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# 1. Precaution

#### **1.1 Safety Precaution**

■ To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage.

■ Before service the unit, be sure to read this service manual at first.

#### 1.2 Warning

#### Installation

■ Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.

There is risk of fire or electric shock.

■ For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.

Do not disassemble or repair the product, there is risk of fire or electric shock.

Always ground the product.

There is risk of fire or electric shock.

■ Install the panel and the cover of control box securely.

There is risk of fire of electric shock.

Always install a dedicated circuit and breaker.

Improper wiring or installation may cause electric shock.

■ Use the correctly rated breaker of fuse.

There is risk of fire or electric shock.

Do not modify or extend the power cable.

There is risk of fire or electric shock.

Do not install, remove, or reinstall the unit by yourself (customer).

There is risk of fire, electric shock, explosion, or injury.

Be caution when unpacking and installing the product.

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

■ For installation, always contact the dealer or an authorized service center.

■ Do not install the product on a defective installation stand.

Be sure the installation area does not deteriorate with age.

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

■ Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

■ Take care to ensure that power cable could not be pulled out or damaged during operation.

There is risk of fire or electric shock.

Do not place anything on the power cable.

There is risk of fire or electric shock.

Do not plug or unplug the power supply plug during operation.

There is risk of fire or electric shock.

Do not touch (operation) the product with wet hands.

■ Do not place a heater or other appliance near the power cable.

There is risk of fire and electric shock.

Do not allow water to run into electrical parts.

It may cause fire, failure of the product, or electric shock.

Do not store or use flammable gas or combustible near the product.

There is risk of fire or failure of product.

Do not use the product in a tightly closed space for a long time.

Oxygen deficiency could occur.

■ When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on. ■ If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.

There is risk of electric shock or fire.

■ Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.

There is risk of property damage, failure of product, or electric shock.

■ Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

There is risk of physical injury, electric shock, or product failure.

■ When the product is soaked, contact an authorized service center.

There is risk of fire or electric shock.

Be caution that water could not enter the product.

There is risk of fire, electric shock, or product damage.

■ Ventilate the product from time to time when operating it together with a stove etc.

There is risk of fire or electric shock.

■ Turn the main power off when cleaning or maintaining the product.

There is risk of electric shock.

When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.

There is risk of product damage or failure, or unintended operation.

■ Take care to ensure that nobody could step on or fall onto the outdoor unit.

This could result in personal injury and product damage.

#### CAUTION

Always check for gas (refrigerant) leakage after installation or repair of product.

Low refrigerant levels may cause failure of product.

Install the drain hose to ensure that water is drained away properly.

A bad connection may cause water leakage.

■ Keep level even when installing the product.

It can avoid vibration of water leakage.

■ Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

It may cause a problem for your neighbors.

■ Use two or more people to lift and transport the product.

■ Do not install the product where it will be exposed to sea wind (salt spray) directly.

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

#### Operational

■ Do not expose the skin directly to cool air for long time. (Do not sit in the draft).

■ Do not use the product for special purposes, such as preserving foods, works of art etc. It is a consumer air conditioner, not a precision refrigerant system.

There is risk of damage or loss of property.

Do not block the inlet or outlet of air flow.

■ Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.

There is risk of fire, electric shock, or damage to the plastic parts of the product.

■ Do not touch the metal parts of the product when removing the air filter. They are very sharp.

■ Do not step on or put anything on the product. (outdoor units)

■ Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

■ Do not insert hands or other objects through air inlet or outlet while the product is operated.

■ Do not drink the water drained from the product.

■ Use a firm stool or ladder when cleaning or maintaining the product.

Be careful and avoid personal injury.

Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.

There is risk of fire or explosion.

■ Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

They may burn of explode.

■ If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.

# 2. Part Names and Features

2.1	Model	Names	of	Indoor/Outdoo	or units

Series	Capacity	Indoor units	Outdoor units
Cassette		MEHSU-09CHC2	
Duct	9К	MEHSU-09CHD2	MCHSU-09PHH2
Console	MEHSU-09CHN2		
Cassette		MEHSU-12CHC2	
Duct	12K	MEHSU-12CHD2	MCHSU-12PHH2
Console		MEHSU-12CHN2	
Cassette		MEHSU-18CHC2	
Duct	18K	MEHSU-18CHD2	MCHSU-18PHH2
Floor Ceiling		MEHSU-18CHF2	
Cassette		MEHSU-24CHC2	
Duct	24K	MEHSU-24CHD2	MCHSU-24PHH2
Floor Ceiling		MEHSU-24CHF2	
Cassette		MEHSU-36CSC2	
Duct	36K	MEHSU-36CSD2	MCHSU-36CSH2
Floor Ceiling		MEHSU-36CSF2	
Cassette		MEHSU-48CSC2	
Duct	48K	MEHSU-48CSD2	MCHSU-48CSH2;
Floor Ceiling	1	MEHSU-48CSF2	

# 2.2 Part names of Indoor/Outdoor units

# **Cassette Unit**



- Air flow louver(at air outlet)
- 2 Drain pump(drain water from indoor unit)
- 3 Drain pipe
- 4 Air outlet
- **b** Air filter(inside air-in grill)
- 6 Air inlet

- Air-in grill
  - Display panel
- Remote controller
- Refrigerant pipe
- Air inlet
- Air outlet

#### **Duct Units**



# **INDOOR UNIT**

- Air outlet
- 2 Air inlet
- Air filter(on some models)
- 4 Electric control cabinet
- 5 Drain pipe

# **OUTDOOR UNIT**

- 6 Connecting pipe
- Air inlet
- Air inlet(side and rear)
- 9 Air outlet



Fig.1

# **INDOOR UNIT**

- Air flow louver (at air outlet)
- Air inlet (with air filter in it)
- Installation part
- 4 Remote controller
- Display panel
- 6 Drain pipe

# OUTDOOR UNIT

- Connecting pipe
- 8 Air inlet
- ④ Air outlet



# **INDOOR UNIT**

- Air flow louver (at air outlet)
- Air inlet (with air filter in it)
- Installation part
- Display panel
- 6 Remote controller
- 6 Drain pipe

# **OUTDOOR UNIT**

- Connecting pipe
- 8 Air inlet
- ④ Air outlet

# 2.3 Features

# 2.3.1 Duct Units

# 2.3.1.1 Installation Accessories: (Optional)

> Front Board, Canvas Air Passage, Filter, Panel, for easy installation



Panel

# 2.3.1.2 Easy Installation: Two air Inlet Styles (Bottom side or Rear side)

- > Air inlet from rear is standard for all capacity; air inlet from bottom is optional.
- The size of air inlet frame from rear and bottom is same, it's very easy to move the cover from bottom to rear side, or from rear to the bottom, in order to matching the installation condition.



# 2.3.1.3 Fresh Air Intake Function

Install one duct from the reserved fresh-air intake to outdoor. Continually inhale the fresh air to improve the quality of the indoor air, fulfills air quality more healthy and comfortable.



#### 2.3.1.4 Easy Maintenance

> Clean the filter (Optional, standard product without filter)

It is easy to draw out the filter from the indoor unit for cleaning, even the filter is installed in rear side or bottom side.



