Refrigerant
R410A

INDOOR UNIT

1. DUCT TYPE :

AR＊A24LATU
AR＊F24LBTU

D2D_AR030E/05
2009.04.16

1. FEATURE

■MODEL :

INDOOR UNIT	OUTDOOR UNIT	
AR∗A24LATU AR∗F24LBTU	AO∗A24LACL AO∗A24LALL	AO∗B24LACL AO∗B24LALL

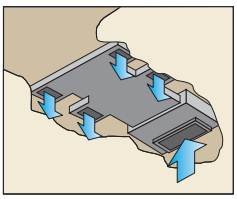
■FEATURES

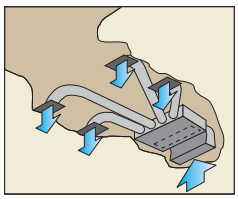
●Energy saving (AO∗A24LACL, AO∗A24LALL connection model)

High energy saving was realized by making the indoor unit and outdoor unit fan motor and compressor all DC and optimal design of the refrigerant cycle. Rank A was achieved in European energy rank.

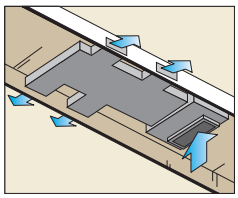
●Installation styles

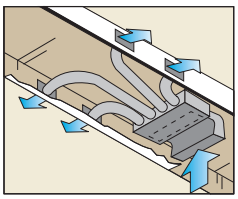
Embedded in Ceiling





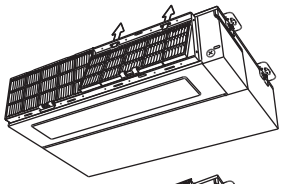
Hanging from Ceiling



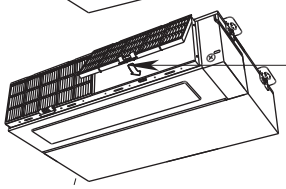


●Slim & compact design

In the case of bottom suction type, as seen from lower rear part.



Control Box united with main unit



One-touch operating and easy-to-install long-life filter (optional)

In addition to the slim height of 270 mm which is our sales point, further com-pactification is attained by reducing 65 mm from the width with the flanking control box embedded inside the chassis.

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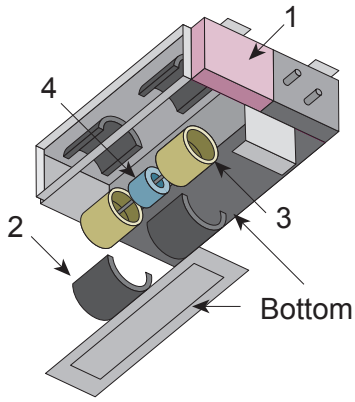
●EASY MAINTENANCE

In the case of rear suction type, as seen from lower rear part.



1. Control box
2. Fan casing
3. Fan
4. Motor

The motor and fan maintenance and dismounting can be made easily by removing the rear panel and lower part of the casing with the main chassis installed.

●Quiet mode

Operation at *25dB(A) possible by Quiet Mode.

* See our measurement conditions page (01-14).

■FUNCTION SETTING

●Static pressure mode setting

Air flow, noise, etc. can be used under the optimum conditions by selecting the static pressure mode matched to the installation conditions.

●Room temperature adjustment correction

Suitable room temperature control is performed by changing the room temperature correction value by simple remote control operation to match the conditions under which the air conditioner is installed.

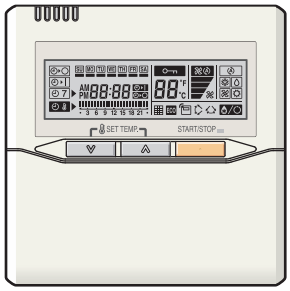
●Auto restart

The units restart automatically when the current was returned even when there was a power interruption during operation.

2. REMOTE CONTROLLER

WIRED REMOTE CONTROLLER

■FEATURES



* Various timer setup (ON / OFF / WEEKLY) are possible.
* Equipped with weekly timer as standard function.
  (2 times Start / Stop per day for a week)
* When setting up a timer, operation mode and a temperature setup can be changed.
* When a failure occurs,the error code is displayed. (Maximum of 16)
* Error indication.(A maximum of 16 error histories are memorizable.)
* Up to 16 indoor units can be simultaneously controlled.
* Economy operation are possible.
* Easy installation with a slim shape with no bulge in the back.
* The room temperature can be controlled by being detected the temperature accurately with built-in thermo sensor.

●Simple function setting

Setting of the air conditioner selection function is performed by remote controller.

●High performance and compact size

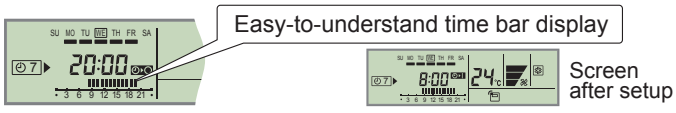
Three functions are combined in one unit.

Wired remote controller + Weekly timer + Setback timer

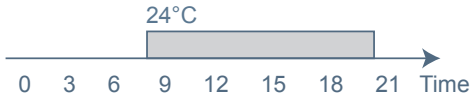
●Built-in timers

Weekly timer

Possible to set ON/OFF time to operate twice each day of the week.

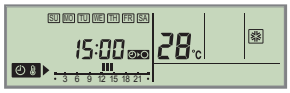


Setup screen example
(Set to Wednesday: 8:00 to 20:00.)

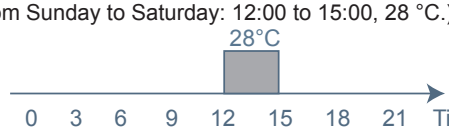


Setback timer

Possible to set temperature for two time spans and for each day of the week.

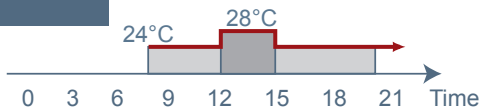


Setup screen example
(Set from Sunday to Saturday: 12:00 to 15:00, 28 °C.)

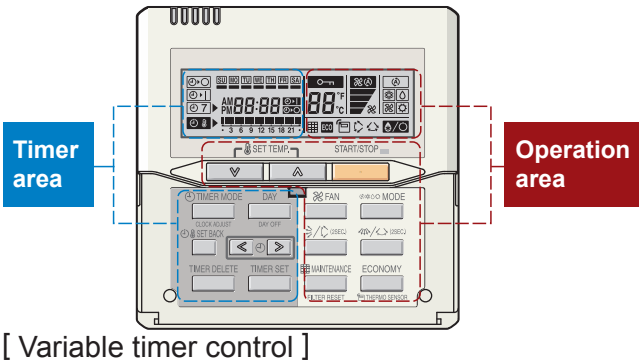


At "Weekly timer" + "Set back timer" setup

24°C → 28°C → 24°C



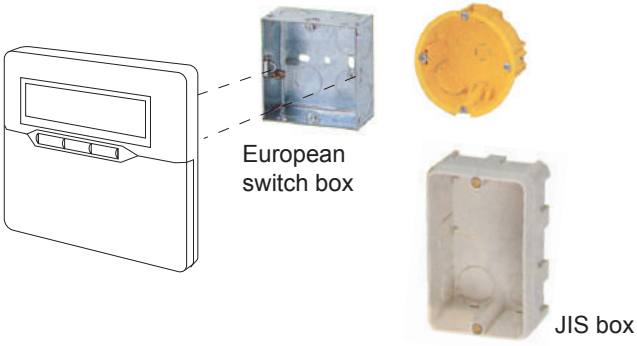
●Easy-to-understand operation



[Variable timer control]
The operation/display sections are zoned according to time and operation, enabling variable programming to match application.

●Simple installation

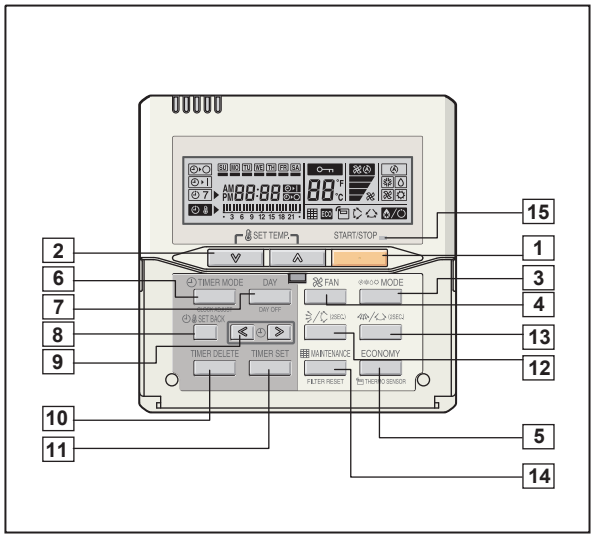
Components are compatible with standard switch boxes. Flat back construction allows equipment to be installed wherever it is needed.



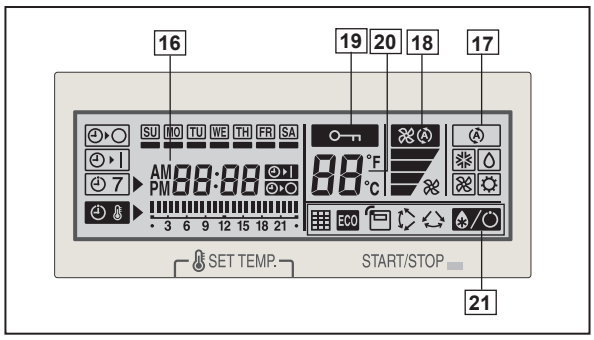
DUCT TYPE
AR✳A24L

DUCT TYPE
AR✳A24L

■FUNCTIONS



Display panel



1 START/STOP button
Pressed to start and stop operation.

2 Set temperature button
Selects the setting temperature.

3 Master control button
Selects the operating mode(AUTO, HEAT, FAN, COOL, DRY).

4 Fan control button
Selects the fan speed (AUTO, QUIET, LOW, MED, HIGH).

5 Economy button
Turns the economy efficient mode on and off.

6 Timer mode (CLOCK ADJUST) button
Selects the timer mode (OFF TIMER, ON TIMER, WEEKLY TIMER).
Set the current time.

7 Day (DAY OFF) button
Temporarily cancels of one day timer.

8 Set back button
Pressed to select the set back timer.

9 Set time button
Pressed to set time.

10 Delete button
The schedule of a weekly timer is deleted.

11 Set button
Sets the date, hour, minute and on-off time.

12 Vertical airflow direction and swing button*
Push for two seconds to change the swing mode.

13 Horizontal airflow direction and swing button*
Push for two seconds to change the swing mode.

14 Filter button*

15 Operation lamp
Lights during operation and when the timer is on.

16 Timer and clock display

17 Operation mode display

18 Fan speed display

19 Operation lock display

20 Temperature display

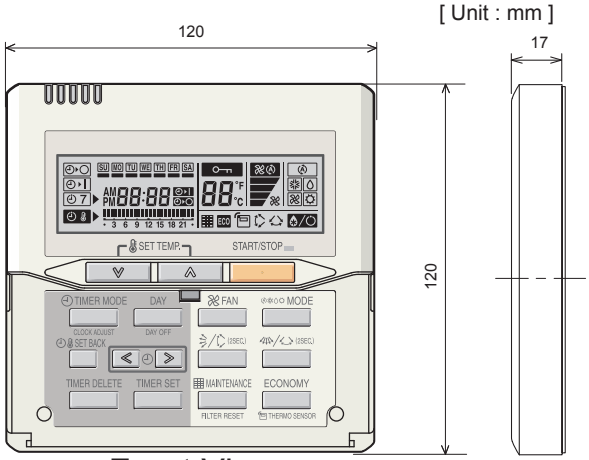
21 Function display

- Defrost display
- Thermo sensor display
- Economy display
- Vertical swing display*
- Horizontal swing display*
- Filter display*

*These functions are not available.

■DIMENSION

[Unit : mm]



Front View

■SPECIFICATION

SIZE (H x W x D mm)	120 x 120 x 17
WEIGHT (g)	160
CABLE LENGTH (m)	10
POWER (V)	12

3. SPECIFICATIONS

DUCT TYPE
AR＊A24L

Type					DUCTED MODEL
					INVERTER HEATPUMP
Model name					AR＊A24LATU, AR＊F24LBTU
					AO＊A24LACL, AO＊A24LALL
Power source					230V ～ 50Hz
Available voltage range					198-264V ～ 50Hz
European energy label				Cooling	A
				Heating	A
Capacity	Cooling	Rated		kW	7.10
				BTU/h	24200
		Min.-Max.		kW	0.90 - 8.00
				BTU/h	3100 - 27300
	Heating	Rated		kW	8.00
				BTU/h	27300
		Min.-Max.		kW	0.90 - 9.10
				BTU/h	3100 - 31000
Input power	Cooling	Rated		kW	2.21
		*Max.			2.85
	Heating	Rated			2.21
		*Max.			3.19
Current	Cooling	Rated		A	9.7
		*Max.			12.0
	Heating	Rated			9.7
		*Max.			13.5
EER		Cooling		kW/kW	3.21
COP		Heating			3.61
Moisture removal				l/h (pints/h)	2.5 (4.4)
Fan	Airflow rate	Cooling	High	m^3/h	1100
			Med		950
			Low		800
			Quiet		600
		Heating	High		1100
			Med		950
			Low		800
			Quiet		600
	Type × Q'ty				Sirocco × 2
	Motor output			W	115
Recommended static pressure				Pa	30 to 150
Sound pressure level		Cooling	High	dB(A)	31
			Med		29
			Low		27
			Quiet		25
		Heating	High		31
			Med		29
			Low		27
			Quiet		25
Heat exchanger type		Dimensions (H × W × D)		mm	294 × 1000 × 39.9
		Fin pitch			1.40
		Rows x Stages			3 × 14
		Pipe type			Copper
		Fin type			Aluminium
Enclosure		Material			Steel
		Colour			—
Dimensions (H×W ×D)	Net			mm	270 × 1135 × 700
	Gross				300 × 1300 × 790
Weight	Net			kg(lb.)	38 (84)
	Gross				45 (99)
Connection pipe	Size	Liquid		mm	Φ6.35 (Φ1 / 4 in.)
		Gas			Φ15.88 (Φ5 / 8 in.)
	Method				Flare
Operation range		Cooling		°C	18 to 32
				%RH	80 or less
		Heating		°C	30 or less
Remote controller type					Wired
Drain pipe	Material				Steel
	Size			mm	Outer diameter : 38.0 / Inner diameter : 36.0

Note :
Specifications are ased on the following conditions.
Cooling : Indoor temperature of 27 °CDB / 19 °CWB.and outdoor temperature of 35 °CDB/24°CWB.
Heating : Indoor temperature of 20 °CDB / 15 °CWB.and outdoor temperature of 7 °CDB/6 °CWB.
Standard static pressure : 30 Pa
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)
Sound pressure level : Install a 2m duct to the outlet port and a 1m duct to the suction poit and measure.
＊ The maximum current and the maximum input value are the maximum values when operated within the operation range (temperature).

DUCT TYPE
AR*A24L

Type					DUCTED MODEL
					INVERTER HEATPUMP
Model name					AR＊A24LATU, AR＊F24LBTU
					AO＊B24LACL, AO＊B24LALL
Power source					230V ～ 50Hz
Available voltage range					198-264V ～ 50Hz
European energy label				Cooling	B
				Heating	B
Capacity	Cooling	Rated		kW	7.10
				BTU/h	24200
		Min.-Max.		kW	0.90 - 7.80
				BTU/h	3100 - 26600
	Heating	Rated		kW	8.00
				BTU/h	27300
		Min.-Max.		kW	0.90 - 8.80
				BTU/h	3100 - 30000
Input power	Cooling	Rated		kW	2.32
		*Max.			2.85
	Heating	Rated			2.33
		*Max.			3.19
Current	Cooling	Rated		A	10.1
		*Max.			12.0
	Heating	Rated			10.2
		*Max.			13.5
EER		Cooling		kW/kW	3.06
COP		Heating			3.43
Moisture removal				l/h (pints/h)	2.5 (4.4)
Fan	Airflow rate	Cooling	High	m^3/h	1100
			Med		950
			Low		800
			Quiet		600
		Heating	High		1100
			Med		950
			Low		800
			Quiet		600
	Type × Q'ty				Sirocco × 2
	Motor output			W	115
Recommended static pressure				Pa	30 to 150
Sound pressure level		Cooling	High	dB(A)	31
			Med		29
			Low		27
			Quiet		25
		Heating	High		31
			Med		29
			Low		27
			Quiet		25
Heat exchanger type		Dimensions (H × W × D)		mm	294 × 1000 × 39.9
		Fin pitch			1.40
		Rows x Stages			3 × 14
		Pipe type			Copper
		Fin type			Aluminium
Enclosure		Material			Steel
		Colour			—
Dimensions (H×W ×D)	Net			mm	270 × 1135 × 700
	Gross				300 × 1300 × 790
Weight	Net			kg(lb.)	38 (84)
	Gross				45 (99)
Connection pipe	Size	Liquid		mm	φ 6.35 (φ 1 / 4 in.)
		Gas			φ15.88 (φ 5 / 8 in.)
	Method				Flare
Operation range		Cooling		˚C	18 to 32
				%RH	80 or less
		Heating		˚C	30 or less
Remote controller type					Wired
Drain pipe	Material				Steel
	Size			mm	Outer diameter：38.0 / Inner diameter：36.0

Note :
Specifications are based on the following conditions.
Cooling : Indoor temperature of 27 °CDB / 19 °CWB.and outdoor temperature of 35 °CDB/24°CWB.
Heating : Indoor temperature of 20 °CDB / 15 °CWB.and outdoor temperature of 7 °CDB/6 °CWB.
Standard static pressure : 30 Pa
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)
Sound pressure level : Install a 2m duct to the outlet port and a 1m duct to the suction poit and measure.
＊ The maximum current and the maximum input value are the maximum values when operated within the operation range (temperature).

