

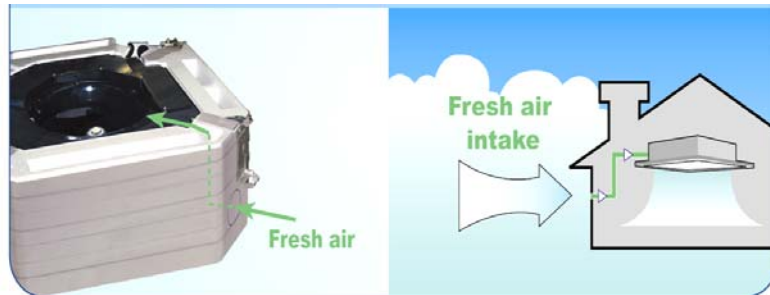
Four-way Cassette Type

Part1. Product features

1) Low operation noise

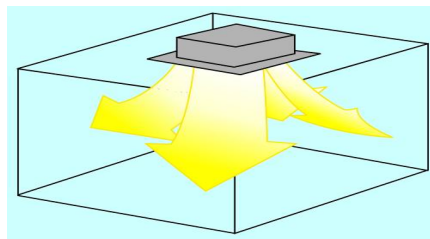
- Streamline plate ensures quietness
- Creates natural and comfortable environment

2) Fresh air make life more healthy and comfortable.



3) Efficient cooling

- Equal, fast and wide—range cooling



Four-way airflow

4) The adoption of the most advanced 3- Dimensional Screw fan

- Reduces the air resistance passing through
- Smooths the air flow
- Makes air speed distribution to the heat exchange uniform



3- Dimensional Screw fan

5) Improvement for easy installation and maintenance

- Little space is required for installation into a shallow ceiling
- Because of the compactness and weight reduction of the main unit and panel, all models can be installed without a hoist

Part2. Specification

Model			MCA-18HRN1	MCA-24HRN1	MCA-30HRN1
Power supply		Ph-V-Hz	1,220-240V,50Hz	1,220-240V,50Hz	3,380V,50Hz
Cooling	Capacity	Btu/h	18000	24000	30000
	Capacity	kW	5.3	7.1	8.8
	Input	W	1900	2560	3250
	Rated current	A	8.8	12.2	5.5
	EER	Btu/W.h	9.6	9.6	9.3
Heating	Capacity	Btu/h	20500	27300	32000
	Capacity	kW	6.0	8.0	9.4
	Input	W	1900	2500	3250
	Rated current	A	8.8	11	5.5
	COP	Btu/W.h	10.7	10.9	10.9
Moisture Removal		L/h	1.8	2.4	3.0
Max. input consumption		W	2300	3300	4620
Max. current		A	11.7	15.3	8.5
Starting current		A	45	60	31
Compressor	Model		PA225X2CS-4KU	PA290X3CS-4MU1	C-SBN303H8D
	Type		ROTARY	ROTARY	SCROLL
	Brand		TOSHIBA	TOSHIBA	SANYO
	Supplier		TOSHIBA (Guangdong)	TOSHIBA (Guangdong)	SANYO(Dalian)
	Capacity	Btu/h	18362	24574	33500
	Input	W	1855	2440	3650
	Rated current(RLA)	A	8.6	11.4	6.58
	Locked rotor Amp(LRA)	A	80	85	65
	Thermal protector		INNER	INNER	INNER
	Capacitor	uF	50	50	/
	Refrigerant oil	ml	750	950	1700
Indoor fan motor	Model		YDK45-4F	YDK55-6	YDK56-6
	Brand		WELING	WELLING	WELLING
	Input	W	63	120	137
	Capacitor	uF	2.5	3.5	3
	Speed(hi/lo)	r/min	930/830	680/600	670/565
Indoor coil	Number of rows		2	2	2
	Tubepitch(a)x row pitch(b)	mm	21×13.37	21×13.37	21×13.37
	Fin spacing	mm	1.3	1.3	1.3
	Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium
	Tube outside dia.and type	mm	Φ7, innergroove tube	Φ7, innergroove tube	Φ7, innergroove tube
	Coil length x height x width	mm	1185×210×26.7	1950×126×26.74	1950×168×26.74

Indoor air flow (Hi/Lo)		m ³ /h	860/760	1050/900	1600/1420
Indoor noise level (Hi/Lo)		dB(A)	43/40	43/40	47/44
Indoor unit	Dimension (W*H*D)(body)	mm	580×254×580	840×240×840	840×310×840
	Packing (W*H*D)(body)	mm	750×340×750	1020×330×930	1020×400×930
	Net/Gross weight(body)	kg	21/30	36/46	40/50
	Dimension (W*H*D)(panel)	mm	650×30×650	950×40×950	950×40×950
	Packing (W*H*D)(panel)	mm	715×115×715	1030×145×1030	1030×145×1030
	Net/Gross weight(panel)	kg	3/5	6/11	6/11
Outdoor fan motor	Model		YDK53-6K	YDK53-6H	YDK250-6D-WL
	Brand		WELLING	WELLING	WELLING
	Input	W	130	130	307
	Capacitor	uF	2.5	3	10
	Speed	r/min	750	800	740
Outdoor coil	Number of rows		2	2	2
	Tube pitch(a)x row pitch(b)	mm	25.4×22	25.4×22	25.4×22
	Fin spacing	mm	1.8	1.5	1.7
	Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium	unhydrophilic aluminium
	Tube outside dia.and type	mm	Φ9.53, innergroove tube	Φ9.53, innergroove tube	Φ9.53, innergroove tube
	Coil length x height x width	mm	775×660×44	850×810×44	955×915×44
	Number of circuits		3	4	8
Outdoor air flow		m ³ /h	2400	3000	5000
Outdoor noise level		dB(A)	48	55	57
Outdoor unit	Dimension(W*H*D)	mm	845×695×335	895×860×330	990×960×360
	Packing (W*H*D)	mm	965×847×395	1000×985×410	1120×1090×435
	Net/ Gross weight	kg	55/58	79/90	101/106
Refrigerant type/Quantity		g	R410A/2050	R410A/2600	R410A/3100
Design pressure (high side/low side)		MPa	4.2/2.5	4.2/2.5	4.2/2.5
Refrigerant piping	Liquid side	mm(inch)	6.35 (1/4)	9.53 (3/8)	12.7 (1/2)
	Gas side	mm(inch)	12.7 (1/2)	16 (5/8)	19 (3/4)
	Max. pipe length	m	30	30	30
	Max. difference in level	m	20	20	20
Operation temp		℃	17~30	17~30	17~30
Ambient temp		℃	-7~45	-7~45	-7~45
Application area		m ²	34~49	40~56	50~75
Qty'per 20' & 40' Fcl		Pieces	56/123/140	30/63/66	25/55/62

Notes: 1. Nominal cooling capacities are based on the following conditions:

Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB;

2. Nominal heating capacities are based on the following conditions:

Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB;

3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

Model			MCA-36HRN1	MCA-48HRN1
Power supply		Ph-V-Hz	3,380V,50Hz	3,380V,50Hz
Cooling	Capacity	Btu/h	36000	48000
	Capacity	kW	10.5	14
	Input	W	3700	4700
	Rated current	A	6.5	8.2
	EER	Btu/W.h	9.6	9.6
Heating	Capacity	Btu/h	39000	52000
	Capacity	kW	11.4	15.2
	Input	W	3350	4900
	Rated current	A	5.8	8.6
	COP	Btu/W.h	11.5	10.6
Moisture Removal		L/h	3.8	4.8
Max. input consumption		W	4620	5870
Max. current		A	8.5	10.7
Starting current		A	31	41
Compressor	Model		C-SBN303H8D	C-SBN373H8D
	Type		SCROLL	SCROLL
	Brand		SANYO	SANYO
	Supplier		SANYO(Dalian)	SANYO(Dalian)
	Capacity	Btu/h	33500	48123
	Input	W	3650	4750
	Rated current(RLA)	A	6.58	8.22
	Locked rotor Amp(LRA)	A	65	82
	Thermal protector		INNER	INNER
	Capacitor	uF	/	/
	Refrigerant oil	ml	1700	1700
Indoor fan motor	Model		YDK56-6	YDK56-6
	Brand		WELLING	WELLING
	Input	W	137	137
	Capacitor	uF	3	3
	Speed(hi/lo)	r/min	670/565	670/565
Indoor coil	Number of rows		2	2
	Tubepitch(a)x row pitch(b)	mm	21×13.37	21×13.37
	Fin spacing	mm	1.3	1.3
	Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	Tube outside dia.and type	mm	Φ7, innergroove tube	Φ7, innergroove tube
	Coil length x height x width	mm	1950×168×26.74	1950×168×26.74
Indoor air flow (Hi/Lo)		m ³ /h	1600/1420	1600/1420
Indoor noise level (Hi/Lo)		dB(A)	47/44	47/44
Indoor unit	Dimension (W*H*D)(body)	mm	840×310×840	840×310×840

	Packing (W*H*D)(body)	mm	1020×400×930	1020×400×930
	Net/Gross weight(body)	kg	40/50	40/50
	Dimension (W*H*D)(panel)	mm	950×40×950	950×40×950
	Packing (W*H*D)(panel)	mm	1030×145×1030	1030×145×1030
	Net/Gross weight(panel)	kg	6/11	6/11
Outdoor fan motor	Model		YDK250-6D-WL	YDK65-6WL; YDK65-6F
	Brand		WEILING	WELLING
	Input	W	307	138+156
	Capacitor	uF	10	3.5×2
	Speed	r/min	740	800
Outdoor coil	Number of rows		2	2
	Tube pitch(a) x row pitch(b)	mm	25.4×22	25.4×22
	Fin spacing	mm	1.7	1.8
	Fin type (code)		unhydrophilic aluminium	hydrophilic aluminium
	Tube outside dia.and type	mm	Φ9.53, innergroove tube	Φ9.53, innergroove tube
	Coil length x height x width	mm	955×915×44	715×1220×44
	Number of circuits		8	4
Outdoor air flow		m³/h	5000	5000
Outdoor noise level		dB(A)	57	58
Outdoor unit	Dimension(W*H*D)	mm	990×960×360	940×1245×360
	Packing (W*H*D)	mm	1120×1090×435	1020×1370×435
	Net/ Gross weight	kg	101/106	110/125
Refrigerant type/Quantity		g	R410A/3100	R410A/4000
Design pressure (high side/low side)		MPa	4.2/2.5	4.2/2.5
Refrigerant piping	Liquid side	mm(inch)	12.7 (1/2)	12.7 (1/2)
	Gas side	mm(inch)	19 (3/4)	19 (3/4)
	Max. pipe length	m	30	30
	Max. difference in level	m	20	20
Operation temp		℃	17~30	17~30
Ambient temp		℃	-7~45	-7~45
Application area		m²	60~85	80~105
Qty'per 20' & 40' Fcl		Pieces	25/55/62	24/52/55

Notes: 1. Nominal cooling capacities are based on the following conditions:

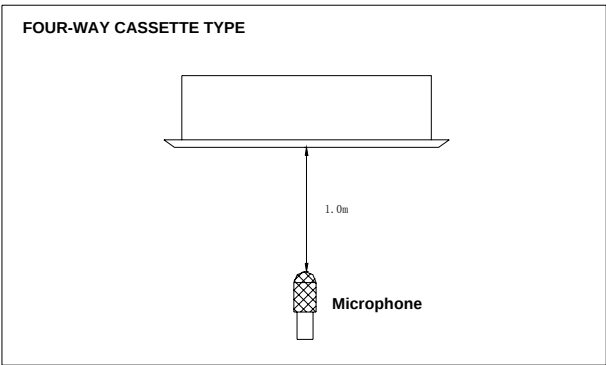
Indoor temp: 27°CDB, 19°CWB; Outdoor temp: 35°CDB;

2. Nominal heating capacities are based on the following conditions:

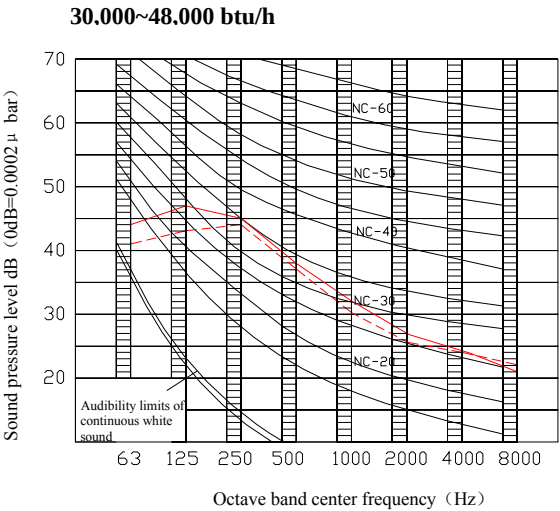
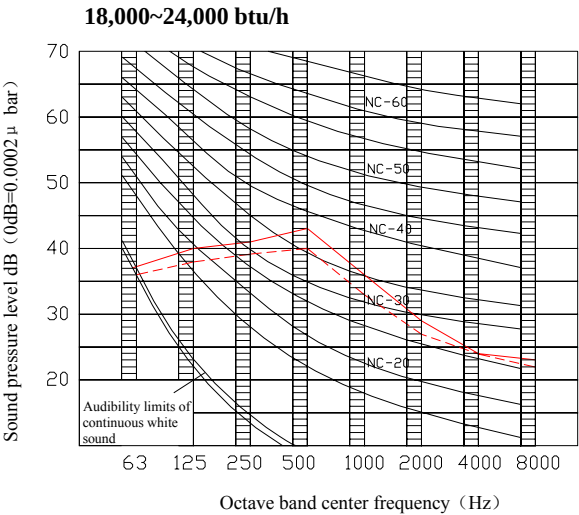
Indoor temp: 20°CDB; Outdoor temp: 7°CDB, 6°CWB;

3. Actual noise level may differ, depending on the room structure, etc, since these noise values are from an anechoic room.

Part 3. Noise level

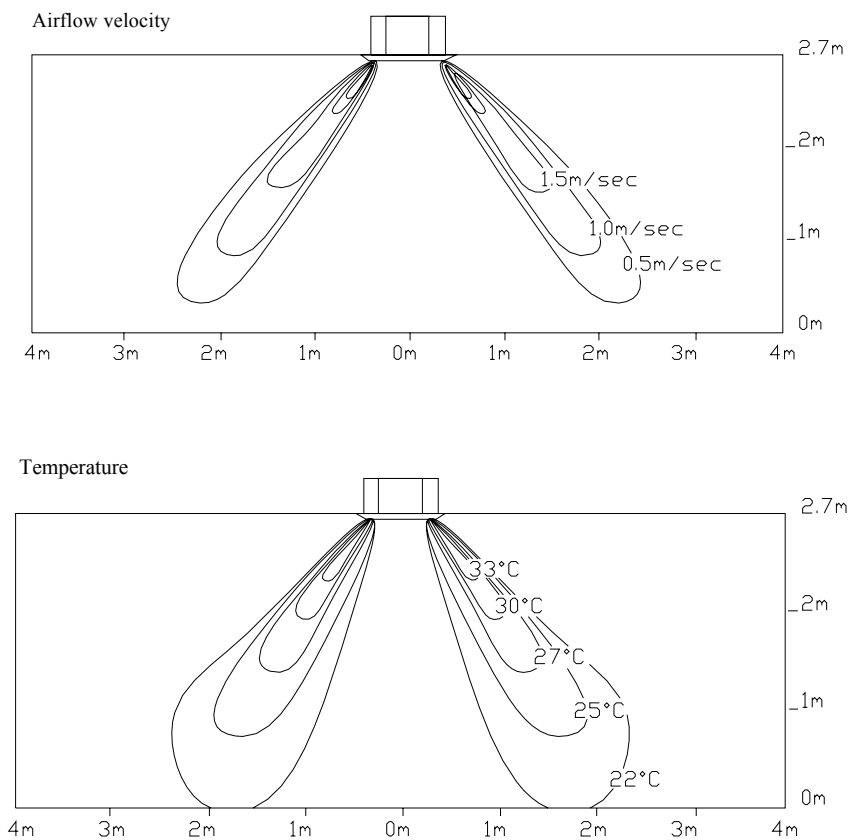


———— High speed
----- Low speed



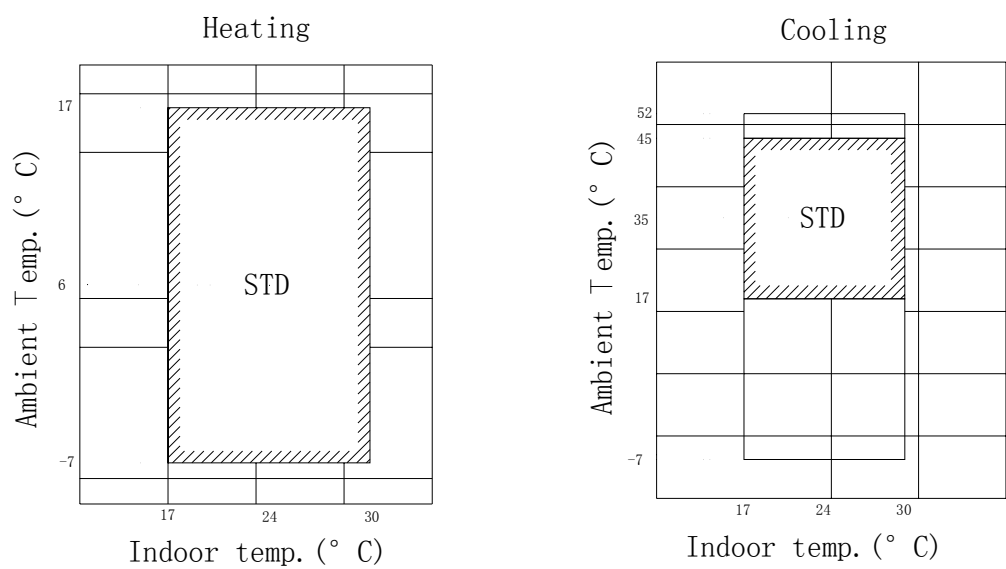
Part4. Velocity & temperature distribution

Discharge angle 60°



Part5. Operation range

Ensure the operating temperature is in allowable range.



