This product utilizes **R-32** *refrigerant*

Universal® Series DC Inverter Package Unit

Installation & Owner's Manual

MODELS:

MDPH180*D



Read this manual carefully before installation and keep it where the operator can easily find it for future reference.

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice.

Version Date: September 10, 2025
Please visit www.mrcool.com/documentation
to ensure you have the latest version of this manual.

MRCOOL®
COMFORT MADE SIMPLE

CONTENTS

1 SAFETY 2
2 UNIT OVERVIEW & FEATURES 5
- 2.1 Unit Information & Features 5
- 2.2 Operating Range 5
- 2.3 Codes & Regulations 5
- 2.4 Physical Dimensions 5
- 2.5 Main Parts 6

3 PRE-INSTALLATION 7
- 3.1 Product Verification & Replacement Parts 7
- 3.2 Location Selection Requirements 7
- 3.3 Installation Location Dimensions & Clearances 8
- 3.4 Minimum Room Area 8
- 3.5 Minimum Circulation Airflow 9
- 3.6 Refrigerant Sensor 9

4 UNIT INSTALLATION 10
- 4.1 Curb-Mounted Installation 10
- 4.2 Pad-Mounted Installation 10
- 4.3 Rigging & Lifting 11
- 4.4 Horizontal Duct & Vertical Duct Conversion 11
- 4.5 Installation of Condensation Pipe 12
- 4.6 Dip Switch Instruction 13
- 4.7 Fan Performance Data 13

5 DUCTWORK 14
6 ELECTRIC HEATER 15
- 6.1 Electric Heater Safety 15
- 6.2 Compatible Heat Kits 15
- 6.3 Heat Kit Installation Precautions 15
- 6.4 Heat Kit Installation Steps 15

7 ELECTRICAL INSTALLATION 16
- 7.1 Electrical Parameters 16
- 7.2 Terminal Connection 17
- 7.3 Wiring Diagram 18
- 7.4 Engineering Wiring Diagram 19

8 TRIAL RUN & TROUBLESHOOTING 20
- 8.1 Post-Installation Check 20
- 8.2 Trial Run 20
- 8.3 Troubleshooting 21

9 MAINTENANCE 25
- 9.1 Cleaning the Air Filter 25
- 9.2 Drainage Pipe 25
- 9.3 Cleaning the Heat Exchanger 25
- 9.4 Before Seasonal Use 25
- 9.5 After Seasonal Use 26
- 9.6 Parts Replacement 26

9.7 After-Sale Service 26
9.8 Unventilated Areas 26
9.9 Transportation & Marking 26
9.10 Servicing 27



This marking indicates that this product should not be disposed with other household wastes throughout the North America. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Safety Precautions

Read Before Using

Incorrect usage may cause serious damage or injury.

The symbols below are used throughout this manual to indicate instructions that should be followed closely or actions that should be avoided to prevent death, injury, and/or property damage.

WARNING	**Indicates that ignoring instructions may cause death or serious injury.**
CAUTION	**Indicates that ignoring instructions may cause bodily injury, damage to the unit, or other surrounding property.**
	Indicates that you should NEVER perform the indicated action.

PROHIBITED

1. The air conditioner should be grounded to avoid electric shock. Do not connect the ground wire to gas pipe, water pipe, lightning arrester or telephone wire.
2. The unit should be stored in a well-ventilated area where the room size corresponds to the correct specified room area.
3. The unit should be stored in a room without continuously operating open flames (for example: an operating gas appliance) and ignition sources (for example: an operating electric heater).
4. According to federal/state/local laws and regulations, all packages and transportation materials, including nails, metal or wooden parts, and plastic packing material must be treated in a safe way.
5. The unit should be at least 5ft (1.5m) away from any inflammable surface.
6. The range of external static pressures at which the unit was tested measures 0-0.8 inches W.C. (those with add-on heat pumps and ducted units with supplementary heaters only).
7. Do not use means to accelerate the defrosting process or to clean, other than those recommended by MRCOOL®.
8. The unit should be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater.
9. Do not pierce or burn.
10. Be aware that refrigerants may not contain an odor.
11. Electric heating and the unit need to be 5ft (1.5m) away from other flammable materials or 1ft (0.3m) away from the wall.
12. The material of the plenum and ductwork must meet the standard NFPA 90B. The supply air plenum or duct must have a solid sheet metal bottom piece directly after the unit with no openings, registers, or flexible air ducts located in it. The first 6in (15.24cm) of supply air plenum and ductwork must be constructed of sheet metal as required by NFPA 90B. The metal plenum of duct may be connected to the non-combustible floor base for downflow. Exposing combustible non-metal material to the supply opening of a downflow unit can cause a fire resulting in property damage, personal injury, or death. If flexible supply air ducts are used, they may be located only in the side walls of the rectangular plenum, a minimum of 6in (15.24cm) from the bottom.
13. All phases of this installation must conform to national, state, and local codes. If additional information is required, please contact your dealer or MRCOOL® Technical Department at (270) 366-0457 or at support@mrcool.com.

1 SAFETY

⚠ WARNING

1. Please install the unit according to this instruction manual. Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
2. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
3. Servicing shall only be performed as recommended by MRCOOL®.
4. The appliance shall be installed in accordance with national wiring regulations.
5. The fixed wires connecting to the appliance must be configured with all-pole disconnection device under voltage grade III according to wiring rules.
6. Air conditioner should be stored with protective measures against mechanical damage caused by accident.
7. During installation, use the specialized accessories and components, otherwise water leakage, electric shock, or fire hazard may occur.
8. Please install the air conditioner in a secure place that can withstand the weight of the air conditioner. Insecure installation may cause the air conditioner to fall down, leading to injury.
9. An independent power circuit must be utilized. If the power cord is damaged, it must be repaired by MRCOOL®, service agent, or other professional agents.
10. The unit can be cleaned only when it's turned off and the power is disconnected, otherwise electric shock may occur.
11. The air conditioner is not intended to be cleaned or maintained by children without supervision.
12. Do not alter the setting of the pressure sensor or other protective devices. If the protective devices are short-circuited or changed against the rules, fire hazard or even explosion may occur.
13. Do not operate the air conditioner with wet hands. Do not wash or sprinkle water on the air conditioner, otherwise malfunction or electric shock will occur.
14. Do not dry the filter with naked flame or an air blower; otherwise the filter will be out of shape.
15. If the unit is to be installed in a small space, adopt protective measures to prevent the concentration of refrigerant from exceeding the allowable safety limit; excessive refrigerant leakage may lead to explosion.
16. This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or those lacking experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
17. The unit must be permanently grounded. Failure to do so can lead to electrical shock causing personal injury or death.

! CAUTION

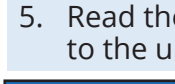
1. Do not put a finger or other objects into the air inlet or return air grill.
2. Adopt safety protection measures before touching the refrigerant pipe; otherwise injury may occur.
3. Please arrange the drain pipe according to the instruction manual.
4. Never stop the air conditioner by directly cutting off the power.
5. Never install the air conditioner in the following places:
   A. Places with oil, smoke or volatile liquid: plastic parts may deteriorate and fall off or cause water leakage.
   B. Places with corrosive gas, copper pipe, or welding parts may be corroded and cause refrigerant leakage.
6. Use measures to protect the unit from small animals, as they may damage electrical components and cause malfunction of the air conditioner.
7. This product can't be installed in corrosive, flammable, or explosive environments to prevent fire or injury.
8. Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions, which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor for information or assistance.
9. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.
10. Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available.