DUCT TYPE
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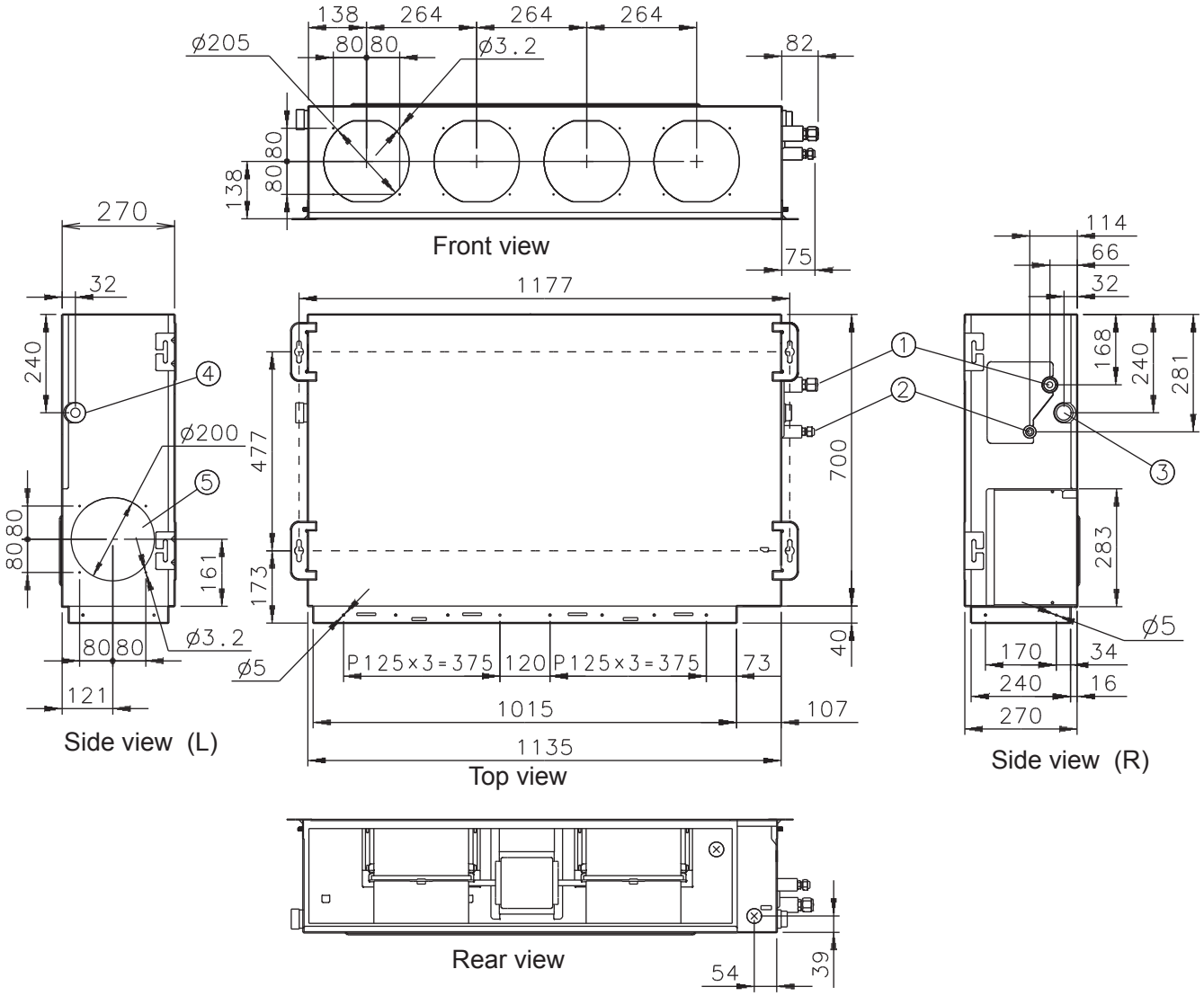
4. DIMENSIONS

■MODEL : AR∗A24L , AR∗ F24L

(Unit : mm)



① Refrigerant piping flare connection (Gas)
② Refrigerant piping flare connection (Liquid)
③ Drain piping connection
④ Drain piping connection with cap.
⑤ Knock out hole for fresh air.

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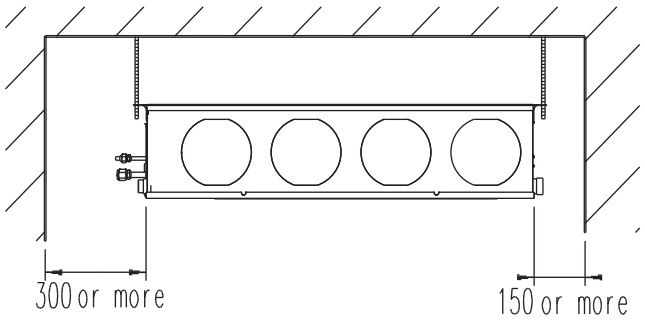
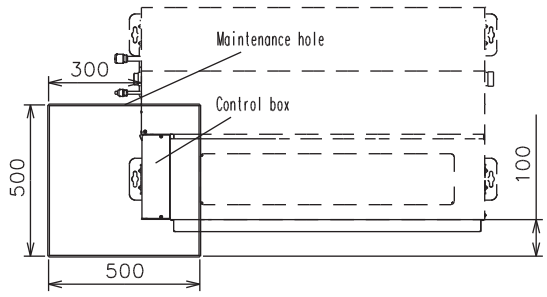
■MOUNTING POSITION

(Unit : mm)

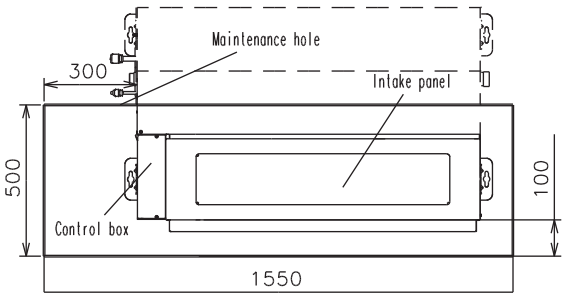


■MAINTENANCE HOLE

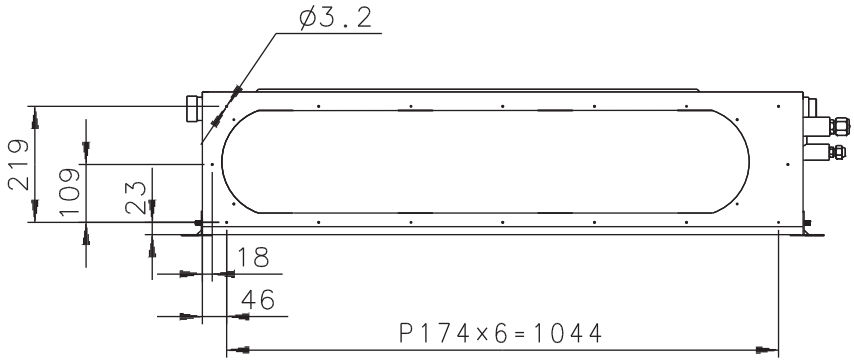
It shall be possible to install and remove the control box.



It shall be possible to install and remove the control box, fan units and filter.

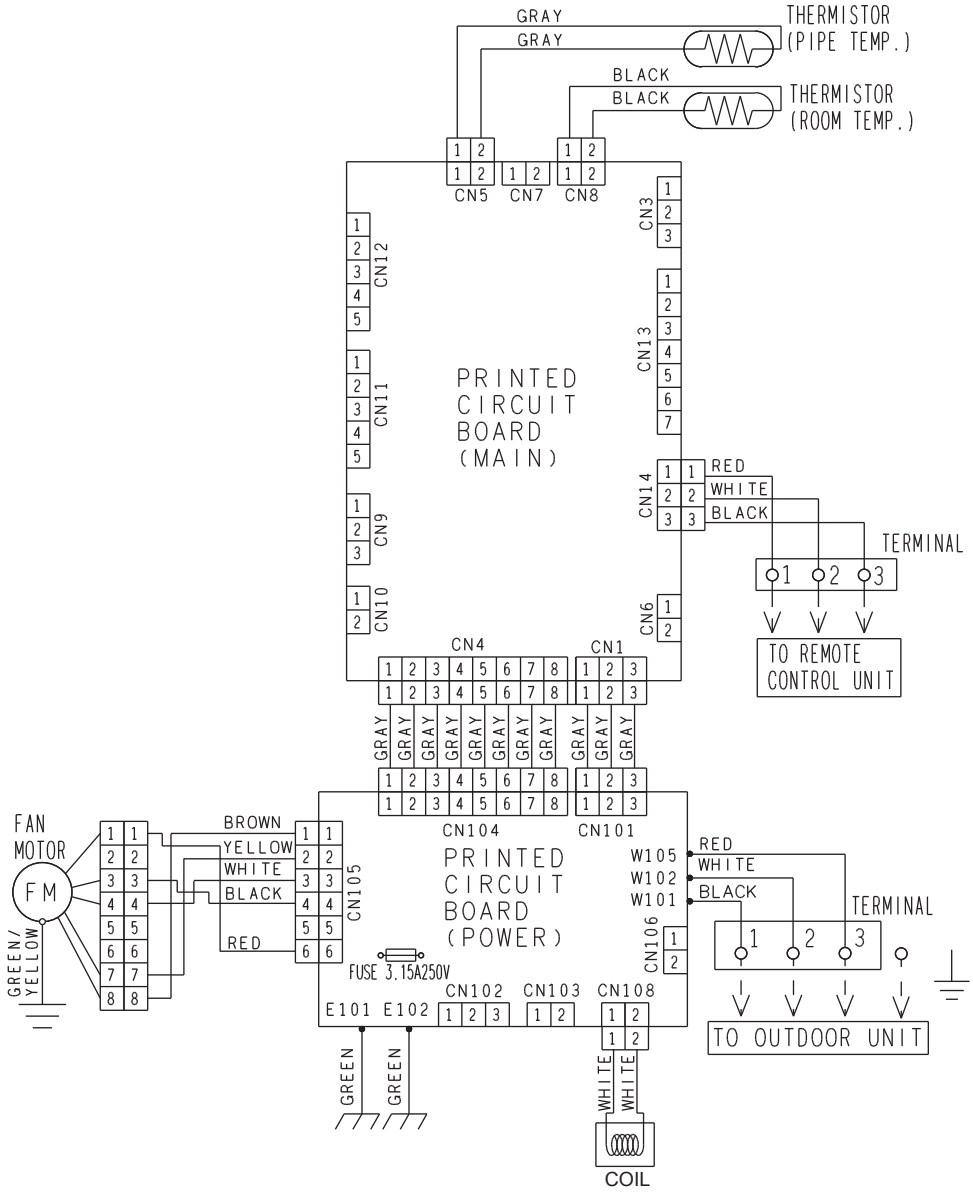


■WHEN USING A SQUARE DUCT



5. WIRING DIAGRAMS

■MODEL : AR∗A24L , AR∗F24L



DUCT TYPE
AR*A24L

6. CAPACITY TABLE

6-1. COOLING CAPACITY

This table is created using the maximum capacity.

■MODEL : AR*A24L, AR*F24L / AO*A24L

AFR	18.3

		Indoor temperature																					
	°CDB	18			21			23			25			27			29			32			
	°CWB	12			15			16			18			19			21			23			
Outdoor temperature	°CDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	
	-10	5.62	4.62	0.60	6.26	4.65	0.61	6.47	5.05	0.62	6.90	5.07	0.62	7.11	5.48	0.62	7.54	5.45	0.63	7.97	5.81	0.64	
	0	5.53	4.58	0.65	6.16	4.60	0.66	6.37	5.00	0.66	6.79	5.02	0.67	7.00	5.42	0.67	7.42	5.40	0.68	7.83	5.75	0.68	
	5	5.34	4.49	0.79	5.94	4.51	0.80	6.15	4.91	0.80	6.55	4.92	0.81	6.75	5.32	0.82	7.16	5.29	0.82	7.57	5.64	0.83	
	10	5.13	4.38	0.92	5.71	4.40	0.93	5.90	4.79	0.94	6.29	4.80	0.95	6.49	5.19	0.95	6.88	5.17	0.96	7.27	5.50	0.97	
	15	5.25	4.44	0.76	5.85	4.47	0.78	6.05	4.86	0.78	6.45	4.87	0.79	6.65	5.26	0.79	7.05	5.24	0.80	7.45	5.58	0.81	
	20	6.78	5.21	1.61	7.55	5.24	1.64	7.81	5.70	1.65	8.32	5.72	1.66	8.58	6.18	1.67	9.09	6.15	1.69	9.61	6.55	1.70	
	25	6.45	5.04	1.81	7.18	5.07	1.84	7.43	5.51	1.85	7.92	5.53	1.87	8.16	5.97	1.88	8.65	5.95	1.90	9.14	6.34	1.91	
	30	6.10	4.87	2.01	6.80	4.90	2.04	7.03	5.32	2.05	7.50	5.34	2.07	7.73	5.77	2.08	8.19	5.74	2.10	8.65	6.12	2.12	
	35	6.32	4.98	2.53	7.04	5.01	2.57	7.28	5.45	2.58	7.76	5.46	2.61	8.00	5.90	2.62	8.48	5.88	2.65	8.96	6.26	2.67	
	40	5.13	4.38	2.05	5.71	4.41	2.08	5.91	4.79	2.09	6.30	4.80	2.11	6.49	5.19	2.12	6.88	5.17	2.14	7.27	5.51	2.16	
	46	3.66	3.68	1.56	4.08	3.70	1.58	4.22	4.02	1.59	4.50	4.03	1.60	4.64	4.36	1.61	4.91	4.34	1.63	5.19	4.62	1.64	

■MODEL : AR*A24L, AR*F24L / AO*B24L

AFR	18.3

		Indoor temperature																					
	°CDB	18			21			23			25			27			29			32			
	°CWB	12			15			16			18			19			21			23			
Outdoor temperature	°CDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	
	-10	5.62	4.62	0.60	6.26	4.65	0.61	6.47	5.05	0.62	6.90	5.07	0.62	7.11	5.48	0.62	7.54	5.45	0.63	7.97	5.81	0.64	
	0	5.53	4.58	0.65	6.16	4.60	0.66	6.37	5.00	0.66	6.79	5.02	0.67	7.00	5.42	0.67	7.42	5.40	0.68	7.83	5.75	0.68	
	5	5.34	4.49	0.79	5.94	4.51	0.80	6.15	4.91	0.80	6.55	4.92	0.81	6.75	5.32	0.82	7.16	5.29	0.82	7.57	5.64	0.83	
	10	5.13	4.38	0.92	5.71	4.40	0.93	5.90	4.79	0.94	6.29	4.80	0.95	6.49	5.19	0.95	6.88	5.17	0.96	7.27	5.50	0.97	
	15	5.25	4.44	0.76	5.85	4.47	0.78	6.05	4.86	0.78	6.45	4.87	0.79	6.65	5.26	0.79	7.05	5.24	0.80	7.45	5.58	0.81	
	20	6.78	5.21	1.61	7.55	5.24	1.64	7.81	5.70	1.65	8.32	5.72	1.66	8.58	6.18	1.67	9.09	6.15	1.69	9.61	6.55	1.70	
	25	6.45	5.04	1.81	7.18	5.07	1.84	7.43	5.51	1.85	7.92	5.53	1.87	8.16	5.97	1.88	8.65	5.95	1.90	9.14	6.34	1.91	
	30	6.10	4.87	2.01	6.80	4.90	2.04	7.03	5.32	2.05	7.50	5.34	2.07	7.73	5.77	2.08	8.19	5.74	2.10	8.65	6.12	2.12	
	35	6.16	4.81	2.53	6.86	4.84	2.57	7.10	5.26	2.58	7.57	5.28	2.61	7.80	5.70	2.62	8.27	5.68	2.65	8.74	6.05	2.67	
	40	5.00	4.24	2.05	5.57	4.27	2.08	5.76	4.64	2.09	6.14	4.65	2.11	6.33	5.03	2.12	6.71	5.01	2.14	7.09	5.33	2.16	
	46	3.57	3.58	1.56	3.98	3.60	1.58	4.11	3.91	1.59	4.38	3.93	1.60	4.52	4.24	1.61	4.79	4.22	1.63	5.06	4.50	1.64	

AFR: Air Flow Rate (m^3/min)
TC : Total Capacity (kW)
SHC: Sensible Heat Capacity (kW)
PI : Power Input (kW)

DUCT TYPE
AR*A24L

6-2. HEATING CAPACITY

This table is created using the maximum capacity.

