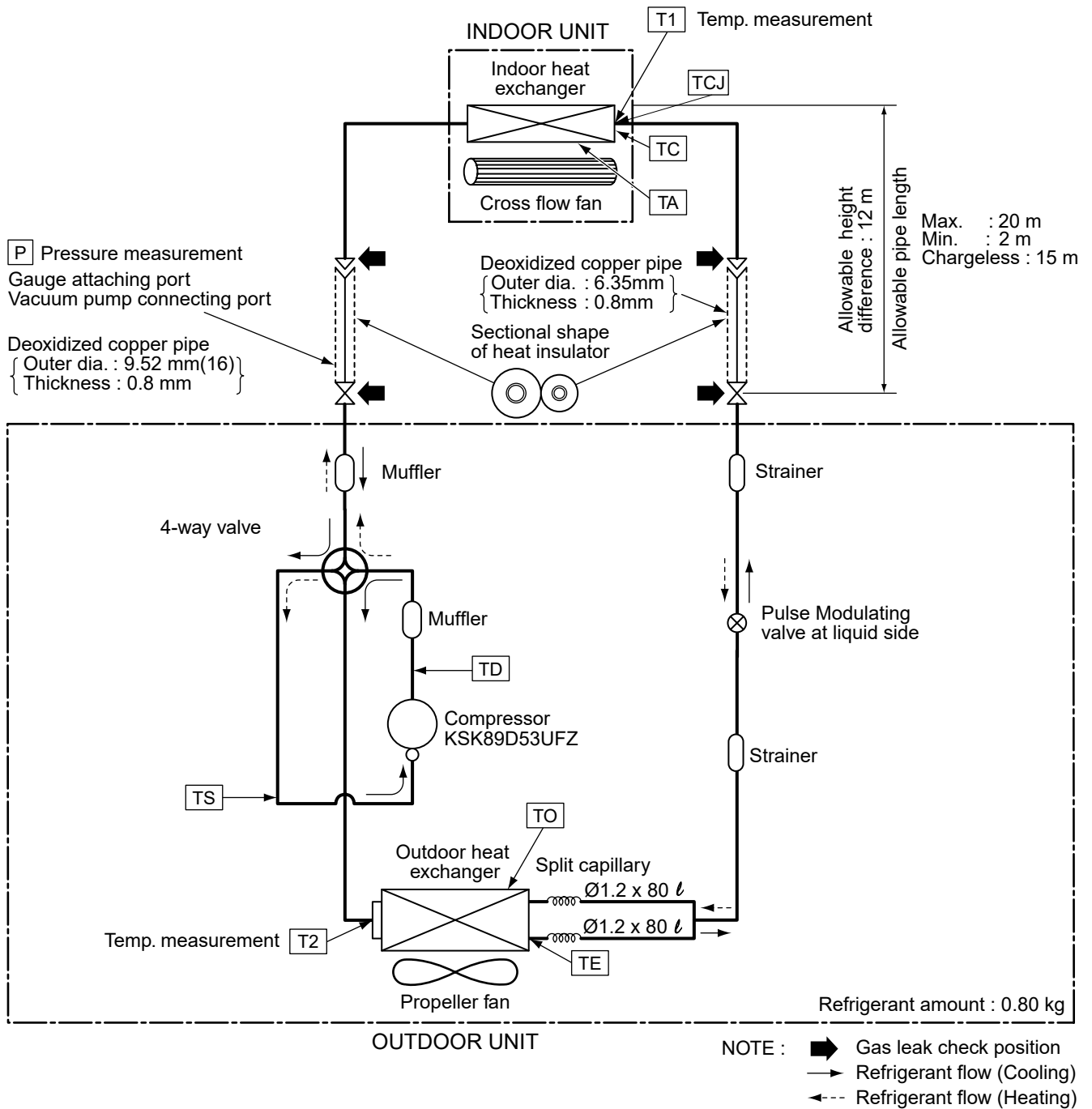
RAS-B10N4KVRG-E ; RAS-10J2AVRG-E1
 RAS-10N4KVRG-TR ; RAS-10J2AVRG-TR1



NOTE :

- The maximum pipe length of this air conditioner is 15 m. When the pipe length exceeds 15 m, the additional charging of refrigerant, 20 g per 1 m for the part of pipe exceeded 15 m is required. (Max. 100g)

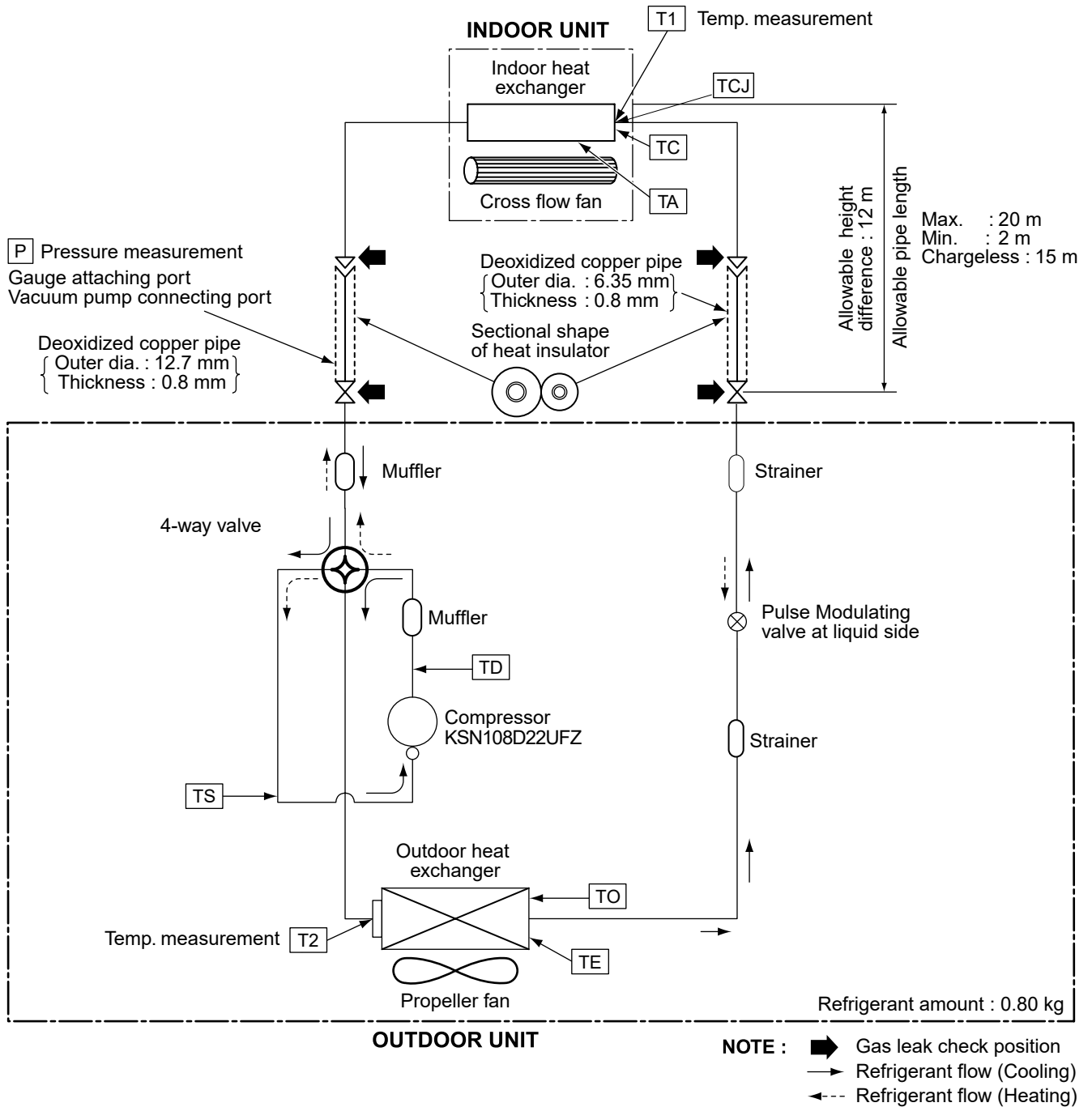
RAS-B13N4KVRG-E ; RAS-13J2AVRG-E1
 RAS-13N4KVRG-TR ; RAS-13J2AVRG-TR1



NOTE :

- The maximum pipe length of this air conditioner is 15 m. When the pipe length exceeds 15 m, the additional charging of refrigerant, 20 g per 1m for the part of pipe exceeded 15 m is required. (Max. 100 g)

RAS-B16N4KVRG-E ; RAS-16J2AVRG-E1
 RAS-16N4KVRG-TR ; RAS-16J2AVRG-TR1



NOTE :

- The maximum pipe length of this air conditioner is 15 m. When the pipe length exceeds 15m, the additional charging of refrigerant, 20 g per 1m for the part of pipe exceeded 15 m is required. (Max. 100 g)

Operation Data

<Cooling>

Temperature condition(°C)		Model name	Standard pressure P (MPa)	Heat exchanger pipe temp.		Indoor fan mode	Outdoor fan mode	Compressor revolution (rps)	Connecting piping (m)
Indoor	Outdoor			T1 (°C)	T2 (°C)				
27 / 19	35 / 24	RAS-(B)10N4KVRG*	1.1 to 1.2	12 to 13	43 to 44	High	High	51	5.0
		RAS-(B)13N4KVRG*	1.0 to 1.1	10 to 11	43 to 44	High	High	63	
		RAS-(B)16N4KVRG*	1.0 to 1.1	8 to 9	46 to 47	High	High	76	

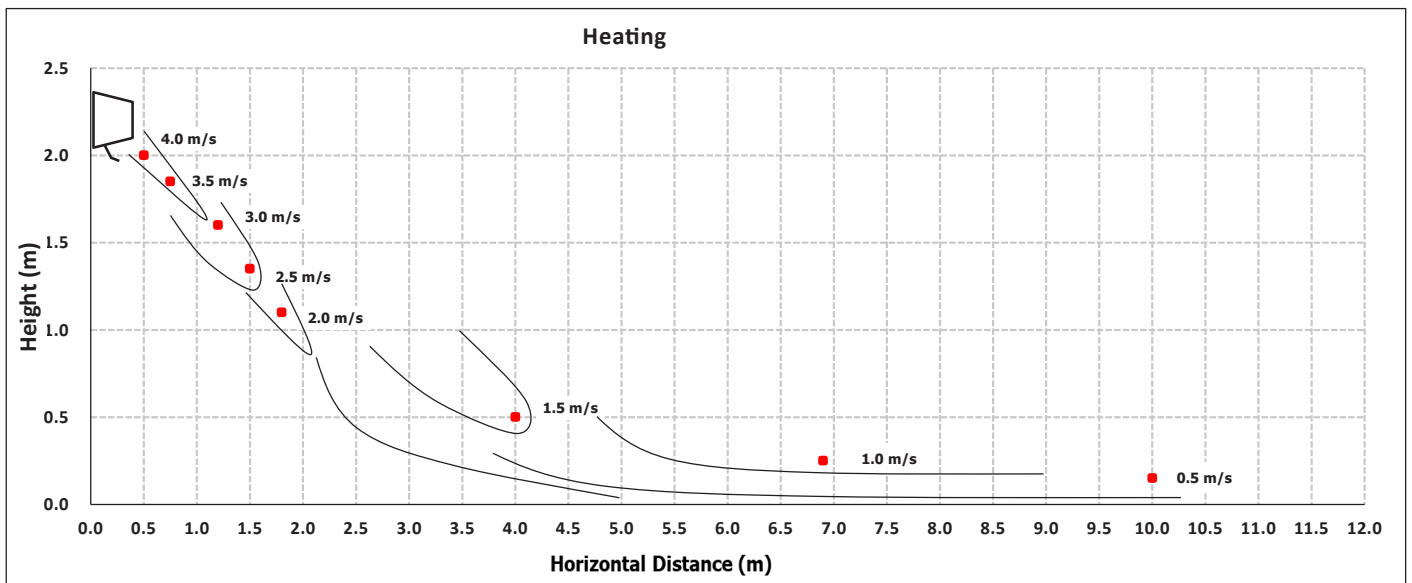
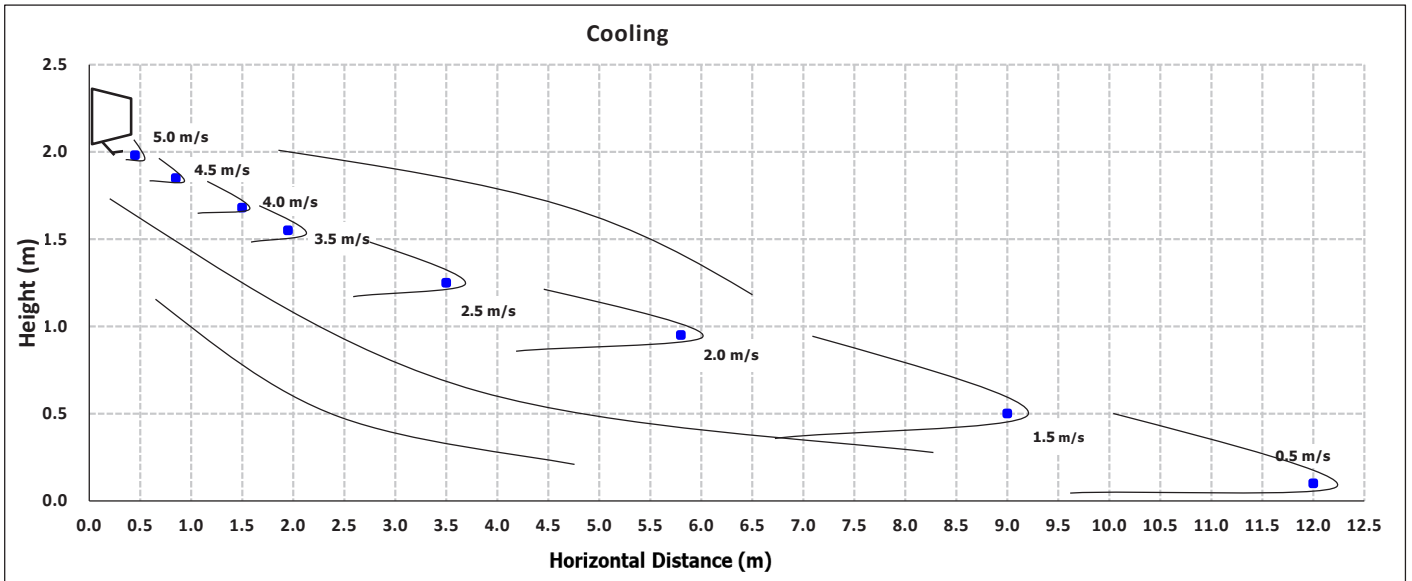
<Heating>

