SPLIT TYPE
ROOM AIR CONDITIONER

DUCT type
INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AR*A12LATN	AO*A12LACL
	AR*A14LATN	AO*A14LACL
	AR*A18LATN	AO*A18LACL
	AR*A24LATN	AO*A24LACL
	AR*A36LATN	AO*A36LATL
	AR*A45LATN	AO*A45LATL

Refrigerant
R410A

FUJITSU GENERAL LIMITED

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Refrigerant
R410A

DUCT type
INVERTER

1 . SPECIFICATIONS

1. SPECIFICATIONS FOR INDOOR UNIT

Type					DUCTED MODEL	
					INVERTER HEATPUMP	
Model name					AR＊A12LATN	AR＊A14LATN
Power source					230V～ 50Hz	
Available voltage range					198-264V ～ 50Hz	
European energy label				Cooling	A	A
				Heating	A	A
Capacity	Cooling	Rated		kW	3.5	4.3
				BTU/h	11950	14650
		Min.-Max.		kW	0.9 - 4.4	0.9 - 5.4
				BTU/h	3100 - 15000	3100 - 18400
	Heating	Rated		kW	4.1	5.0
				BTU/h	14000	17050
		Min.-Max.		kW	0.9 - 5.7	0.9 - 6.5
				BTU/h	3100 - 19400	3100 - 22100
Input power	Cooling	Rated		kW	1.05	1.33
		*Max.			1.73	2.07
	Heating	Rated			1.11	1.34
		*Max.			2.30	2.88
Current	Cooling	Rated		A	4.6	5.8
		*Max.			7.5	9.0
	Heating	Rated			4.9	5.9
		*Max.			10.0	12.5
EER		Cooling		kW/kW	3.33	3.21
COP		Heating			3.69	3.71
Moisture removal				l/h (pints/h)	1.3 (2.3)	1.5 (2.6)
Fan	Airflow rate	Cooling	High	m^3/h	720	820
			Med		630	720
			Low		560	610
			Quiet		480	550
		Heating	High		720	820
			Med		630	720
			Low		560	610
			Quiet		480	550
	Type × Q'ty				Sirocco × 2	
	Motor output			W	60	
Recommended static pressure				Pa	0 to 90	
Sound pressure level		Cooling	High	dB(A)	32	33
			Med		30	31
			Low		28	29
			Quiet		26	27
		Heating	High		32	33
			Med		30	31
			Low		28	29
			Quiet		26	27
Heat exchanger type		Dimensions (H × W × D)		mm	294 × 700 × 26.6	294 × 700 × 39.9
		Fin pitch			1.30	1.30
		Rows x Stages			2 × 14	3 × 14
		Pipe type			Copper	
		Fin type			Aluminium	
Enclosure		Material			Steel	
		Colour			-	-
Dimensions (H×W ×D)	Net			mm	217 × 953 × 595	
	Gross				324 × 1075 × 686	
Weight	Net			kg(lb.)	23 (51)	23 (51)
	Gross				27 (60)	27 (60)
Connection pipe	Size	Liquid		mm	ϕ 6.35 (ϕ 1 / 4 in.)	
		Gas			ϕ9.52 (ϕ 3 / 8 in.)	ϕ12.70 (ϕ 1 / 2 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				PS	
	Size			mm	Outer diameter : 26.0 / Inner diameter : 21.5	

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 : 0 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 port and measure.
*The maximum current and the maximum input value are the maximum values when operated within the operation (temperature) range.

Type					DUCTED MODEL
					INVERTER HEATPUMP
Model name					AR＊A18LATN
Power source					230V～ 50Hz
Available voltage range					198-264V ～ 50Hz
European energy label				Cooling	A
				Heating	A
Capacity	Cooling	Rated		kW	5.2
				BTU/h	17700
		Min-Max		kW	0.9 - 5.9
				BTU/h	3100 - 20100
	Heating	Rated		kW	6.0
				BTU/h	20500
		Min-Max		kW	0.9 - 7.5
				BTU/h	3100 - 25600
Input power	Cooling	Rated		kW	1.62
		Min-Max			0.09 - 1.80
	Heating	Rated			1.66
		Min-Max			0.09 - 2.46
Current	Cooling	Rated		A	7.1
		Max			9.0
	Heating	Rated			7.3
		Max			10.8
EER		Cooling		kW/kW	3.21
COP		Heating			3.61
Moisture removal				l/h (pints/h)	2.0 (3.5)
Fan	Airflow rate	Cooling	High	m^3/h	820
			Med		720
			Low		610
			Quiet		550
		Heating	High		820
			Med		720
			Low		610
			Quiet		550
	Type × Q'ty				Sirocco × 2
	Motor output			W	60
Recommended static pressure				Pa	0 to 90
Sound pressure level		Cooling	High	dB(A)	33
			Med		31
			Low		29
			Quiet		27
		Heating	High		33
			Med		31
			Low		29
			Quiet		27
Heat exchanger type		Dimensions (H × W × D)		mm	294 × 700 × 39.9
		Fin pich			1.30
		Rows x Stages			3 × 14
		Pipe type			Copper
		Fin type			Aluminium
Enclosure		Material			Steel
		Colour			-
Dimensions (H × W × D)	Net			mm	217 × 953 × 595
	Gross				324 × 1075 × 686
Weight	Net			kg(lb.)	23 (51)
	Gross				27 (60)
Connection pipe	Size	Liquid		mm	ϕ 6.35 (ϕ 1 / 4 in.)
		Gas			ϕ12.70 (ϕ 1 / 2 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				PS
	Size			mm	Outer diameter: 26.0 / Inner diameter: 21.5

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 : 0 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.

Type					DUCTED MODEL
					INVERTER HEATPUMP
Model name					AR＊A24LATN
Power source					230V～ 50Hz
Available voltage range					198-264V ～ 50Hz
European energy label				Cooling	A
				Heating	A
Capacity	Cooling	Rated		kW	7.1
				BTU/h	24200
		Min-Max		kW	0.9 - 8.0
				BTU/h	3100 - 27300
	Heating	Rated		kW	8.0
				BTU/h	27300
		Min-Max		kW	0.9 - 9.1
				BTU/h	3100 - 31000
Input power	Cooling	Rated		kW	2.21
		Min-Max			0.09 - 2.62
	Heating	Rated			2.21
		Min-Max			0.09 - 2.77
Current	Cooling	Rated		A	9.7
		Max			11.5
	Heating	Rated			9.7
		Max			12.2
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 pich			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.

Type					DUCTED MODEL	
					INVERTER HEATPUMP	
Model name					AR＊A36LATN	AR＊A45LATN
Power source					230V～ 50Hz	
Available voltage range					198-264V ～ 50Hz	
European energy label				Cooling	A	A
				Heating	A	A
Capacity	Cooling	Rated		kW	10.0	12.5
				BTU/h	34100	42700
		Min.-Max.		kW	3.8 - 11.2	4.0 - 14.0
				BTU/h	13000 - 38200	13700 - 47800
	Heating	Rated		kW	11.2	14.0
				BTU/h	38200	47800
		Min.-Max.		kW	4.0 - 14.0	4.2 - 16.2
				BTU/h	13700 - 47800	14300 - 55300
Input power	Cooling	Rated		kW	3.11	3.89
		*Max.			4.33	4.56
	Heating	Rated			3.02	3.77
		*Max.			4.33	4.56
Current	Cooling	Rated		A	13.6	17.0
		*Max.			19.0	20.0
	Heating	Rated			13.2	16.5
		*Max.			19.0	20.0
EER		Cooling		kW/kW	3.21	3.21
COP		Heating			3.71	3.71
Moisture removal				l/h (pints/h)	3.0 (5.3)	3.5 (6.2)
Fan	Airflow rate	Cooling	High	m^3/h	2020	2250
			Med		1710	1710
			Low		1340	1340
			Quiet		1020	1020
		Heating	High		2020	2250
			Med		1710	1710
			Low		1340	1340
			Quiet		1020	1020
	Type × Q'ty				Sirocco × 2	Sirocco × 2
	Motor output			W	197	197
Recommended static pressure				Pa	30 to 150	30 to 150
Sound pressure level		Cooling	High	dB(A)	42	44
			Med		37	38
			Low		32	33
			Quiet		29	29
		Heating	High		42	44
			Med		37	38
			Low		32	33
			Quiet		29	29
Heat exchanger type		Dimensions (H × W × D)		mm	294 × 1000 × 53.2	294 × 1000 × 53.2
		Fin pitch			1.40	1.40
		Rows x Stages			4 × 14	4 × 14
		Pipe type			Copper	Copper
		Fin type			Aluminium	Aluminium
Enclosure		Material			Steel	Steel
		Colour			-	-
Dimensions (H × W × D)	Net			mm	270 × 1135 × 700	270 × 1135 × 700
	Gross				300 × 1300 × 790	300 × 1300 × 790
Weight	Net			kg(lb.)	41 (90)	41 (90)
	Gross				48 (106)	48 (106)
Connection pipe	Size	Liquid		mm	ϕ 9.52 (ϕ 3 / 8 in.)	ϕ 9.52 (ϕ 3 / 8 in.)
		Gas			ϕ15.88 (ϕ 5 / 8 in.)	ϕ15.88 (ϕ 5 / 8 in.)
	Method				Flare	Flare
Operation range		Cooling		°C	18 to 32	18 to 32
				%RH	80 or less	80 or less
		Heating		°C	30 or less	30 or less
Remote controller type					Wired	Wired
Drain pipe	Material				Steel	Steel
	Size			mm	Outer diameter : 38.0 / Inner diameter : 36.0	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 : 30Pa
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 (temperature) range.

2. SPECIFICATIONS FOR OUTDOOR UNIT

Type					INVERTER HEATPUMP	
Model name					AO＊A12LACL	AO＊A14LACL
Power source					230V～ 50Hz	
Available voltage range					198-264V～ 50Hz	
Starting current				A	4.9	5.9
Fan	Airflow rate	Cooling		m^3/h	1780	1910
		Heating			1630	1740
	Type × Q'ty				Propeller × 1	
	Motor output			W	54	
Sound pressure level		Cooling		dB(A)	47	49
		Heating			48	49
Heat exchanger type		Dimensions (H × W × D)		mm	546 × 876 × 18.2 546 × 842 × 18.2	
		Fin pitch			1.30	
		Rows x Stages			2 × 26	
		Pipe type			Copper	
		Fin type			Aluminium	
Compressor	Type × Q'ty				Twin Rotary × 1	
	Motor output			W	1100	
Refrigerant		Type			R410A	
		Charge		g	1150	1250
Refrigerant oil		Type			POE	
Enclosure		Material			Steel sheet	
		Colour			Beige (10YR7.5/1.0NN)	
Dimensions (H × W × D)	Net			mm	578 × 790 × 300	
	Gross				648 × 910 × 380	
Weight	Net			kg(lb.)	40 (88)	40 (88)
	Gross				44 (97)	44 (97)
Connection pipe	Size	Liquid		mm	ϕ6.35 (ϕ1/4 in.)	
		Gas			ϕ9.52 (ϕ3/8 in.)	ϕ12.70 (ϕ1/2 in.)
	Method				Flare	
	Max. length			m	25 (chargeless : 15)	
	Max. height difference				15	
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)

Type				INVERTER HEATPUMP	
Model name				AO＊A18LACL	AO＊A24LACL
Power source				230V～ 50Hz	
Available voltage range				198-264V～ 50Hz	
Starting currente			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 pich		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	ϕ6.35 (ϕ1/4 in.)	
		Gas		ϕ12.70 (ϕ 1/2 in.)	ϕ15.88(ϕ5/8 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)

Type				INVERTER HEATPUMP	
Model name				AO＊A36LATL	AO＊A45LATL
Power source				230V～ 50Hz	
Available voltage range				198-264V～ 50Hz	
Starting current			A	15.0	15.0
Fan	Airflow rate	Cooling	m^3/h	6600	6600
		Heating		6600	6600
	Type × Q'ty			Propeller × 2	
	Motor output		W	103 × 2	103 × 2
Sound pressure level		Cooling	dB(A)	54	55
		Heating		55	56
Heat exchanger type		Dimensions (H × W × D)	mm	1260 × 900 × 36.4	1260 × 900 × 36.4
		Fin pitch		1.30	1.30
		Rows x Stages		2 × 60	2 × 60
		Pipe type		Copper	
		Fin type		Aluminium	
Compressor	Type × Q'ty			Twin Rotary × 1	
	Motor output		W	3750	
Refrigerant		Type		R410A	
		Charge	g	3350	
Refrigerant oil		Type		POE	
Enclosure		Material		Steel sheet	
		Colour		Beige (10YR7.5/1.0NN)	
Dimensions (H × W × D)	Net		mm	1290 × 900 × 330	
	Gross			1430 × 1050 × 445	
Weight	Net		kg(lb.)	98 (216)	
	Gross			107 (236)	
Connection pipe	Size	Liquid	mm	ϕ9.52 (ϕ3/8 in.)	
		Gas		ϕ15.88 (ϕ5/8 in.)	
	Method			Flare	
	Max. length		m	50 (chargeless : 20)	50 (chargeless : 20)
	Max. height difference			30	30
Operation range		Cooling	°C	-15 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)

Refrigerant
R410A

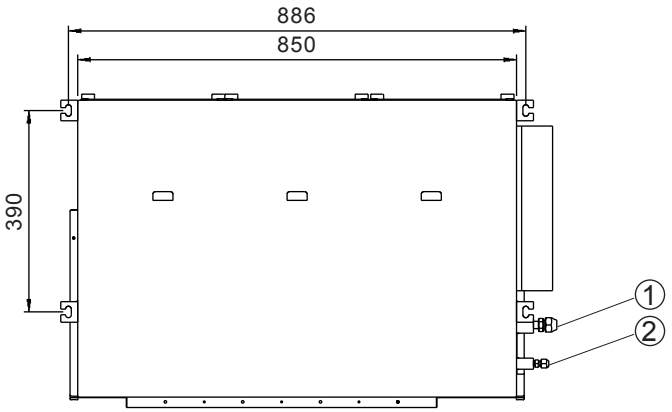
DUCT type
INVERTER

2 . DIMENSIONS

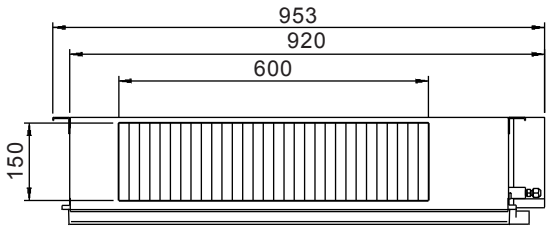
2. DIMENSIONS

■ MODEL : AR*A12LATN / AO*A12LACL
AR*A14LATN / AO*A14LACL

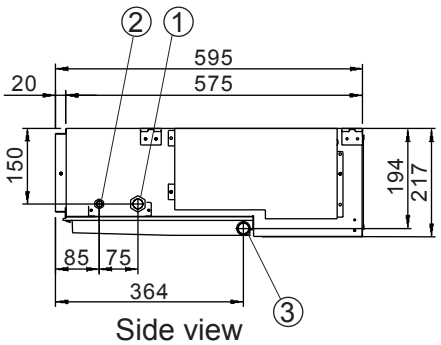
(Unit : mm)



Top view



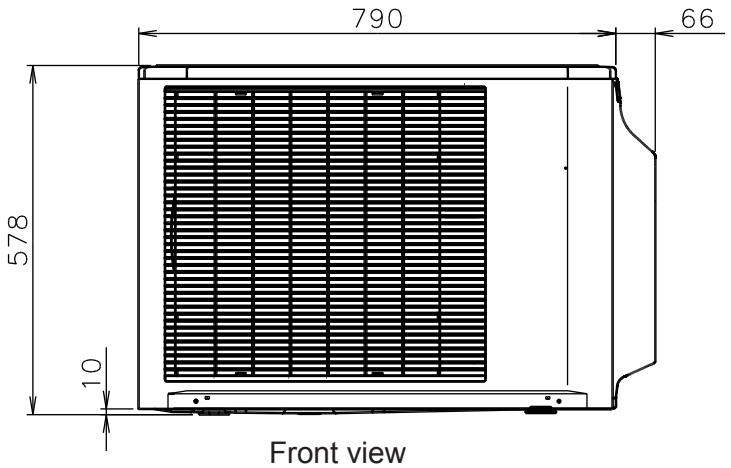
Front view



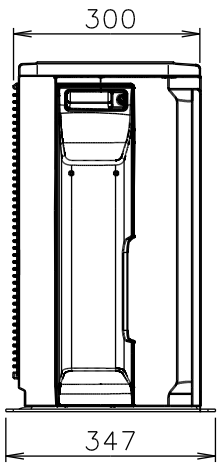
Side view

① Refrigerant piping flare connection (Gas)
② Refrigerant piping flare connection (Liquid)
③ Drain piping connection

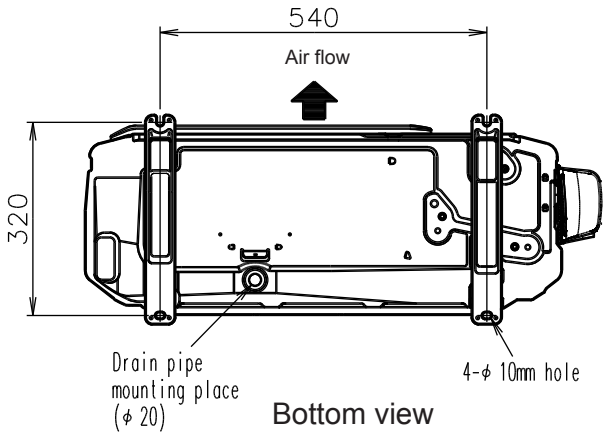
(Unit : mm)



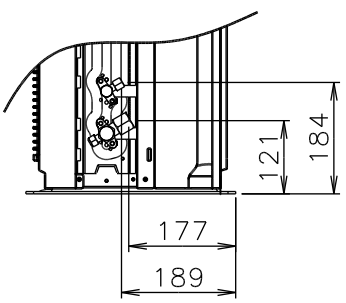
Front view



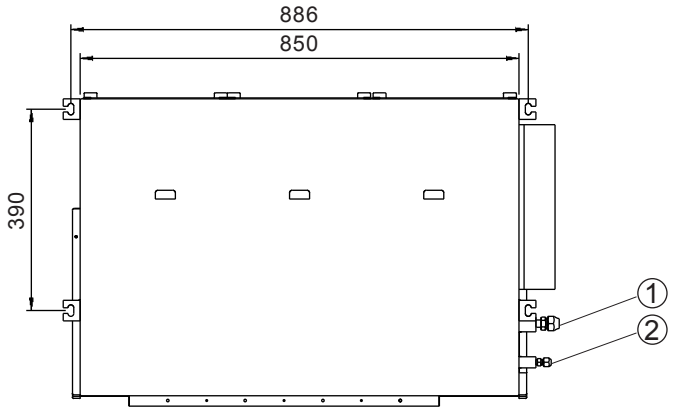
Side view



Bottom view

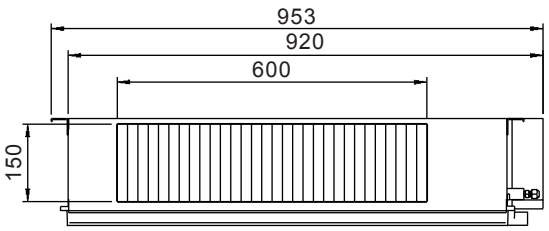


■ MODEL : AR*A18LATN / AO*A18LACL

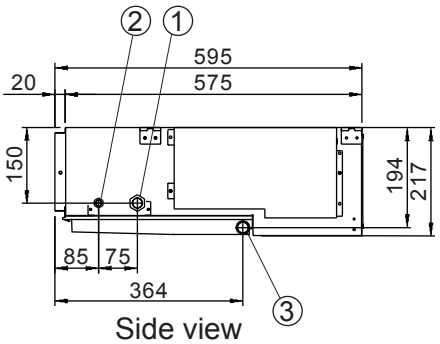


Top view

(Unit : mm)

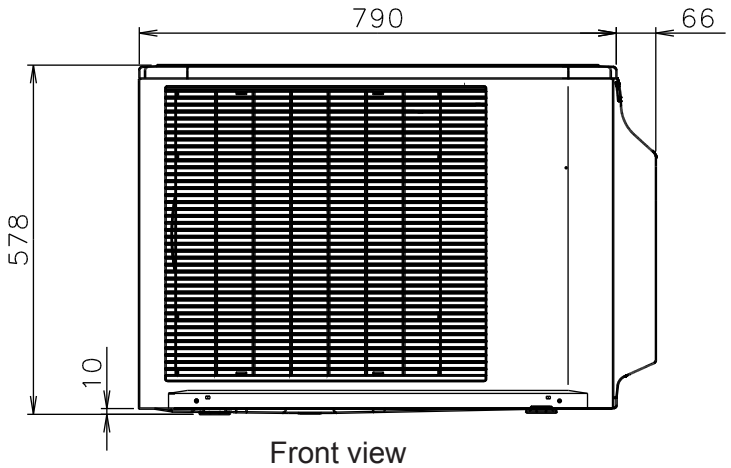


Front view

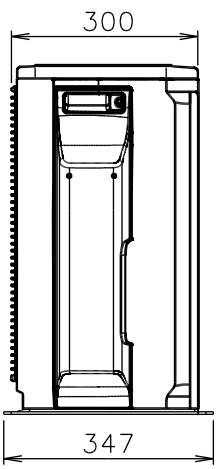


Side view

① Refrigerant piping flare connection (Gas)
② Refrigerant piping flare connection (Liquid)
③ Drain piping connection

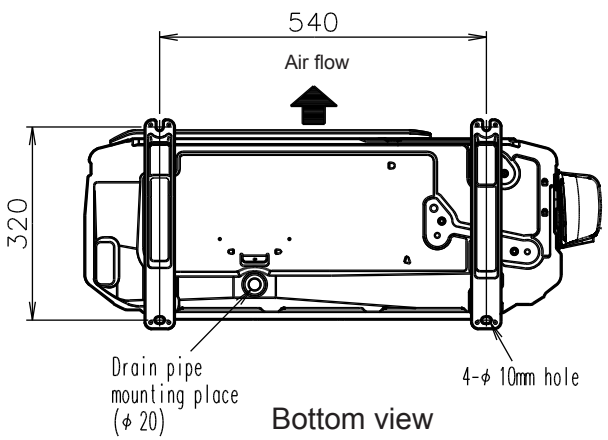


Front view

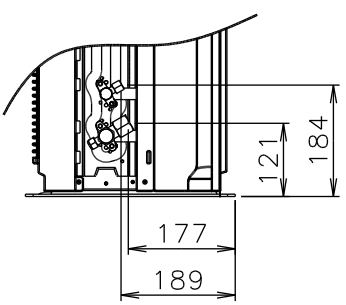


Side view

(Unit : mm)

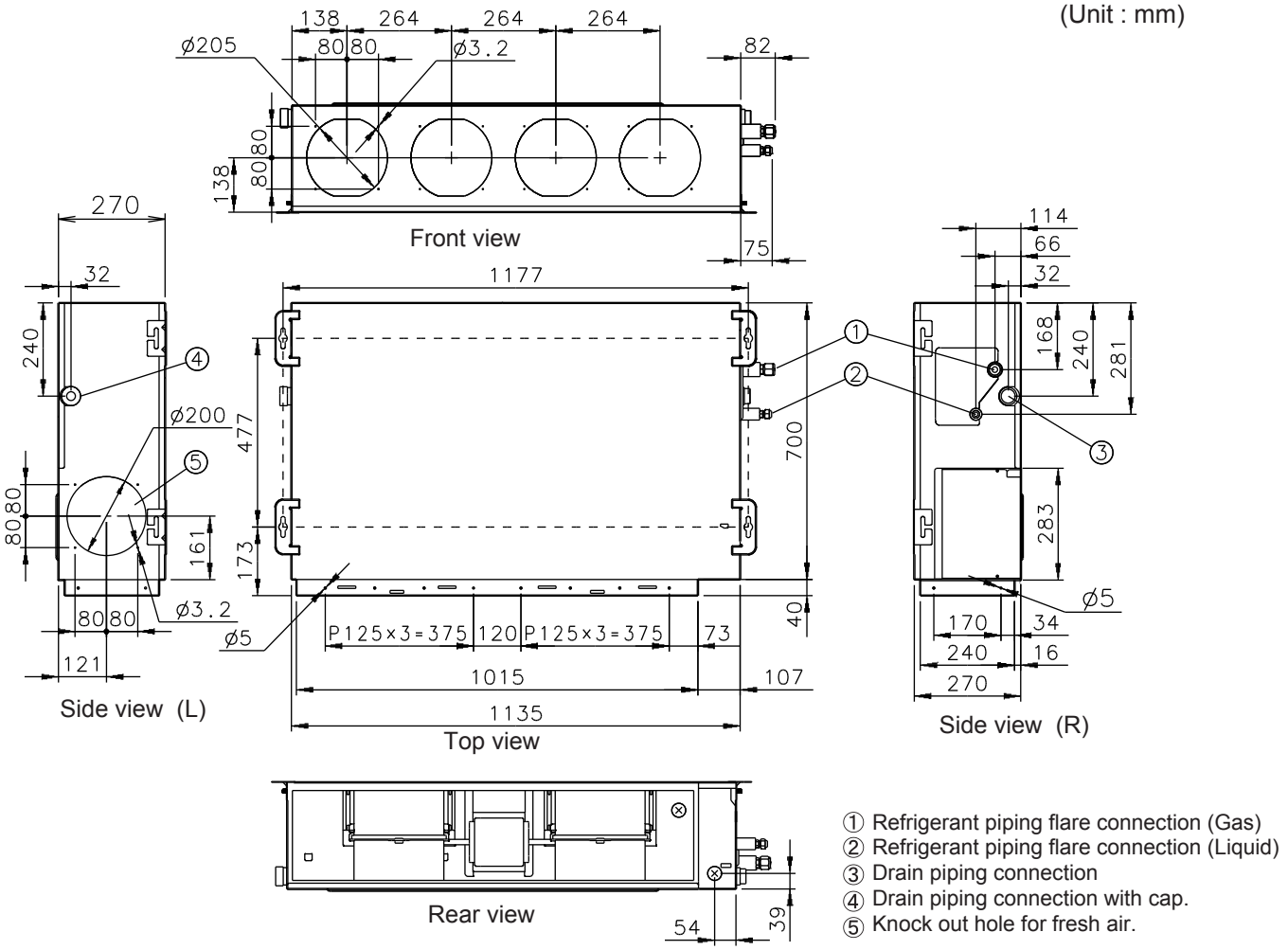


Bottom view



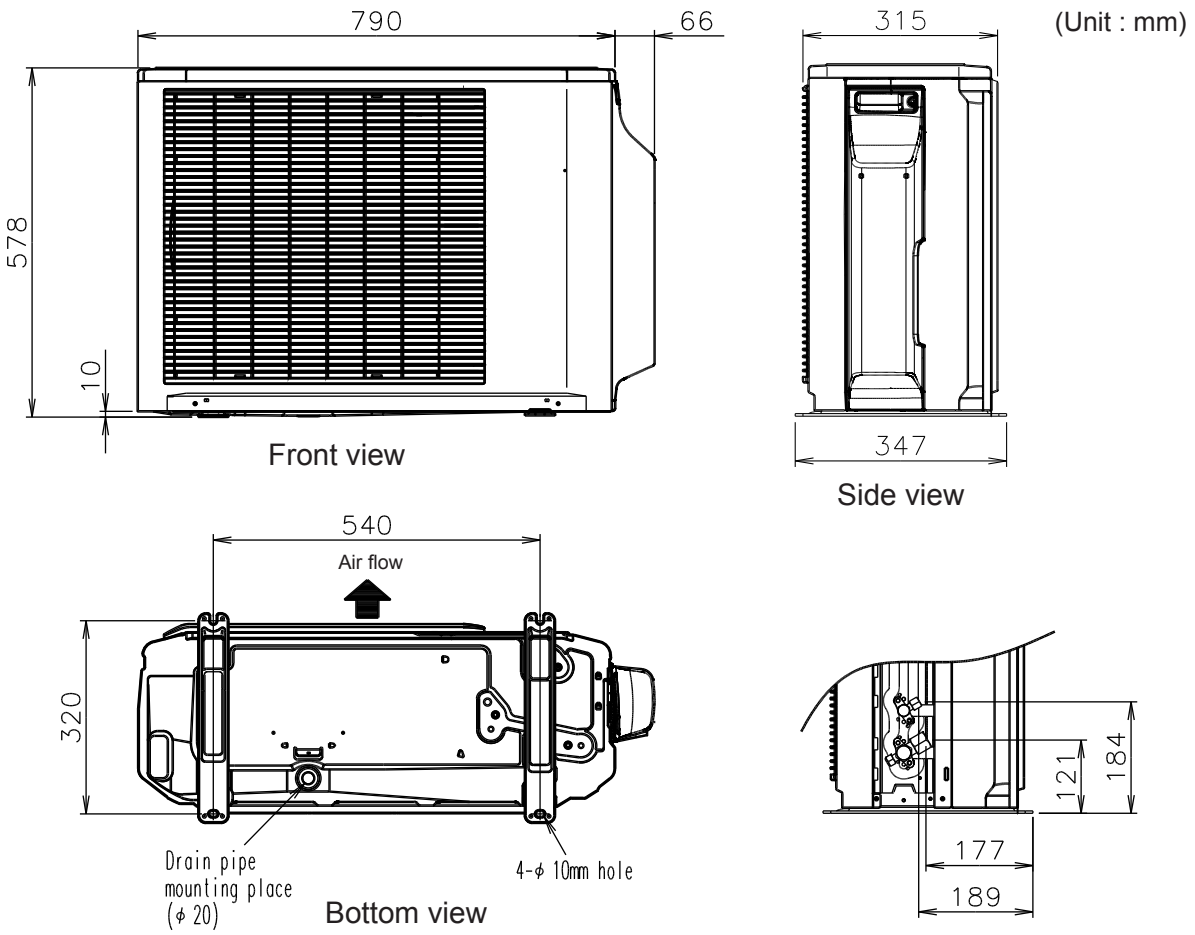
■ MODEL : AR*A24LATN / AO*A24LACL

(Unit : mm)



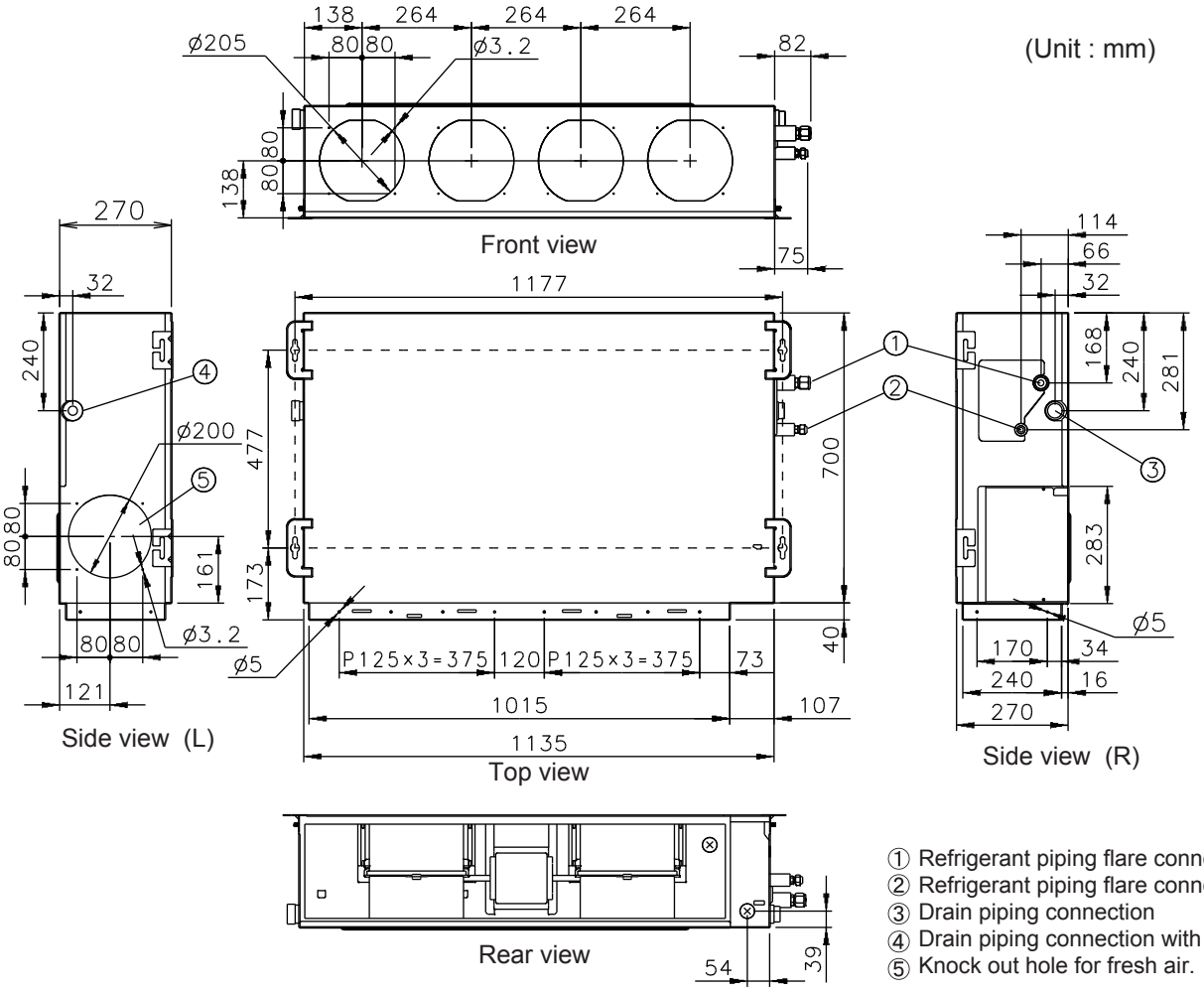
① Refrigerant piping flare connection (Gas)
② Refrigerant piping flare connection (Liquid)
③ Drain piping connection
④ Drain piping connection with cap.
⑤ Knock out hole for fresh air.

(Unit : mm)



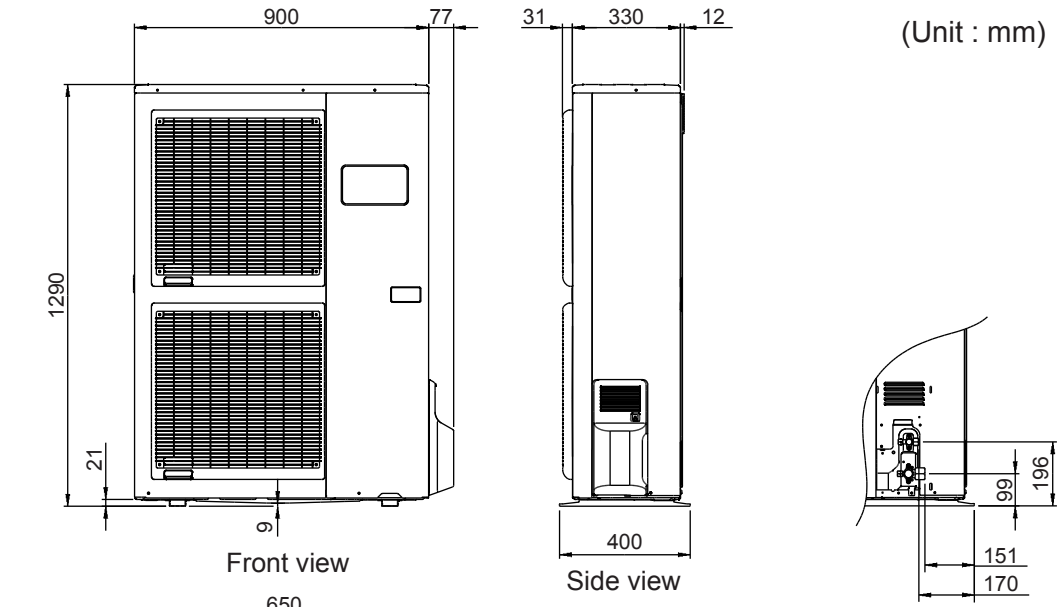
■ MODEL : AR*A36LATN / AO*A36LATL
AR*A45LATN / AO*A45LATL

(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.

(Unit : mm)



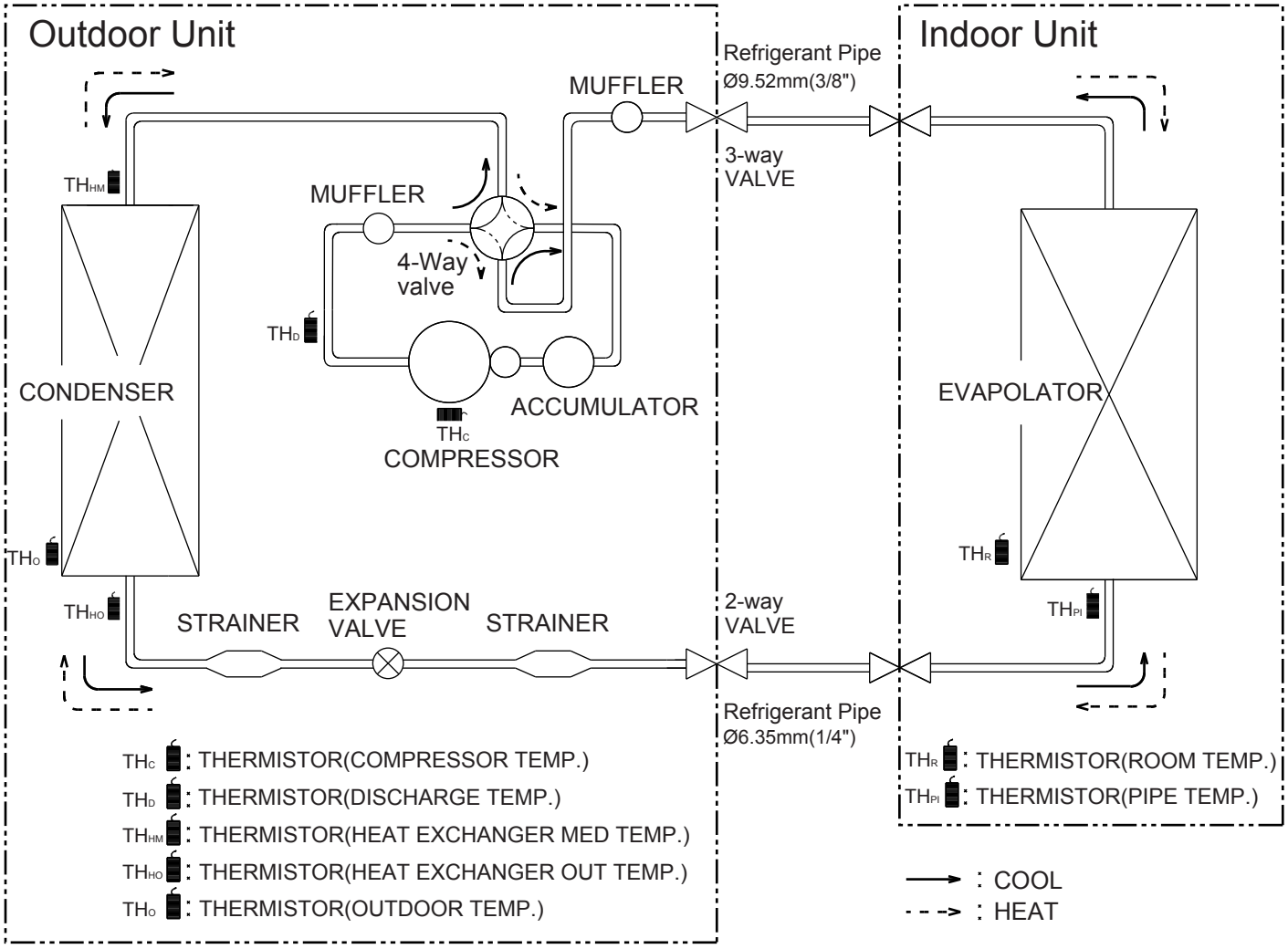
Refrigerant
R410A

DUCT type
INVERTER

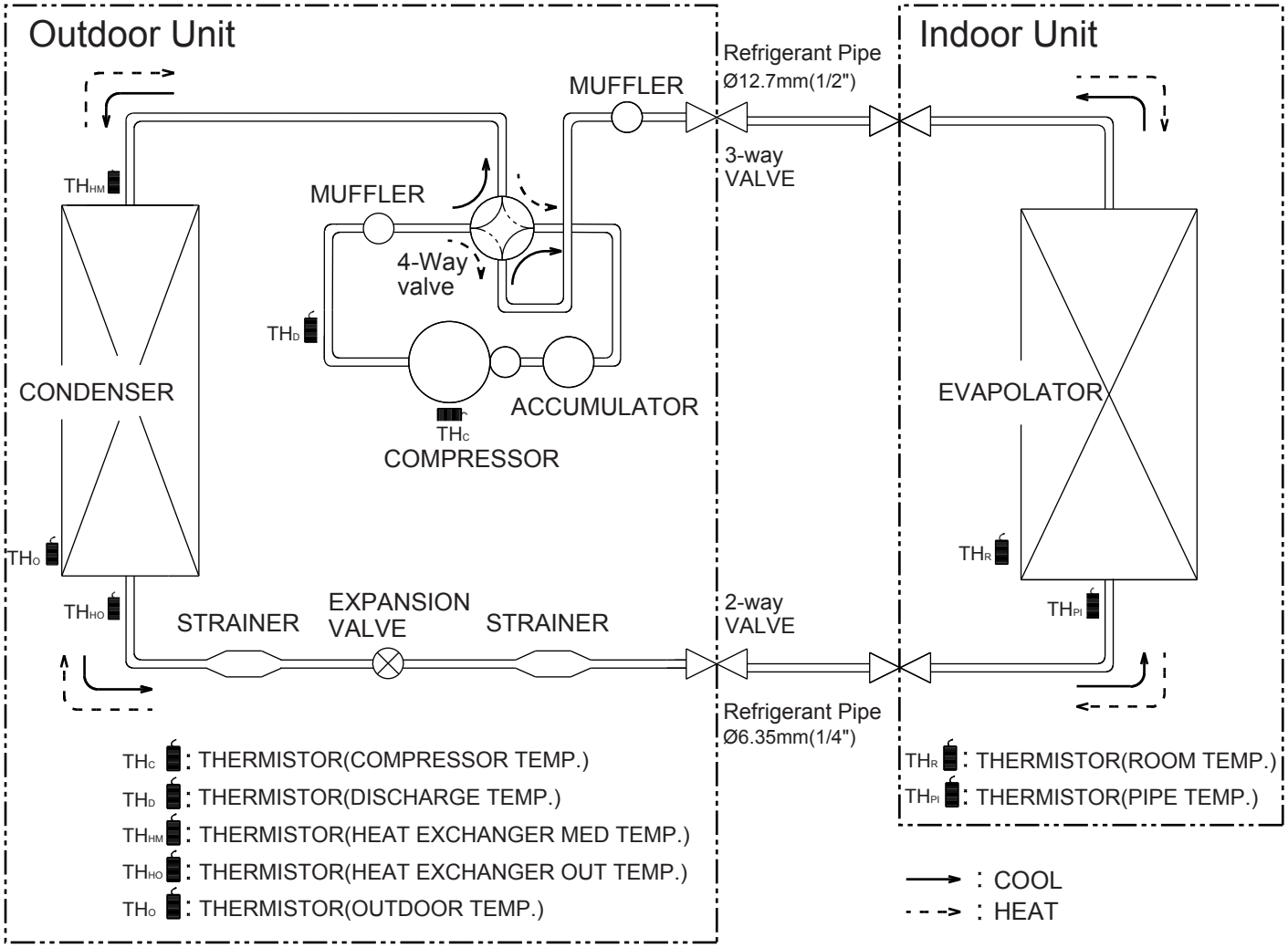
3 . REFRIGERANT SYSTEM DIAGRAM

3. REFRIGERANT CIRCUIT

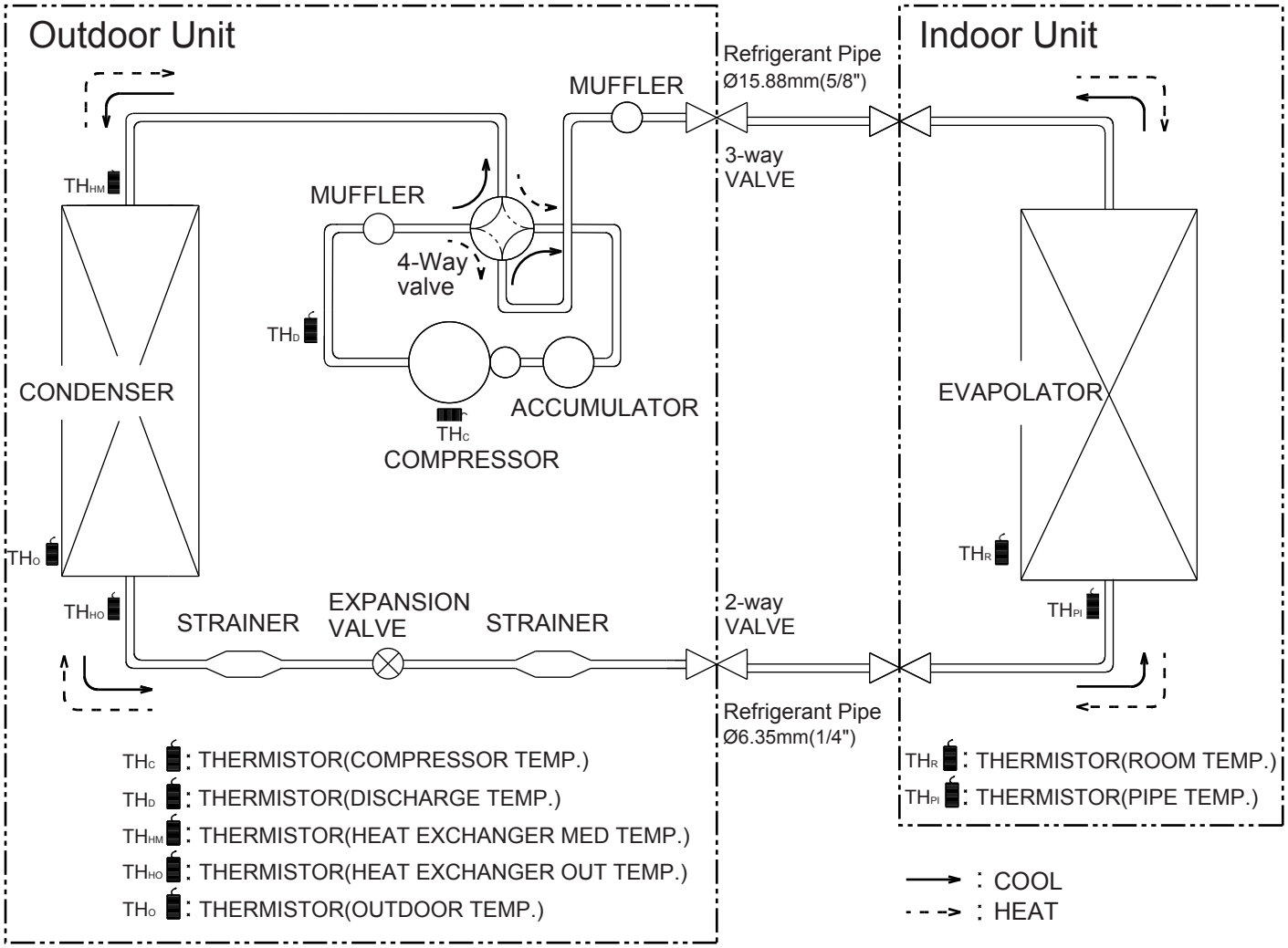
■ MODEL : AR*A12LATN / AO*A12LACL



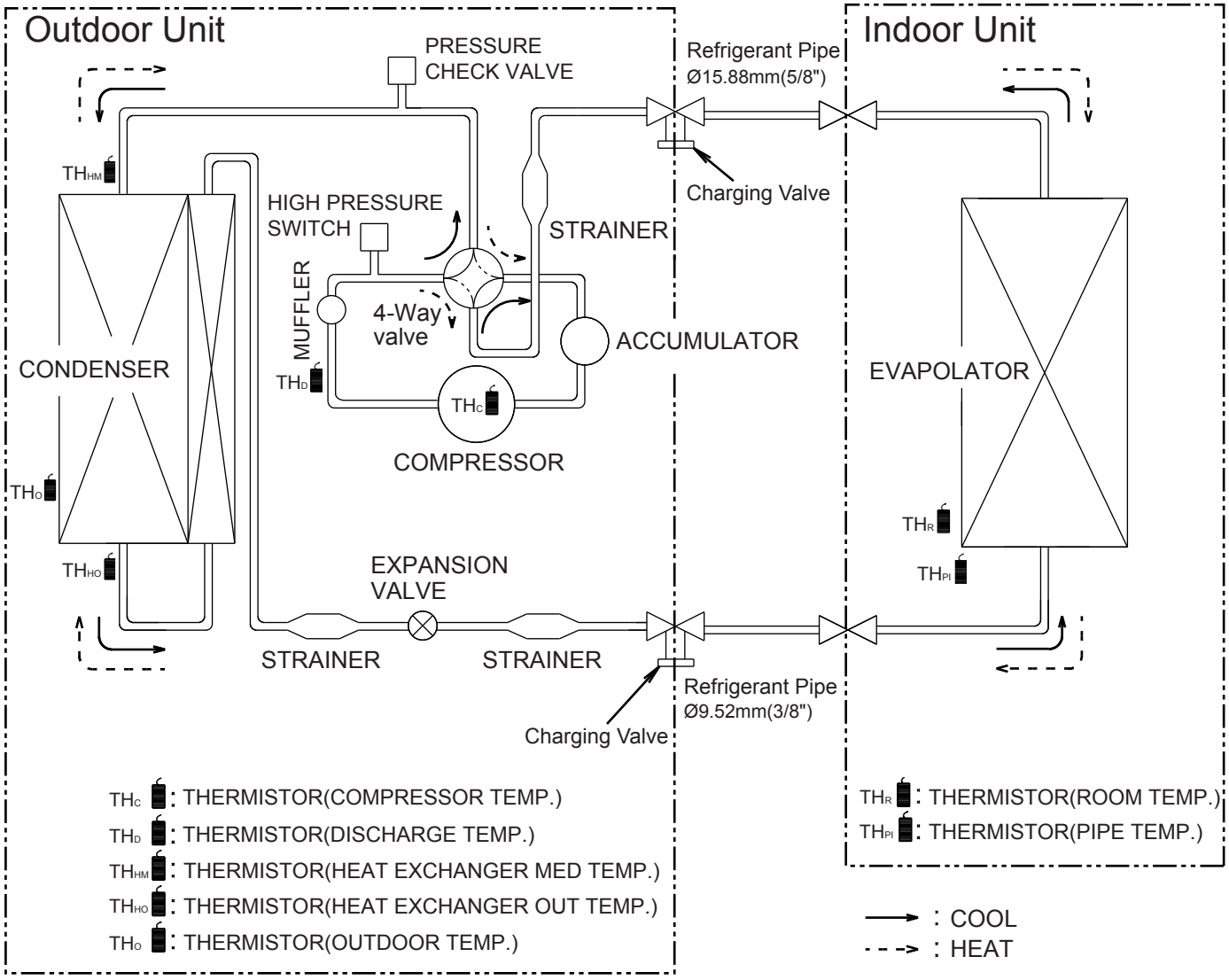
■ MODEL : AR*A14LATN / AO*A14LACL
AR*A18LATN / AO*A18LACL