NOTE

1. If a thermostat is to be used, it should be connected first before powering up the unit, otherwise the thermostat may not work properly.
2. Only use a soft, dry cloth or slightly wet cloth with neutral detergent to clean the casing of the unit.
3. Before operating the unit under low temperature, connect it to power for 8 hours. If it is stopped for a short time, for example, one night, do not cut off the power (This is to protect the compressor).
4. In order to ensure the reliability of the compressor, the unit forces the compressor to run for at least 6 minutes every time the compressor turns on, regardless of room temperature. Therefore, it is necessary, for the sake of the compressor, the thermostat completes its minimum run time or that you delay turning the indoor unit off for a few minutes after the outdoor unit shuts down or stops after reaching the appropriate temperature. This is to avoid the indoor unit being turned off by the thermostat while the outdoor unit is still running, which can result in equipment malfunction.

NOTE

1. In order to ensure reliability of product, the product may consume some power under “standby status” for maintaining normal communication of the system, preheating refrigerant, and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.
2. If the product needs to be installed, moved, or maintained, please contact your designated dealer or local service center for professional support. Users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and MRCOOL® will bear no responsibility.
3. All the illustrations and information in the instruction manual are for reference only. In order to make the product better, we will continuously conduct improvements and innovations. If there are modifications to the product, refer to our online documentation for the most recent version of this manual.
4. Consult local building codes and National Electrical Code (NEC) for special requirements.
5. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit.

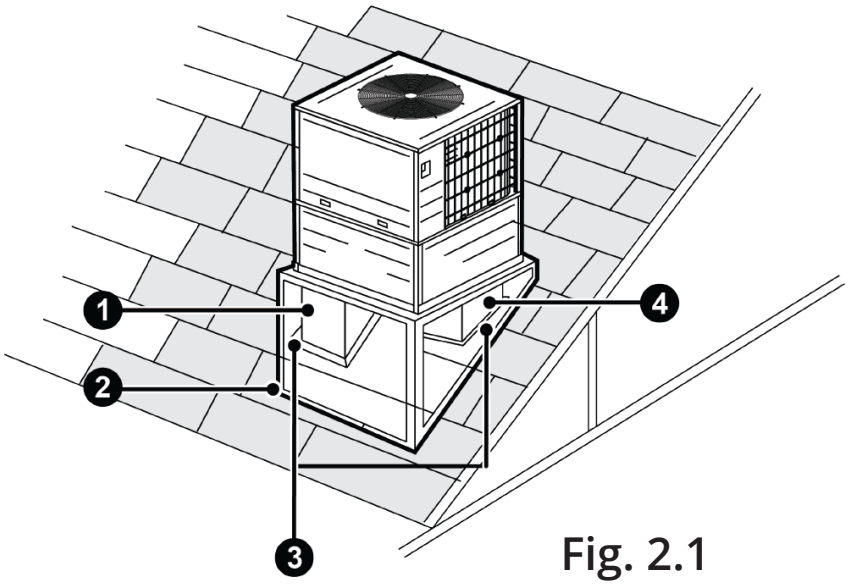
Symbols Displayed on Unit		
	**WARNING**	The appliance is filled with flammable R32 refrigerant
	**CAUTION**	Before use, read the manual.
	**CAUTION**	Before repair, read the manual.
	**CAUTION**	Before installation, read the manual.

2 UNIT OVERVIEW & FEATURES

2.1 Unit Information & Features

The unit is completely assembled, piped, and wired at the factory to provide one-piece shipment and rigging. Each unit is pressurized with a holding charge of R-32 for storage and shipping.

The compact design, attractive appearance, outstanding anti-rust cabinet, and quiet operation make these units suitable for homes, offices, restaurants, residences, or similar places.



1. Return air
2. Angle iron frame
3. Roof flashing
4. Supply air

Fig. 2.1

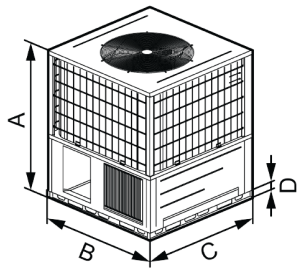
2.2 Operating Range

Outdoor Ambient Temperature	Outdoor Temperatures
Cooling	23°F~125.6°F (-5°C~52°C)
Heating	-22°F~75.2°F (-30°C~24°C)

2.3 Codes & Regulations

This product is designed and manufactured to comply with national codes. It is the installer's responsibility to install the product in accordance with such codes and/or any prevailing local codes/regulations. MRCOOL® assumes no responsibilities for equipment installed in violation of any codes or regulations.

2.4 Physical Dimensions



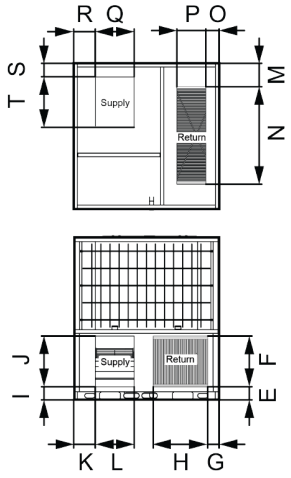


Fig. 2.2

Models	A	B	C	D				
MDPH18024D MDPH18036D	49-1/4 in. 1250 mm.	44 in. 1120 mm.	35-7/16 in. 900 mm.	2-1/2 in. 65 mm.				
	Side Air Vents							
	E	Size of Air Return		G	I	Size of Air Supply		K
		F	H			J	L	
	4-7/16 in. 113 mm.	17-8/16 in. 445 mm.	16-9/16 in. 420 mm.	3-7/16 in. 87 mm.	3-15/16 in. 101 mm.	15-6/16 in. 390 mm.	11-13/16 in. 300 mm.	6-3/16 in. 157 mm.
	Bottom Air Vents							
	M	Side of Air Return		O	R	Size of Air Supply		S
		N	P			Q	T	
	5-14/16 in. 149 mm.	23-1/16 in. 586 mm.	8-10/16 in. 219 mm.	3-11/16 in. 93 mm.	6-3/16 in. 156 mm.	11-14/16 in. 302 mm.	13-12/16 in. 350 mm.	3-10/16 in. 92 mm.

Models	A	B	C	D				
MDPH18048D MDPH18060D	49-1/4 in. 1250 mm.	44 in. 1120 mm.	44 in. 1120 mm.	2-1/2 in. 65 mm.				
	Side Air Vents							
	E	Size of Air Return		G	I	Size of Air Supply		K
		F	H			J	L	
	4 in. 101 mm.	15-3/8 in. 390 mm.	16-1/2 in. 420 mm.	3-3/8 in. 87 mm.	4 in. 101 mm.	15-3/8 in. 390 mm.	11-3/4 in. 300 mm.	6-1/2 in. 166 mm.
	Bottom Air Vents							
	M	Side of Air Return		O	R	Size of Air Supply		S
		N	P			Q	T	
	7-7/8 in. 199 mm.	28 in. 711 mm.	9 in. 228 mm.	3-3/4 in. 96 mm.	6-1/2 in. 166 mm.	11-3/4 in. 300 mm.	15-3/8 in. 390 mm.	4 in. 103 mm.

Note: Above diagrams may be different from the actual model.