Part6. Capacity table

Model: MCA-18HRN1

COOLING		OUTDOOR CONDITIONS						
Indoor Conditions		21°C	25°C	30°C	35°C	40°C	45°C	50°C
21°C D 15°C W	Total capacity kW	5.12	4.90	4.72	4.45	4.27	4.14	4.01
	Sensitive capacity kW	4.10	3.92	3.78	3.56	3.42	3.31	3.21
	Input kW.	1.20	1.37	1.54	1.71	1.88	2.05	2.22
24°C D 17°C W	Total capacity kW	5.61	5.36	5.17	4.88	4.68	4.53	4.39
	Sensitive capacity kW	4.49	4.29	4.13	3.90	3.74	3.63	3.51
	Input kW.	1.26	1.44	1.62	1.81	1.99	2.17	2.35
27°C D 19°C W	Total capacity kW	6.10	5.83	5.62	5.30	5.09	4.93	4.77
	Sensitive capacity kW	4.88	4.66	4.49	4.24	4.07	3.94	3.82
	Input kW.	1.33	1.52	1.71	1.90	2.09	2.28	2.47
32°C D 23°C W	Total capacity kW	7.01	6.70	6.46	6.10	5.85	5.67	5.49
	Sensitive capacity kW	5.61	5.36	5.17	4.88	4.68	4.53	4.39
	Input kW.	1.53	1.75	1.97	2.19	2.40	2.62	2.84

Model: MCA-18HRN1

HEATING		OUTDOOR CONDITIONS							
Indoor Conditions		24°C D 18°C W	12°C D 11°C W	7°C D 6°C W	4°C D 3°C W	0°C D -1°C W	-5°C D -6°C W	-7°C D -8°C W	-15°C D -16°C W
15°C	Capacity kW	7.20	5.76	4.80	4.32	4.08	3.60	3.36	3.12
	Input kW.	2.28	1.82	1.52	1.44	1.37	1.29	1.22	1.06
18°C	Capacity kW	8.10	6.48	5.40	4.86	4.59	4.05	3.78	3.51
	Input kW.	2.57	2.05	1.71	1.62	1.54	1.45	1.37	1.20
20°C	Capacity kW	9.00	7.20	6.00	5.40	5.10	4.50	4.20	3.90
	Input kW.	2.85	2.28	1.90	1.81	1.71	1.62	1.52	1.33
22°C	Capacity kW	9.90	7.92	6.60	5.94	5.61	4.95	4.62	4.29
	Input kW.	3.14	2.51	2.09	1.99	1.88	1.78	1.67	1.46
27°C	Capacity kW	11.70	9.36	7.80	7.02	6.63	5.85	5.46	5.07
	Input kW.	3.71	2.96	2.47	2.35	2.22	2.10	1.98	1.73

Model: MCA-24HRN1

COOLING		OUTDOOR CONDITIONS						
Indoor Conditions		21°C	25°C	30°C	35°C	40°C	45°C	50°C
21°C D 15°C W	Total capacity kW	6.86	6.56	6.32	5.96	5.73	5.55	5.37
	Sensitive capacity kW	5.49	5.25	5.06	4.77	4.58	4.44	4.29
	Input kW.	1.61	1.84	2.07	2.30	2.53	2.76	3.00
24°C D 17°C W	Total capacity kW	7.51	7.19	6.92	6.53	6.27	6.07	5.88
	Sensitive capacity kW	6.01	5.75	5.54	5.23	5.02	4.86	4.70
	Input kW.	1.70	1.95	2.19	2.43	2.68	2.92	3.16
27°C D 19°C W	Total capacity kW	8.17	7.81	7.53	7.10	6.82	6.60	6.39
	Sensitive capacity kW	6.53	6.25	6.02	5.68	5.45	5.28	5.11
	Input kW.	1.79	2.05	2.30	2.56	2.82	3.07	3.33
32°C D 23°C W	Total capacity kW	9.39	8.98	8.65	8.17	7.84	7.59	7.35
	Sensitive capacity kW	7.51	7.19	6.92	6.53	6.27	6.07	5.88
	Input kW.	2.06	2.36	2.65	2.94	3.24	3.53	3.83

Model: MCA-24HRN1

HEATING		OUTDOOR CONDITIONS							
Indoor Conditions		24°C D 18°C W	12°C D 11°C W	7°C D 6°C W	4°C D 3°C W	0°C D -1°C W	-5°C D -6°C W	-7°C D -8°C W	-15°C D -16°C W
15°C	Capacity kW	9.60	7.68	6.40	5.76	5.44	4.80	4.48	4.16
	Input kW.	3.00	2.40	2.00	1.90	1.80	1.70	1.60	1.40
18°C	Capacity kW	10.80	8.64	7.20	6.48	6.12	5.40	5.04	4.68
	Input kW.	3.38	2.70	2.25	2.14	2.03	1.91	1.80	1.58
20°C	Capacity kW	12.00	9.60	8.00	7.20	6.80	6.00	5.60	5.20
	Input kW.	3.75	3.00	2.50	2.38	2.25	2.13	2.00	1.75
22°C	Capacity kW	13.20	10.56	8.80	7.92	7.48	6.60	6.16	5.72
	Input kW.	4.13	3.30	2.75	2.61	2.48	2.34	2.20	1.93
27°C	Capacity kW	15.60	12.48	10.40	9.36	8.84	7.80	7.28	6.76
	Input kW.	4.88	3.90	3.25	3.09	2.93	2.76	2.60	2.28

Model: MCA-30HRN1

COOLING		OUTDOOR CONDITIONS						
Indoor Conditions		21°C	25°C	30°C	35°C	40°C	45°C	50°C
21°C D 15°C W	Total capacity kW	8.50	8.13	7.84	7.39	7.10	6.87	6.65
	Sensitive capacity kW	6.80	6.50	6.27	5.91	5.68	5.50	5.32
	Input kW.	2.05	2.34	2.63	2.93	3.22	3.51	3.80
24°C D 17°C W	Total capacity kW	9.31	8.91	8.58	8.10	7.77	7.53	7.29
	Sensitive capacity kW	7.45	7.12	6.87	6.48	6.22	6.02	5.83
	Input kW.	2.16	2.47	2.78	3.09	3.40	3.71	4.01
27°C D 19°C W	Total capacity kW	10.12	9.68	9.33	8.80	8.45	8.18	7.92
	Sensitive capacity kW	8.10	7.74	7.46	7.04	6.76	6.55	6.34
	Input kW.	2.28	2.60	2.93	3.25	3.58	3.90	4.23
32°C D 23°C W	Total capacity kW	11.64	11.13	10.73	10.12	9.72	9.41	9.11
	Sensitive capacity kW	9.31	8.91	8.58	8.10	7.77	7.53	7.29
	Input kW.	2.62	2.99	3.36	3.74	4.11	4.49	4.86

Model: MCA-30HRN1

HEATING		OUTDOOR CONDITIONS							
Indoor Conditions		24°C D 18°C W	12°C D 11°C W	7°C D 6°C W	4°C D 3°C W	0°C D -1°C W	-5°C D -6°C W	-7°C D -8°C W	-15°C D -16°C W
15°C	Capacity kW	11.28	9.02	7.52	6.77	6.39	5.64	5.26	4.89
	Input kW.	3.90	3.12	2.60	2.47	2.34	2.21	2.08	1.82
18°C	Capacity kW	12.69	10.15	8.46	7.61	7.19	6.35	5.92	5.50
	Input kW.	4.39	3.51	2.93	2.78	2.63	2.49	2.34	2.05
20°C	Capacity kW	14.10	11.28	9.40	8.46	7.99	7.05	6.58	6.11
	Input kW.	4.88	3.90	3.25	3.09	2.93	2.76	2.60	2.28
22°C	Capacity kW	15.51	12.41	10.34	9.31	8.79	7.76	7.24	6.72
	Input kW.	5.36	4.29	3.58	3.40	3.22	3.04	2.86	2.50
27°C	Capacity kW	18.33	14.66	12.22	11.00	10.39	9.17	8.55	7.94
	Input kW.	6.34	5.07	4.23	4.01	3.80	3.59	3.38	2.96

Model: MCA-36HRN1

COOLING		OUTDOOR CONDITIONS						
Indoor Conditions		21°C	25°C	30°C	35°C	40°C	45°C	50°C
21°C D 15°C W	Total capacity kW	10.14	9.70	9.35	8.82	8.47	8.20	7.94
	Sensitive capacity kW	8.11	7.76	7.48	7.06	6.77	6.56	6.35
	Input kW.	2.33	2.66	3.00	3.33	3.66	4.00	4.33
24°C D 17°C W	Total capacity kW	11.11	10.63	10.24	9.66	9.27	8.98	8.69
	Sensitive capacity kW	8.89	8.50	8.19	7.73	7.42	7.19	6.96
	Input kW.	2.46	2.81	3.16	3.52	3.87	4.22	4.57
27°C D 19°C W	Total capacity kW	12.08	11.55	11.13	10.50	10.08	9.77	9.45
	Sensitive capacity kW	9.66	9.24	8.90	8.40	8.06	7.81	7.56
	Input kW.	2.59	2.96	3.33	3.70	4.07	4.44	4.81
32°C D 23°C W	Total capacity kW	13.89	13.28	12.80	12.08	11.59	11.23	10.87
	Sensitive capacity kW	11.11	10.63	10.24	9.66	9.27	8.98	8.69
	Input kW.	2.98	3.40	3.83	4.26	4.68	5.11	5.53

Model: MCA-36HRN1

HEATING		OUTDOOR CONDITIONS							
Indoor Conditions		24°C D 18°C W	12°C D 11°C W	7°C D 6°C W	4°C D 3°C W	0°C D -1°C W	-5°C D -6°C W	-7°C D -8°C W	-15°C D -16°C W
15°C	Capacity kW	13.68	10.94	9.12	8.21	7.75	6.84	6.38	5.93
	Input kW.	4.02	3.22	2.68	2.55	2.41	2.28	2.14	1.88
18°C	Capacity kW	15.39	12.31	10.26	9.23	8.72	7.70	7.18	6.67
	Input kW.	4.52	3.62	3.02	2.86	2.71	2.56	2.41	2.11
20°C	Capacity kW	17.10	13.68	11.40	10.26	9.69	8.55	7.98	7.41
	Input kW.	5.03	4.02	3.35	3.18	3.02	2.85	2.68	2.35
22°C	Capacity kW	18.81	15.05	12.54	11.29	10.66	9.41	8.78	8.15
	Input kW.	5.53	4.42	3.69	3.50	3.32	3.13	2.95	2.58
27°C	Capacity kW	22.23	17.78	14.82	13.34	12.60	11.12	10.37	9.63
	Input kW.	6.53	5.23	4.36	4.14	3.92	3.70	3.48	3.05

Model: MCA-48HRN1

COOLING		OUTDOOR CONDITIONS						
Indoor Conditions		21°C	25°C	30°C	35°C	40°C	45°C	50°C
21°C D 15°C W	Total capacity kW	13.52	12.94	12.47	11.76	11.29	10.94	10.58
	Sensitive capacity kW	10.82	10.35	9.97	9.41	9.03	8.75	8.47
	Input kW.	2.96	3.38	3.81	4.23	4.65	5.08	5.50
24°C D 17°C W	Total capacity kW	14.81	14.17	13.65	12.88	12.36	11.98	11.59
	Sensitive capacity kW	11.85	11.33	10.92	10.30	9.89	9.58	9.27
	Input kW.	3.13	3.57	4.02	4.47	4.91	5.36	5.80
27°C D 19°C W	Total capacity kW	16.10	15.40	14.84	14.00	13.44	13.02	12.60
	Sensitive capacity kW	12.88	12.32	11.87	11.20	10.75	10.42	10.08
	Input kW.	3.29	3.76	4.23	4.70	5.17	5.64	6.11
32°C D 23°C W	Total capacity kW	18.52	17.71	17.07	16.10	15.46	14.97	14.49
	Sensitive capacity kW	14.81	14.17	13.65	12.88	12.36	11.98	11.59
	Input kW.	3.78	4.32	4.86	5.41	5.95	6.49	7.03

Model: MCA-48HRN1

HEATING		OUTDOOR CONDITIONS							
Indoor Conditions		24°C D 18°C W	12°C D 11°C W	7°C D 6°C W	4°C D 3°C W	0°C D -1°C W	-5°C D -6°C W	-7°C D -8°C W	-15°C D -16°C W
15°C	Capacity kW	18.24	14.59	12.16	10.94	10.34	9.12	8.51	7.90
	Input kW.	5.88	4.70	3.92	3.72	3.53	3.33	3.14	2.74
18°C	Capacity kW	20.52	16.42	13.68	12.31	11.63	10.26	9.58	8.89
	Input kW.	6.62	5.29	4.41	4.19	3.97	3.75	3.53	3.09
20°C	Capacity kW	22.80	18.24	15.20	13.68	12.92	11.40	10.64	9.88
	Input kW.	7.35	5.88	4.90	4.66	4.41	4.17	3.92	3.43
22°C	Capacity kW	25.08	20.06	16.72	15.05	14.21	12.54	11.70	10.87
	Input kW.	8.09	6.47	5.39	5.12	4.85	4.58	4.31	3.77
27°C	Capacity kW	29.64	23.71	19.76	17.78	16.80	14.82	13.83	12.84
	Input kW.	9.56	7.64	6.37	6.05	5.73	5.41	5.10	4.46

Part7. Electric control functions

1. Performance Index

No.	Item	Index
1	Applicable Voltage Range	165-253V~, 343-418V~
2	A/C Frequency	50Hz
3	Working environment temperature	-7°C- +45°C

2. Main Parts Introduction

2.1 Indoor Fan

High speed and low speed.

Breeze speed for anti-cold air.

2.2 Outdoor Fan

High speed and low speed.

Remark : some model just have one speed.

2.3 Buzzer

2.3.1 It will buzz when its driving port in the main chip outputs high level.

2.3.2 It will buzz once when the main frame receives remote start-up signal.

2.3.3 It will buzz once for 1 second when receiving turn-off signal.

2.3.4 It will buzz for 0.5 second once receiving other signal.

2.4 Indicator

2.4.1 There are 4 indicators: operating indicator, timer indicator, water level warning indicator, defrosting indicator and pre-heating indicator (wind-delivery indicator for cooling-only A/C).

2.4.2 LED indicates errors when protection is in effective.

2.5 Four-way Valve

It is controlled by relays.

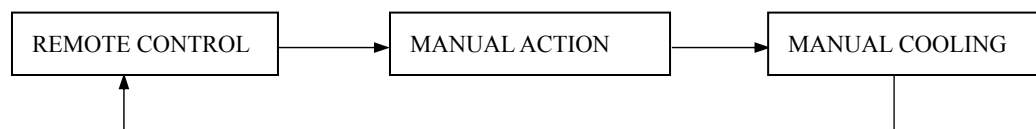
2.6 Condensate Pump

It is controlled by relays.

3. Operation Modes and Functions

3.1 Manual Operation

3.1.1 The manual operation mode is controlled through “manual” pad in the wind in-take grid, including such two modes as manual action and manual cooling. Push the manual pad for each switchover, the order for which is shown below:



3.1.2 Manual Cooling

3.1.2.1 Under this mode, no remote control signal will be received.

3.1.2.2 The compressor is started up unconditionally and the rotating speed of indoor and outdoor fans is set to be

in high and forced cooling operation.

3.1.2.3 Under this mode, the buzzer will buzz twice with each lasting 0.5 second at 0.5 interval. During the first 30 minutes of unconditional forced cooling operation, the operation indicator will blink at 0.5Hz. In the process of switchover to manual action mode, the buzzer buzzes for 0.5 second and the indicator is illuminated.

3.1.2.4 Under this mode, the corresponding protections are in effective (3- minute delayed start-up, over current, outdoor protection and evaporator low temperature protection.). Corresponding protection will act once any protection is in active.

Push “manual” pad once to end this mode and enter the remote control pending status. The buzzer will buzz for 1 second and the indicator turn off.

3.1.3 Manual Action

3.1.3.1 Under this mode, the remote signal will be received and corresponding actions will be taken accordingly upon the receipt of the remote signal.

3.1.3.2 On entering this mode, the buzzer will buzz for 0.5 second and the indicator on.

3.1.3.3 The system will operate under the auto mode whose temperature is set to be 24°C and at the same time, the wind grille will swing automatically.

3.1.3.4 Under this mode, corresponding protections are in effective.

3.1.3.5 Push “ manual” pad to end this mode and switch over to manual cooling mode.

3.2 Heating Mode

3.2.1 Four-way valve opens at once, while defrosting process closes.

3.2.2 Condition for the compressor action: (Ts = set temperature, Ta = room temperature)

	Condition	Compressor	Outdoor fan
Room temp. up	Ta> Ts+4	Off	Off
	Ta<Ts+4	On	On
Room temp. down	Ta< Ts+3	On	On
	Ta>Ts+3	Off	Off

3.2.3 Indoor Fan Action

3.2.3.1 Anytime remote switchover for fan speed among high/low/auto, (anti-cold air function takes priority).

3.2.3.2 Anti-cold air:

Switchover between fan speed and fine tune can be set according to temperature of evaporator pipe .

	Condition T= Indoor exchanger temp.	Indoor fan speed
Indoor exchanger temp. up	T<25°C	Off
	25°C <T<32°C	Breeze
	T>32°C	Setting fan speed
Indoor exchanger temp. down	T> 30°C	Setting fan speed
	15°C <T<30°C	Breeze
	T<15°C	Off

During anti-cold air period, if indoor fan is shut down, then pre-heating/defrosting lamp is on. Once indoor fan starts, pre-heating/defrosting lamp will be off.

3.2.3.3 Auto fan of indoor fan under heating mode.

	Condition (T =Indoor Temp.-Setting Temp.)	Indoor fan speed
Room temp. up	T<3°C	High
	T>3°C	Low
Room temp. down	T> 1°C	Low
	T<1°C	High

3.3 Defrost (only available to heating mode)

3.3.1 The defrosting of 2HP, 3HP is processed by indoor control board.

3.3.1.1 Defrosting Conditions

3.3.1.1.1 Low temperature defrosting condition:

Accumulated operating time when temperature of outdoor heat exchanger coil T3 is below -2°C reaches up to over 40 minutes.

3.3.1.1.2 High temperature defrosting condition:

Under high temperature protection of evaporator, the time when outdoor fan is shut down but compressor is not has been accumulated for up to 90 minutes. It is considered that defrosting is performed when either 3.3.1.1 or 3.3.1.2 is met.

3.3.1.2 Defrosting Action

Four-way valve and outdoor fan are shut down. Indoor fan operates according to anti-cold air function. Compressor keeps on continuously.