■ MODEL : AR*A24LATN / AO*A24LACL



■ MODEL : AR*30/ 36LUAN / AO*30/ 36LMAWL



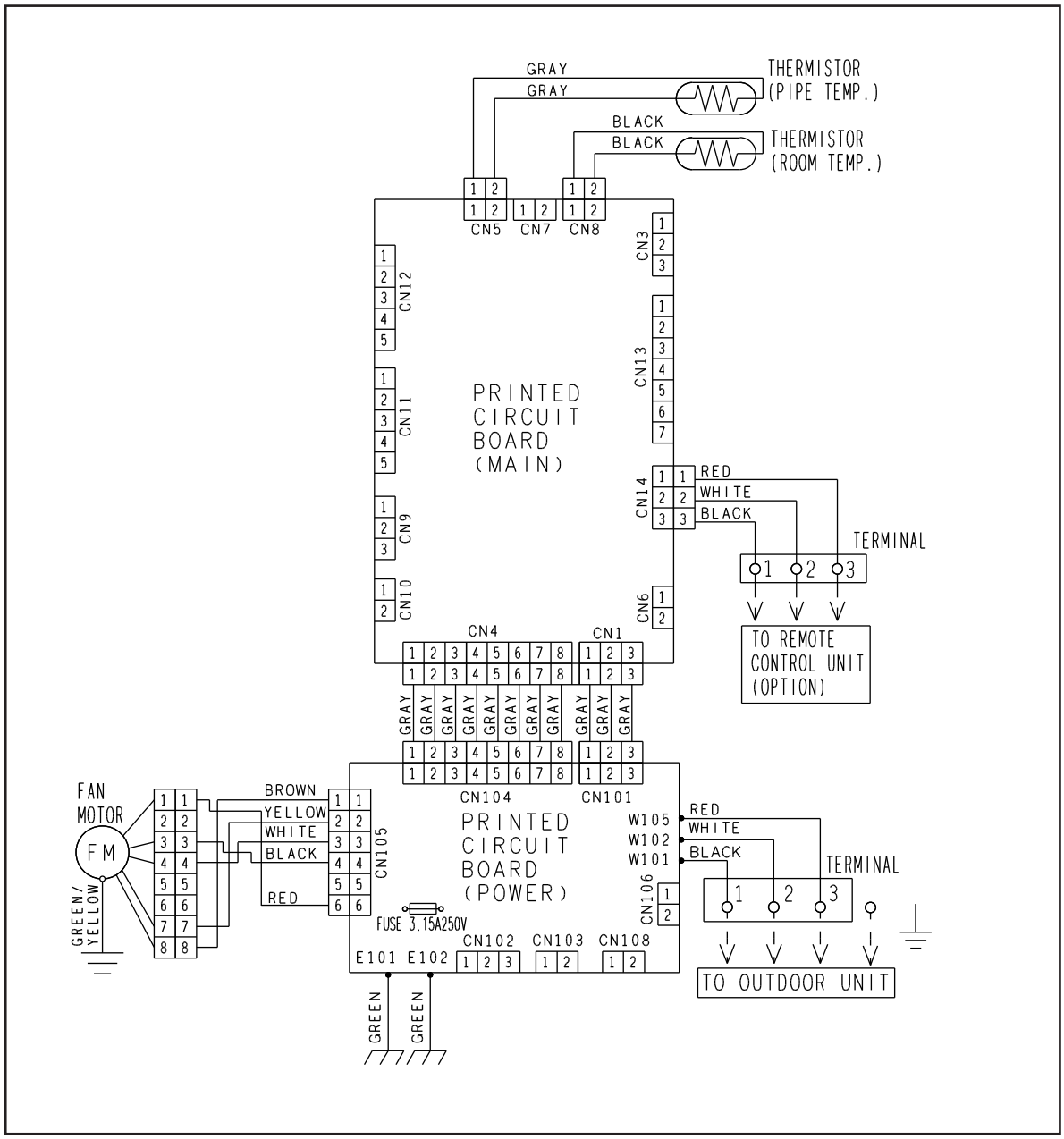
Refrigerant
R410A

DUCT type
INVERTER

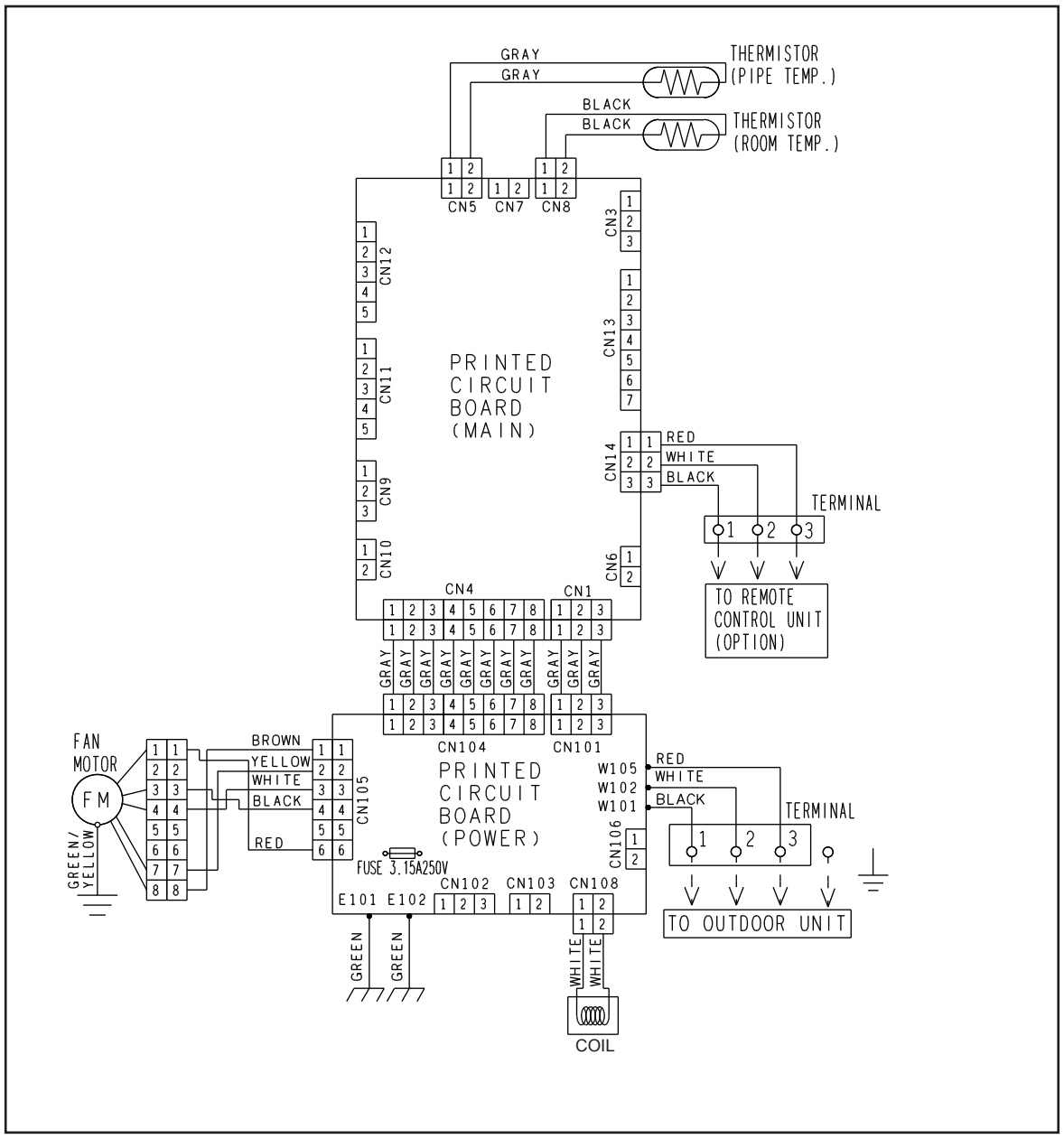
4 . CIRCUIT DIAGRAM

4. CIRCUIT DIAGRAM

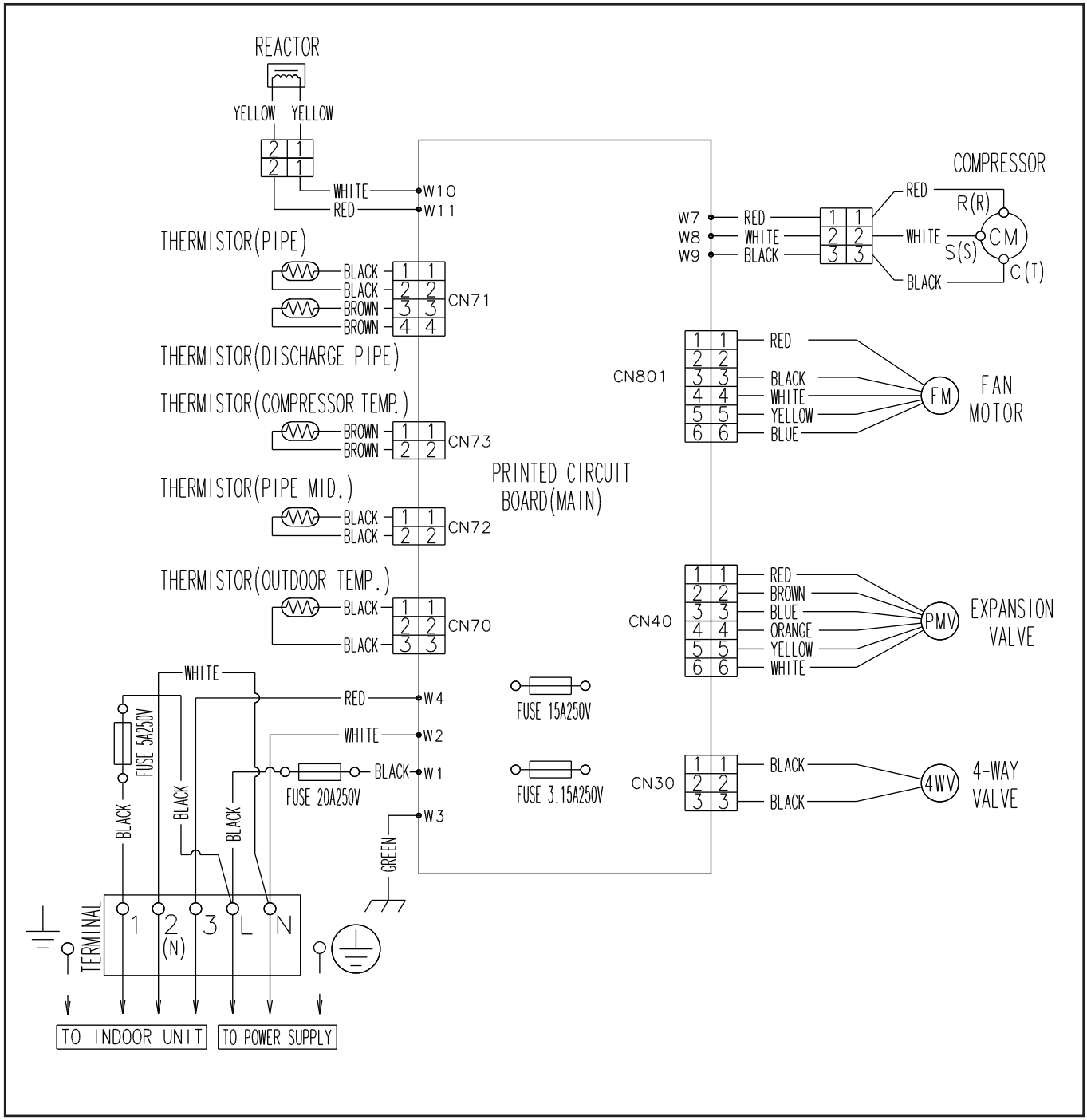
■ MODEL : AR*A12/ 14/ 18LATN



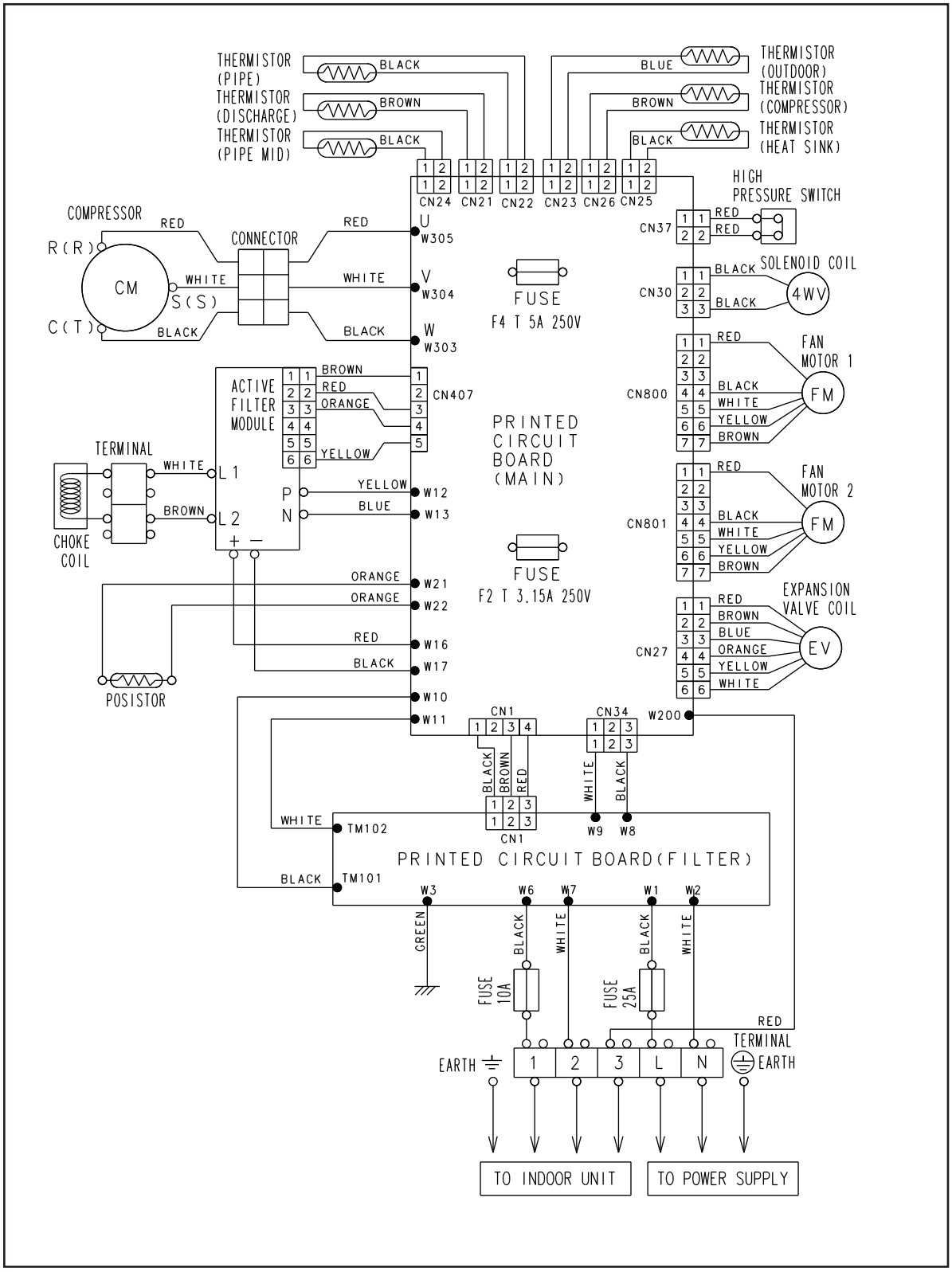
■ MODEL : AR*A24/ 36/ 45LATN



■ MODEL : AO*A12/ 14/ 18/ 24LACL



■ MODEL : AO*A36/ 45LATL



Refrigerant
R410A

DUCT type
INVERTER

5 . DESCRIPTION OF EACH CONTROL OPERATION

5-1. COOLING OPERATION

5-1-1 COOLING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

* If the room temperature is 2 degC higher than a set temperature, the compressor operation frequency will attain to maximum performance.

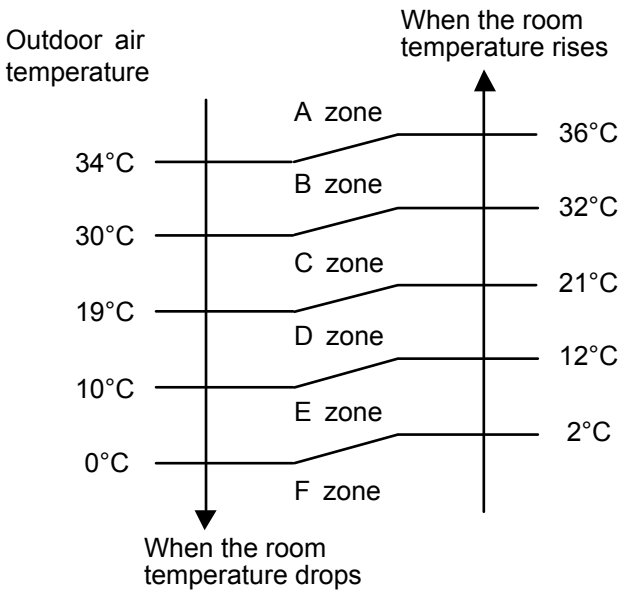
* If the room temperature is 2.5 degC lower than a set temperature, the compressor will be stopped.

* When the room temperature is between +2 degC to -2.5 degC of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Figure 1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency
AR*A12LATN	18Hz	80Hz
AR*A14LATN	18Hz	113Hz
AR*A18LATN	18Hz	113Hz
AR*A24LATN	18Hz	113Hz
AR*A36LATN	18Hz	70Hz
AR*A45LATN	18Hz	77Hz

(Fig. 1 : Limit of Maximum Frequency based on Outdoor Temperature)



Fan speed mode		Hi	Me	Lo	Quiet
AR*A12LATN	A zone	80Hz	49Hz	42Hz	34Hz
	B zone	80Hz	49Hz	42Hz	34Hz
	C zone	80Hz	49Hz	42Hz	34Hz
	D-F zone	49Hz	38Hz	30Hz	22Hz
AR*A14LATN	A zone	113Hz	66Hz	54Hz	34Hz
	B zone	113Hz	66Hz	54Hz	34Hz
	C zone	80Hz	54Hz	45Hz	34Hz
	D-F zone	54Hz	45Hz	38Hz	24Hz
AR*A18LATN	A zone	113Hz	66Hz	54Hz	34Hz
	B zone	113Hz	66Hz	54Hz	34Hz
	C zone	80Hz	54Hz	45Hz	34Hz
	D-F zone	54Hz	45Hz	38Hz	24Hz
AR*A24LATN	A zone	113Hz	66Hz	54Hz	34Hz
	B zone	113Hz	66Hz	54Hz	34Hz
	C zone	80Hz	54Hz	45Hz	34Hz
	D-F zone	54Hz	45Hz	38Hz	24Hz
AR*A36LATN	A zone	70Hz	43Hz	37Hz	29Hz
	B zone	70Hz	43Hz	37Hz	29Hz
	C zone	48Hz	37Hz	33Hz	29Hz
	D-F zone	37Hz	33Hz	29Hz	23Hz
AR*A45LATN	A zone	77Hz	48Hz	41Hz	31Hz
	B zone	77Hz	48Hz	41Hz	31Hz
	C zone	55Hz	41Hz	37Hz	31Hz
	D-F zone	41Hz	37Hz	33Hz	25Hz

5-2. HEATING OPERATION

5-2-1 HEATING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

* If the room temperature is lower 3 degC than a set temperature, the compressor operation frequency will attain to maximum performance.

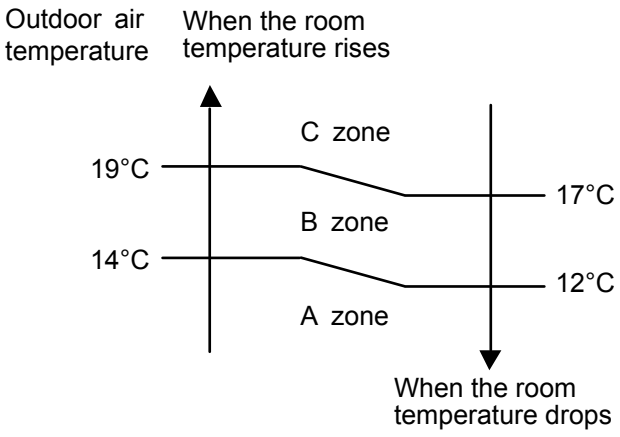
* If the room temperature is higher 2.5 degC than a set temperature, the compressor will be stopped.

* When the room temperature is between +2.5 degC to -3 degC of the setting temperature, the compressor frequency is controlled within the range shown in Table2. However, the maximum frequency is limited in the range shown in Figure 2 based on the outdoor temperature.

(Table 2 : Compressor Frequency Range)

	minimum frequency	maximum frequency
AR*A12LATN	18Hz	120Hz
AR*A14LATN	18Hz	120Hz
AR*A18LATN	18Hz	120Hz
AR*A24LATN	18Hz	120Hz
AR*A36LATN	18Hz	90Hz
AR*A45LATN	18Hz	90Hz

(Fig.2 : Limit of Maximum Frequency based on Outdoor Temperature)



Fan speed mode		Hi Me+	Me	Lo	Quiet
AR*A12LATN	A zone	120Hz	70Hz	60Hz	49Hz
	B zone	120Hz	70Hz	60Hz	49Hz
	C zone	120Hz	70Hz	60Hz	49Hz
AR*A14LATN	A zone	120Hz	101Hz	75Hz	60Hz
	B zone	120Hz	101Hz	75Hz	60Hz
	C zone	120Hz	101Hz	75Hz	60Hz
AR*A18LATN	A zone	120Hz	101Hz	75Hz	60Hz
	B zone	120Hz	101Hz	75Hz	60Hz
	C zone	120Hz	101Hz	75Hz	60Hz
AR*A24LATN	A zone	120Hz	101Hz	75Hz	60Hz
	B zone	120Hz	101Hz	75Hz	60Hz
	C zone	120Hz	101Hz	75Hz	60Hz
AR*A36LATN	A zone	90Hz	66Hz	53Hz	45Hz
	B zone	90Hz	66Hz	53Hz	45Hz
	C zone	90Hz	66Hz	53Hz	45Hz
AR*A45LATN	A zone	90Hz	66Hz	53Hz	45Hz
	B zone	90Hz	66Hz	53Hz	45Hz
	C zone	90Hz	66Hz	53Hz	45Hz

5-3. DRY OPERATION

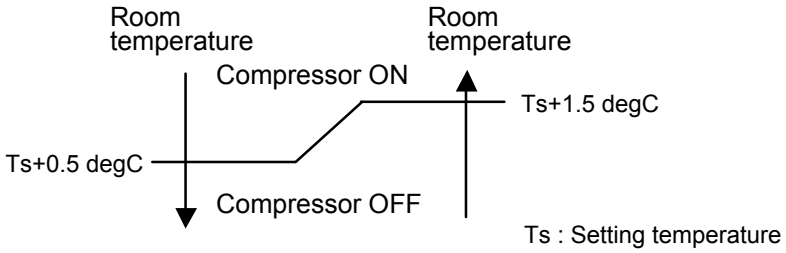
5-3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to set temperature and room temperature variation which the room temperature sensor of the indoor unit has detected as shown in the Fig 3.

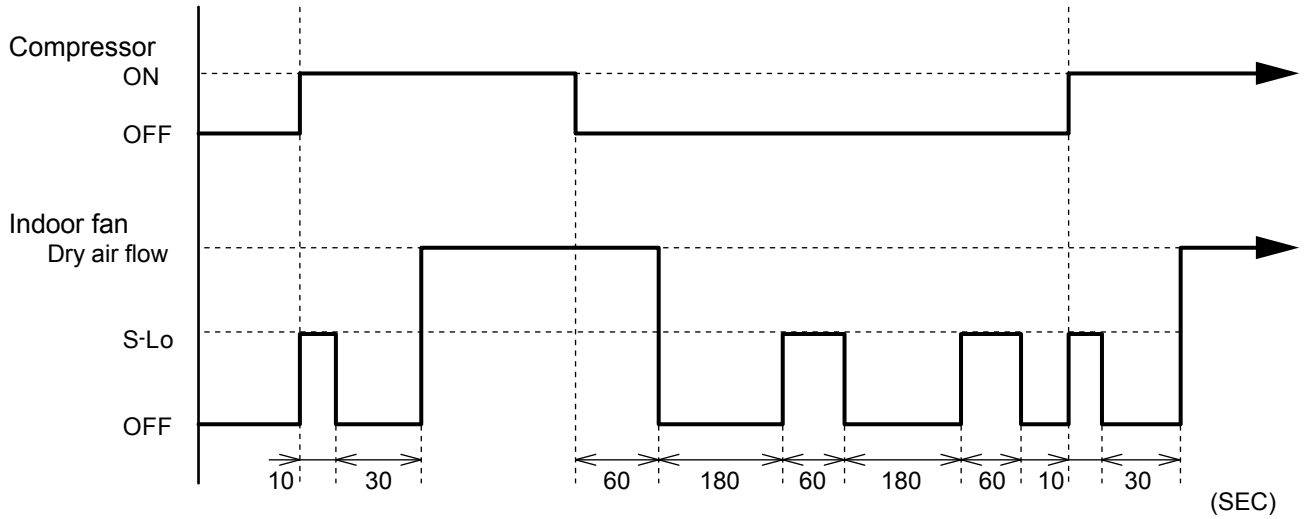
(Table 3 : Compressor frequency)

	Operating frequency
AR*A12LATN	34Hz
AR*A14LATN	34Hz
AR*A18LATN	34Hz
AR*A24LATN	34Hz
AR*A36LATN	31Hz
AR*A45LATN	31Hz

(Fig.3 : Compressor Control based on Room Temperature)



(Fig.4 : Indoor Fan Control)



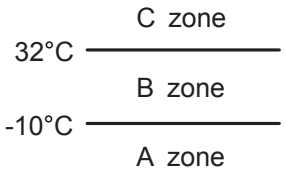
5-4. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the AUTO mode by remote control, operation starts in the optimum mode from among the HEATING, COOLING, DRY and MONITORING modes. During operation, the optimum mode is automatically swiched in accordance with temperature changes.
The temperature can be set between 18°C and 30°C in 1 degC steps.

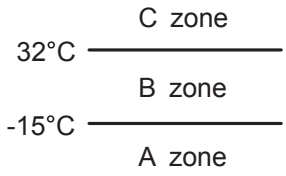
① When operation starts, only the indoor and outdoor fans are operated for 1 minute. After 1 minute, the room temperature and outdoor air temperature are sensed and the operation mode is selected in accordance with the table below.

(Fig.5 : Outdoor air temperature zone selection)

[For AR*A12/ 14/ 18/ 24LATN]



[For AR*A36/ 45LATN]



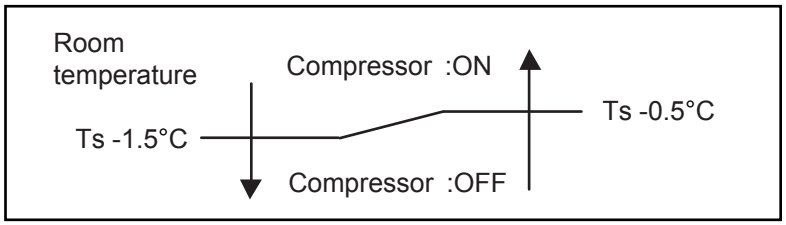
(Table 4 : Operation mode selection table)

Outdoor temperature :To / Room temperature :Tb	A zone	B zone	C zone
Tb > Ts +2 degC	Monitoring	Cooling (Automatic Dry)	Cooling (Automatic Dry)
Ts +2 degC ≧ Tb ≧ Ts-2 degC	Monitoring	Monitoring	Monitoring
Ts +2 degC > Tb	Heating	Heating	Monitoring

Ts : Setting temperature

② When COOLING was selected at ①, the air conditioner operates as follow:

- The same operation as COOLING OPERATION of item 5-1 above is performed. However, the setting temperature is raised 1degC and the room temperature correct coefficient value is 0°C
- When the compressor frequency have been below 20Hz for 8 minutes or the room temperature reaches "setting temperature -1.5°C" , operation is automatically switched to DRY OPERATION of item 5-3 above is performed.
  However, compressor control based on room temperature is as follows.



- If the room temperature reaches "setting temperature +2°C" during DRY operation, operation returns to COOLING operation.

③ When HEATING was selected at ①, the same operation as HEATING OPERATION of item 5-2 above is performed. However, the room temperature correct coefficient value is 0°C.

④ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the COOLING or HEATING operation mode was selected at ① above, operation is switched to MONITORING and the operation mode is selected again.

5-5. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Indoor Fan Speed)

▪ AR*A12LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	880
	Me	780
	Lo	720
	Quiet	620
Dry	Auto	620
Monitoring	S- Lo	450

▪ AR*A14LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	1040
	Me	950
	Lo	840
	Quiet	740
Dry	Auto	740
Monitoring	S- Lo	450

▪ AR*A18LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	1040
	Me	950
	Lo	840
	Quiet	740
Dry	Auto	740
Monitoring	S- Lo	450

▪ AR*A24LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	830
	Me	700
	Lo	600
	Quiet	550
Dry	Auto	550
Monitoring	S- Lo	350

▪ AR*A36LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	1200
	Me	1020
	Lo	840
	Quiet	670
Heating	Hi	1220
	Me	1020
	Lo	840
	Quiet	670
Dry	Auto	670
Monitoring	S- Lo	370

▪ AR*A45LATN

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating Fan	Hi	1310
	Me	1020
	Lo	840
	Quiet	670
Heating	Hi	1300
	Me	1020
	Lo	840
	Quiet	670
Dry	Auto	670
Monitoring	S- Lo	370

2. FAN OPERATION

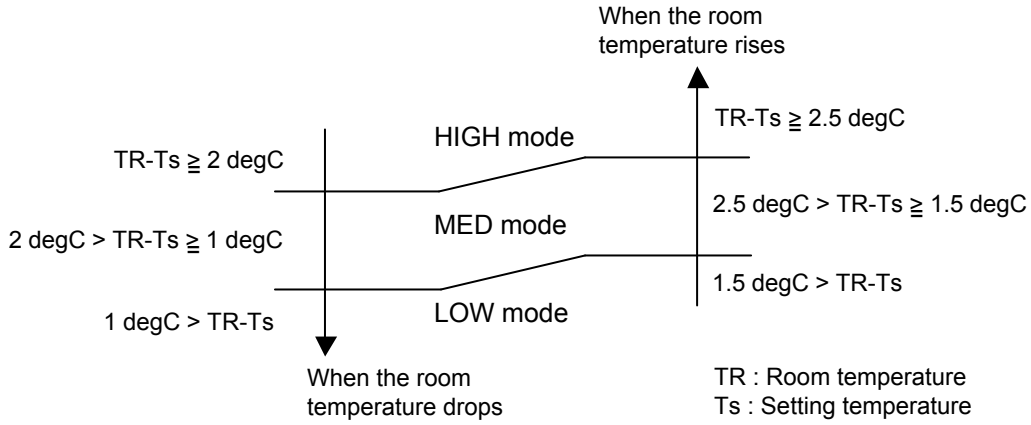
The airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH, while the indoor fan only runs.

When Fan mode is set at (Auto), it operates on [MED] Fan Speed.

3. COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 6.
On the other hand, if switched in [HIGH] ～ [QUIET], the indoor motor will run at a constant airflow of [COOL] operation modes QUIET, LOW, MED, HIGH, as shown in Table 5.

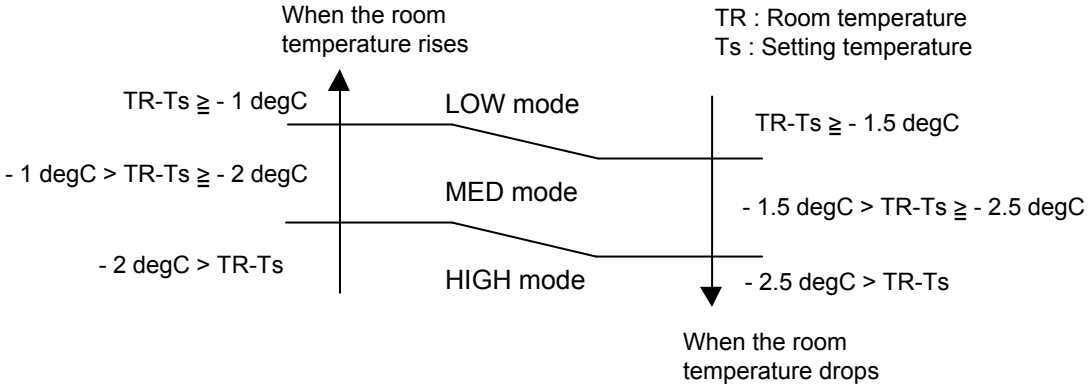
(Fig.6 : Airflow change - over (Cooling : AUTO))



4. HEATING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 7.
On the other hand, if switched [HIGH] ～ [QUIET], the indoor motor will run at a constant airflow of [HEAT] operation modes QUIET, LOW, MED, HIGH, as shown in Table 5.

(Fig.7 : Airflow change - over (Heating : AUTO))

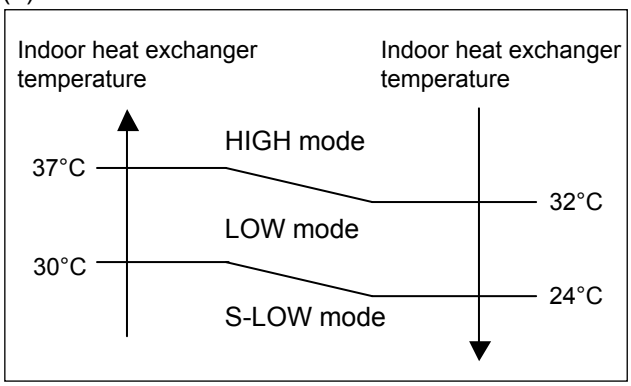


5. COOL AIR PREVENTION CONTROL (Heating mode)

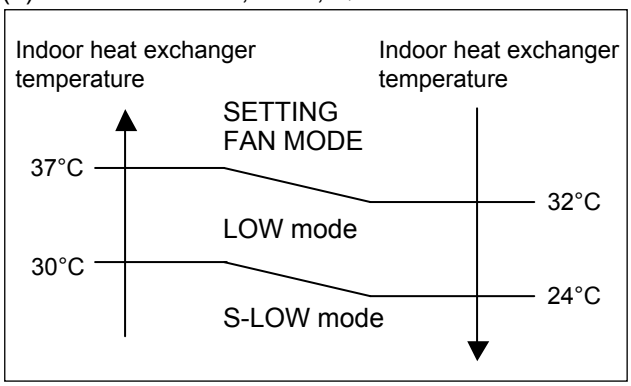
The maximum value of the indoor fan speed is set as shown in Figure 8, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.8 : Cool Air Prevention Control)

(1) Fan mode : HIGH



(2) Fan mode : MED, LOW, QUIET



6. DRY OPERATION

Refer to the Figure 4.

During the dry mode operation, the fan speed setting can not be changed.

5-6. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

1-1. For AR*A12/ 14/ 18/ 24LATN

Following table shows the fan speed of the outdoor unit.

Table 6 : Fan speed of the outdoor unit

	Outdoor temperature	Cooling	Dry
AR*A12LATN	Over than 12°C	860/ 820/ 770/ 670/ 500 rpm	500 rpm
	Less than 12°C	400/ 340/ 280/ 250/ 230 rpm	400/ 340/ 280/ 250/ 230 rpm
AR*A14LATN AR*A18LATN	Over than 12°C	860/ 820/ 670/ 500 rpm	500 rpm
	Less than 12°C	400/ 340/ 280/ 250/ 230 rpm	400/ 340/ 280/ 250/ 230 rpm
AR*A24LATN	Over than 12°C	950/ 820/ 670/ 500 rpm	500 rpm
	Less than 12°C	400/ 340/ 280/ 250/ 230 rpm	400/ 340/ 280/ 250/ 230 rpm

	Heating
AR*A12LATN	950/ 820/ 750/ 700/ 550/ 450 rpm
AR*A14LATN AR*A18LATN	950/ 820/ 750/ 670/ 550/ 450 rpm
AR*A24LATN	1050/ 1000/ 730/ 670/ 550/ 450 rpm

- The outdoor fan speed is changed in the range of the speed shown in the above table, based on the frequency of the compressor.
  (When the compressor frequency increases, the outdoor fan speed is also changed to higher speed. If the compressor frequency decreases, the outdoor fan speed is changed to the lower speed as well.)
  After starting up the outdoor fan, it operates with the following speed for initial 20 seconds.

Table 7 : Fan speed when starting up outdoor fan

	Outdoor temperature	Fan speed
AR*A12LATN AR*A14LATN AR*A18LATN AR*A24LATN	Over than 12°C	500 rpm
	Less than 12°C	200 rpm

- After operating the defrost control function on heating mode except economy operation, its speed becomes 950rpm (AR*A12/14/18L) and 1050rpm (AR*A24L) regardless of the compressor frequency.
  However, it returns to the normal speed control when the defrosting operation does not function for 240 minutes after releasing the defrost operation or when the outdoor temperature sensor detection value becomes higher than 5°C.

1-2. For AR*A36/ 45LATN

Following table shows the fan speed of the outdoor unit.

Table 8 : Fan speed of the outdoor unit

		Cooling	Heating
AR*A36LATN AR*A45LATN	Upper fan	850/ 780/ 520/ 400/ 350/ 300/ 280 rpm	850/ 780/ 350/ 200/ 170/ 150 rpm
	Lower fan	780/ 750/ 520/ 350/ 280/ 0 rpm	780/ 750/ 350/ 200/ 170/ 150 rpm

- AR*A36/ 45LATN have two fan motors.
- The outdoor fan speed changs in the range mentioned avobe depending on the compressor frequency and outdoor temperature.
- It runs at 500rpm for 20 seconds after starting up the outdoor fan.
  When the outdoor heat exchanger temperature is lower than 2°C,
  the fan speed switches to 850rpm(Upper fan) and 750rpm(Lower fan) on heating mode.

5-7. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in Table 9.

(Table 9 : Compressor Operation Frequency Range)

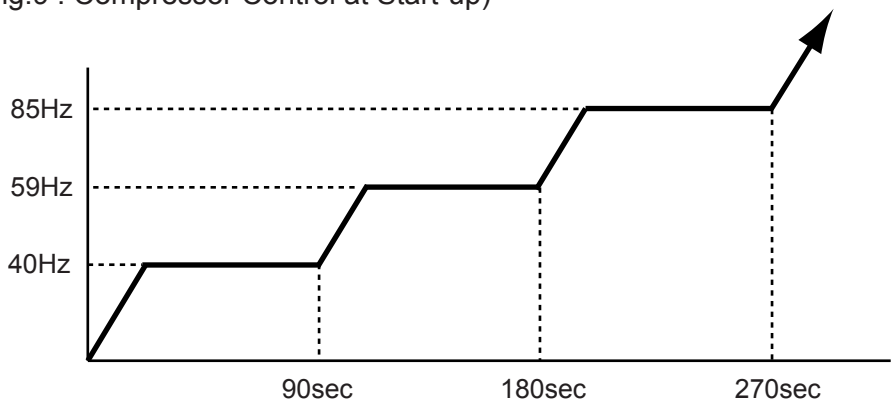
	Cooling		Heating		Dry
	Min	Max	Min	Max	
AR*A12LATN	18Hz	80Hz	18Hz	120Hz	34Hz
AR*A14LATN	18Hz	113Hz	18Hz	120Hz	34Hz
AR*A18LATN	18Hz	113Hz	18Hz	120Hz	34Hz
AR*A24LATN	18Hz	113Hz	18Hz	120Hz	34Hz
AR*A36LATN	18Hz	70Hz	18Hz	90Hz	31Hz
AR*A45LATN	18Hz	77Hz	18Hz	90Hz	31Hz

2. OPERATION FREQUENCY CONTROL AT START UP

2-1. For AR*A12/ 14/ 18/ 24LATN

The compressor frequency soon after the start-up is controlled as shown in Figure 9.