■MODEL : AR*A24L, AR*F24L / AO*A24L

AFR	18.3

			Indoor temperature									
		°CDB	16		18		20		22		24	
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Outdoor temperature	-15	-16	6.27	2.75	6.12	2.81	5.97	2.87	5.82	2.93	5.67	2.98
	-10	-11	7.10	2.97	6.93	3.04	6.76	3.10	6.60	3.16	6.43	3.22
	-5	-7	7.94	3.12	7.75	3.18	7.56	3.25	7.37	3.31	7.18	3.38
	0	-2	8.80	3.05	8.59	3.12	8.38	3.18	8.17	3.25	7.96	3.31
	5	3	9.72	3.08	9.49	3.14	9.26	3.21	9.03	3.27	8.80	3.34
	7	6	9.56	2.66	9.33	2.71	9.10	2.77	8.87	2.83	8.65	2.88
	10	8	9.85	2.66	9.62	2.72	9.38	2.78	9.15	2.83	8.91	2.89
	15	10	9.03	2.13	8.82	2.17	8.60	2.22	8.39	2.26	8.17	2.31
	20	15	8.29	1.65	8.09	1.69	7.90	1.72	7.70	1.76	7.50	1.79
	24	18	8.58	1.65	8.38	1.68	8.17	1.72	7.97	1.75	7.77	1.79

■MODEL : AR*A24L, AR*F24L / AO*B24L

AFR	18.3

			Indoor temperature									
		°CDB	16		18		20		22		24	
	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Outdoor temperature	-15	-16	6.27	2.75	6.12	2.81	5.97	2.87	5.82	2.93	5.67	2.98
	-10	-11	7.10	2.97	6.93	3.04	6.76	3.10	6.60	3.16	6.43	3.22
	-5	-7	7.94	3.12	7.75	3.18	7.56	3.25	7.37	3.31	7.18	3.38
	0	-2	8.51	3.05	8.31	3.12	8.10	3.18	7.90	3.25	7.70	3.31
	5	3	9.40	3.08	9.18	3.14	8.95	3.21	8.73	3.27	8.51	3.34
	7	6	9.24	2.66	9.02	2.71	8.80	2.77	8.58	2.83	8.36	2.88
	10	8	9.53	2.66	9.30	2.72	9.07	2.78	8.85	2.83	8.62	2.89
	15	10	8.73	2.13	8.53	2.17	8.32	2.22	8.11	2.26	7.90	2.31
	20	15	8.02	1.65	7.83	1.69	7.64	1.72	7.44	1.76	7.25	1.79
	24	18	8.30	1.65	8.10	1.68	7.90	1.72	7.71	1.75	7.51	1.79

AFR: Air Flow Rate (m^3/ min)
TC : Total Capacity (kW)
PI : Power Input (kW)

DUCT TYPE
AR∗A24L

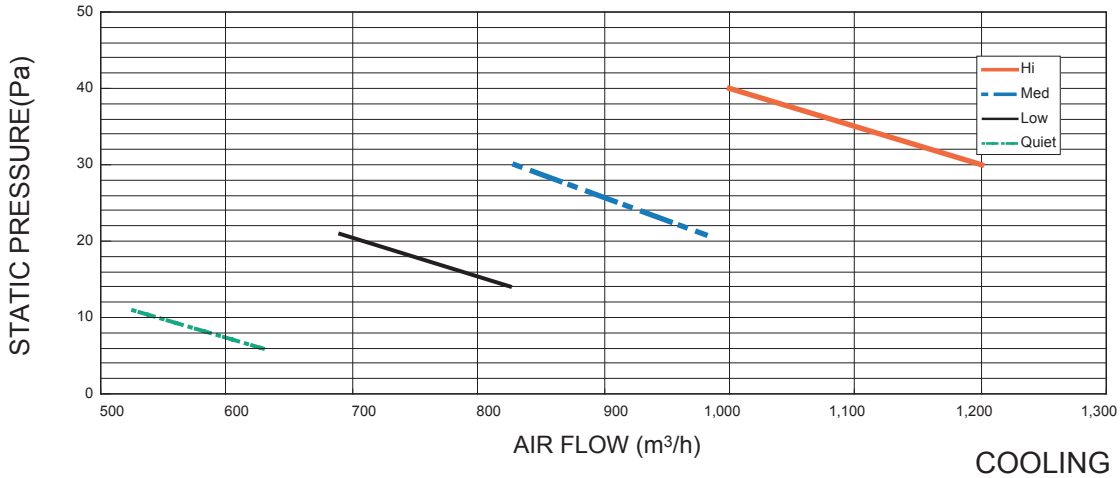
7. FAN PERFORMANCE AND CAPACITY

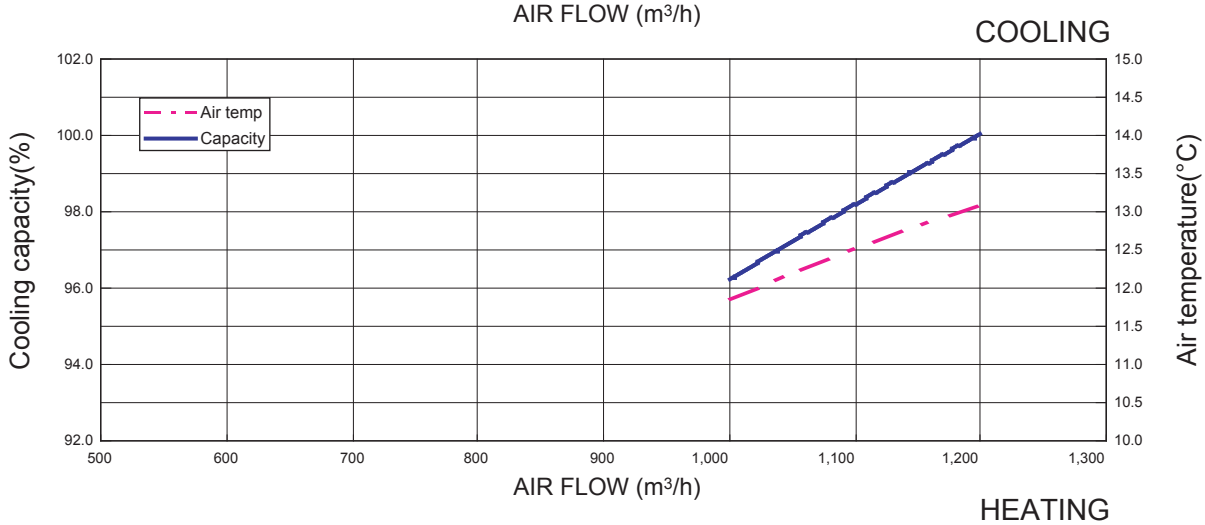
7-1. NORMAL MODE

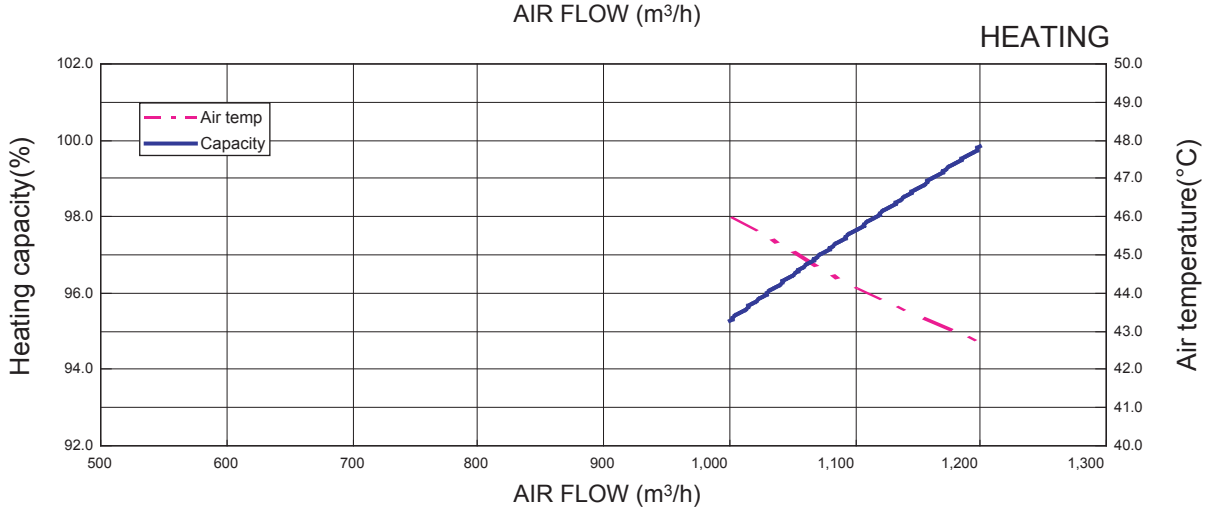
■MODEL : AR∗A24L, AR∗F24L

			Static pressure (Pa)							
			6	11	14	21	25	30	35	40
FAN SPEED	Hi	m^3/h	-	-	-	-	-	1200	1100	1000
		l/s	-	-	-	-	-	333	306	278
		CFM	-	-	-	-	-	706	647	589
	Med	m^3/h	-	-	-	980	915	830	-	-
		l/s	-	-	-	272	254	231	-	-
		CFM	-	-	-	577	539	489	-	-
	Low	m^3/h	-	-	825	690	-	-	-	-
		l/s	-	-	229	192	-	-	-	-
		CFM	-	-	486	406	-	-	-	-
	Quiet	m^3/h	630	525	-	-	-	-	-	-
		l/s	175	146	-	-	-	-	-	-
		CFM	371	309	-	-	-	-	-	-

Q-h Characteristic curve







DUCT TYPE
AR✳A24L

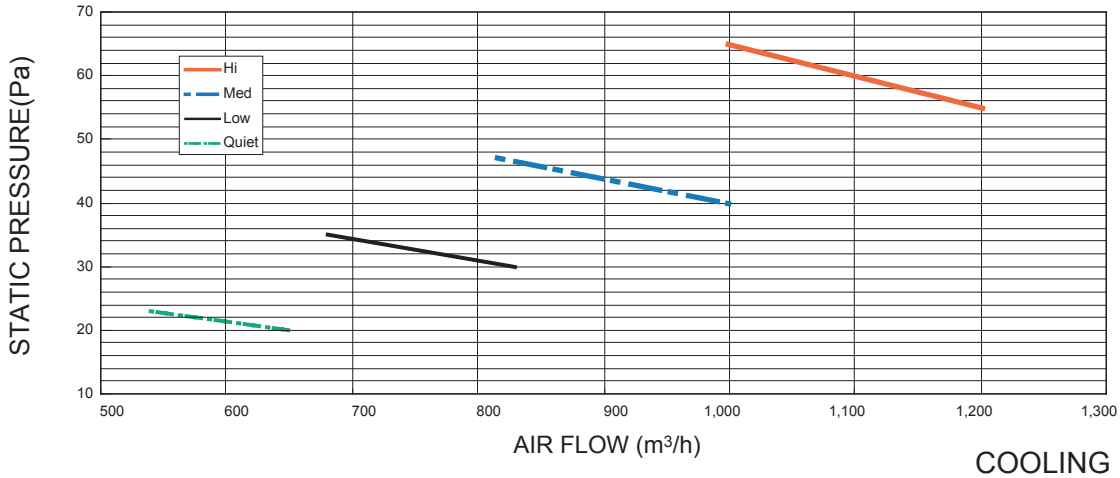
7-2. HIGH STATIC MODE

7-2-1. MODE 1

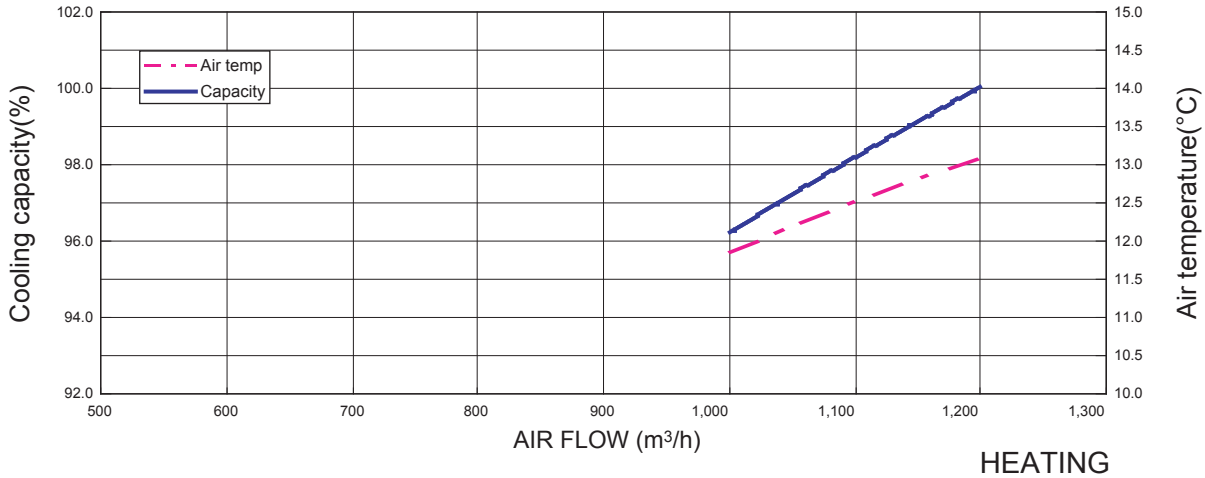
■MODEL : AR✳A24L, AR✳F24L

			Static pressure (Pa)							
			20	23	30	35	40	47	55	65
FAN SPEED	Hi	m^3/h	-	-	-	-	-	-	1200	1000
		l/s	-	-	-	-	-	-	333	278
		CFM	-	-	-	-	-	-	706	589
	Med	m^3/h	-	-	-	-	1000	815	-	-
		l/s	-	-	-	-	278	226	-	-
		CFM	-	-	-	-	589	480	-	-
	Low	m^3/h	-	-	830	680	-	-	-	-
		l/s	-	-	231	189	-	-	-	-
		CFM	-	-	489	400	-	-	-	-
	Quiet	m^3/h	650	540	-	-	-	-	-	-
		l/s	181	150	-	-	-	-	-	-
		CFM	383	318	-	-	-	-	-	-

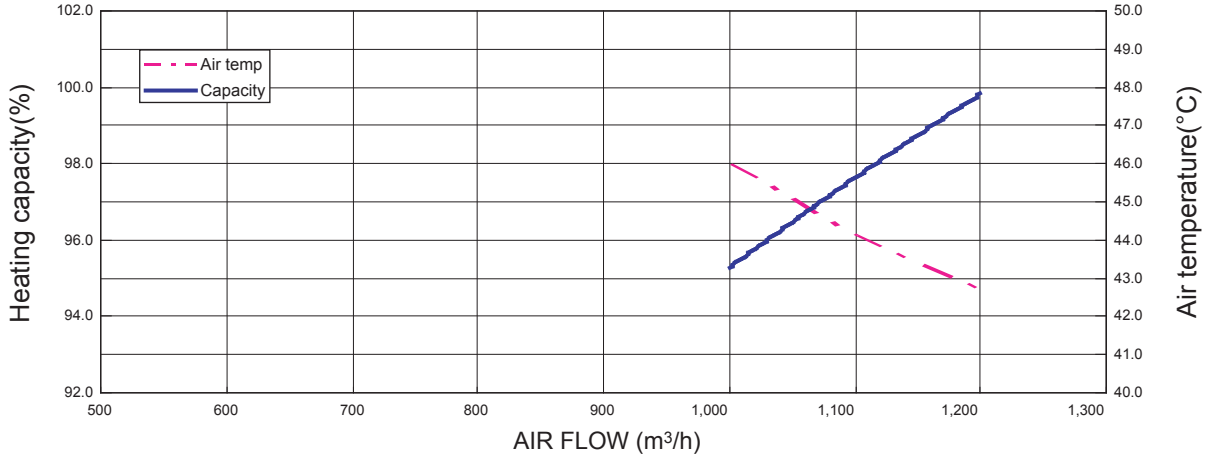
Q-h Characteristic curve



COOLING



HEATING



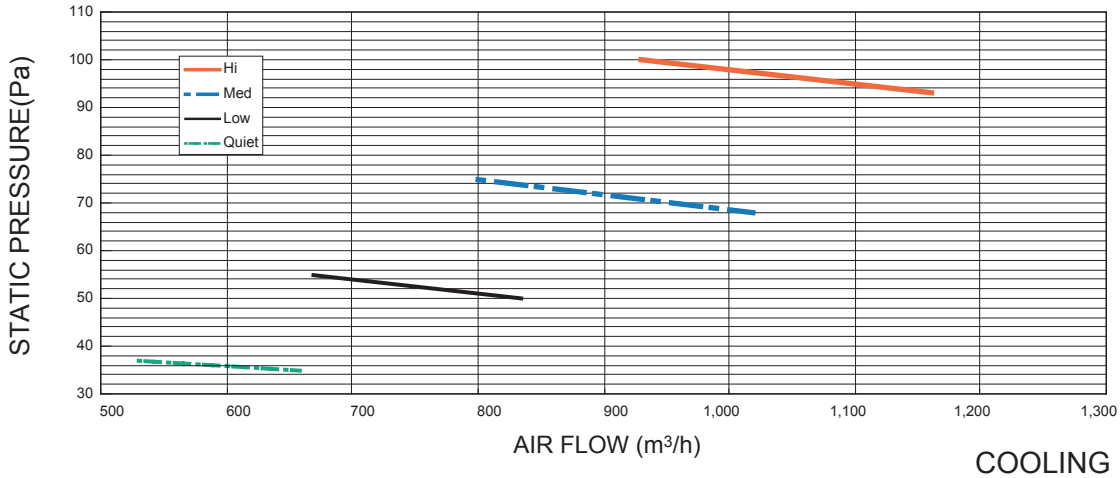
DUCT TYPE
AR*A24L

7-2-2. MODE 2

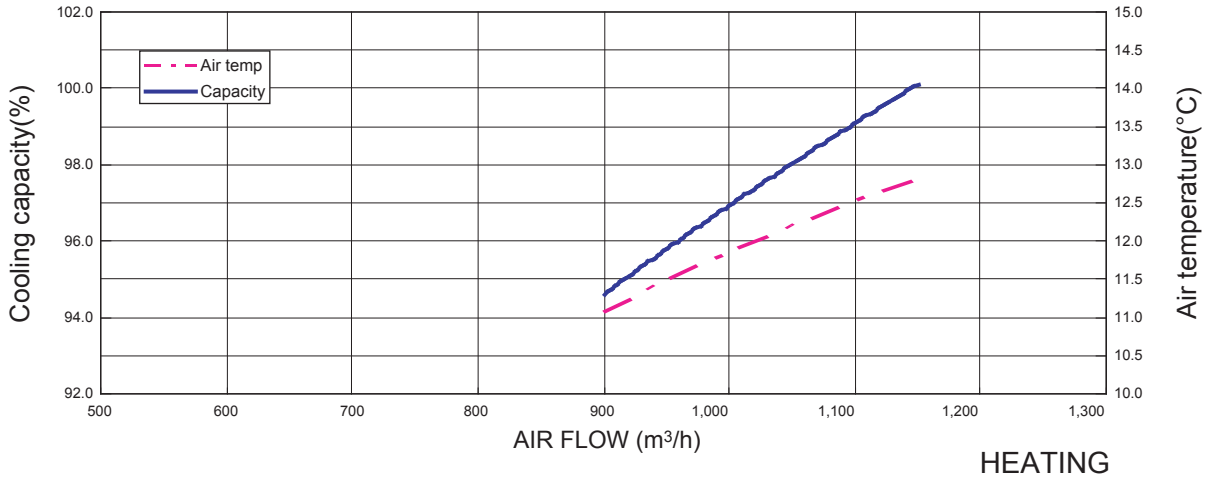
■MODEL : AR*A24L, AR*F24L

			Static pressure (Pa)							
			35	37	50	55	68	75	93	100
FAN SPEED	Hi	m^3/h	-	-	-	-	-	-	1160	930
		l/s	-	-	-	-	-	-	322	258
		CFM	-	-	-	-	-	-	683	547
	Med	m^3/h	-	-	-	-	1020	800	-	-
		l/s	-	-	-	-	283	222	-	-
		CFM	-	-	-	-	600	471	-	-
	Low	m^3/h	-	-	835	670	-	-	-	-
		l/s	-	-	232	186	-	-	-	-
		CFM	-	-	491	394	-	-	-	-
	Quiet	m^3/h	660	530	-	-	-	-	-	-
		l/s	183	147	-	-	-	-	-	-
		CFM	388	312	-	-	-	-	-	-