# Replace the motor or centrifugal fan Remove the ventilated panel firstly. Remove a half of blower housing and take out the motor with centrifugal fan. Directly remove two bolts, and then replace the motor or centrifugal fan easily.



# 2.3.1.5 Reserved Remote On-off and Central Control Ports

Reserved remote on-off ports and central control ports, can connect the cable of an on-off controller or a central controller to realize remote on-off control function or group control function.



Remote on-off ports Central control ports

# 2.3.1.6 Built-in Drain Pump (Optional):

Built-in drain pump can lift the water to 750mm(29.53in) upmost. It's convenient to install drainage piping under most space condition.



#### 2.3.1.7 Built-in Display Board

- > The standard indoor unit can be controlled by wired controller.
- There is a display board with a receiver in the E-box. Move out the display, and fix it in other place, even in the distance of 2m(6.56ft). The unit will realized remoter control.
- The wired controller and the display board can display the error code or production code when the chips detect some failure.



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# 2.3.2 Cassette Unit

# 2.3.2.1 Lower Noise

- > Optimize air channel system design to ensure the maximum quietness and comfort.
- Noise max down 6dB.



# 2.3.2.2 Turbo Mode (Optional)

Turbo function can boost cooling or heating speed in a short period, and makes the room cool down or heat up rapidly.



# 2.3.2.3 Fire-proof Controller Box

> Electrical control box adopts new design, which can meet higher fire safety requirements.



#### 2.3.2.4 Fresh Air

> Fresh air intake function bring you fresh and comfortable air feeling.



# 2.3.2.5 Wired Controller (Optional)

Compared with infrared remote controller, wired controller can be fixed on the wall and avoid mislaying. It's mainly used for commercial zone and makes air conditioner control more convenient.



# 2.3.2.6 Build-in Drain Pump

- > The drain pump can lift the condensing water up to 750mm(29.53in) upmost.
- > It's convenient to install drainage piping under most space condition.



# 2.3.2.7 *Terminals For Alarm Lamp and Long-distance On-off Controller Connection Are Standard*

Reserve terminals for the connection of alarm lamp and long-distance on-off controller, more human control.

# 2.3.3 Console

# 2.3.3.1. Modern and Elegant Appearance

> The simple and stylish designs can nicely harmonies with your living space.



#### 3.2.3.2. Four Panels optional



#### 2.3.3.3. Two Air-outlet Ways Cooling mode



Quick Cooling

To maintain room temp

- Air outlet from top and bottom to make quick cooling -----When the A/C is just switched on, or room temp. is still high, cold air will be blown out from top and bottom air outlet to cool down the room quickly
- Air outlet from top to maintain room temp. ----When the room has been cooled down, or the A/C has been opened over 1 hour, cold air only from the top outlet to keep constant room temp

#### Heating mode

Anti-cold air -----When the AC is just turn on, temperature of evaporator is very low, in this case, in order to prevent cold air direct blowing, only the upper louver is opened in a high position, the lower louver closed.



# 2.3.3.5. Low Noise

- > DC indoor fan motor, which has five speeds.
- Low noise and energy saving.



> Advanced centrifugal fan technology makes a fast airflow and reduces the indoor noise.



- 2.3.3.6. Golden fin is optional.
- 2.3.3.7. Active carbon filter is standard

# 2.3.1 Ceiling-floor Units

# 2.3.1.1 Two-way Installation

The rounded design of the ceiling and floor type air conditioner allows either ceiling or floor-level installation. Ceiling installation saves room space, while floor installation helps prevent the loss of warm air.





# 2.3.1.2 Brief Design

Brief design that is suitable for any interior will not only give you cooling and heating performance but also upgrade your lifestyle.



# 2.3.1.3 3D Airflow

Vertical air flow and horizontal airflow can be adjusted by remote controller, the cooperation of the two airflow ways help to spread air comfortably throughout even a large room. With these functions, the whole room can be evenly air-conditioned for both floor-level and ceiling installation.



# 2.3.1.4 Optional Drainage Pipe Connection

Both right side and left side drainage holes are available to avoid the space limitation for drainage pipe installation. Make you more convenient during installation.



C Panel (LED display)

D Panel

# 2.3.1.5 Convenience Operating and Easy Maintenance

- > Remote controller as standard, wired controller for optional.
- > The filter without screw fixed, can be took out easily.

# 2.3.1.6 Easy Installation, Save Working Time

- > The pipes can be connected from bottom, back and right side, makes the installation more easily.
- > The wiring works can be finished before installation.



2.3.1.7 Outside Water Pump for Ceiling Installation Only. Floor Mount will require an External Pump or Gravity Drain

# 3. Dimension

# 3.1 Indoor Unit

#### **Duct Units**



Capacity (KBtu)		Out	line dim	ension(	mm)	Air c	Air outlet opening size				Air return opening size			Size of install hanger		Size of refrigerant pipe		
		А	В	С	D	E	F	G	Н	Ι	J	к	L	М	H1	H2	W1	W2
0	mm	700	210	635	570	65	493	35	119	595	200	80	740	350	120	143	95	150
9	in	27.56	8.27	25	22.44	2.56	19.41	1.38	4.69	23.43	7.87	3.15	29.13	13.78	4.72	5.63	3.74	5.91
10	mm	700	210	635	570	65	493	35	119	595	200	80	740	350	120	143	95	150
12	in	27.56	8.27	25	22.44	2.56	19.41	1.38	4.69	23.43	7.87	3.15	29.13	13.78	4.72	5.63	3.74	5.91
10	mm	920	210	635	570	65	713	35	119	815	200	80	960	350	120	143	95	150
10	in	36.22	8.27	25.00	22.44	2.56	28.07	1.38	4.69	32.09	7.87	3.15	37.80	13.78	4.72	5.63	3.74	5.91
24	mm	920	270	635	570	65	713	35	179	815	260	20	960	350	120	143	95	150
24	in	36.22	10.63	25.00	22.44	2.56	28.07	1.38	7.05	32.09	10.24	0.78	37.80	13.78	4.72	5.63	3.74	5.91
26	mm	1140	270	775	710	65	933	35	179	1035	260	20	1180	490	120	143	95	150
30	in	44.88	10.63	30.51	27.95	2.56	36.73	1.38	7.05	40.75	10.24	0.78	46.46	19.29	4.72	5.63	3.74	5.91
49	mm	1200	300	865	800	80	968	40	204	1094	288	45	1240	500	175	198	155	210
40	in	47.24	11.81	34.06	31.50	3.15	38.11	1.57	8.03	43.07	11.34	1.77	48.82	19.69	6.89	7.80	6.10	8.27

# Cassette Units(9K, 12K, 18K)



Capacity (Rtu/h)			Body		Panel				
Capacity (Bluill)		w	D	н	W1	W1 D1 H1			
04/424/494	mm	570	260	570	647	50	647		
9R/12R/10R	inch	22.44	10.24	22.44	25.47	1.97	25.47		

# Cassette Units (24K, 36K, 48K)



Capacity				Во	Panel					
(Btu/h)		W	С	Н	Α	В	D	W1	D1	H1
246	mm	840	205	840	160	75	50	950	55	950
24N	inch	33.07	8.07	33.07	6.30	2.95	1.97	37.40	2.17	37.40
2014	mm	840	245	840	160	95	60	950	55	950
301	inch	33.07	9.65	33.07	6.30	3.74	2.36	37.40	2.17	37.40
4017	mm	840	287	840	160	95	60	950	55	950
40N	inch	33.07	11.30	33.07	6.30	3.74	2.36	37.40	2.17	37.40

# **Console Units**





Capacity (Btu/h)		W	D	н
0K / 12K	mm	700	210	600
9K / 12K	inch	27.56	8.27	23.62

# Ceiling-floor Units (18K-48K)



# 3.2 Outdoor Unit







Notor	The above	drawing is on	ly for reference	The appearance of	vour unite may	v ha diffarant
note.		urawing is on	iy ioi reletence.	The appearance of	your units ma	y be unerent.