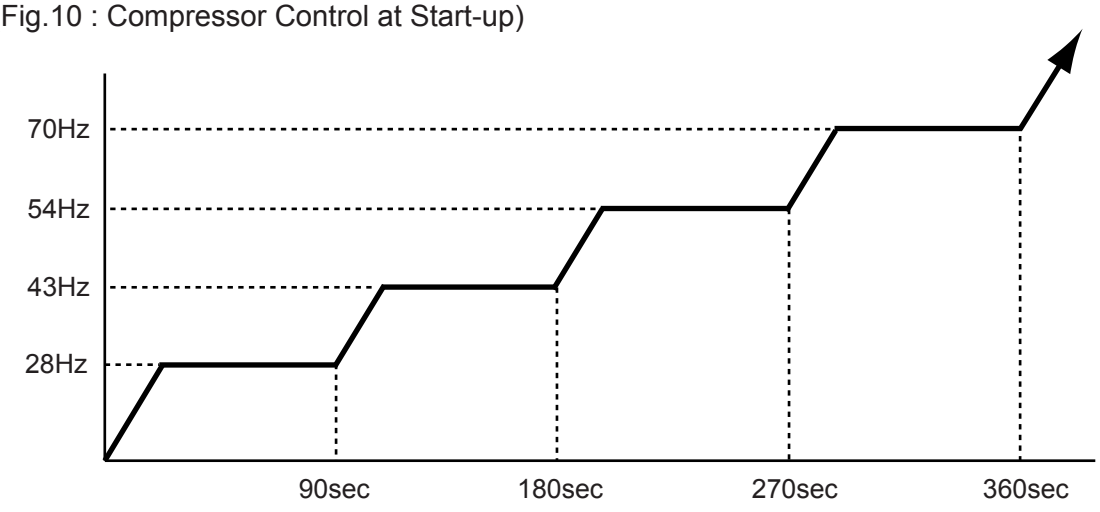
(Fig.9 : Compressor Control at Start-up)



2-2. For AR*A36/ 45LATN

The compressor frequency soon after the start-up is controlled as shown in Figure 10.

(Fig.10 : Compressor Control at Start-up)



5-8. TIMER OPERATION CONTROL

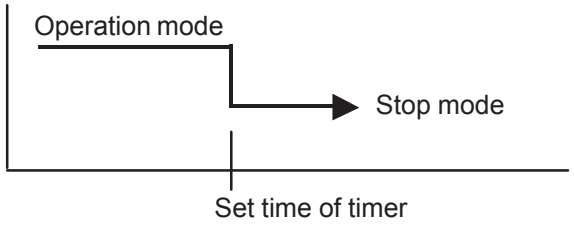
5-8-1 Wired Remote Controller

AR-6TC1

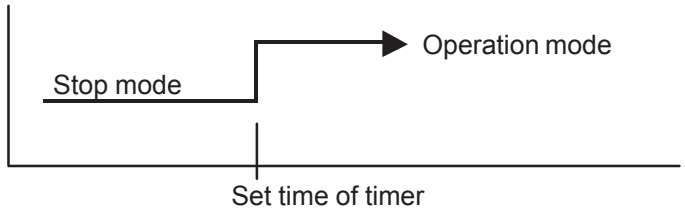
- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER

1. ON / OFF TIMER

・OFF timer : When the clock reaches the set time, the air conditioner will be turned off.



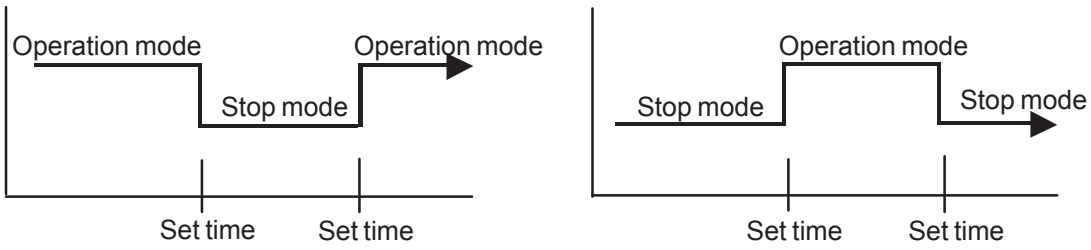
・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. WEEKLY TIMER

2-1. WEEKLY TIMER

・Use this timer function to set operating time for each day of the week.
・The weekly timer allows up to two ON and OFF time to set up per day.

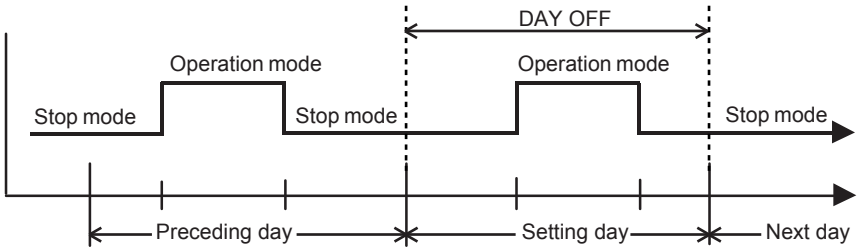


・The operating time can be set in 30 min increments only.
・The OFF time can be carried over to next day.
・The ON timer and the OFF timer functions cannot be set with using the weekly timer.
Both ON and OFF time must be set.

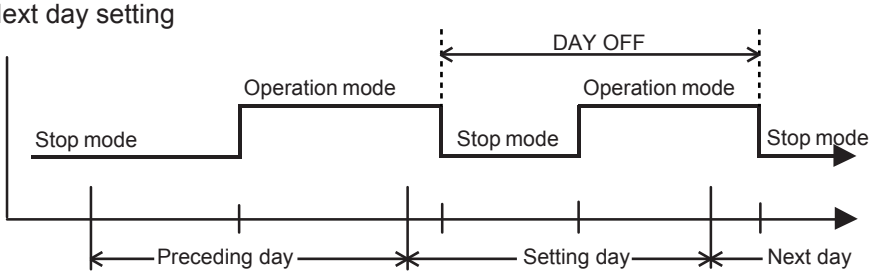
2-2. DAY OFF setting

- The DAY OFF setting is only available for days for which weekly settings already exist.
- If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

- Normal



- Next day setting

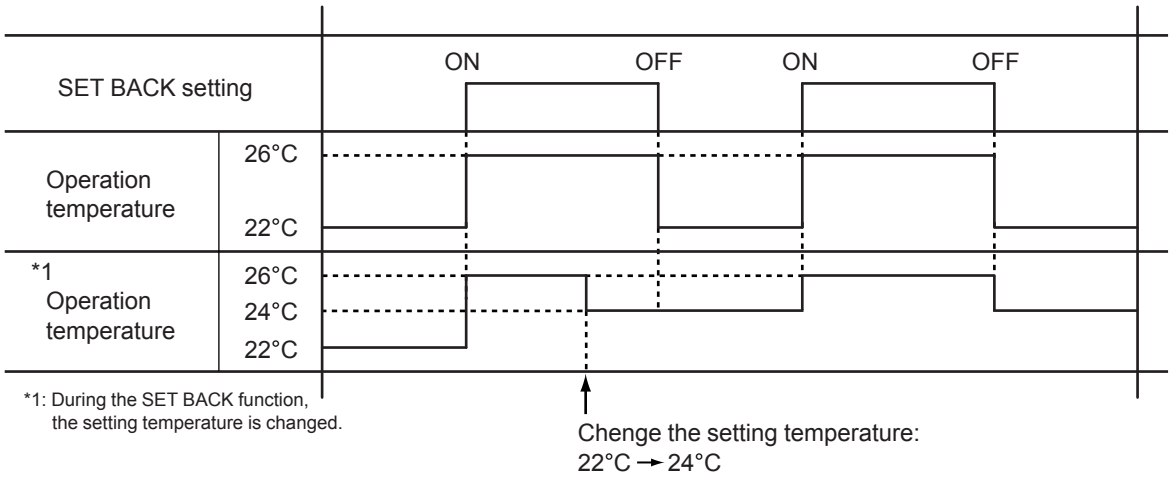


- The DAY OFF setting can only be set one time. The DAY OFF setting is cancelled automatically after the set day has passed.

3. TEMPERATURE SET BACK TIMER

- The SET BACK timer only changes the set temperature for 7 days, it cannot be used to start or stop air conditioner operation.
- The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- During the COOL/DRY mode, the air conditioner will operate at a minimum of 18°C even if the SET BACK temperature is set to 17°C or lower.

Case of SET BACK timer on the Cooling operation.
(Setting temperature :22°C, SET BACK temperature :26°C)



5-9. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.
The compressor frequency, the temperatures detected by the discharge temperature sensor, the indoor heat exchanger sensor, the outdoor heat exchanger sensor, and the outdoor temperature sensor.

(1) Pulse range of EEV

	Operation	Pulse range
AR*A12LATN AR*A14LATN AR*A18LATN AR*A24LATN	Cooling/ Dry	60～480 pulse
	Heating	
AR*A36LATN AR*A45LATN	Cooling/ Dry	50～480 pulse
	Heating	62～480 pulse

(2) The EEV is set up at 480 pulses when the compressor is stopped.

(3) Intialization (Input of 528 pulses toward closing direction) is operated under the following condition.

* When the power is turned on.
* 4 hours has passed since the last initialization, and 3 minutes has passed after the compressor stop.
(If 12 hours has passed since the last initialization, the compressor is compulsorily stopped.)

5-10. TEST OPERATION CONTROL

Under the condition where the air conditioner stops, press the MASTER CONTROL button and the FAN CONTROL button simultaneously for 2 seconds or more, and the test operation control mode will appear.
During test running, "oI" will display on the remote controller display.
Set the test operation mode, and the compressor will continue to run regardless of whatever the room temperature sensor detects.
The test operation mode is released if 60 minutes have passed after setting up the test operation.

5-11. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

The compressor won't enter operation status for 3 minutes after the compressor is stopped, even if any operation is given.

5-12. 4-WAY VALVE EXTENSION SELECT

At the time when the air conditioner is switched from the cooling mode to heating mode, the compressor is stopped, and the 4-way valve is switched in 3 minutes later after the compressor stopped.

5-13. AUTO RESTART

When the power was interrupted by a power failure, etc. during operation, the operation contents at that time are memorized and when power is recovered, operation is automatically resumed with the memorized operation contents.
When the power is interrupted and recovered during timer operation, timer operation is canceled, but only setting time is memorized.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Thermistor detected position (When using the Wired Remote Controller)

5-14. PUMP DOWN (For AR*A36/ 45LATN)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

When the product is stopped:

1. Press the PUMP DOWN switch (SW2) on the outdoor unit.
   (The LED on the outdoor unit circuit board starts flashing (1sec.ON / 1sec.OFF repeated).)
2. The pump down operation (cooling operation) begins right away.
   After operation starts, close the 3-way valve (liquid).
3. After 2-3minutes, operation stops. Close the 3-way valve (gas) within 1minute after operations stops.
4. The LED will go out 3minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.

When the product is operating:

1. Press the PUMP DOWN switch (SW2) on the outdoor unit. The LED on the outdoor unit circuit board starts flashing (1sec.ON / 1sec.OFF repeated), and operation stops.
   At this point, recovery has not been completed, so do not close the 3-way valves (liquid and gas).
2. The pump down operation (cooling operation) begins after 3minutes.
   Close the 3-way valve (liquid) after operation starts.
3. After 2-3minutes, operation stops. Close the 3-way valve (gas) within 1minute after operations stops.
4. The LED will go out 3minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.

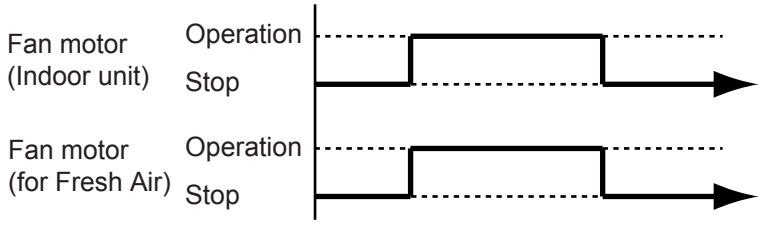
5-15. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than 5°C and the heating operation has been stopped for 30 minutes, power is applied to the compressor and the compressor is heated. (By heating the compressor, warm air is quickly discharged when operation is started.)
When operation was started, and when the outdoor temperature rises to 7°C or greater, preheating is ended.

5-16. FRESH AIR CONTROL

The fan motor for Fresh Air is operated in synchronization with the indoor fan operation as shown in Figure 11.

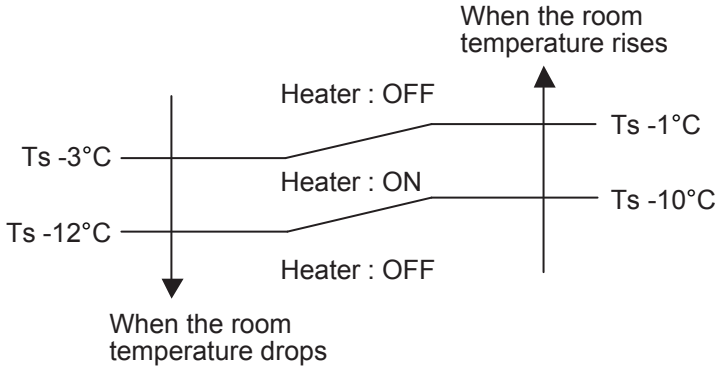
(Fig.11 : Fresh air control)



5-17. EXTERNAL ELECTRICAL HEATER CONTROL

The external electrical heater is operated as shown in Figure 12.

(Fig.12 : External electrical heater control)



- Ts : Setting temperature
- When the compressor stop, External electrical heater is OFF.

5-18. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts when the outdoor heat exchanger temperature sensor detects the temperature lower than the values shown in Table 11.

(Table 11 : Condition of starting Defrost Operation)

- 1st time defrosting after starting operation

Compressor contiguous operation time	Below 10 min.	Above 10 min.		
Compressor integrating operation time	Less than 17 min.	17 to 62 min.	62 min. to 4 hours	After 4 hours
Operation temperature	Does not operate	- 9°C	- 5°C	- 3°C

- Defrosting after 2nd time upon starting operation

Compressor contiguous operation time	Below 10 min.	Above 10 min.	
Compressor integrating operation time	Less than 35 min.	35 min. to 4 hours	After 4 hours
Operation temperature	Does not operate	- 6°C	- 3°C

2. CONDITION OF THE DEFROST OPERATION COMPLETION

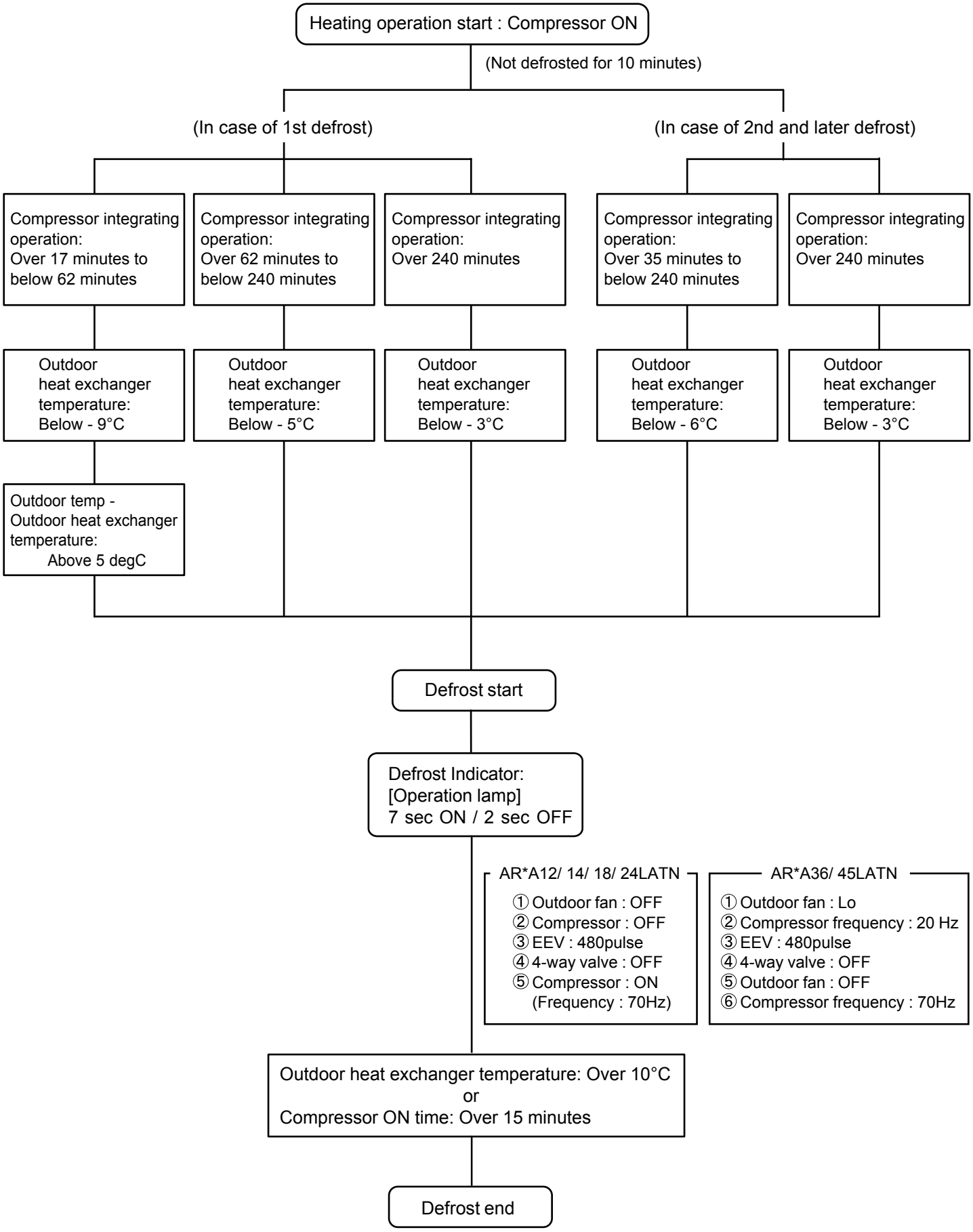
Defrost operation is released when the conditions become as shown in Table 12.

(Table 12 : Defrost Release Condition)

Release Condition
Outdoor heat exchanger temperature sensor value is higher than +10°C or Compressor operation time has passed 15 minutes.

3. Defrost Flow Chart

The defrosting shall proceed by the integrating operation time and outdoor heat exchanger emperature as follows.



5-19. OFF DEFROST OPERATION CONTROL

When operation stops in the [Heating operation] mode, if frost is adhered to the outdoor unit heat exchanger, the defrost operation will proceed automatically.
In this time, if indoor unit operation lamp flashes slowly (7 sec ON / 2 sec OFF), the outdoor unit will allow the heat exchanger to defrost, and then stop.

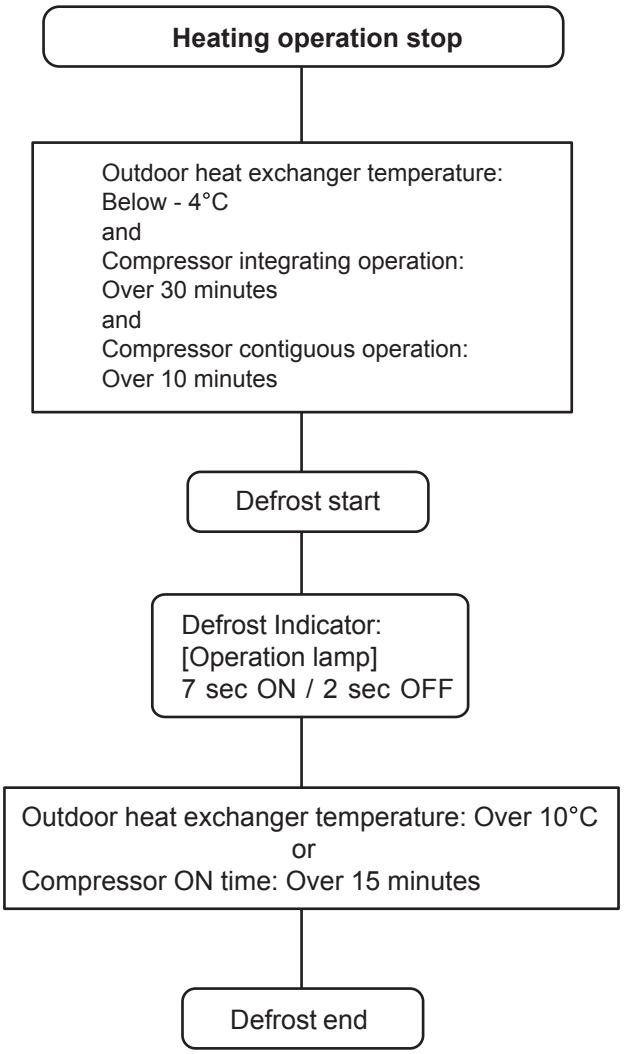
1. OFF DEFROST OPERATION CONDITION

In heating operation, the outdoor heat exchanger temperature is less than - 4 C,
and compressor operation integrating time lasts for more than 30 minutes.
and compressor operation contiguous time lasts for more than 10 minutes.

2. OFF DEFROST END CONDITION

Release Condition
Outdoor heat exchanger temperature sensor value is higher than +10°C or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



5-20. ECONOMY OPERATION

At the maximum output, ECONOMY OPERATION is approximately 70% of normal air conditioner operation for cooling and heating.
When ECONOMY OPERATION is performed during the cooling mode,dehumidification is improved.
This function is especially convenient when you want to remove the humidity in the room without significantly lowering the room temperature.
During ECONOMY OPERATION, the thermostat setting automatically changes according to the temperature to avoid Unnecessary cooling and heating for the most economical operation.

- If the room is not cooled (or heated) well during economy operation, select normal operation.

- During the monitor period in the AUTO mode, the air conditioner operation will not change to ECONOMY OPERATION even if ECONOMY OPERATION is selected by pressing the ECONOMY button.

5-21. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVER RISE PREVENTION CONTROL

1-1. For AR*A12/ 14/ 18/ 24LATN

The discharge gas thermosensor (discharge thermistor : Outdoor side) will detect discharge gas temperature.
When the discharge temperature becomes higher than 104°C, the compressor frequency is decreased 20 Hz, and it continues to decrease the frequency for 20 Hz every 120 seconds until the temperature becomes lower than 101°C.
When the discharge temperature becomes lower than 101°C, the control of the compressor frequency is released.
When the discharge temperature becomes higher than 110°C, the compressor stops

1-2. For AR*A36/ 45LATN

The discharge gas thermosensor (discharge thermistor : Outdoor side) will detect discharge gas temperature.
When the discharge temperature becomes higher than 105°C, the compressor frequency is decreased 10 Hz, and it continues to decrease the frequency for 10 Hz every 120 seconds until the temperature becomes lower than 105°C.
When the discharge temperature becomes lower than 100°C, the control of the compressor frequency is released.
When the discharge temperature becomes higher than 115°C, the compressor stops

2. CURRENT RELEASE CONTROL

2-1. For AR*A12/ 14/ 18/ 24LATN

The compressor frequency is controlled so that the outdoor unit input current does not exceeds the current limit velue that was set up with the outdoor temperature.
The compressor frequency returns to the designated frequency of the indoor unit at the time when the frequency becomes lower than the release value.

(Table 13 : Current Release Operation Value / Release Value)

[Heating]

AR*A12LATN	
OT (Control / Release)	
17°C	6.5A/ 6.0A
12°C	8.0A/ 7.5A
5°C	8.5A/ 8.0A
	9.5A/ 9.0A

OT : Outdoor Temperature

AR*A14/ 18LATN	
OT (Control / Release)	
17°C	7.0A/ 6.5A
12°C	9.0A/ 8.5A
5°C	10.5A/ 10.0A
	12.0A/ 11.5A

OT : Outdoor Temperature

AR*A24LATN	
OT (Control / Release)	
17°C	7.0A/ 6.5A
12°C	9.0A/ 8.5A
5°C	11.5A/ 11.0A
	13.0A/ 12.5A

OT : Outdoor Temperature

[Cooling]

AR*A12LATN	
OT (Control / Release)	
46°C	4.5A/ 4.0A
40°C	6.0A/ 5.5A
	7.0A/ 6.5A

OT : Outdoor Temperature

AR*A14/ 18LATN	
OT (Control / Release)	
46°C	4.5A/ 4.0A
40°C	6.0A/ 5.5A
	8.5A/ 8.0A

OT : Outdoor Temperature

AR*A24LATN	
OT (Control / Release)	
46°C	7.0A/ 6.5A
40°C	9.5A/ 9.0A
	11.5A/ 11.0A

OT : Outdoor Temperature

2-2. For AR*A36/ 45LATN

(Table 13-2 : Current Release Operation Value / Release Value)

[Heating]

	Outdoor unit fan speed (UP / LO)	
	850/ 780 rpm 780/ 780 rpm 350/ 350 rpm	200/ 200 rpm 170/ 170 rpm 150/ 150 rpm
T0 ≧ 20°C	13.0A / 12.5A	13.0A / 12.5A
20°C > T0 ≧ 12°C	15.0A / 14.5A	
T0 < 12°C	18.0A / 17.5A	15.0A / 14.5A

T0: Outdoor temperature

[Cooling]

	Outdoor unit fan speed (UP / LO)					
	850/ 750 rpm 780/ 780 rpm	520/ 520 rpm	350/ 350 rpm	280/ 280 rpm 400/ 0 rpm	350/ 0 rpm	300/ 0 rpm
T0 ≧ 46°C	11.0A / 10.5A	11.0A / 10.5A	11.0A / 10.5A	11.0A / 10.5A	11.0A / 10.5A	11.0A / 10.5A
46°C > T0 ≧ 40°C	14.5A / 14.0A	14.5A / 14.0A	12.0A / 11.5A	12.0A / 11.5A		
40°C > T0 ≧ 31°C	18.0A / 17.5A	15.0A / 14.5A				
31°C > T0 ≧ 25°C		17.5A / 17.0A	14.0A / 13.5A			
25°C > T0 ≧ 13°C	17.5A / 17.0A					
13°C > T0 ≧ 7°C	14.0A / 13.5A	14.0A / 13.5A				
7°C > T0 ≧ 0°C					12.0A / 11.5A	
T0 < 0°C						11.5A / 11.0A

T0: Outdoor temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor frequency is decrease on cooling & dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than TemperatureⅠ.
Then, the anti-freezing control is released when it becomes higher than TemperatureⅡ.

(Table 14 : Anti-freezing Protection Operation / Release Temperature)

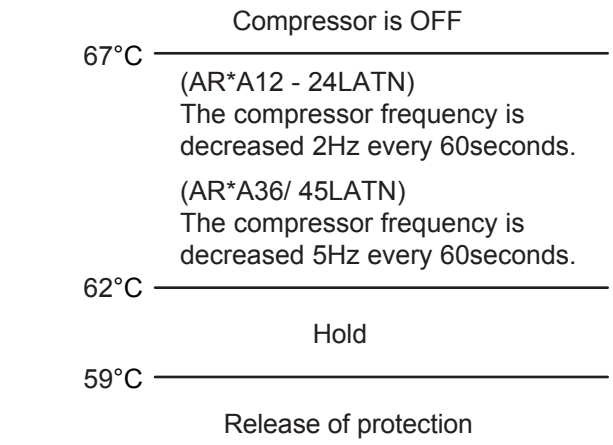
Outdoor temperature	TemperatureⅠ	TemperatureⅡ
Over than 10°C *1 or 12°C *2	4°C	7°C
Less than 10°C *1 or 12°C *2		13°C

*1. When the temperature rises.
*2. When the temperature drops.

4. COOLING PRESSURE OVER RISE PROTECTION

On cooling mode, the compressor frequency is controlled as following based on the detection value of the outdoor heat exchanger temperature sensor.

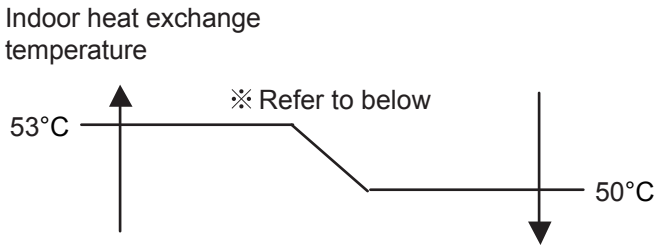
(Fig.13 : Cooling Pressure Over Rise Protection Control)



5. HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

On heating mode, the compressor frequency is controlled as following based on the detection value of the indoor heat exchanger temperature sensor.

(Fig.14 : Heating Overload Protection Control)



※ Compressor Operation

Over than 18Hz → Frequency down every 60 seconds Less than 18Hz → OFF

5-22. FORCED COOLING OPERATION

The forced cooling operation starts up when MANUAL / AUTO button is pressed more than 10 seconds.
During the forced cooling operation, it keeps operation regardless of detection value of room temperature sensor.
Operation LED and Timer LED light up while the unit is on the forced cooling operation.
The forced cooling operation is released after 60 minutes from starting time.

5-23. COMPRESSOR STOP CONTROL

When the detection value of outdoor temperature sensor is lower than temperature Ⅰ in the table below, the compressor is stopped.

(Table 15 : Operation temperature of compressor stop control)

	Temperature Ⅰ	
	Cooling	Heating
Operation temperature	- 20°C	———

Refrigerant
R410A

DUCT type
INVERTER

6 . REFRIGERANT CAUTION -R410A-

6. REFRIGERANT CAUTION -R410A-

6-1. R410A TOOLS

This air conditioner used R410A.
For installation and servicing, it is necessary to prepare the tools and machines that are different from the previous refrigerant.

◎ Mark shows the exclusive use for R410A.

◎ Gauge manifold . . . . . (Fig.4-1)
The specification of the gauge is different due to higher pressure.
The size of connection pipe is also different to prevent mis-use.

◎ Charge hose . . . . . (Fig.4-2)
Since the normal pressure is high, the connection pipe size is also different.

◎ Refrigerant cylinder . . . . . (Fig.4-3)
Confirm the refrigerant type before charging. Always charge liquid-phase refrigerant.

Electronic balance for refrigerant charging . . . . . (Fig.4-4)
Electronic balance is recommended as in the case of R410A.

◎ Vacuum pump with adapter to prevent reverse flow . . . . . .(Fig.4-5)
Conventional pump can be used.

Vacuum holder . . . . . (Fig.4-6)
Conventional pump can be used if adapter for preventing vacuum pump oil from flowing back is used.

◎ Gas leakage tester . . . . . (Fig.4-7)
Exclusive for HFC

Refrigerant cleaner . . . . . (Fig.4-8)
Brown paint as designated by the ARI, USA

◎ Flare tool . . . . . (Fig.4-9)
The shape of flare is different for high pressure condition.

◎ Torque wrench . . . . . (Fig.4-10)

◎ Refrigerant recovering equipment (Collector) . . . . . (Fig.4-11)
The type which can be used for any refrigerant is available

Nitrogen cylinder . . . . . (Fig.4-12)
This prevents an oxide film from forming in the pipe silver-alloy brazing work by turning the air out of the pipe and preventing the inside combustion.

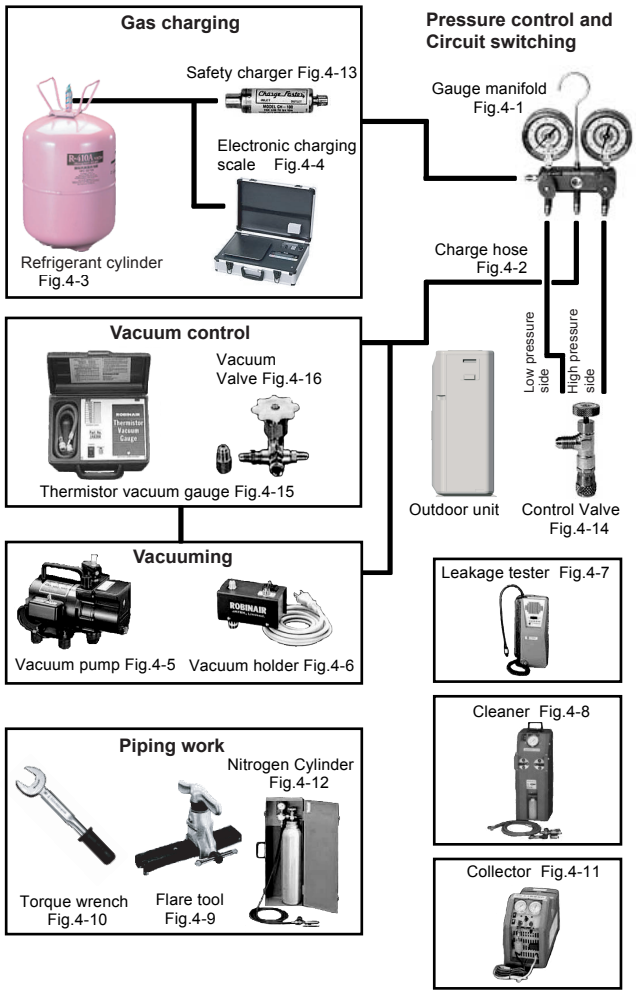
◎ Safety charger . . . . . (Fig.4-13)
It is always compulsory to change the liquid, because R410A is a mixed refrigerant and there is some fear that a mixing ratio changes. In order to avoid the refrigerant from returning to the compressor in a liquid state, the refrigerant can be charged instead of giving a load to the compressor with a safety charger.

Control valve . . . . . (Fig.4-14)
The control valve prevents the refrigerant from spouting when it is removed, as the charging hose side and the service port side are possible to open and close at the same time.

Thermistor vacuum gauge . . . . . (Fig.4-15)
To remove moisture from the refrigerating cycle completely, it is necessary to perform appropriate vacuum drying. For that reason, vacuum conditions can be confirmed certainly.

Vacuum valve . . . . . (Fig.4-16)
This valve builts in a check valve, and it is easily possible to vacuum a refrigerating cycle or check for degree of vacuum with it.

TOOLS AND EQUIPMENT (R410A)



*1 **Gauge Manifold**

	R410A	R22, R407C
High pressure gauge	-0.1～5.3 Mpa	-0.1～3.5 Mpa
Compond gauge	-0.1～3.8 Mpa	-0.1～1.7 Mpa
Port size	1/2UNF 5/16"	7/16UNF 1/4"

*2 **Charge hose**

	R410A	R22, R407C
Normal pressure	5.1 Mpa	3.4 Mpa
Breaking pressure	27.4 Mpa	17.2 Mpa
Port size	1/2UNF	7/16UNF

6-2. PRECAUTION FOR INSTALLATION

Precaution for installation

Pipe diameter, recommended material and wall thickness

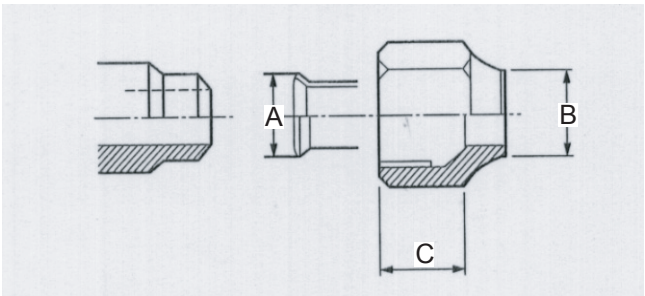
Nominal diameter (in)	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"
Outside diameter (mm)	6.35	9.52	12.70	15.88	19.05	22.22	25.40	28.58	31.75	34.92	38.10
Material	COPPER JIS H3300-C1220T-O or equivalent [1]					COPPER JIS H3300-C1220T-H or equivalent [2]					
Wall thickness [3] (mm)	0.8	0.8	0.8	1.0	1.2	1.0	1.0	1.0	1.1	1.2	1.3

1) Allowable tensile stress ≧ 33 (N/mm^2); 2) Allowable tensile stress ≧ 61 (N/mm^2); 3) Design pressure 4.2MPa.

The pipe must be properly pressure rated for R410A
The pipe must be an air-conditioning refrigerant pipe.

Flare and flare nuts

Diameter	1/4"(6.35mm)		3/8"(9.52mm)		1/2"(12.7mm)		3/8"(15.88mm)		3/4"(19.05mm)	
Refrigerant	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C
A	9.1	9.0	13.2	13.0	16.6	16.2	19.7	19.4	24	23.7
B	13	12	20	15	13	20	25	23	29	29
C	12	11	16	12.5	19	16	22	20	24	24
Nut width	17		22		26	24	29	27	36	



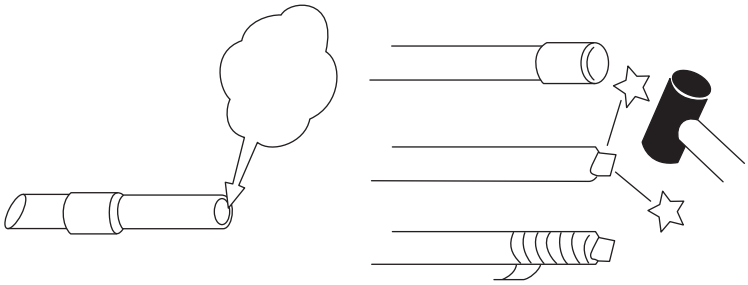
Always use the flare nut that is packed with the product.

Do not use existing (for R22) pipes

- Be sure to use new pipes when replacing conventional (R22) model with HFC (R407C, R410A) model.

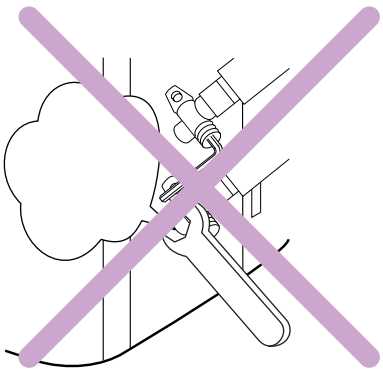
- If you use existing pipes, it may cause resolution of compressor oil by remaining mineral oil.

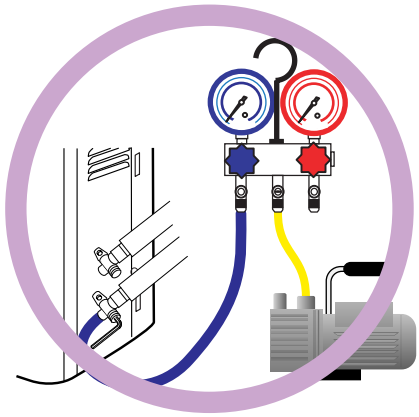
Be careful not to mix moisture and contamination into the pipe



Moisture and contamination in the pipe is a cause of trouble.

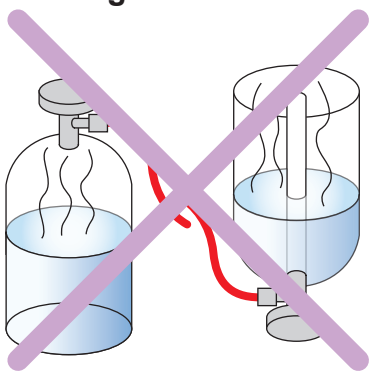
Air purge



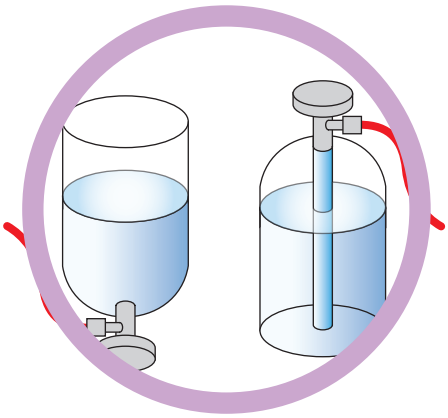


Always use a vacuum pump to purge air.

Refrigerant charge



Don't charge from the gas phase side.



Do it always from the liquid phase side.

Compressor oil is changed

- We developed new synthetic oil, since HFC refrigerant doesn't dissolve in mineral (for R22)oil.
- Be careful to handle synthetic oil, since it resolves easily by moisture and contamination.
- Don't mix new synthetic oil and mineral oil. It may cause trouble.

6-3. PRECAUTION FOR SERVICING

Feature 1 Refrigerant oil is different from before.

Refrigerant oil for New Refrigerant	Different point from previous one	Precaution on Tools
Synthetic oil **Ether** **Esther** ※ Previously it was mineral oil.	• **Absorbent character is high.** • **Contamination occurs when mixed withe other kind of oil.**	• **Use the gauge manifold and charge hose for New Refrigerant(HFC), which shall be segregated from those of R22.** • **Attach the stop valve on the vacuum pump and avoid the oil from reverse frow.** • **It is necessary to use the vacuum pump which can obtain the high vacuum condition.**

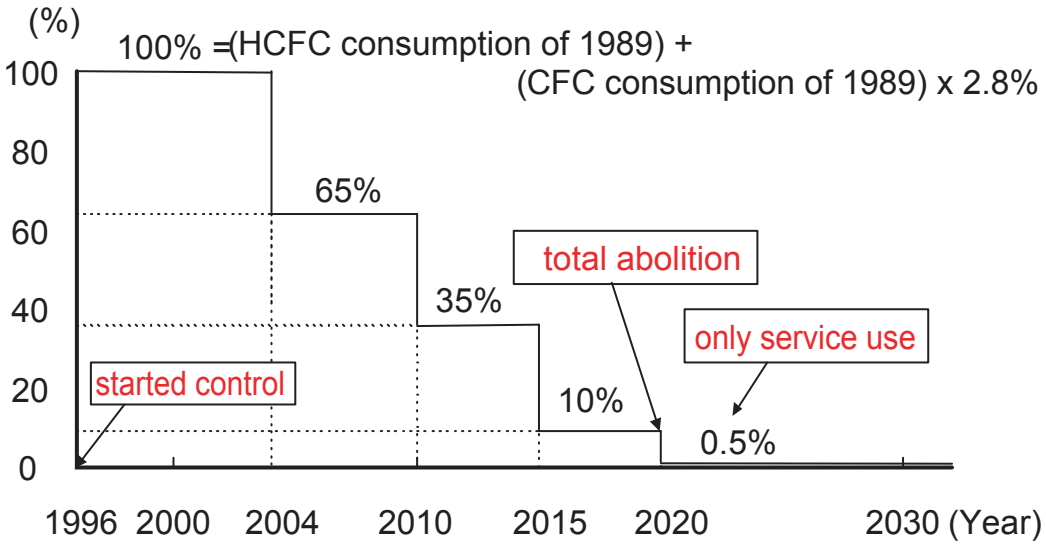
Feature 2 New Refrigerant has Approx 1.6 times higher pressure than previous refrigerant.

R410A	Different point from previous one	Precaution on Tools
High Pressure ※ 1.6 times of R22.	• **Diameter of Service port has been changed from 1/4 Flare to 5/16 Flare.** • **JIS standard of flare process It became lager** • **To keep thethickness of copper tube. (1/4,3/3=more than 0.8mm)**	• **It requires the gauge manifold and charge hose exclusively for R410A.** • **It requires the flare tool and torque wrench that satisfies New JIS standard.** ※ Previous flare tool + flare adapter can be used as well.

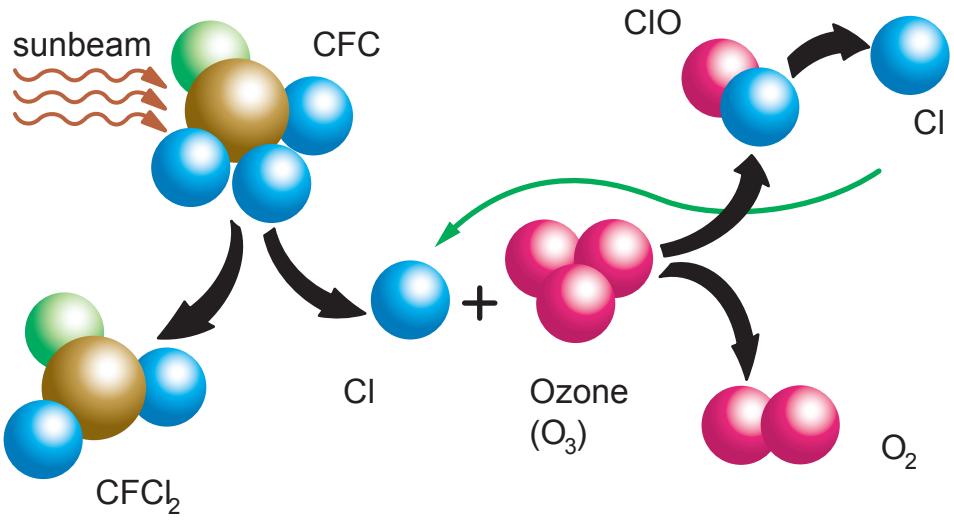
6-4. NEW REFRIGERANT R410A

∗What is HFC ?