3.3.1.3 Ending Of Defrosting Condition

It is considered that defrosting condition is ended when any of the conditions is met:

3.3.1.3.1 Operating current of compressor reaches 1.5Ie.

3.3.1.3.2 Time of defrosting reaches 10 minutes.

3.3.1.3.3 Temperature of outdoor coil T3 is up to 20°C.

3.3.1.4 Ending Action of Defrost

3.3.1.4.1 Outdoor fan and four-way valve are open.

3.3.1.4.2 Compressor keeps on continuously.

3.3.1.4.3 Indoor fan acts according to anti-cold air function.

3.3.1.4.4 Defrosting/pre-heating lamp continues to be on until indoor fan starts up.

3.3.2 The defrosting of 3.5~5HP(3N) is processed by outdoor control board.

3.3.2.1 Defrosting Conditions(any of the following conditions is meet)

3.3.2.1.1 Under indoor pipe high temperature protection in heating mode, accumulated operating time is up to 90 minutes.(if outdoor fan is off and compressor are cut down, time again.)

3.3.2.1.2 When $T_4 \geq -8^\circ\text{C}$, 1min, process the normal defrost mode: compressor operates continue 40 minute, the accumulated time up to 40 minutes when pipe temperature sensor $T_3 \leq -2^\circ\text{C}$ (if compressor is off, time again); when defrosting ends, check T4 again.

3.3.2.2 Defrosting Action

When defrosting, the outdoor four-way valve is power off, defrosting valve is power on, outdoor fan is off, compressor operate continue, indoor fan operates according to anti-cold air condition in heating mode. If indoor fan is to be off, cut down the electric auxiliary heater and after 15 seconds cut down indoor fan.

3.3.2.3 Ending Action of Defrost(any of the following conditions is met)

3.3.2.3.1 Time of defrosting reaches 10 minutes.

3.3.2.3.2 Temperature of outdoor coil T3 is up to 20°C

3.3.2.4 Ending Action of Defrost

Operate in normal heating mode. After defrost stops, indoor fan starts to operate according to anti-cold air condition.

3.4 Cooling Mode

3.4.1 Four-way valve is closed. If four-way valve is open before the machine enters cooling mode, then four-way valve will be closed at the first time the compressor starts under the cooling mode.

3.4.2 Conditions for the compressor and outdoor fan action (T_s = set temperature, T_a =room temperature)

	Condition	Compressor	Outdoor fan
Room temp. up	$T_a > T_s + 1$	On	On
	$T_a < T_s + 1$	Off	Off
Room temp. down	$T_a > T_s$	On	On
	$T_a < T_s$	Off	Off

3.4.3 Action of Indoor Fan

3.4.3.1 HIGH/LOW/AUTO fan can be switched over for your comfort.

3.4.3.2 Auto fan under cooling mode.

	Condition (T =Indoor Temp.-Setting Temp.)	Indoor fan speed
Temp. up	$T < 4^{\circ}\text{C}$	Low
	$T > 4^{\circ}\text{C}$	High
Temp. down	$T > 1^{\circ}\text{C}$	High
	$T < 1^{\circ}\text{C}$	Low

3.5 Dehumidifying Mode

3.5.1 Dehumidifying mode is the cooling operation, under which the indoor fan is high and outdoor fan is low.

3.5.2 Protective condition is activated.

3.6 Auto Mode

3.6.1 Under auto mode, the indoor fan is set to be auto (refer to auto fan under cooling, heating).

3.6.2 When entering auto mode, the heating, fan only or cooling operation will be automatically chosen according to the room temperature T_a and the set temperature T_s .

3.6.2.1 When $T_a < T_s - 1^{\circ}\text{C}$, it performs the heating operation with a set temperature of $T_s - 1^{\circ}\text{C}$ (refer to the heating mode). However the cool only model will be in low fan.

3.6.2.2 When $T_s + 2^{\circ}\text{C} \geq T_a \geq T_s - 1^{\circ}\text{C}$, control according to cooling auto fan with a set temperature of 23°C .

3.6.2.3 When $T_a > T_s + 2^{\circ}\text{C}$, it performs the cooling operation with a set temperature of T_s (refer to the cooling mode).

3.6.3 After one mode is chosen, if the condition $T_a > T_s + 1^{\circ}\text{C}$ or $T_a < T_s - 1^{\circ}\text{C}$ lasts for 15 minutes, meanwhile the compressor doesn't start up within consecutive 15 minutes, the operation mode will be re-chosen according to the T_a and T_s .

3.6.4 Protective condition is activated.

3.7 Fan Only Mode

- 3.7.1 Under this mode, four-way valve, compressor and outdoor fan are shut down.
- 3.7.2 High/Low/Auto fan can be switched over through manual control. Auto fan will be controlled in line with cooling auto fan with temperature set to be 23°C.
- 3.7.3 After entering fan mode, the operating indicator is on. If the model is cooling only mode, fan indicator is on at the same time.

4. Other Functions

4.1 LED Display

Operation lamp, timer lamp, defrosting/pre-heating lamp, and water level alarm lamp.

4.1.1 Operation Lamp

When the operation is recovering, it will blink at 1 Hz.

After the unit is on, the lamp will keep on.

After the unit is off, the lamp will be off.

When the unit is switched over from manual cooling to remote control, the lamp will be off.

4.1.2 Timer Lamp

During timer operation, it will be on.

4.1.3 Defrosting/Pre-Heating Lamp

When heat pump model performs defrosting or anti-cold air, it will be on.

4.1.4 Water Level Alarm Lamp

When water level is above the alarm level, it will blink at 5Hz.

4.2 Timer

Refer to remote controller manual for detail operation.

Note: The timer is valid for one operation of the A/C.

4.3 Louver Action

Closed angle at energized	Heating	Cooling or dehumidifying	Swing range
55°	30°	30°	0-30°

The swing angle is between 15° and -15° with 15° being its center.

4.4 Condensate Pump

4.4.1 The action of the water pump is controlled by water level switch.

4.4.2 Control procedures (check water level every 5 seconds)

4.4.2.1 When entering cooling mode, dehumidifying mode or forced cooling mode, condenser starts at once and operates continue until the above modes stop.

4.4.2.2 Under stand-by, heating or fan mode, if the water level in water receiver rises to the position of the water switch, the controller will make LED flashing to give warning signal, and at the same time forces compressor to stop and the drain pump start. The water level will be checked continuously. If the water level falls to warning water level, the warning signal will disappear (the drain pump delay 1 minute to be off), compressor starts again (3 minutes protection takes priority), and operation recovers according to former setting mode. On the other wise, after 3 minutes, the whole unit stops (including drain pump) and warning signal can't disappear. It can't recover unless out of power.

5. Trouble Shooting

5.1 Protective Function

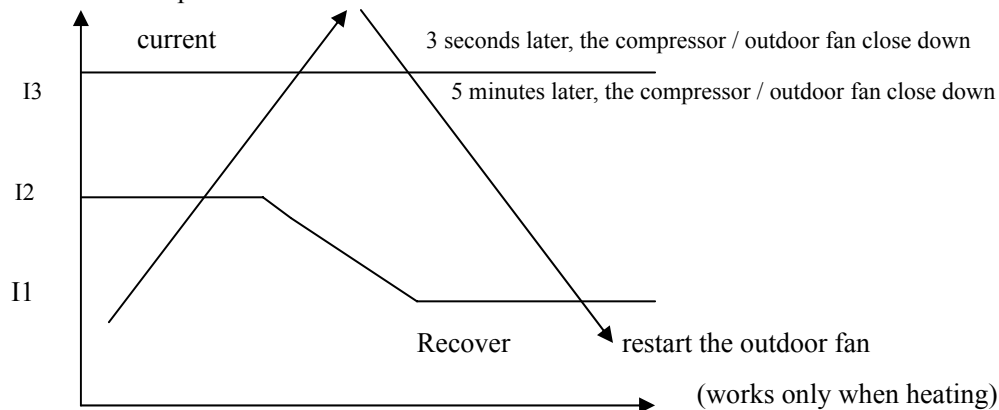
5.1.1 3-minute delay for the compressor start-up.

At the beginning of energizing or after the stop of the compressor, 3-minute delay will be needed to start the compressor.

When switchover between cooling/heating mode, the compressor stops automatically.

5.1.2 Compressor current overload protection

5.1.2.1 3HP compressor current examination and action



Remark : I_e : rating current; I_1 :1.3 time I_e ; I_2 :1.5 time I_e ; I_3 :2.0 time I_e .

- The compressor and outdoor fan closed for protection purpose will restart after 3 minutes.
- During the protection, the indoor fan continues working in a set speed, while the anti-cold air function when heating and the compressor will be 3 minutes delayed to shut down for protection.
- When there are 4 times compressor protection within one hour, the A/C will be shut down, meanwhile the operation light and timer light will be turned on, the defrosting light flashes in a frequency of 0.5Hz. This situation will be recovered only when power is switched off.

5.1.2.2 If the AC don't check the compressor current through electric control system, then use compressor self current protection.

5.1.2.2 4HP(3N), 5HP compressor current is checked by outdoor main board. The protection principle is as following:

In any case, after the compressor starts, if

- Only in heating mode, when current is higher than $1.5I_e$, then outdoor fan will shut off. When compressor current is less than $1.3I_e$, then restart outdoor fan and recover operation.
- when current is higher than $1.5I_e$ and time is up to 20seconds, compressor and outdoor fan will shut down. At the same time, cut down outdoor protection communication wiring, protection malfunction will be indicated by indoor unit and 3minutes later restart compressor.

5.1.3 Evaporator protection against high temperature(heating mode)

Only available to heating mode, including heating mode, heating operation under auto mode.

※ Note: During protection, the indoor fan continues operating at a setting speed, while the anti-cold air function of heating and the compressor will be 3 minute delayed to shut down for protection.

5.1.4 Evaporator Protection against low temperature(cooling mode)

5.1.4.1 When the evaporator pipe temperature $\leq 3^{\circ}\text{C}$ and this lasts for 3 minutes, the compressor and outdoor fan will be shut off.

5.1.4.2 When the evaporator pipe temperature $\geq 7^{\circ}\text{C}$, it recovers.

5.1.4.3 The restart of the compressor shall execute the delay protection.

5.1.5 Anti-cold air protection

Only available to heating mode, including heating mode, heating operation under auto mode.

5.1.6 Condenser high temperature protection

5.1.6.1 Only available to cooling (incl. cooling mode, cooling operation under auto mode) and dehumidifying mode.

5.1.6.2 Delay protection should be performed when the compressor restarts.

5.1.7 Water level protection

5.1.8 Outdoor protection

When outdoor protection signal is high level, outdoor unit will perform protection: the whole machine will be shut down while the LED will indicate the corresponding protection signal.

The A/C will recover if outdoor errors are eliminated after the outdoor protection occurs.

Only 3HP has outdoor protection function.

5.2 Self-diagnosis

5.2.1 Indoor unit

No.	Type	Contents	LED Flashing	Remark
1	protection	Over current protection of the compressor occurs 4 times in 1h	Lamps of operation, timer, defrosting (only fan) flashing simultaneously at 5Hz.	Whole unit is shut down. It cannot recover unless power is cut off
2	protection	Outdoor protection (absent phrase, phrase sequence and temperature protection)	All lamps flashing at 5Hz	Recover automatically after errors are eliminated(For T3 malfunction of 5HP, can't recover automatically)
3	error	Room temperature sensor checking channel is abnormal	Timer lamp flashing at 5Hz	
4	error	Evaporator sensor checking channel is abnormal	Operation lamp flashing at 5Hz	
5	error	Condenser sensor checking channel is abnormal	Defrosting lamp flashing at 5Hz	
6	error	Temperature fuse is melt(reserved)	Operation lamp and timer lamp flashing at 5Hz	

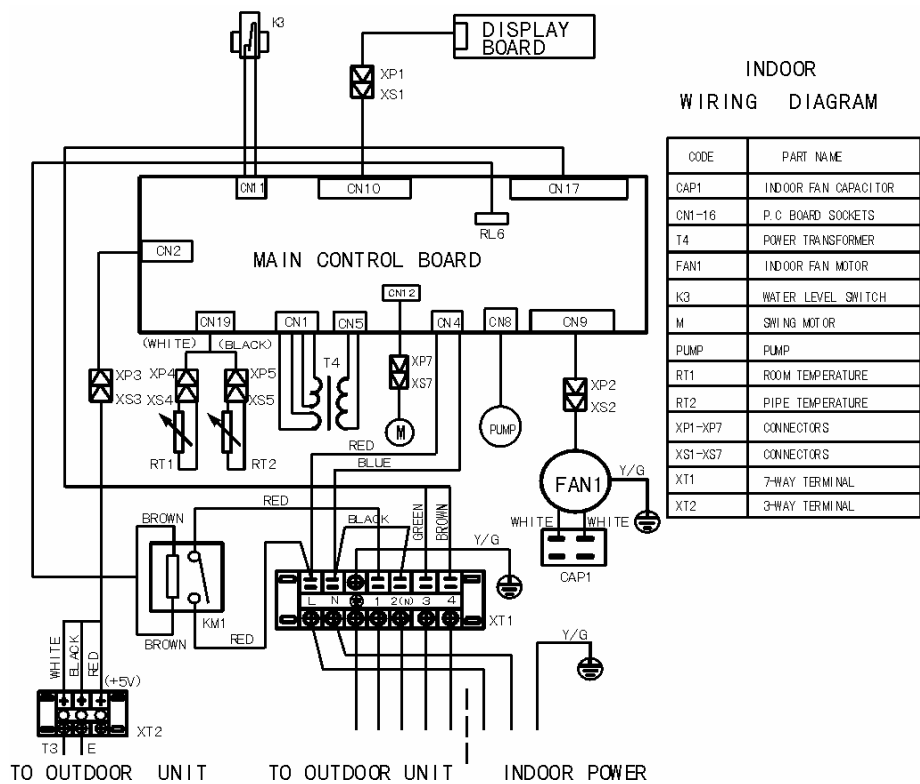
5.2.2 LEDs for the indication of outdoor trouble(3 phase type,3.5~5HP)

Type	Contents	LED1	LED2	LED3
Trouble	Phase sequence	Flash	Off	Off
Trouble	Lack of phase	Flash	Off	Off
Trouble	Protection of pressure	Flash	Flash	Off
Trouble	Overload of current	Off	Off	Flash
Trouble	Open-circuit and short-circuit trouble of T3	Off	Flash	Flash
Trouble	Open-circuit and short-circuit trouble of T4	Off	Flash	Off
Trouble	High temperature protection of condenser	Flash	Flash	Flash

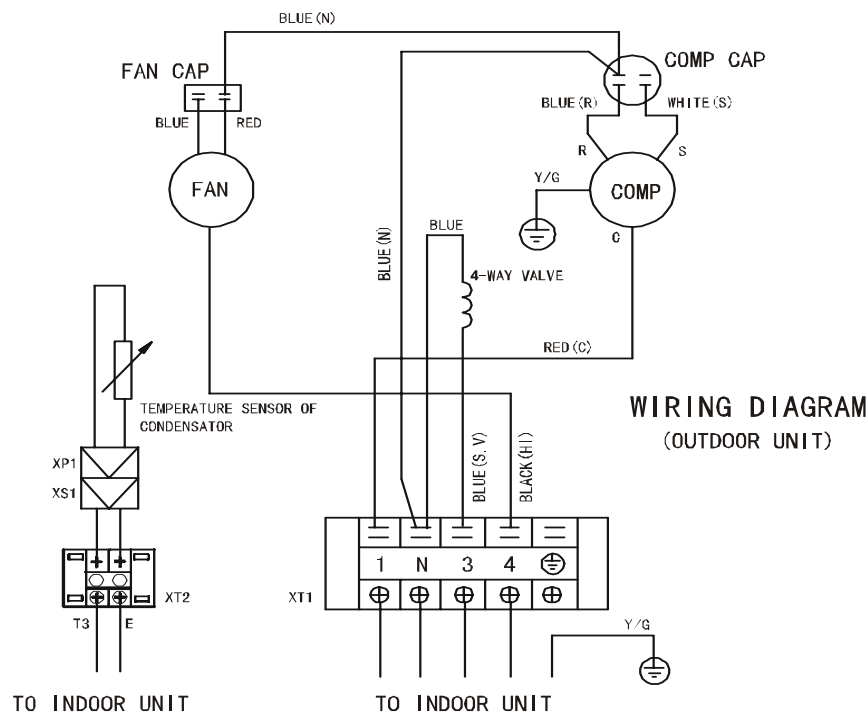
Part8. Wiring diagram

1. MCA-18HRN1

Indoor unit:

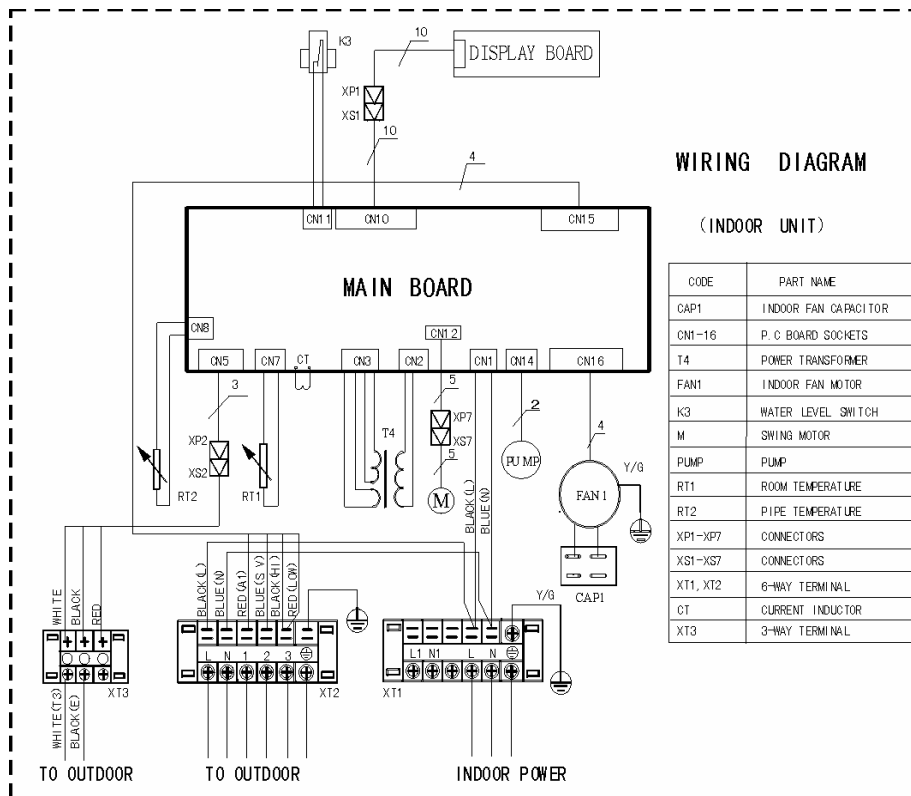


Outdoor unit:

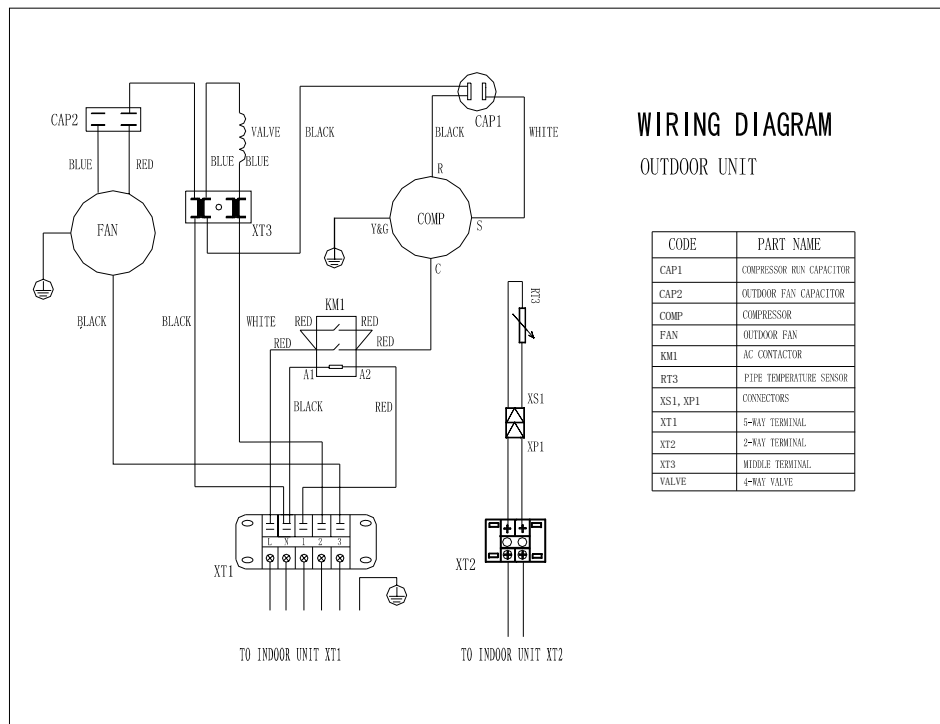


2. MCA-24HRN1

Indoor unit:

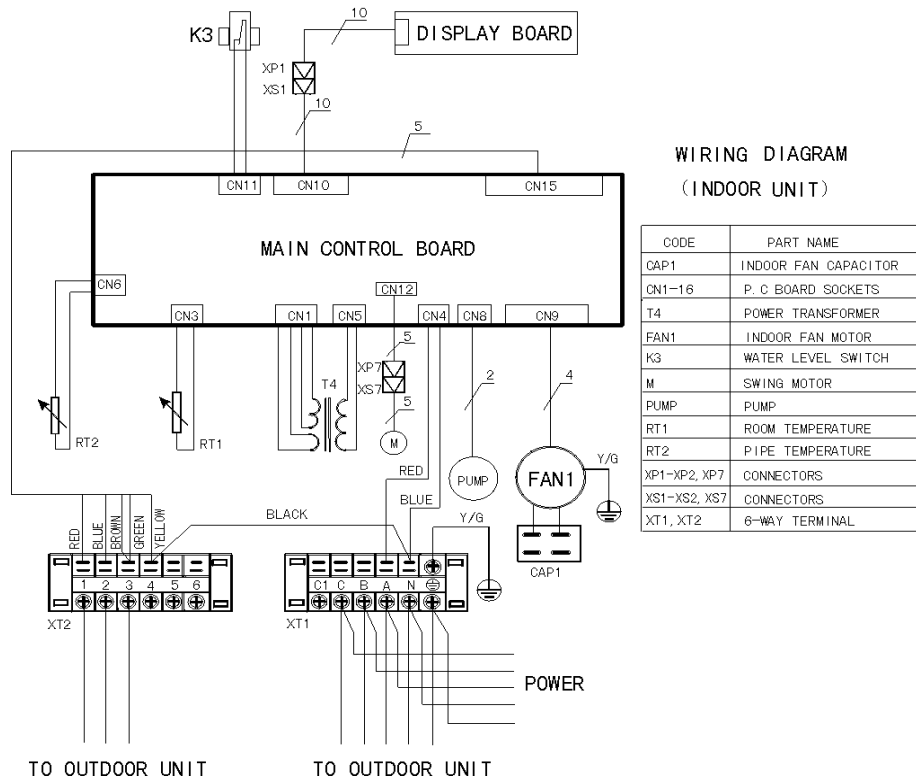


Outdoor unit:

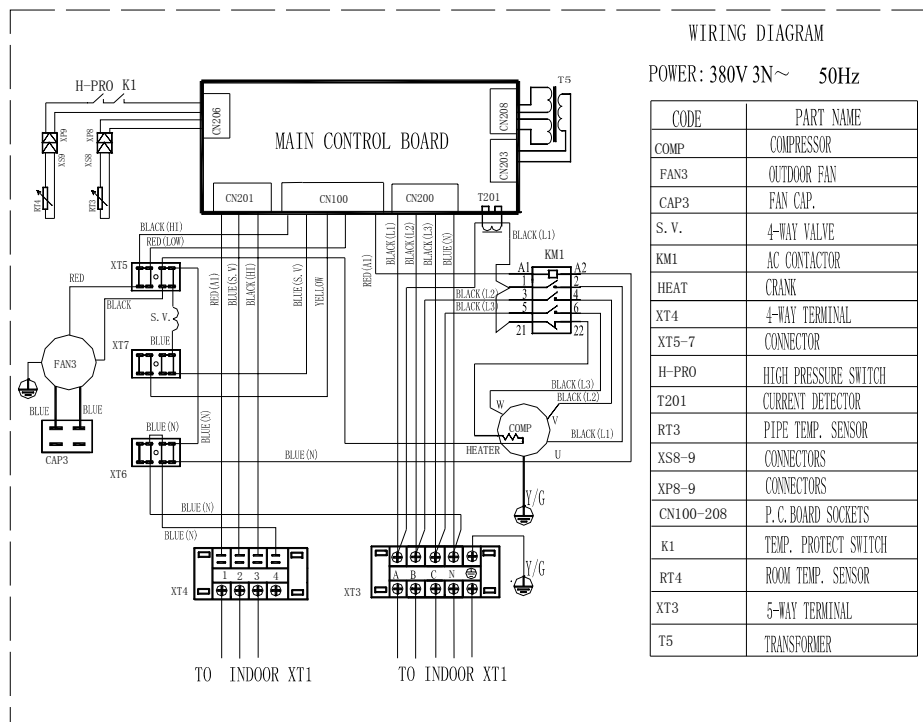


3. MCA-30HRN1 MCA-36HRN1

Indoor unit:

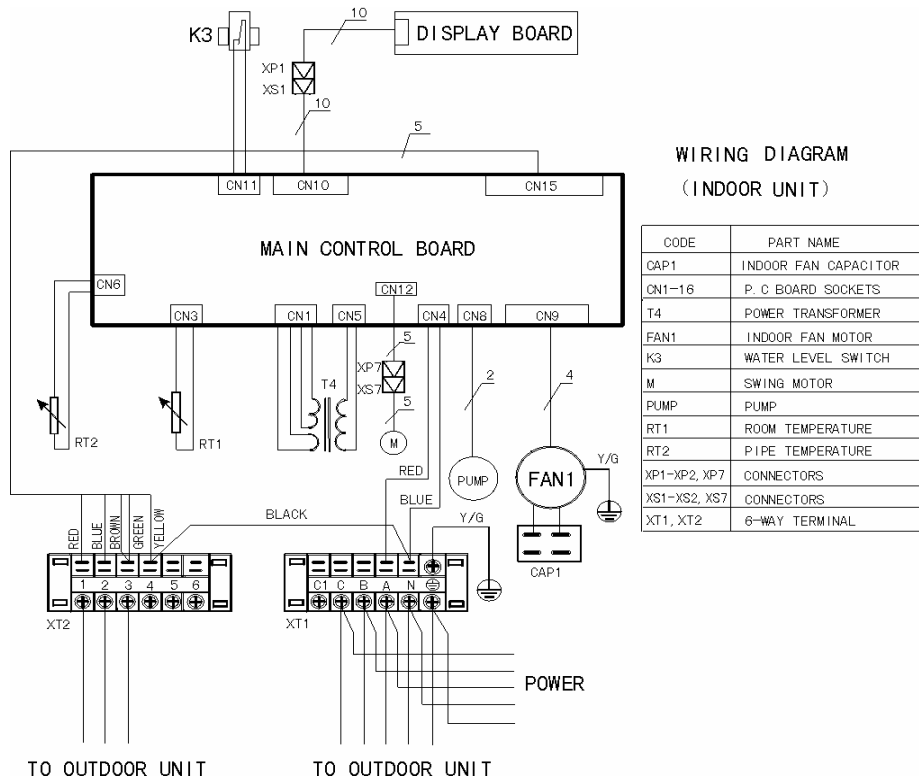


Outdoor unit:

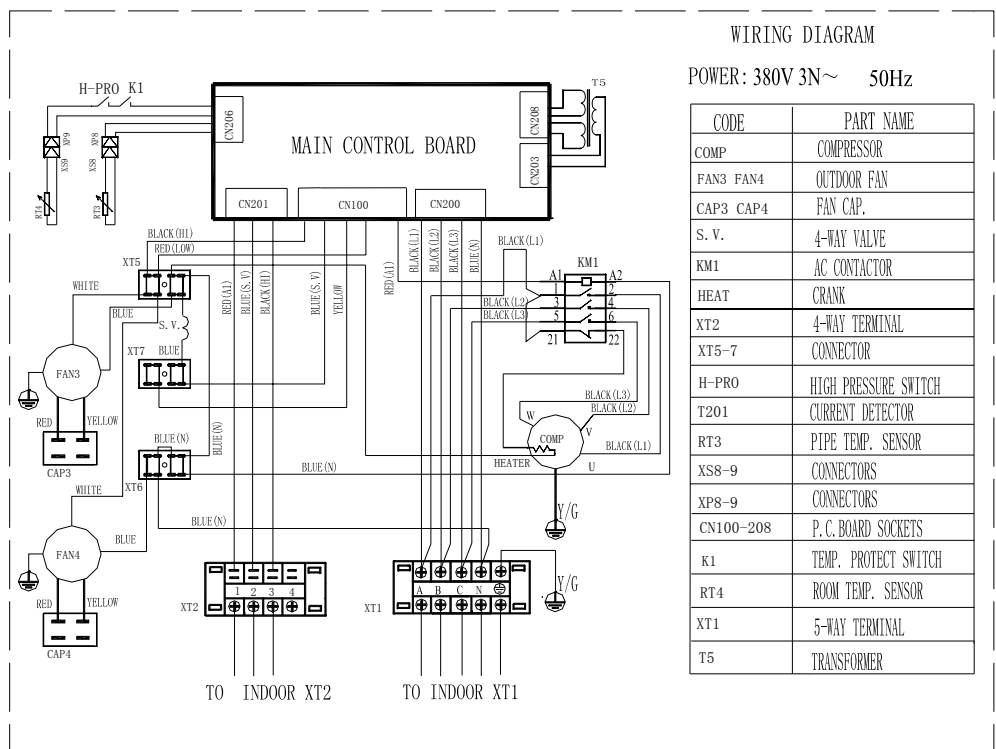


4. MCA-48HRN1

Indoor unit:



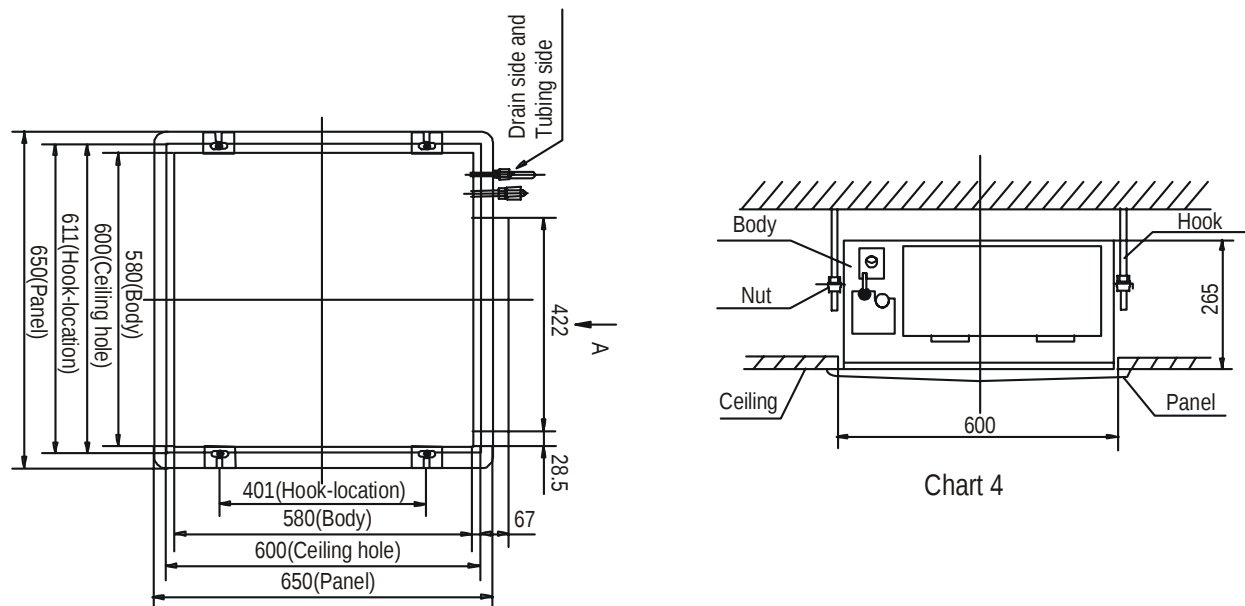
Outdoor unit:



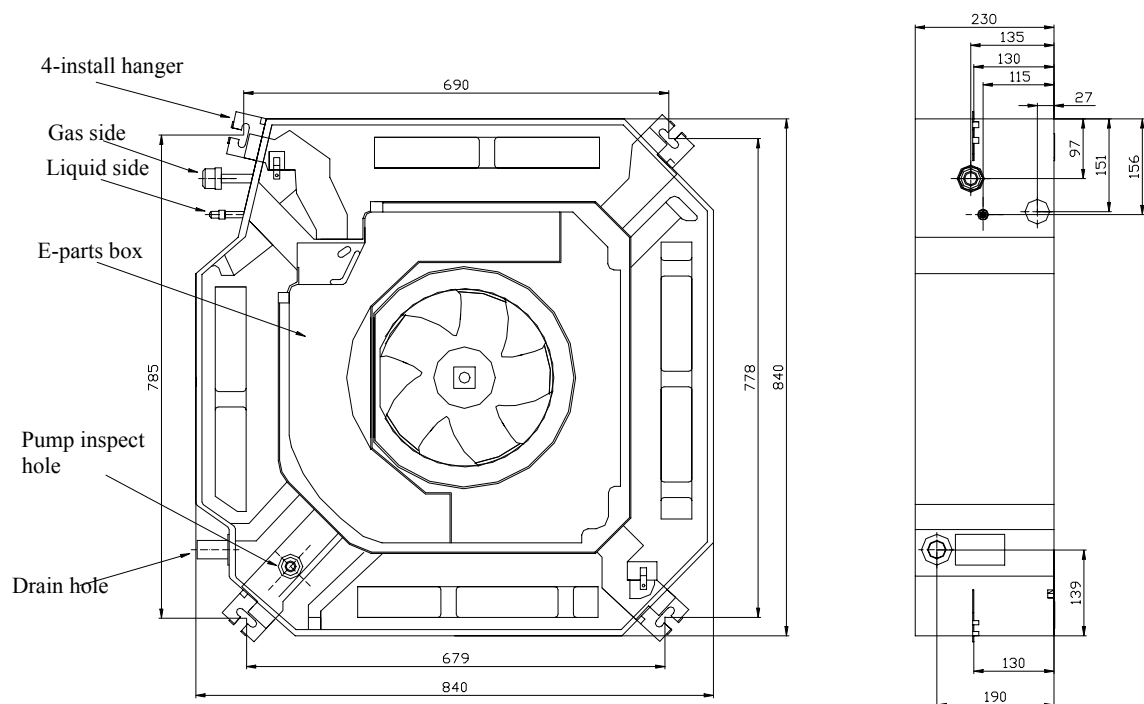
Part9. Outlines and dimension

Indoor units

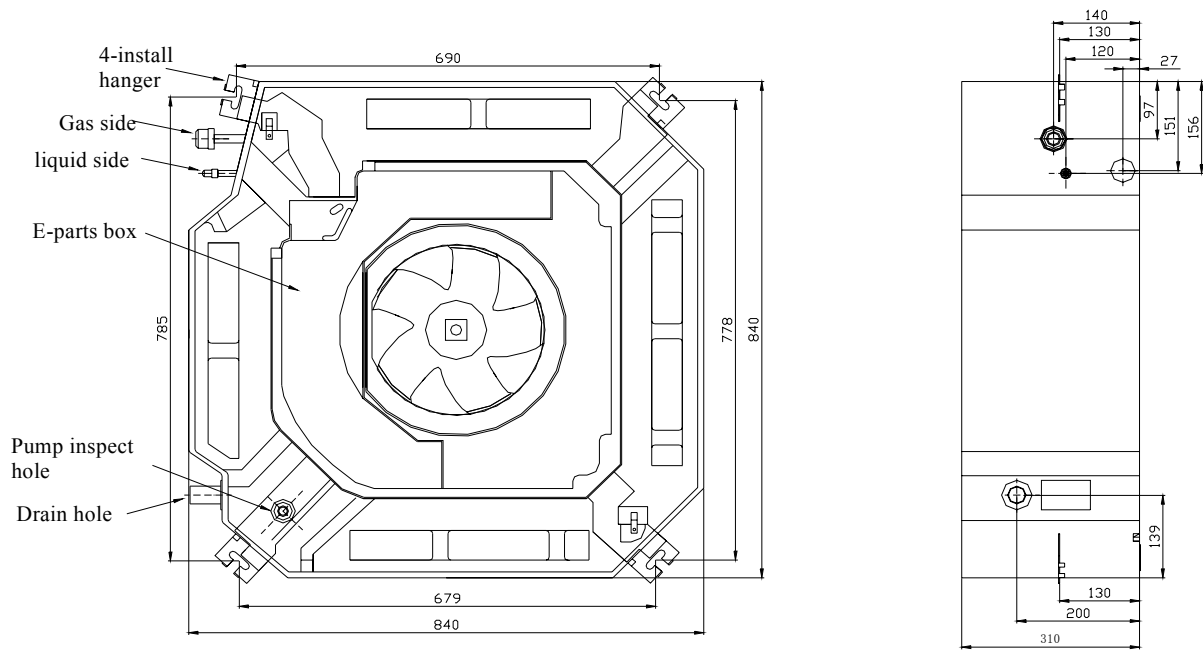
1. MCA-18HRN1



2. MCA-24HRN1

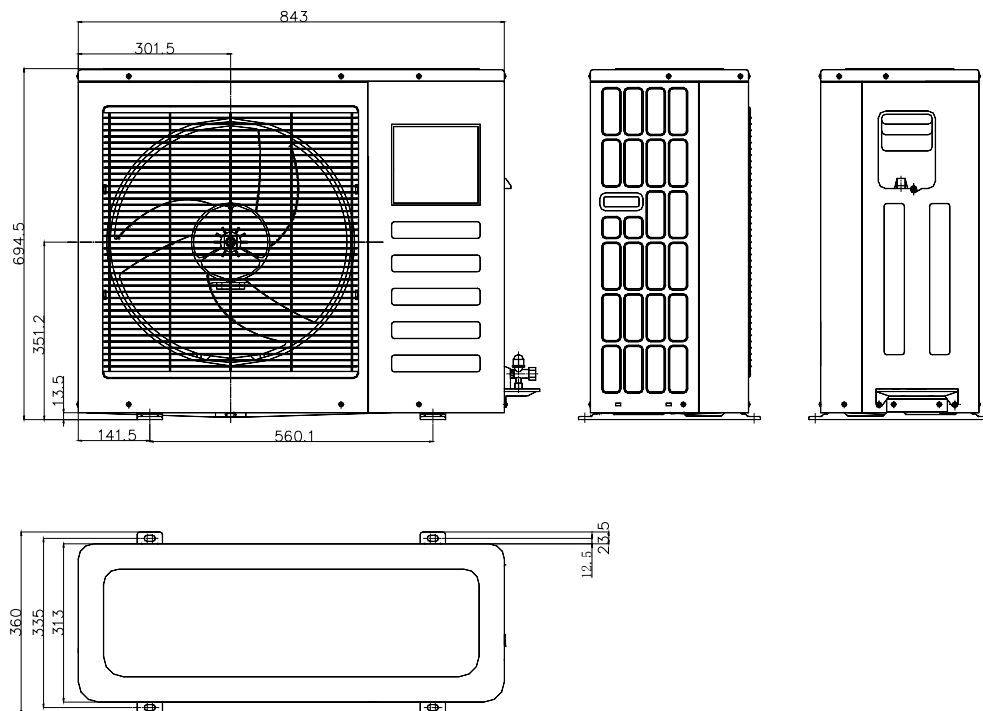


3. MCA-30HRN1 MCA-36HRN1 MCA-48HRN1

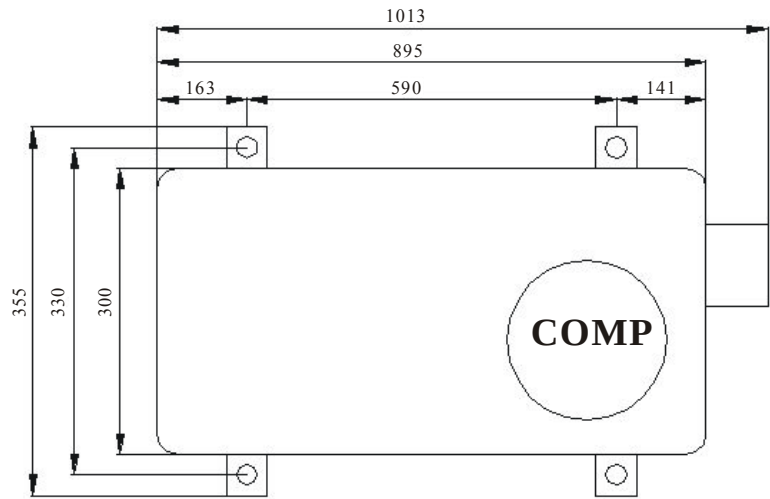


Outdoor units

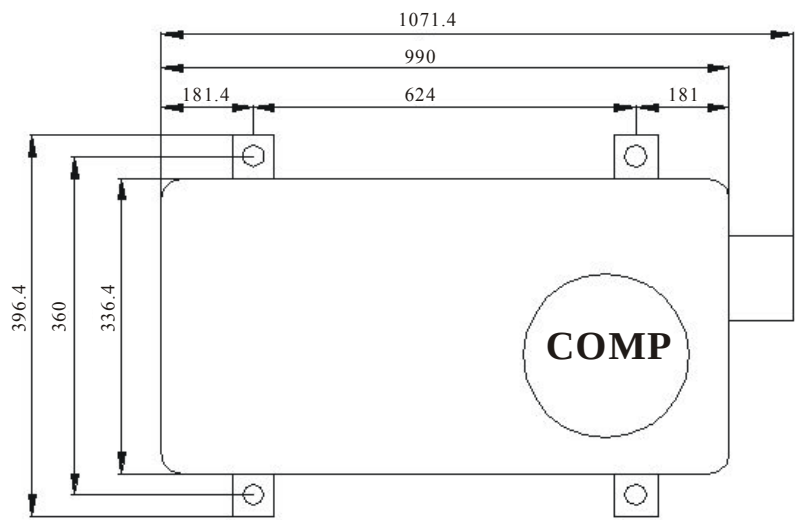
1. MCA-18HRN1



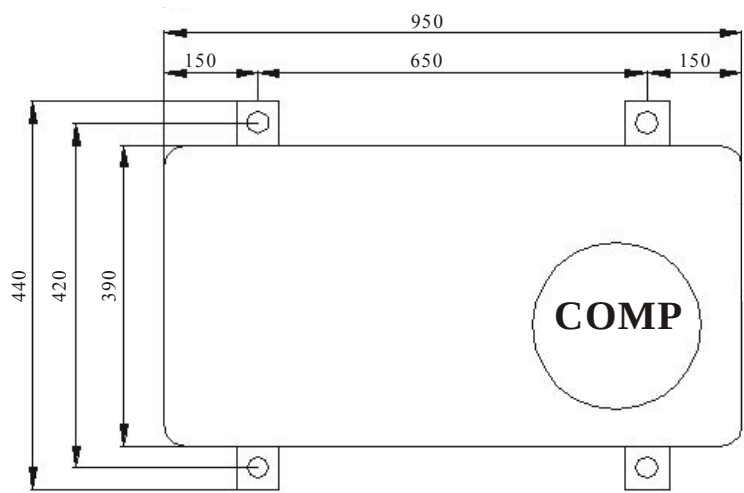
2. MCA-24HRN1



3. MCA-30HRN1 MCA-36HRN1



4. MCA-48HRN1

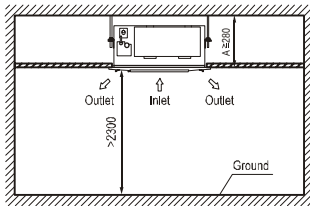


Part10. Installation

1. Installation place

- A place where there is enough room for installation and maintenance. (Refer to Chart 1)
- The ceiling is structurally sound to hold the Indoor Unit.
- A place that is well ventilated and the influence of weather is the least.
- A place that the airflow can reach every corners of the room.
- A place where the drain pipe can reach out easily.

Necessary room MCA-18HRN1

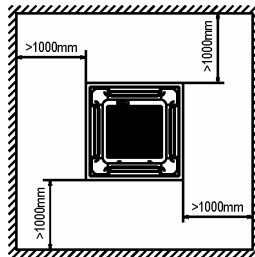
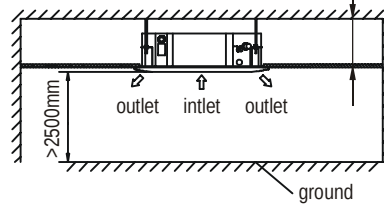


Necessary room MCA-24HRN1.

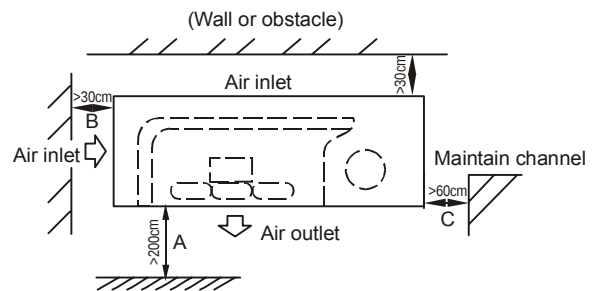
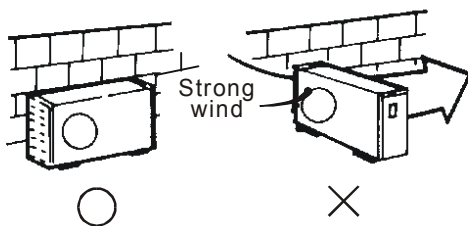
Necessary room MCA-30(36,48)HRN1.

Series: A $\geq$ 260mm

Series: A $\geq$ 330mm



- Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.
- Determine the air outlet direction where the discharged air is not blocked.
- In the case that the installation place is exposed to strong wind such as a seaside or high position, secure the normal fan operation by putting the unit length wise along the wall or using a duct or shield plates.
- Specially in windy area, install the unit to prevent the admission of wind.



2. Indoor unit installation MCA-18HRN1

(1) Install the main body

A. The existing ceiling (to be horizontal)

a. Please cut a quadrangular hole of 600X600mm in the ceiling according to the shape of the installation paper board.

The center of the hole should be at the same position of that of the air conditioner body.

Determine the lengths and outlets of the connecting pipe, drain pipe and cables.

To balance the ceiling and to avoid vibration, please enforce the ceiling when necessary.

b. Please select the position of installation hooks according to the hook holes on the installation board.

Drill four holes of 12mm, 50~55mm deep at the selected positions on the ceiling. Then embed the expansible hooks(fittings).

Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the installation hooks from the height of ceiling, then cut off the unnecessary part.

If the ceiling is extremely high, please determine the length of the installation hook according to facts.

Cut the installation hook open in the middle position, then use appropriate length of reinforcing rod ($\phi 12$) to weld together.

The length could be calculated from Chart5:

Length=210+L(in general, L is half of the whole length of the installation hook)

c. Please adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body.

Use the transparent hose filled with water to check the lever of the main body from the four sides or diagonal line direction, the lever indicator also can check the lever from four sides of the main body .(Refer to chart 6)

If the drainpipe is awry, leakage will be caused by the malfunction of the water-level switch.

Adjust the position to ensure the gaps between the body and the four sides of ceiling are even.

The body's lower part should sink into the ceiling for 10~12mm (Refer to chart5).

Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

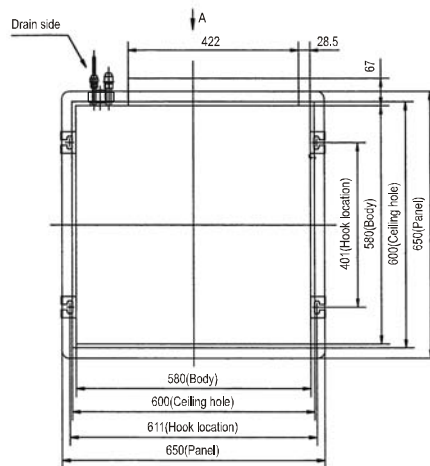


Chart 3

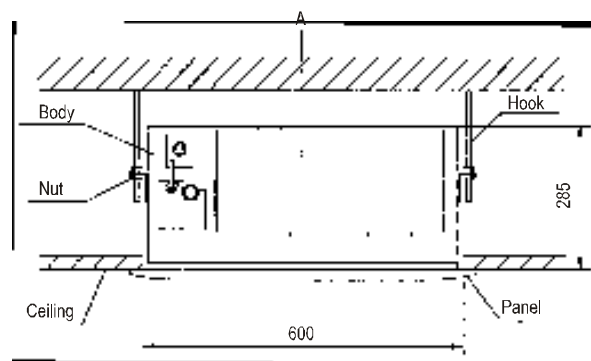


Chart 4

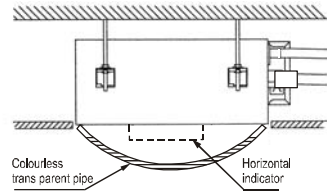
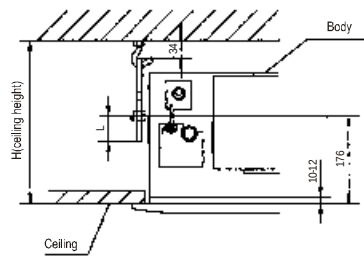


Chart 6

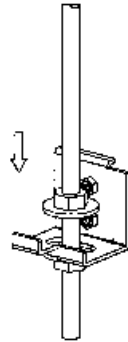


Chart 7

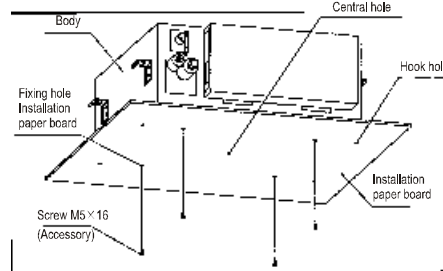


Chart 8

B. New built houses and ceilings

a. In the case of new built house, the hook can be embedded in advance (refer to the A.b mentioned above). But it should be strong enough to bear the indoor unit and will not become loose because of concrete shrinking.

b. After installing the body, please fasten the installation paper board onto the air conditioner with bolts (M5X16) to determine in advance the sizes and positions of the hole opening on ceiling. Please first guarantee the flatness and horizontal of ceiling when installing it. Refer to the A.a mentioned above for others.

c. Refer to the A.c mentioned above for installation.

d. Remove the installation paper board.

(2) Install The Panel

Cautions: Never put the panel face down on floor or against the wall, or on bulgy objects.

Never crash or strike it.

1) Remove the inlet grid.

a. Slide two grid switches toward the middle at the same time, and then pull them up. (Refer to chart 9)

b. Draw the grid up to an angle of about 30°, and remove it. (Refer to chart 10)

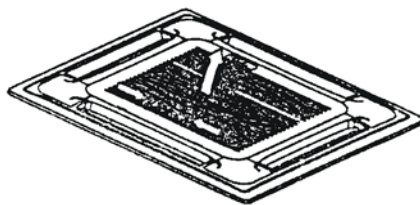


Chart 9



Chart 10

2) Install the panel

a. Align the swing motor on the panel to the water receiver of the body properly. (Refer to chart 11)

b. Hang the four fixed rope of the main body to the installation cover and the other three covers of the swing motor: (Refer to chart 11)

CAUTIONS:

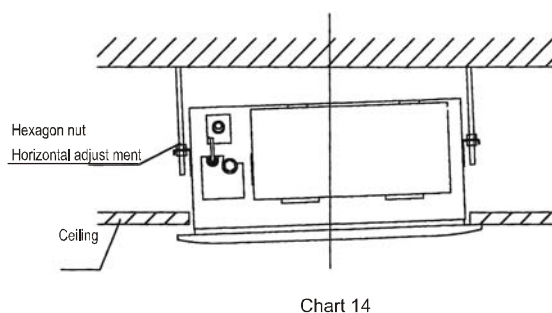
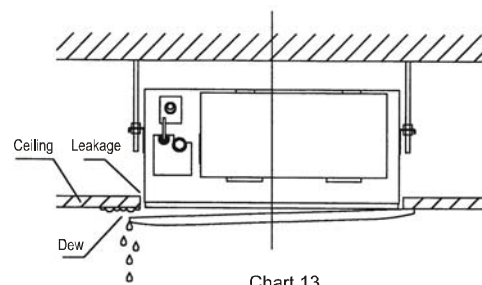
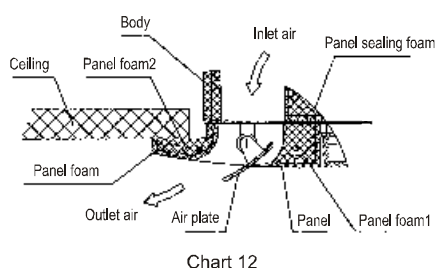
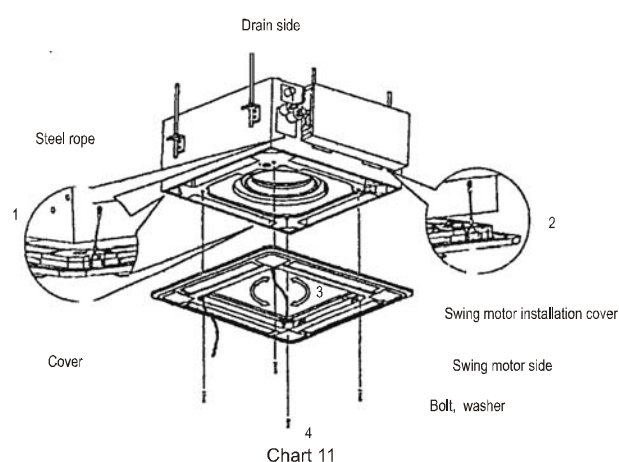
The installation cover of the swing motor must sink into the corresponding water receiver.

- c. Install the panel on the main body with bolt (M5X16) and washer. (Refer to chart 11)
- d. Adjust the four panel hook screws to keep the panel horizontal, and screw them up to the ceiling evenly.
- e. Regulate the panel in the direction of the arrow in Chart 11 (3) slightly to fit the panel's center to the center of the ceiling's opening. Guarantee that hooks of four corners are fixed well.
- f. Keep fastening the screws under the panel hooks, until the thickness of the sponge between the body and the panel's outlet has been reduced to about 4~6mm. The edge of the panel should contact with the ceiling well. (Refer to chart 12)

Malfunction described in Chart 13 can be caused by inappropriate tightness the screw.

If the gap between the panel and ceiling still exists after fastening the screws, the height of the indoor unit should be modified again. You can modify the height of the indoor unit through the openings on the panel's four corners, if the lift of the indoor unit and the drainpipe is not influenced (refer to chart 14-right).

- 3) Hang the air-in grid to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.
- 4) Relocate the air-in grid in the procedure of reversed order, install the air-in grid.