2.5 Main Parts

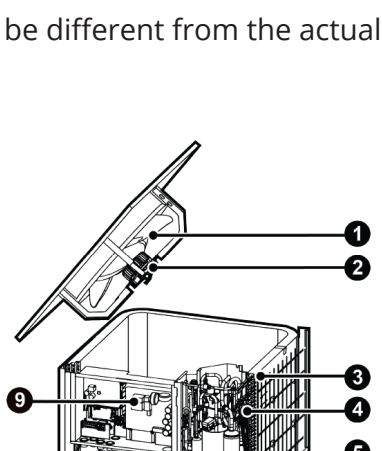


Fig. 2.3

1. Condensate fan
2. Condensate motor
3. Condenser assem
4. Service valves
5. Compressor
6. Evaporation fan
7. Evaporation motor
8. Evaporator assem
9. Electric box assem

3 PRE-INSTALLATION

3.1 Product Verification & Replacement Parts

Product Verification:

Upon receiving the product, check for any damage from transportation. Shipping damage is the responsibility of the carrier. Verify the model number, specifications and accessories are correct prior to installation. MRCOOL® will not accept claims from dealers for transportation damage or installation of incorrectly shipped units.

Replacement Parts:

When reporting shortages or damages, or ordering repair parts, give the complete product model and serial numbers as stamped on the product. Replacement parts for this product are available through your contractor or local distributor.

3.2 Location Selection Requirements

⚠ WARNING

1. The unit must be installed where it is strong enough to withstand the weight of the unit and fixed securely, otherwise the unit may fall over.
2. Do not install where there is danger of a combustible gas leakage.
3. Do not install the unit in a place with leakage of flammable gas.

Select an installation location according to the following conditions:

1. Where noise and air flow produced by the air conditioner will not disturb the neighbors.
2. Select a location that is safe and away from animals and plants. If not, add safety fences to protect the unit.
3. Install in a place with good ventilation. Make sure the air conditioner stays in a well-ventilated place with no obstacles nearby that may obstruct the air inlet and outlet.
4. The installation location should be able to withstand the weight and vibration of the air conditioner and allow the installation to be carried out safely.
5. Avoid installing at a place with leakage of flammable gas, oil smoke, or corrosive gas.
6. Keep it away from strong wind because strong wind may affect the condenser fan and lead to insufficient air flow volume,thus affecting the unit's performance.
7. Away from any object that may cause the air conditioner to generate noise.
8. Install the air conditioner at a place where condensate can be easily drained.
9. Do not install the air conditioner near the bedroom, otherwise the noise of the unit may be disturbing to building occupants.
10. Do not install the unit where water, ice, or snow from overhang or roof may damage or flood the unit.
11. Do not install the unit in a corrosive environment, otherwise it may negatively affect its lifespan and performance.
12. Installation requirements in snowy areas:

a. Install the air conditioner on a stand a minimum of 20in. (500mm) or higher than the expected snowfall to prevent it from being covered by snow.

b. Attach snow hood and snow guard.

c. Do not install the air conditioner in a place where a snowdrift is likely.

d. Remove the air inlet grille to prevent snow from accumulating on it.

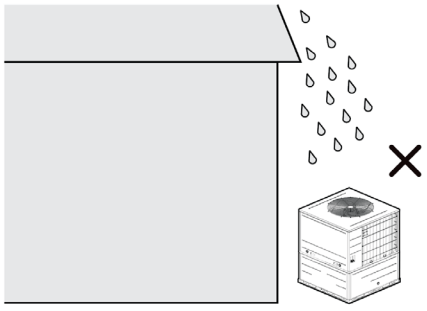
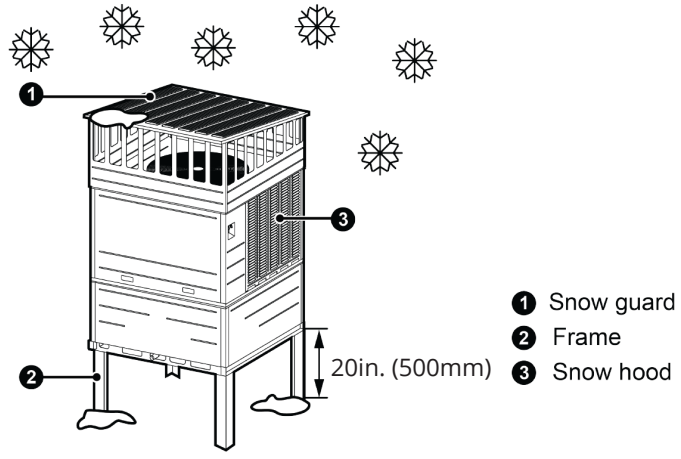


Fig. 3.1



3.3 Installation Location Dimensions & Clearances

For best performance of the unit, ensure its installation space meets the following installation dimensions.

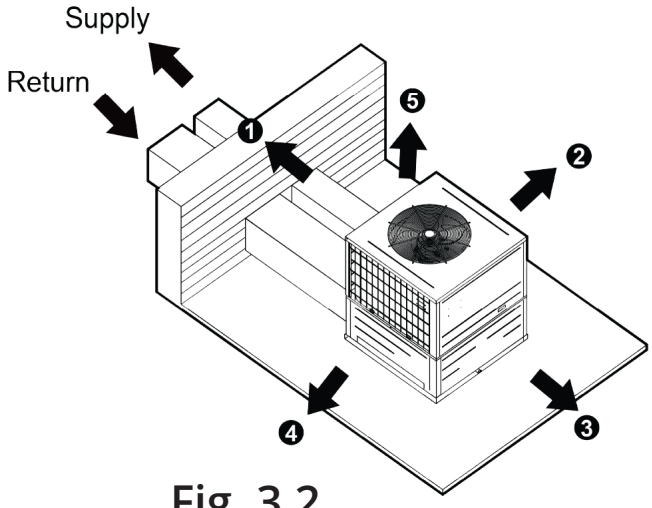


Fig. 3.2

Installation Clearances		
Dimensions (Minimum)	**in.**	**mm.**
1	24	610
2	8	203
3	20	508
4	24	610
5	60	1524

Note: Refer to local code requirements for additional clearance requirements.

Note: Above diagram may be different from actual model.

3.4 Minimum Room Area

No.	Refrigerant Perfusion lbs (kg)	Minimum Room Area (m^2)	Minimum Room Area (ft^2)
1	9.67 (4.25)	12.7	135.9
2	12.8 (5.8)	17.3	185.5

Notes:

1. The room area is calculated according to the height of 7.2ft (2.2m). Minimum room height is 7.2ft (2.2m).
2. This is only applicable to a single room.
3. Correct the minimum room area of the space (Amin) by multiplying Amin by the altitude adjustment factor (AF) based on the building site ground level altitude (Halt), as measured in meters.

Halt	0	200	400	600	800	1000	1200	1400	1600
AF	1	1	1	1	1.02	1.05	1.07	1.1	1.12
Halt	1600	1800	2000	2200	2400	2600	2800	3000	3200
AF	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.4

3.5 Minimum Circulation Airflow

Model	Minimum Circulation Airflow (m^3/h)
MDPH18024D	417
MDPH18036D	417
MDPH18048D	569
MDPH18060D	569

3.6 Refrigerant Sensor

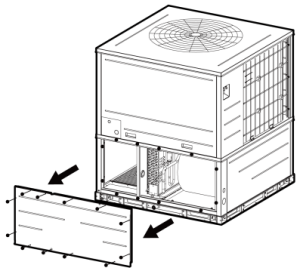
The unit is equipped with a refrigerant sensor. The sensor has a lifetime of 15 years.