Temperature condition(°C)		Model name	Standard pressure P (MPa)	Heat exchanger pipe temp.		Indoor fan mode	Outdoor fan mode	Compressor revolution	Connecting piping (m)
Indoor	Outdoor			T1 (°C)	T2 (°C)				
20 / 15	7 / 6	RAS-(B)10N4KVRG*	2.4 to 2.6	39 to 40	2 to 3	High	High	74	5.0
		RAS-(B)13N4KVRG*	2.6 to 2.8	45 to 46	2 to 3	High	High	79	
		RAS-(B)16N4KVRG*	2.8 to 3.0	46 to 47	2 to 3	High	High	89	

NOTES : Measure surface temperature of heat exchanger pipe around center of heat exchanger path U bent.
(Thermistor thermometer)

6. Air Speed Distribution

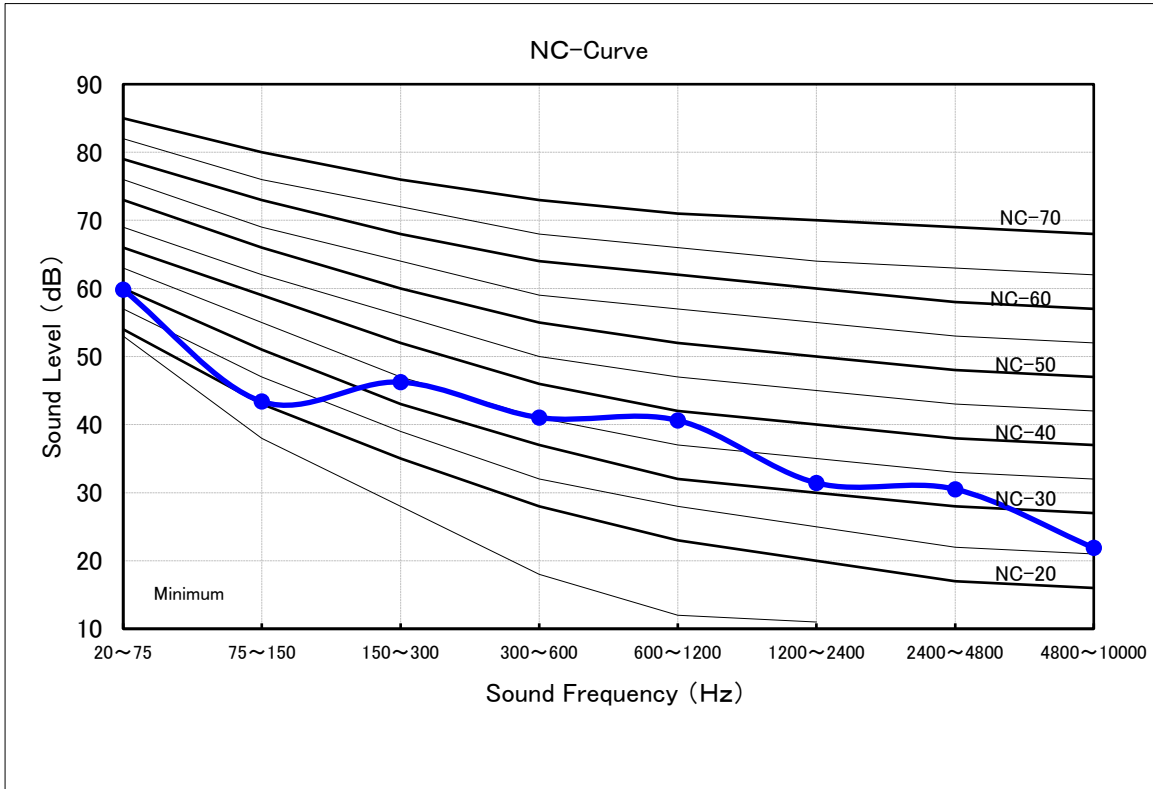
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 RAS-10N4KVRG-TR / RAS-13N4KVRG-TR / RAS-16N4KVRG-TR



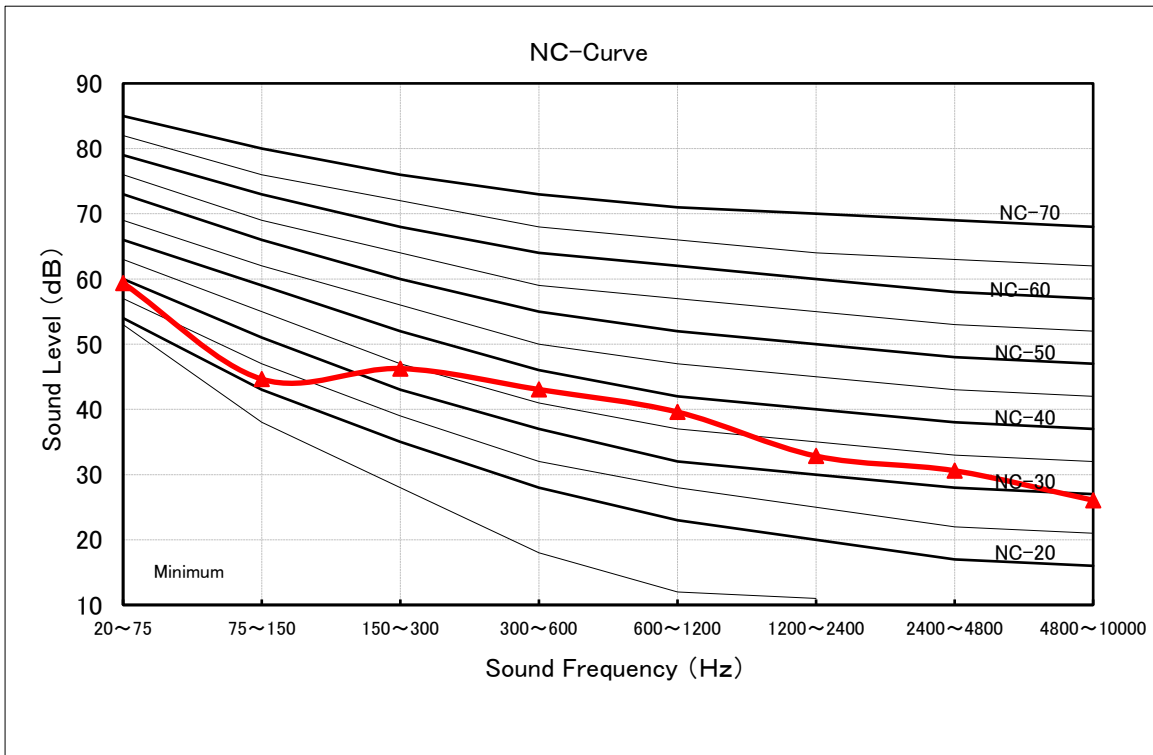
7. Sound Characteristics (NC Curve)

Outdoor Unit : RAS-10J2AVSG-E1 / TR1 (Rated Conditions)