Model		W	D	Н	W1	Α	В
MCHSU-09PHH2	mm	800	333	554	870	514	340
MCHSU-12PHH2	inch	31.5	13.1	21.8	34.3	20.2	13.4
	mm	845	363	702	914	540	350
MCH30-10F HHZ	inch	33.3	14.3	27.6	36.0	21.3	13.8
MCHSU-24PHH2	mm	946	420	810	1030	673	403
MCHS-30PSH2	inch	37.2	16.5	31.9	40.6	26.5	15.9







Model		w	D	Н	W1	Α	В
MCHSU-48CSH2	mm	952	415	1333	1045	634	404
	inch	37.5	16.3	52.5	41.1	25.0	15.9

# 4. Service Space

# 4.1 Indoor Unit

#### **Duct Units**

Ensure enough space required for installation and maintenance.



#### All the indoor units reserve the hole to connect the fresh air pipe. The hole size as following



#### **Cassette Units**





## **Console Unit**



# **Ceiling-floor Units**



# 4.2 Outdoor Unit



# 5. Refrigerant Cycle Diagram



# 6. Wiring Diagram

# 6.1 Indoor Unit

#### I FUNCTION OF SWITCH Inner Driver Output Anti-cold air TO WIRE DC Motor SWITCH FOR CCM UNIT ADDRESS SW1 FAN MOTOR STOP-TEM CONTROLLER Control ! M) 5 M 24 \$2 βĢ D: setting + \$1 eter Reactor TO WIRE 1 BOARD 15 Ð CONTROLLER IMPRES ₿ġ 15 0~15 16~31 JR6 Y/G 10 74 J f---I ₽**₽** \$2 8 Į ON - OFF ALARM $\mathbf{D}$ ЮЮ + \$1 M I ЮЮ RED RED CN8 According CN23 CN16 **BBB** CN15 48~63 DC M DRIVER 32~47 to the **CN33** DLE EEPROM CN7 Outer D river DC Motor setting Ŀ L INDOOR UNIT SW3 SWITCH FOR AUTO-RESTART SETTING W2 SWITCH OUTER PIPE TEMP. FOR FAN MOTER CONTROL (M) DUMP CN13 ON STATE Ĩ MAINBOARD Ð P4 🔘 I ON P STATE -000 CN6 4 KK-CN5 I MODE NO\_REMEMBER REMEMBER MOD 7 FAN ON CH CN4 -000-Factory Setting WATER LEVEL SWITCH CN1 CN110 -RR-~ Factory 1 IP2 ROOM TEMP WHITE BLUE(BLACK) RED(BROWN) XS9 XP9 (SWING MOTOR BROW ٦. SW6 SWITCH FOR TEMP.COMPENSATION SW5 SWITCH FOR MODE-PRIOR SETTING YELLOW I Y/G 6 Y/G Î ₽₽ ON ON ₽₽ FAN Ĩ Į Ő STATE STATE Y/G : I ∎ ٢ ٢ 2 VALUE 6 4 3 E functi MODE HEAT HEAT COOL COOL (D) $\otimes$ $\otimes$ $\otimes$ Ø Factory Setting Factory : V CCM Comm.Busi CAP1 I

#### MEHSU-09CHC2, MEHSU-12CHC2, MEHSU-18CHC2, MEHSU-24CHC2

MEHSU-09CHD2, MEHSU-12CHD2, MEHSU-18CHD2, MEHSU-24CHD2



#### MEHSU-09CHN2, MEHSU-12CHN2



#### MEHSU-36CSC2, MEHSU-48CSC2



#### MEHSU-36CSD2, MEHSU-48CSD2



#### MEHSU-18CHF2, MEHSU-24CHF2



#### MEHSU-36CSF2



#### MEHSU-48CSF2



#### MEHSU-36CSF2, MEHSU-48CSF2



# 6.2 Outdoor Unit



#### MCHSU-09PHH2 , MCHSU-12PHH2 , MCHSU-18PHH2
#### MCHSU-24PHH2



#### MCHSU-36CSH2



#### MCHSU-48CSH2



# PCB board of MCHSU-09PHH2, MCHSU-12PHH2, MCHSU-18PHH2



#### For MCHSU-24PHH2, MCHSU-36CSH2,



### For MCHSU-48CSH2



#### IPM board of MCHSU-24PHH2, MCHSU-36CSH2,



#### For MCHSU-48CSH2



# 7. Fan Curves

ENC2		1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,3460 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	40773460 4008468	1,3460 1,0,3460 1,0,0,1 1,0,0,0,0 1,0,0,0,0,0,0,0,0,0,	4 0 7 1 3 4 6 9 4 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	40773460 4008468	Static Pressure Range In. WG (Pa)
	Model	0	1	2	3	4	
	Model<12	0.02	0.04	0.08	0.12	0.16	0-0.18
		(5)	(10)	(20)	(30)	(40)	(0-45)
Model	Model=18	0.04	0.10	0.14	0.18	0.22	0-0.28
(K Rtu/h)		(10)	(25)	(35)	(45)	(55)	(0-70)
(R Dlu/II)	18 <model≤24< td=""><td>0.04</td><td>0.10</td><td>0.16</td><td>0.22</td><td>0.28</td><td>0-0.40</td></model≤24<>	0.04	0.10	0.16	0.22	0.28	0-0.40
		(10)	(25)	(40)	(55)	(70)	(0-100)
	24-Madal-60	0.08	0.14	0.20	0.26	0.32	0-0.40
	24<1000e1500	(20)	(35)	(50)	(65)	(80)	(0-100)
Facto	ory Setting	$\checkmark$					

MEHSU-09CHD2,











#### MEHSU-12CHD2













#### MEHSU-18CHD2











#### MEHSU-24CHD2











#### MEHSU-36CSD2







Rated Point

1176 1294 (2000) (2200)

1059 (1800)





#### MEHSU-48CSD2



Air volume CFM (m3/h)



Air volume CFM (m3/h)