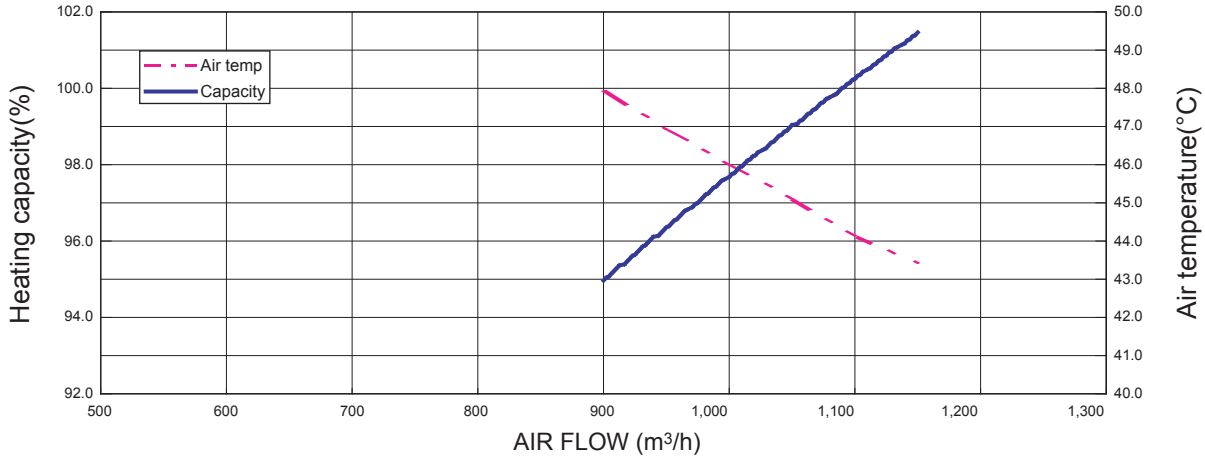
Q-h Characteristic curve



COOLING



HEATING



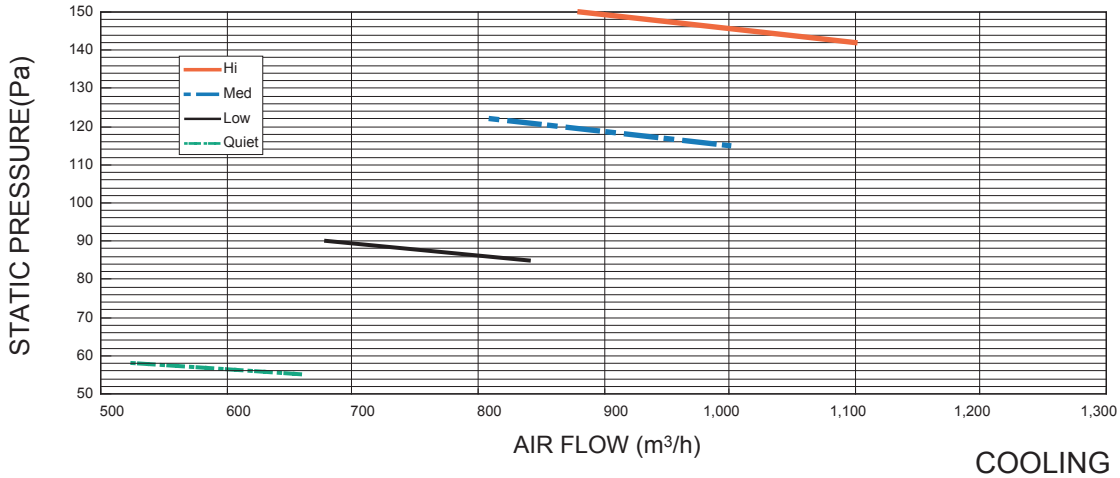
DUCT TYPE
AR∗A24L

7-2-3. MODE 3

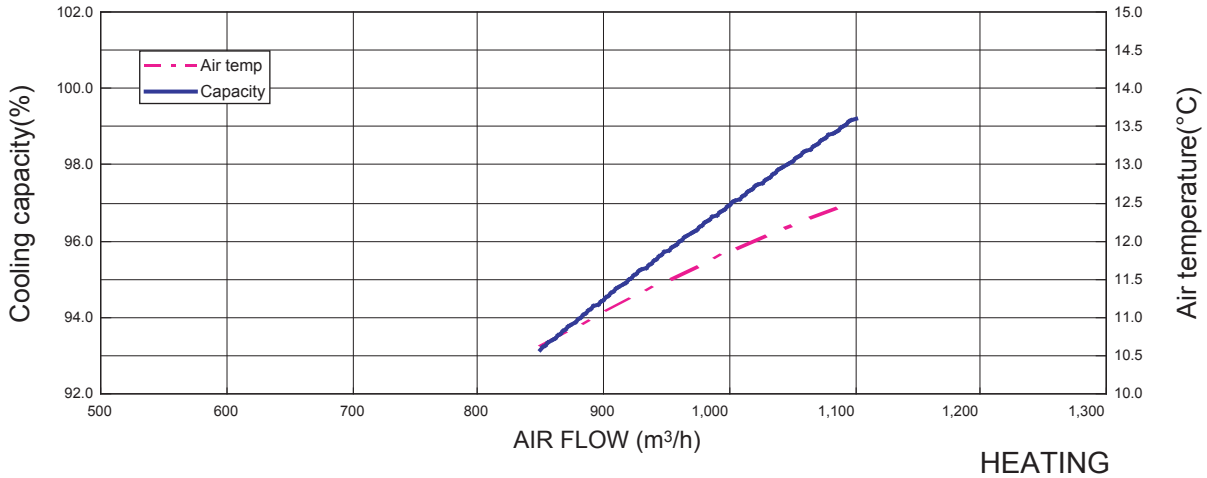
■MODEL : AR∗A24L, AR∗F24L

			Static pressure (Pa)							
			55	58	85	90	115	122	142	150
FAN SPEED	Hi	m^3/h	-	-	-	-	-	-	1100	880
		l/s	-	-	-	-	-	-	306	244
		CFM	-	-	-	-	-	-	647	518
	Med	m^3/h	-	-	-	-	1000	810	-	-
		l/s	-	-	-	-	278	225	-	-
		CFM	-	-	-	-	589	477	-	-
	Low	m^3/h	-	-	840	680	-	-	-	-
		l/s	-	-	233	189	-	-	-	-
		CFM	-	-	494	400	-	-	-	-
	Quiet	m^3/h	660	525	-	-	-	-	-	-
		l/s	183	146	-	-	-	-	-	-
		CFM	388	309	-	-	-	-	-	-

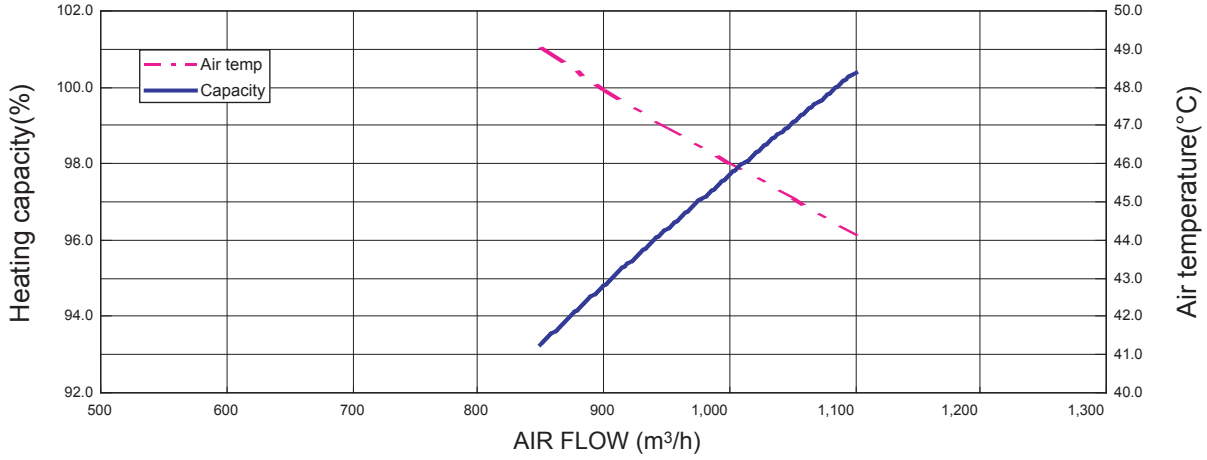
Q-h Characteristic curve



COOLING



HEATING



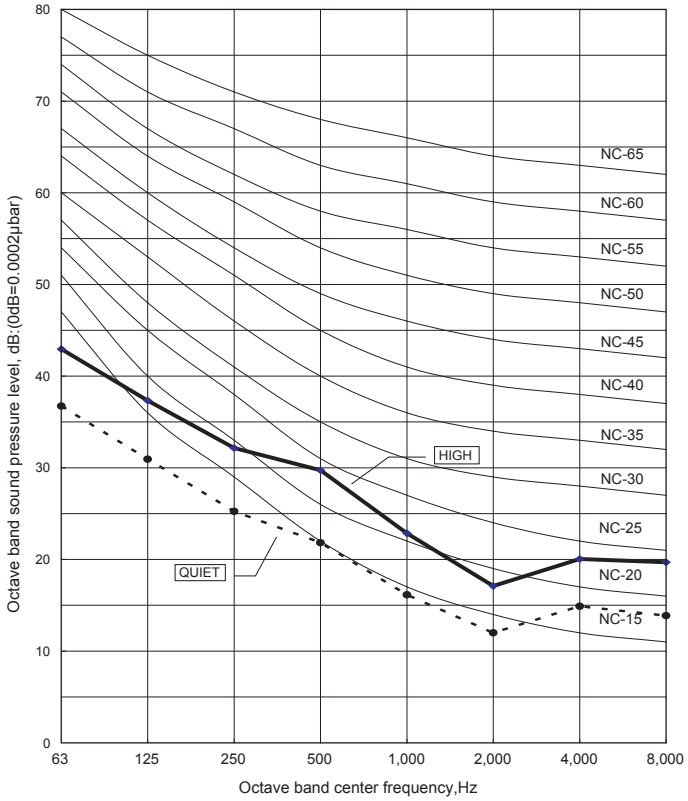
8. OPERATION NOISE

8-1. NOISE LEVEL CURVE

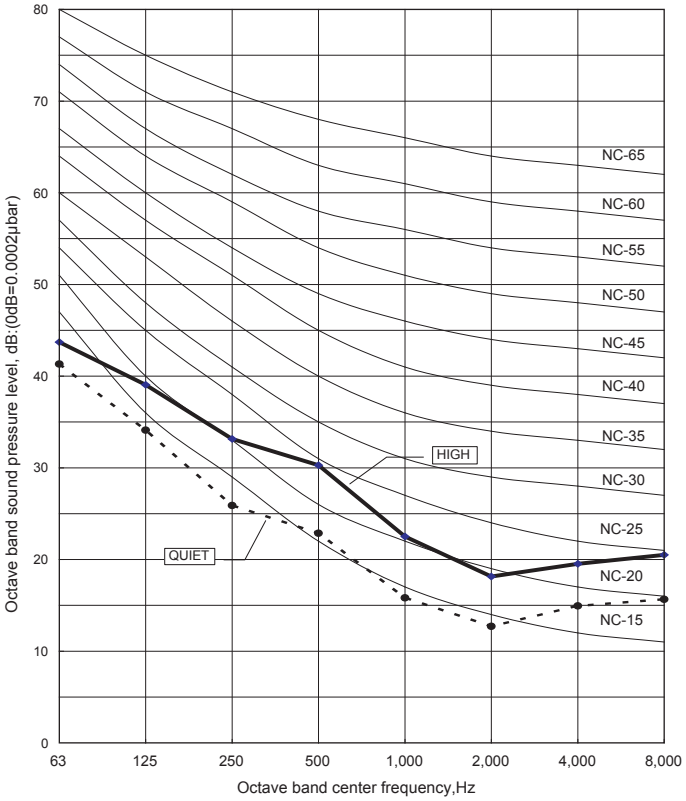
Condition
Static pressure : 30Pa
Static mode : Normal

■MODEL : AR＊A24L, AR＊F24L

●COOLING

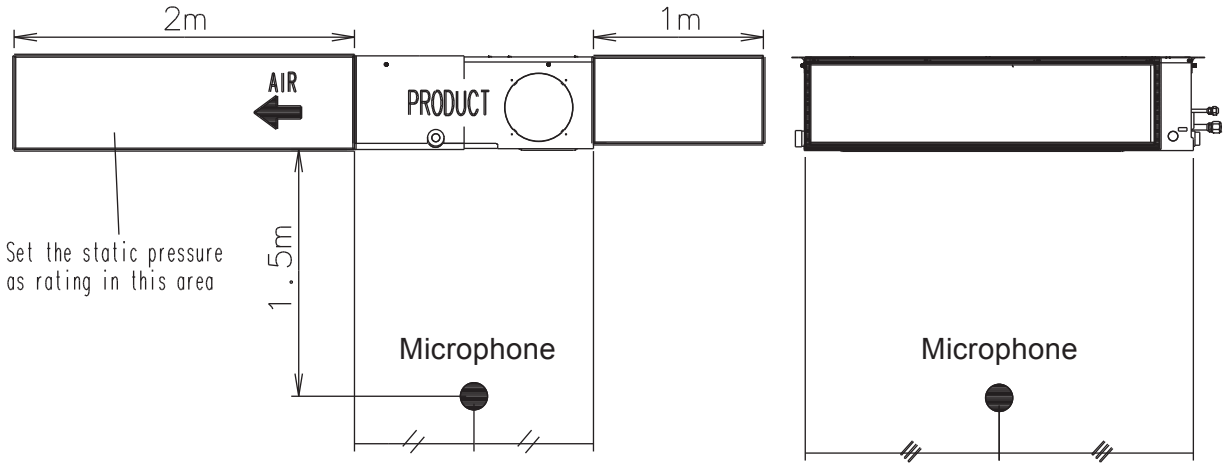


●HEATING



DUCT TYPE
AR✳A24L

8-2. SOUND LEVEL CHECK POINT



DUCT TYPE
AR✳A24L

9. ELECTRIC CHARACTERISTICS

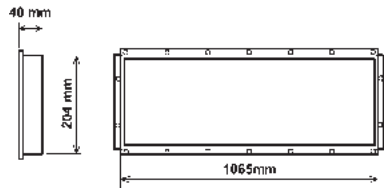
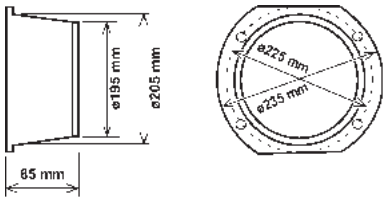
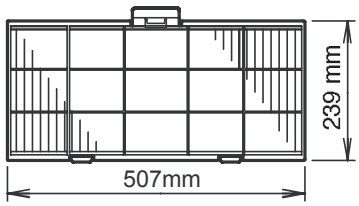
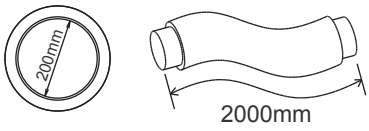
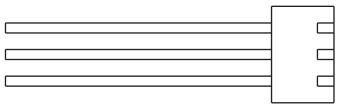
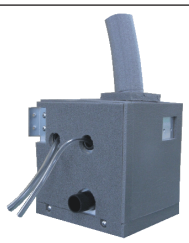
Model Name			AR ∗ A24L	AR ∗ F24L
Power Supply	Voltage	V	230 ～	
	Frequency	Hz	50	
Max Operating Current		A	0.7	
*1)Wiring Spec.	Connection Cable	mm^2	1.5 - 2.5	
	Limited wiring length	m	31	

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

10. SAFETY DEVICES

	Protection form	Model	
		AR ∗ A24L	AR ∗ F24L
Circuit protection	Current fuse (PCB)	3.15A 250V	
Fan motor protection	Thermal protection program	140±20°C OFF 110±20°C ON	

11. OPTIONAL PARTS

Exterior	Parts name	Model No.	Summary
	Square flange	UTD-SF045T	Both the **Square flange** and the **Round flange** can be selected. **Round flange** is also used when the fresh air duct is installed.
	Round flange	UTD-RF204	
	Long-life filter	UTD-LF25NA	**Long-life filter** can be mounted to the indoor unit.
	Flexible duct	UTD-RD202	Connect to **Round flange** and used at fan and fresh air ducts.
	Remote sensor	UTD-RS100	New amenity space can be offered by installing the **Remote sensor** in the remote controller.
	External control set	UTD-ECS5A	Use to connect with various peripheral devices and air conditioner PC board.
	IR Receiver Unit	UTY - LRH∗1	Unit control is performed by wireless remote controller.
	Drain Pump Unit	UTZ - PX1NBA	Optional drain lift up mechanism allows more flexible installation.