Cooling

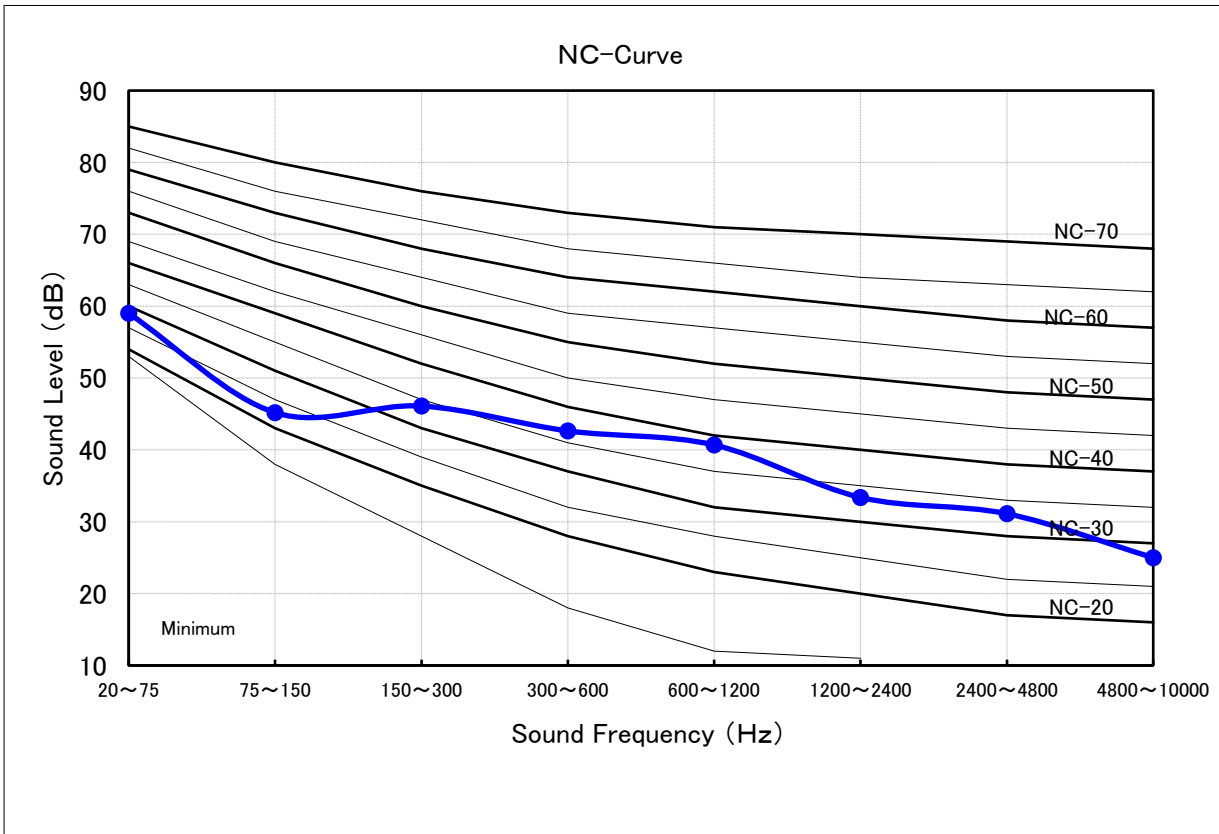


Heating

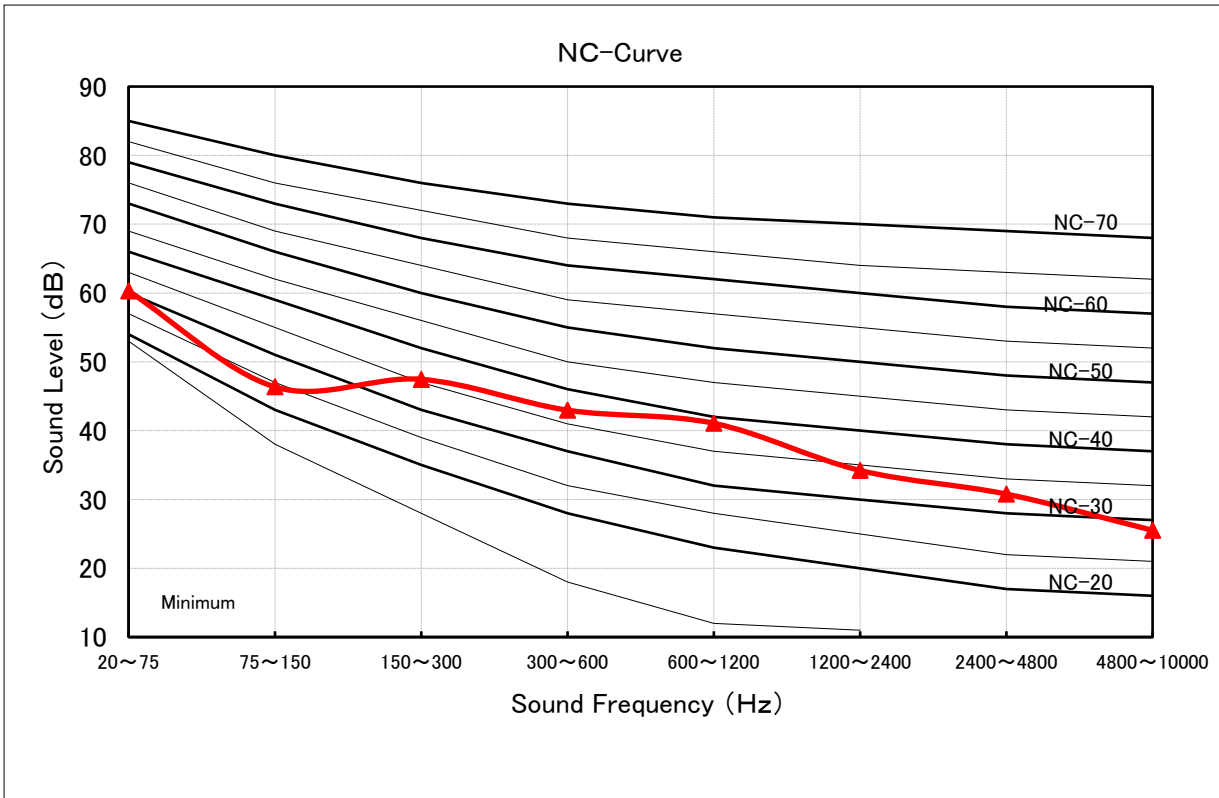


Outdoor Unit : RAS-13J2AVSG-E1 / TR1 (Rated Conditions)

Cooling

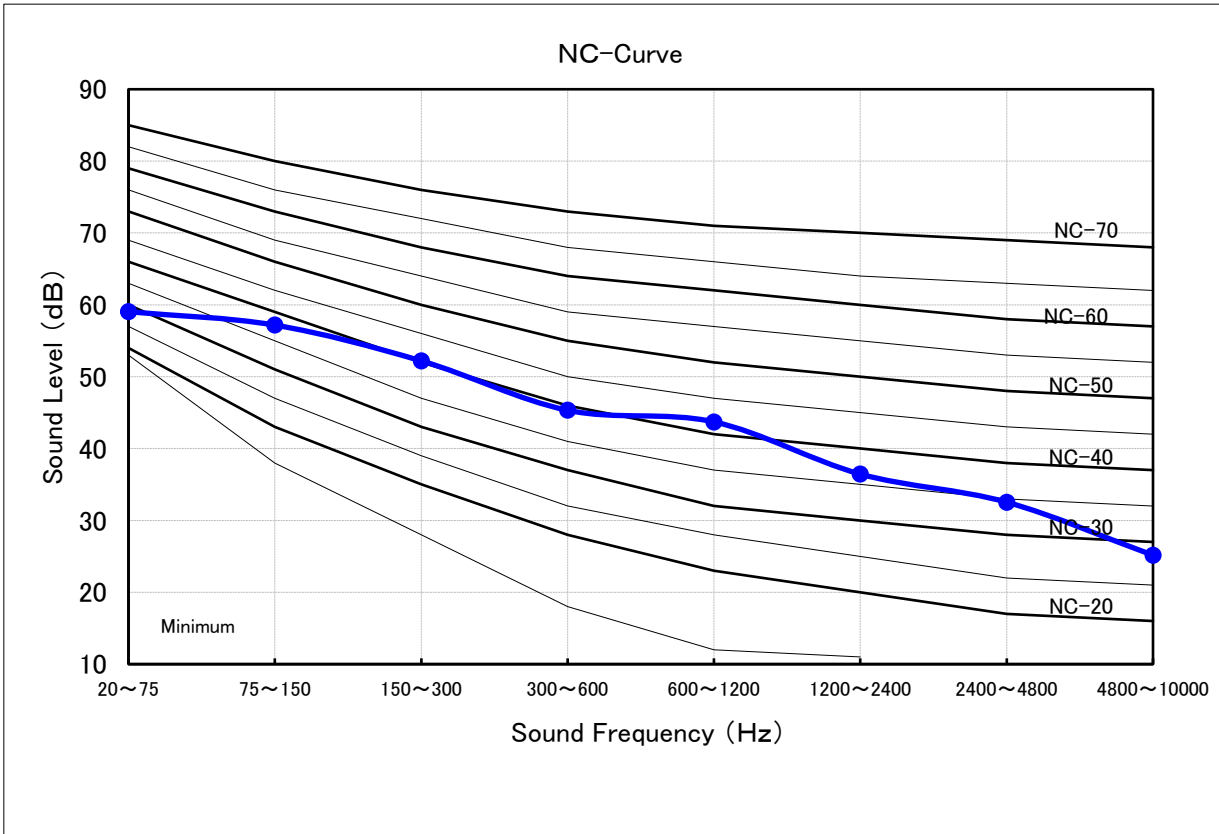


Heating

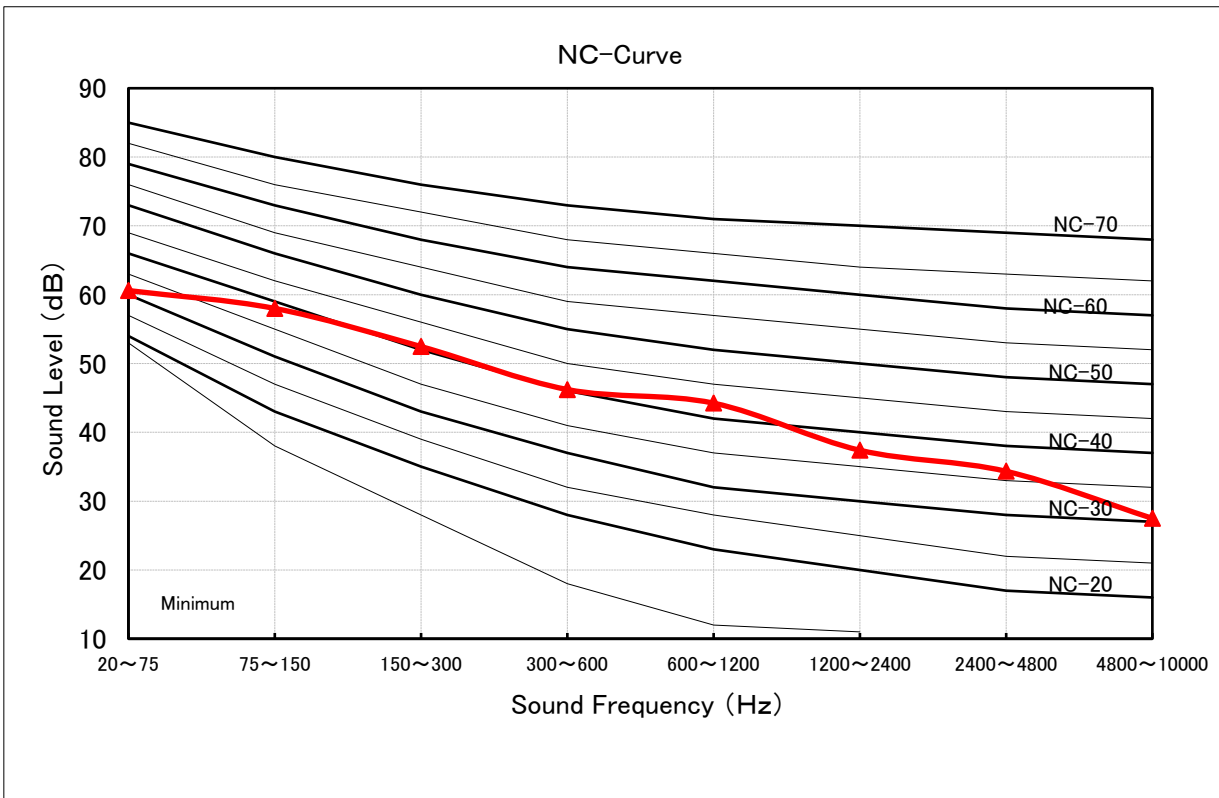


Outdoor Unit : RAS-16J2AVSG-E1 / TR1 (Rated Conditions)

Cooling



Heating



8. Capacity Table

Product models : RAS-B10N4KVRG-E : RAS-10J2AVSG-E1
RAS-10N4KVRG-TR : RAS-10J2AVSG-TR1

Specification of product at standard condition

Standard Condition	Indoor	27°C (DB) / 19°C (WB)	Total Cooling Capacity (TC)	2.50 kW
	Outdoor	35°C (DB) / 24°C (WB)	Sensible Heat Capacity (SHC)	1.90 kW

Outdoor air temperature DB (°C)	Indoor air temperature													
	20.0°C (DB) 14.0°C (WB)		23.0°C (DB) 16.0°C (WB)		26.0°C (DB) 18.0°C (WB)		27.0°C (DB) 19.0°C (WB)		28.0°C (DB) 20.0°C (WB)		30.0°C (DB) 22.0°C (WB)		32.0°C (DB) 24.0°C (WB)	
	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
20	2.45	2.01	2.70	2.14	2.90	2.27	2.98	2.27	3.07	2.26	3.25	2.23	3.40	2.18
21	2.42	1.99	2.68	2.12	2.86	2.25	2.95	2.24	3.03	2.24	3.21	2.21	3.36	2.16
22	2.40	1.97	2.65	2.09	2.83	2.22	2.92	2.22	3.00	2.21	3.18	2.18	3.32	2.13
23	2.37	1.95	2.62	2.07	2.80	2.20	2.89	2.19	2.97	2.19	3.14	2.16	3.29	2.11
24	2.34	1.92	2.59	2.05	2.77	2.18	2.85	2.17	2.93	2.16	3.11	2.14	3.25	2.09
25	2.32	1.90	2.56	2.02	2.74	2.15	2.82	2.14	2.90	2.14	3.07	2.11	3.21	2.06
26	2.29	1.88	2.53	2.00	2.71	2.13	2.79	2.12	2.87	2.11	3.04	2.09	3.18	2.04
27	2.26	1.86	2.50	1.98	2.68	2.10	2.76	2.10	2.84	2.09	3.00	2.06	3.14	2.02
28	2.24	1.84	2.47	1.95	2.65	2.08	2.72	2.07	2.80	2.07	2.97	2.04	3.10	1.99
29	2.21	1.82	2.44	1.93	2.62	2.05	2.69	2.05	2.77	2.04	2.93	2.02	3.07	1.97
30	2.19	1.79	2.41	1.91	2.58	2.03	2.66	2.02	2.74	2.02	2.90	1.99	3.03	1.95
31	2.16	1.77	2.38	1.89	2.55	2.00	2.63	2.00	2.70	1.99	2.86	1.97	2.99	1.92
32	2.13	1.75	2.36	1.86	2.52	1.98	2.60	1.97	2.67	1.97	2.83	1.94	2.96	1.90
33	2.11	1.73	2.33	1.84	2.49	1.96	2.56	1.95	2.64	1.94	2.79	1.92	2.92	1.88
34	2.08	1.71	2.30	1.82	2.46	1.93	2.53	1.92	2.60	1.92	2.76	1.90	2.88	1.85
35	2.05	1.69	2.27	1.79	2.43	1.91	2.50	1.90	2.57	1.90	2.72	1.87	2.85	1.83
36	2.03	1.66	2.24	1.77	2.40	1.88	2.47	1.88	2.54	1.87	2.69	1.85	2.81	1.80
37	2.00	1.64	2.21	1.75	2.37	1.86	2.44	1.85	2.51	1.85	2.65	1.82	2.78	1.78
38	1.97	1.62	2.18	1.72	2.34	1.83	2.40	1.83	2.47	1.82	2.62	1.80	2.74	1.76
39	1.95	1.60	2.15	1.70	2.30	1.81	2.37	1.80	2.44	1.80	2.58	1.78	2.70	1.73
40	1.92	1.58	2.12	1.68	2.27	1.78	2.34	1.78	2.41	1.77	2.55	1.75	2.67	1.71
41	1.90	1.56	2.09	1.66	2.24	1.76	2.31	1.75	2.37	1.75	2.51	1.73	2.63	1.69
42	1.87	1.53	2.06	1.63	2.21	1.74	2.28	1.73	2.34	1.73	2.48	1.70	2.59	1.66
43	1.84	1.51	2.03	1.61	2.18	1.71	2.24	1.70	2.31	1.70	2.44	1.68	2.56	1.64
44	1.82	1.49	2.01	1.59	2.15	1.69	2.21	1.68	2.27	1.68	2.41	1.66	2.52	1.62
45	1.79	1.47	1.98	1.56	2.12	1.66	2.18	1.66	2.24	1.65	2.37	1.63	2.48	1.59
46	1.76	1.45	1.95	1.54	2.09	1.64	2.15	1.63	2.21	1.63	2.34	1.61	2.45	1.57