# **8 Electric Characteristics**

Madal	Indoor Unit				
Wodel	Hz	Voltage	Min.	Max.	
MEHSU-09CHC2	60	208-230V	187V	253V	
MEHSU-09CHD2	60	208-230V	187V	253V	
MEHSU-09CHN2	60	208-230V	187V	253V	
MEHSU-12CHC2	60	208-230V	187V	253V	
MEHSU-12CHD2	60	208-230V	187V	253V	
MEHSU-12CHN2	60	208-230V	187V	253V	
MEHSU-18CHC2	60	208-230V	187V	253V	
MEHSU-18CHD2	60	208-230V	187V	253V	
MEHSU-18CHF2	60	208-230V	187V	253V	
MCHSU-36CSH2	60	208-230V	187V	253V	
MEHSU-24CHD2	60	208-230V	187V	253V	
MEHSU-24CHF2	60	208-230V	187V	253V	
MEHSU-36CSC2	60	208-230V	187V	253V	
MEHSU-36CSD2	60	208-230V	187V	253V	
MEHSU-36CSF2	60	208-230V	187V	253V	
MEHSU-48CSC2	60	208-230V	187V	253V	
MEHSU-48CSD2	60	208-230V	187V	253V	
MEHSU-48CSF2	60	208-230V	187V	253V	

# 9 Sound Level

# 9.1 Indoor unit



Madal	Noise level dB(A)			
Model	Н	М	L	
MEHSU-09CHD2	37	34	31	
MEHSU-12CHD2	39	36	32	
MEHSU-18CHD2	35	33	31	
MEHSU-24CHD2	50	47	45	
MEHSU-36CSD2	53	49	45	
MEHSU-48CSD2	44	47	41	



Madal	Noise level dB(A)			
Widder	Н	М	L	
MEHSU-09CHC2	41	39	37	
MEHSU-12CHC2	41	38	35	
MEHSU-18CHC2	46	43	41	
MEHSU-24CHC2	51	47	43	
MEHSU-36CSC2	52	47	44	
MEHSU-48CSC2	53	49	45	



Madal	Noise level dB(A)			
Model	Н	М	L	
MEHSU-09CHN2	45	41	35	
MEHSU-12CHN2	44	42	38	



Medel	Noise level dB(A)			
iviodei	Н	М	L	
MEHSU-18CHF2	47	44	38	
MEHSU-24CHF2	53	49	45	
MEHSU-36CSF2	55	48	41	
MEHSU-48CSF2	57	54	52	

# 9.2 Outdoor unit





**Note:** H= 0.5 × height of outdoor unit

Model	Noise Level dB(A)
MCHSU-09PHH2	59
MCHSU-12PHH2	56
MCHSU-18PHH2	59
MCHSU-24PHH2	61
MCHSU-36CSH2	65
MCHSU-48CSH2	63

# **10 Accessories**

# **Duct Units**

	Name	Shape	Quantity
	Soundproof / insulation sheath	0)	2
Tubing & Fittings	Binding tape		1
	Seal sponge		1
Drainpipe Fittings	Drain joint	9 <b>m</b>	1
(for cooling & heating)	Seal ring	0	1
Wired controller & Its Frame	Wired controller		1
Others	Owner <sup>:</sup> s manual		1
Others	Installation manual		1
EMS & It's fitting	Magnetic ring (twist the electric wires L and N around it to five circles)		1

# **Cassette Units**

	Name	Shape	Quantity
Installation Fittings	Installation paper board		1
Tubing & Fittings	Soundproof / insulation sheath	$\bigcirc \qquad \qquad \bigcirc$	1
	Out-let pipe sheath		1
Drainning Eittinge	Out-let pipe clasp		1
Drampipe Fittings	Drain joint		1
	Seal ring	$\bigcirc$	1
Remote controller & Its			
Frame(The product you	Remote controller & Its Frame	90 <u>8</u> 1000	1
have might not be			

provided the following accessories)	Remote controller holder		1
	Mounting screw(ST2.9×10-C-H)	S MAR	2
	Remote controller manual		1
	Alkaline dry batteries (AM4)		2
Othere	Owner's manual		1
Others	Installation manual		1
Installation accessory (The product you have	Expansible hook		4
following accessories	Installation hook	□ <u>]]</u>	4
tonowing accessories	Orifice		1

# **Console Units**

	Name	Shape	Quantity
Installation fittings	Hook	25	2
	Remote controller		1
Remote controller & Its Frame	Frame	SM	1
	Mounting screw(ST2.9×10-C-H)	E Martin	2
	Alkaline dry batteries (AM4)	G	2
Others	Installation manual	1	1
oulers	Owner's manual	1	1

# **Ceiling-floor Units**

	1. Remote controller		1
Remote controller & Its	2. Remote controller holder		1
noidei	3. Mounting screw (ST2.9×10-C-H)	s an	2
	4. Alkaline dry batteries (AM4)	œ	2
	5. Owner's manual		1
Others	6. Installation manual		1
	7. Remote controller manual		1

# **11 The Specification of Power**

Туре		9K-18K	24K
Power	Phase	1-phase	1-phase
	Frequency and Voltage	208-230V, 60Hz	208-230V, 60Hz
Circuit Breaker/ Fuse (A)		25/20	40/30
Indoor Unit Powe	er Wiring (mm <sup>2</sup> )		
Indeer/Outdeer	Ground Wiring	2.5	2.0
Connecting	Outdoor Unit Power Wiring	3×2.5	3×2.0
Wiring	Strong Electric Signal	4×1.0	4×1.5
	Weak Electric Signal		

Model		36K	48K
Power	Phase	1-phase	1-phase
	Frequency and Voltage	ency and Voltage 208-230V, 60Hz	
Circuit Breaker/ Fuse (A)		60/40	70/55
Indoor Unit Powe	er Wiring (mm2)		
ladeer/Outdeer	Ground Wiring	4.0	4.0
Connecting	Outdoor Unit Power Wiring	3×4.0	3×4.0
Wiring	Strong Electric Signal	3×1.5	3×1.5
	Weak Electric Signal	3×0.5	3×0.5

# **12 Field Wiring**

36K, 48K



# **12 Installation Details**

# **12.1** Location selection

# 12.1.1 Indoor unit location selection

- The place shall easily support the indoor unit's weight.
- The place can ensure the indoor unit installation and inspection.
- The place can ensure the indoor unit horizontally installed.
- > The place shall allow easy water drainage.
- The place shall easily connect with the outdoor unit.
- The place where air circulation in the room should be good.
- There should not be any heat source or steam near the unit.
- > There should not be any oil gas near the unit
- There should not be any corrosive gas near the unit
- There should not be any salty air neat the unit
- There should not be strong electromagnetic wave near the unit
- There should not be inflammable materials or gas near the unit
- > There should not be strong voltage vibration.

### 12.1.2 Outdoor unit location selection

- The place shall easily support the outdoor unit's weight.
- Locate the outdoor unit as close to indoor unit as possible
- The piping length and height drop cannot exceed the allowable value.
- The place where the noise, vibration and outlet air do not disturb the neighbors.
- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded, and not face the strong wind.
- It is easy to install the connecting pipes and cables.
- There is no danger of fire due to leakage of inflammable gas.
- > It should be a dry and well ventilation place
- > The support should be flat and horizontal
- Do not install the outdoor unit in a dirty or severely polluted place, so as to avoid

blockage of the heat exchanger in the outdoor unit.