Phase-out schedule of HCFC according to Montreal protocol



Ozone Layer depleting mechanism



What is CFC and HCFC?

CFC : Chloro-Fluoro-Carbon

High ODP(ozone depletion potential) chemical compound, including chlorine. (ODP:0.6-1.0)
For example : R12 (for refrigerator and car air-conditioner)

HCFC : Hydro-Chloro-Fluoro-Carbon

Low ODP chemical compound, including chlorine and hydrogen. (ODP:0.02-01)
For example : R22 (for air-conditioner)

HFC_3 : Hydro-Fluoro-Carbon

R134a (for Car air conditioner)
R407C (for air conditioner)

Refrigerant characteristics

	R410A	R407C	R22
Composition (wt%)	R32/R125 (50/50)	R32/R125/R134a (23/25/52)	R22 (100)
Boiling Point	- 51.4	- 43.6	- 40.8
Behavior	near azeotrope	zeotrope	---
Pressure at 54.5 °C (kPa)	3,406	2,262	2,151
Temperature Glide (deg)	0.11	5.4	0
ODP	0	0	0.055

Summary of R407C and R410A characteristics

	R410A	R407C
Advantage	• higher system performance • Near-Azeotropic refrigerant	• similar pressure as R22 (possible to design large equipment)
Disadvantage	• 1.6 times higher pressure than R22 (difficult to design against pressure resistance)	• Zeotropic refrigerant (handle with care)
Suitable for	• Small Air-Conditioners	• Large Air-Conditioners

* Desighed pressure of R410A refrigerant

Relation between R410A condensing temperature and saturated pressure.

< Pressure →Temp >

Pressure (Mpa)	Temp (℃)
2.20	37.9
2.25	38.7
2.30	39.6
2.35	40.5
2.40	41.3
2.45	42.1
2.55	43.8
2.60	44.6
2.65	45.3
2.70	46.1
2.75	46.8
2.80	47.6
2.85	48.3
2.90	49.0
2.95	49.8
3.00	50.5
3.05	51.2
3.10	51.9
3.15	52.6
3.20	53.2
3.25	53.9
3.30	54.6
3.35	55.3
3.40	55.9
3.45	56.5
3.50	57.1
2.55	57.8
3.60	58.4
3.65	59.0
3.70	59.6
3.75	60.2
3.80	60.8
3.85	61.4
3.90	52.0
3.95	62.5
4.00	63.1
4.05	63.6
4.10	64.2
4.15	64.8

< Temp→Pressure >

Temp (℃)	Pressure (Mpa)
39	2.27
40	2.32
41	2.38
42	2.44
44	2.57
45	2.63
46	2.69
47	2.76
48	2.83
49	2.90
51	3.04
52	3.11
53	3.18
54	3.26
56	3.41
57	3.49
58	3.57
59	3.65
61	3.82
62	3.90
63	3.99
64	4.08

6-5. DEFFERENCE FROM CONVENTIONAL MODEL (R22) AND PRECAUTIONS

OIL

- Use new synthetic oils such as ester because HFC series refrigerant has less solubility with mineral oils conventionally used for R22.
- As these new synthetic oils are easily influenced by moisture and dusts, they must be treated more carefully than the conventional lubricating oils.

CAUTION

For installation/servicing, take more precautions than the case of conventional refrigerants to avoid moisture and dusts entering the refrigerant circuit. Also, for storing parts, more precautions must be taken.

COMPRESSOR

- Use better grade of material for sliding parts for securing good lubrication of sliding part as HFC refrigerant does not contain chloride.
- Review insulating materials
- Increase pressure resistance strength

CAUTION

Check if the compressor is suitable for the refrigerant (model) when replacing. Complete welding within 15minutes after opening the cap when replacing.

HEAT EXCHANGER

- Review the water,contaminants controlling level
- Use thinner tube to increase pressure Increase capacity for resistance strength (only outdoor unit) improving performance

CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

4-WAY VALVE

- Review materials

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

2, 3-WAY VALVE

- Review material O-ring, valve core seal for securing suitability with oil.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

Check Valve

- Review materials
- Change shape of pipe ends to increase pressure resistance strength.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

Other Piping

- Review the water, contaminants controlling level.
- Review thickness of pipes.

CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

Refrigerant
R410A

DUCT type
INVERTER

7 . TROUBLE SHOOTING

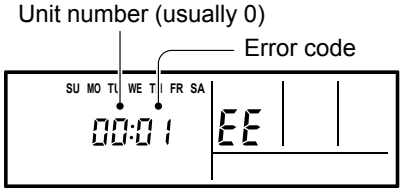
7. TROUBLESHOOTING

7-1 ERROR DISPLAY

7-1-1 WIRED REMOTE CONTROLLER DISPLAY

1. SELF - DIAGNOSIS

When "EE" in Temperature Display is displayed, inspection of the air conditioning system is necessary. Please consult authoilzed servise personnel.



ex. Self-diagnosis check

Error code	Error contents	Trouble shooting
00	Communication error (indoor unit ← remote control)	1
01	Communication error (Serial reverse transfer error)	2
02	Room temperature sensor error	3
04	Indoor heat exchanger temperature sensor error	4
06	Outdoor heat exchanger temperature sensor(outlet) error	5
09	Water drain abnormal	*(6)
08	Outdoor temperature sensor error	7
0C	Outdoor discharge pipe temperature sensor error	8
0F	Discharge temperature error	9
11	Indoor EEPROM abnormal (Model No.)	10
12	Indoor fan motor abnormal	11
13	Outdoor communication signal error (Forward transfer signal error)	12
15	Compressor temperature sensor error	13
16	Pressure switch error	14
17	IPM error	15
18	CT error	16
19	Active filter module (AFM) error	17
1A	Compressor rotor location cannot detect (permanent stop)	18
1b	Outdoor unit fan motor error	19
1c	Outdoor unit computer communication error	20
20	Indoor manual auto switch error	21
24	Exessive high pressure protection on cooling	22
25	PFC circuit error	23
26	Communication error (Main PCB → Display PCB)	*(24)
27	Communication error (Main PCB ← Display PCB)	*(25)
29	Outdoor heat exchanger temperature sensor(middle) error	26
2b	Compressor temperature error	27
2c	4-way valve error	28

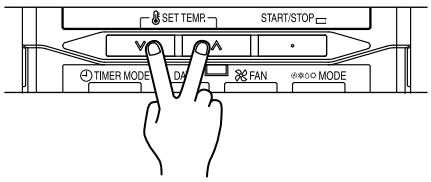
- If “CO” appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.
- Trouble shooting No.6,24,and 25 have no application in this models.

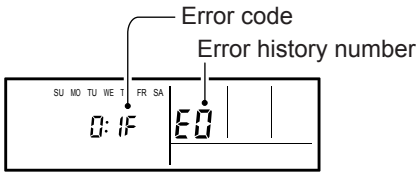
2. ERROR CODE HISTORY DISPLAY

Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

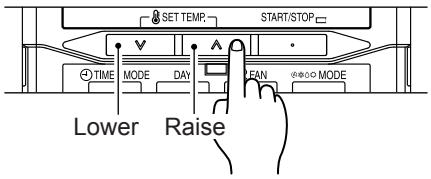
1. Stop the air conditioner operation.

2. Press the SET TEMPERATURE buttons ∨, ∧ simultaneously for 3 seconds or more to start the self-diagnosis.





3. Press the SET TEMPERATURE button to select the error history number.



0 ↔ 1 ↔ 2 ↔ 3 ↔ 4 ↔ 5 ↔ 6 ↔ 7
F ↔ E ↔ d ↔ c ↔ b ↔ A ↔ 9 ↔ 8

4. Press the SET TEMPERATURE buttons ∨, ∧ simultaneously for 3 seconds or more or there is no key input for 60 seconds to stop the display.

7-1-2 OUTDOOR UNIT DISPLAY

1. ERROR DISPLAY

1-1. For AR*A12L/ 14L/ 18L/ 24L (AO*A12L/ 14L/ 18L/ 24L)

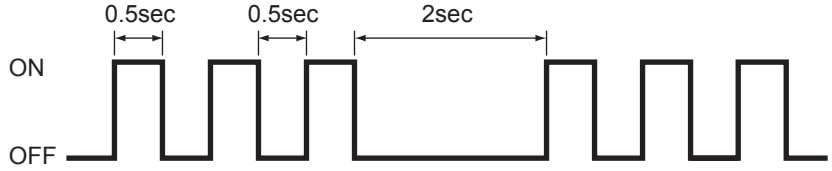
Error contents	LED Flashing Pattern	Trouble shooting
Discharge temperature error	Continuously lighting	9
IPM error	0.5sec ON / 0.5sec OFF	15
CT error	2sec ON / 2sec OFF	16
Compressor rotor location cannot detect	0.1sec ON / 2sec OFF	18,30
Outdoor unit sensor error (Discharge or Outdoor or Heat EX(In)(Out))	0.1sec ON / 0.1sec OFF	5,7,8,26
Outdoor unit fan motor error	5sec ON / 5sec OFF	19
Compressor temperature error	2sec ON / 5sec OFF	27
PFC circuit error	5sec ON / 2sec OFF	23

1-2. For AR*A36L/ 45L (AO*A36L/ 45L)

Error contents	LED Flashing Pattern	Display priority	Trouble shooting
Outdoor communication signal error (Forward transfer signal error)	1 time flash	1	12
Outdoor discharge pipe temperature sensor error	2 times blink	2	8
Outdoor heat exchanger temperature(outlet) sensor error	3 times blink	3	5
Outdoor temperature sensor error	4 times blink	4	7
Outdoor heat exchanger temperature(middle) sensor error	5 times blink	5	26
Discharge temperature error	6 times blink	6	9
Compressor temperature sensor error	7 times blink	7	13
Heat sink temperature sensor error	8 times blink	8	29
Pressure switch abnormal	9 times blink	9	14
Compressor temperature error	10 times blink	10	27
IPM error	12 times blink	11	15
Compressor rotor location cannot detect	13 times blink	12	18
Compressor Start-up error	14 times blink	13	30
Outdoor unit fan motor error (upper fan)	15 times blink	14	19
Outdoor unit fan motor error (lower fan)	16 times blink	15	

1-2-1. ERROR DISPLAY METHOD

Outdoor LED Blink (1 to 16 times) 0.5sec ON / 0.5sec OFF blinking



1-2-2. NORMAL OPERATION DISPLAY

Operation	LED Blinking Pattern
Normal operation	OFF
Protected operation	5sec ON / 1sec OFF
Pump down operation	1sec ON / 1sec OFF

7-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **INDOOR UNIT Error Method:** **Communication Error** **(Indoor unit ← Remote control)**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 00**
Detective Actuators: Indoor unit controller PCB circuit Wired Remote Control	**Detective details:** When the indoor unit cannot receive the signal from Wired Remote more than 10seconds after power ON, or the indoor unit cannot receive the signal more than 1minute during normal operation.

Forecast of Cause:

1. Terminal connection abnormal 2. Wired Remote Control failure 3. Controller PCB failure

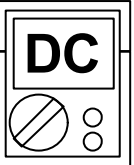
Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

- Check the connection of terminal between remote control and Indoor unit, and check if there is a disconnection of the cable.

OK

Check Point 2 : Check Remote Control and Controller PCB



- Check Voltage at CN14 (terminal 1-3) of Controller PCB. (Power supply to Remote Control)

>> If it is DC12V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB

▶ **Upon correcting the removed connector or mis-wiring, reset the power.**

Trouble shooting 2 **OUTDOOR UNIT Error Method:** **Communication Error** **(Serial Reverse Transfer Error)**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 01**
Detective Actuators: Outdoor Unit Main PCB Circuit Active Filter Module	**Detective details:** When the indoor unit cannot receive the serial signal from Outdoor unit more than 10seconds, then permanent stop after 20seconds.

Forecast of Cause:

1. Connection failure 2. External cause 3. Main PCB failure 4. Active Filter Module failure

Check Point 1-1 : Reset the power and operate

- Does Error indication show again?

NO → **Check Point 1-2: Check external cause such as noise**

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

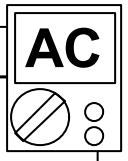
YES

Check Point 2 : Check Connection

- Check any loose or removed connection line of Indoor unit and Outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection between Outdoor Unit Main PCB and Filter PCB.
  (If there is loose connector or open cable)

OK

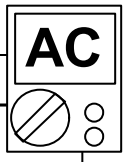
Check Point 3 : Check the voltage of power supply



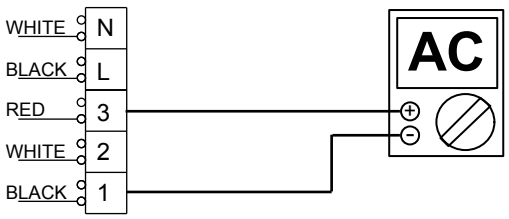
- Check the voltage of power supply
  >> Check if AC198 - 264V appears at Outdoor Unit Terminal L - N.

OK

Check Point 4 : Check Serial Signal (Reverse Transfer Signal)



- Check Serial Signal (Reverse Transfer Signal)
  >> Check if Indicated value swings between AC70V and AC130V at Outdoor Unit Terminal 1 - 3.
  >> If it is abnormal, Check Active Filter Module. (PARTS INFORMATION 3)
  >>If Active Filter Module is abnormal, replace it.
  >>If Active Filter Module is normal, replace Main PCB.



Trouble shooting 3 **INDOOR UNIT Error Method:** **Room Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 02**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Room Temperature Thermistor	When Room Temperature Thermistor open or short-circuit is detected at power ON.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Controller PCB failure

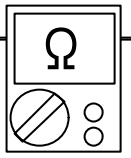
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

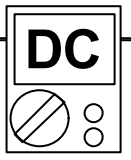
Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
Resistance Value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.04	6.51

Temperature	40°C	45°C	50°C
Resistance Value (kΩ)	5.30	4.35	3.59

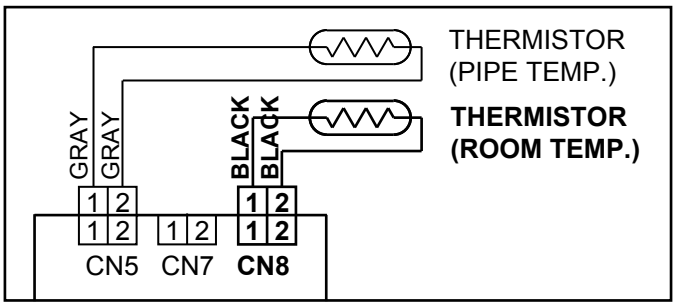
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)



Make sure circuit diagram of indoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Controller PCB.**

Trouble shooting 4 **INDOOR UNIT Error Method:** **Indoor Heat Exchanger Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 04**
Detective Actuators: Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor	**Detective details:** When Heat Exchanger Temperature Thermistor open or short-circuit is detected at power ON.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Controller PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
Resistance Value (kΩ)	176	134	103	80.3	62.9	49.7	39.6	31.7

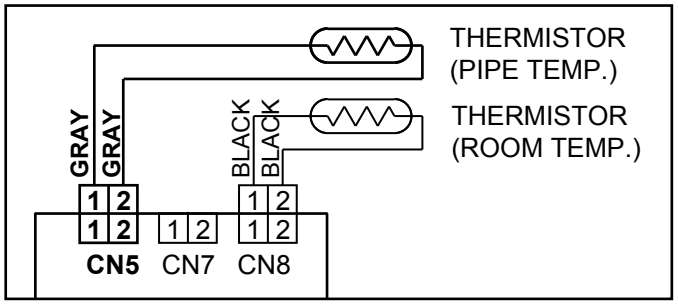
Temperature	40°C	45°C	50°C
Resistance Value (kΩ)	25.6	20.8	17.1

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Make sure circuit diagram of indoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Controller PCB.**

Trouble shooting 5 **OUTDOOR UNIT Error Method:** **Outdoor Heat Exchanger Temperature Sensor (Outlet) Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 0.1sec OFF** **(AR*A36L/ 45L) : LED 3 times blink** **ERROR CODE : E : 06**
Detective Actuators: Outdoor Unit Main PCB Circuit Heat Exchanger Temperature Thermistor (Outlet)	**Detective details:** When Heat Exchanger Temperature Thermistor (Outlet) open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84

Temperature	35°C	40°C	45°C	50°C	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	3.11	2.53	2.08	1.71	1.19	0.840	0.606	0.446	0.333

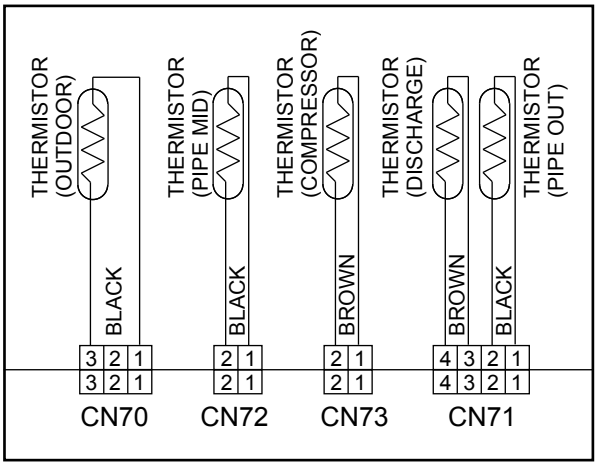
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

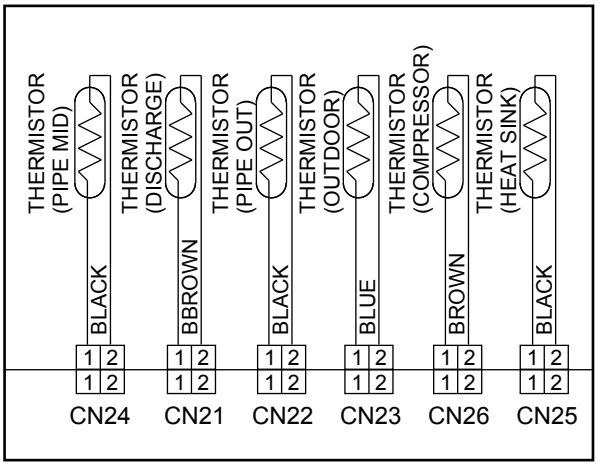
Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A12L- 24L



For AR*A36L/ 45L



▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 7 **OUTDOOR UNIT Error Method:** **Outdoor Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 0.1sec OFF** **(AR*A36L/ 45L) : LED 4 times blink** **ERROR CODE : E : 0A**
Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Temperature Thermistor	**Detective details:** When Outdoor Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-20°C	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C
Resistance Value (kΩ)	115	62.3	46.6	35.2	26.9	20.7	16.1	12.6

Temperature	30°C	40°C	50°C	60°C	70°C
Resistance Value (kΩ)	7.97	5.18	3.45	2.36	1.65

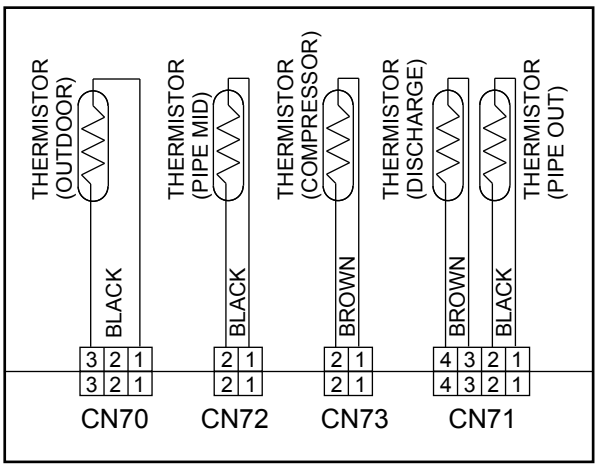
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

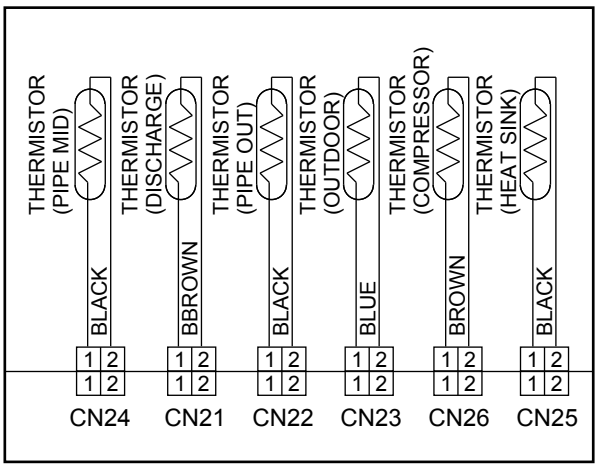
Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A12L- 24L



For AR*A36L/ 45L



▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 8 **OUTDOOR UNIT Error Method:** **Outdoor Discharge Pipe Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 0.1sec OFF** **(AR*A36L/ 45L) : LED 2 times blink** **ERROR CODE : E : 0C**
Detective Actuators: Outdoor Unit Main PCB Circuit Discharge Pipe Temperature Thermistor	**Detective details:** When Discharge Pipe Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (kΩ)	169	130	101	79.1	62.6	40.0	26.3	17.8	12.3

Temperature	70°C	80°C	90°C	100°C	120°C	140°C
Resistance Value (kΩ)	8.70	6.27	4.60	3.43	2.00	1.22

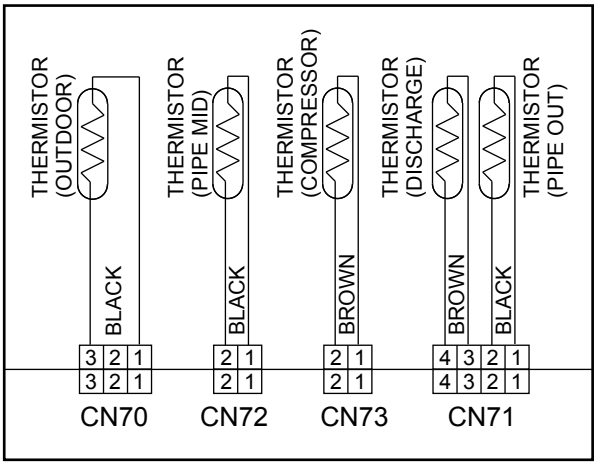
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

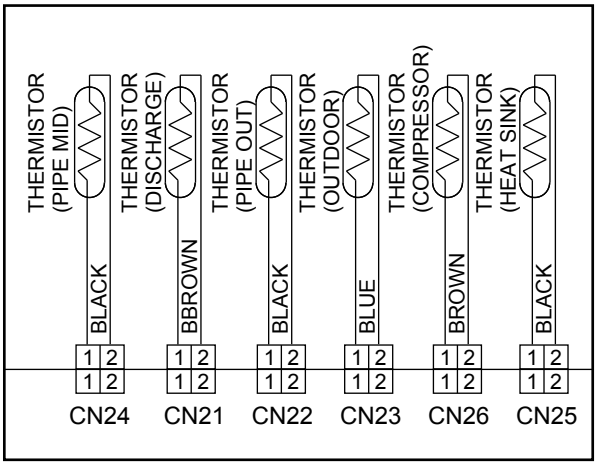
Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A12L- 24L



For AR*A36L/ 45L



▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 9 **OUTDOOR UNIT Error Method:** **Discharge temperature error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED continuously lighting** **(AR*A36L/ 45L) : LED 6 times blink** **ERROR CODE : E : 0F**
Detective Actuators: Outdoor Unit Main PCB Circuit Discharge Pipe Temperature Thermistor	**Detective details:** ① When the discharge temperature becomes higher than 110°C (AR*A36L and 45L is 115°C), the compressor stops. ② After the compressor restarts, if the same operation is repeated, the compressor stops permanently.

Forecast of Cause :

1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Discharge Thermistor failure
5. Outdoor Fan Operation failure 6. Outdoor Heat Exchanger clogged

< Cooling mode >

Check Point 1 : Check if Gas Valve is open

- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open? (Refer to PARTS INFORMATION 4)

>>If EEV or Strainer is defective, replace it.

OK

Check Point 3 : Check if gas leak or less gas

- Measure Gas pressure, if there is a leak, correct it.

>>If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Discharge Thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

>> Check characteristics of thermistor (Refer to Trouble shooting 8), If defective, replace the thermistor

OK

Check Point 5 : Check Outdoor FAN, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating? (Check by hand and if it is locked, replace the motor)
- Check Outdoor Fan Motor.

>>If the Fan Motor is defective, replace it.

< Heating mode >

Check Point 1 : Check if LIquid Valve is open

- If it is not open, open it and check the operation.

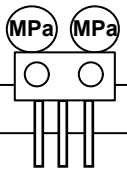
OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open? (Refer to PARTS INFORMATION 4)

>>If EEV or Strainer is defective, replace it.

OK



Trouble shooting 10 **INDOOR UNIT Error Method:** **Indoor EEPROM abnormal (Model No.)**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 11**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB circuit	When the model information being read from EEPROM has an apparent error.

Forecast of Cause:

1. External cause 2. Defective connection of electric components 3. Controller PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 :
Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line.(Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

YES → Check Point 2 :
Check Indoor Unit electric components

- Check all connectors. (loose connector or incorrect wiring)
- Check any shortage or corrosion on PCB.

→ Check Point 3 : Replace Controller PCB

▶ **Change Controller PCB.**

Note : EEPROM

EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically.
To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.)
There is a limit in a number of rewriting.

Trouble shooting 11 **INDOOR UNIT Error Method:** **Indoor Fan Motor abnormal**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 12**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Indoor Fan Motor	When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency is continued more than 56 seconds.

Forecast of Cause:

1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise
4. Control PCB failure

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
  (Check if fan is caught, dropped off or locked motor)
  >>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)
  >>Upon the temperature coming down, restart operation.

OK

Check Point 3 : Replace Controller PCB

▶ **If Check Point 1- 2 do not improve the symptom, replace Controller PCB.**

Trouble shooting 12 **INDOOR UNIT Error Method:** **Outdoor Communication Signal Error (Forward Transfer Signal Error)**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : No indication** **(AR*A36L/ 45L) : LED 4 times blink** **ERROR CODE : E : 13**
Detective Actuators: Indoor Unit Controller PCB Circuit	**Detective details:** When the outdoor unit cannot receive the serial signal from Indoor unit more than 10seconds.

Forecast of Cause:

1. Connection failure 2. External cause 3. Controller PCB failure

Check Point 1-1 : Reset the power

- Does Error indication reappear?

NO

YES

Check Point 2 : Check Connection

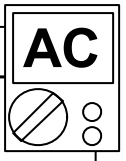
- Check any loose or removed connection line of Indoor unit and Outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection between Indoor Unit Controller PCB and Filter PCB.
  (If there is loose connector or open cable)

Check Point 1-2:
Check external cause such as noise

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

OK

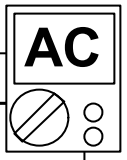
Check Point 3 : Check the voltage of power supply



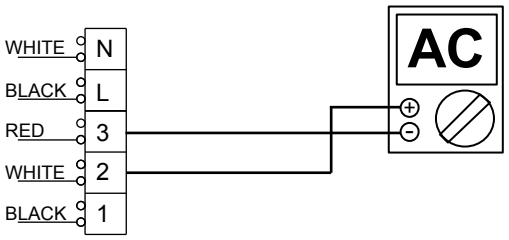
- Check the voltage of power supply
  >> Check if AC198 - 264V appears at Outdoor Unit Terminal L - N.

OK

Check Point 4 : Check Serial Signal (Forward Transfer Signal)



- Check Serial Signal (Forward Transfer Signal)
  >> Check if Indicated value swings between AC70V and AC130V at Outdoor Unit Terminal 2 - 3.
  >> If it is abnormal, Controller PCB is failure. >> Replace Controller PCB



Trouble shooting 13 **OUTDOOR UNIT Error Method:** **Compressor Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 0.1sec OFF** **(AR*A36L/ 45L) : LED 7 times blink** **ERROR CODE : E : 15**
Detective Actuators: Outdoor Unit Main PCB Circuit Compressor Temperature Thermistor	**Detective details:** When Compressor Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Rough value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (kΩ)	169	130	101	79.1	62.6	40.0	26.3	17.8	12.3

Temperature	70°C	80°C	90°C	100°C	120°C	140°C
Resistance Value (kΩ)	8.70	6.27	4.60	3.43	2.00	1.22

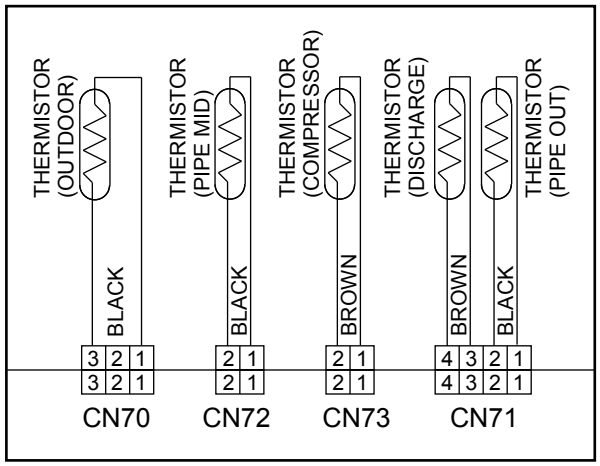
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

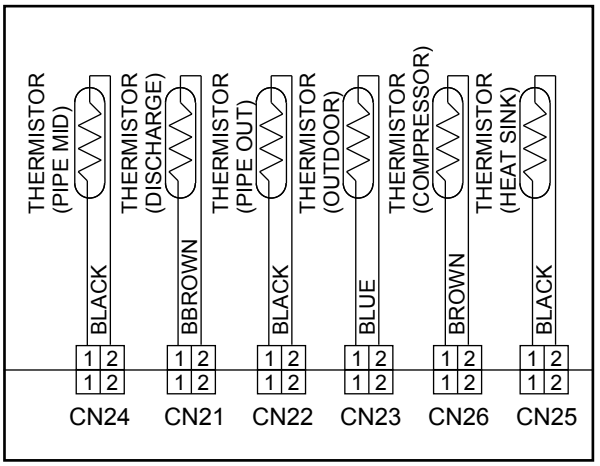
Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A12L- 24L



For AR*A36L/ 45L



▶ **If the voltage does not appear, replace Main PCB.**

(For AR*A36L/ 45L)

Trouble shooting 14 **OUTDOOR UNIT Error Method:** **Pressure Switch Error**	**Indicate or Display:** **Outdoor Unit : LED 9 times blink** **ERROR CODE : E : 16**
Detective Actuators: Outdoor Unit Main PCB Circuit Pressure Switch	**Detective details:** When pressure switch open is detected in 10 seconds after the power is turned on.

Forecast of Cause :

1. Connector connection failure 2. Pressure Switch failure 3. Main PCB failure

Check Point 1 : Reset Power Supply and operate

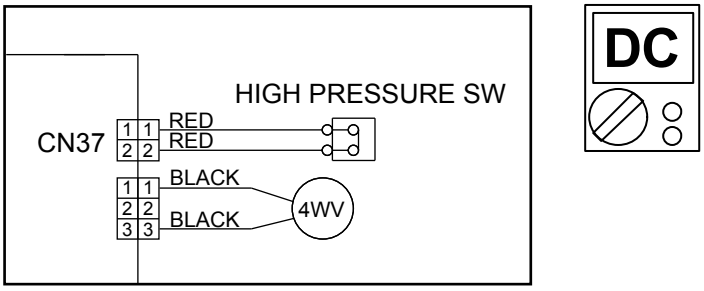
- Does abnormal LED indication show again?

NO

YES

Check Point 2 : Check voltage of Main PCB (DC5.0V)

- Make sure circuit diagram of outdoor unit and check terminal voltage at Pressure Switch. (DC5.0V)



▶ **If the voltage does not appear, replace Main PCB.**

OK

Check Point 3 : Check Pressure Switch

- Check if connector is loose or cable is open.
  >> If no abnormal connection is found, replace Pressure Switch.

▶ **After replacing Pressure Switch, check operating condition and pressure in operation.**

OK

Check Point 4 : Check High Pressure Protection on cooling

- Check Excessive high pressure protection on cooling. (Refer to Trouble shooting 22)

Trouble shooting 15 **OUTDOOR UNIT Error Method:** **IPM error (Permanent Stop)**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.5sec ON/ 0.5sec OFF** **(AR*A36L/ 45L) : LED 12 times blink** **ERROR CODE : E : 17**
Detective Actuators: Outdoor Unit Main PCB Circuit Compressor	**Detective details:** ① When more than normal operating current to IPM in Main PCB flows, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components
2. Outdoor Fan Operation failure
3. Outdoor Heat Exchanger clogged
4. Compressor failure
5. Main PCB failure

Check Point 1 : Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check Outdoor Fan, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating by hand when operation is off ?

>> If the Fan Motor is locked, replace it.

OK

Check Point 3 : Check Outdoor Fan

- Check Outdoor Fan Motor. (Refer to Trouble shooting 19)

>> If the Fan Motor is failure, replace it.

OK

Check Point 4 : Check Compressor

- Check Compressor. **(PARTS INFORMATION 2)**

OK

Check Point 5 : Replace Main PCB

▶ **If Check Point 1～4 do not improve the symptom, change Main PCB.**

Trouble shooting 16 **OUTDOOR UNIT Error Method:** CT error	**Indicate or Display:** Outdoor Unit (AR*A12L- 24L) : LED 2sec ON/ 2sec OFF (AR*A36L/ 45L) : No indication ERROR CODE : E : 18
Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Unit Filter PCB Circuit (Input current sensor unit)	**Detective details:** When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 56Hz(for AR*A12L-24L) or 50Hz(for AR*A36L/ 45L), after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Defective connection of electric components 2. External cause 3. Filter PCB failure 4. Main PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 :
Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line.(Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

YES → Check Point 2 :
Check connections of Outdoor Unit Electrical Components

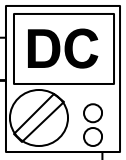
- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

AR*A12L- 24L

Check Point 3 : Check Filter PCB and Main PCB



- Check DC voltage of CN1 (between 2 (Brown) and 3 (Red)) on Filter PCB.

>> After 40seconds upon starting the Compressor,
If it is higher than 0.2V, Main PCB is failure. (Filter PCB is normal) >> Replace Main PCB
>> If it is lower than 0.2V, Filter PCB is failure. >> Replace Filter PCB

▶ **If it does not improve the symptom, change Main PCB.**

Check Point 4 : Replace Main PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Main PCB.**

(For AR*A36L/ 45L)

Trouble shooting 17 **OUTDOOR UNIT Error Method:** **Active Filter Module (AFM) error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 19**
Detective Actuators: Outdoor Unit Main PCB Circuit Active Filter Module	**Detective details:** When inverter input DC voltage is higher than 467V or lower than 237V. When a momentary power cut off occurred on low voltage.

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Active Filter Module failure 4 . Main PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 2 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Check Active Filter Module

- Check Active Filter Module. **(PARTS INFORMATION 3)**

>>If Active Filter Module is abnormal, replace it.

OK

Check Point 4 : Replace Main PCB

▶ **If Check Point 1～3 do not improve the symptom, change Main PCB.**

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **Compressor rotor location cannot detect (Permanent Stop)**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 2sec OFF** **(AR*A36L/ 45L) : LED 13 times blink** **ERROR CODE : E : 1A**
Detective Actuators: Outdoor Unit Main PCB Circuit Compressor	**Detective details:** ① While running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90 degrees, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Main PCB failure 3. Compressor failure

Check Point 1 : Check Noise from Compressor

- Turn on Power and check operation noise.

▶ **If an abnormal noise show, replace Compressor.**

OK

Check Point 2 : Check connection of around the Compressor components

For Compressor Terminal, Main PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.
  (Refer to PARTS INFORMATION 2)

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3: Replace Main PCB

▶ **If Check Point 1,2 do not improve the symptom, change Main PCB.**

Trouble shooting 19 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 5sec ON/ 5sec OFF** **(AR*A36L/ 45L) : LED 15 times blink (Upper fan)** **LED 16 times blink (Lower fan)** **ERROR CODE : E : 1b**

Detective Actuators:	**Detective details:**
Outdoor Unit Main PCB Circuit Outdoor Fan Motor	① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 5 times in a row, compressor and fan motor stops permanently.

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure

Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

・Check excessively high temperature around the motor.
(If there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation.

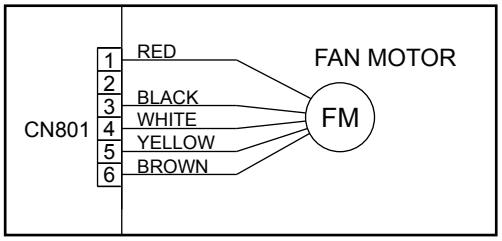
OK

Check Point 3 : Check Output Voltage of Main PCB

DC

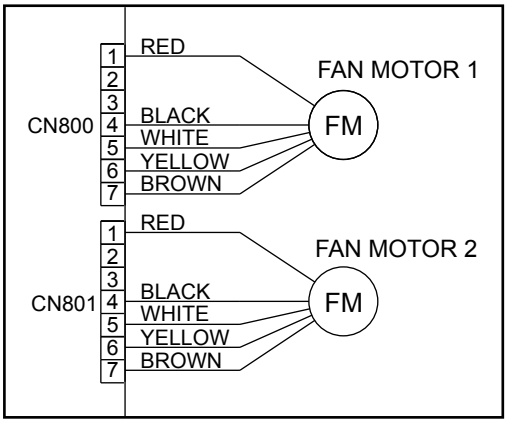
・Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector)

AR*A12L- 24L



Read wire	DC voltage
Red - Black	150～390V
White - Black	15±1.5V

AR*A36L/ 45L



Read wire	DC voltage
Red - Black	300～400V
White - Black	15±1.5V

▶ **If the voltage is not correct, replace Main PCB.**

Trouble shooting 20 **OUTDOOR UNIT Error Method:** **Outdoor unit computer communication error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 1c**

Detective Actuators:	**Detective details:**
Outdoor Unit Main PCB Circuit	When it cannot receive an effective signal for 10sec between the Main CPU and Sub CPU in outdoor unit.

Forecast of Cause :

1. Main PCB failure

Check Point 1 : Replace Main PCB

▶ **Change Main PCB.**

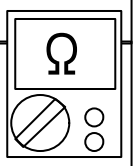
Trouble shooting 21 **INDOOR UNIT Error Method:** **Indoor manual auto switch error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 20**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Forced auto switch	When the Forced auto switch becomes ON for 30 consecutive seconds.

Forecast of Cause :

1. Forced auto switch failure 2.Controller PCB failure

Check Point 1 : Check the Forced auto switch



- Check if Forced auto switch is kept pressed.
- Check ON/OFF switching operation by using a meter.

>>If Forced auto switch is detective, replace it.

OK

Check Point 2 : Replace Controller PCB

▶ **If Check Point 1 do not improve the symptom, change Controller PCB.**

Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Excessive high pressure protection on cooling**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 24**

Detective Actuators:	**Detective details:**
Outdoor Unit Main PCB Circuit Outdoor Fan Motor Heat Exchanger Temp. Thermistor (Middle) Outdoor unit Electronic Expansion Valve	Excessive high pressure protection on cooling mode has been activated.

Forecast of Cause :

1. Defective connection of electric components 2. Outdoor Fan Operation failure
3. Outdoor Heat Exchanger clogged 4. Thermistor failure 5. EEV failure 6. Main PCB failure

Check Point 1 : Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check Outdoor Fan, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating by hand when operation is off ?

>> If the Fan Motor is locked, replace it.

OK

Check Point 3 : Check Outdoor Fan

- Check Outdoor Fan Motor. (Refer to Trouble shooting 19)

>> If the Fan Motor is failure, replace it.

OK

Check Point 4 : Check Thermistor (middle)

- Check Thermistor (middle). (Refer to Trouble shooting 26)

>> If the Thermistor (middle) is failure, replace it.

OK

Check Point 5 : Check Electronic Expansion Valve

- Check EEV. **(PARTS INFORMATION 4)**

OK

Check Point 6 : Replace Main PCB

▶ **If Check Point 1～5 do not improve the symptom, change Main PCB.**

(For AR*A12L - 24L)

Trouble shooting 23 **OUTDOOR UNIT Error Method:** **PFC circuit error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 25**
Detective Actuators: Outdoor Unit Main PCB Circuit	**Detective details:** When inverter output DC voltage is higher than 415V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Main PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 2 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Replace Main PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Main PCB.**

Trouble shooting 26 **OUTDOOR UNIT Error Method:** **Outdoor Heat Exchanger Temperature Sensor (Middle) Error**	**Indicate or Display:** **Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 0.1sec OFF** **(AR*A36L/ 45L) : LED 5 times blink** **ERROR CODE : E : 29**
Detective Actuators: Outdoor Unit Main PCB Circuit Heat Exchanger Temperature Thermistor (Middle)	**Detective details:** When Heat Exchanger Temperature Thermistor (Middle) open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84

Temperature	35°C	40°C	45°C	50°C	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	3.11	2.53	2.08	1.71	1.19	0.840	0.606	0.446	0.333

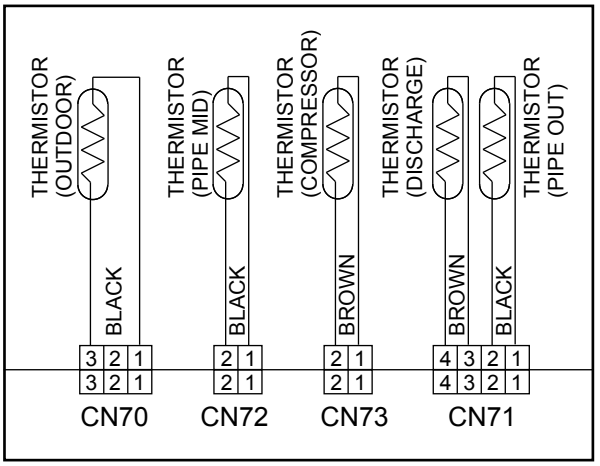
▶ If Thermistor is either open or shorted, replace it and reset the power.

OK

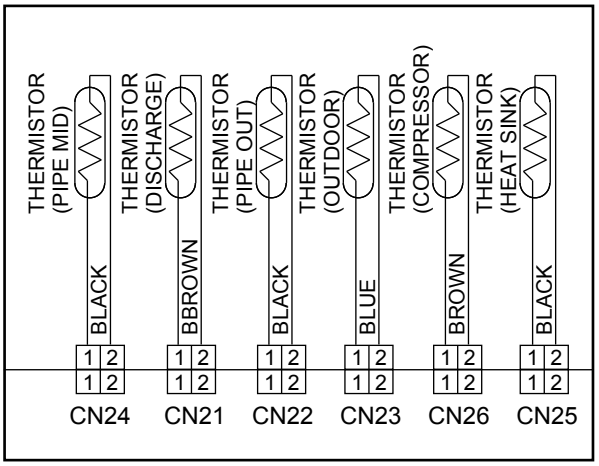
Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A12L- 24L



For AR*A36L/ 45L



▶ If the voltage does not appear, replace Main PCB.

Trouble shooting 27 **OUTDOOR UNIT Error Method:** Compressor temperature error	**Indicate or Display:** Outdoor Unit (AR*A12L- 24L) : LED 2sec ON/ 5sec OFF (AR*A36L/ 45L) : LED 10 times blink ERROR CODE : E : 2b
Detective Actuators: Outdoor Unit Main PCB Circuit Compressor Temperature Thermistor	**Detective details:** ① When the compressor temperature becomes higher than 110°C, the compressor stops. ② After the compressor restarts, if the same operation is repeated, the compressor stops permanently.

Forecast of Cause :

1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Compressor Thermistor failure
5. Outdoor Fan Operation failure 6. Outdoor Heat Exchanger clogged

< Cooling mode >

Check Point 1 : Check if Gas Valve is open

- If it is not open, open it and check the operation.

OK

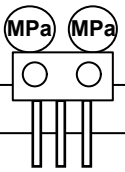
Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 4)

>>If EEV or Strainer is defective, replace it.

OK

Check Point 3 : Check if gas leak or less gas



- Measure Gas pressure, if there is a leak, correct it.

>>If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Compressor Thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

>> Check characteristics of thermistor (Refer to Trouble shooting 13), If defective, replace the thermistor

OK

Check Point 5 : Check Outdoor FAN, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating? (Check by hand and if it is locked, replace the motor)
- Check Outdoor Fan Motor.

>>If the Fan Motor is defective, replace it.

< Heating mode >

Check Point 1 : Check if LIquid Valve is open

- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 4)

>>If EEV or Strainer is defective, replace it.

OK

Trouble shooting 28 **INDOOR UNIT Error Method:** **4-way valve error**	**Indicate or Display:** **Outdoor Unit : No indication** **ERROR CODE : E : 2c**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor Room Temperature Thermistor 4-way valve	When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. ▪ Cooling or Dry operation [Indoor heat exchanger temp.] - [Room temp.] > 10degC ▪ Heating operation [indoor heat exchanger temp.] - [room temp.] < -10degC If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Coil failure 4. 4-way valve failure
5. Controller PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check Heat exchanger temp. thermistor and Room temp. thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

>> Check characteristics of thermistor (Refer to Trouble shooting 3, 4), If defective, replace the thermistor

OK

Check Point 3 : Check the solenoid coil and 4-way valve

[Solenoid coil]

- Remove CN30 from PCB and check the resistance value of coil.
  Resistance value is about 1.4kΩ

>>If it is Open or abnormal resistance value, replace Solenoid Coil.