Product models : RAS-B13N4KVRG-E : RAS-13J2AVSG-E1
 RAS-13N4KVRG-TR : RAS-13J2AVSG-TR1

Specification of product at standard condition

Standard Condition	Indoor	27°C (DB) / 19°C (WB)	Total Cooling Capacity (TC)	3.50 kW
	Outdoor	35°C (DB) / 24°C (WB)		Sensible Heat Capacity (SHC)

Outdoor air temperature DB (°C)	Indoor air temperature													
	20.0°C (DB) 14.0°C (WB)		23.0°C (DB) 16.0°C (WB)		26.0°C (DB) 18.0°C (WB)		27.0°C (DB) 19.0°C (WB)		28.0°C (DB) 20.0°C (WB)		30.0°C (DB) 22.0°C (WB)		32.0°C (DB) 24.0°C (WB)	
	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
20	3.43	2.75	3.79	2.92	4.05	3.10	4.17	3.09	4.29	3.08	4.55	3.03	4.76	2.96
21	3.39	2.72	3.75	2.89	4.01	3.07	4.13	3.06	4.25	3.05	4.50	3.00	4.70	2.93
22	3.35	2.69	3.70	2.86	3.97	3.03	4.08	3.02	4.20	3.01	4.45	2.97	4.65	2.89
23	3.32	2.66	3.66	2.82	3.92	3.00	4.04	2.99	4.15	2.98	4.40	2.94	4.60	2.86
24	3.28	2.63	3.62	2.79	3.88	2.97	3.99	2.96	4.11	2.95	4.35	2.90	4.55	2.83
25	3.24	2.60	3.58	2.76	3.84	2.93	3.95	2.92	4.06	2.91	4.30	2.87	4.50	2.80
26	3.21	2.57	3.54	2.73	3.79	2.90	3.90	2.89	4.02	2.88	4.25	2.84	4.45	2.77
27	3.17	2.54	3.50	2.70	3.75	2.87	3.86	2.86	3.97	2.85	4.20	2.80	4.40	2.73
28	3.13	2.51	3.46	2.67	3.71	2.83	3.81	2.82	3.92	2.81	4.16	2.77	4.35	2.70
29	3.10	2.48	3.42	2.64	3.66	2.80	3.77	2.79	3.88	2.78	4.11	2.74	4.29	2.67
30	3.06	2.45	3.38	2.60	3.62	2.77	3.72	2.76	3.83	2.75	4.06	2.71	4.24	2.64
31	3.02	2.42	3.34	2.57	3.57	2.73	3.68	2.72	3.78	2.71	4.01	2.67	4.19	2.61
32	2.99	2.39	3.30	2.54	3.53	2.70	3.63	2.69	3.74	2.68	3.96	2.64	4.14	2.58
33	2.95	2.36	3.26	2.51	3.49	2.67	3.59	2.66	3.69	2.65	3.91	2.61	4.09	2.54
34	2.91	2.33	3.22	2.48	3.44	2.63	3.54	2.62	3.65	2.62	3.86	2.58	4.04	2.51
35	2.87	2.30	3.17	2.45	3.40	2.60	3.50	2.59	3.60	2.58	3.81	2.54	3.99	2.48
36	2.84	2.27	3.13	2.42	3.36	2.57	3.46	2.56	3.55	2.55	3.76	2.51	3.94	2.45
37	2.80	2.24	3.09	2.38	3.31	2.53	3.41	2.52	3.51	2.52	3.71	2.48	3.89	2.42
38	2.76	2.21	3.05	2.35	3.27	2.50	3.37	2.49	3.46	2.48	3.67	2.45	3.83	2.38
39	2.73	2.18	3.01	2.32	3.23	2.47	3.32	2.46	3.42	2.45	3.62	2.41	3.78	2.35
40	2.69	2.15	2.97	2.29	3.18	2.43	3.28	2.42	3.37	2.42	3.57	2.38	3.73	2.32
41	2.65	2.12	2.93	2.26	3.14	2.40	3.23	2.39	3.32	2.38	3.52	2.35	3.68	2.29
42	2.62	2.10	2.89	2.23	3.09	2.37	3.19	2.36	3.28	2.35	3.47	2.32	3.63	2.26
43	2.58	2.07	2.85	2.20	3.05	2.33	3.14	2.32	3.23	2.32	3.42	2.28	3.58	2.23
44	2.54	2.04	2.81	2.17	3.01	2.30	3.10	2.29	3.18	2.28	3.37	2.25	3.53	2.19
45	2.51	2.01	2.77	2.13	2.96	2.27	3.05	2.26	3.14	2.25	3.32	2.22	3.48	2.16
46	2.47	1.98	2.73	2.10	2.92	2.23	3.01	2.22	3.09	2.22	3.27	2.18	3.42	2.13

Product models : RAS-B16N4KVRG-E : RAS-16J2AVSG-E1
 RAS-16N4KVRG-TR : RAS-16J2AVSG-TR1

Specification of product at standard condition

Standard Condition	Indoor	27°C (DB) / 19°C (WB)	Total Cooling Capacity (TC)	4.60 kW
	Outdoor	35°C (DB) / 24°C (WB)		Sensible Heat Capacity (SHC)

Outdoor air temperature DB (°C)	Indoor air temperature													
	20.0°C (DB) 14.0°C (WB)		23.0°C (DB) 16.0°C (WB)		26.0°C (DB) 18.0°C (WB)		27.0°C (DB) 19.0°C (WB)		28.0°C (DB) 20.0°C (WB)		30.0°C (DB) 22.0°C (WB)		32.0°C (DB) 24.0°C (WB)	
	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
20	4.51	3.56	4.98	3.79	5.33	4.02	5.49	4.00	5.64	3.99	5.98	3.93	6.25	3.82
21	4.46	3.52	4.92	3.75	5.27	3.98	5.43	3.96	5.58	3.95	5.91	3.88	6.18	3.78
22	4.41	3.49	4.87	3.71	5.21	3.94	5.37	3.92	5.52	3.90	5.85	3.84	6.12	3.74
23	4.36	3.45	4.82	3.66	5.16	3.89	5.31	3.88	5.46	3.86	5.78	3.80	6.05	3.70
24	4.31	3.41	4.76	3.62	5.10	3.85	5.25	3.83	5.40	3.82	5.72	3.76	5.98	3.66
25	4.26	3.37	4.71	3.58	5.04	3.81	5.19	3.79	5.34	3.78	5.65	3.72	5.91	3.62
26	4.21	3.33	4.65	3.54	4.98	3.76	5.13	3.75	5.28	3.73	5.59	3.67	5.85	3.58
27	4.17	3.29	4.60	3.50	4.93	3.72	5.07	3.70	5.22	3.69	5.53	3.63	5.78	3.54
28	4.12	3.26	4.55	3.46	4.87	3.68	5.01	3.66	5.16	3.65	5.46	3.59	5.71	3.49
29	4.07	3.22	4.49	3.42	4.81	3.63	4.95	3.62	5.10	3.60	5.40	3.55	5.64	3.45
30	4.02	3.18	4.44	3.38	4.76	3.59	4.90	3.57	5.04	3.56	5.33	3.50	5.58	3.41
31	3.97	3.14	4.39	3.34	4.70	3.55	4.84	3.53	4.97	3.52	5.27	3.46	5.51	3.37
32	3.92	3.10	4.33	3.30	4.64	3.50	4.78	3.49	4.91	3.48	5.20	3.42	5.44	3.33
33	3.88	3.06	4.28	3.26	4.58	3.46	4.72	3.44	4.85	3.43	5.14	3.38	5.38	3.29
34	3.83	3.03	4.23	3.22	4.53	3.42	4.66	3.40	4.79	3.39	5.08	3.34	5.31	3.25
35	3.78	2.99	4.17	3.18	4.47	3.37	4.60	3.36	4.73	3.35	5.01	3.29	5.24	3.21
36	3.73	2.95	4.12	3.13	4.41	3.33	4.54	3.31	4.67	3.30	4.95	3.25	5.17	3.17
37	3.68	2.91	4.07	3.09	4.35	3.29	4.48	3.27	4.61	3.26	4.88	3.21	5.11	3.12
38	3.63	2.87	4.01	3.05	4.30	3.24	4.42	3.23	4.55	3.22	4.82	3.17	5.04	3.08
39	3.58	2.83	3.96	3.01	4.24	3.20	4.36	3.19	4.49	3.17	4.75	3.12	4.97	3.04
40	3.17	2.51	3.50	2.67	3.75	2.83	3.86	2.82	3.97	2.81	4.21	2.76	4.40	2.69
41	3.09	2.44	3.41	2.59	3.65	2.76	3.76	2.74	3.87	2.73	4.09	2.69	4.28	2.62
42	3.00	2.38	3.32	2.52	3.55	2.68	3.66	2.67	3.76	2.66	3.98	2.62	4.17	2.55
43	2.92	2.31	3.23	2.46	3.46	2.61	3.56	2.60	3.66	2.59	3.88	2.55	4.06	2.48
44	2.85	2.25	3.14	2.39	3.37	2.54	3.46	2.53	3.56	2.52	3.77	2.48	3.95	2.41
45	2.77	2.19	3.06	2.33	3.27	2.47	3.37	2.46	3.47	2.45	3.67	2.41	3.84	2.35
46	2.69	2.13	2.98	2.26	3.19	2.41	3.28	2.39	3.37	2.39	3.57	2.35	3.74	2.29

9. Part Load Performance

Indoor : RAS-B10N4KVRG-E / RAS-10N4KVRG-TR
 Outdoor : RAS-10J2AVSG-E1 / TR1

Operation range	Cooling		Heating	
	Q	P	Q	P
MINIMUM	W 890	190	900	180
RATING	W 2500	540	3200	740
MAXIMUM	W 3200	790	4800	1230