3. Indoor unit installation MCA-24~48HRN1

(1) Install the main body

A. The existing ceiling (to be horizontal)

- a. Please cut a quadrangular hole of 880X880mm in the ceiling according to the shape of the installation paper board. (Refer to Chart3,4)

The center of the hole should be at the same position of that of the air conditioner body.

Determine the lengths and outlets of the connecting pipe, drain pipe and cables.

To balance the ceiling and to avoid vibration, please enforce the ceiling when necessary.

- b. Please select the position of installation hooks according to the hook holes on the installation board.

Drill four holes of 12mm, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks(fittings).

Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the

installation hooks from the height of ceiling, then cut off the unnecessary part.

If the ceiling is extremely high, please determine the length of the installation hook according to facts.

The length could be calculated from Chart5:

Length=H-181+L(in general, L is half of the whole length of the installation hook)

c. Please adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body.

If the drainpipe is awry, leakage will be caused by the malfunction of the water-level switch.

Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12mm (Refer to chart5).

Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

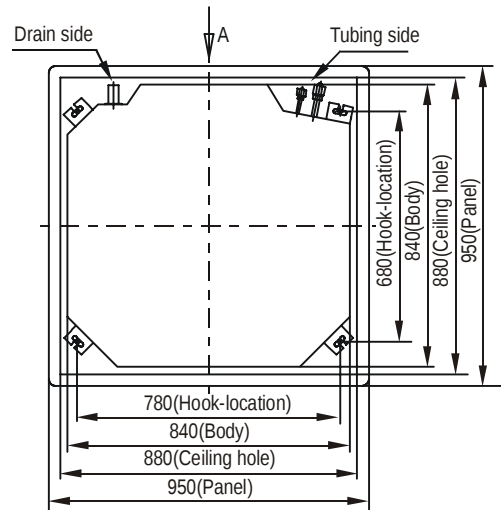


Chart 3

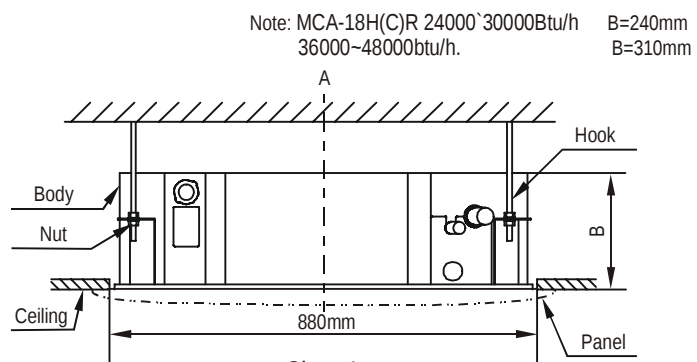


Chart 4

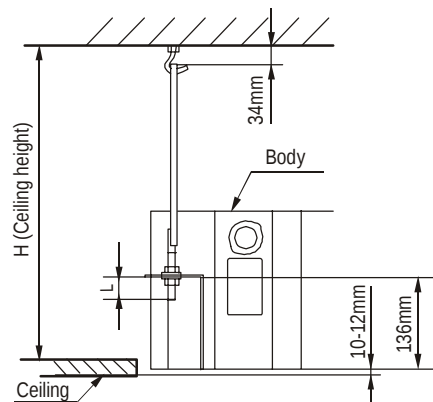


Chart 5

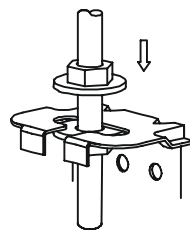


Chart 6

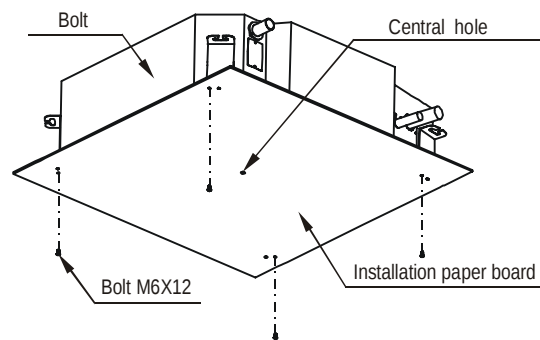


Chart 7

B. New built houses and ceilings

a. In the case of new built house, the hook can be embedded in advance (refer to the A.b mentioned above). But it should be strong enough to bear the indoor unit and will not become loose because of concrete shrinking.

b. After installing the body, please fasten the installation paper board onto the air conditioner with bolts (M6X12) to determine in advance the sizes and positions of the hole opening on ceiling. Please first guarantee the flatness and horizontal of ceiling when installing it. Refer to the A.a mentioned above for others.

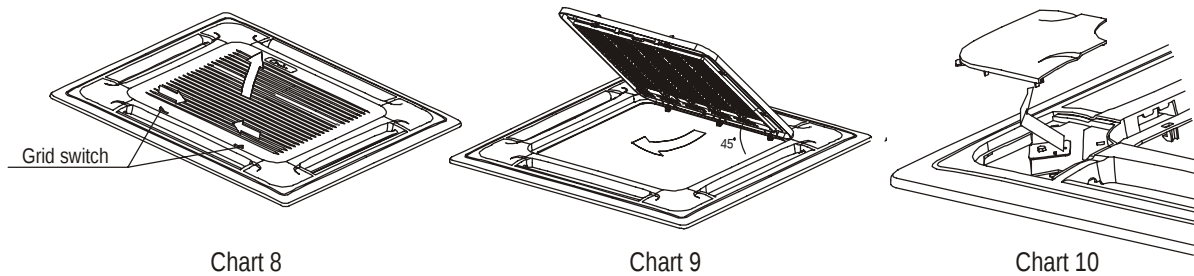
c. Refer to the A.c mentioned above for installation.

d. Remove the installation paper board.

(2) Install The Panel

1) Remove the inlet grid.

- a. Slide two grid switches toward the middle at the same time, and then pull them up. (Refer to chart 8)
- b. Draw the grid up to an angle of about 45°, and remove it. (Refer to chart 9)



2) Remove the installation covers at the four corners.

Wrench off the bolts, loose the rope of the installation covers, and remove them. (Refer to chart 10)

3) Install the panel

- a. Align the swing motor on the panel to the tubing joints of the body properly. (Refer to chart 11)
- b. Fix hooks of the panel at swing motor and its opposite sides to the hooks of corresponding water receiver. Then hang the other two panel hooks onto corresponding hangers of the body.
- c. Adjust the four panel hook screws to keep the panel horizontal, and screw them up to the ceiling evenly.
- d. Regulate the panel in the direction of the arrow in Chart11(4) slightly to fit the panel's center to the center of the ceiling's opening. Guarantee that hooks of four corners are fixed well.
- e. Keep fastening the screws under the panel hooks, until the thickness of the sponge between the body and the panel's outlet has been reduced to about 4~6mm. The edge of the panel should contact with the ceiling well. (Refer to chart 12)

Malfunction described in Chart13 can be caused by inappropriate tightness the screw.

If the gap between the panel and ceiling still exists after fastening the screws, the height of the indoor unit should be modified again. (Refer to chart 14-left)

You can modify the height of the indoor unit through the openings on the panel's four corners, if the lift of the indoor unit and the drainpipe is not influenced (refer to chart 14-right).

4) Hang the air-in grid to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

- 5) Relocate the air-in grid in the procedure of reversed order.
- 6) Relocate the installation cover.
 - a. Fasten the rope of installation cover on the bolt of the installation cover. (Refer to chart 15-left)
 - b. Press the installation cover into the panel slightly. (Refer to chart 15-right)

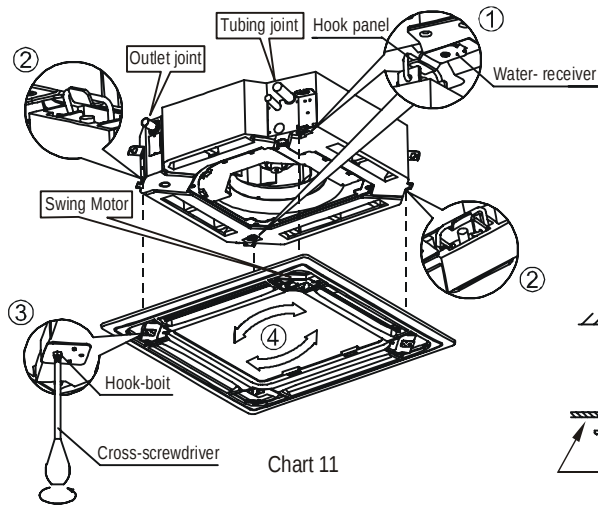


Chart 11

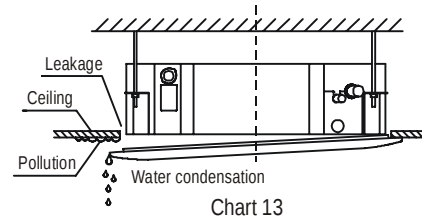


Chart 13

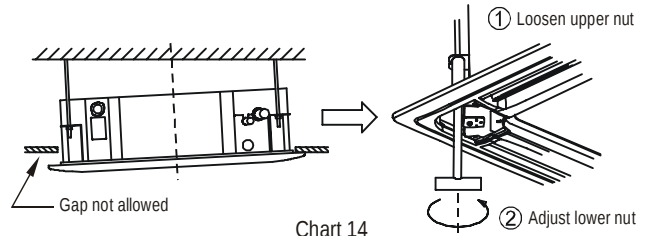


Chart 14

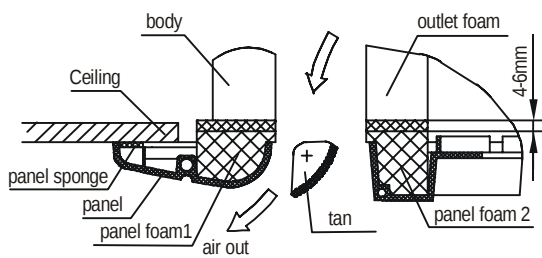


Chart 12

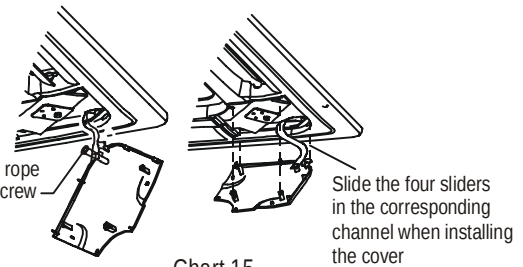
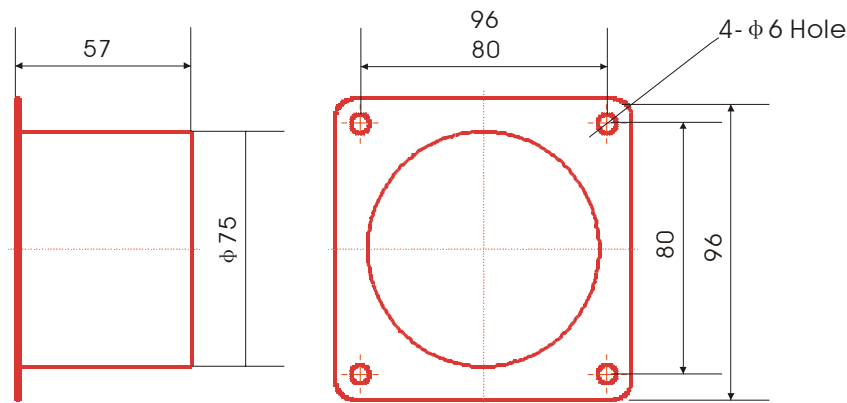


Chart 15

(3) Installation of Flange and duct

Fresh air is intaken by indoor fan motors or ductable fan motor devices on field. The positions of fresh air intake can be changed according to the installation of ductable fan motor.

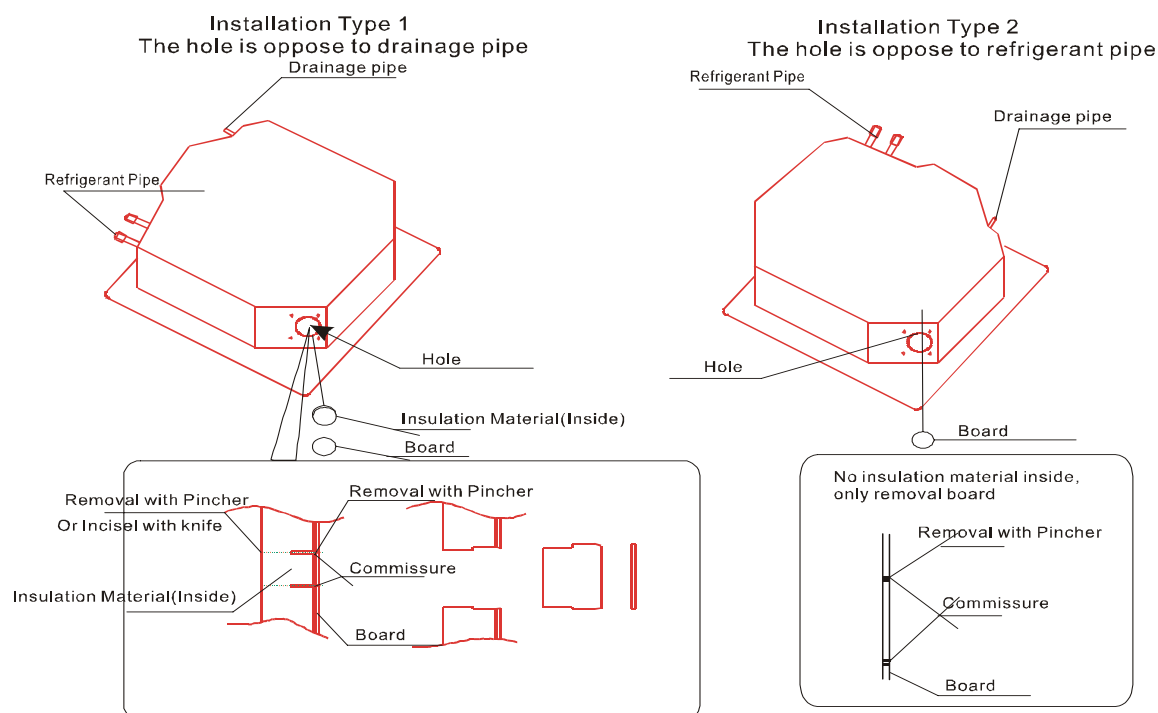


Note:

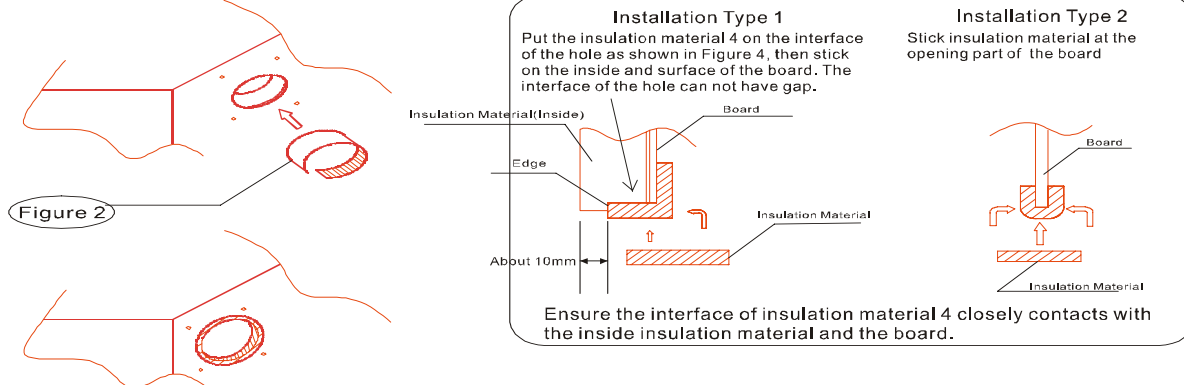
1. The device can be installed in ceiling cassette type indoor units (several-direction flow).
2. When installing the device, duct is needed on field and the rated diameter is 75mm.
3. When metal duct pass through wooden wall, electric insulation must be add between duct and wall.
The duct must be pulled out downside to prevent rain and water entering.
Net cover must be set at places where duct explodes to outdoor air to prevent birds and animals entering

For different type of indoor units, the installation methods are different and the position of holes are different.

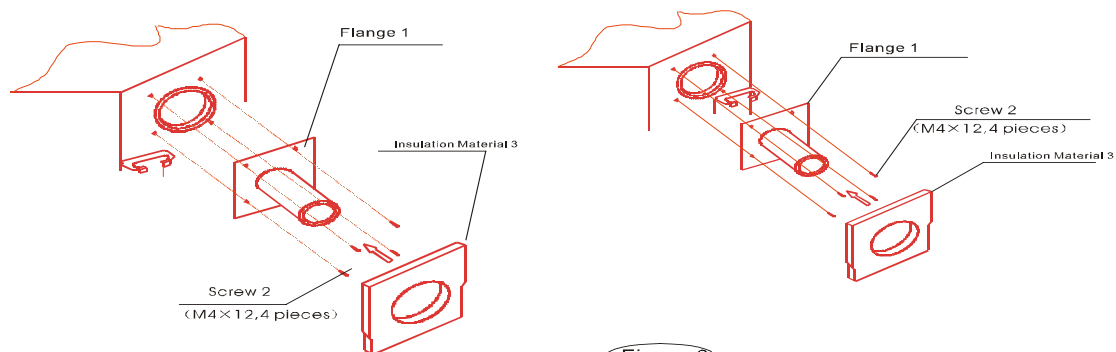
1. Removal the hole on the board.



Stick insulation material 4 at indoor hole

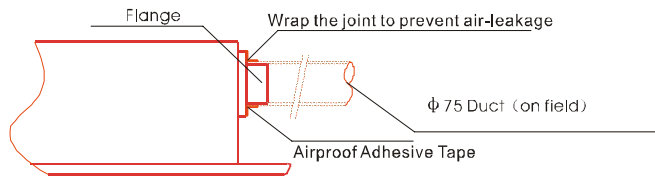


Use screw 2 (M4X12, 4 Pieces) to install flange at the hole, and then stick insulation material 3.



Install Duct (the rated diameter: $\Phi 75$)

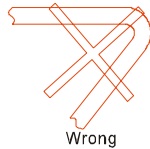
1. Connect the duct to the flange. (the flange is assembled with the interface of duct.)
2. After connection, use the ethylene tape (provided on field) to wrap the joint to prevent air-leakage.