At the end of lifetime or when the sensor faults, the mainboard will display the error code of “FE”, and emit an alarm sound, the blower motor will turn on, and the compressor will shut down. If the sensor detects a refrigerant leak, the mainboard will display the error code of “EA”, and emit an alarm sound, the blower motor will turn on, and the compressor will shut down.

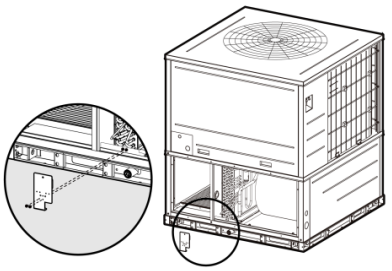
The blower motor will keep running and the system cannot be operated until the leak is repaired.

If the refrigerant sensor is damaged, the sensor can only be replaced with the particular sensor specified by MRCOOL®. Replace the refrigerant sensor as follows:

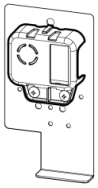
① Remove the side plate.



② Remove the holder.



③ Replace the refrigerant leakage sensor with a new one.



Where a single remote refrigerant sensor is used in a room with multiple units, all units in the room, which do not have a dedicated refrigerant detection system, shall take the same actions. When an ITE Cooling Appliance or a Partial Unit’s Refrigerant Detection System for an appliance’s refrigerant circuit resets to a safe condition, the unit should not be allowed to initiate normal operation until all refrigerant detection systems in the circulation airflow have been reset.

Where a single remote refrigerant detection system sensor is used in a room with multiple units, this requirements shall apply to all units in the room which do not have a dedicated leak detection system installed. The unit must be powered on except during servicing.

Continuous air circulation is required for proper functioning. Unit must be powered on except during servicing.

4.1 Curb-Mounted Installation

1. Install curb. (Note: MRCOOL does not supply roof curb. Refer to the following figure for roof curb reference dimensions.) Prior to fabrication, confirm the reference dimensions meet the needs of the application.

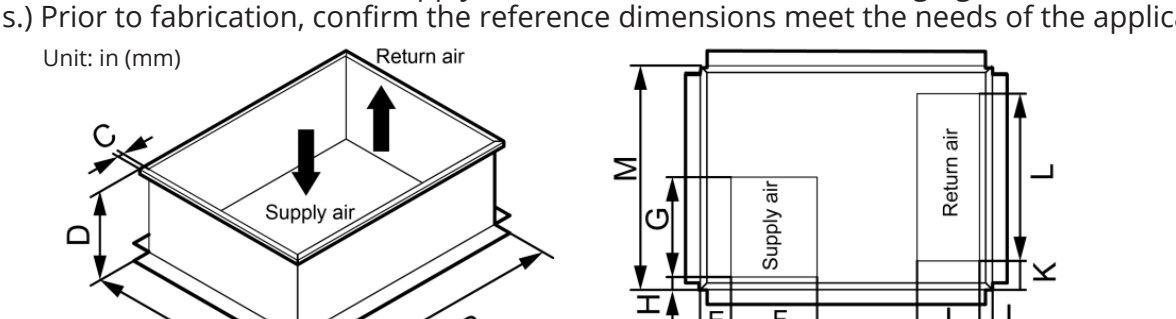


Fig. 4.1

in. (mm.)

Models	A	B	C	D	E	F
MDPH18024D MDPH18036D	29 in. 736 mm.	38-7/16 in. 976 mm.	1 in. 25 mm.	14 in. 356 mm.	4-1/4 in. 109 mm.	11-7/8 in. 302 mm.
MDPH18048D MDPH18060D	37-5/8 in. 956 mm.	38-7/16 in. 976 mm.	1 in. 25 mm.	14 in. 356 mm.	4-11/16 in. 119.5 mm.	11-13/16 in. 300 mm.
	G	H	I	J	K	L
MDPH18024D MDPH18036D	13-3/4 in. 350 mm.	1-3/4 in. 45 mm.	8-5/8 in. 219 mm.	1-3/4 in. 46 mm.	4 in. 102 mm.	23 in. 586 mm.
MDPH18048D MDPH18060D	15-3/8 in. 390 mm.	2-3/16 in. 56 mm.	8-3/4 in. 223 mm.	2-3/16 in. 55 mm.	5-1/4 in. 133 mm.	29-1/2 in. 750 mm.
	M	N				
MDPH18024D MDPH18036D	30-15/16 in. 786 mm.	40-3/8 in. 1026 mm.				
MDPH18048D MDPH18060D	39-5/8 in. 1006 mm.	40-3/8 in. 1026 mm.				

2. Field fabricate ductwork inside curb and secure supply and return ducts to roof curb and building structure.
3. Rig and place unit. (See 4.3 Rigging & Lifting)
4. Convert unit to vertical duct connection.
5. Install condensate drain piping.
6. Make electrical connections.

4.2 Pad-Mounted Installation

1. Prepare pad and unit supports.
2. Rig and place unit. (See section 4.3 Rigging & Lifting)
3. Convert unit to horizontal duct connection.
4. Field fabricate ductwork at unit duct openings.
5. Install condensate drain piping.
6. Make electrical connections.

4.3 Rigging & Lifting

Do not remove the unit's package materials before installation. Keep unit upright and do not drop. Rig the unit by attaching chain or cable slings to the lifting holes in base rails.

Place the unit on roof curb and maintain the clearance between the roof curb and the base rail inside at 1/4 inch. (6.4mm)

After unit is in position, remove rigging skids and package materials.

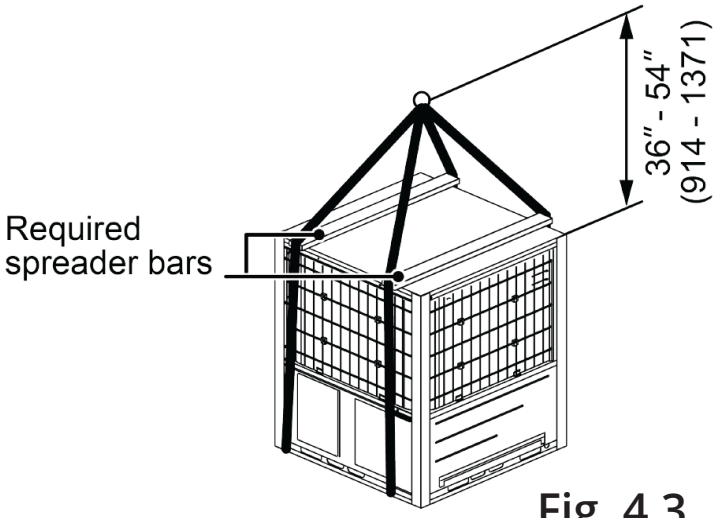


Fig. 4.3

NOTICE

1. **Spreader bars are required in order to prevent rigging straps from damaging the unit.**
2. **All panels must be in place when rigging.**
3. **The height between the top of the unit and the rigging cables' connection point should be 36-54 in. (914-1371mm).**

4.4 Horizontal Duct and Vertical Duct Conversion

- To convert to a horizontal duct configuration, remove the screws from the side duct opening covers (see Figure 4.4) and remove the covers.
- To convert to a vertical duct configuration, remove the screws from the base pan duct opening covers (see Figure 4.5) and remove the covers.