[4-way valve]

- Check each piping temperature,
  and the location of the valve by the temperature difference.

>>If the value location is not proper, replace 4-way valve.

OK

Check Point 4 : Replace Controller PCB

▶ **If Check Point 1- 3 do not improve the symptom, replace Controller PCB.**

(For AR*A36L/ 45L)

Trouble shooting 29 **OUTDOOR UNIT Error Method:** **Heat Sink Temperature Sensor Error**	**Indicate or Display:** **Outdoor Unit : LED 8 times blink** **ERROR CODE : No indication**

Detective Actuators: Outdoor Unit Main PCB Circuit Heat Sink Temperature Thermistor	**Detective details:** When Heat Sink Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84

Temperature	35°C	40°C	45°C	50°C	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	3.11	2.53	2.08	1.71	1.19	0.840	0.606	0.446	0.333

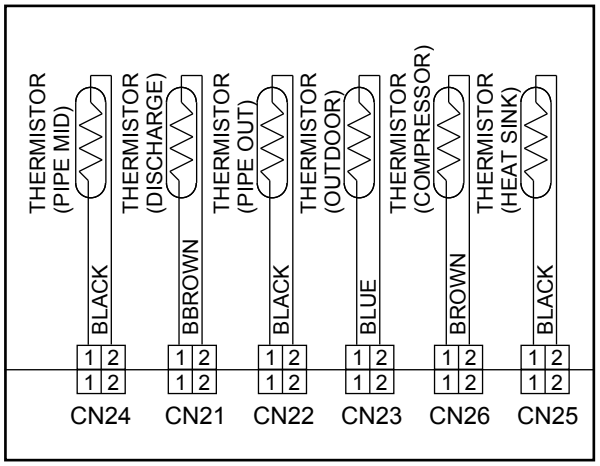
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

For AR*A36L/ 45L



▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 30 **OUTDOOR UNIT Error Method:** Compressor Start-up error (Permanent Stop)	**Indicate or Display:** Outdoor Unit (AR*A12L- 24L) : LED 0.1sec ON/ 2sec OFF (AR*A36L/ 45L) : LED 14 times blink ERROR CODE : E : 1A
Detective Actuators: Outdoor Unit Main PCB Circuit Compressor	**Detective details:** ① On start-up the compressor, when detected rotor position is out of phase with actual rotor position more than 90 degrees,the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Main PCB failure 3. Compressor failure

Check Point 1 : Check Noise from Compressor

- Turn on Power and check operation noise.

▶ **If an abnormal noise show, replace Compressor.**

OK

Check Point 2 : Check connection of around the Compressor components

For Compressor Terminal, Main PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.
  (Refer to PARTS INFORMATION 2)

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Replace Main PCB

▶ **If Check Point 1,2 do not improve the symptom, replace Main PCB.**

7-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 31

Indoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

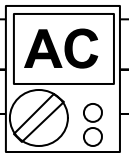
OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check Voltage of power supply.

>> Check AC198 - 264V appears at Indoor Unit Terminal 1 - 2 (Power Supply).

NO

YES

- Check Fuse in Filter PCB.

>> If Fuse is open, check if the wiring between Terminal and Filter PCB is loose, and replace Fuse.

- Check Varistor in Filter PCB.

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power supply and replace Varistor.

OK

▶ If the symptom does not change by above Check3, replace Filter PCB.

Trouble shooting 32

Outdoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

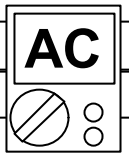
OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.

>> Check if AC198 - 264V appears at Outdoor Unit Terminal L - N.

NO

YES

- Check Fuse in Main PCB.

>> If Fuse is open, check loose terminal or removed connector (CN1) , and replace Fuse.

- Check Varistor in Main PCB.

>> If Varistor is defective, there is a possibility of an abnormal power supply.
Check the correct power supply and replace Varistor.
Upon checking the normal power supply, replace Varistor.

YES

- Check Active Filter Module. **(PARTS INFORMATION 3)**

>>If Active Filter Module is abnormal, replace it.

OK

▶ **If the symptom does not change by above Check 3, replace Main PCB.**

Trouble shooting 33

No Operation (Power is ON)

Forecast of Cause:

1. Setting/ Connection failure 2. External cause
3. Electrical Component defective

Check Point 1 : Check indoor and outdoor installation condition

- Indoor Unit - Check incorrect wiring between Indoor Unit - Remote Control, or terminals between Indoor Units. Or, check if there is an open cable connection.
- Are these Indoor Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?

>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

- Is there loose or removed communication line of Indoor Unit and Outdoor Unit?

OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components at Indoor and Outdoor

- Check Voltage at CN14 of Controller PCB.
  (Power supply to Remote Control)

>> If it is DC12V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB

>> If the symptom does not change by above Check 1, 2, 3, replace Main PCB of Outdoor unit.

Trouble shooting 34

No Cooling / No Heating

Forecast of Cause:

1. Indoor Unit error 2. Outdoor Unit error
3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure 5. Refrigeration cycle failure

Check Point 1 : Check Indoor Unit

- Does Indoor Unit FAN run on HIGH FAN?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?
- Check if Energy save function is operated.

OK

Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
  (If not, refer to Trouble shooting 32)
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?

OK

Check Point 3 : Check Site Condition

- Is capacity of Indoor Unit fitted to Room size?
- Any windows open? Or direct sunlight ?

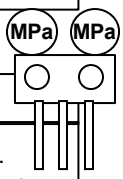
OK

Check Point 4 :
Check Indoor/ Outdoor Installation Condition

- Check connection pipe
  (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.

>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

OK



Check Point 5 : Check Refrigeration Cycle

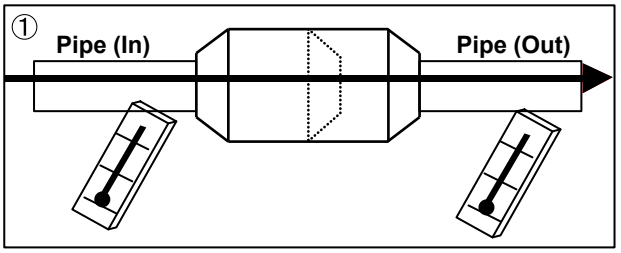
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

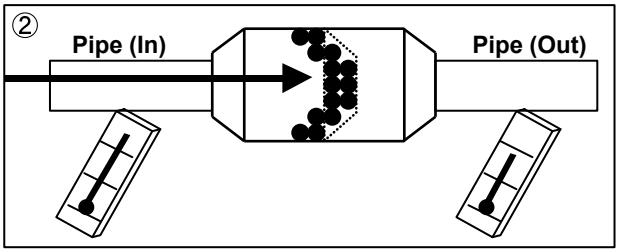
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- Check EEV (PARTS INFORMATION 4)
- Check Compressor (PARTS INFORMATION 1,2)

Attention

Strainer normally does not have temperature difference between inlet and outlet as shown in ①, but if there is a difference like shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.





Trouble shooting 35

Abnormal Noise

Forecast of Cause :

1. Abnormal installation (Indoor/ Outdoor) 2. Fan failure(Indoor/ Outdoor)
3. Compressor failure (Outdoor)

Diagnosis method when Abnormal Noise is occurred

- Abnormal noise is coming from Indoor Unit. (Check and correct followings)
  - Is Main Unit installed in stable condition?
  - Is the installation of Air suction grille and front panel normal?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

- Abnormal noise is coming from Outdoor Unit. (Check and correct followings)
  - Is Main Unit installed in stable condition?
  - Is Fan Guard installed normally?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

OK

  - Check if vibration noise by loose bolt or contact noise of piping is happening.

OK

  - Is Compressor locked? >> Check Compressor (PARTS INFORMATION 1,2)

Trouble shooting 36

Water Leaking

Forecast of Cause:

1. Erroneous installation 2. Drain hose failure

Diagnosis method when water leak occurs

- Is Main Unit installed in stable condition?
- Is Main Unit broken or deformed at the time of transportation or maintenance?

OK

- Is Drain Hose connection loose?
- Is there a trap in Drain Hose?
- Is Drain Hose clogged?

OK

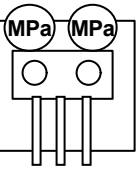
- Is Fan rotating?

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

- Check Gas Pressure and correct it if there was a gas leak.



7-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit LED displays Error, refer to Trouble shooting)

Does not start up

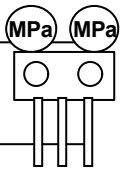
- Is there open or loose connection cable?
- Check Filter PCB, Main PCB, connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

Replace Compressor

Stops soon after starting up

- Is there open or loose connection cable?
- Is Gas Pipe Valve open? (Low Pressure is too low)
- Check if Refrigerant is leaking. (Recharge Refrigerant)



- Check if Strainer is clogged. (PARTS INFORMATION 4)
- Check Filter PCB, Main PCB, connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor can be considered. (Compression part broken or valve defective.)

Replace Compressor

Abnormal noise

- Check if vibration noise by loose bolt or contact noise of piping is happening.

▶Defective Compressor can be considered. (due to inside dirt clogging or broken component)

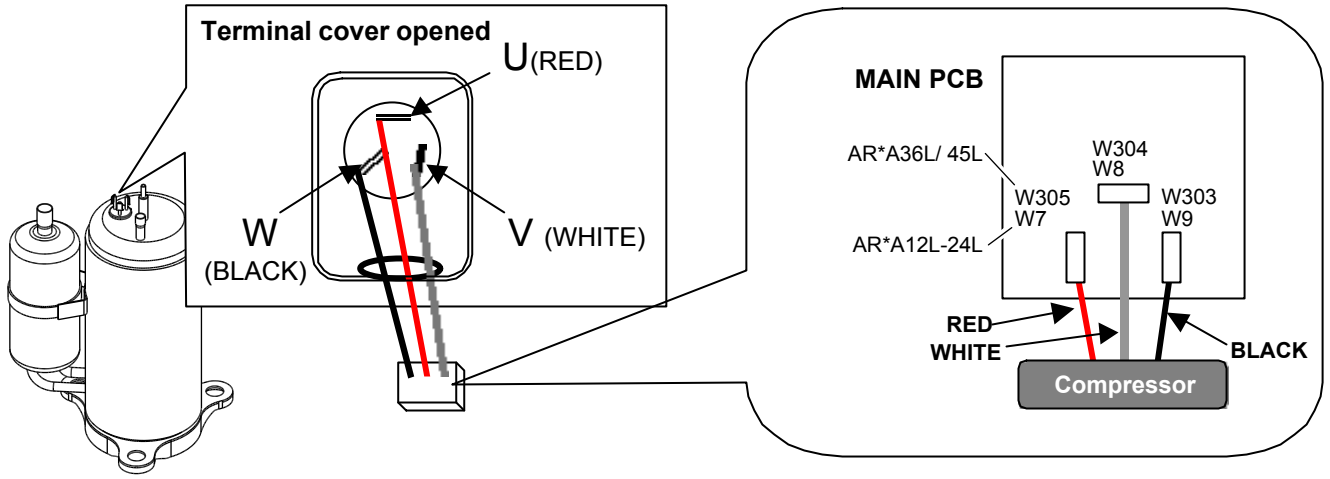
Replace Compressor

SERVICE PARTS INFORMATION 2

Inverter Compressor

Check Point 1 : Check Connection

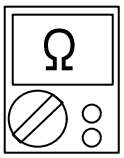
- Check terminal connection of Compressor (loose or incorrect wiring)
- Check connection of Main PCB (Loose or incorrect wiring)

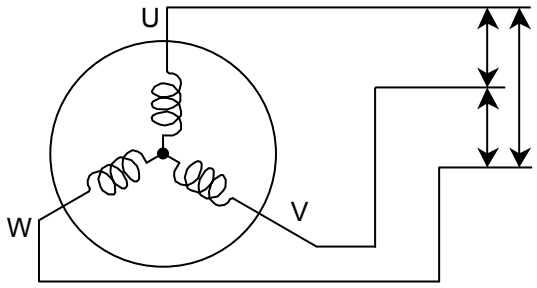


Check Point 2 : Check Winding Resistance

- Check winding resistance of each terminal

▶ **If the resistance value is 0Ω or infinite, replace Compressor.**





Resistance Value :
0.73 Ω (For AR*A12L/ 14L/ 18L)
0.97 Ω (For AR*A24L)
0.26 Ω (For AR*A36L/ 45L)
at 20°C

Check Point 3 : Replace Main PCB

▶ **If the symptom does not change with above Check 1, 2, replace Main PCB.**

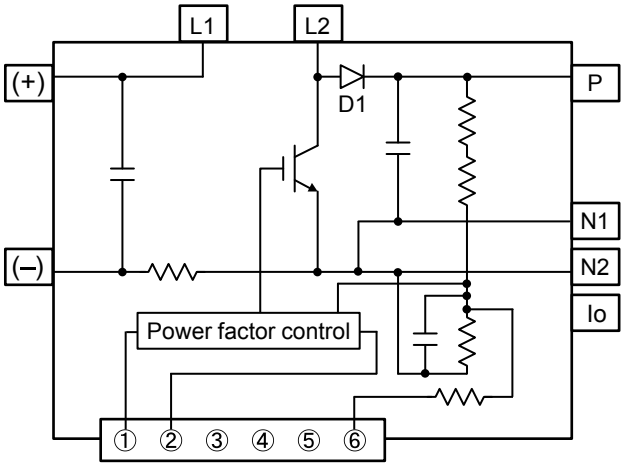
(For AR*A36L/ 45L)

SERVICE PARTS INFORMATION 3

Active Filter Module

Check Point 1 : Check Open or Short-circuit and Diode (D1)

・Remove connector, check the open or short-circuit and the diode in the module



Check the open or short-circuit

Terminal		Resistance value
Tester(+)	Tester(-)	
(+)	(–)	**360k**Ω
(–)	N1	**0**Ω
P	(+)	**720k**Ω
L1	L2	**5.4M**Ω (approx.)
P	N1	**360k**Ω
L1,L2	Control Box	**∞** Ω
L2	N2	**5.8M**Ω(approx.)

Check the diode

Terminal		Resistance value
Tester(+)	Tester(-)	
L2	P	**5.3M**Ω (approx.)
P	L2	**5.4M**Ω (approx.)

▶ **If it is abnormal,replace ACTIVE FILTER MODULE**

Check Point 2 : Check the Output DC voltage (between P and N1)

・Check the Output DC voltage (between P and N1) of compressor stopping and operating.

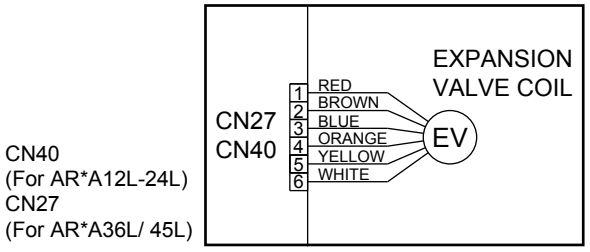
>> If the output voltage of compressor operating is less than the output voltage of compressor stopping, Active Filter Module is detective. >> **Replace Active Filter Module**

SERVICE PARTS INFORMATION 4

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

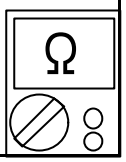
・Check connection of connector (CN27 or CN40)
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46**Ω ± **4**Ω at 20°C
Yellow - Brown	
Orange - Red	
Blue - Brown	



▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Main PCB.

・Remove Connector and check Voltage (DC12V)

▶ **If it does not appear, replace Main PCB.**

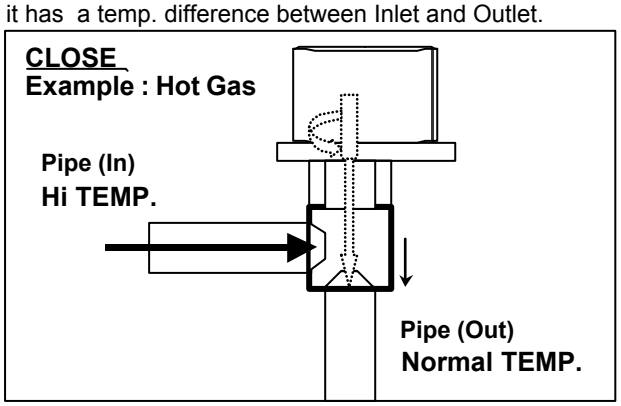
Check Point 4 : Check Noise at start up

・Turn on Power and check operation noise.

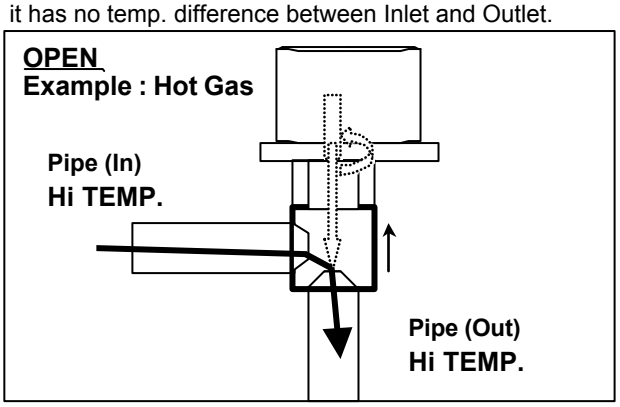
▶ **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

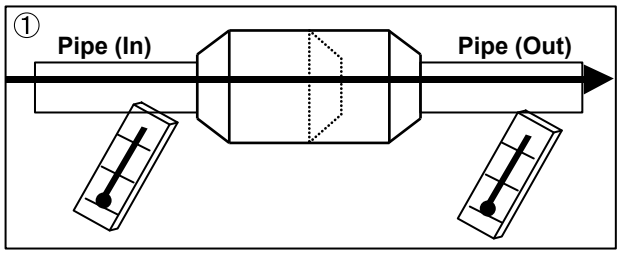


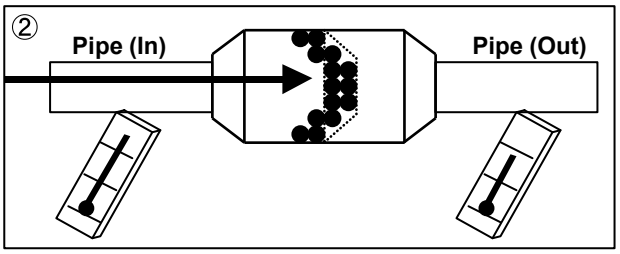
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in ① ,
but if there is a difference as shown in ② , there is a possibility of inside clogged. In this case, replace Strainer.





Refrigerant
R410A

DUCT type
INVERTER

8 . APPENDING DATA

8. APPENDING DATA

8-1. CAPACITY TABLE

■ MODEL : AR*A12LATN / AO*A12LACL

● COOLING

AFR	12.2

		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	3.52	3.13	0.31	3.92	3.15	0.31	4.05	3.42	0.32	4.32	3.43	0.32	4.46	3.70	0.32	4.72	3.69	0.32	4.99	3.93	0.33
	0	3.33	3.00	0.51	3.71	3.02	0.52	3.84	3.28	0.52	4.09	3.29	0.53	4.22	3.55	0.53	4.47	3.54	0.54	4.73	3.77	0.54
	5	3.33	3.00	0.49	3.71	3.02	0.50	3.84	3.28	0.50	4.09	3.29	0.51	4.22	3.55	0.51	4.47	3.54	0.52	4.73	3.77	0.52
	10	3.33	2.99	0.45	3.71	3.01	0.46	3.84	3.27	0.46	4.09	3.29	0.46	4.21	3.55	0.47	4.47	3.53	0.47	4.72	3.76	0.48
	15	3.22	2.92	0.55	3.59	2.94	0.56	3.71	3.19	0.56	3.95	3.20	0.57	4.08	3.46	0.57	4.32	3.44	0.58	4.57	3.67	0.58
	20	4.20	3.60	1.29	4.68	3.63	1.31	4.84	3.94	1.32	5.16	3.95	1.33	5.32	4.27	1.34	5.64	4.25	1.35	5.95	4.53	1.36
	25	4.03	3.49	1.44	4.49	3.51	1.46	4.64	3.81	1.47	4.95	3.83	1.48	5.10	4.13	1.49	5.41	4.11	1.51	5.71	4.38	1.52
	30	3.80	3.32	1.53	4.23	3.34	1.56	4.37	3.63	1.56	4.66	3.64	1.58	4.81	3.93	1.59	5.09	3.92	1.60	5.38	4.17	1.62
	35	3.48	3.10	1.54	3.88	3.12	1.57	4.01	3.39	1.57	4.27	3.40	1.59	4.40	3.67	1.60	4.67	3.65	1.61	4.93	3.89	1.63
	40	2.93	2.72	1.31	3.26	2.74	1.33	3.37	2.98	1.33	3.59	2.99	1.35	3.70	3.22	1.35	3.93	3.21	1.37	4.15	3.42	1.38
	46	2.16	2.20	1.01	2.40	2.21	1.03	2.48	2.40	1.03	2.65	2.41	1.04	2.73	2.60	1.05	2.89	2.59	1.06	3.06	2.76	1.07

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
SHC : Sensible Heat capacity (kW)
PI : Power Input (kW)

● HEATING

AFR	12.2

		Indoor temperature									
	°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-15	-16	3.41	1.87	3.32	1.91	3.24	1.95	3.16	1.99	3.08	2.03
	-10	-11	4.16	1.87	4.06	1.91	3.96	1.95	3.86	1.99	3.76	2.03
	-5	-7	4.76	2.15	4.65	2.19	4.53	2.24	4.42	2.28	4.26	2.30
	0	-2	5.43	2.22	5.30	2.27	5.17	2.30	4.92	2.30	4.70	2.30
	5	3	5.91	2.21	5.77	2.26	5.63	2.30	5.37	2.30	5.14	2.30
	7	6	5.99	2.06	5.84	2.10	5.70	2.15	5.56	2.19	5.42	2.23
	10	8	6.20	2.04	6.06	2.08	5.91	2.12	5.76	2.16	5.61	2.21
	15	10	6.39	2.01	6.24	2.05	6.09	2.09	5.93	2.14	5.78	2.18
	20	15	6.42	1.78	6.27	1.81	6.12	1.85	5.96	1.89	5.81	1.92
	24	18	6.46	1.76	6.31	1.79	6.15	1.83	6.00	1.87	5.84	1.90

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
PI : Power Input (kW)

■ MODEL : AR*A14LATN / AO*A14LACL

● COOLING

AFR	13.7

		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	4.06	3.64	0.36	4.52	3.67	0.36	4.68	3.98	0.36	4.99	4.00	0.37	5.14	4.32	0.37	5.45	4.30	0.37	5.76	4.58	0.38
	0	3.97	3.58	0.42	4.42	3.60	0.43	4.57	3.91	0.43	4.87	3.92	0.43	5.03	4.24	0.44	5.33	4.22	0.44	5.63	4.50	0.44
	5	3.84	3.49	0.53	4.28	3.51	0.54	4.43	3.81	0.54	4.72	3.82	0.54	4.87	4.13	0.55	5.16	4.11	0.55	5.45	4.38	0.56
	10	3.70	3.38	0.63	4.12	3.40	0.64	4.26	3.70	0.64	4.54	3.71	0.65	4.68	4.01	0.65	4.96	3.99	0.66	5.24	4.25	0.67
	15	3.75	3.42	0.55	4.18	3.44	0.56	4.32	3.74	0.56	4.60	3.75	0.57	4.75	4.05	0.57	5.03	4.03	0.58	5.32	4.30	0.58
	20	4.78	4.17	1.20	5.32	4.19	1.22	5.51	4.56	1.22	5.87	4.57	1.24	6.05	4.94	1.24	6.41	4.92	1.26	6.78	5.24	1.27
	25	4.56	4.01	1.35	5.08	4.03	1.37	5.25	4.38	1.38	5.60	4.40	1.39	5.77	4.75	1.40	6.12	4.73	1.41	6.47	5.04	1.43
	30	4.33	3.84	1.50	4.82	3.86	1.52	4.98	4.20	1.53	5.31	4.21	1.55	5.48	4.55	1.55	5.81	4.53	1.57	6.13	4.82	1.59
	35	4.27	3.79	1.78	4.75	3.81	1.81	4.91	4.15	1.82	5.24	4.16	1.84	5.40	4.49	1.85	5.72	4.47	1.87	6.05	4.77	1.88
	40	3.12	2.97	1.27	3.47	2.99	1.29	3.59	3.25	1.29	3.83	3.26	1.31	3.95	3.52	1.31	4.18	3.50	1.33	4.42	3.73	1.34
	46	2.22	2.34	0.96	2.47	2.35	0.98	2.56	2.56	0.98	2.73	2.56	0.99	2.81	2.77	1.00	2.98	2.76	1.01	3.15	2.94	1.02

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
SHC : Sensible Heat capacity (kW)
PI : Power Input (kW)

● HEATING

AFR	13.7

			Indoor temperature									
		°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-15	-16	4.35	2.16	4.25	2.21	4.14	2.25	4.04	2.30	3.94	2.34
	-10	-11	4.92	2.16	4.80	2.21	4.68	2.25	4.56	2.30	4.45	2.34
	-5	-7	5.48	2.39	5.35	2.44	5.22	2.49	5.09	2.54	4.96	2.59
	0	-2	6.29	2.56	6.14	2.61	5.99	2.67	5.84	2.72	5.69	2.77
	5	3	7.04	2.74	6.88	2.80	6.71	2.85	6.46	2.87	6.17	2.87
	7	6	6.83	2.35	6.66	2.40	6.50	2.45	6.34	2.49	6.18	2.54
	10	8	7.08	2.40	6.91	2.45	6.74	2.50	6.57	2.55	6.40	2.60
	15	10	6.71	2.06	6.55	2.10	6.39	2.14	6.23	2.19	6.07	2.23
	20	15	6.28	1.64	6.13	1.67	5.98	1.71	5.83	1.74	5.68	1.78
	24	18	6.47	1.64	6.32	1.68	6.16	1.71	6.01	1.75	5.85	1.78

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
PI : Power Input (kW)

■ MODEL : AR*A18LATN / AO*A18LACL

● COOLING

AFR	13.7

		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	4.44	3.44	0.35	4.94	3.46	0.35	5.11	3.77	0.35	5.45	3.78	0.36	5.62	4.08	0.36	5.96	4.06	0.36	6.29	4.33	0.37
	0	4.34	3.40	0.41	4.83	3.42	0.42	5.00	3.71	0.42	5.33	3.72	0.42	5.49	4.02	0.42	5.82	4.01	0.43	6.15	4.27	0.43
	5	4.20	3.33	0.51	4.68	3.35	0.52	4.84	3.64	0.52	5.16	3.65	0.53	5.32	3.94	0.53	5.64	3.93	0.54	5.96	4.19	0.54
	10	4.04	3.25	0.62	4.50	3.27	0.63	4.66	3.56	0.63	4.96	3.57	0.63	5.12	3.86	0.64	5.42	3.84	0.64	5.73	4.09	0.65
	15	4.10	3.28	0.54	4.56	3.30	0.54	4.72	3.59	0.55	5.03	3.60	0.55	5.19	3.89	0.56	5.50	3.87	0.56	5.81	4.12	0.57
	20	5.22	3.83	1.17	5.82	3.85	1.19	6.02	4.19	1.19	6.41	4.20	1.21	6.61	4.54	1.21	7.01	4.52	1.22	7.40	4.81	1.24
	25	4.98	3.71	1.31	5.55	3.73	1.33	5.74	4.06	1.34	6.12	4.07	1.35	6.31	4.40	1.36	6.69	4.38	1.38	7.06	4.66	1.39
	30	4.73	3.58	1.46	5.27	3.60	1.48	5.45	3.92	1.49	5.81	3.93	1.51	5.98	4.25	1.51	6.34	4.23	1.53	6.70	4.50	1.55
	35	4.66	3.55	1.74	5.19	3.57	1.76	5.37	3.88	1.77	5.72	3.90	1.79	5.90	4.21	1.80	6.25	4.19	1.82	6.61	4.46	1.84
	40	3.41	2.96	1.24	3.80	2.98	1.25	3.92	3.24	1.26	4.18	3.25	1.27	4.31	3.51	1.28	4.57	3.50	1.29	4.83	3.72	1.31
	46	2.43	2.53	0.94	2.70	2.54	0.95	2.79	2.76	0.96	2.98	2.77	0.97	3.07	2.99	0.97	3.25	2.98	0.98	3.44	3.18	0.99

AFR : Air flow rate (m^3/min) TC : Total capacity (kW) SHC : Sensible Heat capacity (kW) PI : Power Input (kW)

● HEATING

AFR	13.7

		Indoor temperature									
	°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-15	-16	5.06	2.18	4.94	2.22	4.81	2.27	4.69	2.31	4.57	2.36
	-10	-11	5.71	2.29	5.58	2.33	5.44	2.38	5.30	2.43	5.17	2.48
	-5	-7	6.37	2.41	6.22	2.46	6.06	2.51	5.91	2.56	5.76	2.61
	0	-2	7.25	2.58	7.08	2.63	6.91	2.68	6.73	2.74	6.56	2.79
	5	3	8.13	2.75	7.93	2.81	7.74	2.87	7.55	2.93	7.35	2.98
	7	6	7.87	2.36	7.69	2.41	7.50	2.46	7.31	2.51	7.12	2.56
	10	8	8.16	2.41	7.97	2.46	7.77	2.51	7.58	2.57	7.39	2.62
	15	10	7.75	2.07	7.56	2.11	7.38	2.16	7.19	2.20	7.01	2.24
	20	15	7.24	1.65	7.07	1.68	6.90	1.72	6.73	1.75	6.55	1.79
	24	18	7.46	1.65	7.29	1.69	7.11	1.72	6.93	1.76	6.75	1.79

AFR : Air flow rate (m^3/min) TC : Total capacity (kW) PI : Power Input (kW)

■ MODEL : AR*A24LATN / AO*A24LACL

● COOLING

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

AFR : Air flow rate (m^3/min) TC : Total capacity (kW) SHC : Sensible Heat capacity (kW) PI : Power Input (kW)

● HEATING

AFR	18.3

		Indoor temperature									
	°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-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

AFR : Air flow rate (m^3/min) TC : Total capacity (kW) PI : Power Input (kW)

■ MODEL : AR*A36LATN / AO*A36LATL

● COOLING

AFR	32.2

		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
	-15	8.68	6.29	1.21	9.67	6.33	1.23	10.00	6.88	1.24	10.66	6.91	1.25	10.99	7.46	1.26	11.65	7.43	1.27	12.31	7.91	1.28
	-10	8.37	6.18	1.44	9.33	6.21	1.47	9.65	6.75	1.47	10.28	6.78	1.49	10.60	7.32	1.50	11.24	7.29	1.51	11.87	7.76	1.53
	0	8.53	6.24	1.30	9.50	6.28	1.32	9.82	6.83	1.32	10.47	6.85	1.34	10.79	7.40	1.34	11.44	7.37	1.36	12.09	7.85	1.37
	5	8.21	6.11	1.52	9.14	6.15	1.54	9.45	6.68	1.55	10.08	6.70	1.56	10.39	7.24	1.57	11.01	7.21	1.59	11.63	7.68	1.60
	10	8.23	6.12	1.47	9.17	6.16	1.49	9.48	6.69	1.50	10.11	6.72	1.52	10.42	7.25	1.52	11.05	7.22	1.54	11.67	7.69	1.55
	15	7.89	5.99	1.69	8.79	6.03	1.72	9.09	6.55	1.73	9.68	6.57	1.75	9.98	7.10	1.76	10.58	7.07	1.77	11.18	7.53	1.79
	20	9.72	6.71	2.51	10.82	6.75	2.55	11.19	7.33	2.56	11.93	7.36	2.59	12.30	7.94	2.60	13.04	7.91	2.63	13.77	8.43	2.66
	25	9.58	6.66	2.60	10.67	6.70	2.64	11.03	7.28	2.66	11.76	7.30	2.68	12.13	7.89	2.70	12.85	7.85	2.72	13.58	8.37	2.75
	30	9.12	6.48	2.91	10.16	6.52	2.95	10.51	7.09	2.97	11.20	7.11	3.00	11.54	7.68	3.01	12.24	7.65	3.04	12.93	8.15	3.08
	35	8.85	6.37	3.37	9.86	6.40	3.42	10.19	6.96	3.44	10.86	6.98	3.47	11.20	7.54	3.49	11.87	7.51	3.52	12.54	8.00	3.56
	40	7.05	5.68	2.81	7.85	5.72	2.85	8.12	6.22	2.87	8.65	6.24	2.89	8.92	6.73	2.91	9.46	6.71	2.94	9.99	7.15	2.97
	46	4.98	4.95	2.24	5.54	4.98	2.27	5.73	5.42	2.28	6.11	5.43	2.31	6.30	5.87	2.32	6.68	5.85	2.34	7.05	6.23	2.37

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
SHC : Sensible Heat capacity (kW)
PI : Power Input (kW)

● HEATING

AFR	32.2

		Indoor temperature									
	°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-15	-16	10.17	3.61	9.93	3.68	9.68	3.76	9.44	3.83	9.20	3.91
	-10	-11	10.91	3.63	10.65	3.71	10.39	3.78	10.13	3.86	9.87	3.93
	-5	-7	11.69	3.62	11.41	3.70	11.13	3.78	10.86	3.85	10.58	3.93
	0	-2	12.75	3.62	12.44	3.69	12.14	3.77	11.84	3.84	11.53	3.92
	5	3	13.68	3.59	13.36	3.67	13.03	3.74	12.70	3.82	12.38	3.89
	7	6	14.70	3.62	14.35	3.69	14.00	3.77	13.65	3.85	13.30	3.92
	10	8	15.44	3.59	15.07	3.67	14.70	3.74	14.34	3.82	13.97	3.89
	15	10	14.72	3.17	14.37	3.24	14.02	3.30	13.67	3.37	13.32	3.44
	20	15	14.15	2.78	13.81	2.83	13.48	2.89	13.14	2.95	12.80	2.99
	24	18	14.92	2.75	14.57	2.81	14.21	2.86	13.86	2.92	13.50	2.97

AFR : Air flow rate (m^3/min)
TC : Total capacity (kW)
PI : Power Input (kW)

■ MODEL : AR*A45LATN / AO*A45LATL

● COOLING

AFR	35.3

		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
	-15	10.59	8.61	1.51	11.80	8.66	1.54	12.20	9.42	1.55	13.00	9.45	1.56	13.41	10.20	1.57	14.21	10.16	1.58	15.02	10.82	1.60
	-10	10.20	8.42	1.79	11.37	8.47	1.81	11.75	9.21	1.82	12.53	9.24	1.84	12.92	9.98	1.85	13.69	9.94	1.87	14.47	10.58	1.89
	0	10.42	8.52	1.59	11.60	8.57	1.62	12.00	9.32	1.63	12.79	9.35	1.64	13.19	10.10	1.65	13.98	10.06	1.67	14.77	10.71	1.68
	5	10.01	8.33	1.86	11.15	8.37	1.89	11.53	9.10	1.90	12.29	9.13	1.92	12.68	9.86	1.93	13.44	9.83	1.95	14.20	10.47	1.97
	10	10.06	8.35	1.80	11.21	8.40	1.83	11.59	9.13	1.84	12.35	9.16	1.86	12.73	9.89	1.87	13.50	9.85	1.89	14.26	10.49	1.90
	15	9.63	8.14	2.07	10.72	8.19	2.10	11.09	8.90	2.12	11.82	8.93	2.14	12.18	9.64	2.15	12.92	9.60	2.17	13.65	10.23	2.19
	20	11.94	9.29	3.05	13.31	9.34	3.10	13.76	10.16	3.12	14.67	10.19	3.15	15.12	11.00	3.17	16.03	10.96	3.20	16.93	11.67	3.23
	25	11.79	9.22	3.16	13.14	9.28	3.21	13.58	10.09	3.22	14.48	10.12	3.26	14.93	10.93	3.27	15.82	10.88	3.31	16.72	11.59	3.34
	30	11.21	8.93	3.52	12.49	8.98	3.58	12.91	9.76	3.60	13.76	9.80	3.63	14.19	10.58	3.65	15.04	10.54	3.69	15.89	11.22	3.72
	35	11.06	8.84	4.21	12.32	8.89	4.27	12.74	9.67	4.29	13.58	9.70	4.34	14.00	10.48	4.36	14.84	10.44	4.40	15.68	11.12	4.45
	40	8.53	7.62	3.36	9.50	7.66	3.41	9.83	8.33	3.43	10.47	8.36	3.46	10.80	9.02	3.48	11.45	8.99	3.51	12.09	9.57	3.55
	46	6.03	6.44	2.72	6.71	6.48	2.76	6.94	7.04	2.77	7.40	7.06	2.80	7.63	7.63	2.82	8.09	7.60	2.84	8.54	8.09	2.84

AFR : Air flow rate (m^3/min)

TC : Total capacity (kW)

SHC : Sensible Heat capacity (kW)

PI : Power Input (kW)

● HEATING

AFR	35.3

		Indoor temperature									
	°CDB	16		18		20		22		24	
Outdoor temperature	°CDB	°CWB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	-15	-16	11.58	4.19	11.31	4.28	11.03	4.37	10.75	4.46	10.48	4.54
	-10	-11	12.51	4.19	12.22	4.28	11.92	4.36	11.62	4.45	11.32	4.54
	-5	-7	13.43	4.20	13.11	4.29	12.79	4.37	12.47	4.46	12.15	4.55
	0	-2	14.50	4.20	14.15	4.29	13.81	4.37	13.46	4.46	13.12	4.55
	5	3	15.93	4.21	15.55	4.30	15.17	4.39	14.79	4.47	14.41	4.56
	7	6	17.01	4.19	16.60	4.28	16.20	4.37	15.79	4.46	15.39	4.54
	10	8	17.74	4.19	17.32	4.28	16.90	4.37	16.47	4.45	16.05	4.54
	15	10	16.63	3.51	16.23	3.58	15.84	3.66	15.44	3.73	15.04	3.80
	20	15	15.75	3.05	15.37	3.11	15.00	3.17	14.62	3.24	14.25	3.29
	24	18	16.76	3.05	16.36	3.11	15.96	3.17	15.56	3.24	15.16	3.29

AFR : Air flow rate (m^3/min)

TC : Total capacity (kW)

PI : Power Input (kW)

8-2. OPERATION RANGE

■ MODEL : AR*A12/ 14/ 18/ 24LATN / AO*A12/ 14/ 18/ 24LACL

Mode	Operation Range		
	Indoor temperature	Indoor humidity	Outdoor temperature
Cooling Dry	18 to 32°C	About 80% or less	-10 to 46°C
Heating	30°C or less	–	-15 to 24°C

■ MODEL : AR*A36/ 45LATN / AO*A36/ 45LATL

Mode	Operation Range		
	Indoor temperature	Indoor humidity	Outdoor temperature
Cooling Dry	18 to 32°C	About 80% or less	-15 to 46°C
Heating	30°C or less	–	-15 to 24°C

8-3. ELECTRIC CHARACTERISTICS

Model Name			AR*A12LATN	AR*A14LATN
Power Supply	Voltage	V	230 ~	
	Frequency	Hz	50	
Max Operating Current		A	0.3	0.3
Wiring Spec. (Indoor unit to outdoor unit)	Connection cable	mm^2	1.5 - 2.5	
	Limited wiring length	m	26	

Model Name			AO*A12LACL	AO*A14LACL
Power Supply	Voltage	V	230 ~	
	Frequency	Hz	50	
Max Operating Current		A	10.0	12.5
Starting Current		A	4.9	5.9
*1) Wiring Spec.	Main Fuse (Circuit breaker) Curren	A	25	25
	Power Cable	mm^2	3.5 - 4.0	
	*2) Limited wiring length	m	36	28

Model Name			AR*A18LATN	AR*A24LATN
Power Supply	Voltage	V	230 ~	
	Frequency	Hz	50	
Max Operating Current		A	0.5	0.7
*1) Wiring Spec.	Circuit breaker	A	0.6	0.9
	Connection cable	mm^2	1.5 - 2.5	
	Limited wiring length	m	26	31

Model Name			AO*A18LACL	AO*A24LACL
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) Curren	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 Code 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 more larger diameter.

Model Name			AR*A36LATN	AR*A45LATN
Power Supply	Voltage	V	230 ～	
	Frequency	Hz	50	
Max Operating Current		A	2.0	2.1
Wiring Spec. (Indoor unit to outdoor unit)	Connection cable	mm^2	1.5 - 2.5	
	Limited wiring length	m	51	

Model Name			AO*A36LATL	AO*A45LATL
Power Supply	Voltage	V	230 ～	
	Frequency	Hz	50	
Max Operating Current		A	19.0	20.5
Starting Current		A	15.0	
*1) Wiring Spec.	Main Fuse (Circuit breaker) Curren	A	30	
	Power Cable	mm^2	5.3 - 6.0	
	*2) Limited wiring length	m	17	

*1) Wiring Spec.
Selected Sample
(Selected based on Japan Electrotechnical Standard and Code 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 more larger diameter.

8-4. SAFETY DEVICE

■ OUTDOOR UNIT

		Model	
		AO*A12LACL	AO*A14LACL
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	
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	

		Model	
		AO*A18LACL	AO*A24LACL
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	

		Model	
		AO*A36LATL	AO*A45LATL
Circuit protection	Current fuse (NEAR THE TERMINAL)	25A 250V	
		10A 250V	
	Current fuse (MAIN PRINTED CIRCUIT BOARD)	5A 250V	
		3.15A 250V	
Fan motor protection	Thermal protection program	OFF : 130±20°C ON : 100±20°C	
High Pressure protection	High Pressure Switch	OFF : 4.2±0.1MPa ON : 3.2±0.15MPa	
Compressor protection	Thermal protection program (COMPRESSOR TEMP.)	OFF : 110°C ON : 80°C	
	Thermal protection program (DISCHARGE TEMP.)	OFF : 115°C ON : After 7 minutes	

■ INDOOR UNIT

		Model	
		AR*A12LATN	AR*A14LATN
Circuit protection	Current fuse (PCB)	3.15A 250V	
Fan motor protection	Thermal protection program	OFF : 140±20°C ON : 110±20°C	

		Model	
		AR*A18LATN	AR*A24LATN
Circuit protection	Current fuse (PCB)	3.15A 250V	
Fan motor protection	Thermal protection program	OFF : 140±20°C ON : 110±20°C	

		Model	
		AR*A18LATN	AR*A24LATN
Circuit protection	Current fuse (PCB)	3.15A 250V	
Fan motor protection	Over current protection	1.90±0.24A	
	Thermal protection program	OFF : 115±10°C ON : 90±10°C	

8-5. FUNCTION SETTING

8-5-1 INDOOR UNIT

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition.
  After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

1-1. Setting the Static Pressure

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Normal	21	00
	High static pressure 1		01
	High static pressure 2		02
	High static pressure 3		03

Determine the wind volume in each mode i.e., applicable range of static pressure, refering to TECHNICAL MANUAL.

1-2. Setting the Cooler Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard	30	00
	Lower control		01

1-3. Setting the Heater Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction. The settings may be changed as shown in the table below.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard	31	00
	Lower control		01
	Slightly warmer control		02
	Warmer control		03

1-4. Setting Other Functions

The following settings are also possible, depending on the operating conditions.

Auto Restart (◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Yes	40	00
	No		01

Indoor Room Temperature Sensor Switching Function
(Only for Wired remote controller)

(◆. . . Factory setting)

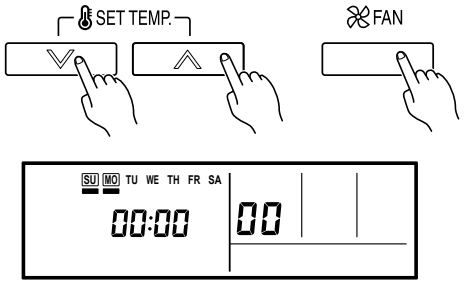
	Setting Description	Function Number	Setting Value
◆	No	42	00
	Yes		01

- If setting value is “00”,
  room temperature is controlled by the indoor unit temperature sensor.
- If setting value is “01”,
  room temperature is controlled by either indoor unit temperature sensor
  or remote control unit sensor.

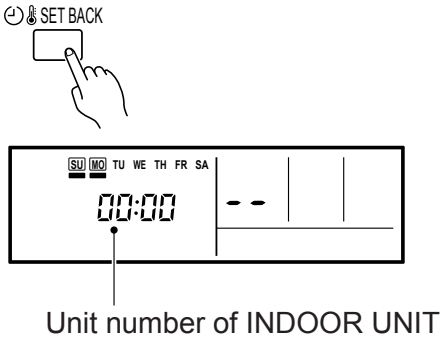
8-5-2 Procedures to change the Function Setting

- This procedure changes the function settings used to control the indoor unit according to the installation conditions.
  Incorrect settings can cause the indoor unit to malfunction.
  This procedure should be performed by authorized installation or service personnel only.
- Perform the "FUNCTION SETTING" according to the installation conditions using the remote controller.

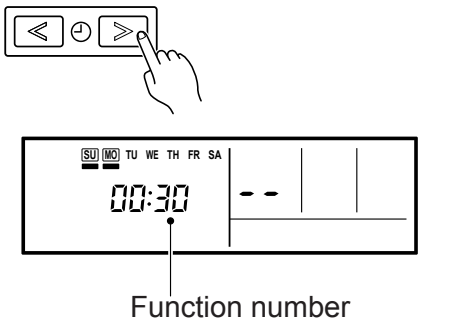
(1) Press the set temperature buttons (∨) (∧) and fan control button simultaneously for more than 5 seconds to enter the function setting mode.