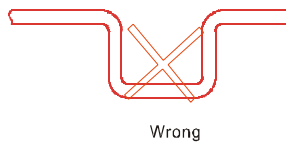
Note:

1. All ducts must be completely heat-insulated.
2. The following phenomenon are not allowed when installing duct:

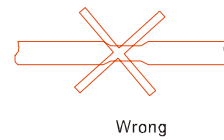
A) Bend too much



B) Too many bender



C) diameter reduce



4. Install outdoor unit

5. Refrigerant pipe connecting

(1) Piping sizes

Model (Btu/h)	Liquid (mm/inch)	Gas (mm/inch)
18,000	6.35(1/4)	12.7(1/2)
24,000	9.53(3/8)	16.0(5/8)
30,000~60,000.	12.7(1/2)	19.0(3/4)

(2) Piping connection

1). Measure the necessary length of the connecting pipe, and make it by the following way.

a. Connect the indoor unit at first, then the outdoor unit.

Bend the tubing in proper way. Do not harm them.

CAUTIONS

Daub the surfaces of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds

With hands before fasten the flare nuts.

Be sure to use two wrenches simultaneously when you connect or disconnect the pipes.

Tubing size	Torque
6.35	1420~1720N.cm(144~176kgf.cm)
9.52	3270~3990N.cm(333~407kgf.cm)
12.7	4950~6030N.cm(504~616kgf.cm)
16	6180~7540N.cm(630~770kgf.cm)
19	9720~11860N.cm(990~12106kgf.cm)

b. The stop value of the outdoor unit should be closed absolutely (as original state). Every time you connect it, first loosen the nuts at the part of stop value, then connect the flare pipe immediately (in 5 minutes). If the nuts have been loosened for a long time, dusts and other impurities may enter the pipe system and may cause malfunction later. So please expel the air out of the pipe with refrigerant before connection.

c. Expel the air after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the

nuts at the repair-points.

2) Locate The Pipe

- Drill a hole in the wall (suitable just for the size of the wall conduit), then set on the fittings such as the wall conduit and its cover.
- Bind the connecting pipe and the cables together tightly with binding tapes. Do not let air in, which will cause water leakage by condensation.
- Pass the bound connecting pipe through the wall conduit from outside. Be careful of the pipe allocation to do no damage to the tubing.

3) Connect the pipes.

- Then, open the stem of stop valves of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow.
- Be sure of no leakage by checking it with leak detector or soap water.
- Cover the joint of the connecting pipe to the indoor unit with the soundproof / insulating sheath (fittings), and bind it well with the tapes to prevent leakage.

(3) Additional charge

When the length of the one-way pipe is less than 8m, additional refrigerant charge after vacuuming is not necessary.

When the length of one-way pipe is over 8m, the quantity to be added is as follows (unit in gram):

Connective pipe length	Air purging method	Additional amount of refrigerant to be charged
Less than 8m	Use refrigerant of outdoor unit	
Over 8m	Use vacuum pump or refrigerant cylinder	30g(length-8m) (capacity $\leq$ 20000btu/h.) 65g(length-8m) (capacity $\geq$ 24000btu/h.)

6. Connect the drain pipe

7. Wiring

Please refer to the Wiring Diagram.

8. Test operation

(1) The test operation must be carried out after the entire installation has been completed.

(2) Please confirm the following points before the test operation.

The indoor unit and outdoor unit are installed properly.

Tubing and wiring are correctly completed.

The refrigerant pipe system is leakage-checked.

The drainage is unimpeded.

The ground wiring is connected correctly.

The length of the tubing and the added stow capacity of the refrigerant have been recorded.

The power voltage fits the rated voltage of the air conditioner.

There is no obstacle at the outlet and inlet of the outdoor and indoor units.

The gas-side and liquid-side stop valves are both opened.

The air conditioner is pre-heated by turning on the power.

(3) According to the user's requirement, install the remote controller when the remote controller's signal can reach the indoor unit smoothly.

(4) Test operation

Indoor unit

Whether the switch on the remote controller works well.

Whether the buttons on the remote controller works well.

Whether the air flow louver moves normally.

Whether the room temperature is adjusted well.

Whether the indicator lights normally.

Whether the drainage is normal.

Whether there is vibration or abnormal noise during operation.

Outdoor unit

Whether there is vibration or abnormal noise during operation.

Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.

Whether any of the refrigerant is leaked.

Part11. Servicing and maintenance

1. Troubles and Solutions

If any the following abnormal conditions occur, turn off the power supply immediately. Please contact our dealer.	
TROUBLES	Indicator lamps flash rapidly, after your disconnecting and connecting the unit, the situation is the same.
	Fuse or circuit breaker work frequently.
	Foreign matter or water has fallen into the unit.
	Remote controller is disabled or the switch is out of hand.
	Any other unusual conditioner is observed.

If any of the following conditions occur, check your unit and resolve corresponding problems referring to given remediation. If the trouble can't be settled contact our dealer.		
Trouble	Cause	Solutions
Unit does not start	Power failure.	Wait for the comeback of power
	Power switch is open.	Switch on the power
	Fuse of power switch may have blown.	Replace the fuse
	Batteries of remote controller are exhausted.	Replace the batteries
	The time is not start-up time you have set.	Wait or cancel the time set.
Air flowing normally with low cooling(heating) effect	Temperature is not set correctly.	Set the temperature properly.
	Door or window is open.	Close door and window.
	Air filter is blocked with dust or dirtiness.	Clean the air filter.
	Inlet/outlet of indoor/outdoor units are blocked.	Clear all blockages.
	Inlet/outlet of indoor/outdoor units are blocked.	Clear the blockage, then restart your operation.
	Be in 3 minutes protection of compressor	Wait

NOTE: Do not replace electric wire or repair the air conditioner by yourself to avoid possible danger.

2. Troubles and solutions concerning the remote controller

Please make the following check before asking for repair or maintenance.

Trouble	Cause	Solutions
CAN NOT CHANGE THE FAN SPEED SETTING	Check if the mode display on the LCD is AUTO	The Indoor Unit will select fan speed automatically when AUTO mode is selected.
	Check if the mode display on the LCD is DRY	The Indoor Unit will select fan speed automatically when the unit is on DRY mode.

The transmission symbol does not flash		
Symptom	Checking items	Cause
Press ON/OFF button, the remote controlling signals can not be transmitted	Check if the remote controller has run out of power	When the battery was out, transmission signals can not be sent

Temperature display disappear		
Symptom	Checking items	Cause
Temperature Display does not light.	Check if the mode display on the LCD is FAN ONLY	You can not set the temperature when the unit is on FAN ONLY mode.

The Display Goes Off		
Symptom	Checking items	Cause
The indication on the display disappears after a lapse of time.	Check whether the timer operation has come to an end when the OFF TIMER is indicated on the display.	The air conditioner operation stops since the set time elapsed.
The ON TIMER indicators go off after a lapse of certain time.	Check whether the timer operation is started when the ON TIMER is indicated on the display.	When the time set to start the air conditioner is reached, the air conditioner will automatically start and the appropriate indicator will go off.

The Signal Receiving Tone does Not Sound		
Symptom	Checking items	Cause
No receiving tone sounds from the indoor unit even when the ON/OFF button is pushed.	Check whether the signal transmitter of the remote controller is properly directed to the receiver of the indoor unit when the ON/OFF button is pushed.	Direct the signal transmitter of the remote controller to the receiver of the indoor unit, and then repeatedly push the ON/OFF button twice.
Buttons on the remote controller don't work.		Press Reset button.

3. Clean

CAUTION: Please turn off your air conditioner and disconnect power supply before cleaning.

(1) CLEANING INDOOR UNIT

Use a dry to wipe the indoor unit.

A cloth dampened with cold water may be used if the indoor unit is too dirty.

It is allowed to remove the front panel of indoor unit and clean it with water, and ensure to wipe it up with a dry rag.

Note: Do not use a chemically treated duster for wiping or leave such materials near the unit for long.

Do not use benzene, thinner, polishing powder, or similar solvents for cleaning.

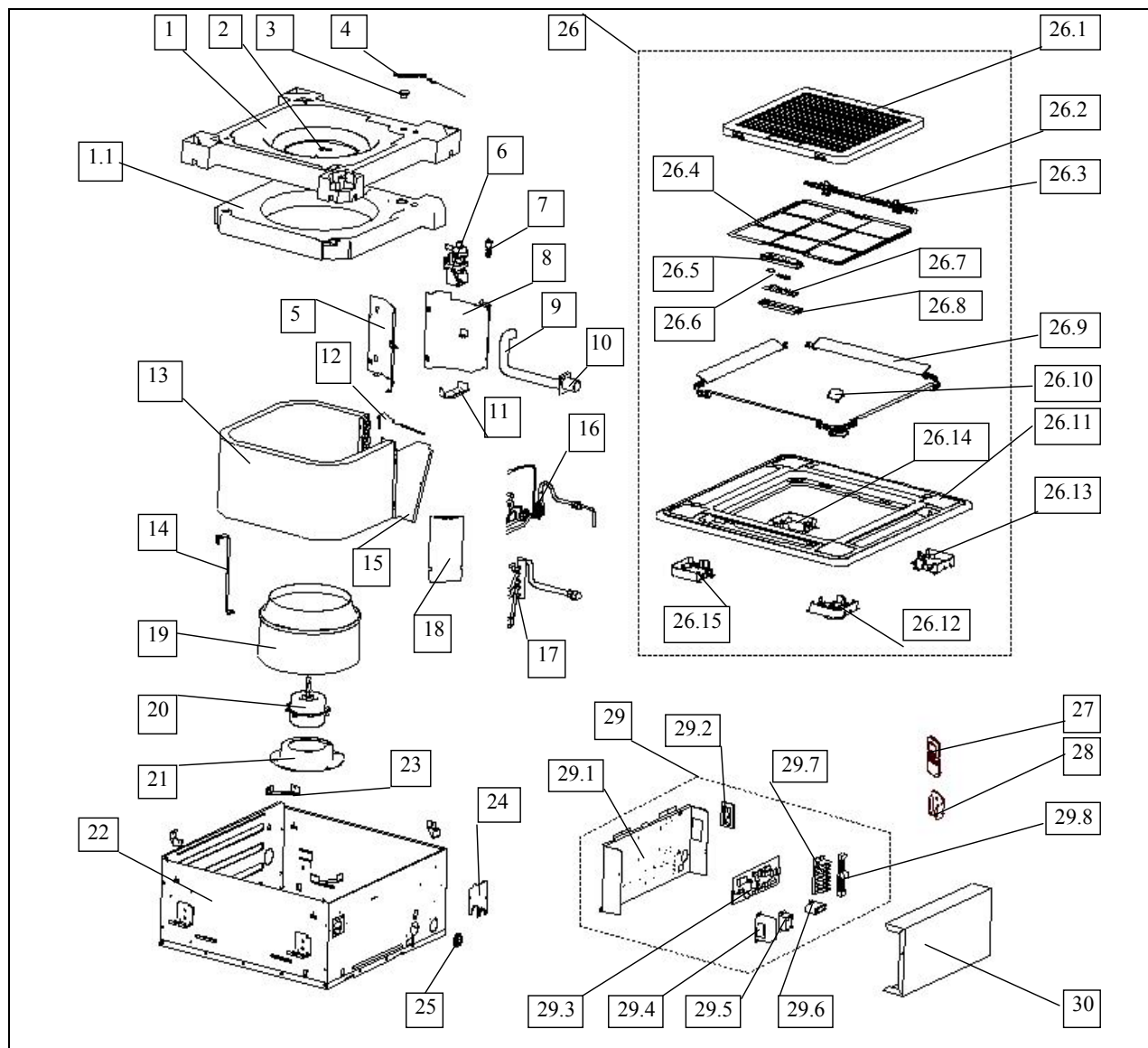
(2) CLEANING AIR FILTER

The air filter in unit can filter dust and other granules in air. It may reduce the cooling effect that the air filter is covered with dust. So clean the air filter often.

Part12. Exploded view

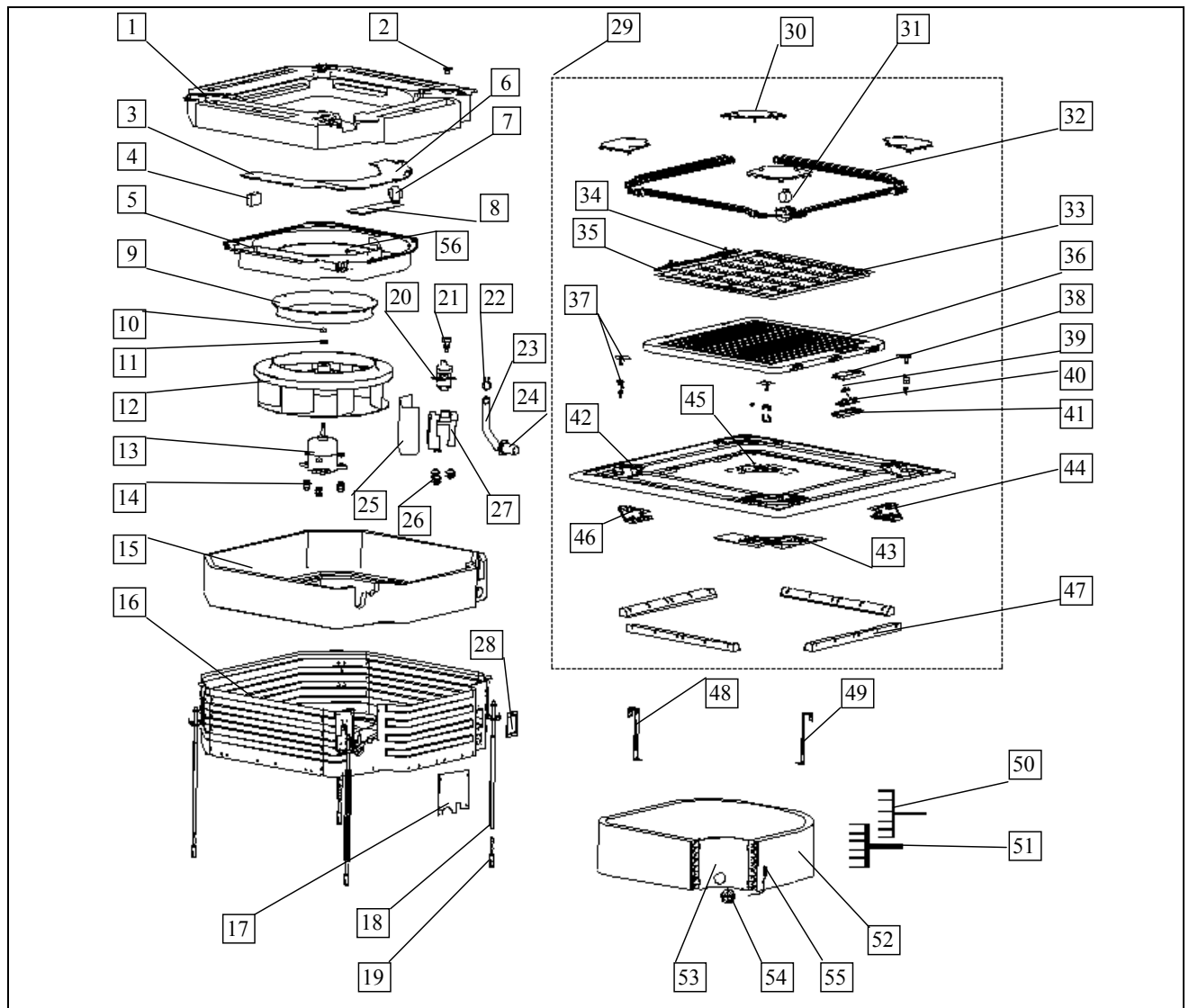
Indoor unit

1. MCA-18HRN1



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Collect Water Pan ,Ass'y	1	26.1	Air inlet grille	1
1.1	Foam, Collect Water Pan	1	26.2	Switch cover, air inlet grille	1
2	Wire fixing board	1	26.3	Switch, air inlet grille	2
3	Stopper, Water Drain	1	26.4	Filter	1
4	Room Temperature Sensor Ass'y	1	26.5	Control box	1
5	Evaporater Fixture Board Ass'y	1	26.6	LED holder	1
6	Drain Pump	1	26.7	Control board	1
7	Liquid Position Sensor Ass'y	1	26.8	Cover, control box	1
8	Deseparating board, right	1	26.9	Fan guide	4
9	Drain pipe	1	26.10	Swing motor	1
10	Extend water pipe	1	26.11	Panel	1
11	Drain Pump Holder	1	26.12	Install cover, swing motor	1
12	Pipe Temperature Sensor Ass'y	1	26.13	Install cover I	1
13	Evaporator Ass'y	1	26.14	Install cover II	1
14	Fixing clamp, evaaporater	1	26.15	Install cover I	1
15	Deseparating board, left	1	27	Remoter	1
16	Inlet pipe, eva	1	28	Holder, Remote Controller	1
17	Outlet pipe, eva	1	29	E-control Assy	1
18	Wire crossing board	1	29.1	Control Box	1
19	Fan	1	29.2	Rubber, wire crossing	1
20	Fan Motor	1	29.3	PCB Ass'y	1
21	Fan Motor Underlay	1	29.4	Transformer	1
22	Base Pan Ass'y	1	29.5	Relay	1
23	Fixing board, water pan	4	29.6	Capacity	1
24	Sealing board, pipe out	1	29.7	Base, wire fixing	1
25	Rubber, wire crossing	2	29.8	Cover, wire fixing	1
26	Panel Ass'y	1	30	Control Box Cover	1