If is built over the unit to prevent direct sunlight, rain exposure, direct strong wend, snow and other scraps accumulation, make sure that heat radiation from the condenser is not restricted.



# 12.2 Indoor unit installation

# 12.2.1 A5 duct indoor unit installation 12.2.1.1 Service space for indoor unit



#### 12.2.1.2 Bolt pitch



Capacity(KBtu)		Size of outline dimension mounted		
		plug		
		L	М	
0	mm	740	350	
9	in	29.13	13.78	
12	mm	740	350	
12 in		29.13	13.78	
10	10 mm 960		350	
in in		37.80	13.78	
24	mm	960	350	
24 in		37.80	13.78	
mm		1180	490	
- 50	in	46.46	19.29	
10	mm	1240	500	
40	in	48.82	19.69	

### 12.2.1.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of Ø12mm(0.47in), 45~50mm(1.57~1.97in) deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



12.2.1.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within  $\pm 1^{\circ}$ .



12.2.1.5 Install the air filter

Insert the air filter through the filter slot and fix it with 2 screws.



# 12.2.1.6 Install the air duct

Please design the air duct as below recommended picture



12.2.1.7 Change the air inlet direction

① Take off ventilation panel and flange, cut off the staples at side rail.



② Stick the attached seal sponge as per the indicating place in the following fig, and then change the mounting positions of air return panel and air return flange.



③ When install the filter mesh, please plug it into flange inclined from air return opening, and then push up.



④ The installation has finish, upon filter mesh which fixing blocks have been insert to the flange positional holes.



# 12.2.2 Compact cassette indoor unit installation







#### 12.2.2.2 Bolt pitch



#### 12.2.2.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of Ø12mm(0.47in), 45~50mm (1.57in~1.97in) 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 depending on the real situation.

#### 12.2.2.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within  $\pm 1^{\circ}$ .





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 10~12 mm (0.39-0.47in). In general, L is half of the screw length of the installation hook.



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



**12.2.2.5 Install the panel** Remove the grille



Hang the panel to the hooks on the mainbody.



Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.



Hang the air-in grill 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.

Note: The panel shall be installed after the wiring connected.

# 12.2.3 Console indoor unit installation 12.2.3.1 Service space for indoor unit



# 12.2.3.2 Install the main body

Fix the hook with tapping screw onto the • wall



Hang the indoor unit on the hook.

(The bottom of body can touch with floor or suspended, but the body must install vertically.)



14.2.4 Ceiling-floor unit installation 12.2.4.1 Service space for indoor unit



# 12.2.4.2 Bolt pitch

① Ceiling installation



Capacity (Btu/h)		D	E
196 / 246	mm	983	220
18K / 24K	inch	38.70	8.66
36K	mm	1200	220
	inch	47.24	8.66
4914	mm	1565	220
48N	inch	61.61	8.66

# 2 Wall-mounted installation



# 12.2.4.3 Install the pendant bolt

① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of Ø12mm(0.47in),

45~50mm(1.77~1.97in) deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



2 Wall-mounted installation Install the tapping screws onto the wall.(Refer to picture below)



# 12.2.4.4 Install the main body

① Ceiling installation (The only installation method for the unit with drain pump) Remove the side board and the grille.



Locate the hanging arm on the hanging screw bolt. Prepare the mounting bolts on the unit.



#### Put the side panels and grilles back.





② Wall-mounted installation

Hang the indoor unit by insert the tapping screws into the hanging arms on the main unit. (The bottom of body can touch with floor or suspended, but the body must install vertically.)



# 12.2.5 Slim cassette indoor unit installation







Capacity (Btu/h)		Α	н
24K	mm	205	>235
24N	inch	8.07	>9.25
36K	mm	245	>275
	inch	9.65	>10.83
48K	mm	287	>317
	inch	11.30	>12.48

# 12.2.5.2 Bolt pitch



# 12.2.5.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of Ø12mm(0.47in), 45~50mm(1.77~1.97in) deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



### 12.2.5.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within  $\pm 1^{\circ}$ .



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 10~12 mm(0.39~0.47in). In general, L is half of the screw length of the installation hook.



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



# 12.2.5.5 Install the panel

Remove the grille



Remove the 4 corner covers.



Hang the panel to the hooks on the mainbody. If the panel is with auto-lift grille, please watch the ropes lifing the grille, DO NOT make the ropes enwinded or blocked.



Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.





Hang the air-in grill 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.

Install the 4 corner covers back.



Note: The panel shall be installed after the wiring connected.

# 12.3 Outdoor unit installation

# 12.3.1 Service space for outdoor unit





# 12.3.2 Bolt pitch



For the value of A,B and D, please refer to the dimension part.

#### 14.3.3 Install the Unit

Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling.

Never hold the inlet of the outdoor unit to prevent it from deforming.

Do not touch the fan with hands or other objects.

Do not lean it more than 45, and do not lay it sidelong.

Make concrete foundation according to the specifications of the outdoor units.

Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind.



# 12.4 Refrigerant pipe installation

12.4.1 Maximum pipe length and height drop

Considering the allowable pipe length and height drop to decide the installation position. Make sure the distance and height drop between indoor and outdoor unit not exceeded the date in the following table.

Model	Max. Length		Max. Elevation	
WOUEI	m	Ft.	m	Ft.
9,000Btu/h	25	82.2	10	32.9
12,000Btu/h	25	82.2	10	32.9
18,000Btu/h	30	98.7	20	65.8
24,000Btu/h	50	164.5	25	82.2
36,000Btu/h	65	213.8	30	98.7
48,000Btu/h	65	213.8	30	98.7

#### 12.4.2 The procedure of connecting pipes

- 1. Choose the pipe size according to the specification table.
- 2. Confirm the cross way of the pipes.
- 3. Measure the necessary pipe length.
- 4. Cut the selected pipe with pipe cutter
- Make the section flat and smooth.