Cooling

Outdoor Temperature DB (°C)	Parts Load (%)																			
	100		90		80		70		60		50		40		30		20		10	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
20	2981	424	2683	381	2385	339	2087	296	1789	253	1491	211	1193	168	1061	149	1061	149	1061	149
21	2949	432	2654	388	2359	345	2064	301	1770	258	1475	214	1180	171	1050	152	1050	152	1050	152
22	2917	439	2625	395	2334	351	2042	307	1750	262	1459	218	1167	174	1038	155	1038	155	1038	155
23	2885	447	2597	402	2308	357	2020	312	1731	267	1443	222	1154	177	1027	157	1027	157	1027	157
24	2853	455	2568	409	2282	363	1997	318	1712	272	1426	226	1141	180	1016	160	1016	160	1016	160
25	2821	463	2539	416	2257	369	1975	323	1693	276	1410	230	1128	183	1004	163	1004	163	1004	163
26	2789	470	2510	423	2231	376	1952	328	1673	281	1394	234	1116	186	993	165	993	165	993	165
27	2757	478	2481	430	2205	382	1930	334	1654	286	1378	238	1103	189	981	168	981	168	981	168
28	2725	486	2452	437	2180	388	1907	339	1635	290	1362	241	1090	192	970	171	970	171	970	171
29	2693	494	2423	444	2154	394	1885	345	1616	295	1346	245	1077	196	959	174	959	174	959	174
30	2660	501	2394	451	2128	400	1862	350	1596	299	1330	249	1064	199	947	176	947	176	947	176
31	2628	509	2366	458	2103	407	1840	355	1577	304	1314	253	1051	202	936	179	936	179	936	179
32	2596	517	2337	465	2077	413	1817	361	1558	309	1298	257	1039	205	924	182	924	182	924	182
33	2564	525	2308	472	2051	419	1795	366	1539	313	1282	261	1026	208	913	185	913	185	913	185
34	2532	532	2279	479	2026	425	1772	372	1519	318	1266	264	1013	211	901	187	901	187	901	187
35	2500	540	2250	486	2000	431	1750	377	1500	323	1250	268	1000	214	890	190	890	190	890	190
36	2468	548	2221	493	1974	437	1728	382	1481	327	1234	272	987	217	879	193	879	193	879	193
37	2436	555	2192	500	1949	444	1705	388	1462	332	1218	276	974	220	867	195	867	195	867	195
38	2404	563	2163	507	1923	450	1683	393	1442	336	1202	280	962	223	856	198	856	198	856	198
39	2372	571	2135	513	1897	456	1660	399	1423	341	1186	284	949	226	844	201	844	201	844	201
40	2340	579	2106	520	1872	462	1638	404	1404	346	1170	287	936	229	833	204	833	204	833	204
41	2308	586	2077	527	1846	468	1615	409	1385	350	1154	291	923	232	821	206	821	206	821	206
42	2275	594	2048	534	1820	475	1593	415	1365	355	1138	295	910	235	810	209	810	209	810	209
43	2243	602	2019	541	1795	481	1570	420	1346	360	1122	299	897	238	799	212	799	212	799	212
44	2211	610	1990	548	1769	487	1548	426	1327	364	1106	303	885	242	787	215	787	215	787	215
45	2179	617	1961	555	1743	493	1525	431	1308	369	1090	307	872	245	776	217	776	217	776	217
46	2147	625	1932	562	1718	499	1503	436	1288	373	1074	311	859	248	764	220	764	220	764	220

Heating

Outdoor Temperature DB (°C)	Parts Load (%)																			
	100		90		80		70		60		50		40		30		20		10	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
-15	1193	439	1073	393	954	346	835	300	716	254	596	208	477	162	358	115	335	107	335	107
-14	1259	449	1133	402	1007	355	881	307	755	260	629	213	504	165	378	118	354	109	354	109
-13	1325	460	1193	411	1060	363	928	315	795	266	663	218	530	169	398	121	373	112	373	112
-12	1391	470	1252	421	1113	371	974	322	835	272	696	223	557	173	417	124	391	114	391	114
-11	1458	481	1312	430	1166	379	1020	329	875	278	729	228	583	177	437	126	410	117	410	117
-10	1524	491	1371	439	1219	388	1067	336	914	284	762	233	610	181	457	129	429	119	429	119
-9	1590	505	1431	452	1272	398	1113	345	954	292	795	239	636	186	477	133	447	123	447	123
-8	1656	518	1491	464	1325	409	1159	355	994	300	828	246	663	191	497	136	466	126	466	126
-7	1723	532	1550	476	1378	420	1206	364	1034	308	861	252	689	196	517	140	484	129	484	129
-6	1789	546	1610	488	1431	431	1252	373	1073	316	894	258	716	201	537	144	503	133	503	133
-5	1855	559	1670	500	1484	442	1299	383	1113	324	928	265	742	206	557	147	522	136	522	136
-4	1921	573	1729	513	1537	452	1345	392	1153	332	961	271	769	211	576	151	540	139	540	139
-3	1988	587	1789	525	1590	463	1391	401	1193	340	994	278	795	216	596	154	559	143	559	143
-2	2054	600	1848	537	1643	474	1438	411	1232	347	1027	284	822	221	616	158	578	146	578	146
-1	2120	614	1908	549	1696	485	1484	420	1272	355	1060	291	848	226	636	161	596	149	596	149
0	2186	628	1968	562	1749	495	1530	429	1312	363	1093	297	875	231	656	165	615	153	615	153
1	2253	641	2027	574	1802	506	1577	439	1352	371	1126	304	901	236	676	169	634	156	634	156
2	2319	655	2087	586	1855	517	1623	448	1391	379	1159	310	928	241	696	172	652	159	652	159
3	2387	664	2121	594	1885	524	1650	454	1414	384	1178	314	943	244	707	175	663	161	663	161
4	2395	672	2155	602	1916	531	1676	460	1437	389	1197	318	958	248	718	177	674	164	674	164
5	2433	681	2190	610	1946	538	1703	466	1460	394	1216	323	973	251	730	179	684	166	684	166
6	3117	729	2806	652	2494	575	2182	498	1870	422	1559	345	1247	268	935	192	877	177	877	177
7	3200	740	2880	662	2560	584	2240	506	1920	428	1600	350	1280	273	960	195	900	180	900	180
8	3283	751	2954	672	2626	593	2298	514	1970	435	1641	356	1313	277	985	198	923	183	923	183
9	3365	763	3029	683	2692	602	2356	522	2019	442	1683	361	1346	281	1010	201	946	186	946	186
10	3448	774	3103	693	2758	611	2413	530	2069	448	1724	367	1379	285	1034	204	970	188	970	188
11	3530	786	3177	703	2824	620	2471	538	2118	455	1765	372	1412	289	1059	207	993	191	993	191
12	3613	797	3252	713	2890	629	2529	545	2168	462	1806	378	1445	294	1084	210	1016	194	1016	194
13	3695	809	3326	724	2956	638	2587	553	2217	468	1848	383	1478	298	1109	213	1039	197	1039	197
14	3778	820	3400	734	3022	647	2645	561	2267	475	1889	388	1511	302	1133	216	1063	200	1063	200
15	3861	832	3475	744	3089	657	2702	569	2316	481	1930	394	1544	306	1158	219	1086	202	1086	202
16	3943	843	3549	754	3155	666	2760	577	2366	488	1972	399	1577	310	1183	222	1109	205	1109	205
17	4026	855	3623	765	3221	675	2818	585	2415	495	2013	405	1610	315	1208	225	1132	208	1132	208
18	4108	866	3698	775	3287	684	2876	592	2465	501	2054	410	1643	319	1233	228	1155	211	1155	211
19	4191	877	3772	785	3353	693	2934	600												

Indoor : RAS-B13N4KVRG-E / RAS-13N4KVRG-TR
Outdoor : RAS-13J2AVSG-E1 / TR1

Table with columns: Operation range, Cooling (Q, P), Heating (Q, P). Rows: MINIMUM, RATING, MAXIMUM.

Cooling

Large table for Cooling performance. Columns: Outdoor Temperature DB (°C), Parts Load (%), Q, P. Rows: 20 to 46.

Heating

Large table for Heating performance. Columns: Outdoor Temperature DB (°C), Parts Load (%), Q, P. Rows: -15 to 24.

Indoor : RAS-B16N4KVRG-E / RAS-16N4KVRG-TR
 Outdoor : RAS-16J2AVSG-E1 / TR1

Operation range	Cooling		Heating	
	Q	P	Q	P
MINIMUM	W 1200	340	1100	240
RATING	W 4600	1350	5500	1520
MAXIMUM	W 5300	1720	6300	1900

Cooling

Outdoor Temperature DB (°C)	Parts Load (%)																			
	100		90		80		70		60		50		40		30		20		10	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
20	5486	1060	4937	952	4388	845	3840	738	3291	631	2743	523	2194	416	1646	309	1431	267	1431	267
21	5426	1079	4884	970	4341	861	3799	751	3256	642	2713	533	2171	424	1628	315	1416	272	1416	272
22	5367	1098	4831	987	4294	876	3757	765	3220	654	2684	543	2147	431	1610	320	1400	277	1400	277
23	5308	1118	4778	1005	4247	892	3716	778	3185	665	2654	552	2123	439	1593	326	1385	282	1385	282
24	5249	1137	4724	1022	4199	907	3675	792	3150	677	2625	562	2100	447	1575	331	1369	286	1369	286
25	5190	1157	4671	1039	4152	922	3633	805	3114	688	2595	571	2076	454	1557	337	1354	291	1354	291
26	5131	1176	4618	1057	4105	938	3592	819	3079	700	2566	581	2053	462	1539	343	1339	296	1339	296
27	5072	1195	4565	1074	4058	953	3551	832	3043	711	2536	590	2029	469	1522	348	1323	301	1323	301
28	5013	1215	4512	1092	4011	969	3509	846	3008	723	2507	600	2005	477	1504	354	1308	306	1308	306
29	4954	1234	4459	1109	3963	984	3468	859	2973	734	2477	609	1982	485	1486	360	1292	311	1292	311
30	4895	1253	4406	1126	3916	1000	3427	873	2937	746	2448	619	1958	492	1469	365	1277	316	1277	316
31	4836	1273	4353	1144	3869	1015	3385	886	2902	757	2418	629	1934	500	1451	371	1262	321	1262	321
32	4777	1292	4299	1161	3822	1030	3344	900	2866	769	2389	638	1911	507	1433	377	1246	325	1246	325
33	4718	1311	4246	1179	3774	1046	3303	913	2831	780	2359	648	1887	515	1415	382	1231	330	1231	330
34	4659	1331	4193	1196	3727	1061	3261	927	2795	792	2330	657	1864	523	1398	388	1215	335	1215	335
35	4600	1350	4140	1213	3680	1077	3220	940	2759	803	2300	667	1840	530	1380	393	1200	340	1200	340
36	4541	1369	4087	1231	3633	1092	3179	954	2725	815	2270	676	1816	538	1362	399	1185	345	1185	345
37	4482	1389	4034	1248	3586	1108	3137	967	2689	826	2241	686	1793	545	1345	405	1169	350	1169	350
38	4423	1408	3981	1266	3538	1123	3096	980	2654	838	2211	695	1769	553	1327	410	1154	355	1154	355
39	4364	1427	3927	1283	3491	1138	3055	994	2618	849	2182	705	1746	561	1309	416	1138	359	1138	359
40	3861	1298	3475	1166	3089	1035	2703	904	2317	772	1931	641	1544	510	1158	378	1007	327	1007	327
41	3758	1298	3382	1166	3006	1035	2631	904	2255	772	1879	641	1503	510	1127	378	980	327	980	327
42	3657	1298	3292	1166	2926	1035	2560	904	2194	772	1829	641	1463	510	1097	378	954	327	954	327
43	3560	1298	3204	1166	2848	1035	2492	904	2136	772	1780	641	1424	510	1068	378	929	327	929	327
44	3464	1298	3118	1166	2771	1035	2425	904	2078	772	1732	641	1386	510	1039	378	904	327	904	327
45	3371	1298	3034	1166	2697	1035	2360	904	2023	772	1686	641	1348	510	1011	378	879	327	879	327
46	3280	1298	2952	1166	2624	1035	2296	904	1968	772	1640	641	1312	510	984	378	856	327	856	327