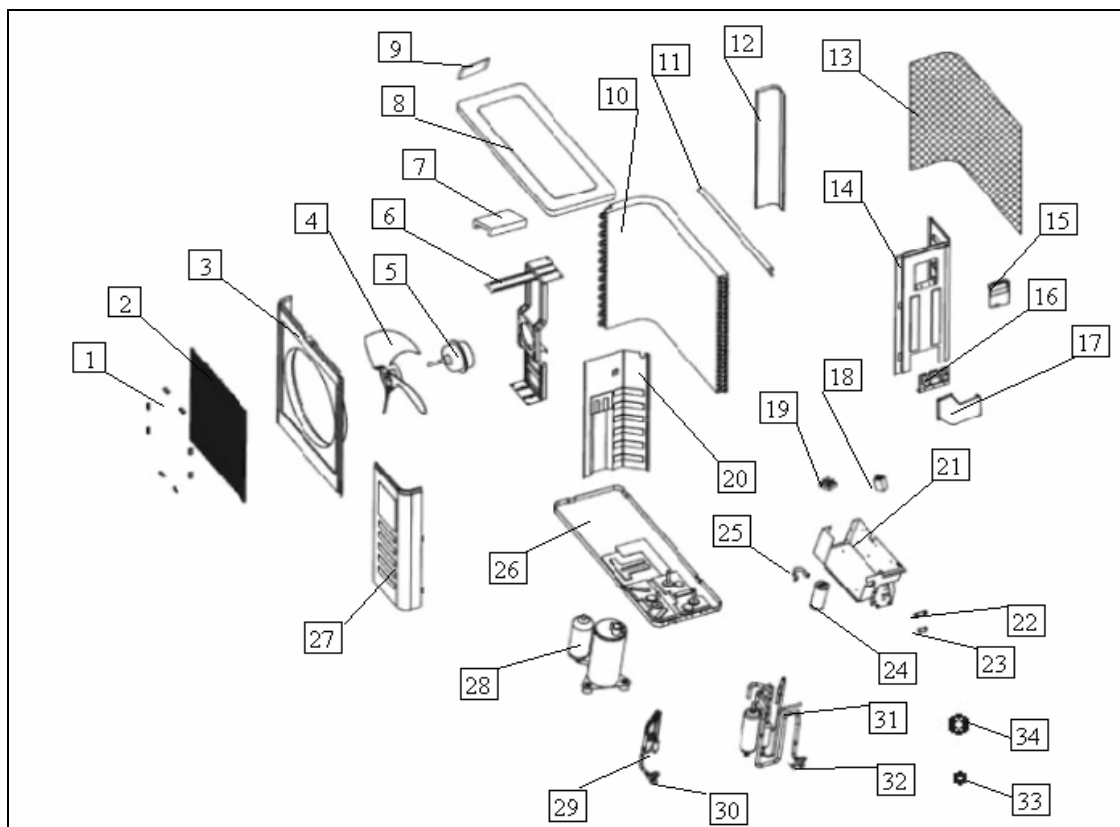
2. MCA-24HRN1 MCA-30HRN1 MCA-36HRN1 MCA-48HRN1



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Water collector, assy	1	30	Installing cover	4
2	Stopper, Water Drain	1	31	Louver motor	1
3	E-Parts Box Cover1	1	32	Louver	4
4	Fan motor capacitor	1	33	Filter	1
5	E-Parts Box	1	34	Grille switch	2
6	E-Parts Box Cover2	1	35	Grille switch cover	1
7	Transformer	1	36	Grille	1
8	Main control board	1	37	Hanger for panel, assy	4
9	Wind inlet guide	1	38	Control box	1
10	nut	1	39	LED holder	1
11	Fan clamp	1	40	Display board, Ass'y	1
12	Fan	1	41	Control box cover	1
13	Fan Motor	1	42	Panel	1
14	Gasket for motor	6	43	Back board, Air out 1	1
15	Evaporator base assy	1	44	Back board, Air out 2	1
16	Chassis	1	45	Back board, Air out 3	1
16	Wire clamp board	1	46	Back board, Air out 4	1
17	Sealing board, pipe out	1	47	Foam, air out 1	4
18	Installation hanger	4	47	Foam, air out 2	4
19	Expandable hanger	4	48	Fixing hanger 1, Evaporator	1
20	Drain pump	1	49	Fixing hanger, Evaporator	1
21	Water depth sensor	1	50	Inlet pipe for evaporator	1
22	Water pipe clamp	1	51	Outlet pipe for evaporator	1
23	Water pipe	1	52	Evaporator	1
24	Extended water pipe	1	53	Fixing board, Evaporator	1
25	Separating board, pump	1	54	Rubber, wire crossing	1
26	Rubber washer, pump	3	55	Evaporator temp sensor	1
27	Pump holder	1	56	Indoor temp sensor	1
28	Water trying board	1	57	Remote Controller	1
29	Panel Ass'y	1			

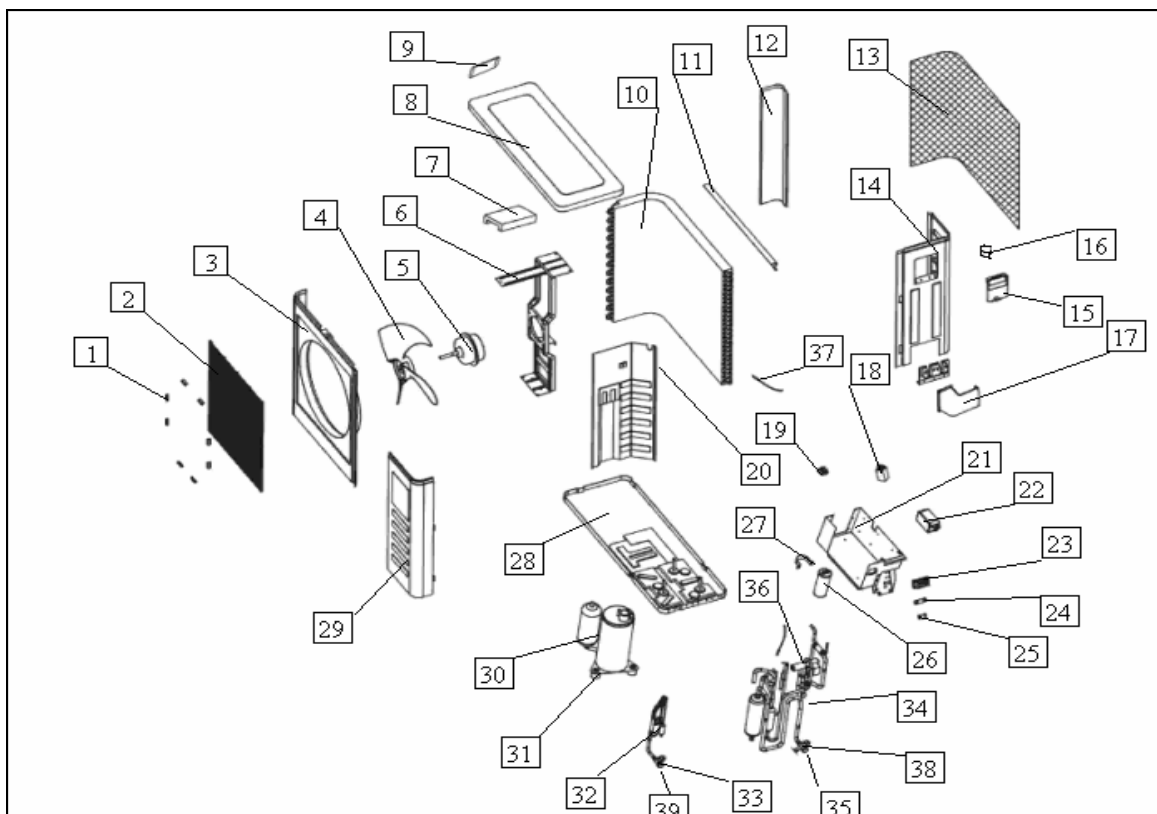
Outdoor units

1. MTA3-18HRN1



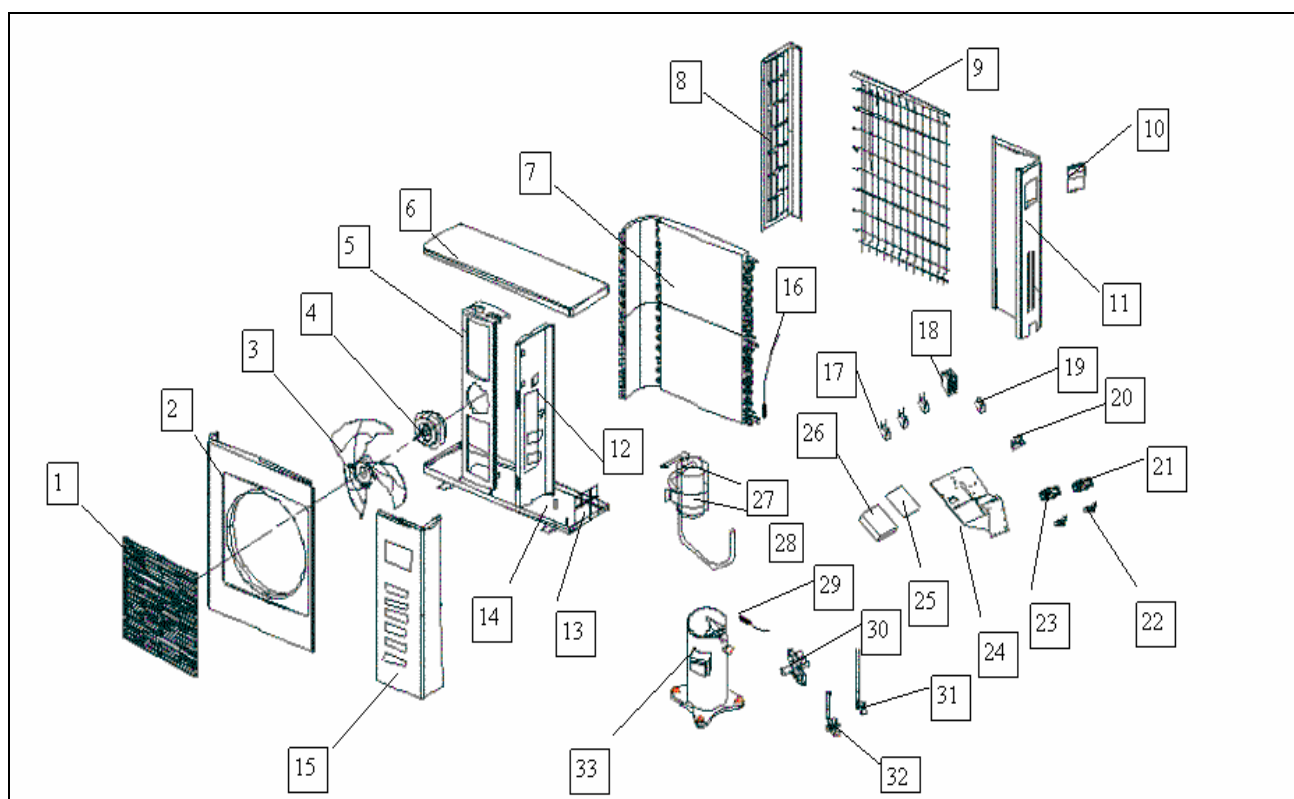
No.	Part Name	Quantity	No.	Part Name	Quantity
1	Clamp for front net	8	19	Wire joint	1
2	Front net	1	20	Separating board	1
3	Front clapboard	1	21	Installation board for E-parts	1
4	Propeller fan	1	22	Washer for wire joint	1
5	Fan motor	1	23	Clamp for wiring	1
6	Holder for fan motor	1	24	Compressor capacitor	1
7	Foam over holder for motor	1	25	Capacitor clamp	1
8	Cover	1	26	Chassis	1
9	Little handle	1	27	Front right clapboard	1
10	Condenser	1	28	Compressor	1
11	Support board, motor holder	1	29	Rubber underlay, compressor	3
12	Left clapboard	1	30	Liquid valve assy	1
13	Rear net	1	31	Liquid pipe valve	1
14	Rear right clapboard	1	32	4-Ways valve assy	1
15	Big handle	1	33	Gas pipe valve	1
16	Installation plate for valves	1	34	Four-way Valve	1
17	Water collector	1	35	Copper nut, TLM-B02	1
18	Fan motor capacitor	1			

2. MTA3-24HRN1



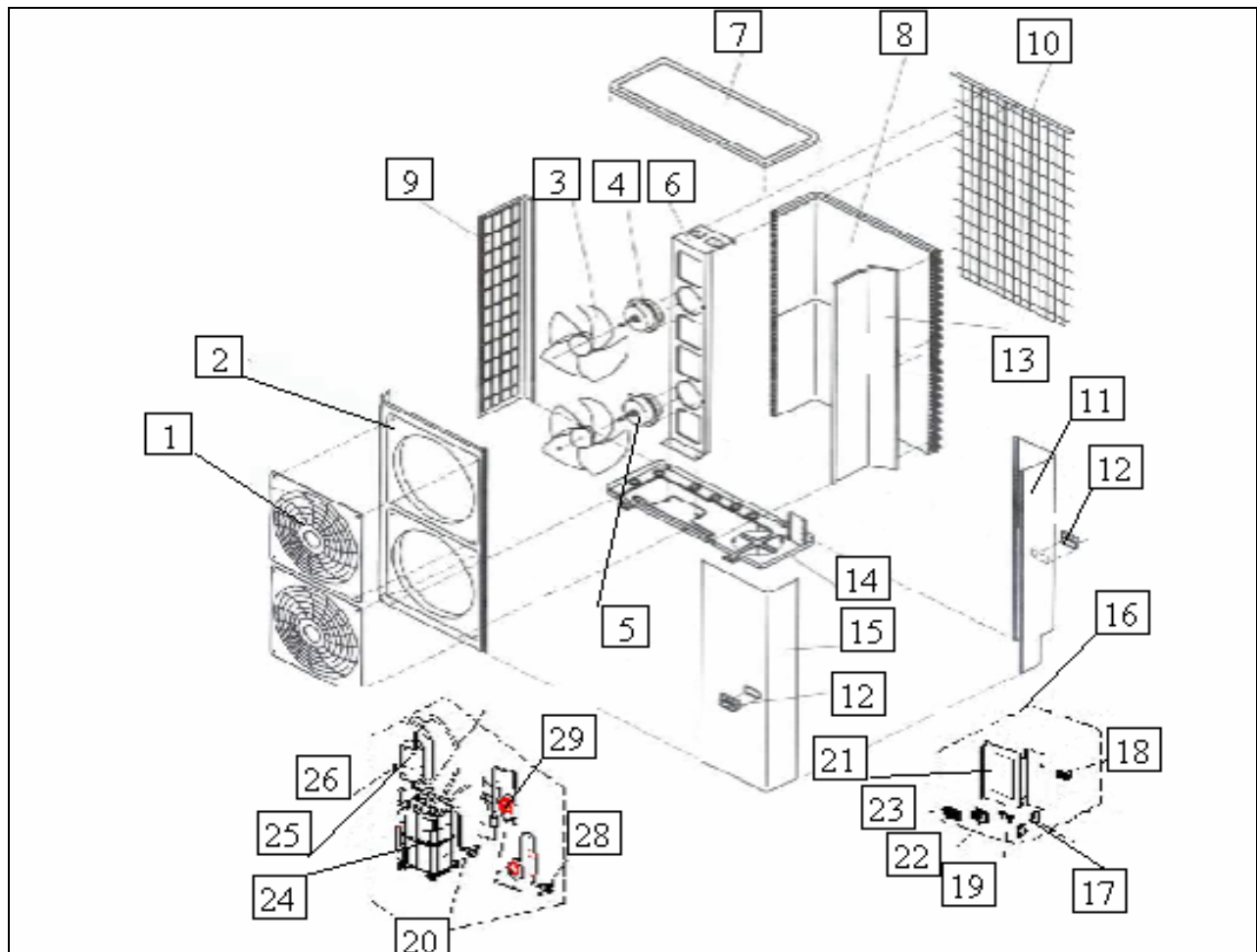
No.	Part Name	Quantity	No.	Part Name	Quantity
1	Clamp for front net	8	21	Wiring Installation Panel	1
2	Front net	1	22	Contactor, AC	1
3	Front clapboard	1	23	Terminal Block, 5p	1
4	Propeller fan	1	24	Washer for wire joint	1
5	Fan motor	1	25	Wire Clamp	1
6	Holder for fan motor	1	26	Running Capacitor, Compressor	1
7	Foam over holder for motor	1	27	Capacitor Clamp	1
8	Cover	1	28	Base Pan Ass'y	1
9	Little handle	1	29	Cabinet, Front-Right	1
10	Condenser Ass'y	1	30	Compressor	1
11	Support board, motor holder	1	31	Rubber underlay, compressor	3
12	Left clapboard	1	32	Capillary pipe Ass'y	1
13	Rear net	1	33	High Pressure Valve, 1/4 in.	1
14	Rear right clapboard	1	34	Four-way valve Ass'y	1
15	Big handle	1	35	Gas pipe valve	1
16	Handle	2	36	4-way valve	1
17	Water collector	1	37	Condenser temp sensor	1
18	Fan motor capacitor	1	38	Copper nut	1
19	Terminal Block, 2p	1	39	Copper nut	1
20	Separating board	1			

3. MTA3-30HRN1 MTA3-36HRN1



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Front net	1	18	AC Contactor	1
	Clamp for front net	10	19	Running Capacitor, Compressor	1
2	Front clapboard	1	20	Fan motor capacitor	1
3	Propeller fan	1	21	Wire joint, 3p	1
4	Fan Motor	1	22	Washer for wire joint	1
5	Holder for fan motor	1	23	Wire joint, 5p	1
6	Top Cover	1	24	Installation board for E-parts	1
7	Condenser I	1	25	Clamp for wiring	1
7	Condenser II	1	26	Terminal install board	1
8	Left clapboard	1	27	Refrigerant container	1
9	Rear Net	1	28	Fixing clamp, container	1
10	Big Handle	1	29	Discharge temp sensor	1
11	Rear right clapboard	1	30	4-Ways valve	1
12	Separating board	1	31	Liquid pipe valve	1
13	Installation plate for valves	1	32	Gas pipe valve	1
14	Chassis	1	33	Compressor	1
15	Front right clapboard	1		Electric heater for compressor	1
16	Condenser pipe temp sensor	1			
17	Wire joint for multiplexer	2			

4. MTA3-48HRN1 MTA-60HRN1



No.	Part Name	Quantity
1	Guard fan	2
2	Cabinet, Front	1
3	Fan, Propeller	2
4	Fan motor, Down	1
5	Fan Motor	1
6	Mount, Fan Motor	1
7	Top cap Ass'y	1
8	Condenser, Up	1
	Condenser, Down	1
9	Left Side Cabinet	1
10	Supporter, Rear Cabinet	1
11	Cabinet, Back side	1
12	Handle	2
13	Plate, Sound-proof	1
14	Base Pan Ass'y	1
15	Cabinet, Front Side	1

No.	Part Name	Quantity
16	E-control box, ass'y	1
17	Capacitor, Fan Motor	2
18	Terminal Block,2p	3
19	Contactor, AC	1
20	Low Pressure Valve ,3/8 in.	1
21	PCB Ass'y	1
22	Terminal Block,4p	1
23	Wire joint for power	1
24	Compressor	1
25	Refrigerator Container	1
26	Fixture, Segregator	1
27	High Pressure Valve .	1
27	Capillary Tube	1
28	Electric heat belt for comp	1
29	Discharge temp controller	1