(2) Press the SET BACK button to select the indoor unit number.

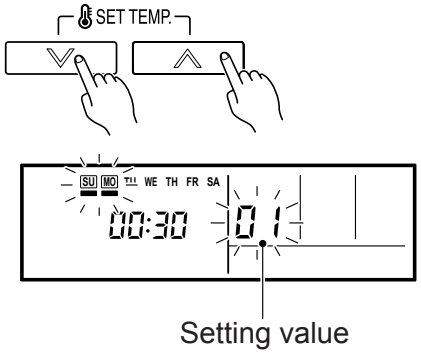


(3) Press the set time buttons to select the function number.



(4) Press set temperature buttons (∨) (∧) to select the setting value.
The display flashes as shown to the right during setting value selection.

(5) Press the SET button to confirm the setting.
Press the SET button for a few seconds until the setting value stops flashing.
If the setting value display changes or if "- -" is displayed when the flashing stops, the setting value has not been set correctly.
(An invalid setting value may have been selected for the indoor unit.)



(6) Repeat steps 2 to 5 to perform additional settings.
Press the set temperature buttons (∨) (∧) and fan control button simultaneously again for more than 5 secondsto cancel the function setting mode.
In addition, the function setting mode will be automatically canceled after 1 minute if no operation is performed.

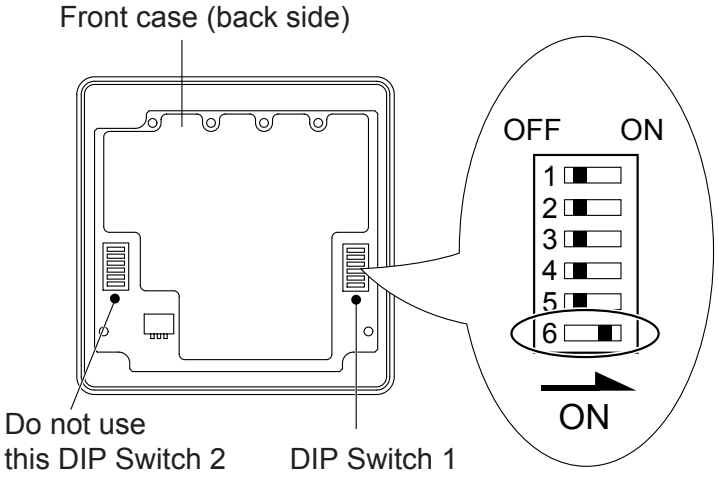
(7) After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

8-5-3 WIRED REMOTE CONTROLLER

Wired remote controller		
DIP SW	1	Can be used. (Do not change.)
	2	Dual remote controller setting
	3	Filter reset operation and filter display (Duct model is nonfunctional.)
	4	Can be used. (Do not change.)
	5	Can be used. (Do not change.)
	6	Memory backup setting

■ SWITCH POSITION

● Wired remote controller



■ DIP SWITCH SETTING

1. SW setting

1-1 Dual remote controller setting

Set the remote controller DIP switch 1 No.2 according to the following table.

(◆ ▪ ▪ ▪Factory setting)

	Number of remote controller	Master unit	Slave unit
		DIP-SW 1 No.2	DIP-SW 1 No.2
◆	1 (Normal)	OFF	—
	2 (Dual)	OFF	ON

1-2 Memory backup setting

Set to ON to use batteries for the memory backup.if batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

※ This function is wired remotecontroll only.

(◆ ▪ ▪ ▪Factory setting)

	DIP-SW No.6	Memory backup
◆	OFF	Invalidity
	ON	Validity

Refrigerant
R410A

DUCT type
INVERTER

9 . INSTALLATION MANUAL

Duct Type
SPLIT TYPE AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET
(PART NO. 9374815043)

⚠ CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and /or service of this product.

Indoor unit is an appliance not accessible to the general public.

For authorized service personnel only.

⚠ DANGER	**This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.**
⚠ WARNING	**This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.**
⚠ CAUTION	**This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.**

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

① Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]

③ Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

④ When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes
It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in)	1.00 mm

For authorized service personnel only.

⚠ WARNING

① For the room air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.

② Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.

③ Installation work must be performed in accordance with national wiring standards by authorized personnel only.

④ If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

⑤ Do not use an extension cord.

⑥ Do not turn on the power until all installation work is complete.

⚠ CAUTION

This installation instruction sheet describes how to install the indoor unit only.
To install the outdoor unit, refer to the installation instruction sheet included with the outdoor unit.

- **Be careful not to scratch the room air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.**

SELECTING THE MOUNTING POSITION

⚠ WARNING

Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

⚠ CAUTION

① Do not install where there is the danger of combustible gas leakage.

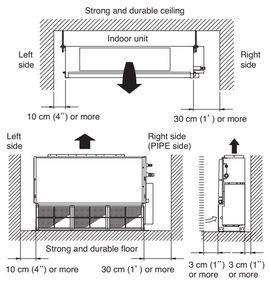
② Do not install near heat sources.

③ If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

④ Take precautions to prevent the unit from falling.

Decide the mounting position with the customer as follows:

INDOOR UNIT
(1) Install the indoor unit level on a strong wall, floor, ceiling which is not subject to vibration.
(2) The inlet and outlet ports should not be obstructed : the air should be able to blow all over the room.
(3) Install the unit near an electric outlet or special branch circuit.
(4) Install the unit where connection to the outdoor unit is easy.
(5) Install the unit where the drain pipe can be easily installed.
(6) Take servicing, etc. into consideration and leave the spaces shown on the right. Also install the unit where the filter can be removed.
(7) Install the indoor unit where vibrations and noise are not amplified.
(8) When installing the unit on the floor, provide an opening that will allow sufficient air to reach the air inlet panel.



STANDARD PARTS
The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

Name and Shape	Q'ty	Application
Installation template	1	For positioning the indoor unit
Hanger	4	For suspending the indoor unit from ceiling
Tapping screw (ø4 × 10)	8	For installing the hanger
Special nut A (large flange)	4	For suspending the indoor unit from ceiling
Special nut B (small flange)	4	

Name and Shape	Q'ty	Application
Coupler heat insulation (large)	1	For indoor side pipe joint (large pipe)
Coupler heat insulation (small)	1	For indoor side pipe joint (small pipe)
Binder	(Large) 4	For fixing the coupler heat insulation
Filter	2	9000 BTU/h model
	3	12000 - 22000 BTU/h models
Drain hose insulation	1	Insulates the drain hose and vinyl hose connection

CONNECTING PIPE REQUIREMENT

⚠ CAUTION

Refer to the installation instruction sheet of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

MODEL		12000 BTU/h model	14000/18000 BTU/h model
Diameter	Small	6.35 mm (1/4 in.)	6.35 mm (1/4 in.)
	Large	9.52 mm (3/8 in.)	12.70 mm (1/2 in.)

- Use pipe with water-resistant heat insulation.

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker. If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

Connection cord (mm²)	
MAX.	**MIN.**
2.5	1.5

- Use conformed cord with Type 245 IEC57.
- Install all electrical works in accordance to the standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)

INSTALLATION PROCEDURE
Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

⚠ WARNING

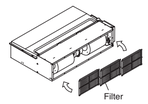
① Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.

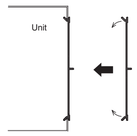
② If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

⚠ CAUTION

For installation, refer to the technical data.

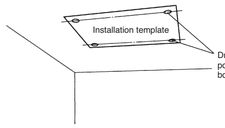
A. CEILING CONCEALED TYPE
1. INSTALL THE FILTERS
- Install the filters to the unit.



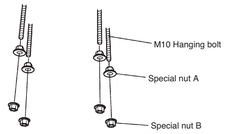


This unit may also be installed with the air inlet facing down. See also 1 - B - 1 for such cases.

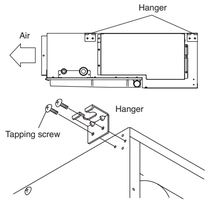
2. DRILLING HOLES FOR BOLTS AND INSTALLING THE BOLTS
- Using the installation template, drill holes for bolts (4 holes).



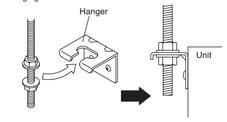
3. INSTALLING THE HANGERS
- Fasten the hanging bolts to the ceiling and install special nuts A and B.



- Install the hangers to the unit (4 places).



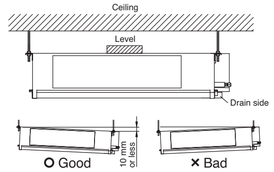
- Hang the unit.
  Pass the hanging bolts through the hangers (4 places).

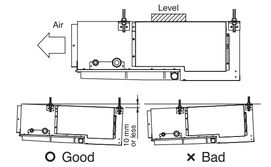


⚠ CAUTION

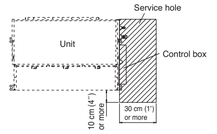
Fasten the unit securely with special nuts A and B.

4. LEVELING
Base horizontal direction leveling on top of the unit.

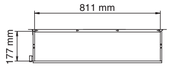




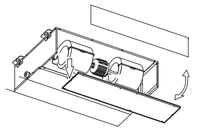
5. SERVICE HOLE DIMENSIONS
Open a service hole with the dimensions shown.



6. INTAKE DUCT CONNECTION
Follow the procedure in the following figure to the ducts.



The air inlet duct can be changed by replacing the intake cover.



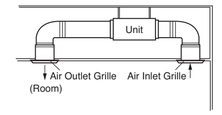
⚠ CAUTION

When air is taken in from the bottom side, the operating sound of the product will easily enter the room.
Install the product and intake grilles where the affect of the operating sound is small.

⚠ CAUTION

① If an intake duct is installed, take care not to damage the temperature sensor.

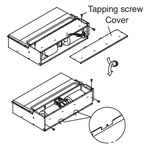
② Be sure to install the air inlet grille and the air outlet grille for air circulation. The correct temperature cannot be detected.



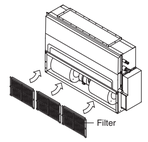
③ Grills must be fixed so that man cannot touch indoor unit fan, and cannot be removed by only hand operation without tool.

④ Be sure to install the air filter in the air inlet. If the air filter is not installed, the heat exchanger may be clogged and its performance may decrease.

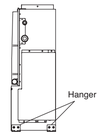
B. FLOOR STANDING CONCEALED TYPE
1. INSTALL THE FILTERS
- Remove the 4 tapping screws, and then remove cover.
- Install the cover with the 4 tapping screws as shown in the illustration below.



- Install the filters to the unit referring to 1 - A -1.



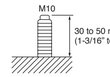
2. INSTALLING THE HANGERS
- Install the hangers to the unit (4 places).



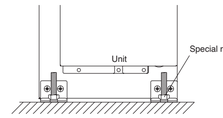
3. DRILLING HOLES FOR BOLTS AND INSTALLING THE BOLTS
- Drilling position for bolts.

⚠ CAUTION

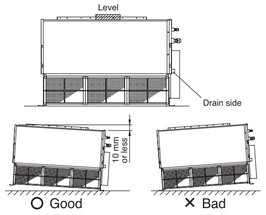
Secure with an M10 anchor bolts. If securing the unit to the floor is difficult, first build a stand or platform.



4. INSTALL THE UNIT
- Fix the unit.
  Install the unit and fasten with special nut B.



5. LEVELING
Base horizontal and vertical direction leveling on top of the unit.



⚠ CAUTION

In order to prevent water from leaking around the outlet port, make sure to insulate it (on both the CEILING CONCEALED type and the FLOOR STANDING CONCEALED type).

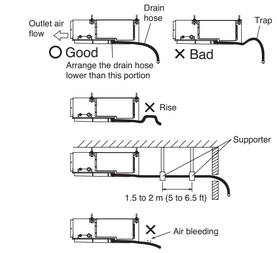
NOTE: INSTALLING DRAIN HOSE

⚠ CAUTION

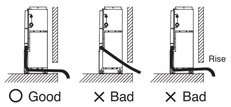
Install the drain hose in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

INSTALL THE DRAIN HOSE
- Install the drain hose with downward gradient (1/50 to 2/50) and so there are no rises or traps in the hose.
- Use general hard polyvinyl chloride pipe and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the hose is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain hose.

A. CEILING CONCEALED TYPE



B. FLOOR STANDING CONCEALED TYPE



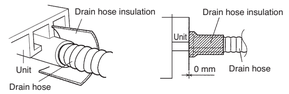
⚠ CAUTION

① Install the drain hose so that the control box cover can be removed for servicing.

② In order to prevent water from leaking into the control box, make sure that the drain hose is well insulated.

③ After the wiring is connected and installation of the piping and drain hose is complete, make a seal around the opening in the wall.

The outside diameter of drain port is 26 mm, use a suitable drain hose.



2 CONNECTING THE PIPE

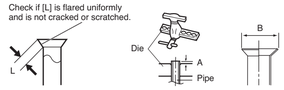
⚠ CAUTION

① Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

② While welding the pipes, be sure to blow dry nitrogen gas through them.

1. FLARING
(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.

Check if [L] is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	

Pipe outside diameter	Dimension B $^{0}_{-0.4}$ (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

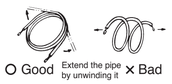
Width across flats

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm

(Continued to the next page.)

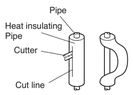
2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.



Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown on the right, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.



⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends.**
Bend the pipe with a radius of curvature of 150 mm or over.

② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

Indoor unit

(1) Detach the caps and plugs from the pipes.

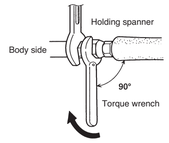
⚠ CAUTION

① **Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**

② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.

(3) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

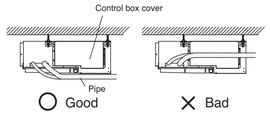
Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
9.52 mm (3/4 in.) dia.	33 to 42 N·m (330 to 420 kgf·cm)
12.70 mm (1/2 in.) dia.	50 to 62 N·m (500 to 620 kgf·cm)

⚠ CAUTION

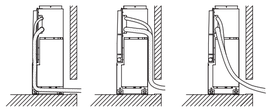
Be sure to connect the large pipe after connecting the small pipe completely.

- Lay the piping.

A. CEILING CONCEALED TYPE



B. FLOOR STANDING CONCEALED TYPE



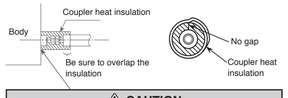
⚠ CAUTION

① **Install the piping so that the control box cover can be removed for servicing.**

② **In order to prevent water from leaking into the control box, make sure that the piping is well insulated.**

3 INSTALLING THE COUPLER HEAT INSULATION

After checking for gas leaks, insulate by wrapping insulation around the two parts (gas and liquid) of the indoor unit coupling, using the coupler heat insulation.
After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap.



⚠ CAUTION

Must fit tightly against body without any gap.

4 ELECTRICAL WIRING

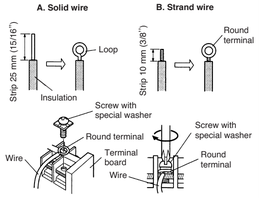
HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring

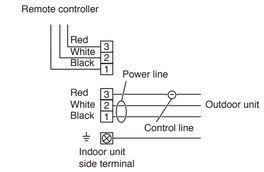
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") of expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") of expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

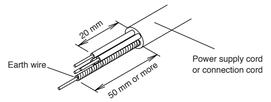


1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

Keep the earth wire longer than the other wires.



3. CONNECTION OF WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit.**
Erroneous wiring may cause burning of the electric parts.

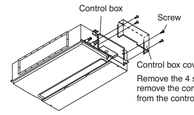
③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

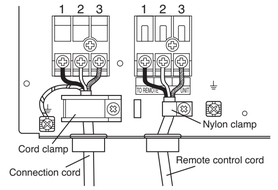
⑤ **Always connect the ground wire.**

⑥ **Install the remote controller wires so as not to be direct touched with your hand.**

(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cord, connection cord, and power cord with the cord clamps.



⚠ CAUTION

① **Tighten the indoor unit connection cord (to the outdoor unit) and power supply indoor and outdoor unit terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.**

② **If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.**

③ **Wire the indoor unit connection cord (to the outdoor unit) by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.**

④ **Ground both the indoor and outdoor units by attaching a ground wire.**

⑤ **Unit shall be grounded in compliance with the applicable local and national codes.**

5 FUNCTION SETTING

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition. After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

Setting the Static Pressure

Setting Description	Function Number	Setting Value
Normal	21	00
High static pressure 1		01
High static pressure 2		02
High static pressure 3		03

Determine the wind volume in each mode i.e., applicable range of static pressure, refering to [7] STATIC PRESSURE CHARACTERISTICS. (The unit is factory-set to "00".)

Setting the Cooler Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	30	00
Lower control		01

Setting the Heater Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be changed as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	31	00
Lower control		01
Slightly warmer control		02
Warmer control		03

Setting Other Functions

- The following settings are also possible, depending on the operating conditions. (The unit is factory-set to "00".)

Auto Restart

Setting Description	Function Number	Setting Value
Yes	40	00
No		01

Indoor Room Temperature Sensor Switching Function (Wired remote controller only)

Setting Description	Function Number	Setting Value
No	42	00
Yes		01

- If setting value is "00", room temperature is controlled by the indoor unit temperature sensor.
- If setting value is "01", room temperature is controlled by either indoor unit temperature sensor or remote control unit sensor.

[When using the wireless remote controller]

SWITCHING REMOTE CONTROL UNIT SIGNAL CODES

- Confirm the setting of the remote control unit signal code and the printed circuit board setting.
  If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

Jumper wire		Remote control unit signal code
JM1	JM2	
Connect	Connect	A (Primary setting)
Disconnect	Connect	b
Connect	Disconnect	c
Disconnect	Disconnect	d

Setting Record

- Record any changes to the settings in the following table.

Setting	Setting Value
Static pressure	
Cooler room temperature correction	
Heater room temperature correction	
Auto restart	
Indoor room temperature sensor switching function	

After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

6 TEST RUN

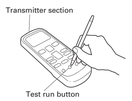
CHECK ITEMS

(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do not air flow direction louvers operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

- Do not operate the air conditioner in the running state for a long time.

[Using the wireless remote control]

- For the operation method, refer to the operating manual.
- The outdoor unit may not operate, depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)

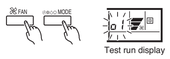


- To end test operation, press the remote control unit START/STOP button.
  (When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

[Using the wired remote control]

- For the operation method, refer to the operating manual.

(1) Stop the air conditioner operation.
(2) Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.



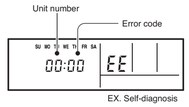
(3) Press the start/stop button to stop the test run.

[Troubleshooting at the remote control LCD]

This is possible only on the wired remote control.

[SELF-DIAGNOSIS]

If an error occurs, the following display will be shown.
("EE" will appear in the set room temperature display.)



Error code	Error contents
01 13 26 27	Indoor signal error
00	Wired remote controller abnormal
02	Indoor room temperature sensor error
04	Indoor heat exchanger temperature sensor (middle) error
28	Indoor heat exchanger temperature sensor (inlet) error
09	Float switch operated
0C	Outdoor discharge pipe temperature sensor error
06	Outdoor heat exchanger temperature sensor (outlet) error
0A	Outdoor temperature sensor error
15	Compressor temperature sensor error
1d	2-way valve temperature sensor error
1E	3-way valve temperature sensor error
29	Outdoor heat exchanger temperature sensor (middle) error
20	Indoor manual auto switch abnormal
2A	Power supply frequency detection error
17	IPM protection
18	CT error
1A	Compressor location error
1b	Outdoor fan error
1F	Connected indoor unit abnormal
1c	Outdoor unit computer communication error
12	Indoor fan abnormal
0F	Discharge temperature error
24	Exessive high pressure protection on cooling
2c	4-way valve abnormal
16	Pressure switch abnormal
2b	Compressor temperature error
19	Active filter abnormal
25	PFC circuit error

If "CO" appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

7 STATIC PRESSURE CHARACTERISTIC

⚠ CAUTION

If the applicable static pressure does not match the static pressure mode, the static pressure mode may be changed to another mode automatically.

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE

0Pa to 90Pa

1. STATIC PRESSURE MODE

It is necessary to set up a static pressure mode for each usage of static pressure.
Determine the applicable range of static pressure in each mode and wind volume, referring to the TECHNICAL MANUAL.

2. MODE SETTING

It is possible to change the setting of static pressure mode. Refer to [5] FUNCTION SETTING and to the INSTALLATION INSTRUCTION SHEET of remote controller for a setting method.

8 SPECIAL INSTALLATION METHODS

⚠ CAUTION

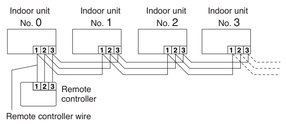
① **When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.**

② **Be sure to turn off the main power.**

GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

(1) Wiring method (indoor unit to remote controller)

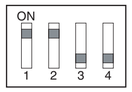


(2) DIP switch setting (Indoor unit)
Set the unit number of each indoor unit using DIP switch on the indoor unit circuit board. (See following table and figure.)
DIP switch is normally set to make unit number No. 0.

Indoor unit

Unit number	DIP SWITCH No.			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Example : No. 3



9 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating and installation manuals to the customer.
(4) If the signal code is changed, explain to the customer how it change (the system returns to signal code A when the batteries in the remote control unit are replaced).

*(4) is applicable to using wireless remote control.

PART NO. 9374815043

Duct Type
SPLIT TYPE AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET
(PART NO. 9374815036)

⚠ CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and /or service of this product.

Indoor unit is an appliance not accessible to the general public.

For authorized service personnel only.

⚠ DANGER	**This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.**
⚠ WARNING	**This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.**
⚠ CAUTION	**This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.**

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

① Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]

③ Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

④ When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes
It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in)	1.00 mm

For authorized service personnel only.

⚠ WARNING

① For the room air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.

② Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.

③ Installation work must be performed in accordance with national wiring standards by authorized personnel only.

④ If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

⑤ Do not use an extension cord.

⑥ Do not turn on the power until all installation work is complete.

⚠ CAUTION

This installation instruction sheet describes how to install the indoor unit only.
To install the outdoor unit, refer to the installation instruction sheet included with the outdoor unit.

- **Be careful not to scratch the room air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.**

SELECTING THE MOUNTING POSITION

⚠ WARNING

Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

⚠ CAUTION

① Do not install where there is the danger of combustible gas leakage.

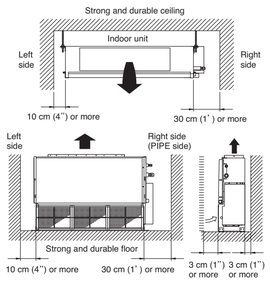
② Do not install near heat sources.

③ If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

④ Take precautions to prevent the unit from falling.

Decide the mounting position with the customer as follows:

INDOOR UNIT
(1) Install the indoor unit level on a strong wall, floor, ceiling which is not subject to vibration.
(2) The inlet and outlet ports should not be obstructed : the air should be able to blow all over the room.
(3) Install the unit near an electric outlet or special branch circuit.
(4) Install the unit where connection to the outdoor unit is easy.
(5) Install the unit where the drain pipe can be easily installed.
(6) Take servicing, etc. into consideration and leave the spaces shown on the right. Also install the unit where the filter can be removed.
(7) Install the indoor unit where vibrations and noise are not amplified.
(8) When installing the unit on the floor, provide an opening that will allow sufficient air to reach the air inlet panel.



STANDARD PARTS
The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

Name and Shape	Q'ty	Application
Installation template	1	For positioning the indoor unit
Hanger	4	For suspending the indoor unit from ceiling
Tapping screw (ø4 × 10)	8	For installing the hanger
Special nut A (large flange)	4	For suspending the indoor unit from ceiling
Special nut B (small flange)	4	

Name and Shape	Q'ty	Application
Coupler heat insulation (large)	1	For indoor side pipe joint (large pipe)
Coupler heat insulation (small)	1	For indoor side pipe joint (small pipe)
Binder	(Large) 4	For fixing the coupler heat insulation
Filter	2	9000 BTU/h model
	3	12000 - 22000 BTU/h models
Drain hose insulation	1	Insulates the drain hose and vinyl hose connection

CONNECTING PIPE REQUIREMENT

⚠ CAUTION

Refer to the installation instruction sheet of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

Diameter		
	Small	6.35 mm (1/4 in.)
	Large	12.70 mm (1/2 in.)

- Use pipe with water-resistant heat insulation.

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation.
In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

Connection cord (mm²)	
MAX.	**MIN.**
2.5	1.5

- Use conformed cord with Type 245 IEC57.
- Install all electrical works in accordance to the standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)

INSTALLATION PROCEDURE
Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

⚠ WARNING

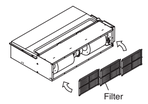
① Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration.
If the installation location is not strong enough, the indoor unit may fall and cause injuries.

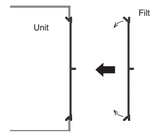
② If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

⚠ CAUTION

For installation, refer to the technical data.

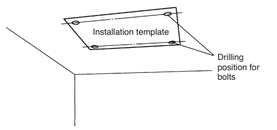
A. CEILING CONCEALED TYPE
1. INSTALL THE FILTERS
- Install the filters to the unit.



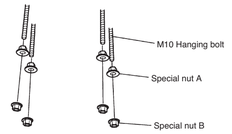


This unit may also be installed with the air inlet facing down. See also 1 - B - 1 for such cases.

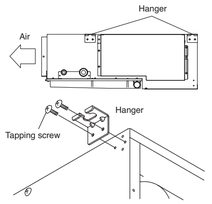
2. DRILLING HOLES FOR BOLTS AND INSTALLING THE BOLTS
- Using the installation template, drill holes for bolts (4 holes).



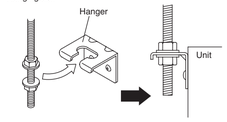
3. INSTALLING THE HANGERS
- Fasten the hanging bolts to the ceiling and install special nuts A and B.



- Install the hangers to the unit (4 places).



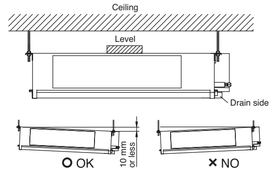
- Hang the unit.
  Pass the hanging bolts through the hangers (4 places).

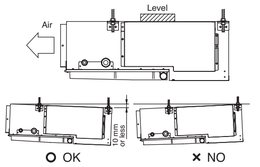


⚠ CAUTION

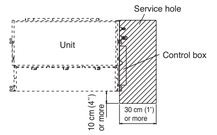
Fasten the unit securely with special nuts A and B.

4. LEVELING
Base horizontal direction leveling on top of the unit.

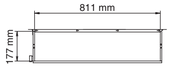




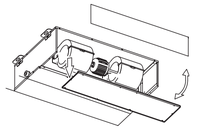
5. SERVICE HOLE DIMENSIONS
Open a service hole with the dimensions shown.



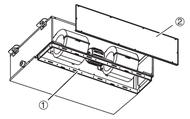
6. INTAKE DUCT CONNECTION
Follow the procedure in the following figure to the ducts.



The air inlet duct can be changed by replacing the intake grille and flange.



For the bottom air intake, follow the procedure of ① → ② for installation.
(The factory setting is back air intake.)



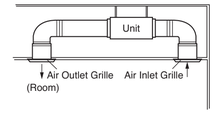
⚠ CAUTION

When air is taken in from the bottom side, the operating sound of the product will easily enter the room.
Install the product and intake grilles where the affect of the operating sound is small.

⚠ CAUTION

① If an intake duct is installed, take care not to damage the temperature sensor (the temperature sensor is attached to the intake port flange).

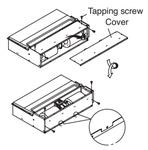
② Be sure to install the air inlet grille and the air outlet grille for air circulation. The correct temperature cannot be detected.



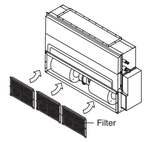
③ Grills must be fixed so that man cannot touch indoor unit fan, and cannot be removed by only hand operation without tool.

④ Be sure to install the air filter in the air inlet. If the air filter is not installed, the heat exchanger may be clogged and its performance may decrease.

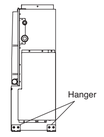
B. FLOOR STANDING CONCEALED TYPE
1. INSTALL THE FILTERS
- Remove the 4 tapping screws, and then remove cover.
- Install the cover with the 4 tapping screws as shown in the illustration below.



- Install the filters to the unit referring to 1 - A -1.



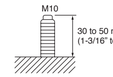
2. INSTALLING THE HANGERS
- Install the hangers to the unit (4 places).



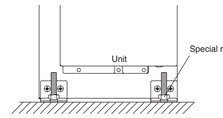
3. DRILLING HOLES FOR BOLTS AND INSTALLING THE BOLTS
- Drilling position for bolts.

⚠ CAUTION

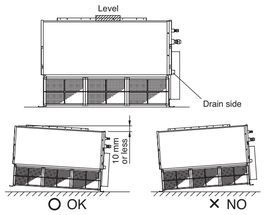
Secure with an M10 anchor bolts. If securing the unit to the floor is difficult, first build a stand or platform.



4. INSTALL THE UNIT
- Fix the unit.
  Install the unit and fasten with special nut B.



5. LEVELING
Base horizontal and vertical direction leveling on top of the unit.



⚠ CAUTION

In order to prevent water from leaking around the outlet port, make sure to insulate it (on both the CEILING CONCEALED type and the FLOOR STANDING CONCEALED type).

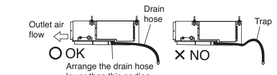
NOTE: INSTALLING DRAIN HOSE

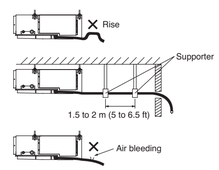
⚠ CAUTION

Install the drain hose in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

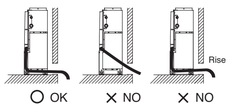
INSTALL THE DRAIN HOSE
- Install the drain hose with downward gradient (1/50 to 2/50) and so there are no rises or traps in the hose.
- Use general hard polyvinyl chloride pipe and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the hose is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain hose.

A. CEILING CONCEALED TYPE





B. FLOOR STANDING CONCEALED TYPE



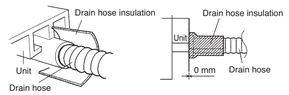
⚠ CAUTION

① Install the drain hose so that the control box cover can be removed for servicing.

② In order to prevent water from leaking into the control box, make sure that the drain hose is well insulated.

③ After the wiring is connected and installation of the piping and drain hose is complete, make a seal around the opening in the wall.

The outside diameter of drain port is 26 mm, use a suitable drain hose.



2 CONNECTING THE PIPE

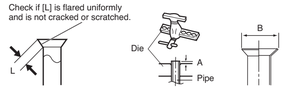
⚠ CAUTION

① Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

② While welding the pipes, be sure to blow dry nitrogen gas through them.

1. FLARING
(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.

Check if [L] is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	

Pipe outside diameter	Dimension B $^{0}_{-0.4}$ (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6

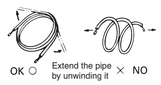
When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm

(Continued to the next page.)

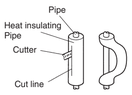
2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.



Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown on the right, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.



⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends.**
Bend the pipe with a radius of curvature of 150 mm or over.

② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

Indoor unit

(1) Detach the caps and plugs from the pipes.

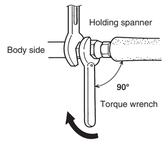
⚠ CAUTION

① **Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**

② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.

(3) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

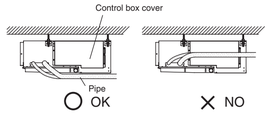
Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
12.70 mm (1/2 in.) dia.	50 to 62 N·m (500 to 620 kgf·cm)

⚠ CAUTION

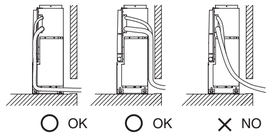
Be sure to connect the large pipe after connecting the small pipe completely.

- Lay the piping.

A. CEILING CONCEALED TYPE



B. FLOOR STANDING CONCEALED TYPE



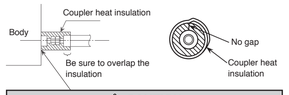
⚠ CAUTION

① **Install the piping so that the control box cover can be removed for servicing.**

② **In order to prevent water from leaking into the control box, make sure that the piping is well insulated.**

3 INSTALLING THE COUPLER HEAT INSULATION

After checking for gas leaks, insulate by wrapping insulation around the two parts (gas and liquid) of the indoor unit coupling, using the coupler heat insulation.
After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap.



⚠ CAUTION

Must fit tightly against body without any gap.

4 ELECTRICAL WIRING

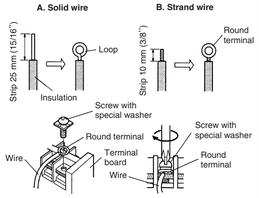
HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring

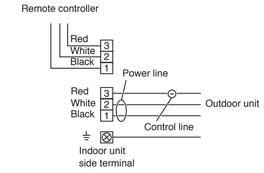
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") of expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") of expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

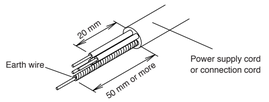


1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

Keep the earth wire longer than the other wires.



3. CONNECTION OF WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit.**
Erroneous wiring may cause burning of the electric parts.

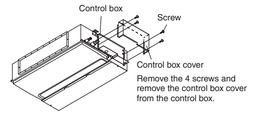
③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

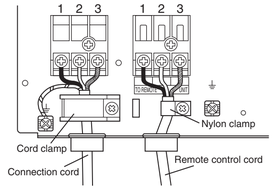
⑤ **Always connect the ground wire.**

⑥ **Install the remote controller wires so as not to be direct touched with your hand.**

(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cord, connection cord, and power cord with the cord clamps.



⚠ CAUTION

① **Tighten the indoor unit connection cord (to the outdoor unit) and power supply indoor and outdoor unit terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.**

② **If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.**

③ **Wire the indoor unit connection cord (to the outdoor unit) by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.**

④ **Ground both the indoor and outdoor units by attaching a ground wire.**

⑤ **Unit shall be grounded in compliance with the applicable local and national codes.**

5 FUNCTION SETTING

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition. After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

Setting the Static Pressure

Setting Description	Function Number	Setting Value
Normal	21	00
High static pressure 1		01
High static pressure 2		02
High static pressure 3		03

Determine the wind volume in each mode i.e., applicable range of static pressure, refering to [7] STATIC PRESSURE CHARACTERISTICS. (The unit is factory-set to "00")

Setting the Cooler Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	30	00
Lower control		01

Setting the Heater Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be changed as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	31	00
Lower control		01
Slightly warmer control		02
Warmer control		03

Setting Other Functions

- The following settings are also possible, depending on the operating conditions. (The unit is factory-set to "00".)

Auto Restart

Setting Description	Function Number	Setting Value
Yes	40	00
No		01

Indoor Room Temperature Sensor Switching Function (Wired remote controller only)

Setting Description	Function Number	Setting Value
No	42	00
Yes		01

- If setting value is "00", room temperature is controlled by the indoor unit temperature sensor.
- If setting value is "01", room temperature is controlled by either indoor unit temperature sensor or remote control unit sensor.

[When using the wireless remote controller]

SWITCHING REMOTE CONTROL UNIT SIGNAL CODES

- Confirm the setting of the remote control unit signal code and the printed circuit board setting.
  If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

Jumper wire		Remote control unit signal code
JM1	JM2	
Connect	Connect	A (Primary setting)
Disconnect	Connect	b
Connect	Disconnect	c
Disconnect	Disconnect	d

Setting Record

- Record any changes to the settings in the following table.

Setting	Setting Value
Static pressure	
Cooler room temperature correction	
Heater room temperature correction	
Auto restart	
Indoor room temperature sensor switching function	

After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

6 TEST RUN

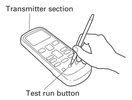
CHECK ITEMS

(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do not air flow direction louvers operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

- Do not operate the air conditioner in the running state for a long time.

[Using the wireless remote control]

- For the operation method, refer to the operating manual.
- The outdoor unit may not operate, depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)

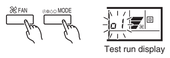


- To end test operation, press the remote control unit START/STOP button.
  (When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

[Using the wired remote control]

- For the operation method, refer to the operating manual.

(1) Stop the air conditioner operation.
(2) Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.



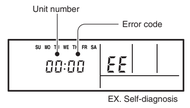
(3) Press the start/stop button to stop the test run.

[Troubleshooting at the remote control LCD]

This is possible only on the wired remote control.

[SELF-DIAGNOSIS]

If an error occurs, the following display will be shown.
("EE" will appear in the set room temperature display.)



Error code	Error contents
01 13 26 27	Indoor signal error
00	Wired remote controller abnormal
02	Indoor room temperature sensor error
04	Indoor heat exchanger temperature sensor (middle) error
28	Indoor heat exchanger temperature sensor (inlet) error
09	Float switch operated
0C	Outdoor discharge pipe temperature sensor error
06	Outdoor heat exchanger temperature sensor (outlet) error
0A	Outdoor temperature sensor error
15	Compressor temperature sensor error
1d	2-way valve temperature sensor error
1E	3-way valve temperature sensor error
29	Outdoor heat exchanger temperature sensor (middle) error
20	Indoor manual auto switch abnormal
2A	Power supply frequency detection error
17	IPM protection
18	CT error
1A	Compressor location error
1b	Outdoor fan error
1F	Connected indoor unit abnormal
1c	Outdoor unit computer communication error
12	Indoor fan abnormal
0F	Discharge temperature error
24	Exessive high pressure protection on cooling
2c	4-way valve abnormal
16	Pressure switch abnormal
2b	Compressor temperature error
19	Active filter abnormal
25	PFC circuit error

If "CO" appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

7 STATIC PRESSURE CHARACTERISTIC

⚠ CAUTION

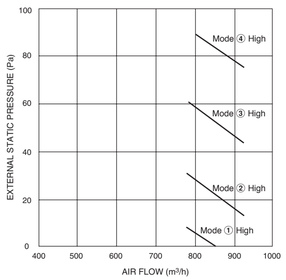
If the applicable static pressure does not match the static pressure mode, the static pressure mode may be changed to another mode automatically.

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE

0Pa to 90Pa

1. FAN PERFORMANCE AND AIR FLOW

EXTERNAL STATIC PRESSURE



2. AIR FLOW SETTING

The air flow is set according to the FUNCTION settings in the following tables.

Mode	Setting condition	Static pressure range
①	Normal	0 ≤ P ≤ 8
②	High static pressure 1	13 ≤ P ≤ 31
③	High static pressure 2	44 ≤ P ≤ 62
④	High static pressure 3	76 ≤ P ≤ 90

8 SPECIAL INSTALLATION METHODS

⚠ CAUTION

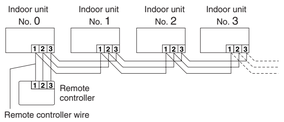
① **When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.**

② **Be sure to turn off the main power.**

GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

(1) Wiring method (indoor unit to remote controller)

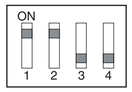


(2) DIP switch setting (Indoor unit)
Set the unit number of each indoor unit using DIP switch on the indoor unit circuit board. (See following table and figure.)
DIP switch is normally set to make unit number No. 0.

Indoor unit

Unit number	DIP SWITCH No.			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Example : No. 3



9 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating and installation manuals to the customer.
(4) If the signal code is changed, explain to the customer how it change (the system returns to signal code A when the batteries in the remote control unit are replaced).

*(4) is applicable to using wireless remote control.

PART NO. 9374815036

Duct Type
SPLIT TYPE AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET
(PART NO. 9374318148)

⚠ CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and /or service of this product.

Indoor unit is an appliance not accessible to the general public.

For authorized service personnel only.

⚠ DANGER	**This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.**
⚠ WARNING	**This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.**
⚠ CAUTION	**This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.**

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

① Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]

③ Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

④ When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes
It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in)	1.00 mm

For authorized service personnel only.

⚠ WARNING

① For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.

② Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.

③ Installation work must be performed in accordance with national wiring standards by authorized personnel only.

④ If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

⑤ Do not use an extension cord.

⑥ Do not turn on the power until all installation work is complete.

⚠ CAUTION

This installation instruction sheet describes how to install the indoor unit only.
To install the outdoor unit, refer to the installation instruction sheet included with the outdoor unit.

- **Be careful not to scratch the air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.**

SELECTING THE MOUNTING POSITION

⚠ WARNING

Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

⚠ CAUTION

① Do not install where there is the danger of combustible gas leakage.

② Do not install the unit near heat source of heat, steam, or flammable gas.

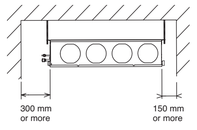
③ If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

④ Take precautions to prevent the unit from falling.

Decide the mounting position with the customer as follows:

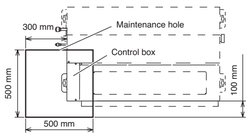
INDOOR UNIT

(1) Install the indoor unit on a place having a sufficient strength so that it withstand against the weight of the indoor unit.
(2) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
(3) Leave the space required to service the air conditioner.
(4) Install the unit where the drain pipe can be easily installed.
(5) Providing as much space as possible between the indoor unit and the ceiling will make work much easier.
(6) If installing in a place where its humidity exceeds 80%, use heat insulation to prevent condensation.

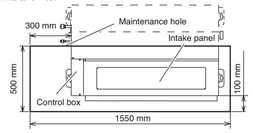


Maintenance hole dimension

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.



STANDARD PARTS

The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

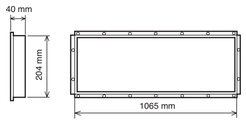
Name and Shape	Q'ty	Application
Hanger 	4	For suspending the indoor unit from ceiling
Drain hose insulation 	1	Insulates the drain hose and vinyl hose

Name and Shape	Q'ty	Application
Coupler heat insulation (large) 	1	For indoor side pipe joint (large pipe)
Coupler heat insulation (small) 	1	For indoor side pipe joint (small pipe)
Binder 	1 (large)	For fixing the drain hose
Special nut A (large flange) 	4	For suspending the indoor unit from ceiling
Special nut B (small flange) 	4	

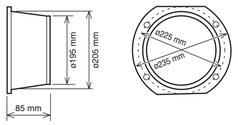
OPTIONAL PARTS

When connecting the square duct and round duct, use the optional square flange or round flange and flexible duct.

Square flange
Model name : UTD–SF045T (P/N 9098180007)

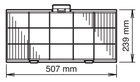


Round flange
Model name : UTD–RF204 (P/N 9093160004)



Flexible duct
Model name : UTD–RD202 (P/N 9074165004)

Long-life filter
Model name : UTD–LF25NA (P/N9079892004)



CONNECTING PIPE REQUIREMENT

⚠ CAUTION

Refer to the installation instruction sheet of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

Diameter	Small	6.35 mm (1/4 in.)
	Large	15.88 mm (5/8 in.)

- **Use pipe with water-resistant heat insulation.**

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

Connection cord (mm²)	
MAX.	MIN.
2.5	1.5

- **Use conformed cord with Type 245 IEC57**
- **Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)**
- **Install all electrical works in accordance to the standard.**

INSTALLATION PROCEDURE

Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

⚠ WARNING

① Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration.
If the installation location is not strong enough, the indoor unit may fall and cause injuries.

② If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

⚠ CAUTION

For installation, refer to the technical data.

1. INSTALLING THE HANGERS

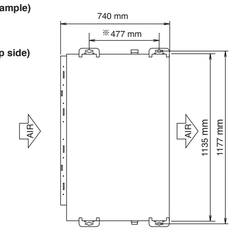
⚠ WARNING

When fastening the hangers, make the bolt positions uniform.

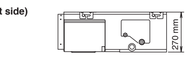
Hanging bolt installation diagram.

(Example)

(Top side)

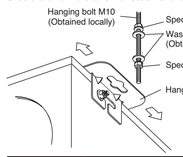


(Left side)



The distance of ※ is adjustable according to the place of the hanging bolts.
(MAX : 550 mm, MIN : 410 mm)

Slide the unit in the arrow direction and fasten it.



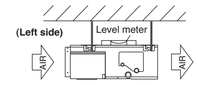
Bolt Strength	9.81 to 14.71 N·m (100 to 150 kgf·cm)

⚠ WARNING

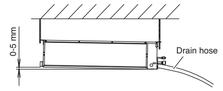
Fasten the unit securely with special nuts A and B.

2. LEVELING

Base vertical direction leveling on the unit (right and left).



Base horizontal direction leveling on top of the unit.

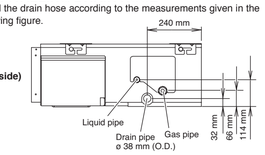


Give a slight tilt to the side to which the drain hose is connected. The tilt should be in the range of 0 mm to 5 mm.

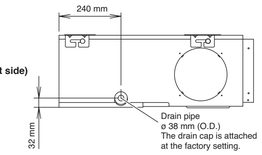
3. INSTALLING DRAIN HOSE

Install the drain hose according to the measurements given in the following figure.

(Left side)



(Right side)

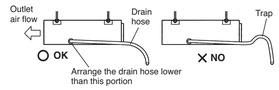


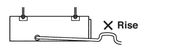
⚠ CAUTION

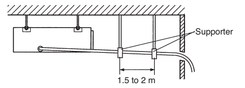
Install the drain hose in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

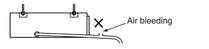
NOTE: INSTALL THE DRAIN HOSE

- Install the drain hose with downward gradient (1/50 to 1/100) and so there are no rises or traps in the hose.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38mm] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the hose is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain hose.