- 5. Insulate the copper pipe
- Before test operation, the joint parts should not be heat insulated.
- 6. Flare the pipe
- Insert a flare nut into the pipe before flaring the pipe
- According to the following table to flare the pipe

Pipe	Flare din	nension A	
diamete	(mm/in)		Flare shape
r	Min	Max	
1/4"	8 3/0 33	8 7/0 34	90°+4
(6.35)	0.3/0.33	0.770.34	- 450
3/8"	12.0/0.4	12 1/0 10	
(9.52)	7	12.4/0.49	
1/2"	15.4/0.6	15 8/0 62	R0.4~
(12.7)	1	15.0/0.02	
5/8"	18.6/0.7	10 1/0 75	
(15.9)	3	19.1/0.75	
3/4"	22.9/0.9		
(19)	0	23.3/0.92	

- After flared the pipe, the opening part must be seal by end cover or adhesive tape to avoid duct or exogenous impurity come into the pipe.
- 7. Drill holes if the pipes need to pass the wall.
- 8. According to the field condition to bend the pipes so that it can pass the wall smoothly.
- 9. Bind and wrap the wire together with the insulated pipe if necessary.
- 10. Set the wall conduit
- 11. Set the supporter for the pipe.
- 12. Locate the pipe and fix it by supporter
- For horizontal refrigerant pipe, the distance between supporters should not be exceed 1m.
- For vertical refrigerant pipe, the distance between supporters should not be exceed 1.5m.
- 13. Connect the pipe to indoor unit and outdoor unit by using two spanners.
- Be sure to use two spanners and proper torque to fasten the nut, too large torque will damage the flare, and too small torque may cause leakage. Refer the following table for different pipe connection.
- ⊳

Pipe	Torque	Sketch map	
Diameter	(kgf.cm)	(N.cm)	a M
1/4" (6.35)	144~176	1420~1720	
3/8" (9.52)	333~407	3270~3990	
1/2" (12.7)	504~616	4950~6030	
5/8" (15.9)	630~770	6180~7540	

3/4" (19)	990~1210	9270~11860	
-----------	----------	------------	--

# 12.4.3 First-Time Installation

Air and moisture in the refrigerant system cause the following problems:

- Increases in system pressure
- Increases in operating current
- Decreases in cooling and heating efficiency
- Blocks in capillary tubing caused by moisture in the refrigerant circuit freezing
- Corrosion of parts in the refrigerant system caused by water

The indoor units and the pipes between indoor and outdoor units must be tested for leakages and evacuated to remove gas and moisture from the system.

Gas leak check with soap water:

Apply soap water or a liquid neutral detergent on the connections with a soft brush to check for leakage in the pipe connecting points. If bubbles emerge, the pipes are leaking.

# 1. Air Purging Using the Vacuum Pump



- Completely tighten the flare nuts on the indoor and outdoor units. Confirm that both the2-way and 3-way valves are set to the closed position.
- Connect the charge hose with the push pin of the Handle Lo to the 3-way valve gas service port.
- Connect the charge hose of the Handle Hi to the vacuum pump.
- 4) Fully open the Handle Lo of the manifold valve.

- 5) Turn on the vacuum pump to begin evacuation.
- 6) Conduct a 30-minute evacuation. Check whether the compound meter indicates -0.1Mpa(14.5Psi). If the meter does not indicate -0.1Mpa(14.5Psi) after 30 minutes has elapsed, continue evacuation for 20 more minutes. If the pressure does not reach -0.1Mpa(14.5Psi) after 50 minutes has elapsed, check if there are any leaks.

Fully close the Handle Lo valve of the manifold valve and turn off the vacuum pump. After 5 minutes, confirm that the gauge needle is not moving.

- 7) Turn the flare nut on the 3-way valve45° counterclockwise for 6-7 seconds. Once gas begins to come out, tighten the flare nut. Make sure the pressure display on the pressure indicator is higher than atmospheric pressure. Then remove the charge hose from the 3-way valve.
- 8) Fully open the 2-wayand 3-way valves and securely tighten the cap on the 3-way valve.

# 2. Air Purging Using Refrigerant



#### Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port on the 3-way valve.3). Air purging:

Open the valves on the charging cylinder and the charge set. Loosen the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute. Repeat 3 times. After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check for gas leaks.

Check the flare connections for gas leaks.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge displays a value between 0.3 to 0.5 Mpa(43.5 to 72.5Psi)

6). Disconnect the charge set and the charging cylinder. Set the 2-way and 3-way values to the open position.

Be sure to use a hexagonal wrench to open and close the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque of  $18N \cdot m$ .

Be sure to check for gas leaks.

# 12.4.4 Adding Refrigerant after Long-Term System Operation



#### Procedure

1). Connect the charge hose to the 3-way service port and open the 2-way and 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, place the cylinder bottom-up to ensure liquid charge.

2). Purge the air from the charge hose. Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant). 3) Place the charging cylinder onto the electronic scale and record the weight.

4) Turn on the air conditioner in cooling mode.

5) Open the valves (Low side)on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port.

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leaks.

# 12.4.5 Re-installation When Indoor Unit Requires Repairs

1. Collecting the Refrigerant into the Outdoor Unit



#### Procedure

1). Confirm that both the 2-way and 3-way valves are open.

Remove the valve stem caps and confirm that the valve stems are open.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Purge the air from the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Close the 2-way valve.

5). Turn on the air conditioner in cooling mode. Turn it off when the gauge indicates -0.1MPa(14.5Psi).

6).Immediately close the 3-way valve

Do this quickly so that the gauge displays a value between 0.3 to 0.5 Mpa(43.5 to 72.5Psi).

Disconnect the charge set, and tighten the 2-way and 3-way valves' stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leaks.

#### 2. Air Purging by the Refrigerant



### Procedure:

1). Confirm that both the 2-way and 3-way valves are closed.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve Leave the valve on the charging cylinder closed.

3). Purge the air from the charge hose.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds and then closing it for 1 minute. Repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check for gas leaks

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3 to 0.5 Mpa(43.5 to 72.5Psi)

6). Disconnect the charge set and the charging cylinder, and open the 2-way and 3-way valves Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check for gas leakage.

# 12.4.6 Re-Installation When the Outdoor Unit Requires Repairs

# 1. Evacuation for the whole system



# Procedure:

1).Confirm that both the 2-way and 3-way valves are open.

2). Connect the vacuum pump to 3-way valve's service port.

3). Conduct an evacuation for approximately one hour. Confirm that the compound meter displays a value of -0.1Mpa(14.5Psi).

4). Close the valve (Low side) on the charge set, turn off the vacuum pump. After 5 minutes,

confirm that the gauge needle is not moving.

5). Disconnect the charge hose from the vacuum pump.

# 2. Refrigerant charging



# Procedure:

 Connect the charge hose to the charging cylinder. Open the 2-way 3-way valve.
With the charge hose you disconnected from the vacuum pump, connect it to the valve at the bottom of the cylinder. If the refrigerant is R410A, place the cylinder bottom-up to ensure liquid charge.

2). To purge the air from the charge hose, open

the valve at the bottom of the cylinder and press

the check valve on the charge set (be careful of

the liquid refrigerant).

3) Place the charging cylinder onto the

electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant If the system cannot be charged with the specified amount of refrigerant, or can be charged with a only a small amount at a time (approximately 150g each time),turn the unit on in cooling mode; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).If the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately.

If the system has been charged with liquid refrigerant while the air conditioner is on, turn off the air conditioner before disconnecting the hose.

6). Mount the valve stem caps and the service port.

Use a torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

# 12.5 Drainage pipe installation

Install the drainage pipe as shown below and take measures against condensation. Improperly installation could lead to leakage and eventually wet furniture and belongings.

# 12.5.1 Installation principle

- Ensure at least 1/100 slope of the drainage pipe
- > Adopt suitable pipe diameter
- > Adopt nearby condensate water discharge
- 12.5.2 Key points of drainage water pipe installation
- 1. Considering the pipeline route and elevation
- Before installing condensate water pipeline, determine its route and elevation to avoid intersection with other pipelines and ensure slope is straight.
- 2. Drainage pipe selection
- The drainage pipe diameter shall not small than the drain hose of indoor unit
- According to the water flowrate and drainage pipe slope to choose the suitable pipe, the water flowrate is decided by the capacity of indoor unit.