Refrigerant
R410A

OUTDOOR UNIT

2. SINGLE TYPE :

AO＊A18LACL

AO＊A18LALL

AO＊A24LACL

AO＊A24LALL

D2D_AO004E/04
2008.04.08

1. SPECIFICATIONS

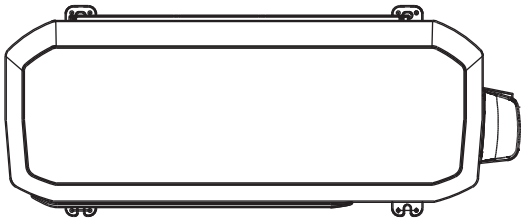
Type					INVERTER HEATPUMP	
Model name					AO ∗ A18LACL AO ∗ A18LALL	AO ∗ A24LACL AO ∗ A24LALL
Power source					230V～ 50Hz	
Available voltage range					198-264V～ 50Hz	
Starting current				A	7.7	10.0
Fan	Airflow rate	Cooling		m^3/h	2000	2470
		Heating			1910	2470
	Type × Q'ty				Propeller × 1	
	Motor output			W	54	65
Sound pressure level		Cooling		dB(A)	50	52
		Heating			50	53
Heat exchanger type		Dimensions (H × W × D)		mm	546 × 876 × 18.2 546 × 842 × 18.2	546 × 866 × 18.2 546 × 832 × 18.2 504 × 589 × 18.2
		Fin pitch			1.30	1.40
		Rows x Stages			2 × 26	2 × 26 1 × 24
		Pipe type			Copper	
		Fin type			Aluminium	
Compressor	Type × Q'ty				Twin Rotary × 1	
	Motor output			W	1100	
Refrigerant		Type			R410A	
		Charge		g	1250	1700
Refrigerant oil		Type			POE	
Enclosure		Material			Steel sheet	
		Colour			Beige (10YR7.5/1.0NN)	
Dimensions (H × W × D)	Net			mm	578 × 790 × 300	578 × 790 × 315
	Gross				648 × 910 × 380	
Weight	Net			kg(lb.)	40 (88)	44 (97)
	Gross				44 (97)	48 (106)
Connection pipe	Size	Liquid		mm	Φ 6.35 (Φ 1/4 in.)	
		Gas			Φ 12.70 (Φ 1/2 in.)	Φ 15.88(Φ 5/8 in.)
	Method				Flare	
	Max. length			m	25(chargeless : 15)	30(chargeless : 15)
	Max. height difference				15	20
Operation range		Cooling		°C	-10 to 46	
		Heating			-15 to 24	

Note :
Specifications are based on the following conditions.
Cooling : Indoor temperature of 27°CDB/19°CWB. and outdoor temperature of 35°CDB/24°CWB.
Heating : Indoor temperature of 20°CDB/15°CWB. and outdoor temperature of 7°CDB/6°CWB.
Pipe length : 7.5 m, Height difference : 0 m. (Outdoor unit - Indoor unit)

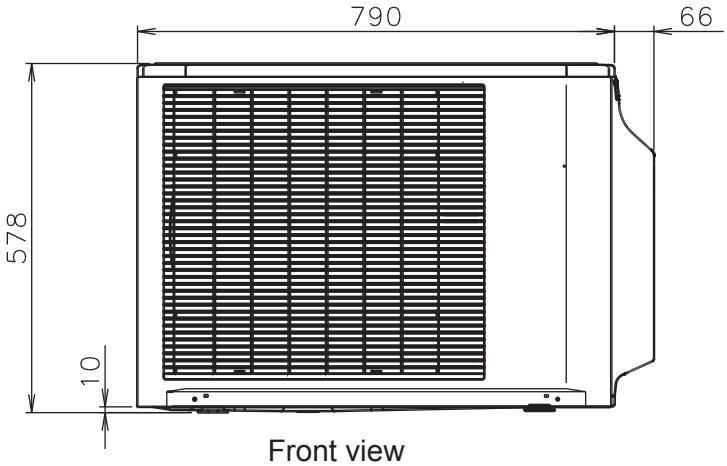
2. DIMENSIONS

■MODELS : AO∗A18L, AO∗A24L

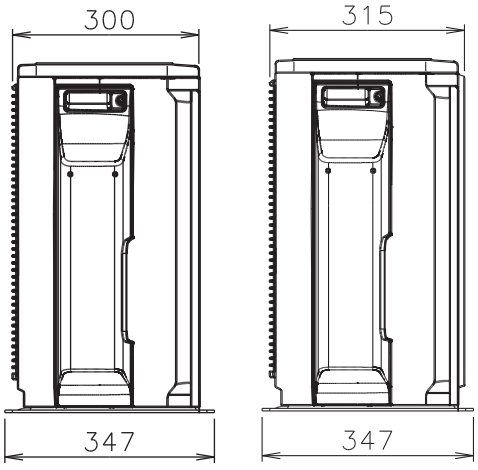
(Unit : mm)



Top view

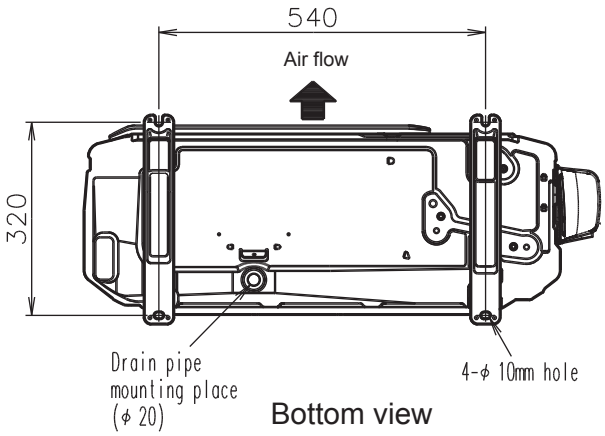


Front view

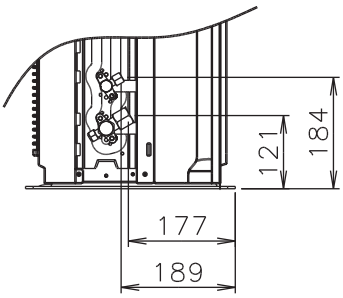


AO∗A18L AO∗A24L

Side view

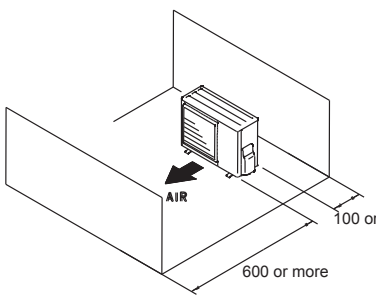


Bottom view

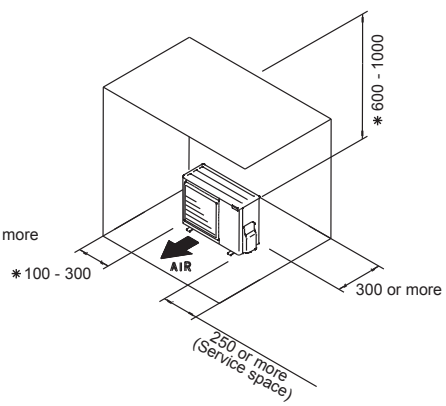


■MOUNTING POSITION

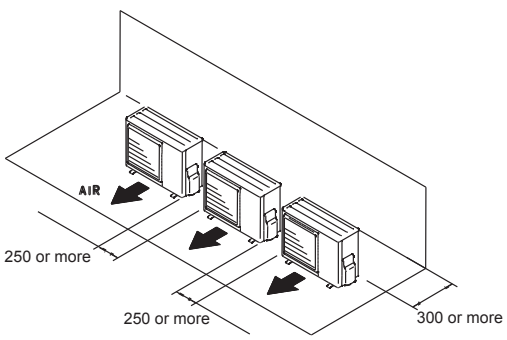
When there are obstacles at the back or front sides.



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

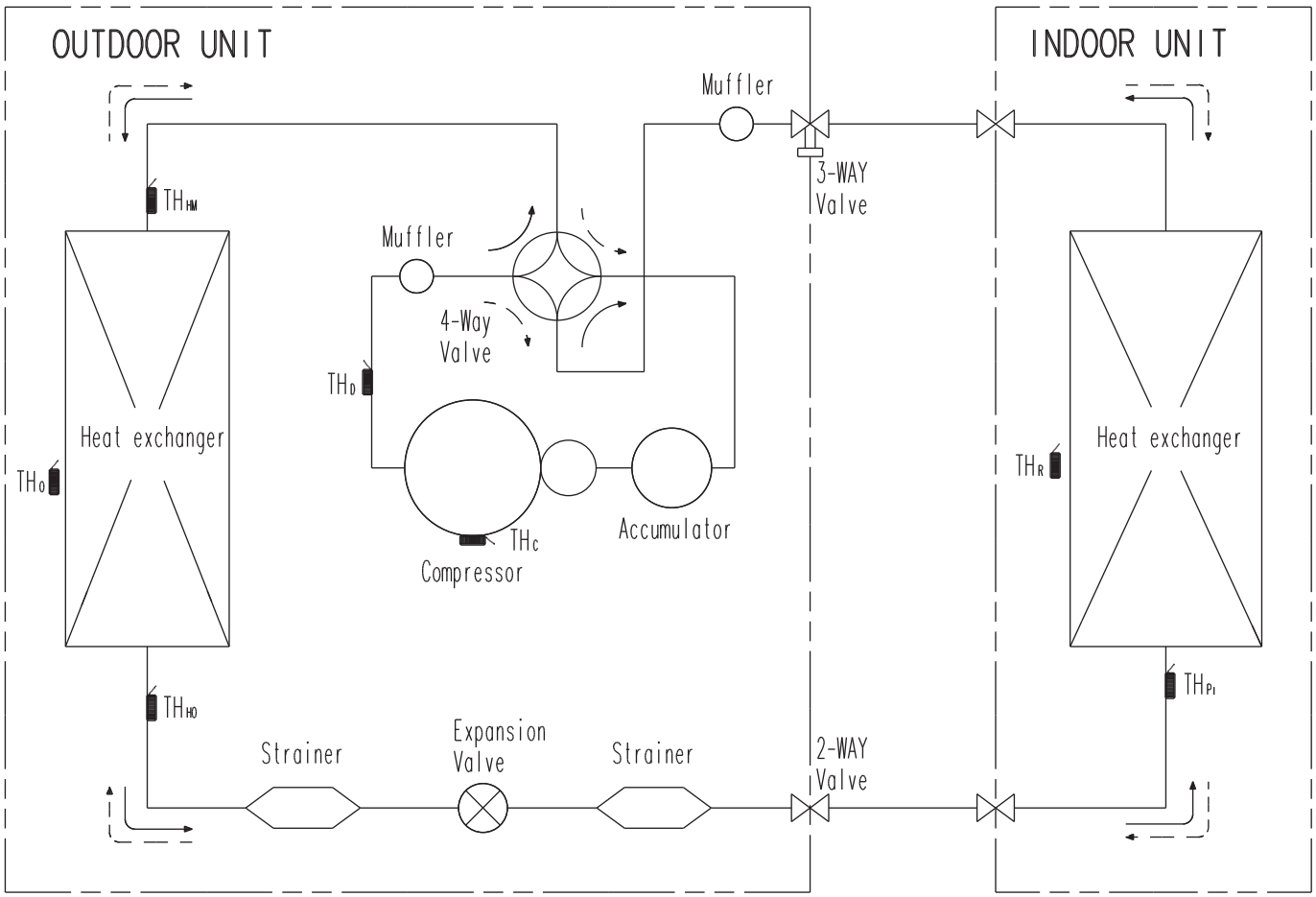


When there are obstacles at the back, side with the installation of more than one unit.



∗If the space is larger that is stated, the condition will be the same as that are no obstacles.

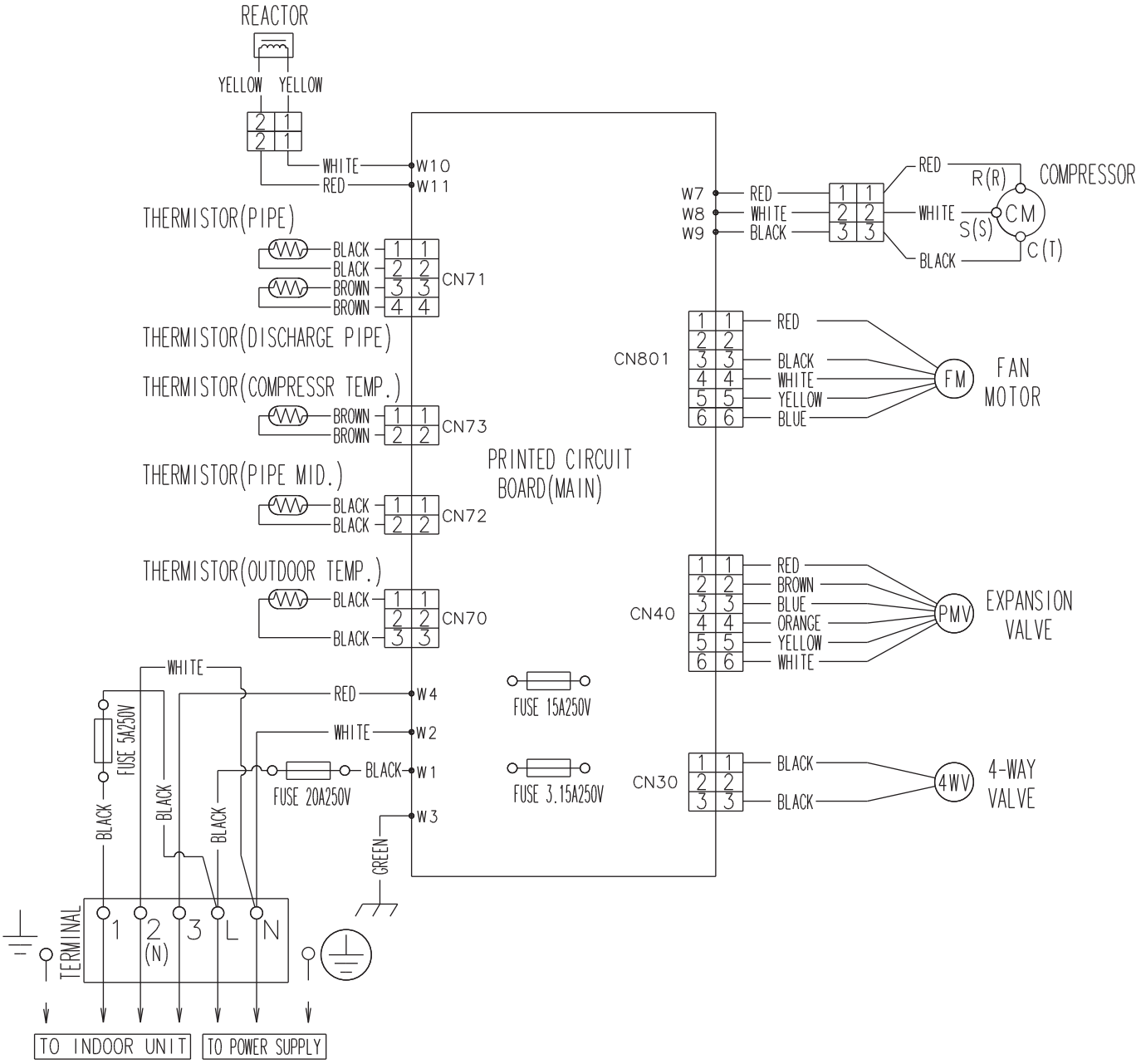
3. REFRIGERANT CIRCUIT



OUTDOOR UNIT
AO*A18-24L

4. WIRING DIAGRAMS

■MODELS : AO*A18L, AO*A24L



OUTDOOR UNIT
AO*A18-24L

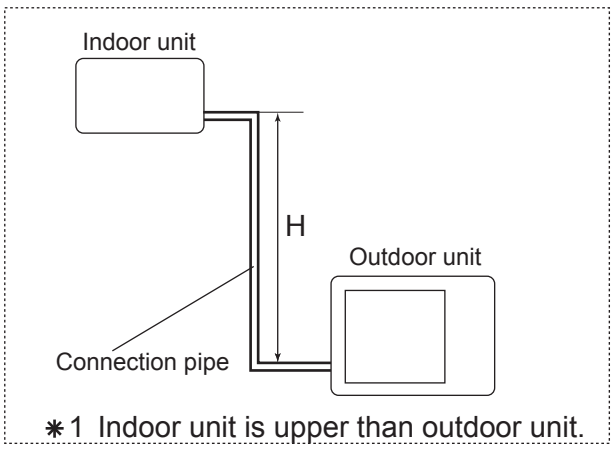
5. CAPACITY COMPENSATION RATE FOR PIPE LENGTH AND HEIGHT DIFFERENCE

■MODEL : AO∗A18L

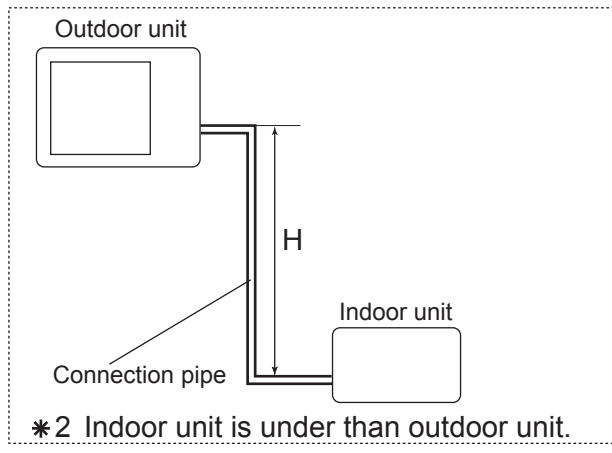
COOLING			Pipe length (m)					
			5	7.5	10	15	20	25
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	15	-	-	-	0.953	0.950	0.947
		10	-	-	0.983	0.968	0.966	0.962
		7.5	-	0.988	0.987	0.972	0.970	0.966
		5	0.992	0.992	0.991	0.976	0.974	0.970
		0	1.000	1.000	0.999	0.984	0.982	0.978
	∗2 Indoor unit is under than outdoor unit	-5	1.000	1.000	0.999	0.984	0.982	0.978
		-7.5	-	1.000	0.999	0.984	0.982	0.978
		-10	-	-	0.999	0.984	0.982	0.978
		-15	-	-	-	0.984	0.982	0.978