Heating

Outdoor Temperature DB (°C)	Parts Load (%)																			
	100		90		80		70		60		50		40		30		20		10	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
-15	2391	1009	2152	903	1913	796	1674	690	1435	584	1196	478	957	372	717	265	478	159	478	159
-14	2498	1042	2248	933	1998	823	1748	713	1499	604	1249	494	999	384	749	274	500	165	500	165
-13	2604	1076	2343	963	2083	850	1823	736	1562	623	1302	510	1042	396	781	283	521	170	521	170
-12	2710	1110	2439	993	2168	876	1897	759	1626	642	1355	526	1084	409	813	292	542	175	542	175
-11	2816	1143	2535	1023	2253	903	1971	782	1690	662	1408	542	1127	421	845	301	563	181	563	181
-10	2923	1177	2630	1053	2338	929	2046	805	1754	681	1461	558	1169	434	877	310	585	186	585	186
-9	3031	1191	2710	1066	2409	940	2108	815	1807	690	1506	564	1205	439	903	313	602	188	602	188
-8	3100	1205	2790	1078	2480	951	2170	824	1860	698	1550	571	1240	444	930	317	620	190	620	190
-7	3188	1219	2870	1091	2551	962	2232	834	1913	706	1594	577	1275	449	957	321	638	192	638	192
-6	3277	1233	2949	1103	2622	973	2294	844	1966	714	1638	584	1311	454	983	324	655	195	655	195
-5	3366	1247	3029	1116	2692	985	2356	853	2019	722	1683	591	1346	459	1010	328	673	197	673	197
-4	3454	1261	3109	1128	2763	996	2418	863	2072	730	1727	597	1382	465	1036	332	691	199	691	199
-3	3543	1275	3188	1141	2834	1007	2480	872	2126	738	1771	604	1417	470	1063	336	709	201	709	201
-2	3631	1289	3268	1153	2905	1018	2542	882	2179	746	1816	611	1452	475	1089	339	726	204	726	204
-1	3720	1303	3348	1166	2976	1029	2604	892	2232	754	1860	617	1488	480	1116	343	744	206	744	206
0	3808	1317	3428	1178	3047	1040	2666	901	2285	763	1904	624	1523	485	1143	347	762	208	762	208
1	3897	1331	3507	1191	3118	1051	2728	911	2338	771	1948	631	1559	490	1169	350	779	210	779	210
2	3986	1345	3587	1204	3188	1062	2790	920	2391	779	1993	637	1594	496	1196	354	797	212	797	212
3	4051	1363	3646	1220	3241	1076	2836	933	2430	789	2025	646	1620	502	1215	359	810	215	810	215
4	4116	1381	3704	1236	3293	1091	2881	945	2470	800	2058	654	1646	509	1235	364	823	218	823	218
5	4181	1399	3763	1252	3345	1105	2927	957	2509	810	2091	663	1673	516	1254	368	836	221	836	221
6	5358	1496	4822	1339	4286	1181	3751	1024	3215	866	2679	709	2143	551	1607	394	1072	236	1072	236
7	5500	1520	4950	1360	4400	1200	3850	1040	3300	880	2750	720	2200	560	1650	400	1100	240	1100	240
8	5642	1544	5078	1381	4514	1219	3949	1056	3385	894	2821	731	2257	569	1693	406	1128	244	1128	244
9	5784	1567	5205	1402	4627	1237	4049	1072	3470	907	2892	742	2314	577	1735	412	1157	247	1157	247
10	5926	1591	5333	1423	4741	1256	4148	1088	3555	921	2963	753	2370	586	1778	419	1185	251	1185	251
11	6068	1614	5461	1444	4854	1274	4247	1104	3641	935	3034	765	2427	595	1820	425	1214	255	1214	255
12	6210	1638	5589	1465	4968	1293	4347	1121	3726	948	3105	776	2484	603	1863	431	1242	259	1242	259
13	6352	1661	5716	1486	5081	1311	4446	1137	3811	962	3176	787	2541	612	1905	437	1270	262	1270	262
14	6494	1685	5844	1507	5195	1330	4545	1153	3896	975	3247	798	2597	621	1948	443	1299	266	1299	266
15	6635	1708	5972	1528	5308	1349	4645	1169	3981	989	3318	809	2654	629	1991	450	1327	270	1327	270
16	6777	1732	6100	1550	5422	1367	4744	1185	4066	1003	3389	820	2711	638	2033	456	1355	273	1355	273
17	6919	1755	6227	1571	5535	1386	4844	1201	4152	1016	3460	831	2768	647	2076	462	1384	277	1384	

10. Performance Characteristic

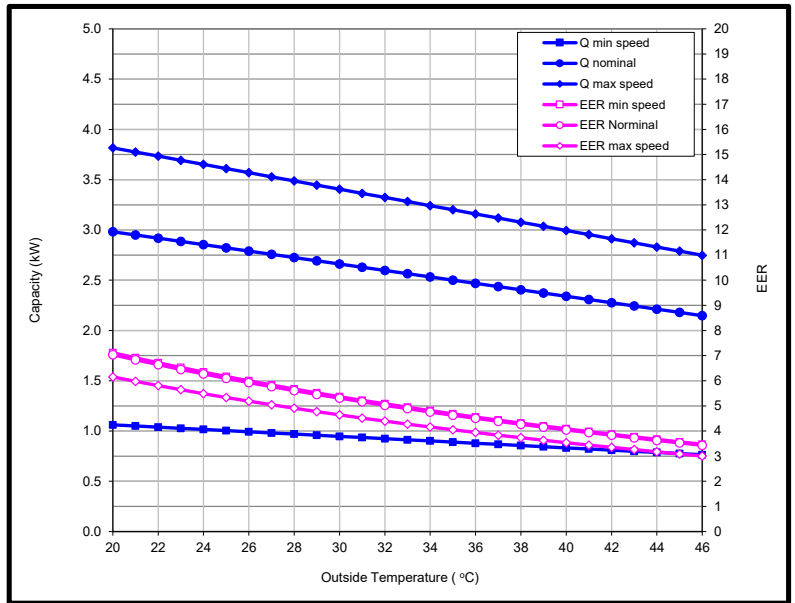
Model : RAS-B10N4KVRG-E ; RAS-10J2AVSG-E1 / RAS-10N4KVRG-TR ; RAS-10J2AVSG-TR1

Product specification :

Condition		Capacity (kW)	Power (kW)	EER/COP
Cooling JIS In: 27°C DB/19°C WB Out: 35°C DB/24°C WB	Min	0.89	0.19	4.68
	Rated	2.50	0.54	4.63
	Max	3.20	0.79	4.05
Heating JIS In: 20°C DB/15°C WB Out: 7°C DB/6°C WB	Min	0.90	0.18	5.00
	Rated	3.20	0.74	4.32
	Max	4.70	1.23	3.82
Heating Low Temp. In: 20°C DB/15°C WB Out: 2°C DB/1°C WB	Max	3.50	1.00	3.50
	Max	2.30	0.750	3.07
Heating Low Temp. In: 20°C DB/15°C WB Out: -10°C DB	Max	1.80	0.670	2.69

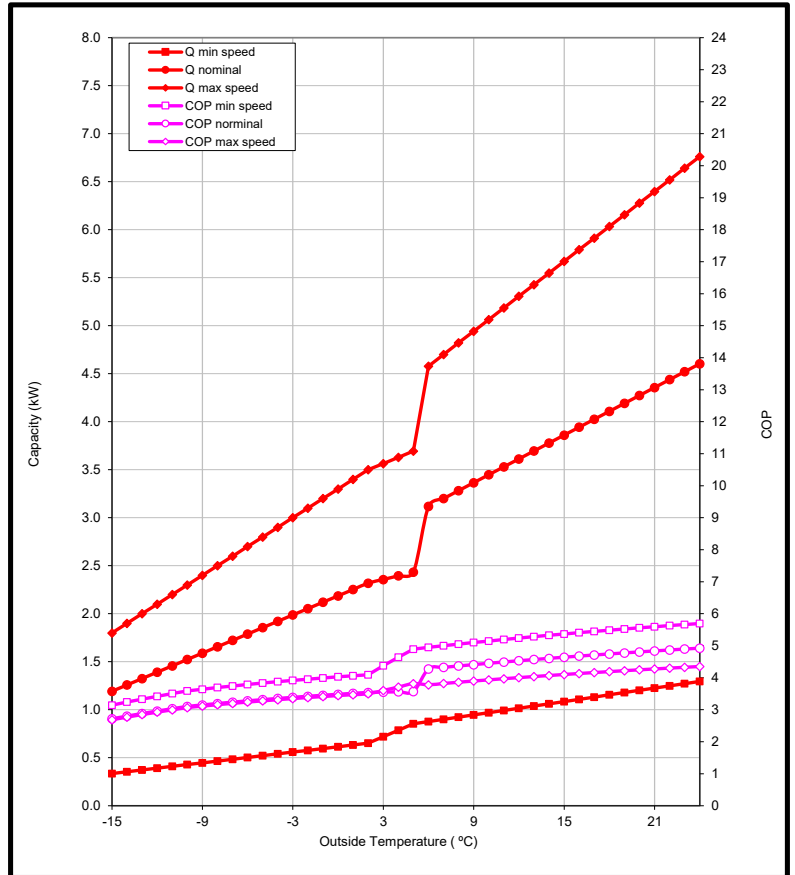
Cooling performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)
20	1.06	0.15	7.12	2.98	0.42	7.03	3.82	0.62	6.15
21	1.05	0.15	6.91	2.95	0.43	6.83	3.77	0.63	5.98
22	1.04	0.15	6.72	2.92	0.44	6.64	3.73	0.64	5.81
23	1.03	0.16	6.53	2.89	0.45	6.45	3.69	0.65	5.65
24	1.02	0.16	6.35	2.85	0.45	6.27	3.65	0.67	5.49
25	1.00	0.16	6.17	2.82	0.46	6.10	3.61	0.68	5.34
26	0.99	0.17	6.00	2.79	0.47	5.93	3.57	0.69	5.19
27	0.98	0.17	5.83	2.76	0.48	5.77	3.53	0.70	5.04
28	0.97	0.17	5.67	2.72	0.49	5.61	3.49	0.71	4.91
29	0.96	0.17	5.52	2.69	0.49	5.46	3.45	0.72	4.77
30	0.95	0.18	5.37	2.66	0.50	5.31	3.41	0.73	4.64
31	0.94	0.18	5.22	2.63	0.51	5.16	3.36	0.74	4.52
32	0.92	0.18	5.08	2.60	0.52	5.02	3.32	0.76	4.40
33	0.91	0.18	4.95	2.56	0.52	4.89	3.28	0.77	4.28
34	0.90	0.19	4.81	2.53	0.53	4.76	3.24	0.78	4.16
35	0.89	0.19	4.68	2.50	0.54	4.63	3.20	0.79	4.05
36	0.88	0.19	4.56	2.47	0.55	4.51	3.16	0.80	3.94
37	0.87	0.20	4.44	2.44	0.56	4.39	3.12	0.81	3.84
38	0.86	0.20	4.32	2.40	0.56	4.27	3.08	0.82	3.73
39	0.84	0.20	4.20	2.37	0.57	4.15	3.04	0.84	3.63
40	0.83	0.20	4.09	2.34	0.58	4.04	2.99	0.85	3.54
41	0.82	0.21	3.98	2.31	0.59	3.93	2.95	0.86	3.44
42	0.81	0.21	3.87	2.28	0.59	3.83	2.91	0.87	3.35
43	0.80	0.21	3.77	2.24	0.60	3.73	2.87	0.88	3.26
44	0.79	0.21	3.67	2.21	0.61	3.63	2.83	0.89	3.17
45	0.78	0.22	3.57	2.18	0.62	3.53	2.79	0.90	3.09
46	0.76	0.22	3.48	2.15	0.63	3.43	2.75	0.91	3.01