# Relationship between water flowrate and

# capacity of indoor unit

Capacity (x1000Btu)	Water flowrate (I/h)
12	2.4
18	4
24	6
30	7
36	8
42	10
48	12
60	14

According to the above table to calculate the total water flowrate for the confluence pipe selection.

For horizontal drainage pipe (The following table is for reference)

PVC pipe	Reference value of inner diameter of	Allowal maximu water f (l/h)	ole um lowrate	Remark	
	pipe (mm/in)	Slope 1/50	Slope 1/100		
PVC25	20/0.79	39	27	For branch	
PVC32	25/0.98	70	50	pipe	
PVC40	31/1.22	125	88	Could be used	
PVC50	40/1.57	247	175	for confluence pipe	
PVC63	51/2.01	473	334		

Attention: Adopt PVC40 or bigger pipe to be the main pipe.

# **For Vertical drainage pipe** (The following table is for reference)

PVC pipe	Reference value of inner diameter of pipe (mm/in)	Allowable maximum water flowrate (I/h)	Remark
PVC25	20/0.79	220	For branch
PVC32	25/0.98	410	pipe
PVC40	31/1.22	730	
PVC50	40/1.57	1440	Could be used
PVC63	51/2.01	2760	for confluence
PVC75	67/2.64	5710	pipe
PVC90	77/3.03	8280	

Attention: Adopt PVC40 or bigger pipe to be the main pipe.

- 3. Individual design of drainage pipe system
- The drainage pipe of air conditioner shall be installed separately with other sewage pipe, rainwater pipe and drainage pipe in building.
- The drainage pipe of the indoor unit with water pump should be apart from the one without water pump.

# 4. Supporter gap of drainage pipe

- In general, the supporter gap of the drainage pipe horizontal pipe and vertical pipe is respectively 1m~1.5m (3.28~4.92ft) and 1.5m~2.0m(4.95~6.56ft).
- Each vertical pipe shall be equipped with not less than two hangers.
- Overlarge hanger gap for horizontal pipe shall create bending, thus leading to air block.



5. The horizontal pipe layout should avoid converse flow or bad flow




- The correct installation will not cause converse water flow and the slope of the branch pipes can be adjusted freely
- The false installation will cause converse water flow and the slope of the branch pipe cannot be adjusted.
- 6. Water storage pipe setting
- If the indoor unit has high extra static pressure and without water pump to elevate the condensate water, such as high extra static pressure duct unit, the water storage pipe should be set to avoid converse flow or blow water phenomena.



### 7. Lifting pipe setting of indoor unit with water pump

- The length of lifting pipe should not exceed the pump head of indoor unit water pump.
- The drainage pipe should be set down inclined after the lifting pipe immediately to avoid wrong operation of water level switch.
- Refer the following picture for installation reference.



### 8. Blowhole setting

- For the concentrated drainage pipe system, there should design a blowhole at the highest point of main pipe to ensure the condensate water discharge smoothly.
- The air outlet shall face down to prevent dirt entering pipe.
- Each indoor unit of the system should be installed it.
- The installation should be considering the convenience for future cleaning.



9. The end of drainage pipe shall not contact with ground directly.

### 12.5.3 Drainage test 12.5.3.1.Water leakage test

After finishing the construction of drainage pipe system, fill the pipe with water and keep it for 24 hours to check whether there is leakage at joint section.

### 12.5.3.2. Water discharge test

 Natural drainage mode(the indoor unit with outdoor drainage pump)

Infuse above 600ml water through water test hole slowly into the water collector, observe whether the water can discharge through the transparent hard pipe at drainage outlet.



2. Pump drainage mode

2.1 Disconnect the plug of water level switch, remove the cover of water test hole and slowly infuse about 2000ml water through the water test hole, be sure that the water will not touch the motor of drainage pump.



2.2 Power on and let the air conditioner operate for cooling. Check operation status of drainage pump, and then connect the plug of water level switch, check the operation sound of water pump and observe whether the water can discharge through the transparent hard pipe at drainage outlet. (In light of the length of drainage pipe, water shall be discharged about 1 minute delayed)

- 2.3 Stop the operation of air conditioner, power off the power supply and put the cover of water test hole back to the original place.
- After stopped the air conditioner 3 minutes, check whether there is anything abnormal. If drainage pipes have not been distributed properly, over back-flow water shall cause the flashing of alarm indicator at remote-controlled receiving board and even water shall run over the water collector.
- b. Continuously infusing water until water level alarmed, check whether the drainage pump could discharge water at once. If water level does not decline under warning water level 3 minutes later, it shall cause shutdown of unit. When this situation happens, the normal startup only can be recovered by turning down power supply and eliminating accumulated water.

**Note:** Drain plug at the main water-containing plate is used for eliminating accumulated water in water-containing plate when maintaining air conditioner fault. During normal operation, the plug shall be filled in to prevent leakage.

12.5.4 Insulation work of drainage pipe Refer the introduction to the insulation engineering parts.

### 12.6 Vacuum Drying and Leakage Checking

#### 12.6.1 Purpose of vacuum drying

Eliminating moisture in system to prevent the phenomena of ice-blockage and copper oxidation. Ice-blockage shall cause abnormal operation of system, while copper oxide shall damage compressor.

Eliminating the non-condensable gas (air) in system to prevent the components oxidizing, pressure fluctuation and bad heat exchange during the operation of system.

#### 12.6.2 Selection of vacuum pump

- The ultimate vacuum degree of vacuum pump shall be -756mmHg or above.
- Precision of vacuum pump shall reach 0.02mmHg or above.

# 12.6.3 Operation procedure for vacuum drying

Due to different construction environment, two kinds of vacuum drying ways could be chosen, namely ordinary vacuum drying and special vacuum drying.

### 1 Ordinary vacuum drying

- When conduct first vacuum drying, connect pressure gauge to the infusing mouth of gas pipe and liquid pipe, and keep vacuum pump running for 1hour (vacuum degree of vacuum pump shall be reached -755mmHg).
- If the vacuum degree of vacuum pump could not reach -755mmHg after 1 hour of drying, it indicates that there is moisture or leakage in pipeline system and need to go on with drying for half an hour.
- If the vacuum degree of vacuum pump still could not reach -755mmHg after 1.5 hours of drying, check whether there is leakage source.
- Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

### 2 Special vacuum drying

The special vacuum drying method shall be adopted when:

- Finding moisture during flushing refrigerant pipe.
- Conducting construction on rainy day, because rain water might penetrated into pipeline.
- Construction period is long, and rain water might penetrated into pipeline.
- Rain water might penetrate into pipeline during construction.