HEATING			Pipe length (m)					
			5	7.5	10	15	20	25
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	15	-	-	-	0.920	0.894	0.867
		10	-	-	0.982	0.920	0.894	0.867
		7.5	-	1.000	0.982	0.920	0.894	0.867
		5	0.993	1.000	0.982	0.920	0.894	0.867
		0	0.993	1.000	0.982	0.920	0.894	0.867
	∗2 Indoor unit is under than outdoor unit	-5	0.988	0.995	0.977	0.916	0.889	0.862
		-7.5	-	0.993	0.975	0.913	0.887	0.860
		-10	-	-	0.972	0.911	0.885	0.858
		-15	-	-	-	0.902	0.876	0.849

Height difference H



∗1 Indoor unit is upper than outdoor unit.



∗2 Indoor unit is under than outdoor unit.

OUTDOOR UNIT
AO∗A18-24L

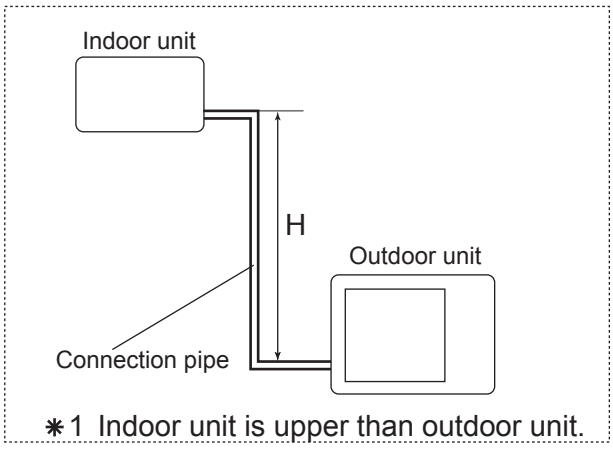
OUTDOOR UNIT
AO∗A18-24L

■MODEL : AO∗A24L

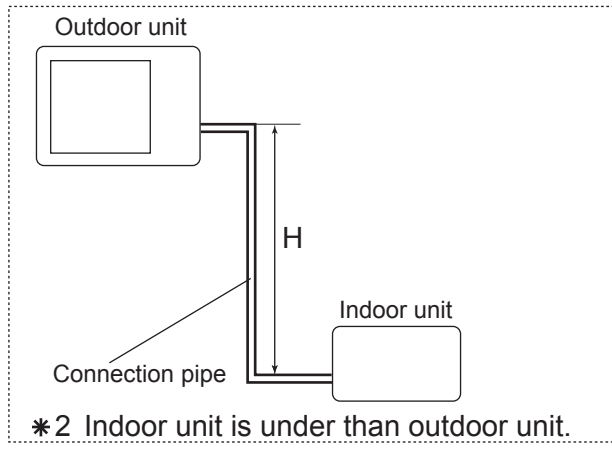
COOLING			Pipe length (m)						
			5	7.5	10	15	20	25	30
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	20	-	-	-	-	0.963	0.961	0.959
		10	-	-	0.984	0.981	0.979	0.977	0.975
		7.5	-	0.988	0.988	0.985	0.983	0.981	0.979
		5	0.992	0.992	0.992	0.989	0.987	0.985	0.983
		0	1.000	1.000	1.000	0.997	0.995	0.993	0.991
	∗2 Indoor unit is under than outdoor unit	-5	1.000	1.000	1.000	0.997	0.995	0.993	0.991
		-7.5	-	1.000	1.000	0.997	0.995	0.993	0.991
		-10	-	-	1.000	0.997	0.995	0.993	0.991
		-20	-	-	-	-	0.995	0.993	0.991

HEATING			Pipe length (m)						
			5	7.5	10	15	20	25	30
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	20	-	-	-	-	0.927	0.893	0.863
		10	-	-	0.992	0.952	0.927	0.893	0.863
		7.5	-	1.000	0.992	0.952	0.927	0.893	0.863
		5	1.001	1.000	0.992	0.952	0.927	0.893	0.863
		0	1.001	1.000	0.992	0.952	0.927	0.893	0.863
	∗2 Indoor unit is under than outdoor unit	-5	0.996	0.995	0.987	0.947	0.922	0.888	0.859
		-7.5	-	0.993	0.984	0.945	0.920	0.886	0.857
		-10	-	-	0.982	0.943	0.917	0.884	0.855
		-20	-	-	-	-	0.908	0.875	0.846

Height difference H



∗1 Indoor unit is upper than outdoor unit.



∗2 Indoor unit is under than outdoor unit.

6. ADDITIONAL CHARGE CALCULATION

■MODEL : AO*A18L

Refrigerant type		R410A
Refrigerant amount	g	1250

●REFRIGERANT CHARGE

Pipe length	m	～ 15	20	25	20g/m
Additional charge	g	0 (Chargeless)	+100	+200	

■MODEL : AO*A24L

Refrigerant type		R410A
Refrigerant amount	g	1700

●REFRIGERANT CHARGE

Pipe length	m	～ 15	20	25	30	20g/m
Additional charge	g	0 (Chargeless)	+100	+200	+300	

OUTDOOR UNIT
AO*A18-24L

7. AIR FLOW

■MODEL : AO*A18L

●COOLING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
860	m^3/h	2000
	l/s	556
	CFM	1177

●HEATING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
820	m^3/h	1910
	l/s	531
	CFM	1124

■MODEL : AO*A24L

●COOLING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
1050	m^3/h	2470
	l/s	686
	CFM	1454

●HEATING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
1050	m^3/h	2470
	l/s	686
	CFM	1454

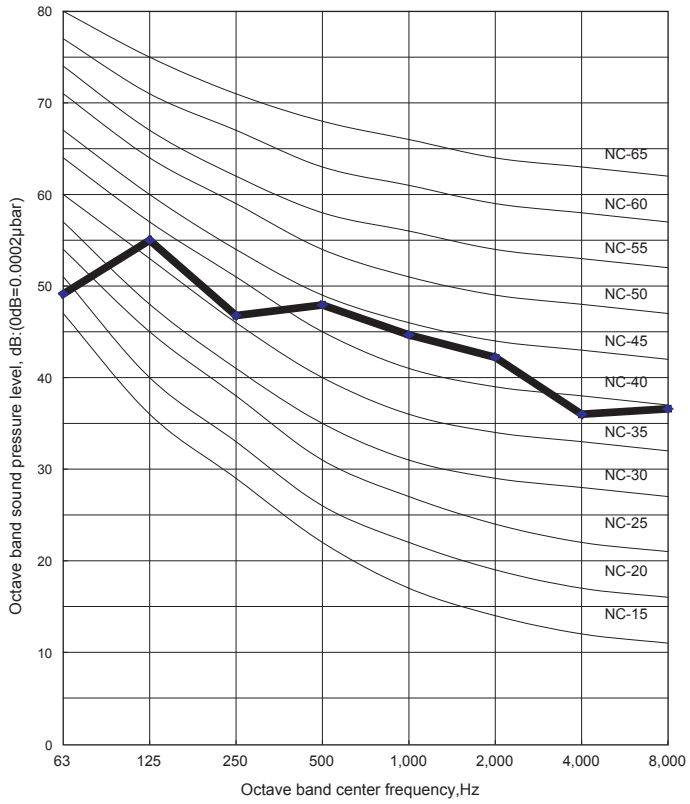
OUTDOOR UNIT
AO*A18-24L

8. OPERATION NOISE

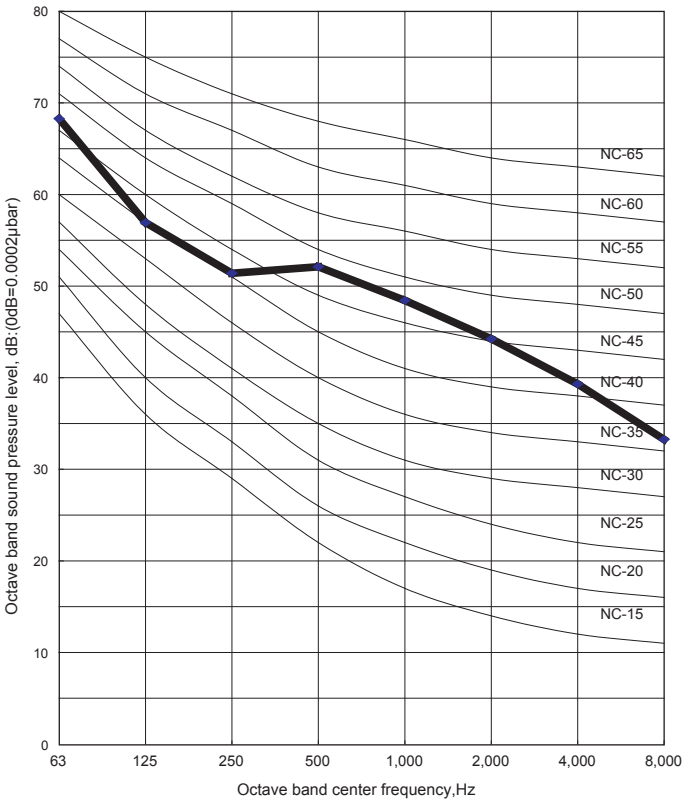
8-1. NOISE LEVEL CURVE

■COOLING

●MODEL : AO∗A18L

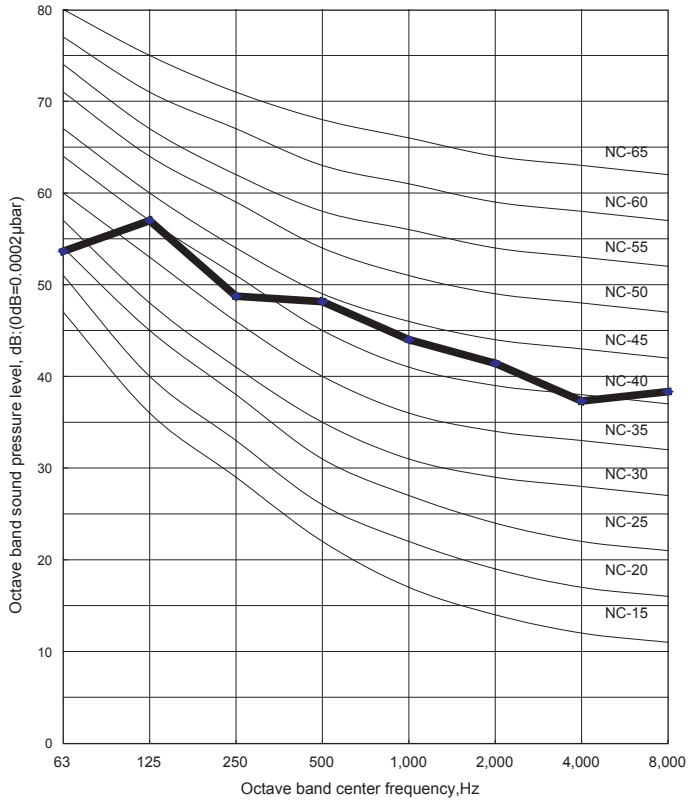


●MODEL : AO∗A24L

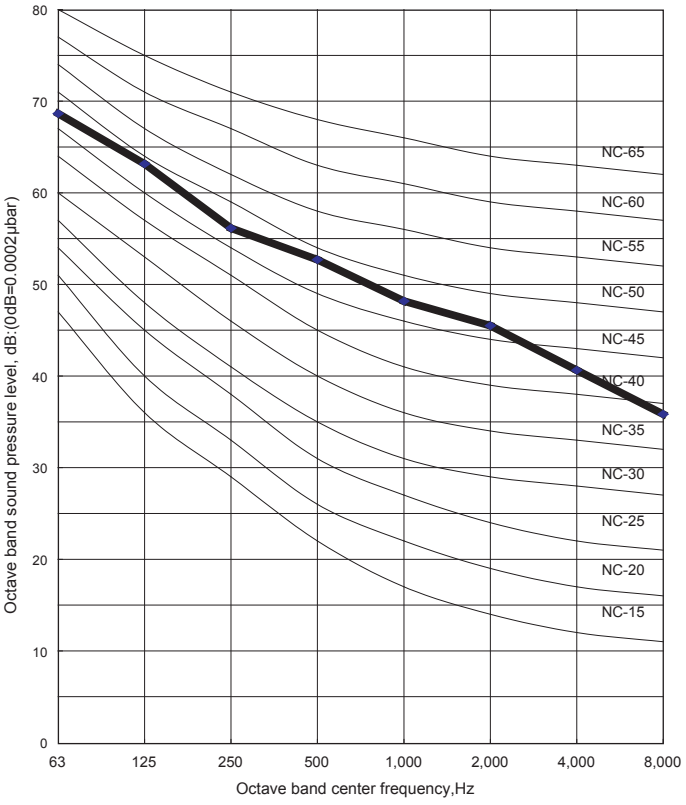


■HEATING

●MODEL : AO∗A18L

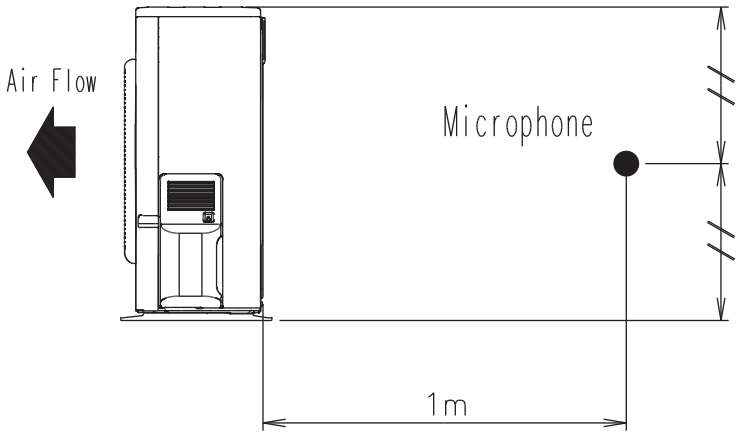


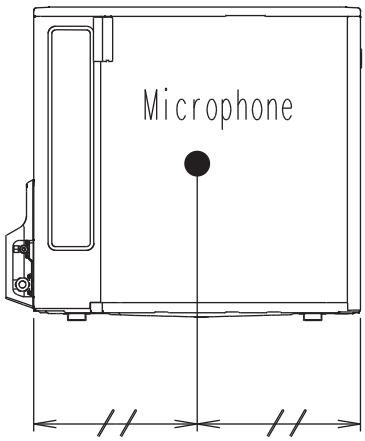
●MODEL : AO∗A24L



OUTDOOR UNIT
AO∗A18-24L

8-2. SOUND LEVEL CHECK POINT





OUTDOOR UNIT
AO*A18-24L

9. ELECTRIC CHARACTERISTICS

Model Name			AO ∗ A18L	AO ∗ A24L
Power Supply	Voltage	V	230～	
	Frequency	Hz	50	
Max Operating Current		A	15.0	16.2
Starting Current		A	7.7	10.0
*1) Wiring Spec.	Main Fuse (Circuit breaker) Current	A	20	20
	Power Cable	mm^2	3.5 - 4.5	
	*2)Limited wiring length	m	24	22