Heating performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)
-15	0.34	0.11	3.14	1.19	0.44	2.72	1.80	0.67	2.69
-14	0.35	0.11	3.24	1.26	0.45	2.80	1.90	0.69	2.77
-13	0.37	0.11	3.33	1.33	0.46	2.88	2.00	0.70	2.85
-12	0.39	0.11	3.42	1.39	0.47	2.96	2.10	0.72	2.92
-11	0.41	0.12	3.51	1.46	0.48	3.03	2.20	0.73	3.00
-10	0.43	0.12	3.59	1.52	0.49	3.10	2.30	0.75	3.07
-9	0.45	0.12	3.64	1.59	0.50	3.15	2.40	0.77	3.11
-8	0.47	0.13	3.69	1.66	0.52	3.19	2.50	0.79	3.16
-7	0.48	0.13	3.74	1.72	0.53	3.24	2.60	0.81	3.20
-6	0.50	0.13	3.79	1.79	0.55	3.28	2.70	0.83	3.24
-5	0.52	0.14	3.83	1.86	0.56	3.32	2.80	0.85	3.28
-4	0.54	0.14	3.88	1.92	0.57	3.35	2.90	0.88	3.31
-3	0.56	0.14	3.92	1.99	0.59	3.39	3.00	0.90	3.35
-2	0.58	0.15	3.96	2.05	0.60	3.42	3.10	0.92	3.38
-1	0.60	0.15	3.99	2.12	0.61	3.45	3.20	0.94	3.41
0	0.61	0.15	4.03	2.19	0.63	3.48	3.30	0.96	3.44
1	0.63	0.16	4.06	2.25	0.64	3.51	3.40	0.98	3.47
2	0.65	0.16	4.09	2.32	0.65	3.54	3.50	1.00	3.50
3	0.72	0.16	4.38	2.36	0.66	3.55	3.56	0.99	3.60
4	0.79	0.17	4.64	2.39	0.67	3.56	3.63	0.98	3.71
5	0.85	0.17	4.89	2.43	0.68	3.57	3.69	0.97	3.82
6	0.88	0.18	4.95	3.12	0.73	4.28	4.58	1.21	3.78
7	0.90	0.18	5.00	3.20	0.74	4.32	4.70	1.23	3.82
8	0.92	0.18	5.05	3.28	0.75	4.37	4.82	1.25	3.86
9	0.95	0.19	5.10	3.37	0.76	4.41	4.94	1.27	3.90
10	0.97	0.19	5.15	3.45	0.77	4.45	5.06	1.29	3.93
11	0.99	0.19	5.19	3.53	0.79	4.49	5.19	1.31	3.97
12	1.02	0.19	5.24	3.61	0.80	4.53	5.31	1.33	4.00
13	1.04	0.20	5.28	3.70	0.81	4.57	5.43	1.34	4.04
14	1.06	0.20	5.33	3.78	0.82	4.61	5.55	1.36	4.07
15	1.09	0.20	5.37	3.86	0.83	4.64	5.67	1.38	4.10
16	1.11	0.21	5.41	3.94	0.84	4.68	5.79	1.40	4.13
17	1.13	0.21	5.45	4.03	0.85	4.71	5.91	1.42	4.16
18	1.16	0.21	5.49	4.11	0.87	4.74	6.03	1.44	4.19
19	1.18	0.21	5.52	4.19	0.88	4.78	6.16	1.46	4.22
20	1.20	0.22	5.56	4.27	0.89	4.81	6.28	1.48	4.25
21	1.23	0.22	5.59	4.36	0.90	4.84	6.40	1.50	4.27
22	1.25	0.22	5.63	4.44	0.91	4.87	6.52	1.52	4.30
23	1.27	0.22	5.66	4.52	0.92	4.90	6.64	1.53	4.33
24	1.29	0.23	5.69	4.60	0.93	4.93	6.76	1.55	4.35



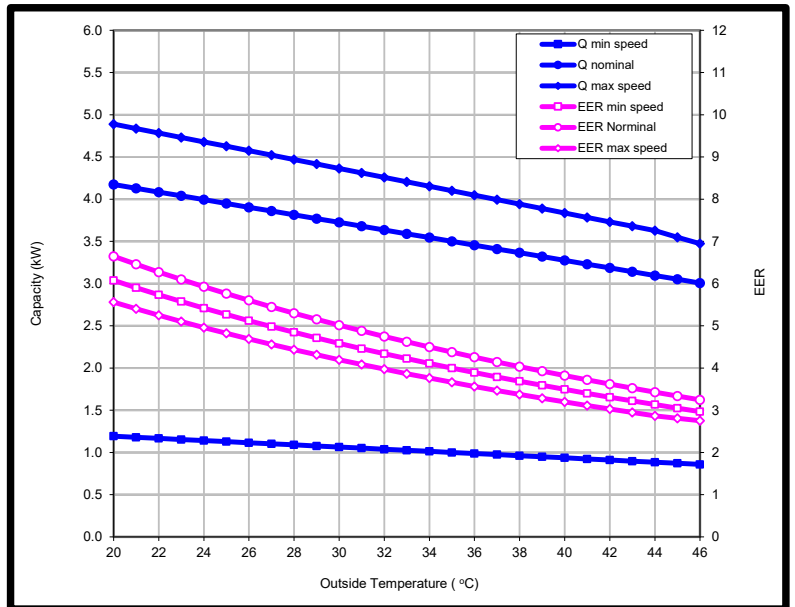
Model : RAS-B13N4KVRG-E ; RAS-13J2AVSG-E1 / RAS-13N4KVRG-TR ; RAS-13J2AVSG-TR1

Product specification :

Condition		Capacity (kW)	Power (kW)	EER/COP
Cooling JIS In: 27 °C DB/19°C WB Out: 35°C DB/24°C WB	Min	1.00	0.25	4.00
	Rated	3.50	0.80	4.38
	Max	4.10	1.12	3.66
Heating JIS In: 20 °C DB/15°C WB Out: 7 °C DB/6°C WB	Min	1.00	0.20	5.00
	Rated	4.20	1.08	3.89
	Max	5.30	1.55	3.42
Heating Low Temp. In: 20 °C DB/15°C WB Out: 2 °C DB/1°C WB	Max	3.90	1.30	3.00
	Max	2.80	1.050	2.67
Heating Low Temp. In: 20 °C DB/15°C WB Out: -10°C DB	Max	2.20	0.850	2.59

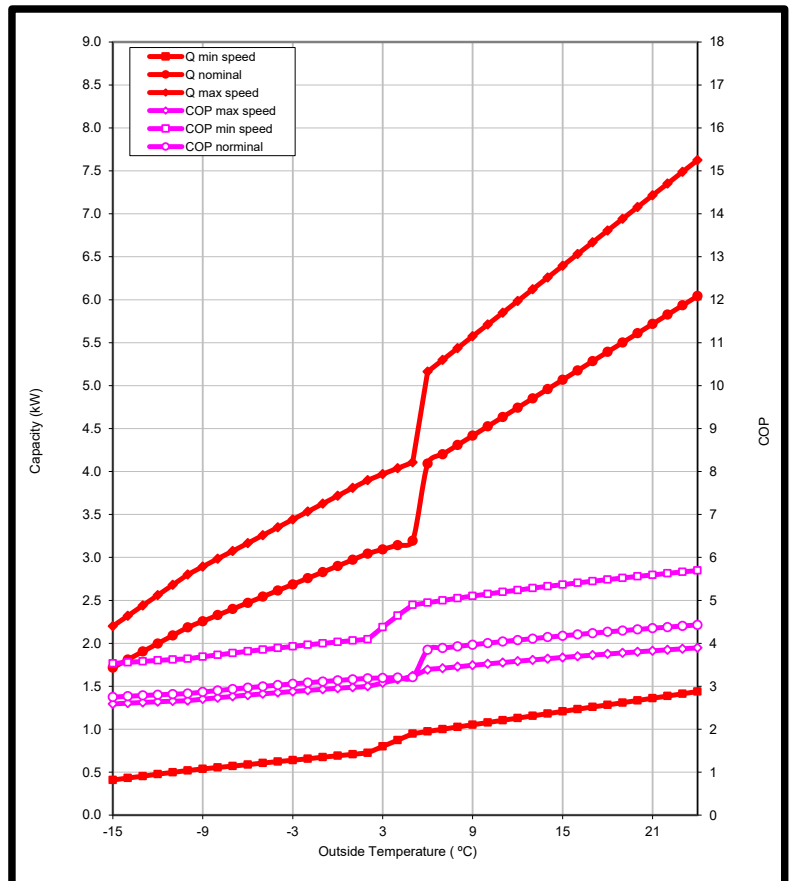
Cooling performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)
20	1.19	0.20	6.08	4.17	0.63	6.65	4.89	0.88	5.56
21	1.18	0.20	5.90	4.13	0.64	6.46	4.84	0.90	5.40
22	1.17	0.20	5.74	4.08	0.65	6.27	4.78	0.91	5.25
23	1.15	0.21	5.57	4.04	0.66	6.10	4.73	0.93	5.10
24	1.14	0.21	5.42	3.99	0.67	5.93	4.68	0.94	4.96
25	1.13	0.21	5.27	3.95	0.69	5.76	4.63	0.96	4.82
26	1.12	0.22	5.12	3.90	0.70	5.60	4.57	0.98	4.69
27	1.10	0.22	4.98	3.86	0.71	5.45	4.52	0.99	4.56
28	1.09	0.22	4.85	3.81	0.72	5.30	4.47	1.01	4.43
29	1.08	0.23	4.71	3.77	0.73	5.16	4.42	1.02	4.31
30	1.06	0.23	4.59	3.72	0.74	5.02	4.36	1.04	4.20
31	1.05	0.24	4.46	3.68	0.75	4.88	4.31	1.06	4.08
32	1.04	0.24	4.34	3.63	0.77	4.75	4.26	1.07	3.97
33	1.03	0.24	4.22	3.59	0.78	4.62	4.21	1.09	3.87
34	1.01	0.25	4.11	3.54	0.79	4.50	4.15	1.10	3.76
35	1.00	0.25	4.00	3.50	0.80	4.38	4.10	1.12	3.66
36	0.99	0.25	3.89	3.46	0.81	4.26	4.05	1.14	3.56
37	0.97	0.26	3.79	3.41	0.82	4.14	3.99	1.15	3.47
38	0.96	0.26	3.69	3.37	0.83	4.03	3.94	1.17	3.37
39	0.95	0.26	3.59	3.32	0.85	3.93	3.89	1.18	3.28
40	0.94	0.27	3.49	3.28	0.86	3.82	3.84	1.20	3.20
41	0.92	0.27	3.40	3.23	0.87	3.72	3.78	1.22	3.11
42	0.91	0.28	3.31	3.19	0.88	3.62	3.73	1.23	3.03
43	0.90	0.28	3.22	3.14	0.89	3.52	3.68	1.25	2.95
44	0.88	0.28	3.13	3.10	0.90	3.43	3.63	1.26	2.87
45	0.87	0.29	3.05	3.05	0.91	3.34	3.55	1.26	2.81
46	0.86	0.29	2.97	3.01	0.93	3.25	3.47	1.26	2.75



Heating performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)
-15	0.41	0.12	3.53	1.72	0.62	2.75	2.20	0.85	2.59
-14	0.43	0.12	3.56	1.81	0.65	2.77	2.32	0.89	2.61
-13	0.45	0.13	3.58	1.90	0.68	2.78	2.44	0.93	2.62
-12	0.48	0.13	3.60	2.00	0.71	2.80	2.56	0.97	2.64
-11	0.50	0.14	3.62	2.09	0.74	2.82	2.68	1.01	2.65
-10	0.52	0.14	3.64	2.19	0.77	2.83	2.80	1.05	2.67
-9	0.54	0.15	3.69	2.26	0.79	2.87	2.89	1.07	2.70
-8	0.55	0.15	3.73	2.33	0.80	2.90	2.98	1.09	2.73
-7	0.57	0.15	3.77	2.40	0.82	2.93	3.08	1.11	2.76
-6	0.59	0.15	3.81	2.47	0.83	2.97	3.17	1.13	2.79
-5	0.61	0.16	3.85	2.54	0.85	3.00	3.26	1.15	2.82
-4	0.62	0.16	3.89	2.61	0.86	3.03	3.35	1.18	2.85
-3	0.64	0.16	3.93	2.69	0.88	3.05	3.44	1.20	2.88
-2	0.66	0.17	3.96	2.76	0.89	3.08	3.53	1.22	2.90
-1	0.67	0.17	4.00	2.83	0.91	3.11	3.63	1.24	2.93
0	0.69	0.17	4.03	2.90	0.93	3.14	3.72	1.26	2.95
1	0.71	0.17	4.06	2.97	0.94	3.16	3.81	1.28	2.98
2	0.72	0.18	4.09	3.04	0.96	3.18	3.90	1.30	3.00
3	0.80	0.18	4.38	3.09	0.97	3.19	3.97	1.29	3.08
4	0.87	0.19	4.64	3.14	0.98	3.20	4.04	1.28	3.16
5	0.95	0.19	4.89	3.19	0.99	3.21	4.11	1.27	3.24
6	0.97	0.20	4.95	4.09	1.06	3.85	5.16	1.53	3.38
7	1.00	0.20	5.00	4.20	1.08	3.89	5.30	1.55	3.42
8	1.03	0.20	5.05	4.31	1.10	3.93	5.44	1.57	3.45
9	1.05	0.21	5.10	4.42	1.11	3.97	5.57	1.60	3.49
10	1.08	0.21	5.15	4.53	1.13	4.00	5.71	1.62	3.52
11	1.10	0.21	5.19	4.63	1.15	4.04	5.85	1.65	3.55
12	1.13	0.22	5.24	4.74	1.16	4.08	5.98	1.67	3.58
13	1.15	0.22	5.28	4.85	1.18	4.11	6.12	1.69	3.61
14	1.18	0.22	5.33	4.96	1.20	4.14	6.26	1.72	3.64
15	1.21	0.22	5.37	5.07	1.21	4.17	6.39	1.74	3.67
16	1.23	0.23	5.41	5.18	1.23	4.21	6.53	1.77	3.70
17	1.26	0.23	5.45	5.28	1.25	4.24	6.67	1.79	3.72
18	1.28	0.23	5.49	5.39	1.26	4.27	6.80	1.81	3.75
19	1.31	0.24	5.52	5.50	1.28	4.30	6.94	1.84	3.78
20	1.34	0.24	5.56	5.61	1.30	4.32	7.08	1.86	3.80
21	1.36	0.24	5.59	5.72	1.31	4.35	7.21	1.89	3.83
22	1.39	0.25	5.63	5.83	1.33	4.38	7.35	1.91	3.85
23	1.41	0.25	5.66	5.93	1.35	4.40	7.49	1.93	3.87
24	1.44	0.25	5.69	6.04	1.36	4.43	7.63	1.96	3.89