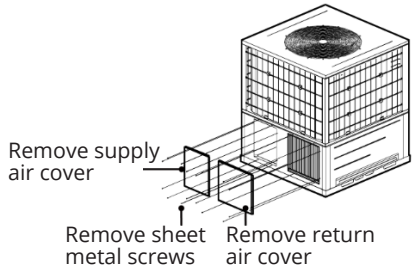
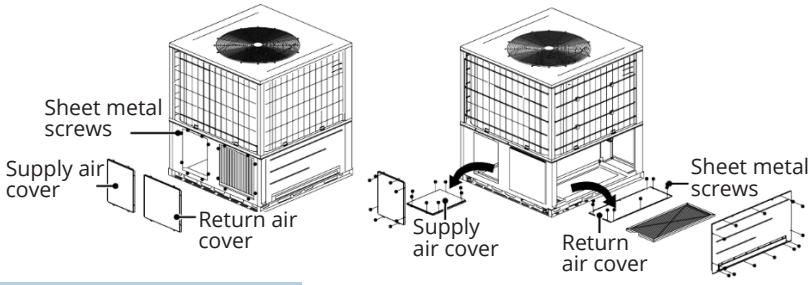


Fig. 4.5



4.5 Installation of Condensate Pipe

1. The condensate drain side is pitched lower than the opposite side. See figure below.
2. When shipped out from the factory, both the condensate outlets are blocked by a rubber plug. Remove the plug before installation.
3. Condensate removal is performed by attaching a PVC pipe to the drain pan and terminated in accordance with local or state Plumbing/HVAC codes.
4. The condensate pipe shall be installed with an inclining angle of 5~10°, so as to facilitate the drainage of condensate.
5. Since the inside of the unit is in a negative pressure status, it is required to set up a backwater elbow. The requirement is: A=B≥P/.4in+.8in (A=B≥P/10mm+20mm). P is the absolute pressure inside the unit; in pascals (Pa).
6. After the electrical installation is completed, test the drainage system.
7. Do not connect the condensate drain pipe into a waste pipe or other pipelines likely to produce a corrosive or peculiar smells, as the smell could move indoors or corrupt the unit.
8. Do not connect the condensate drain pipe with a rain pipe as it may cause rain water flooding, potentially creating property loss or personal injury.
9. The condensate drain pipe should be connected to a special drain system for the unit.

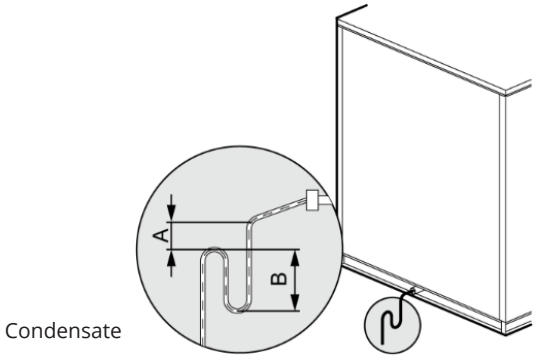


Fig. 4.6

Model	Drain Connection Size (inch/mm)
All Models	3/4 in / 19.05 mm (NPT)

4.6 Dip Switch Instruction

During initial installation, check DIP switch SA1, which may be set to the default 0000. To ensure proper functionality with a 24V thermostat, this setting must be changed to 1111. NOTE: 0 means dip switch to 'on', 1 means dip switch equals the number.

Setting different positions of the dip switch will correspond to different speeds. The relationship between the combination and speeds are as follows:

Level	Dip Switch SA1			
	4	**3**	**2**	**1**
Speed 4	0	1	0	0
Speed 5	0	1	0	1
Speed 6	0	1	1	0
Speed 7	0	1	1	1
Speed 8	1	0	0	0
Speed 9	1	0	0	1
Speed 10	1	0	1	0
Speed 11	1	0	1	1
Speed 12	1	1	0	0
Speed 13	1	1	0	1

Note: 0 means dip switch to "on", 1 means dip switch to the number.

4.7 Fan Performance Data

External static pressure should stay within the minimum and maximum limits shown in the table below in order to ensure proper operation of both cooling, heating, and electric heating operation.

Model	**MDPH18024D, MDPH18036D**								
Level	Static Pressure: Inches W.C. (Pa)								
	0 (0)	**0.1 (25)**	**0.2 (50)**	**0.3 (75)**	**0.4 (100)**	**0.5 (125)**	**0.6 (150)**	**0.7 (175)**	**0.8 (200)**
Speed 4 (CFM)	1216	/	/	/	/	/	/	/	/
Speed 5 (CFM)	1293	/	/	/	/	/	/	/	/
Speed 6 (CFM)	1368	1264	/	/	/	/	/	/	/
Speed 7 (CFM)	1447	1348	1230	/	/	/	/	/	/
Speed 8 (CFM)	1501	1436	1327	1195	/	/	/	/	/
Speed 9 (CFM)	1506	1464	1417	1383	/	/	/	/	/
Speed 10 (CFM)	1498	1466	1423	1378	1280	/	/	/	/
Speed 11 (CFM)	1514	1472	1424	1385	1344	1303	/	/	/
Speed 12 (CFM)	1505	1467	1420	1375	1340	1303	1258	/	/
Speed 13 (CFM)	1510	1463	1424	1380	1340	1297	1258	1216	/

Model	MDPH18048D, MDPH18060D								
Level	Static Pressure: Inches W.C. (Pa)								
	0 (0)	0.1 (25)	0.2 (50)	0.3 (75)	0.4 (100)	0.5 (125)	0.6 (150)	0.7 (175)	0.8 (200)
Speed 4 (CFM)	1850	/	/	/	/	/	/	/	/
Speed 5 (CFM)	-	1780	/	/	/	/	/	/	/
Speed 6 (CFM)	-	1870	/	/	/	/	/	/	/
Speed 7 (CFM)	-	-	1830	/	/	/	/	/	/
Speed 8 (CFM)	-	-	1870	/	/	/	/	/	/
Speed 9 (CFM)	-	-	-	1860	/	/	/	/	/
Speed 10 (CFM)	-	-	-	-	1900	/	/	/	/
Speed 11 (CFM)	-	-	-	-	-	1880	1790	/	/
Speed 12 (CFM)	-	-	-	-	-	1980	1880	1804	1730
Speed 13 (CFM)	-	-	-	-	-	2030	1930	1854	1780

Note:

1) " / " denotes the static pressure is out of range. Air volume drop may affect the performance and reliability.

2) " - " denotes the air volume is out of range, may lead to overload, and cause unstable operation of the fan motor.

3) The red-line frame " □ " indicates electric heating is allowed.