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

*2) 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	
		AO ∗ A18L	AO ∗ A24L
Circuit protection	Current fuse (NEAR THE TERMINAL)	20A 250V	
		5A 250V	
	Current fuse (MAIN PRINTED CIRCUIT BOARD)	15A 250V	
		3.15A 250V	
Fan motor protection	Thermal protection program	OFF:100^{+15}_{-10}°C ON:95^{+15}_{-10}°C	OFF:110^{+15}_{-10}°C ON:105^{+15}_{-10}°C
Compressor protection	Thermal protection program (COMPRESSOR TEMP.)	OFF:110°C ON: After 40 minutes	
	Thermal protection program (DISCHARGE TEMP.)	OFF:110°C ON: After 7 minutes	

OUTDOOR UNIT
AO∗A18-24L

Refrigerant
R410A

OUTDOOR UNIT

2. SINGLE TYPE :

AO＊B18LACL

AO＊B18LALL

AO＊B24LACL

AO＊B24LALL

D2D_AO021E/02
2008.04.08

1. SPECIFICATIONS

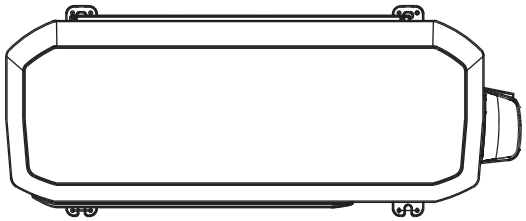
Type				INVERTER HEATPUMP	
Model name				AO*B18LACL AO*B18LALL	AO*B24LACL AO*B24LALL
Power source				230V ～ 50Hz	
Available voltage range				198-264V ～ 50Hz	
Starting current			A	7.7	10.0
Fan	Airflow rate	Cooling	m^3/h	2000	2470
		Heating		1910	2470
	Type × Q'ty			Propeller × 1	
	Motor output		W	54	65
Sound pressure level		Cooling	dB(A)	50	52
		Heating		50	53
Heat exchanger type		Dimensions (H × W × D)	mm	546 × 876 × 18.2 546 × 842 × 18.2	546 × 866 × 18.2 546 × 832 × 18.2 504 × 589 × 18.2
		Fin pitch		1.30	1.40
		Rows x Stages		2 × 26	2 × 26 1 × 24
		Pipe type		Copper	
		Fin type		Aluminium	
Compressor	Type × Q'ty			Twin Rotary × 1	
	Motor output		W	1100	
Refrigerant		Type		R410A	
		Charge	g	1250	1700
Refrigerant oil		Type		POE	
Enclosure		Material		Steel sheet	
		Colour		Beige (10YR7.5/1.0NN)	
Dimensions (H×W×D)	Net		mm	578 × 790 × 300	578 × 790 × 315
	Gross			648 × 910 × 380	
Weight	Net		kg(lb.)	40 (88)	44 (97)
	Gross			44 (97)	48 (106)
Connection pipe	Size	Liquid	mm	Φ 6.35 (Φ 1/4 in.)	
		Gas		Φ 12.70 (Φ 1/2 in.)	Φ 15.88 (Φ 5/8 in.)
	Method			Flare	
	Max. length		m	25(chargeless:15)	30(chargeless:15)
	Max. height difference			15	20
Operation range		Cooling	°C	-10 to 46	
		Heating		-15 to 24	

Note :
Specifications are based on the following conditions.
Cooling : Indoor temperature of 27°CDB/19°CWB. and outdoor temperature of 35°CDB/24°CWB.
Heating : Indoor temperature of 20°CDB/15°CWB. and outdoor temperature of 7°CDB/6°CWB.
Pipe length : 7.5 m, Height difference : 0 m. (Outdoor unit - Indoor unit)

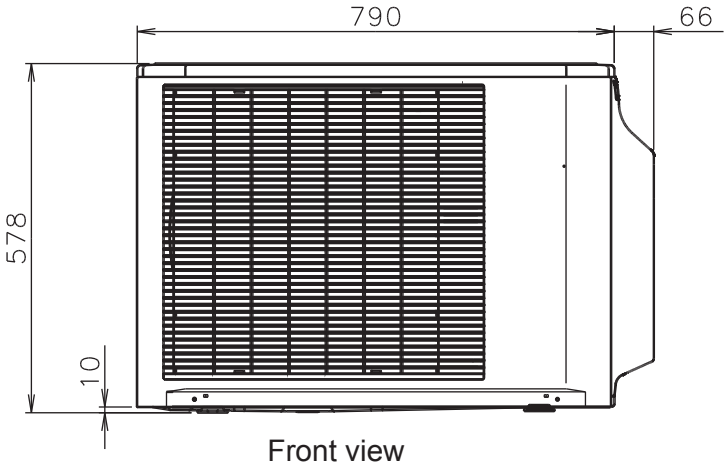
2. DIMENSIONS

■MODEL : AO∗B18L, AO∗B24L

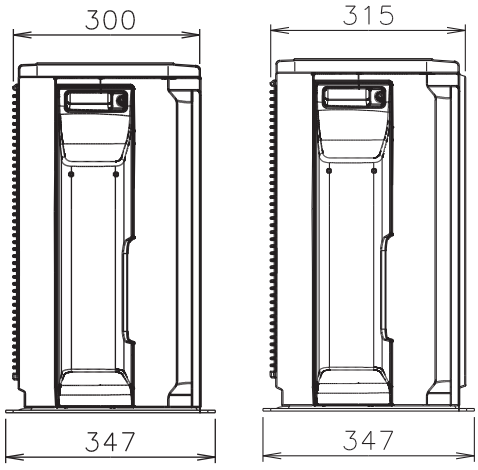
(Unit : mm)



Top view

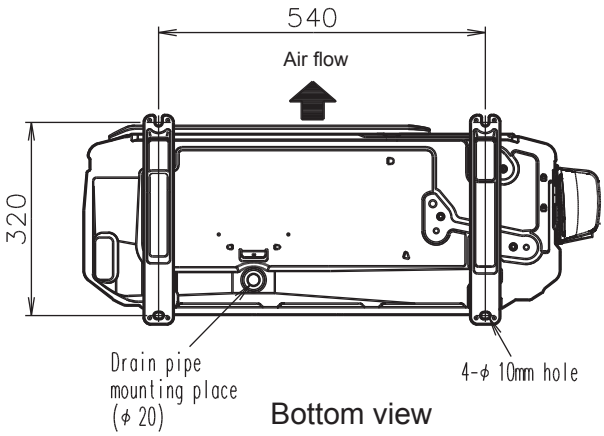


Front view

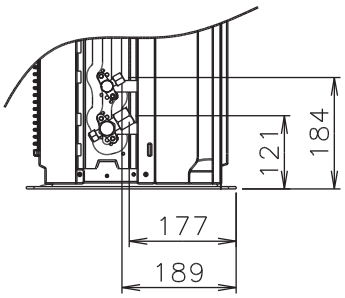


AO∗B18L AO∗B24L

Side view



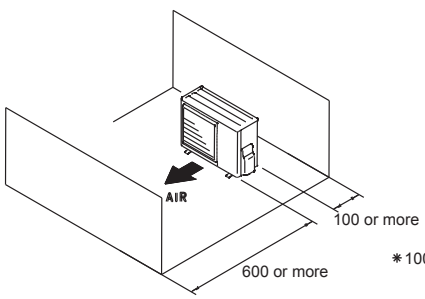
Bottom view



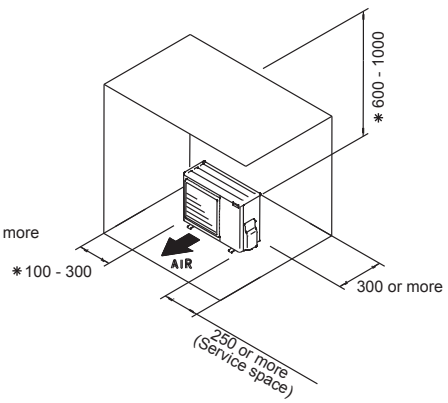
■MOUNTING POSITION

(Unit : mm)

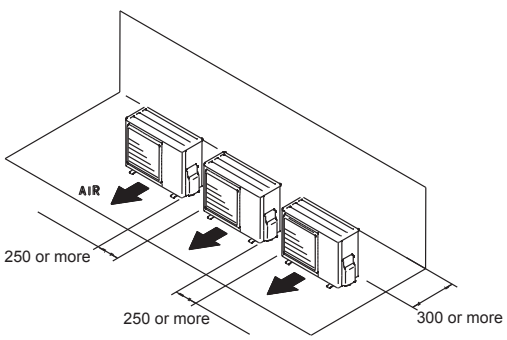
When there are obstacles at the back or front sides.



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

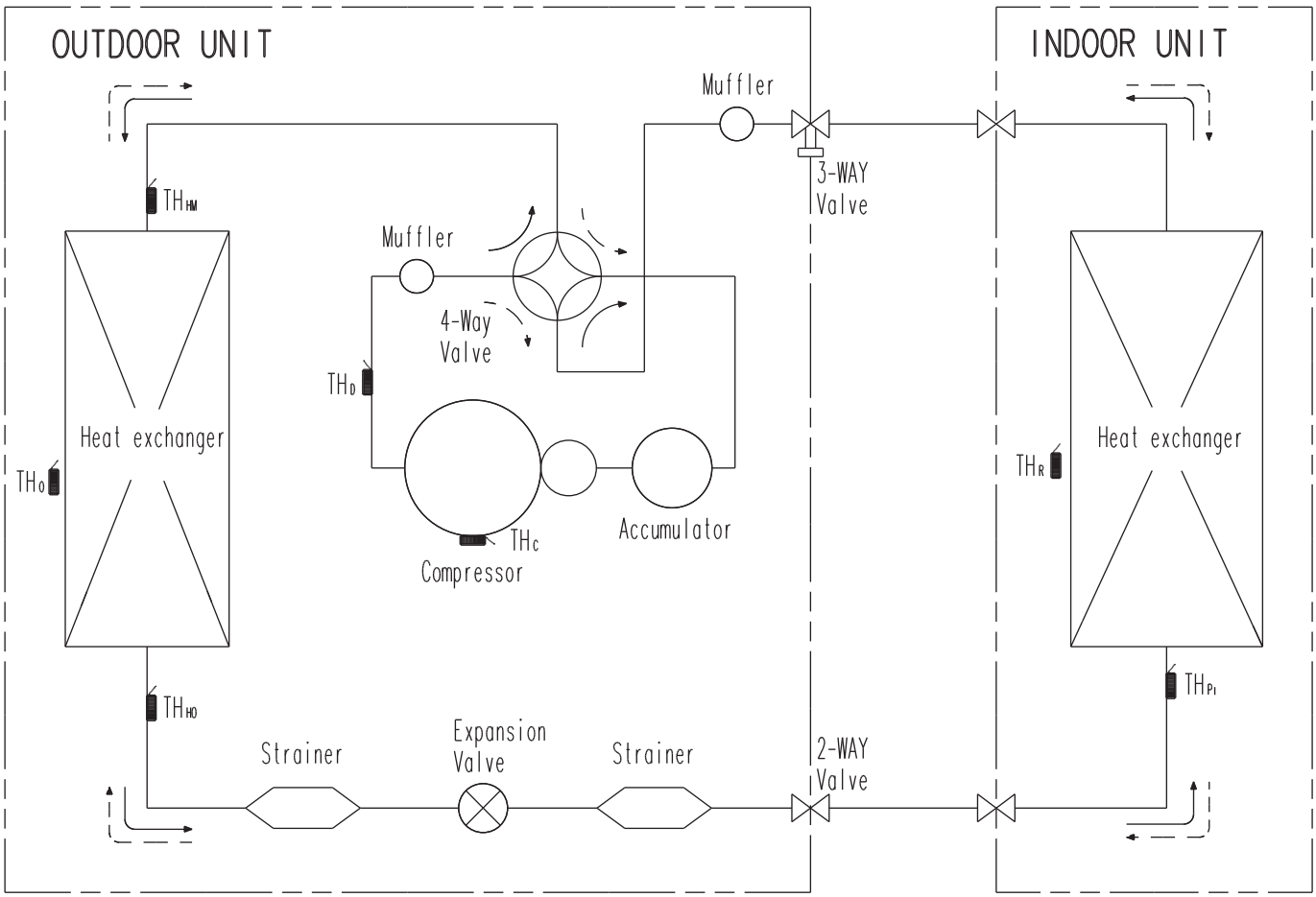


When there are obstacles at the back, side with the installation of more than one unit.



∗If the space is larger that is stated, the condition will be the same as that are no obstacles.

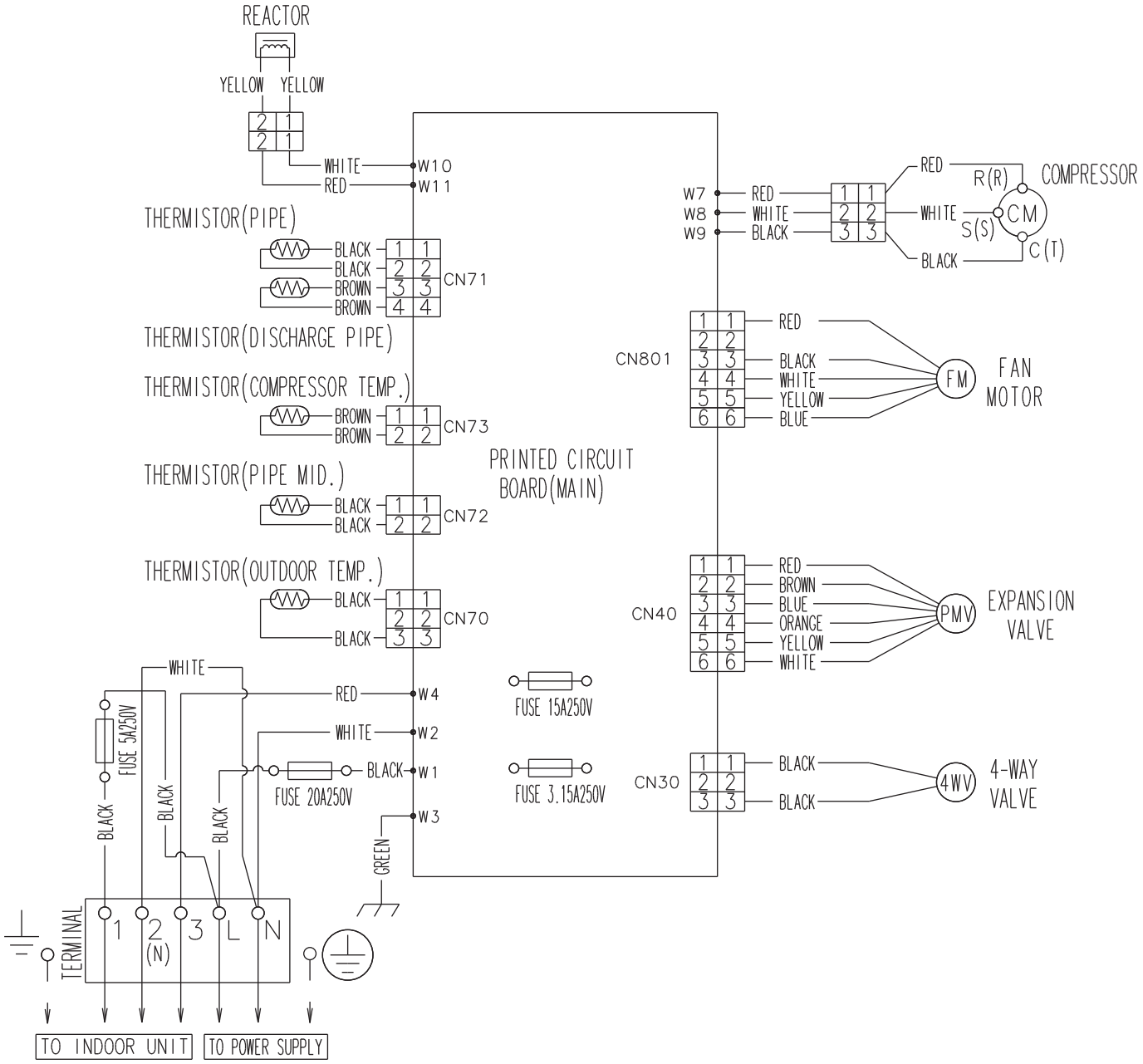
3. REFRIGERANT CIRCUIT



OUTDOOR UNIT
AO*B18-24L

4. WIRING DIAGRAMS

■MODEL : AO*B18L, AO*B24L



OUTDOOR UNIT
AO*B18-24L

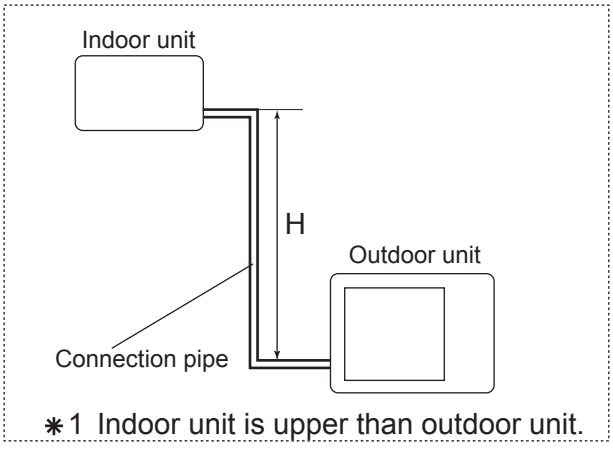
5. CAPACITY COMPENSATION RATE FOR PIPE LENGTH AND HEIGHT DIFFERENCE

■MODEL : AO∗B18L

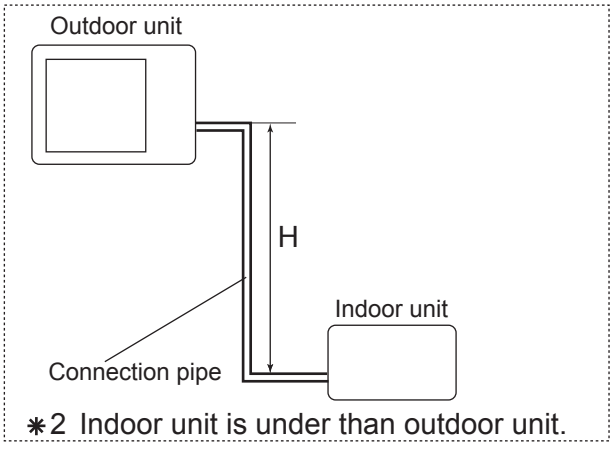
COOLING			Pipe length (m)					
			5	7.5	10	15	20	25
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	15	-	-	-	0.953	0.950	0.947
		10	-	-	0.983	0.968	0.966	0.962
		7.5	-	0.988	0.987	0.972	0.970	0.966
		5	0.992	0.992	0.991	0.976	0.974	0.970
		0	1.000	1.000	0.999	0.984	0.982	0.978
	∗2 Indoor unit is under than outdoor unit	-5	1.000	1.000	0.999	0.984	0.982	0.978
		-7.5	-	1.000	0.999	0.984	0.982	0.978
		-10	-	-	0.999	0.984	0.982	0.978
		-15	-	-	-	0.984	0.982	0.978

HEATING			Pipe length (m)					
			5	7.5	10	15	20	25
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	15	-	-	-	0.920	0.894	0.867
		10	-	-	0.982	0.920	0.894	0.867
		7.5	-	1.000	0.982	0.920	0.894	0.867
		5	0.993	1.000	0.982	0.920	0.894	0.867
		0	0.993	1.000	0.982	0.920	0.894	0.867
	∗2 Indoor unit is under than outdoor unit	-5	0.988	0.995	0.977	0.916	0.889	0.862
		-7.5	-	0.993	0.975	0.913	0.887	0.860
		-10	-	-	0.972	0.911	0.885	0.858
		-15	-	-	-	0.902	0.876	0.849

Height difference H



∗1 Indoor unit is upper than outdoor unit.