Procedures of special vacuum drying are as follows:

- Vacuum drying for 1 hour.
- Vacuum damage, filling nitrogen to reach 0.5Kgf/cm2.
  - Because nitrogen is dry gas, vacuum damage could achieve the effect of vacuum drying, but this method could not achieve drying thoroughly when there is too much moisture. Therefore, special attention shall be drawn to prevent the entering of water and the formation of condensate water.
- > Vacuum drying again for half an hour.
  - If the pressure reaches -755mmHg,start to pressure leakage test. If it cannot reach the value, repeat vacuum damage and vacuum drying again for 1 hour.
- Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

### 12.7 Additional refrigerant charge

- After the vacuum drying process is carried out, the additional refrigerant charge process needs to be performed.
- The outdoor unit is factory charged with refrigerant. The additional refrigerant charge volume is decided by the diameter and length of the liquid pipe between indoor and outdoor unit. Refer the following formula to calculate the charge volume.

Diameter	of		
liquid	pipe	Ф6.35(1/4in)	Ф9.52(3/8in)
(mm)			
Formula		V=15g/m×(L-7.5)	V=30g/m×(L-7.5)

V: Additional refrigerant charge volume (g).

**L:** The length of the liquid pipe (m).

### Note:

- Refrigerant may only be charged after performed the vacuum drying process.
- Always use gloves and glasses to protect your hands and eyes during the charge work.
- Use electronic scale or fluid infusion apparatus to weight refrigerant to be recharged. Be sure to avoid extra refrigerant charged, it may cause liquid hammer of the compressor or protections.
- Use supplementing flexible pipe to connect refrigerant cylinder, pressure gauge and outdoor unit. And The refrigerant should be charged in liquid state. Before recharging, The air in the flexible pipe and manifold gauge should be exhausted.
- After finished refrigerant recharge process, check whether there is refrigerant leakage at the connection joint part. (Using gas leakage detector or soap water to detect).

### 12.8 Engineering of insulation

### 12.8.1 Insulation of refrigerant pipe

## 1 Operational procedure of refrigerant pipe insulation

Cut the suitable pipe  $\rightarrow$  insulation (except joint section)  $\rightarrow$  flare the pipe  $\rightarrow$  piping layout and connection $\rightarrow$  vacuum drying  $\rightarrow$  insulate the joint parts

### 2 Purpose of refrigerant pipe insulation

- During operation, temperature of gas pipe and liquid pipe shall be over-heating or over-cooling extremely. Therefore, it is necessary to carry out insulation; otherwise it shall debase the performance of unit and burn compressor.
- Gas pipe temperature is very low during cooling. If insulation is not enough, it shall form dew and cause leakage.
- Temperature of gas pipe is very high (generally 50-100 °C) during heating. Insulation work must be carried out to prevent hurt by carelessness touching.
- 3 Insulation material selection for refrigerant pipe
- > The burning performance should over  $120^{\circ}C$
- According to the local law to choose insulation materials
- The thickness of insulation layer shall be above 10mm(0.39in).If in hot or wet environment place, the layer of insulation should be thicker accordingly.

## 4 Installation highlights of insulation construction

Gas pipe and liquid pipe shall be insulated separately, if the gas pipe and liquid pipe were insulated together; it will decrease the performance of air conditioner.



> The insulation material at the joint pipe shall be  $5\sim10$ cm $(1.97\sim3.94$ in) longer than the gap of the insulation material.

> The insulation material at the joint pipe shall be inserted into the gap of the insulation material.

> The insulation material at the joint pipe shall be banded to the gap pipe and liquid pipe tightly.

- The linking part should be use glue to paste together
- Be sure not bind the insulation material over-tight, it may extrude out the air in the material to cause bad insulation and cause easy aging of the material.

### 12.8.2 Insulation of drainage pipe

1 Operational procedure of refrigerant pipe insulation

Select the suitable pipe  $\rightarrow$  insulation (except joint section)  $\rightarrow$  piping layout and connection $\rightarrow$  drainage test $\rightarrow$  insulate the joint parts

### 2 Purpose of drainage pipe insulation

The temperature of condensate drainage water is very low. If insulation is not enough, it shall form dew and cause leakage to damage the house decoration.

- 3 Insulation material selection for drainage pipe
- The insulation material should be flame retardant material, the flame retardancy of the material should be selected according to the local law.
- Thickness of insulation layer is usually above 10mm(0.39in).
- Use specific glue to paste the seam of insulation material, and then bind with adhesive tape. The width of tape shall not be less than 5cm(1.97in). Make sure it is firm and avoid dew.

### 4 Installation and highlights of insulation construction

- The single pipe should be insulated before connecting to another pipe, the joint part should be insulated after the drainage test.
- There should be no insulation gap between the insulation material.

### 12.9 Engineering of electrical wiring

1 Highlights of electrical wiring installation

- All field wiring construction should be finished by qualified electrician.
- Air conditioning equipment should be grounded according to the local electrical regulations.
- Current leakage protection switch should be installed.
- Do not connect the power wire to the terminal of signal wire.
- When power wire is parallel with signal wire, put wires to their own wire tube and remain at least 300mm(11.81in) gap.
- According to table in indoor part named "the specification of the power" to choose the wiring, make sure the selected wiring not small than the date showing in the table.
- Select different colors for different wire according to relevant regulations.
- Do not use metal wire tube at the place with acid or alkali corrosion, adopt plastic wire tube to replace it.
- There must be not wire connect joint in the wire tube If joint is a must, set a connection box at the place.
- The wiring with different voltage should not be in one wire tube.
- Ensure that the color of the wires of outdoor and the terminal No. are same as those of indoor unit respectively.

### 12.10 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 values are both opened.
- The air conditioner is pre-heated by turning on the power.

### 3 Test operation

Set the air conditioner under the mode of "COOLING" by remote controller, and check the following points.

### 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 temporary buttons works well.
- > 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.

### **13. Operation Characteristics**

Temperature Mode	Cooling operation	Heating operation	Drying operation	
Room temperature	<b>17℃~32℃(62</b> ℉~90℉)	0℃~30℃ (32℉~86℉)	10℃~32℃ (50℉~90℉)	
Outdoor temperature (Entry level)	0°C ~ 50°C (32°F ~ 122°F) ( -15°C ~ 50°C(5°F ~ 122°F) : For the models with low temperature cooling system )	-15℃ ~ 30℃ (5℉ ~ 86℉)	0°C ~ 50°C	
Outdoor temperature (E-Star level)	-25℃~50℃(-13℉~122℉)	-25℃ ~ 30℃ (-13℉ ~ 86℉)	(32°F ~ 122°F)	
Outdoor temperature (Hyper heat)	-30℃~50℃(-22℉~122℉)	-30℃ ~ 50℃ (-22℉ ~ 122℉)		

### CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. The optimum performance will be achieved during this operating temperature zone.

		connector for fan motor	
		from the electronic control	
		board.	
		<ul> <li>4) Remove the four fixing screws of the fan motor.</li> <li>5) Then remove the fan motor.</li> </ul>	
3	Electrical	How to remove the	
	parts	electrical parts.	0
		1) After finish work of	
		item 1 and item 2, remove	Compressor connector
		the connectors for the	
	compressor and reactor.		
		2) Pull out the two blue wires connected with the	٢
		1	