5- Ductwork

⚠ WARNING

1. Field ductwork must meet the National Fire Protection Association NFPA 90A, NFPA 90B, and any applicable local ordinance.
2. Sheet metal ductwork ran in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if it is constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with the National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.
3. Duct systems must be designed within the same range of external static pressure as the unit it is designed to operate against. It is important the system airflow is adequate. Ensure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See fan performance data in this manual.
4. Do not operate the unit without all ductwork completed.
5. Do not operate the unit without all ductwork attached.
6. Inadequate ductwork that restricts airflow can result in improper performance and compressor or heater failure. Ductwork needs to be constructed in a manner that limits restrictions and maintains suitable air velocity. Ductwork must be sealed to the unit in a manner that will prevent leakage.
7. Return Ductwork: Do not terminate the return ductwork in an area that can introduce toxic or objectionable fumes/odors into the ductwork. The return ductwork needs to be set into the air handler bottom (upflow configuration).
8. Return Air Filters: Each installation must include a return air filter. This filtering must be performed at the air handler or externally, such as with a return air filter grille.

6 ELECTRIC HEATER

6.1 Electric Heater Safety

This unit does not offer a factory-installed electric heating function. Electric heat is available as an accessory. Refer to the installation instructions provided with the heat kit for the correct installation procedure.

⚠ WARNING

1. Refer to the "Electric Heat Kit Installation" section of this manual and the instructions provided with the heat kit for the correct installation procedure.
2. The electrical characteristics of the unit, electric heat kit, and supply power should be identical. If installing this option, the only heat kits that can be used are indicated below. Do not use an electric heat kit other than those recommended.
3. Pay attention to the switch order of the electric heating and indoor fan during installation and debugging. The fan must be turned on before electric heating is in operation. Make sure to stop the indoor fan after the electric heating is turned off to avoid malfunctions.
4. Refer to the "Fan Performance Data" section of this manual on page 13, otherwise it may cause abnormal electric heating and increase the risk of dry burning.
5. There should be at least 5ft (1.524m) between electric heating and the supply air duct, and should be at least 1ft (0.304m) away from other combustible materials or walls.

6.2 Compatible Heat Kits

Model Number	Heat Kit Model	Description
All Models	MDPHK06D	5kW Heat Kit
	MDPHK09D	9kW Heat Kit
	MDPHK12D	12kW Heat Kit

6.3 Heat Kit Installation Precautions

! CAUTION

1. Ensure power supply is disconnected prior to installing the heat kit.
2. Provide strain relief and conductor protection at the supply wire entrance into the cabinet.
3. Use copper conductors only.
4. Installation must follow national electric code and other applicable codes.
5. If the unit is installed in an enclosed area, such as a garage or utility room, with a carbon-monoxide producing appliance, ensure the area is properly ventilated.

6.4 Heat Kit Installation Steps

1. Refer to the table above for the appropriate heat kit.
2. Check for any physical damage. Do not install a damaged heat kit.
3. Remove the access panel from the unit.
4. Remove the cover plate from the unit.
5. Slide the heat kit into the slot and secure the element plate with the previously removed screws.
6. Insert power leads into the circuit breaker lugs.
7. Connect the ground wire to the ground lug.
8. Knock out the hole in the stand column. If a circuit breaker is not installed, do not knock out the holes. It could negatively affect the unit's performance and reliability.
9. Replace the access panel and check operation.

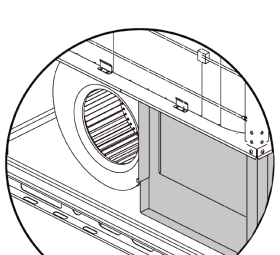


Fig. 6.1

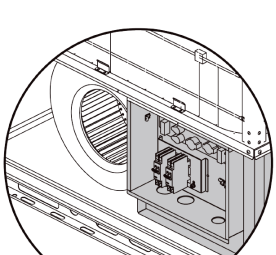


Fig. 6.2

10. Connect power cords and reserve lines.

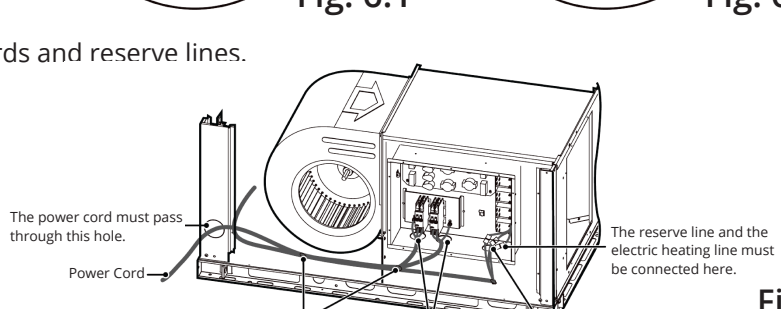


Fig. 6.3

7.1 Electrical Parameters

Unit Model	Power Supply	Fuse Capacity (A)	Max. Over-Current Prot. (A)	Min. Circuit Amp. (A)
MDPH18024D MDPH18036D	208/230V-1Ph-60Hz	40	40	35
MDPH18048D MDPH18060D	208/230V-1Ph-60Hz	45	45	39.1

⚠ WARNING

The electrical installation for the unit should observe the following requirements:

1. The electrical installation must be conducted by professionals in compliance with local laws, regulations, and the instructions in this manual. The electric circuit must be equipped with a circuit breaker and an air switch with sufficient capacity.
2. The unit's operating power must be within the nominal range stated in the instruction manual. Use a specialized power circuit for the air conditioner. Do not draw power from another power circuit.
3. The air conditioner circuit should be at least 1.5m (4.92ft) away from any flammable surfaces.
4. The external power cords, thermostat wires, and unit must be effectively fixed in place.
5. The external power cords, thermostat wires, and unit can't directly contact any hot objects. For example: they must not contact chimney pipes, warm gas pipes, or other hot objects.
6. The external power cords, thermostat wires, and unit must not be squeezed. Never pull, stretch, or bend the wires.
7. The external power cords, thermostat wires, and unit must not collide with any metal beam, edge on the ceiling, or touch any metal burrs or sharp metal edges.
8. Connect wires by referring to the circuit diagram labeled on the unit or electric box. Screws must be tightened. Slipped screws must be replaced by specialized flat-head screws.
9. Wiring terminals should be connected firmly to the terminal board. Loose connections are forbidden.
10. The wire gauge of power cords must be large enough. Damaged power cords or other wires must be replaced by specialized wires. Wiring must be done according to national wiring rules and regulations.
11. The unit has a heating four-way valve.
12. All wires must go through the tube.

7.2 Terminal Connection

For solid wires (as shown below):

1) Use wire cutters to cut the wire end and peel away about 1in (25mm) of the insulation layer.

2) Use a screwdriver to unscrew the terminal screw on the terminal board.

3) Use pliers to bend the solid wire into a ring to fit the terminal screw.

4) Form a proper ring and attach it to the terminal board. Use a screwdriver to tighten the terminal screw.

For strand wires (as shown below):

1) Use wire cutters to cut the wire end and peel away about 0.5in (10mm) of the insulation layer.

2) Use a screwdriver to unscrew the terminal screw on the terminal board.

3) Use a round terminal fastener or clamp to fix the round terminal firmly on the peeled wire end.