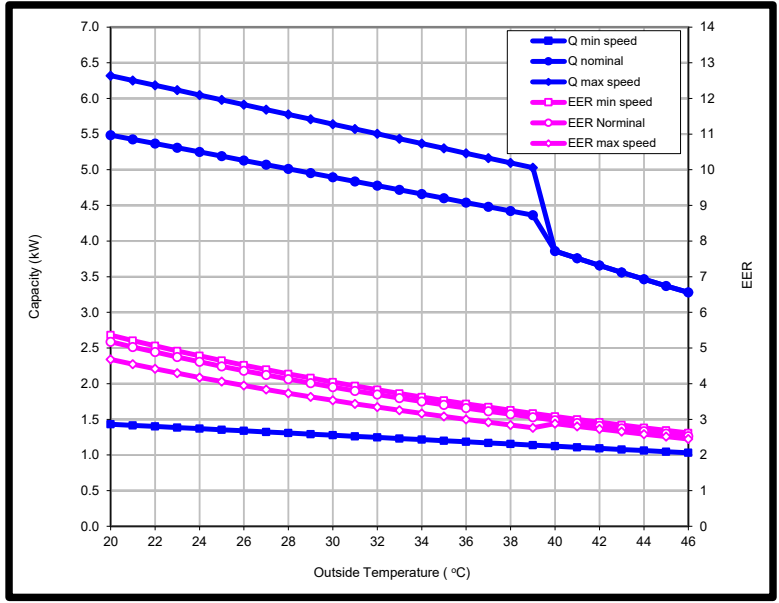
Model : RAS-B16N4KVRG-E ; RAS-16J2AVSG-E1 / RAS-16N4KVRG-TR ; RAS-16J2AVSG-TR1

Product specification :

Condition		Capacity (kW)	Power (kW)	EER/COP
Cooling JIS In: 27°C DB/19°C WB Out: 35°C DB/24°C WB	Min	1.20	0.34	3.53
	Rated	4.60	1.35	3.41
	Max	5.30	1.72	3.08
Heating JIS In: 20°C DB/15°C WB Out: 7°C DB/6°C WB	Min	1.10	0.30	3.67
	Rated	5.50	1.52	3.62
	Max	6.30	1.90	3.32
Heating Low Temp. In: 20°C DB/15°C WB Out: 2°C DB/1°C WB	Max	4.50	1.60	2.81
	Max	3.30	1.400	2.36
Heating Low Temp. In: 20°C DB/15°C WB Out: -10°C DB	Max	2.70	1.200	2.25

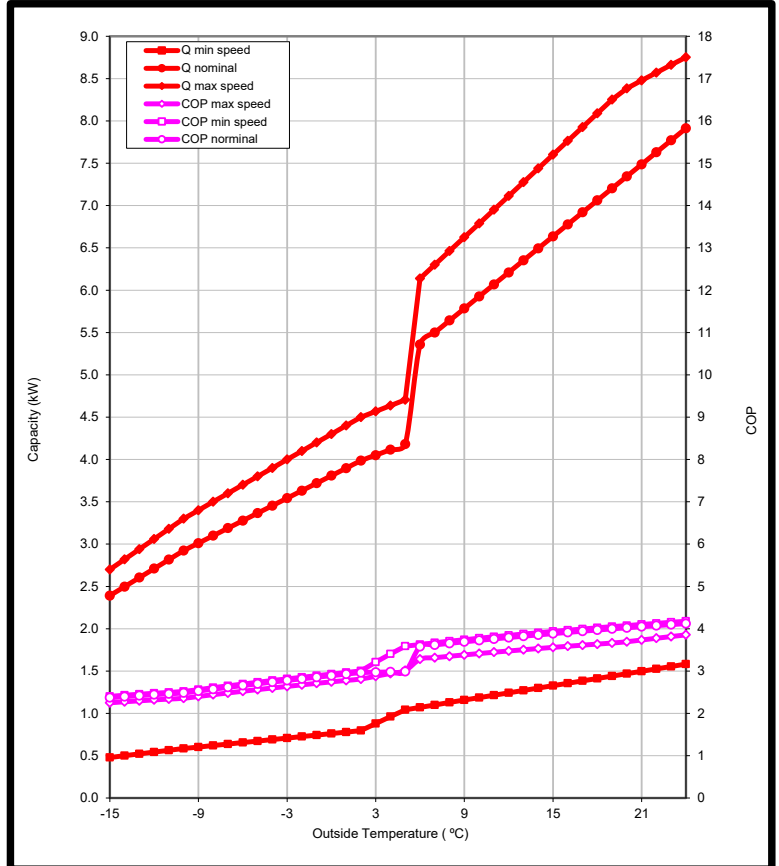
Cooling performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)	Capacity (kW)	Power (kW)	EER (-)
20	1.43	0.27	5.36	5.49	1.06	5.18	6.32	1.35	4.68
21	1.42	0.27	5.21	5.43	1.08	5.03	6.25	1.37	4.55
22	1.40	0.28	5.06	5.37	1.10	4.89	6.18	1.40	4.42
23	1.38	0.28	4.92	5.31	1.12	4.75	6.12	1.42	4.29
24	1.37	0.29	4.78	5.25	1.14	4.62	6.05	1.45	4.17
25	1.35	0.29	4.65	5.19	1.16	4.49	5.98	1.47	4.06
26	1.34	0.30	4.52	5.13	1.18	4.36	5.91	1.50	3.95
27	1.32	0.30	4.40	5.07	1.20	4.24	5.84	1.52	3.84
28	1.31	0.31	4.28	5.01	1.21	4.13	5.78	1.55	3.73
29	1.29	0.31	4.16	4.95	1.23	4.02	5.71	1.57	3.63
30	1.28	0.32	4.05	4.90	1.25	3.91	5.64	1.60	3.53
31	1.26	0.32	3.94	4.84	1.27	3.80	5.57	1.62	3.44
32	1.25	0.33	3.83	4.78	1.29	3.70	5.50	1.65	3.34
33	1.23	0.33	3.73	4.72	1.31	3.60	5.44	1.67	3.25
34	1.22	0.34	3.63	4.66	1.33	3.50	5.37	1.70	3.17
35	1.20	0.34	3.53	4.60	1.35	3.41	5.30	1.72	3.08
36	1.18	0.34	3.43	4.54	1.37	3.32	5.23	1.74	3.00
37	1.17	0.35	3.34	4.48	1.39	3.23	5.16	1.77	2.92
38	1.15	0.35	3.25	4.42	1.41	3.14	5.10	1.79	2.84
39	1.14	0.36	3.17	4.36	1.43	3.06	5.03	1.82	2.76
40	1.12	0.36	3.08	4.30	1.45	2.98	4.96	1.84	2.68
41	1.11	0.37	3.00	4.24	1.47	2.90	4.90	1.86	2.60
42	1.09	0.37	2.92	4.18	1.49	2.82	4.84	1.88	2.52
43	1.08	0.38	2.84	4.12	1.51	2.74	4.78	1.90	2.44
44	1.06	0.38	2.77	4.06	1.53	2.67	4.72	1.92	2.36
45	1.05	0.39	2.69	4.00	1.55	2.60	4.66	1.94	2.28
46	1.03	0.39	2.62	3.94	1.57	2.53	4.60	1.96	2.20



Heating performance characteristic :

Outside Temp (°C)	Min capacity			Nominal capacity			Max capacity		
	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)	Capacity (kW)	Power (kW)	COP (-)
-15	0.48	0.20	2.40	2.39	1.01	2.37	2.70	1.20	2.25
-14	0.50	0.21	2.43	2.50	1.04	2.40	2.82	1.24	2.27
-13	0.52	0.21	2.45	2.60	1.08	2.42	2.94	1.28	2.30
-12	0.54	0.22	2.47	2.71	1.11	2.44	3.06	1.32	2.32
-11	0.56	0.23	2.50	2.82	1.14	2.46	3.18	1.36	2.34
-10	0.58	0.23	2.52	2.92	1.18	2.48	3.30	1.40	2.36
-9	0.60	0.24	2.56	3.01	1.19	2.53	3.40	1.42	2.40
-8	0.62	0.24	2.61	3.10	1.21	2.57	3.50	1.43	2.44
-7	0.64	0.24	2.65	3.19	1.22	2.62	3.60	1.45	2.48
-6	0.66	0.24	2.69	3.28	1.23	2.66	3.70	1.47	2.52
-5	0.67	0.25	2.73	3.37	1.25	2.70	3.80	1.48	2.56
-4	0.69	0.25	2.78	3.45	1.26	2.74	3.90	1.50	2.60
-3	0.71	0.25	2.82	3.54	1.28	2.78	4.00	1.52	2.64
-2	0.73	0.25	2.85	3.63	1.29	2.82	4.10	1.53	2.67
-1	0.74	0.26	2.89	3.72	1.30	2.85	4.20	1.55	2.71
0	0.76	0.26	2.93	3.81	1.32	2.89	4.30	1.57	2.74
1	0.78	0.26	2.97	3.90	1.33	2.93	4.40	1.58	2.78
2	0.80	0.27	3.00	3.99	1.35	2.96	4.50	1.60	2.81
3	0.88	0.27	3.21	4.05	1.36	2.97	4.57	1.59	2.88
4	0.96	0.28	3.40	4.12	1.38	2.98	4.64	1.57	2.94
5	1.04	0.29	3.59	4.18	1.40	2.99	4.71	1.56	3.01
6	1.07	0.30	3.63	5.36	1.50	3.58	6.14	1.87	3.28
7	1.10	0.30	3.67	5.50	1.52	3.62	6.30	1.90	3.32
8	1.13	0.30	3.70	5.64	1.54	3.66	6.46	1.93	3.35
9	1.16	0.31	3.74	5.78	1.57	3.69	6.63	1.96	3.38
10	1.19	0.31	3.78	5.93	1.59	3.73	6.79	1.99	3.41
11	1.21	0.32	3.81	6.07	1.61	3.76	6.95	2.02	3.44
12	1.24	0.32	3.84	6.21	1.64	3.79	7.11	2.05	3.47
13	1.27	0.33	3.87	6.35	1.66	3.82	7.28	2.08	3.50
14	1.30	0.33	3.91	6.49	1.68	3.85	7.44	2.11	3.53
15	1.33	0.34	3.94	6.64	1.71	3.88	7.60	2.14	3.56
16	1.36	0.34	3.97	6.78	1.73	3.91	7.76	2.16	3.59
17	1.38	0.35	3.99	6.92	1.76	3.94	7.93	2.19	3.61
18	1.41	0.35	4.02	7.06	1.78	3.97	8.09	2.22	3.64
19	1.44	0.36	4.05	7.20	1.80	4.00	8.25	2.25	3.66
20	1.47	0.36	4.08	7.35	1.83	4.02	8.38	2.27	3.69
21	1.50	0.37	4.10	7.49	1.85	4.05	8.48	2.27	3.73
22	1.53	0.37	4.13	7.63	1.87	4.07	8.57	2.27	3.78
23	1.55	0.37	4.15	7.77	1.90	4.10	8.66	2.27	3.82
24	1.58	0.38	4.18	7.91	1.92	4.12	8.75	2.27	3.86



TOSHIBA CARRIER (THAILAND) CO.,LTD.

144/9 Moo 5, Bangkadi Industrial Park, Tivanon Road, Tambol Bangkadi,
Amphur Muang, Pathumthani 12000, Thailand

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