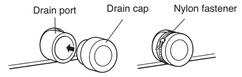








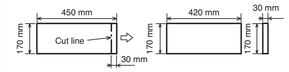
- When the unit is shipped from the factory, the drain port is on the left side (control box side).
- When using the drain port on the right side of the unit, reinstall the drain cap to the left side drain port.

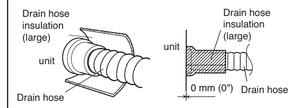


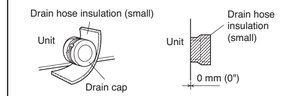
⚠ CAUTION

Always check that the drain cap is installed to the unused drain port and is fastened with the nylon fastener.
If the drain cap is not installed, or is not sufficiently fastened by the nylon fastener, water may drip during the cooling operation.

- Cut the drain hose insulation at a position approximately 30mm from the end with cutters, etc.
- Stick the large drain hose insulation at the drain hose installation side.
- Stick the small drain hose insulation at the drain cap side.

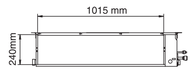




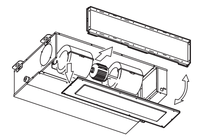


4. INTAKE DUCT CONNECTION

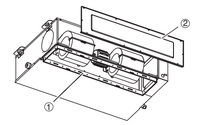
Follow the procedure in the following figure to the ducts.



The air inlet duct can be changed by replacing the intake grille and flange.



For the bottom air intake, follow the procedure of ① → ② for installation.
(The factory setting is back air intake.)



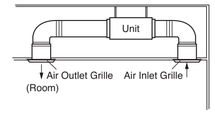
⚠ CAUTION

When air is taken in from the bottom side, the operating sound of the product will easily enter the room. Install the product and intake grilles where the affect of the operating sound is small.

⚠ CAUTION

① If an intake duct is installed, take care not to damage the temperature sensor (the temperature sensor is attached to the intake port flange).

② Be sure to install the air inlet grille and the air outlet grille for air circulation. The correct temperature cannot be detected.



③ Grills must be fixed so that man cannot touch indoor unit fan, and cannot be removed by only hand operation without tool.

④ Be sure to install the air filter in the air inlet. If the air filter is not installed, the heat exchanger may be clogged and its performance may decrease.

5. OUTLET DUCT CONNECTION

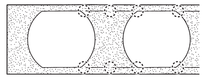
Duct installation pattern (■ CUT PART)

(1) Square duct

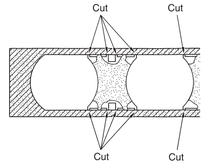
(2) Round duct outlet ×4 (This is the factory setting.)

When using as a square duct

(1) Cut the slit seam ⋯ with a cutter.

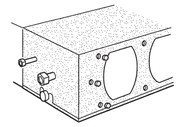


(2) Turn up the insulation around the points to be cut according to the outlet port shape working points so that the insulation does not stick out at the ////// part.



(3) Cut with nippers and remove the sheet metal.

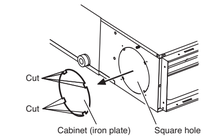
(4) Since there is a slit in the insulation, use radio pliers, tweezers, etc. to stretch the screw hole part used when installing the round flange and square flange when connecting the duct.



6. FRESH AIR INTAKE

(Processing before use)

(1) When taking in fresh air, cut a slit shaped cabinet in the left side of the outer case with nippers.

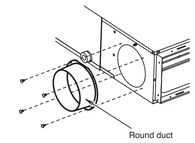


⚠ CAUTION

① When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).

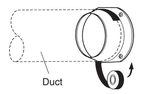
② When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Install the round flange (option parts) to the fresh air intake.



(3) Connect the duct to the round flange.

(4) Seal with a band and vinyl tape, etc. so that air does not leak from the connection.



(Continued to the next page.)

2 CONNECTING THE PIPE

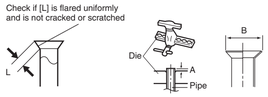
⚠ CAUTION

① Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

② While welding the pipes, be sure to blow dry nitrogen gas through them.

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	

Pipe outside diameter	Dimension B $^{0}_{-0.4}$ (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	24.0

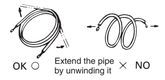
When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Width across flats

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm

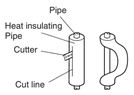
2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.



Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bent or stretched , the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown on the right, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.



⚠ CAUTION

① To prevent breaking of the pipe, avoid sharp bends.
Bend the pipe with a radius of curvature of 150 mm or over.

② If the pipe is bent repeatedly at the same place, it will break.

3. CONNECTION PIPES

Indoor unit

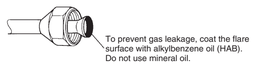
(1) Detach the caps and plugs from the pipes.

⚠ CAUTION

① Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.

② Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

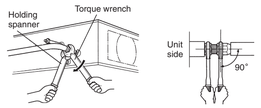
(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe , in order to tighten the flare nut correctly.

When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



Flare nut tightening torque

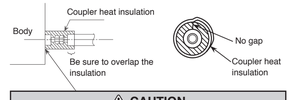
Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 77 N·m (630 to 770 kgf·cm)

⚠ CAUTION

Be sure to connect the gas pipe after connecting the liquid pipe completely.

3 INSTALLING THE COUPLER HEAT INSULATION

After checking for gas leaks, insulate by wrapping insulation around the two parts (gas and liquid) of the indoor unit coupling, using the coupler heat insulation.
After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap.



⚠ CAUTION

Must fit tightly against body without any gap.

4 ELECTRICAL WIRING

⚠ CAUTION

Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.

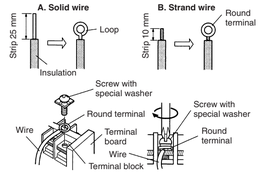
HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring

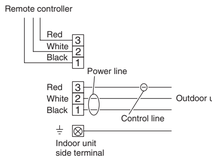
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") to expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

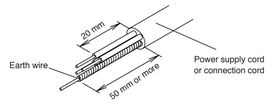


1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

Keep the earth wire longer than the other wires.



3. CONNECTION OF WIRING

⚠ WARNING

① Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.

② Match the terminal board numbers and connection cord colors with those of the outdoor unit.
Erroneous wiring may cause burning of the electric parts.

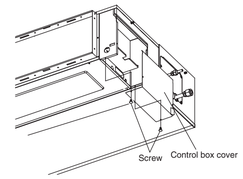
③ Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.

④ Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)

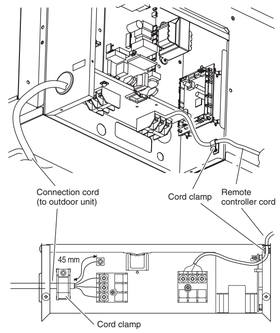
⑤ Always connect the ground wire.

⑥ Install the remote controller wires so as not to be direct touched with your hand.

(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cord, connection cord, and power cord with the cord clamps.



⚠ CAUTION

① Tighten the indoor unit connection cord (to the outdoor unit) and power supply indoor and outdoor unit terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.

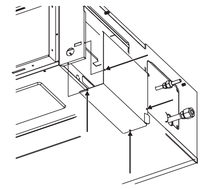
② If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.

③ Wire the indoor unit connection cord (to the outdoor unit) by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.

④ Ground both the indoor and outdoor units by attaching a ground wire.

⑤ Unit shall be grounded in compliance with the applicable local and national codes.

(3) Install control box cover.



Adjust the position of the screws for control box cover according to the installation.

5 FUNCTION SETTING

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition. After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

Setting the Static Pressure

Setting Description	Function Number	Setting Value
Normal	21	00
High static pressure 1		01
High static pressure 2		02
High static pressure 3		03

Determine the wind volume in each mode i.e., applicable range of static pressure, refering to [7] STATIC PRESSURE CHARACTERISTICS. (The unit is factory-set to "00")

Setting the Cooler Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	30	00
Lower control		01

Setting the Heater Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be changed as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	31	00
Lower control		01
Slightly warmer control		02
Warmer control		03

Setting Other Functions

- The following settings are also possible, depending on the operating conditions. (The unit is factory-set to "00".)

Auto Restart

Setting Description	Function Number	Setting Value
Yes	40	00
No		01

Indoor Room Temperature Sensor Switching Function (Wired remote controller only)

Setting Description	Function Number	Setting Value
No	42	00
Yes		01

- If setting value is "00", room temperature is controlled by the indoor unit temperature sensor.
- If setting value is "01", room temperature is controlled by either indoor unit temperature sensor or remote control unit sensor.

[When using the wireless remote controller]

SWITCHING REMOTE CONTROL UNIT SIGNAL CODES

- Confirm the setting of the remote control unit signal code and the printed circuit board setting.
If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

Jumper wire		Remote control unit signal code
JM1	JM2	
Connect	Connect	A (Primary setting)
Disconnect	Connect	b
Connect	Disconnect	c
Disconnect	Disconnect	d

Setting Record

- Record any changes to the settings in the following table.

Setting	Setting Value
Static pressure	
Cooler room temperature correction	
Heater room temperature correction	
Auto restart	
Indoor room temperature sensor switching function	

After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

6 TEST RUN

CHECK ITEMS

(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do not air flow direction louvers operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

- Do not operate the air conditioner in the running state for a long time.

[Using the wireless remote control]

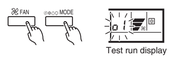
- For the operation method, refer to the operating manual.
- The outdoor unit may not operate depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)

- To end test operation, press the remote control unit START/STOP button.
(When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

[Using the wired remote control]

- For the operation method, refer to the operating manual.

(1) Stop the air conditioner operation.
(2) Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.



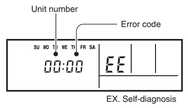
(3) Press the start/stop button to stop the test run.

[Troubleshooting at the remote control LCD]

This is possible only on the wired remote control.

[SELF-DIAGNOSIS]

If an error occurs, the following display will be shown.
("EE" will appear in the set room temperature display.)



Error code	Error contents
01 13 26 27	Indoor signal error
00	Wired remote controller abnormal
02	Indoor room temperature sensor error
04	Indoor heat exchanger temperature sensor (middle) error
28	Indoor heat exchanger temperature sensor (inlet) error
09	Float switch operated
0C	Outdoor discharge pipe temperature sensor error
06	Outdoor heat exchanger temperature sensor (outlet) error
0A	Outdoor temperature sensor error
15	Compressor temperature sensor error
1d	2-way valve temperature sensor error
1E	3-way valve temperature sensor error
29	Outdoor heat exchanger temperature sensor (middle) error
20	Indoor manual auto switch abnormal
2A	Power supply frequency detection error
17	IPM protection
18	CT error
1A	Compressor location error
1b	Outdoor fan error
1F	Connected indoor unit abnormal
1c	Outdoor unit computer communication error
12	Indoor fan abnormal
0F	Discharge temperature error
24	Exessive high pressure protection on cooling
2c	4-way valve abnormal
16	Pressure switch abnormal
2b	Compressor temperature error
19	Active filter abnormal
25	PFC circuit error

If "CO" appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

7 STATIC PRESSURE CHARACTERISTIC

⚠ CAUTION

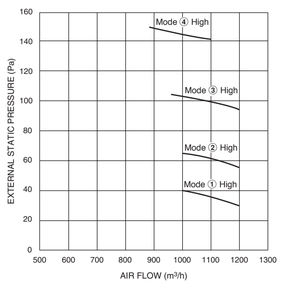
If the applicable static pressure does not match the static pressure mode, the static pressure mode may be changed to another mode automatically.

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE

30Pa to 150Pa

1. FAN PERFORMANCE AND AIR FLOW

EXTERNAL STATIC PRESSURE



2. AIR FLOW SETTING

The air flow is set according to the DIP switch settings in the following tables.

Mode	Setting condition	Static pressure range
①	Normal	30 ≤ P ≤ 40
②	High static pressure 1	56 ≤ P ≤ 65
③	High static pressure 2	95 ≤ P ≤ 105
④	High static pressure 3	142 ≤ P ≤ 150

8 SPECIAL INSTALLATION METHODS

⚠ CAUTION

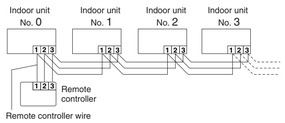
① When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.

② Be sure to turn off the main power.

GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

(1) Wiring method (indoor unit to remote controller)

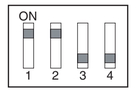


(2) DIP switch setting (Indoor unit)
Set the unit number of each indoor unit using DIP switch on the indoor unit circuit board. (See following table and figure.)
DIP switch is normally set to make unit number No. 0.

Indoor unit

Unit number	DIP SWITCH No.			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Example : No. 3



9 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating and installation manuals to the customer.
(4) If the signal code is changed, explain to the customer how it changed (the system returns to signal code A when the batteries in the remote control unit are replaced).
*(4) is applicable to using wireless remote control.

PART NO. 9374318148

Duct Type
SPLIT TYPE AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET
(PART NO. 9374318193)

⚠ CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and /or service of this product.

Indoor unit is an appliance not accessible to the general public.

For authorized service personnel only.

⚠ DANGER	**This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.**
⚠ WARNING	**This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.**
⚠ CAUTION	**This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.**

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

① Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]

③ Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

④ When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes
It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in)	1.00 mm

For authorized service personnel only.

⚠ WARNING

① For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.

② Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.

③ Installation work must be performed in accordance with national wiring standards by authorized personnel only.

④ If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

⑤ Do not use an extension cord.

⑥ Do not turn on the power until all installation work is complete.

⚠ CAUTION

This installation instruction sheet describes how to install the indoor unit only.
To install the outdoor unit, refer to the installation instruction sheet included with the outdoor unit.

- **Be careful not to scratch the air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.**

SELECTING THE MOUNTING POSITION

⚠ WARNING

Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

⚠ CAUTION

① Do not install where there is the danger of combustible gas leakage.

② Do not install the unit near heat source of heat, steam, or flammable gas.

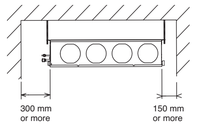
③ If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

④ Take precautions to prevent the unit from falling.

Decide the mounting position with the customer as follows:

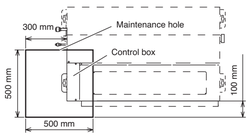
INDOOR UNIT

(1) Install the indoor unit on a place having a sufficient strength so that it withstand against the weight of the indoor unit.
(2) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
(3) Leave the space required to service the air conditioner.
(4) Install the unit where the drain pipe can be easily installed.
(5) Providing as much space as possible between the indoor unit and the ceiling will make work much easier.
(6) If installing in a place where its humidity exceeds 80%, use heat insulation to prevent condensation.

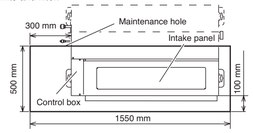


Maintenance hole dimension

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.

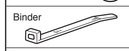


STANDARD PARTS

The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

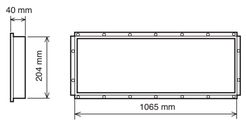
Name and Shape	Q'ty	Application
Hanger 	4	For suspending the indoor unit from ceiling
Drain hose insulation 	1	Insulates the drain hose and vinyl hose

Name and Shape	Q'ty	Application
Coupler heat insulation (large) 	1	For indoor side pipe joint (large pipe)
Coupler heat insulation (small) 	1	For indoor side pipe joint (small pipe)
Binder 	1 (large)	For fixing the drain hose
Special nut A (large flange) 	4	For suspending the indoor unit from ceiling
Special nut B (small flange) 	4	

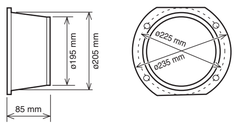
OPTIONAL PARTS

When connecting the square duct and round duct, use the optional square flange or round flange and flexible duct.

Square flange
Model name : UTD–SF045T (P/N 9098180007)

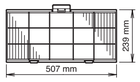


Round flange
Model name : UTD–RF204 (P/N 9093160004)



Flexible duct
Model name : UTD–RD202 (P/N 9074165004)

Long-life filter
Model name : UTD–LF25NA (P/N9079892004)



CONNECTING PIPE REQUIREMENT

⚠ CAUTION

Refer to the installation instruction sheet of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

MODEL		24000 BTU/h model	36000/45000 BTU/h model
Diameter	Small	6.35 mm (1/4 in.)	9.52 mm (3/8 in.)
	Large	15.88 mm (5/8 in.)	15.88 mm (5/8 in.)

- **Use pipe with water-resistant heat insulation.**

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

Connection cord (mm²)	
MAX.	MIN.
2.5	1.5

- **Use conformed cord with Type 245 IEC57**
- **Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)**
- **Install all electrical works in accordance to the standard.**

INSTALLATION PROCEDURE

Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

⚠ WARNING

① Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration.
If the installation location is not strong enough, the indoor unit may fall and cause injuries.

② If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

⚠ CAUTION

For installation, refer to the technical data.

1. INSTALLING THE HANGERS

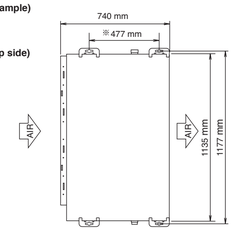
⚠ WARNING

When fastening the hangers, make the bolt positions uniform.

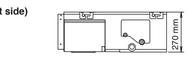
Hanging bolt installation diagram.

(Example)

(Top side)

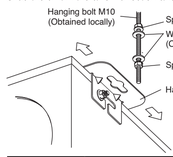


(Left side)



The distance of ※ is adjustable according to the place of the hanging bolts.
(MAX : 550 mm, MIN : 410 mm)

Slide the unit in the arrow direction and fasten it.



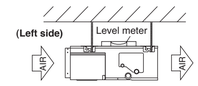
Bolt Strength	9.81 to 14.71 N·m (100 to 150 kgf·cm)

⚠ WARNING

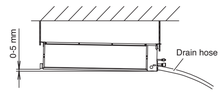
Fasten the unit securely with special nuts A and B.

2. LEVELING

Base vertical direction leveling on the unit (right and left).



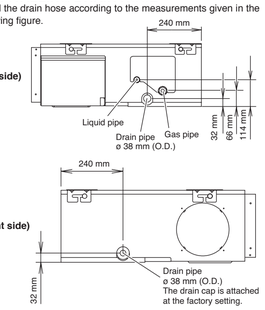
Base horizontal direction leveling on top of the unit.



Give a slight tilt to the side to which the drain hose is connected. The tilt should be in the range of 0 mm to 5 mm.

3. INSTALLING DRAIN HOSE

Install the drain hose according to the measurements given in the following figure.

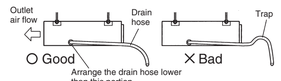


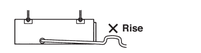
⚠ CAUTION

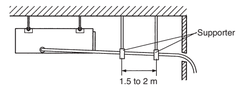
Install the drain hose in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

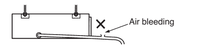
NOTE: INSTALL THE DRAIN HOSE

- Install the drain hose with downward gradient (1/50 to 1/100) and so there are no rises or traps in the hose.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38mm] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the hose is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain hose.

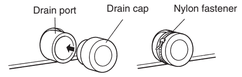








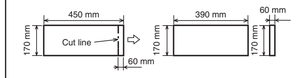
- When the unit is shipped from the factory, the drain port is on the left side (control box side).
- When using the drain port on the right side of the unit, reinstall the drain cap to the left side drain port.

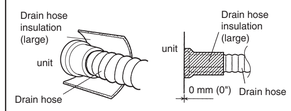


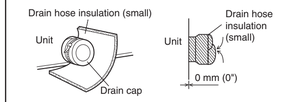
⚠ CAUTION

Always check that the drain cap is installed to the unused drain port and is fastened with the nylon fastener.
If the drain cap is not installed, or is not sufficiently fastened by the nylon fastener, water may drip during the cooling operation.

- Cut the drain hose insulation at a position approximately 60 mm from the end with cutters, etc.
- Stick the large drain hose insulation at the drain hose installation side.
- Stick the small drain hose insulation at the drain cap side.



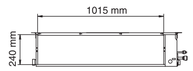




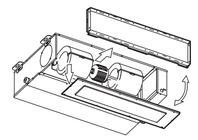
- Cover the drain cap with the drain hose insulation.

4. INTAKE DUCT CONNECTION

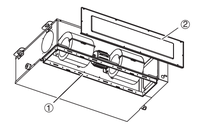
Follow the procedure in the following figure to the ducts.



The air inlet duct can be changed by replacing the intake grille and flange.



For the bottom air intake, follow the procedure of ① → ② for installation.
(The factory setting is back air intake.)



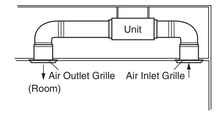
⚠ CAUTION

When air is taken in from the bottom side, the operating sound of the product will easily enter the room. Install the product and intake grilles where the affect of the operating sound is small.

⚠ CAUTION

① If an intake duct is installed, take care not to damage the temperature sensor.

② Be sure to install the air inlet grille and the air outlet grille for air circulation. The correct temperature cannot be detected.



③ Grills must be fixed so that man cannot touch indoor unit fan, and cannot be removed by only hand operation without tool.

④ Be sure to install the air filter in the air inlet. If the air filter is not installed, the heat exchanger may be clogged and its performance may decrease.

5. OUTLET DUCT CONNECTION

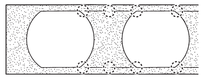
Duct installation pattern (■ CUT PART)

(1) Square duct 

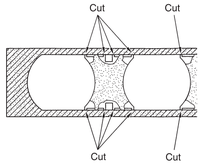
(2) Round duct outlet ×4 (This is the factory setting.) 

When using as a square duct

(1) Cut the slit seam ⋯ with a cutter.

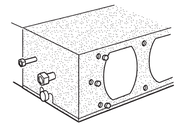


(2) Turn up the insulation around the points to be cut according to the outlet port shape working points so that the insulation does not stick out at the ////// part.



(3) Cut with nippers and remove the sheet metal.

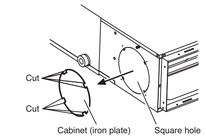
(4) Since there is a slit in the insulation, use radio pliers, tweezers, etc. to stretch the screw hole part used when installing the round flange and square flange when connecting the duct.



6. FRESH AIR INTAKE

(Processing before use)

(1) When taking in fresh air, cut a slit shaped cabinet in the left side of the outer case with nippers.

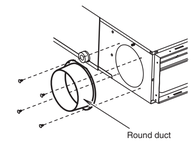


⚠ CAUTION

① When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).

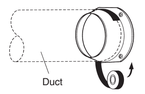
② When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Install the round flange (option parts) to the fresh air intake.



(3) Connect the duct to the round flange.

(4) Seal with a band and vinyl tape, etc. so that air does not leak from the connection.



(Continued to the next page.)

2 CONNECTING THE PIPE

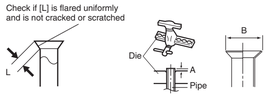
⚠ CAUTION

① **Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.**

② **While welding the pipes, be sure to blow dry nitrogen gas through them.**

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	

Pipe outside diameter	Dimension B $^{0}_{-0.4}$ (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Width across flats

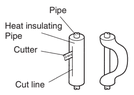
Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm

2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.

Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown on the right, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.



⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends.**
Bend the pipe with a radius of curvature of 150 mm or over.

② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

Indoor unit

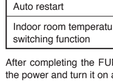
(1) Detach the caps and plugs from the pipes.

⚠ CAUTION

① **Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**

② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.

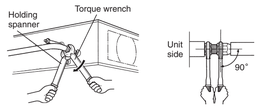


To prevent gas leakage, coat the flare surface with alkylbenzene oil (HAB). Do not use mineral oil.

⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe , in order to tighten the flare nut correctly.

When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



Flare nut tightening torque

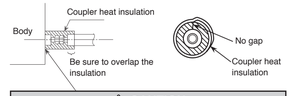
Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
9.52 mm (3/8 in.) dia.	33 to 42 N·m (330 to 420 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 77 N·m (630 to 770 kgf·cm)

⚠ CAUTION

Be sure to connect the gas pipe after connecting the liquid pipe completely.

3 INSTALLING THE COUPLER HEAT INSULATION

After checking for gas leaks, insulate by wrapping insulation around the two parts (gas and liquid) of the indoor unit coupling, using the coupler heat insulation.
After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap.



⚠ CAUTION

Must fit tightly against body without any gap.

4 ELECTRICAL WIRING

⚠ CAUTION

Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.

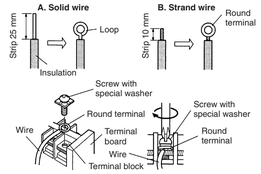
HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring

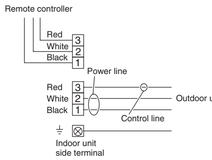
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") to expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

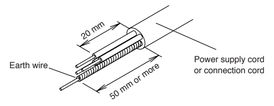


1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

Keep the earth wire longer than the other wires.



3. CONNECTION OF WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit.**
Erroneous wiring may cause burning of the electric parts.

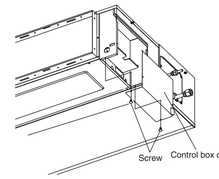
③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

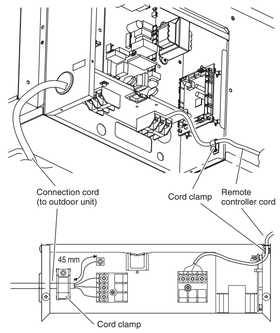
⑤ **Always connect the ground wire.**

⑥ **Install the remote controller wires so as not to be direct touched with your hand.**

(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cord, connection cord, and power cord with the cord clamps.



⚠ CAUTION

① **Tighten the indoor unit connection cord (to the outdoor unit) and power supply indoor and outdoor unit terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.**

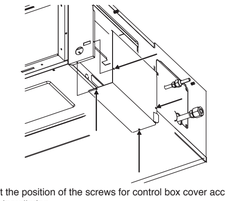
② **If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.**

③ **Wire the indoor unit connection cord (to the outdoor unit) by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.**

④ **Ground both the indoor and outdoor units by attaching a ground wire.**

⑤ **Unit shall be grounded in compliance with the applicable local and national codes.**

(3) Install control box cover.



Adjust the position of the screws for control box cover according to the installation.

5 FUNCTION SETTING

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition. After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

Setting the Static Pressure

Setting Description	Function Number	Setting Value
Normal	21	00
High static pressure 1		01
High static pressure 2		02
High static pressure 3		03

Determine the wind volume in each mode i.e., applicable range of static pressure, refering to [7] STATIC PRESSURE CHARACTERISTICS. (The unit is factory-set to "00".)

Setting the Cooler Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	30	00
Lower control		01

Setting the Heater Room Temperature Correction

- Depending on the installed environment, the room temperature sensor may require a correction. The settings may be changed as shown in the table below. (The unit is factory-set to "00".)

Setting Description	Function Number	Setting Value
Standard	31	00
Lower control		01
Slightly warmer control		02
Warmer control		03

Setting Other Functions

- The following settings are also possible, depending on the operating conditions. (The unit is factory-set to "00".)

Auto Restart

Setting Description	Function Number	Setting Value
Yes	40	00
No		01

Indoor Room Temperature Sensor Switching Function (Wired remote controller only)

Setting Description	Function Number	Setting Value
No	42	00
Yes		01

- If setting value is "00", room temperature is controlled by the indoor unit temperature sensor.
- If setting value is "01", room temperature is controlled by either indoor unit temperature sensor or remote control unit sensor.

[When using the wireless remote controller]

SWITCHING REMOTE CONTROL UNIT SIGNAL CODES

- Confirm the setting of the remote control unit signal code and the printed circuit board setting.
If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

Jumper wire		Remote control unit signal code
JM1	JM2	
Connect	Connect	A (Primary setting)
Disconnect	Connect	b
Connect	Disconnect	c
Disconnect	Disconnect	d

Setting Record

- Record any changes to the settings in the following table.

Setting	Setting Value
Static pressure	
Cooler room temperature correction	
Heater room temperature correction	
Auto restart	
Indoor room temperature sensor switching function	

After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

6 TEST RUN

CHECK ITEMS

(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do not air flow direction louvers operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

- Do not operate the air conditioner in the running state for a long time.

[Using the wireless remote control]

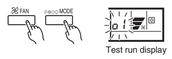
- For the operation method, refer to the operating manual.
- The outdoor unit may not operate depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)

- To end test operation, press the remote control unit START/STOP button.
(When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

[Using the wired remote control]

- For the operation method, refer to the operating manual.

(1) Stop the air conditioner operation.
(2) Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.



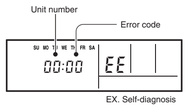
(3) Press the start/stop button to stop the test run.

[Troubleshooting at the remote control LCD]

This is possible only on the wired remote control.

[SELF-DIAGNOSIS]

If an error occurs, the following display will be shown.
("EE" will appear in the set room temperature display.)



Error code	Error contents
01 13 26 27	Indoor signal error
00	Wired remote controller abnormal
02	Indoor room temperature sensor error
04	Indoor heat exchanger temperature sensor (middle) error
28	Indoor heat exchanger temperature sensor (inlet) error
09	Float switch operated
0C	Outdoor discharge pipe temperature sensor error
06	Outdoor heat exchanger temperature sensor (outlet) error
0A	Outdoor temperature sensor error
15	Compressor temperature sensor error
1d	2-way valve temperature sensor error
1E	3-way valve temperature sensor error
29	Outdoor heat exchanger temperature sensor (middle) error
20	Indoor manual auto switch abnormal
2A	Power supply frequency detection error
17	IPM protection
18	CT error
1A	Compressor location error
1b	Outdoor fan error
1F	Connected indoor unit abnormal
1c	Outdoor unit computer communication error
12	Indoor fan abnormal
0F	Discharge temperature error
24	Exessive high pressure protection on cooling
2c	4-way valve abnormal
16	Pressure switch abnormal
2b	Compressor temperature error
19	Active filter abnormal
25	PFC circuit error

If "CO" appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

7 STATIC PRESSURE CHARACTERISTIC

⚠ CAUTION

If the applicable static pressure does not match the static pressure mode, the static pressure mode may be changed to another mode automatically.

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE

30Pa to 150Pa

1. STATIC PRESSURE MODE

It is necessary to set up a static pressure mode for each usage of static pressure.
Determine the applicable range of static pressure in each mode and wind volume, referring to the TECHNICAL MANUAL.

2. MODE SETTING

It is possible to change the setting of static pressure mode. Refer to [5] FUNCTION SETTING and to the INSTALLATION INSTRUCTION SHEET of remote controller for a setting method.

8 SPECIAL INSTALLATION METHODS

⚠ CAUTION

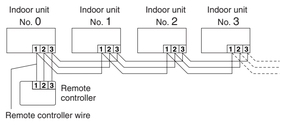
① **When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.**

② **Be sure to turn off the main power.**

GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

(1) Wiring method (indoor unit to remote controller)

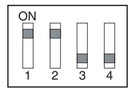


(2) DIP switch setting (Indoor unit)
Set the unit number of each indoor unit using DIP switch on the indoor unit circuit board. (See following table and figure.)
DIP switch is normally set to make unit number No. 0.

Indoor unit

Unit number	DIP SWITCH No.			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Example : No. 3



9 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating and installation manuals to the customer.
(4) If the signal code is changed, explain to the customer how it changed (the system returns to signal code A when the batteries in the remote control unit are replaced).
*(4) is applicable to using wireless remote control.

PART NO. 9374318193

SPLIT TYPE ROOM AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET

(PART NO. 9377863034)

⚠ CAUTION
R410A
REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

For authorized service personnel only.
This installation instruction sheet describes how to install the outdoor unit only. To install the indoor unit, refer to the installation instruction sheet included with the indoor unit.

⚠ DANGER	This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.
⚠ WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
⚠ CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models.
However, pay careful attention to the following points:

① **Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.)**
Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② **Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]**

③ **Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.**

④ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

⚠ WARNING

①	**For the room air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.**
②	**Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.**
③	**Installation work must be performed in accordance with national wiring standards by authorized personnel only.**
④	**Also, do not use an extension cord.**
⑤	**Do not turn on the power until all installation work is complete.**
⑥	**Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.**
⑦	**There is not extra refrigerant in the outdoor unit for air purging.**
⑧	**Use a vacuum pump for R410A exclusively.**
⑨	**Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.**
⑩	**Use a clean gauge manifold and charging hose for R410A exclusively.**
⑪	**If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.**

- **Be careful not to scratch the room air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the room air conditioner is serviced or moved.**

STANDARD PARTS

The following installation parts are furnished.
Use them as required.

Name and Shape	Q'ty	Application
Drain pipe 	1	For outdoor unit drain piping work
Adapter assy 12.7 mm → 9.52 mm 	1	For use when connecting ※12000 BTU model only

1. LIMITATION OF REFRIGERANT PIPING LENGTH

⚠ CAUTION

The total maximum pipe lengths and height difference of this product are shown in the table.
If the units are further apart than this, correct operation cannot be guaranteed.

Model Type	Pipe length MAX.	Pipe length MIN.	Maximum height (between indoor and outdoor)
12,000, 14,000 18,000 BTU/h class	25 m	5 m	15 m
24,000 BTU/h class	30 m		20 m

2. SELECTING PIPE SIZES

The diameters of the connection pipes differ according to the capacity of the indoor unit.
Refer to the following table for the proper diameters of the connection pipes between the indoor and outdoor units.

Capacity of indoor unit	Gas pipe size (thickness) [mm]	Liquid pipe size (thickness) [mm]
12	ø9.52 (0.8)	ø6.35 (0.8)
14, 18	ø12.7 (0.8)	ø6.35 (0.8)
24	ø15.88 (1.0)	ø6.35 (0.8)

⚠ CAUTION

Operation cannot be guaranteed if the correct combination of pipes, valves, etc., is not used to connect the indoor and outdoor units.

3. HEAT INSULATION AROUND CONNECTION PIPES REQUIREMENTS

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

Connect the connection pipes according to "5 CONNECTING THE PIPING" in this installation instruction sheet.

4. ELECTRICAL REQUIREMENT

- Use conformed cord with Type 245 IEC57.
- Electric wire size and fuse capacity:

Power supply cord (mm²)	MAX.	4.0
	MIN.	3.5
Connection cord (mm²)	MAX.	2.5
	MIN.	1.5
Fuse capacity (A)	OUTDOOR UNIT	25

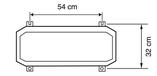
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (both indoor unit and outdoor unit)
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.

INSTALLATION PROCEDURE

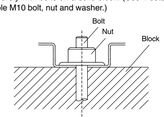
1 OUTDOOR UNIT INSTALLATION

1. OUTDOOR UNIT PROCESSING

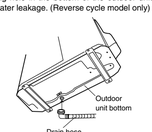
(1) Outdoor unit to be fasten with bolts at the four places indicated by the arrows without fail.



(2) Fix securely with bolts on a solid block. (Use 4 sets of commercially available M10 bolt, nut and washer.)



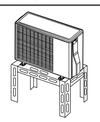
(3) Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (Reverse cycle model only)
(4) When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Reverse cycle model only)



⚠ CAUTION

① **When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)**

② **In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).**



- Set the unit on a strong stand, such as one made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

Connector cover removal

- Remove the tapping screws.

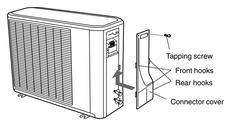
Installing the connector cover

(1) After inserting the two front hooks, then insert the rear hook.
(2) Tighten the tapping screws.

⚠ WARNING

① **Install the unit where it will not be tilted by more than 5°.**

② **When installing the outdoor unit where it may exposed to strong wind, fasten it securely.**



2 CONNECTING THE PIPE

⚠ CAUTION

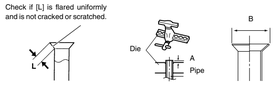
① **Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.**

② **While welding the pipes, be sure to blow dry nitrogen gas through them.**

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.

Check if [L] is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm) Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	
19.05 mm (3/4 in.)	

Pipe outside diameter	Dimension B +0 -0.4 (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	19.7
19.05 mm (3/4 in.)	24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Width across flats

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm
19.05 mm (3/4 in.)	36 mm

2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them. Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.**

② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

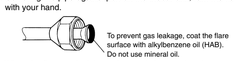
Outdoor unit
(1) Detach the caps and plugs from the pipes.

⚠ CAUTION

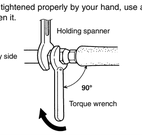
① **Be sure to apply the pipe against the port on the indoor unit and outdoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**

② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



(3) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	16 to 18 N·m (160 to 180 kgf·cm)
9.52 mm (3/8 in.) dia.	30 to 42 N·m (300 to 420 kgf·cm)
12.70 mm (1/2 in.) dia.	49 to 61 N·m (490 to 610 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 75 N·m (630 to 750 kgf·cm)
19.05 mm (3/4 in.) dia.	90 to 110 N·m (900 to 1100 kgf·cm)

4. HOW TO USE ADAPTER (Connection ports of outdoor unit) ※12000BTU model only

- When using the ADAPTER, be careful not to overtighten the nut, or the smaller pipe may be damaged.
- Apply a coat of refrigeration oil to the threaded connection port of the outdoor unit where the flare nut comes in.
- Use appropriate wrenches to avoid damaging the connection thread by overtightening the flare nut.
- Apply wrenches on both of flare nut (local part), and ADAPTER to tighten them.

Adapter tightening torque

Adapter type	Tightening torque
ø12.7 mm → ø9.52 mm	50 to 62 [N·m] (500 to 620 kgf·cm)

5. VACUUM

⚠ CAUTION

① **Always use a vacuum pump to purge the air.**

② **Refrigerant for purging the air is not charged in the outdoor unit at the factory.**

③ **Refrigerant must not be discharged into atmosphere.**

④ **Use a vacuum pump, gauge manifold and charge hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.**

⑤ **After connecting the piping, check the joints for gas leakage with gas leak detector or soapy water.**

CHECKING GAS LEAKAGE AND PURGING AIR

Gas leak checks are performed using either vacuum or nitrogen gas, so select the proper one depending on the situation.

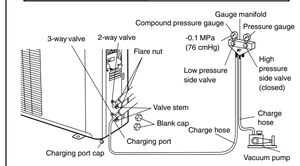
Checking gas leaks with vacuum:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Open the valve of the gauge manifold fully.
(4) Operate the vacuum pump and start pump down.
(5) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(6) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(It checks that leave as it is for about 10 minutes, and a needle does not return.)
(7) Disconnect the charge hose from the 3-way valve charging port.
(8) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf·cm)].
(9) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.

Checking gas leaks with nitrogen gas:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Pressurize with nitrogen gas using the 3-way valve charging port.
(4) Do not pressurize up to the specified pressure all at once but do so gradually.
① Increase the pressure up to 0.5 Mpa (5 kgf/cm²), let it sit for about five minutes and then check for any decrease in pressure.
② Increase the pressure up to 1.5 Mpa (15 kgf/cm²), let it sit for about five minutes and then check for any decrease in pressure.
③ Increase the pressure up to the specified pressure (the pressure designed for the product) and then make a note of it.
(5) Let it sit at the specified pressure and if there is no decrease in pressure then it is satisfactory. If a pressure decrease is confirmed, there is a leak, so it is necessary to specify the leak location and make minor adjustments.
(6) Discharge the nitrogen gas and starting removing the gas with a vacuum pump.
(7) Open the valve of the gauge manifold fully.
(8) Operate the vacuum pump and start pump down.
(9) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(10) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(11) Disconnect the charge hose from the 3-way valve charging port.
(12) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf·cm)].
(13) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.

		Tightening torque
Blank cap	6.35 mm (1/4 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	12.70 mm (1/2 in.)	28 to 32 N·m (280 to 320 kgf·cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf·cm)
Charging port cap		12.5 to 16 N·m (125 to 160 kgf·cm)



6. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory.
When the piping is longer than 15 m, additional charging is necessary.
For the additional amount, see the table below.

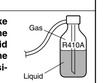
Pipe length / Model type	15 m	20 m	25 m	30 m
12,000 14,000 18,000 BTU/h class	None	100 g	200 g	–
24,000 BTU/h class	None	100 g	200 g	300 g

⚠ CAUTION

① **When moving and installing the air conditioner, do not mix gas other than the specified refrigerant (R410A) inside the refrigerant cycle.**

② **When charging the refrigerant R410A, always use an electronic balance for refrigerant charging (to measure the refrigerant by weight).**

③ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**



④ **Add refrigerant from the charging valve after the completion of the work.**

⑤ **If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.**

SELECTING THE MOUNTING POSITION

⚠ WARNING

Select installation locations that can properly support the weight of the indoor and outdoor units. Install the units securely so that they do not topple or fall.

⚠ CAUTION

① **Do not install where there is the danger of combustible gas leakage.**

② **Do not install the unit near heat source of heat, steam, or flammable gas.**

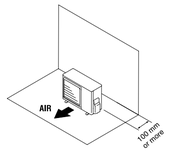
③ **If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.**

⚠ WARNING

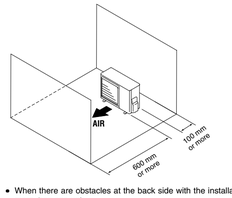
When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

Decide the mounting position with the customer as follows:
(1) Install the outdoor unit in a location which can withstand the weight of the unit and vibration, and which can install horizontally.
(2) Provide the indicated space to ensure good airflow.
(3) If possible, do not install the unit where it will be exposed to direct sunlight.
(If necessary, install a blind that does not interfere with the airflow.)
(4) Do not install the unit near a source of heat, steam, or flammable gas.
(5) During heating operation, drain water flows from the outdoor unit.
Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
(6) Do not install the unit where strong wind blows or where it is very dusty.
(7) Do not install the unit where people pass.
(8) Install the outdoor unit in a place where it will be free from being dirty or getting wet by rain as much as possible.
(9) Install the unit where connection to the indoor unit is easy.

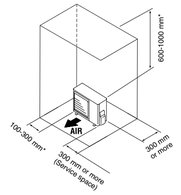
- When there are obstacles at the back side.



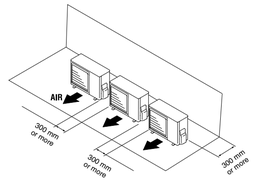
- When there are obstacles at the back and front sides.



- 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 than that is stated, the condition will be the same as that there are no obstacles.

3 POWER

⚠ WARNING

① **The rated voltage of this product is 220-240 V a.c. 50 Hz.**

② **Before turning on, verify that the voltage is within the 198 V to 264 V range.**

③ **Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.**

④ **Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)**

⑤ **Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.**

⑥ **Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.**

⑦ **The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.**

⚠ CAUTION

① **The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.**

② **When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.**

4 ELECTRICAL WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.**

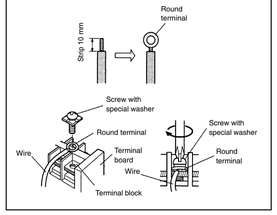
③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

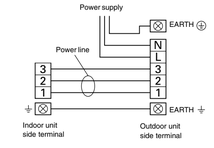
⑤ **Always connect the ground wire.**

HOW TO CONNECT WIRING TO THE TERMINALS

For strand wiring
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm to expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

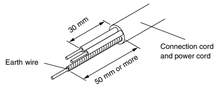


1. CONNECTION DIAGRAMS



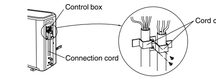
2. CORD PREPARATION

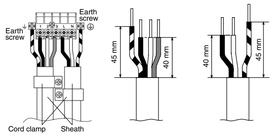
Keep the earth wire longer than the other wires.



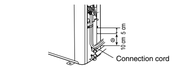
3. OUTDOOR UNIT

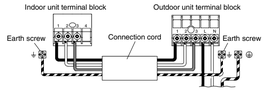
(1) Remove the outdoor unit connector cover.
(2) Bend the end of the cord as shown in the figure.
(3) Connect the end of the connection cord fully into the terminal block.
(4) Fasten the sheath with a cord clamp.
(5) Install the connector cover.





Connection cord wiring
Run the connection cord to the rear of the outdoor unit within the Ⓐ range of the arrows shown in the figure.
(The connector cover becomes difficult to install.)





⚠ CAUTION

① **Match the terminal block numbers and connection cord colors with those of the indoor unit. Erroneous wiring may cause burning of the electric parts.**

② **Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.**

③ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

④ **Securely earth the power cord plug.**

⑤ **Do not use the earth screw for an external connector. Only use for interconnection between two units.**

5 TEST RUNNING

1. Make a TEST RUN in accordance with the installation instruction sheet for the indoor unit.

CHECK ITEMS

(1) INDOOR UNIT
(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do the air flow-direction louver operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

(2) OUTDOOR UNIT
(1) Is there any abnormal noise and vibration during operation?
(2) Will noise, wind, or drain water from the unit disturb the neighbors?
(3) Is there any gas leakage?

- Do not operate the air conditioner in the test running state for a long time.
- For the operation method, refer to the operating manual and perform operation check.

2. OUTDOOR UNIT LEDS

When a malfunction occurs in the outdoor unit, the LED on the circuit board lights to indicate the error. Refer to the following table for the description of each error according to the LED.

Error contents	LED
Thermistor malfunction	on 0.1 sec/off 0.1 sec
Abnormal discharge temperature	on
Current surge protection	on 0.5 sec/off 0.5 sec
CT abnormality	on 2.0 sec/off 2.0 sec
Compressor position detection malfunction	on 0.1 sec/off 2.0 sec
Fan malfunction	on 5.0 sec/off 5.0 sec
PAM voltage abnormality	on 5.0 sec/off 0.1 sec
Timer short	on 1.0 sec/off 1.0 sec
Compressor temperature protection (permanent stop)	on 2.0 sec/off 5.0 sec
PFC surge protection (permanent stop)	on 5.0 sec/off 2.0 sec

6 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow adjustment, and other remote control unit operations.
(2) Air filter removal and cleaning.
(3) Give the operating manual and installation instruction sheet to the customer.