4) Locate the round terminal conduit. Use a screwdriver to replace and tighten the terminal screw. (See Fig. 7.2)

Unit:inch(mm)

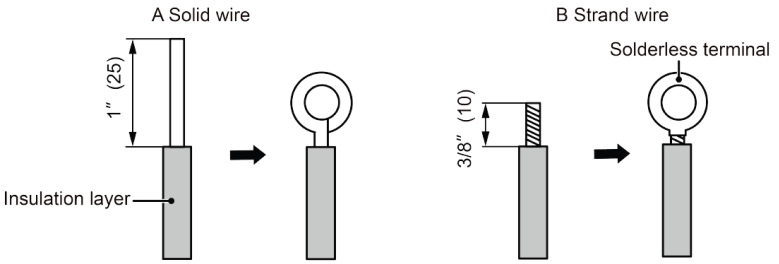


Fig. 7.1

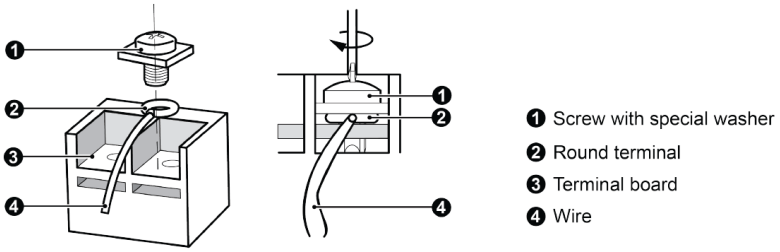


Fig. 7.2

How to connect the thermostat wires and power cords:

Lead the thermostat wires and power cords through the insulation tube, as shown in Figure 7.3 below.

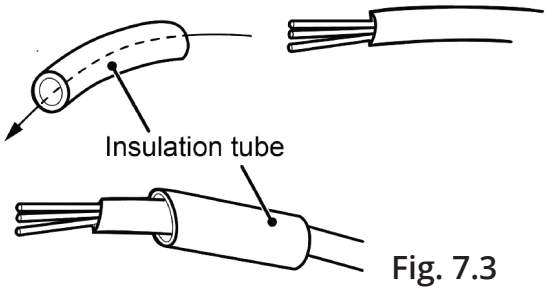


Fig. 7.3

Note: Remember to change dip switch settings on SA1 to 1111.

WARNING
1. Before working, check whether the unit is powered on.
2. An incorrect wire connection may burn the electrical components.
3. Connect the wires firmly to the wiring box. Incomplete installation may lead to fire hazard.
4. Ground wire should be connected.

7.3 Wiring Diagram

Note:

1. The unit has been short-circuited. When the emergency stop switch needs to be connected, remove the corresponding short-circuit wire.

2. The unit can only be connected to a thermostat or wired controller.

Note:

Y means compressor control signal

B is energized under the heating mode and means 4-way valve control signal

W1 means heater control signal

R means 24V AC power supply

C means 24V common

G means indoor side fan signal

Without Electric Heater

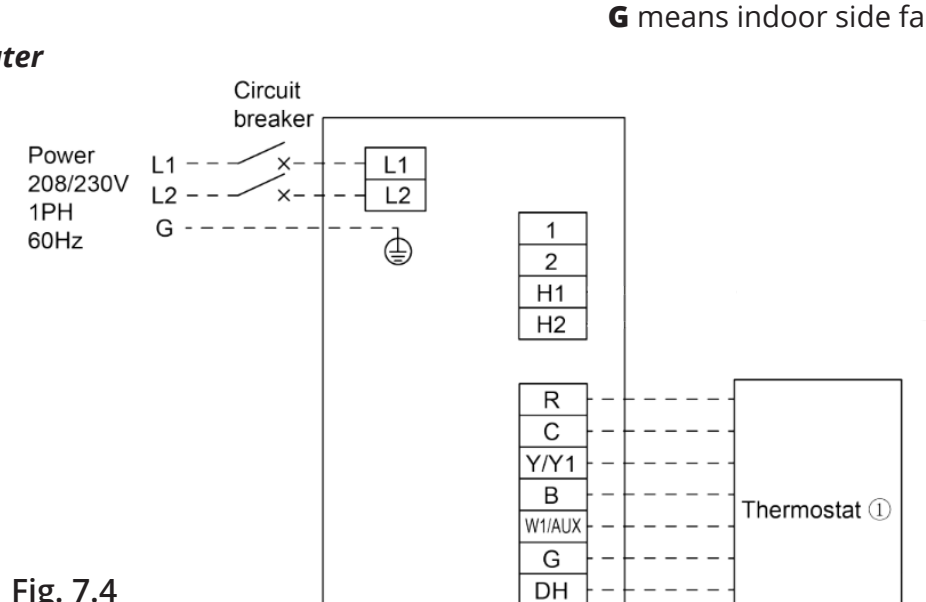


Fig. 7.4

Note:

The unit can only be connected to a thermostat or the wired controller.

With Electric Heater

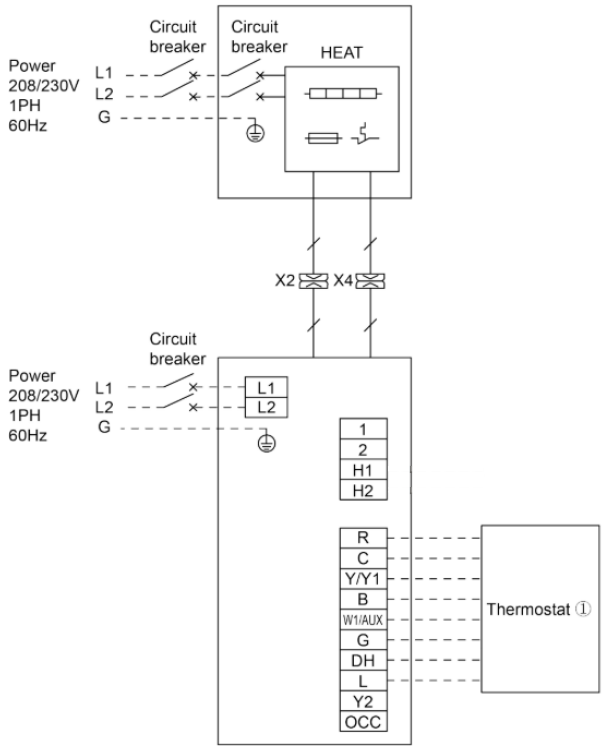


Fig. 7.5 (With MDPHK06D)