∗2 Indoor unit is under than outdoor unit.

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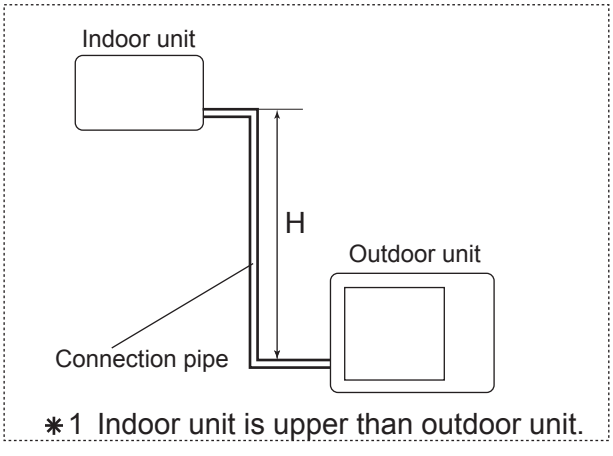
■MODEL : AO∗B24L

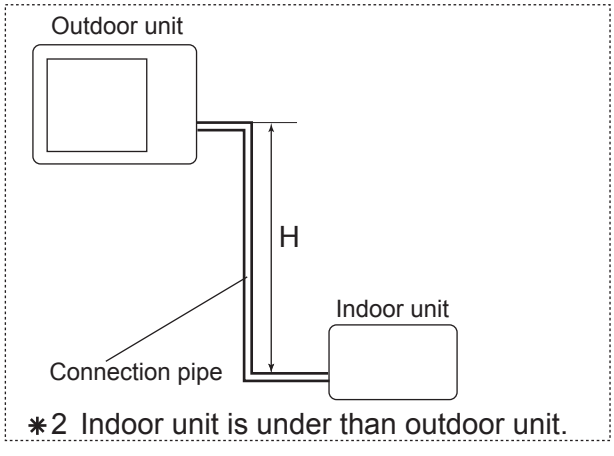
COOLING			Pipe length (m)						
			5	7.5	10	15	20	25	30
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	20	-	-	-	-	0.963	0.961	0.959
		10	-	-	0.984	0.981	0.979	0.977	0.975
		7.5	-	0.988	0.988	0.985	0.983	0.981	0.979
		5	0.992	0.992	0.992	0.989	0.987	0.985	0.983
		0	1.000	1.000	1.000	0.997	0.995	0.993	0.991
	∗2 Indoor unit is under than outdoor unit	-5	1.000	1.000	1.000	0.997	0.995	0.993	0.991
		-7.5	-	1.000	1.000	0.997	0.995	0.993	0.991
		-10	-	-	1.000	0.997	0.995	0.993	0.991
		-20	-	-	-	-	0.995	0.993	0.991

HEATING			Pipe length (m)						
			5	7.5	10	15	20	25	30
Height difference H (m)	∗1 Indoor unit is upper than outdoor unit.	20	-	-	-	-	0.927	0.893	0.863
		10	-	-	0.992	0.952	0.927	0.893	0.863
		7.5	-	1.000	0.992	0.952	0.927	0.893	0.863
		5	1.001	1.000	0.992	0.952	0.927	0.893	0.863
		0	1.001	1.000	0.992	0.952	0.927	0.893	0.863
	∗2 Indoor unit is under than outdoor unit	-5	0.996	0.995	0.987	0.947	0.922	0.888	0.859
		-7.5	-	0.993	0.984	0.945	0.920	0.886	0.857
		-10	-	-	0.982	0.943	0.917	0.884	0.855
		-20	-	-	-	-	0.908	0.875	0.846

Height difference H



∗1 Indoor unit is upper than outdoor unit.



∗2 Indoor unit is under than outdoor unit.

6. ADDITIONAL CHARGE CALCULATION

■MODEL : AO∗B18L

Refrigerant type		R410A
Refrigerant amount	g	1250

●REFRIGERANT CHARGE

Pipe length	m	～ 15	20	25	20g/m
Additional charge	g	0 (Chargeless)	+100	+200	

■MODEL : AO∗B24L

Refrigerant type		R410A
Refrigerant amount	g	1700

●REFRIGERANT CHARGE

Pipe length	m	～ 15	20	25	30	20g/m
Additional charge	g	0 (Chargeless)	+100	+200	+300	

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7. AIR FLOW

■MODEL : AO∗B18L

●COOLING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
860	m^3/h	2000
	l/s	556
	CFM	1177

●HEATING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
820	m^3/h	1910
	l/s	531
	CFM	1124

■MODEL : AO∗B24L

●COOLING

NUMBER OF ROTATIONS (r.p.m)	Airflow	
1050	m^3/h	2470
	l/s	686
	CFM	1454

●HEATING

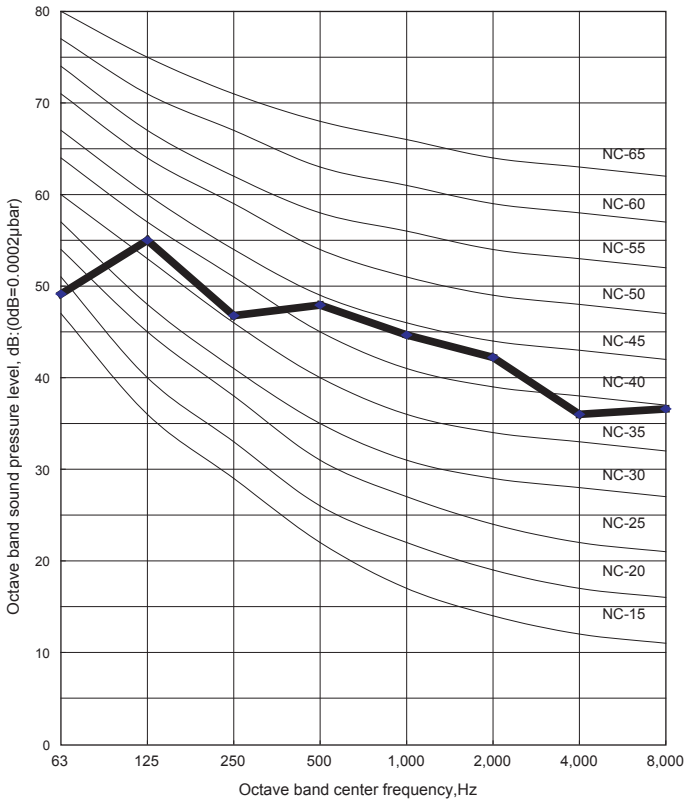
NUMBER OF ROTATIONS (r.p.m)	Airflow	
1050	m^3/h	2470
	l/s	686
	CFM	1454

8. OPERATION NOISE

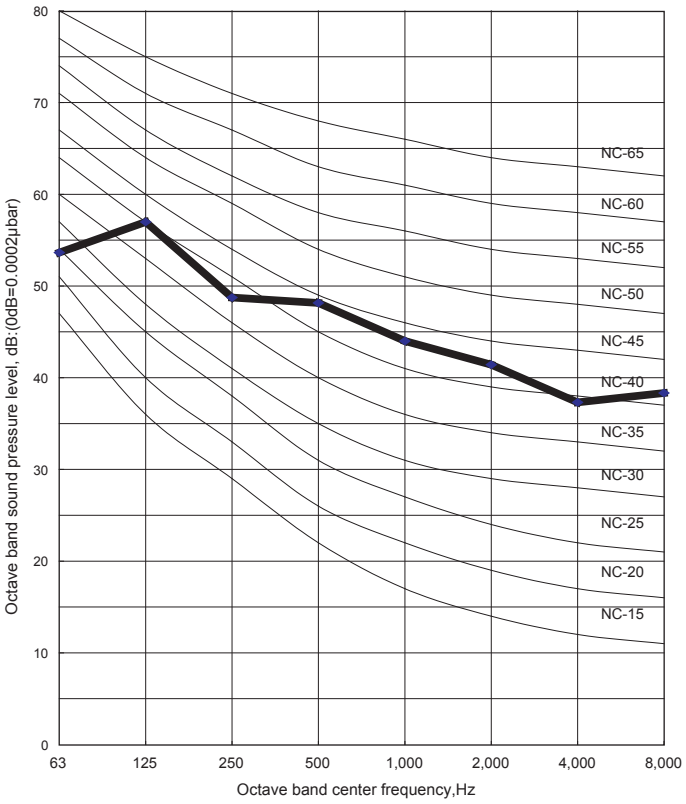
8-1. NOISE LEVEL CURVE

■MODEL : AO∗B18L

●COOLING

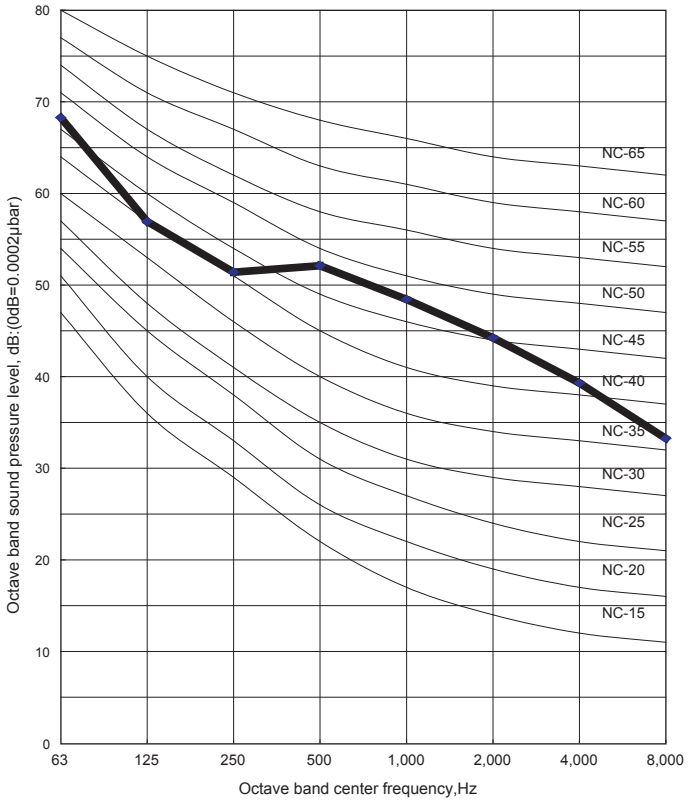


●HEATING

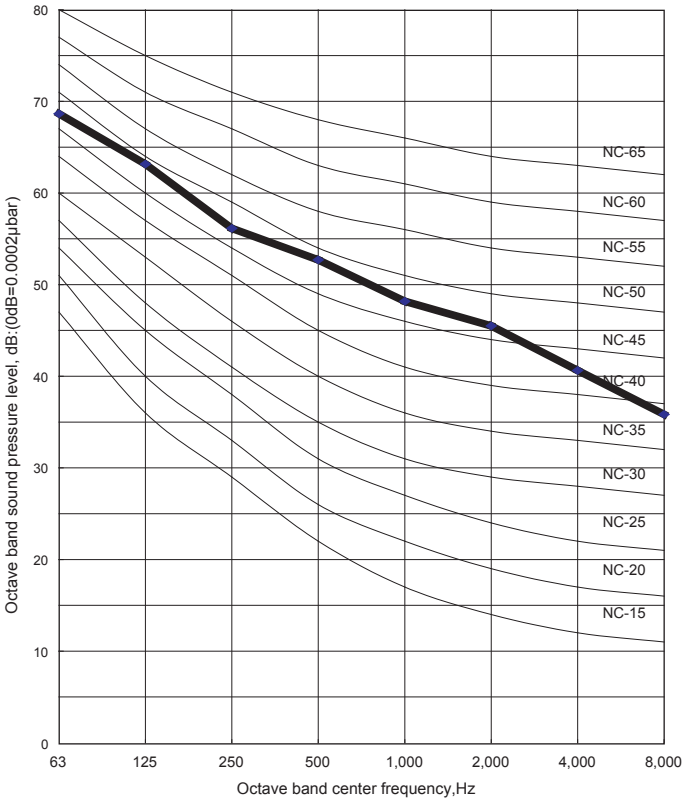


■MODEL : AO∗B24L

●COOLING



●HEATING



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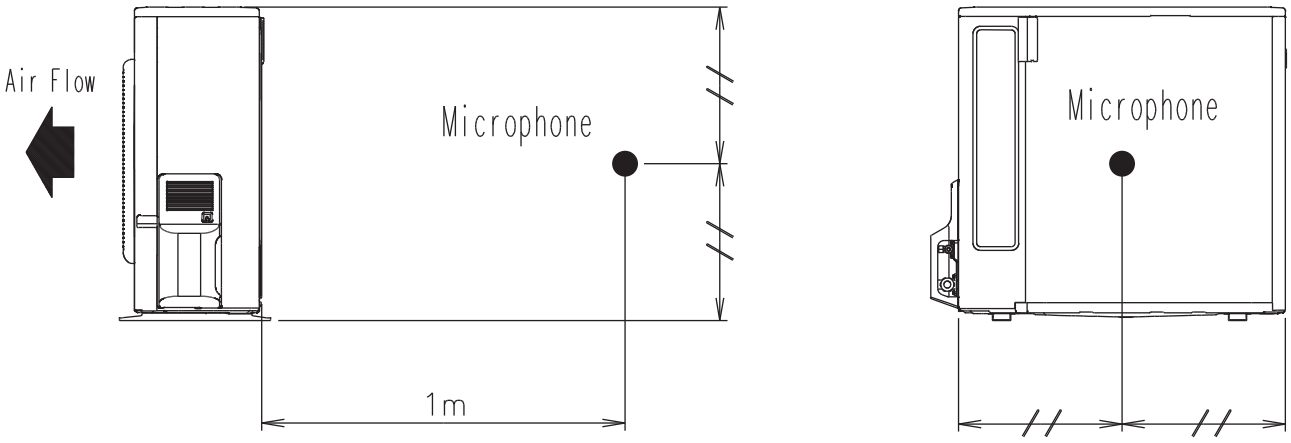
8-2. SOUND LEVEL CHECK POINT



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9. ELECTRIC CHARACTERISTICS

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Model name			AO＊B18L	AO＊B24L
Power supply	Voltage	V	230 ～	
	Frequency	Hz	50	
Max. operating current		A	15.0	16.2
Starting current		A	7.7	10.0
*1) Wiring spec.	Main fuse (Circuit breaker) current	A	20	20
	Power cable	mm^2	4.0	
	*2)Limited wiring length	m	24	22

*1) Wiring spec.
Selected sample
(Selected based on Japan Electrotechnical Standard and Codes Committee E0005)

*2) 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	
		AO∗B18L	AO∗B24L
Circuit protection	Current fuse (NEAR THE TERMINAL)	20A 250V	
		5A 250V	
	Current fuse (MAIN PRINTED CIRCUIT BOARD)	15A 250V	
		3.15A 250V	
Fan motor protection	Thermal protection program	OFF:100^{+15}_{-10}°C ON:95^{+15}_{-10}°C	OFF:110^{+15}_{-10}°C ON:105^{+15}_{-10}°C
Compressor protection	Thermal protection program (COMPRESSOR TEMP.)	OFF:110°C ON: After 40 minutes	
	Thermal protection program (DISCHARGE TEMP.)	OFF:110°C ON: After 7 minutes	

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