SPLIT TYPE ROOM AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET

⚠ CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

(PART NO. 9377863010)

For authorized service personnel only.

This installation instruction sheet describes how to install the outdoor unit only. To install the indoor unit, refer to the installation instruction sheet included with the indoor unit.

⚠ DANGER	This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.
⚠ WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
⚠ CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

① **Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.**

② **Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]**

③ **Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.**

④ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

1. LIMITATION OF REFRIGERANT PIPING LENGTH

⚠ CAUTION

The total maximum pipe lengths and height difference of this product are shown in the table.
If the units are further apart than this, correct operation cannot be guaranteed.

Model Type	Pipe length		Maximum height (between indoor and outdoor)
	MAX.	MIN.	
18,000 BTU/h class	25 m	5 m	15 m
24,000 BTU/h class	30 m		20 m

2. SELECTING PIPE SIZES

The diameters of the connection pipes differ according to the capacity of the indoor unit.
Refer to the following table for the proper diameters of the connection pipes between the indoor and outdoor units.

Capacity of indoor unit	Gas pipe size (thickness) [mm]	Liquid pipe size (thickness) [mm]
18	ø12.7 (0.8)	ø6.35 (0.8)
24	ø15.88 (1.0)	ø6.35 (0.8)

⚠ CAUTION

Operation cannot be guaranteed if the correct combination of pipes, valves, etc., is not used to connect the indoor and outdoor units.

3. HEAT INSULATION AROUND CONNECTION PIPES REQUIREMENTS

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

Connect the connection pipes according to "3 CONNECTING THE PIPING" in this installation instruction sheet.

4. ELECTRICAL REQUIREMENT

- Use conformed cord with Type 245 IEC57.
- Electric wire size and fuse capacity:

Power supply cord (mm²)	MAX.	4.0
	MIN.	3.5
Connection cord (mm²)	MAX.	2.5
	MIN.	1.5
Fuse capacity (A)	OUTDOOR UNIT	25

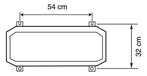
- Install the disconnect device with a contact gap of at least 3 mm nearby the units.
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.

INSTALLATION PROCEDURE

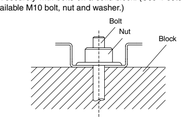
1 OUTDOOR UNIT INSTALLATION

1. OUTDOOR UNIT PROCESSING

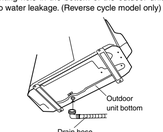
(1) Outdoor unit to be fasten with bolts at the four places indicated by the arrows without fail.



(2) Fix securely with bolts on a solid block. (Use 4 sets of commercially available M10 bolt, nut and washer.)



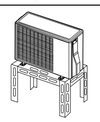
(3) Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (Reverse cycle model only)
(4) When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Reverse cycle model only)



⚠ CAUTION

① **When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)**

② **In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).**



- Set the unit on a strong stand, such as one made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

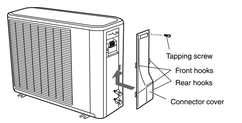
Connector cover removal
- Remove the tapping screws.

Installing the connector cover
(1) After inserting the two front hooks, then insert the rear hook.
(2) Tighten the tapping screws.

⚠ WARNING

① **Install the unit where it will not be tilted by more than 5°.**

② **When installing the outdoor unit where it may exposed to strong wind, fasten it securely.**



2 CONNECTING THE PIPE

⚠ CAUTION

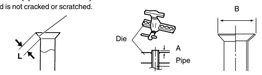
① **Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.**

② **While welding the pipes, be sure to blow dry nitrogen gas through them.**

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.

Check if [L] is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	
19.05 mm (3/4 in.)	

Pipe outside diameter	Dimension B +0 -0.4 (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	19.7
19.05 mm (3/4 in.)	24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Width across flats

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm
19.05 mm (3/4 in.)	36 mm

2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them. Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.**

② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

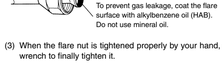
Outdoor unit
(1) Detach the caps and plugs from the pipes.

⚠ CAUTION

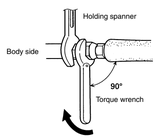
① **Be sure to apply the pipe against the port on the indoor unit and outdoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**

② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



(3) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



⚠ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	16 to 18 N·m (160 to 180 kgf-cm)
9.52 mm (3/8 in.) dia.	30 to 42 N·m (300 to 420 kgf-cm)
12.70 mm (1/2 in.) dia.	49 to 61 N·m (490 to 610 kgf-cm)
15.88 mm (5/8 in.) dia.	63 to 75 N·m (630 to 750 kgf-cm)
19.05 mm (3/4 in.) dia.	90 to 110 N·m (900 to 1100 kgf-cm)

4. VACUUM

⚠ CAUTION

① **Always use a vacuum pump to purge the air.**

② **Refrigerant for purging the air is not charged in the outdoor unit at the factory.**

③ **Refrigerant must not be discharged into atmosphere.**

④ **Use a vacuum pump, gauge manifold and charge hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.**

⑤ **After connecting the piping, check the joints for gas leakage with gas leak detector or soapy water.**

CHECKING GAS LEAKAGE AND PURGING AIR

Gas leak checks are performed using either vacuum or nitrogen gas, so select the proper one depending on the situation.

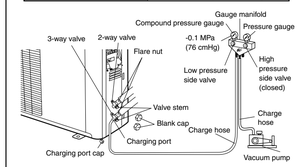
Checking gas leaks with vacuum:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Open the valve of the gauge manifold fully.
(4) Operate the vacuum pump and start pump down.
(5) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(6) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(It checks that leave as it is for about 10 minutes, and a needle does not return.)
(7) Disconnect the charge hose from the 3-way valve charging port.
(8) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf-cm)].
(9) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.

Checking gas leaks with nitrogen gas:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Pressurize with nitrogen gas using the 3-way valve charging port.
(4) Do not pressurize up to the specified pressure all at once but do so gradually.
① Increase the pressure up to 0.5 Mpa (5 kgf/cm²), let it sit for about five minutes and then check for any decrease in pressure.
② Increase the pressure up to 1.5 Mpa (15 kgf/cm²), let it sit for about five minutes and then check for any decrease in pressure.
③ Increase the pressure up to the specified pressure (the pressure designed for the product) and then make a note of it.
(5) Let it sit at the specified pressure and if there is no decrease in pressure then it is satisfactory. If a pressure decrease is confirmed, there is a leak, so it is necessary to specify the leak location and make minor adjustments.
(6) Discharge the nitrogen gas and starting removing the gas with a vacuum pump.
(7) Open the valve of the gauge manifold fully.
(8) Operate the vacuum pump and start pump down.
(9) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(10) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(11) Disconnect the charge hose from the 3-way valve charging port.
(12) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf-cm)].
(13) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.

		Tightening torque
Blank cap	6.35 mm (1/4 in.)	20 to 25 N·m (200 to 250 kgf-cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf-cm)
	12.70 mm (1/2 in.)	28 to 32 N·m (280 to 320 kgf-cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf-cm)
	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf-cm)
Charging port cap		12.5 to 16 N·m (125 to 160 kgf-cm)



5. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory.
When the piping is longer than 15 m, additional charging is necessary.
For the additional amount, see the table below.

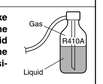
Pipe length / Model type	15 m	20 m	25 m	30 m
18,000 BTU/h class	None	100 g	200 g	–
24,000 BTU/h class	None	100 g	200 g	300 g

⚠ CAUTION

① **When moving and installing the air conditioner, do not mix gas other than the specified refrigerant (R410A) inside the refrigerant cycle.**

② **When charging the refrigerant R410A, always use an electronic balance for refrigerant charging (to measure the refrigerant by weight).**

③ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**



④ **Add refrigerant from the charging valve after the completion of the work.**

⑤ **If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.**

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

⚠ WARNING

①	**For the room air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.**
②	**Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.**
③	**Installation work must be performed in accordance with national wiring standards by authorized personnel only.**
④	**Also, do not use an extension cord.**
⑤	**Do not turn on the power until all installation work is complete.**
⑥	**Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.**
⑦	**There is not extra refrigerant in the outdoor unit for air purging.**
⑧	**Use a vacuum pump for R410A exclusively.**
⑨	**Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.**
⑩	**Use a clean gauge manifold and charging hose for R410A exclusively.**
⑪	**If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.**

- **Be careful not to scratch the room air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the room air conditioner is serviced or moved.**

STANDARD PARTS

The following installation parts are furnished.
Use them as required.

Name and Shape	Q'ty	Application
Drain pipe 	1	For outdoor unit drain piping work

SELECTING THE MOUNTING POSITION

⚠ WARNING

Select installation locations that can properly support the weight of the indoor and outdoor units. Install the units securely so that they do not topple or fall.

⚠ CAUTION

① **Do not install where there is the danger of combustible gas leakage.**

② **Do not install the unit near heat source of heat, steam, or flammable gas.**

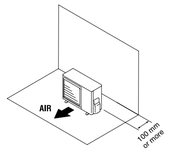
③ **If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.**

⚠ WARNING

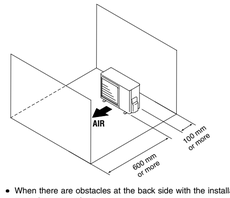
When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

Decide the mounting position with the customer as follows:
(1) Install the outdoor unit in a location which can withstand the weight of the unit and vibration, and which can install horizontally.
(2) Provide the indicated space to ensure good airflow.
(3) If possible, do not install the unit where it will be exposed to direct sunlight.
(If necessary, install a blind that does not interfere with the airflow.)
(4) Do not install the unit near a source of heat, steam, or flammable gas.
(5) During heating operation, drain water flows from the outdoor unit.
Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
(6) Do not install the unit where strong wind blows or where it is very dusty.
(7) Do not install the unit where people pass.
(8) Install the outdoor unit in a place where it will be free from being dirty or getting wet by rain as much as possible.
(9) Install the unit where connection to the indoor unit is easy.

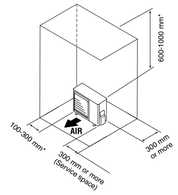
- When there are obstacles at the back side.



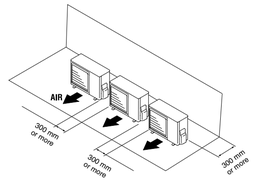
- When there are obstacles at the back and front sides.



- 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 than that is stated, the condition will be the same as that there are no obstacles.

3 POWER

⚠ WARNING

① **The rated voltage of this product is 220-240 V a.c. 50 Hz.**

② **Before turning on, verify that the voltage is within the 198 V to 264 V range.**

③ **Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.**

④ **Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)**

⑤ **Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.**

⑥ **Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.**

⑦ **The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.**

⚠ CAUTION

① **The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.**

② **When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.**

4 ELECTRICAL WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.**

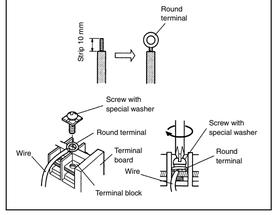
③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

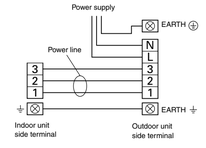
⑤ **Always connect the ground wire.**

HOW TO CONNECT WIRING TO THE TERMINALS

For strand wiring
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm to expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

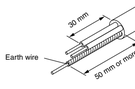


1. CONNECTION DIAGRAMS



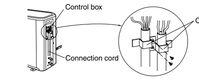
2. CORD PREPARATION

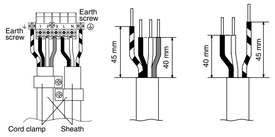
Keep the earth wire longer than the other wires.



3. OUTDOOR UNIT

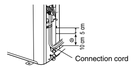
(1) Remove the outdoor unit connector cover.
(2) Bend the end of the cord as shown in the figure.
(3) Connect the end of the connection cord fully into the terminal block.
(4) Fasten the sheath with a cord clamp.
(5) Install the connector cover.

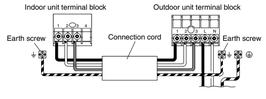




Connection cord wiring

Run the connection cord to the rear of the outdoor unit within the Ⓐ range of the arrows shown in the figure.
(The connector cover becomes difficult to install.)





⚠ CAUTION

① **Match the terminal block numbers and connection cord colors with those of the indoor unit. Erroneous wiring may cause burning of the electric parts.**

② **Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.**

③ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

④ **Securely earth the power cord plug.**

⑤ **Do not use the earth screw for an external connector. Only use for interconnection between two units.**

5 TEST RUNNING

1. Make a TEST RUN in accordance with the installation instruction sheet for the indoor unit.

CHECK ITEMS

(1) INDOOR UNIT
(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do the air flow-direction louver operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

(2) OUTDOOR UNIT
(1) Is there any abnormal noise and vibration during operation?
(2) Will noise, wind, or drain water from the unit disturb the neighbors?
(3) Is there any gas leakage?

- Do not operate the air conditioner in the test running state for a long time.
- For the operation method, refer to the operating manual and perform operation check.

2. OUTDOOR UNIT LEDS

When a malfunction occurs in the outdoor unit, the LED on the circuit board lights to indicate the error. Refer to the following table for the description of each error according to the LED.

Error contents	LED
Thermistor malfunction	on 0.1 sec/off 0.1 sec
Abnormal discharge temperature	on
Current surge protection	on 0.5 sec/off 0.5 sec
CT abnormality	on 2.0 sec/off 2.0 sec
Compressor position detection malfunction	on 0.1 sec/off 2.0 sec
Fan malfunction	on 5.0 sec/off 5.0 sec
PAM voltage abnormality	on 5.0 sec/off 0.1 sec
Timer short	on 1.0 sec/off 1.0 sec
Compressor temperature protection (permanent stop)	on 2.0 sec/off 5.0 sec
PFC surge protection (permanent stop)	on 5.0 sec/off 2.0 sec

6 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow adjustment, and other remote control unit operations.
(2) Air filter removal and cleaning.
(3) Give the operating manual and installation instruction sheet to the customer.

SPLIT TYPE AIR CONDITIONER
INSTALLATION INSTRUCTION SHEET

⚠ CAUTION
R410A
REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and Polyol Ester oil.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

(PART NO. 9374995066)

For authorized service personnel only.

This installation instruction sheet describes how to install the outdoor unit only. To install the indoor unit, refer to the installation instruction sheet included with the indoor unit.

⚠ DANGER	This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.
⚠ WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
⚠ CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

⚠ DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models.
However, pay careful attention to the following points:

① **Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.)**
Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.

② **Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]**

③ **Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.**

④ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure. –0.1 to 3.8 MPa (–76 cmHg to 38 kgf/cm²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

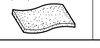
⚠ WARNING

① **For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.**
② **Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.**
③ **Installation work must be performed in accordance with national wiring standards by authorized personnel only.**
④ **Also, do not use an extension cord.**
⑤ **Do not turn on the power until all installation work is complete.**
⑥ **Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.**
⑦ **There is not extra refrigerant in the outdoor unit for air purging.**
⑧ **Use a vacuum pump for R410A exclusively.**
⑨ **Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.**
⑩ **Use a clean gauge manifold and charging hose for R410A exclusively.**
⑪ **If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.**

- **Be careful not to scratch the air conditioner when handling it.**
- **After installation, explain correct operation to the customer, using the operating manual.**
- **Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.**

STANDARD PARTS

The following installation parts are furnished.
Use them as required.

Name and Shape	Q'ty	Application
Drain pipe 	1	For outdoor unit drain piping work (May not be supplied, depending on the model.)
Drain cap 	2	
Insulation (seal) 	1	For filling in a gap at the entrance of connection cords

CONNECTION PIPE REQUIREMENT

⚠ CAUTION

The maximum lengths of this product are shown in the following table. If the units are further apart than this, correct operation can not be guaranteed.

Diameter		Pipe length		Maximum height (between indoor and outdoor)
Liquid	Gas	MAX.	MIN.	
9.52 mm (3/8 in.)	15.88 mm (5/8 in.)	50 m	5 m	30 m

- Use pipe with water-resistant heat insulation.

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation.
In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

- Electric wire size and breaker capacity:

Power supply cord			Connection cord			Breaker capacity (A)
Conductor size (mm²)		Maximum length (m)	Conductor size (mm²)		Maximum length (m)	
MAX.	MIN.		MAX.	MIN.		
6.0	5.3	17	2.5	1.5	51	30

- Use conformed cord with Type 245 IEC57.
- Install all electrical works in accordance to the standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)
- Install the circuit breaker nearby the units.

SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

⚠ WARNING

Select installation locations that can properly support the weight of the indoor and outdoor units. Install the units securely so that they do not topple or fall.

⚠ CAUTION

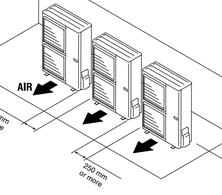
① **Do not install where there is the danger of combustible gas leakage.**
② **Do not install the unit near heat source of heat, steam, or flammable gas.**
③ **If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.**

⚠ WARNING

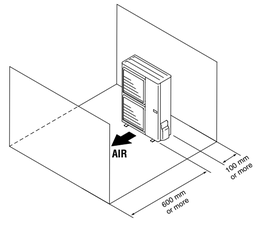
① **Install the unit where it will not be tilted by more than 3˚. However, do not install the unit with it tilted towards the side containing the compressor.**
② **When installing the outdoor unit where it may exposed to strong wind, fasten it securely.**

(1) Install the outdoor unit in a location which can withstand the weight of the unit and vibration, and which can install horizontally.
(2) Provide the indicated space to ensure good airflow.
(3) If possible, do not install the unit where it will be exposed to direct sunlight.
(If necessary, install a blind that does not interfere with the airflow.)
(4) Do not install the unit near a source of heat, steam, or flammable gas.
(5) During heating operation, drain water flows from the outdoor unit.
Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
(6) Do not install the unit where strong wind blows or where it is very dusty.
(7) Do not install the unit where people pass.
(8) Install the outdoor unit in a place where it will be free from being dirty or getting wet by rain as much as possible.
(9) Install the unit where connection to the indoor unit is easy.

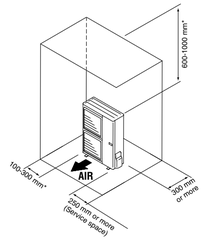
When there are obstacles at the back side.



When there are obstacles at the back and 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.

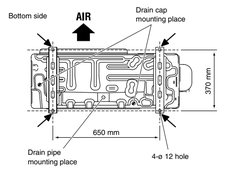
- If the space is larger than that is stated, the condition will be the same as that there are no obstacles.

INSTALLATION PROCEDURE

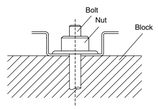
1 OUTDOOR UNIT INSTALLATION

1. OUTDOOR UNIT PROCESSING

(1) Outdoor unit to be fasten with bolts at the four places indicated by the arrows without fail.



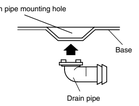
(2) Fix securely with bolts on a solid block. (Use 4 sets of commercially available M10 bolt, nut and washer.)



(3) Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (Reverse cycle model only)
(4) When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Reverse cycle model only)

⚠ CAUTION

When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)



2 CONNECTING THE PIPE

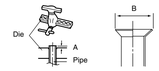
⚠ CAUTION

① **Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.**
② **While welding the pipes, be sure to blow dry nitrogen gas through them.**
③ **The maximum lengths of this product are shown in the table. If the units are further apart than this, correct operation can not be guaranteed.**

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional flare tool.

Check if [L] is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm)
	Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	
19.05 mm (3/4 in.)	

Pipe outside diameter	Dimension B $^{+0}_{-0.4}$ (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	19.7
19.05 mm (3/4 in.)	24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm
19.05 mm (3/4 in.)	36 mm

2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.
Do not bend the pipes in an angle more than 90°.
When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

⚠ CAUTION

① **To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.**
② **If the pipe is bent repeatedly at the same place, it will break.**

3. CONNECTION PIPES

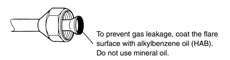
Outdoor unit

(1) Detach the caps and plugs from the pipes.

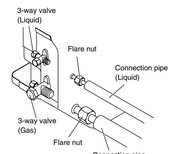
⚠ CAUTION

① **Be sure to apply the pipe against the port on the indoor unit and the outdoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.**
② **Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.**

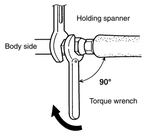
(2) Centering the pipe against port on the outdoor unit, turn the flare nut with your hand.



(3) Tighten the flare nut of the connection pipe at the outdoor unit valve connector.



(4) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



⚠ CAUTION

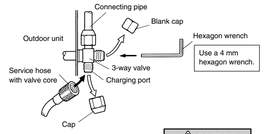
Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

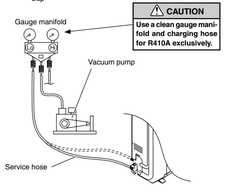
Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
9.52 mm (3/8 in.) dia.	33 to 42 N·m (330 to 420 kgf·cm)
12.70 mm (1/2 in.) dia.	50 to 62 N·m (500 to 620 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 77 N·m (630 to 770 kgf·cm)
19.05 mm (3/4 in.) dia.	100 to 110 N·m (1000 to 1100 kgf·cm)

4. VACUUM

(1) Remove the cap, and connect the gauge manifold and the vacuum pump to the charging valve by the service hoses.
(2) Vacuum the indoor unit and the connecting pipes until the pressure gauge indicates –0.1 MPa (–76 cmHg).
(3) When –0.1 MPa (–76 cmHg) is reached, operate the vacuum pump for at least 60 minutes.
(4) Disconnect the service hoses and fit the cap to the charging valve to the specified torque.
(5) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench [Torque: 6–7 N·m (60 to 70 kgf·cm)].
(6) Tighten the blank caps of the 2-way valve and 3-way valve to the specified torque.

		Tightening torque
Blank cap	6.35 mm (1/4 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	12.70 mm (1/2 in.)	25 to 30 N·m (250 to 300 kgf·cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf·cm)
Charging port cap		10 to 12 N·m (100 to 120 kgf·cm)





⚠ CAUTION

Use a clean gauge manifold and charging hose for R410A exclusively.

⚠ CAUTION

① **Do not purge the air with refrigerants, but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!**
② **Use a vacuum pump and gauge manifold and charging hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.**

5. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 20 m is charged in the outdoor unit at the factory.
When the piping is longer than 20 m, additional charging is necessary.
For the additional amount, see the table below.

Pipe length	20 m	30 m	40 m	50 m	g/m
Additional refrigerant	None	500 g	1000 g	1500 g	50 g/m

⚠ CAUTION

① **When moving and installing the air conditioner, do not mix gas other than the specified refrigerant R410A inside the refrigerant cycle.**
② **When charging the refrigerant R410A, always use an electronic balance for refrigerant charging (to measure the refrigerant by weight).**
③ **When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.**

④ **Add refrigerant from the charging valve after the completion of the work.**
⑤ **If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.**

6. GAS LEAKAGE INSPECTION

⚠ CAUTION

① **After connecting the piping, check the all joints for gas leakage with gas leak detector.**
② **When inspecting gas leakage, always use the vacuum pump for pressure. Do not use nitrogen gas.**

3 POWER

⚠ WARNING

① **The rated voltage of this product is 220-240 V a.c. 50 Hz.**
② **Before turning on, verify that the voltage is within the 198 V to 264 V range.**
③ **Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.**
④ **Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)**
⑤ **Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.**
⑥ **Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.**
⑦ **The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.**

⚠ CAUTION

① **The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.**
② **When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.**

(Continued to the next page)

4 ELECTRICAL WIRING

⚠ WARNING

① **Before starting work, check that power is not being supplied to all poles of the indoor unit and outdoor unit.**

② **Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.**

③ **Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.**

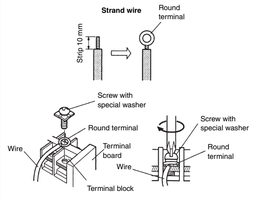
④ **Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)**

⑤ **Always connect the ground wire.**

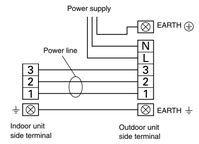
HOW TO CONNECT WIRING TO THE TERMINALS

For strand wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm to expose the strand wiring.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

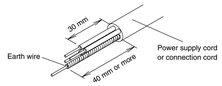


1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

Keep the earth wire longer than the other wires.

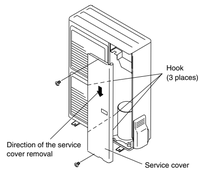


3. OUTDOOR UNIT

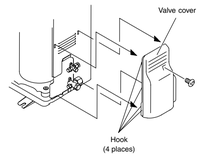
⚠ CAUTION

When connecting the power supply cord, make sure that the phase of the power supply matches with the phase of the terminal board. If the phases do not match, the compressor will rotate in reverse and will not be able to compress.

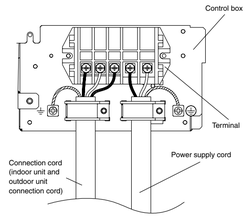
(1) Service cover removal
- Remove the two mounting screws.
- Remove the service cover by pushing downwards.

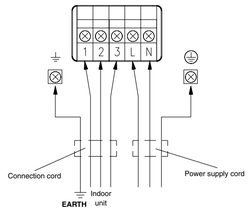


(2) Valve cover removal.
- Remove the one mounting screw.
- Remove the valve cover by sliding upward.

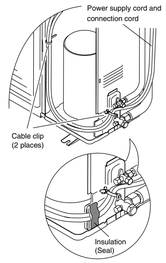


(3) Connect the power supply cord and the connection cord to terminal.
(4) Fasten the power supply cord and connection cord with cord clamp.



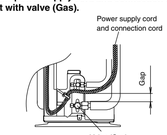


(5) Power supply cord and connection cord should be fixed with cable clip as shown in the figure.
Fill in a gap at the entrance of the cords with insulation (seal).



⚠ CAUTION

Do not make power supply cord and connection cord come in contact with valve (Gas).



(6) Put the service cover and valve cover back after completion of the work.

5 TEST RUN

1. Make a TEST RUN in accordance with the installation instruction sheet for the indoor unit.

2. OUTDOOR UNIT LEDS

When a malfunction occurs in the outdoor unit, the LED on the circuit board lights to indicate the error. Refer to the following table for the description of each error according to the LED.

LED	Error contents
1 flash	Communication error (Indoor unit – Outdoor unit)
2 flash	Discharge pipe temperature sensor
3 flash	Outdoor heat exchanger temperature (OUTLET) sensor
4 flash	Outdoor temperature sensor
5 flash	Outdoor heat exchanger temperature (MID) sensor
6 flash	Discharge pipe temperature abnormal
7 flash	Compressor temperature sensor
8 flash	Heat sink temperature sensor
9 flash	Pressure switch abnormal
10 flash	Compressor temperature abnormal
12 flash	IPM error
13 flash	Compressor rotor position cannot detect
14 flash	Compressor cannot operate
15 flash	Outdoor fan abnormal (upper fan)
16 flash	Outdoor fan abnormal (lower fan)
5 sec. ON/ 1 sec. OFF repeated	Protect operation
1 sec. ON/ 1 sec. OFF repeated	PUMP DOWN operation
OFF	No error

6 SPECIAL INSTALLATION SETTING

PUMP DOWN (Refrigerant collecting operation)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

1. When the product is stopped:

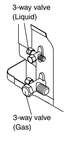
①	**Press the PUMP DOWN switch on the outdoor unit. (The LED on the outdoor unit circuit board starts flashing (1 sec. ON / 1 sec. OFF repeated).)**
②	**The pump down operation (cooling operation) begins right away. After operation starts, close the three-way valve (liquid).**
③	**After 2 – 3 minutes, operation stops. Close the three-way valve (gas) within one minute after operations stops.**
④	**The LED will go out three minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.**

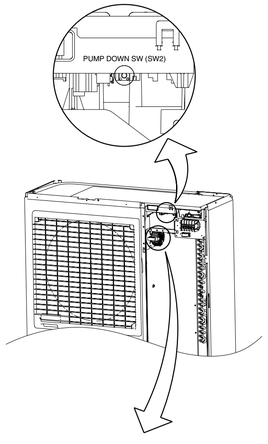
2. When the product is operating:

①	**Press the PUMP DOWN switch on the outdoor unit. The LED on the outdoor unit circuit board starts flashing (1 sec. ON / 1 sec. OFF repeated), and operation stops. At this point, recovery has not been completed, so do not close the three-way valves (liquid and gas).**
②	**The pump down operation (cooling operation) begins after three minutes. Close the three-way valve (liquid) after operation starts.**
③	**After 2 – 3 minutes, operation stops. Close the three-way valve (gas) within one minute after operations stops.**
④	**The LED will go out three minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.**

*When the pump down operation is repeated, temporarily disconnect the power supply after opening the closed valves (both liquid and gas).
Reconnect the power supply after 2 - 3 minutes and perform the pump down operation.

*When the start of the operation after pump down operation has been completed, temporarily disconnect the power supply after opening the closed valves (both liquid and gas).
Reconnect the power supply after 2 - 3 minutes and be sure to perform a test operation for cooling.





⚠ DANGER

**This part (Choke coil) generates high voltages.
Never touch this part.**

PART NO. 9374995066

Remote Controller (Wired Type)

INSTALLATION INSTRUCTION SHEET

(PART NO. 9373328063-02)

For authorized service personnel only.

⚠WARNING!	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.

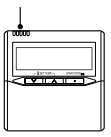
- **For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.**
- **Installation work must be performed in accordance with national wiring standards by authorized personnel only.**
- **Do not turn on the power until all installation work is complete.**

- **Let the customer keep this installation instruction sheet because it is needed when the air conditioner or remote controller is serviced or moved.**

⚠CAUTION!	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

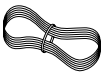
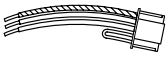
- **In order to detect the room temperature correctly when using the temperature sensor of the remote controller, do not install the remote controller in a place where it will be exposed to direct sunlight or directly below the air outlet of the indoor unit.**
- **Do not touch the remote controller PC board and PC board parts directly with your hands.**
- **Do not wire the remote controller cord and the bus wire together with or parallel to the connection cables, transmission cords, and power supply cords of the indoor and outdoor units. It may cause erroneous operation.**
- **When installing the bus wire near a source of electromagnetic waves, use shielded wire.**
- **Do not set the DIP switches, either on the air conditioner or the remote controller, in any way other than indicated in this sheet or the manual that is supplied with the air conditioner. Doing so may result in an accident.**

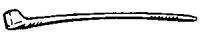
Temperature sensor



1 STANDARD PARTS

The following installation parts are supplied. Use them as required.

Name and Shape	Q'ty	Application
Remote controller 	1	For air conditioner operation
Remote controller cord (*1) 	1	For connecting the remote controller
Connecting cord (*2) 	1	For connecting the remote controller cord to the indoor unit

Name and Shape	Q'ty	Application
Tapping screw (M4 × 16) 	2	For installing the remote controller
Binder 	1	For remote controller and remote controller cord binding
Tapping screw (M4 × 14) (*2) 	1	For installing the remote controller cord to the indoor unit
Cord clamper (*2) 	1	For installing the remote controller cord to the indoor unit

(*1) UTB-YU/GU/XU only
(*2) Use only if the remote controller cord must be modified for the indoor unit model.

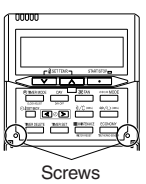
2 REMOTE CONTROLLER SETTING

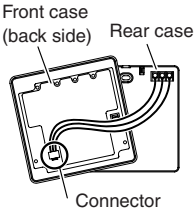
1. INSTALLING THE REMOTE CONTROLLER

Open the operation panel on the front of the remote controller, remove the two screws indicated in the following figure, and then remove the front case of the remote controller.

When installing the remote controller, remove the connector from the front case. The wires may break if the connector is not removed and the front case hangs down.
When installing the front case, connect the connector to the front case.

Fig. 1

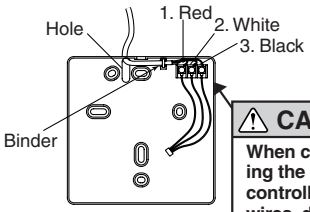




When remote controller cord is embedded

(1) Embed the remote controller cord and box.
(2) Pass the remote controller cord through the hole in the rear case and connect the remote controller cord to the remote controller terminal board specified in Fig. 2.
(3) Clamp the remote controller cord sheath with the binder as shown in Fig. 2.
(4) Cut off the excess binder.
(5) Install the rear case to the wall, box, etc., with two screws (Fig. 3).

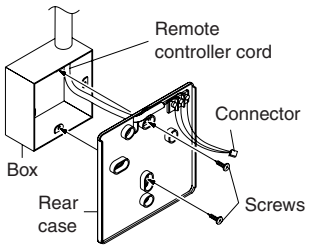
Fig. 2



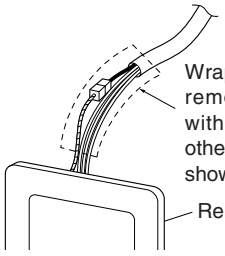
⚠ CAUTION

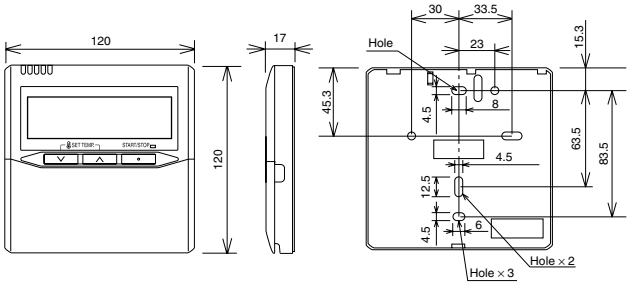
When connecting the remote controller wires, do not overtighten the screws.

Fig. 3
[Example]



Ground the remote controller if it has a ground wire.





Unit: mm

⚠ CAUTION

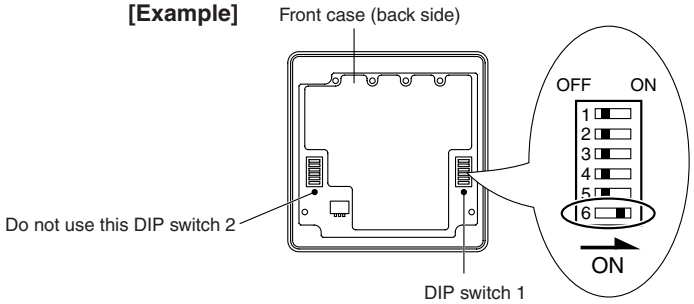
① Install the remote controller wires so as not to be direct touched with your hand.

② Do not touch the remote controller PC board and PC board parts directly with your hands.

2. SETTING THE DIP SWITCHES

Set the remote controller DIP switches.

[Example]



	NO.	SW state		Detail
		OFF	ON	
DIP switch 1	1	★		Cannot be used. (Do not change)
	2	★		Dual remote controller setting *Refer to 2. DUAL REMOTE CONTROLLERS in 3 SPECIAL INSTALLATION METHODS.
	3	Follow the selection in FUNCTION SETTING	Invalidity	Filter reset operation and filter display
	4	★		Cannot be used. (Do not change)
	5	★		Cannot be used. (Do not change)
	6	★ Invalidity	Validity	Memory backup setting *Set to ON to use batteries for the memory backup. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

(★ Factory setting)

3 REMOTE CONTROLLER CORD MODIFICATION

When the installation instruction sheet for the indoor unit contains information that the remote controller cord must be modified, perform the following work.

The remote controller cord must be modified when connecting it to some indoor unit models.

(1) Use a tool to cut off the terminal on the end of the remote controller cord, and then remove the insulation from the cut end of the cord as shown in Fig. 4.

(2) Connect the remote controller cord and connecting cord as shown in Fig. 5.

Important: Be sure to insulate the connection between the cords.

Fig. 4

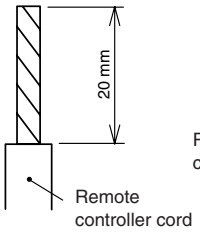
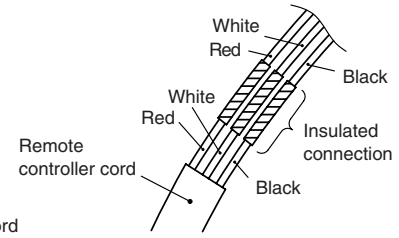


Fig. 5

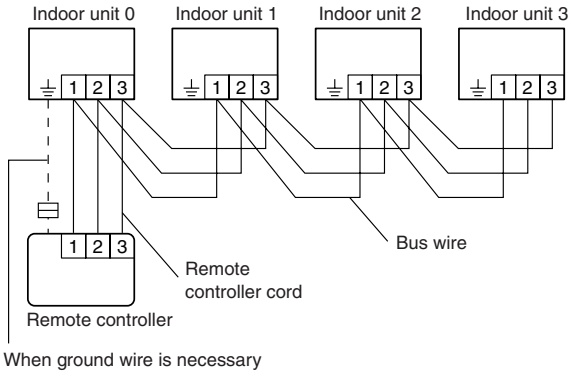


4 SPECIAL INSTALLATION METHODS

1. GROUP CONTROL

- A number of indoor units can be operated at the same time using a single remote controller.
- Depending on the model, some indoor units cannot be connected for group control.
- Some functions may become unusable, depending on the combination of the indoor units that are connected in a group.

(1) Wiring method (indoor unit to remote controller)

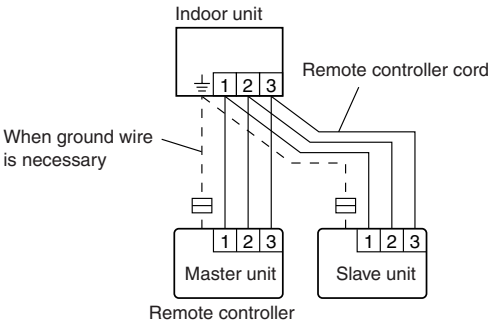


(2) Indoor unit address setting
Set each indoor unit address using the DIP switch of each indoor unit.
(Refer to the installation instruction sheet for the indoor unit.)

2. DUAL REMOTE CONTROLLERS

- Two separate remote controllers can be used to operate the indoor units.
- The timer and self-diagnosis functions cannot be used on the slave units.

(1) Wiring method (indoor unit to remote controller)



(2) Remote controller DIP switch 1 setting
Set the remote controller DIP switch 1 No. 2 according to the following table.

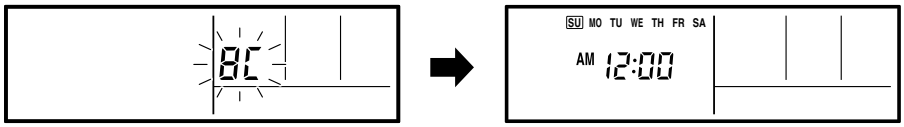
Number of remote controllers	Master unit	Slave unit
	DIP SW 1 No. 2	DIP SW 1 No. 2
1 (Normal)	OFF	–
2 (Dual)	OFF	ON

5 TURNING ON THE POWER

1. Check the remote controller wiring and DIP switch settings.
2. Install the front case.

* When installing the front case, connect the connector to the front case (in 2 REMOTE CONTROLLER SETTING).

3. Check the indoor and outdoor unit wiring and circuit board switch settings, and then turn on the indoor and outdoor units. After "8C" has flashed on the set temperature display for several seconds, the clock display will appear in the center of the remote controller display.The clock display will appear in the center of the remote controller display.

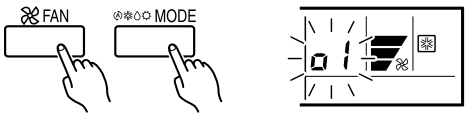


6 TEST OPERATION

1. If the operation lamp is on, press the Start/Stop button to turn it off.
2. Press the Master Control and Fan Control buttons at the same time for more than two seconds to start the test operation. The operation lamp will light up and "01" will be displayed on the set temperature display.

* Perform the test operation for 60 minutes.

* Pressing the Start/Stop button will stop the test operation.

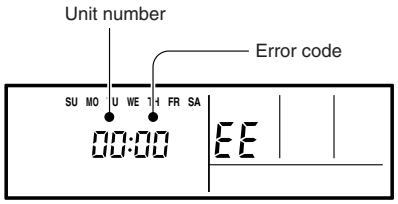


Test operation display

SELF-DIAGNOSIS

If an error occurs, the following display will be shown.
("EE" will appear in the set room temperature display.)

Unit number	Error code	Content
C0	1d	Incompatible indoor unit is connected
C0	1c	Indoor unit ↔ remote controller communication error



Ex. Self-diagnosis

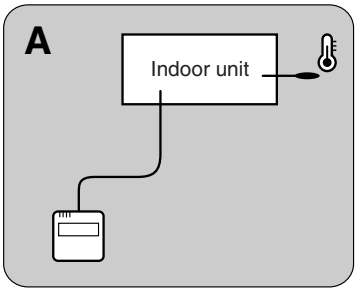
7 SETTING THE ROOM TEMPERATURE DETECTION LOCATION

The detection location of the room temperature can be selected from the following two examples. Choose the detection location that is best for the installation location.

A. Indoor unit setting (factory setting)

The room temperature is detected by the indoor unit temperature sensor.

(1) When the THERMO SENSOR button is pressed, the lock display flashes because the function is locked at the factory.

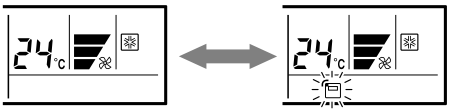


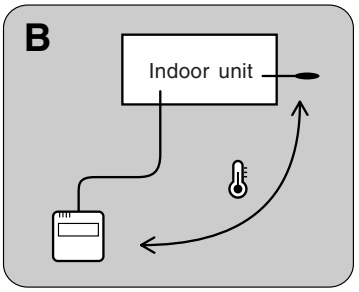
B. Indoor unit/remote controller setting (room temperature sensor selection)

The temperature sensor of the indoor unit or the remote controller can be used to detect the room temperature.

(1) Enable the room temperature sensor selection in FUNCTION SETTING, which will be described later.

(2) Press the THERMO SENSOR button for 5 seconds or more to select the temperature sensor of the indoor unit or the remote controller.





NOTES

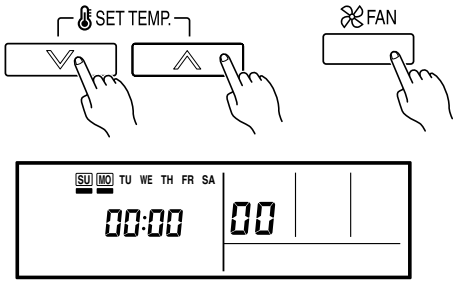
If the function to change the temperature sensor is used as shown in examples A (other than example B), be sure to lock the detection location. If the function is locked, the lock display will flash when the THERMO SENSOR button is pressed.

FUNCTION SETTING

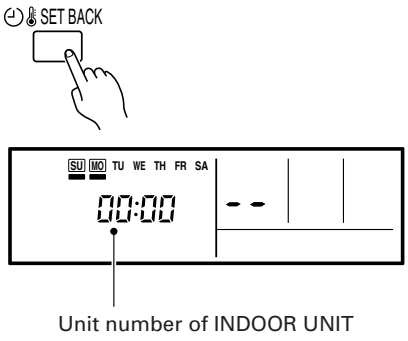
This procedure changes the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the indoor unit to malfunction. This procedure should be performed by authorized installation or service personnel only.

Perform the “FUNCTION SETTING” according to the installation conditions using the remote controller. (Refer to the indoor unit installation instruction sheet for details on the function numbers and setting values.)

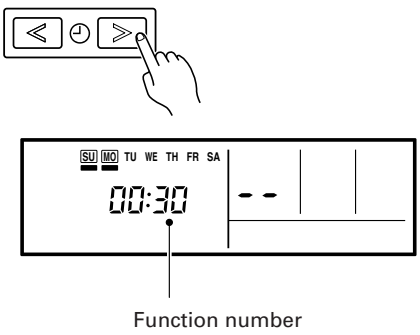
(1) Press the set temperature buttons (⋁) (⋀) and fan control button simultaneously for more than 5 seconds to enter the function setting mode.



(2) Press the SET BACK button to select the indoor unit number.



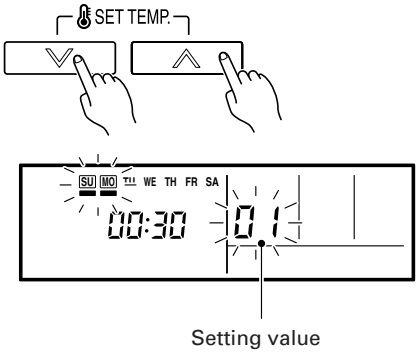
(3) Press the set time buttons to select the function number.



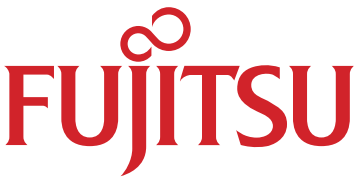
(4) Press the set temperature buttons (⋁) (⋀) to select the setting value.
The display flashes as shown to the right during setting value selection.

(5) Press the SET button to confirm the setting.
Press the SET button for a few seconds until the setting value stops flashing.
If the setting value display changes or if “- -” is displayed when the flashing stops, the setting value has not been set correctly.
(An invalid setting value may have been selected for the indoor unit.)

(6) Repeat steps 2 to 5 to perform additional settings.
Press the set temperature buttons (⋁) (⋀) and fan control button simultaneously again for more than 5 seconds to cancel the function setting mode.
In addition, the function setting mode will be automatically canceled after 1 minute if no operation is performed.



(7) After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.



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