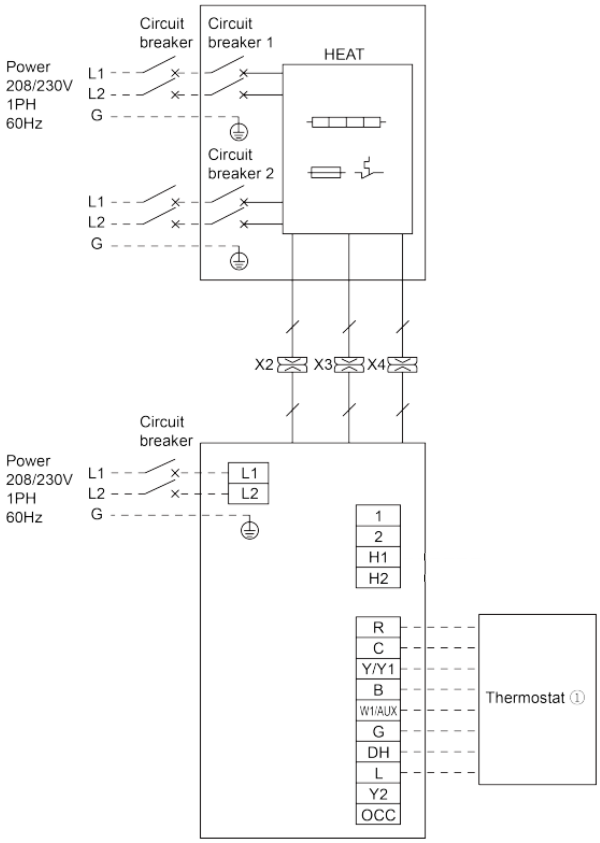
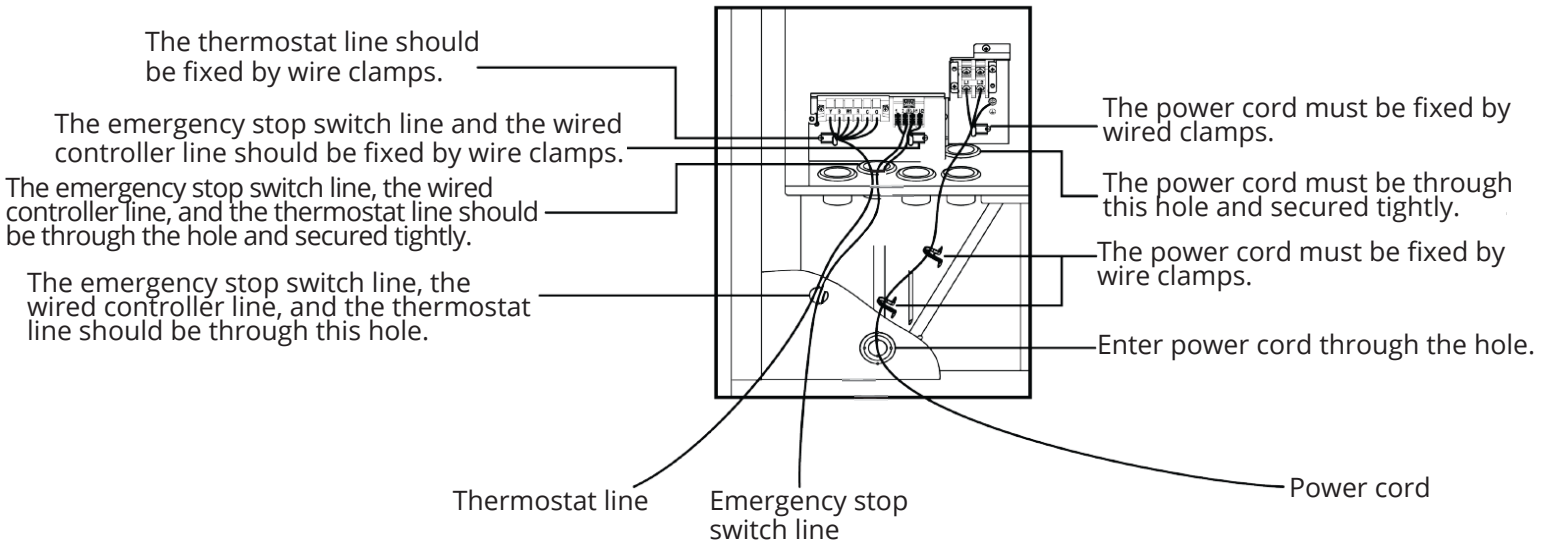


Fig. 7.6 (With MDPHK09D, MDPHK12D)

7.4 Engineering Wiring Diagram



Note: 1. If there is no emergency stop switch, ignore additional wiring.
2. The unit can only be connected to a thermostat or a wired controller.

Fig. 7.7

8.1 Post-Installation Check

Check Items	Possible Events due to Improper Installation
Is the main body installed securely?	The unit may fall down, vibrate, or produce noise.
Was the water leakage test performed?	Cooling capacity may become unsatisfactory.
Is the unit well-insulated from the heat?	Condensation and water drops may occur.
Does water drain easily?	Condensation and water drops may occur.
Is the voltage consistent with what's stated on the nameplate?	The unit may fail or its components may burn.
Are the wires and pipes installed correctly?	The unit may fail or its components may burn.
Has the unit been safely grounded?	There is a risk of electrical leakage.
Do the wire specifications comply with the requirements?	The unit may fail or its components may burn.
Are there any obstacles blocking the air inlet and outlet of the units?	Cooling capacity may become unsatisfactory.

8.2 Trial Run

Preparation before connecting the power:

1. The power should not be connected if the installation work has not been completed.
2. The control circuit must be correct and all the wires are firmly connected.
3. The inside of the unit should be clean. Take all irrelevant objects out, if there are any.

Operation after connecting the power:

1. If all the above works are finished, power on the unit.
2. If the outside temperature is more than 30°C (86°F), heating mode can't be enabled.
3. Before test operation, make sure the unit is powered on and the compressor has been preheated for more than 8 hours. Touch the unit to check whether it's normally preheated. Start the test operation after the unit is normally preheated, otherwise compressor might be damaged. Debugging must be performed by professional technicians or under the guide of professional technicians.
4. Make sure the unit can run normally.
5. If there's a sound of liquid shock when the compressor is running, stop the air conditioner immediately. Wait until the electric heating belt is heated enough, and then restart the air conditioner.

NOTICE
1. If a thermostat is used to turn off the unit and immediately turned on again, the compressor unit will need 3 minutes to restart. Even if the "ON/OFF" button on the thermostat is pressed, the compressor will not start up right away.
2. If no display appears on the thermostat, check the connection wires between the unit and the thermostat to verify they are connected.

8.3 Troubleshooting

Failure	Possible Cause	Solution
The unit cannot be started.	The power supply does not connect or there is an improper phase sequence.	Connect the power supply or change to a random phase.
	Electrical leakage of the unit is causing the leakage switch to trip.	Contact the MRCOOL® Technical Department at (270) 366-0457
	The voltage is too low.	Contact the MRCOOL® Technical Department at (270) 366-0457
	The control loop has a failure.	Contact the MRCOOL® Technical Department at (270) 366-0457
The unit operates for a while and then stops.	Air outlet port or intake port is blocked.	Remove the obstacles.
	There is an obstacle in front of the condenser.	Remove the obstacles.
	The control loop is abnormal.	Contact the MRCOOL® Technical Department at (270) 366-0457
Poor cooling effect.	Air filter is dirty.	Clean the air filter.
	Air outlet port or intake port of indoor/outdoor side is blocked.	Move the obstacles.
	Too many people or there is a heat source in the room.	If possible, clear heat sources.
	Doors or windows are open.	Close windows and doors.
	Refrigerant leakage.	Contact the MRCOOL® Technical Department at (270) 366-0457
	Some model units have a high pressure switch welded on the discharge pipe. When the switch goes into effect, the power supply of the compressor will be shut off.	Find and manually reset the high pressure switch welded on the discharge pipe.

NOTE: If after performing the troubleshooting above and taking measures to resolve the problems, the unit is still performing poorly, stop operation of the unit immediately and contact the MRCOOL® Technical Department at (270) 366-0457. Only ask professional servicemen to check and repair the unit.

Code List:

No.	Code	Error or Status
1	A1	Outdoor fan IPM module protection
2	A5	Outdoor condenser inlet pipe temperature sensor error
3	A6	Malfunction from fan driving part to main-control communication
4	A8	Overheat protection from fan radiator
5	A9	Fan radiator sensor malfunction
6	AA	Fan AC current protection (input side)
7	Ab	Fan drive board module reset
8	Ac	Outdoor fan startup failure
9	Ad	Outdoor fan out-of-phase protection
10	AE	Outdoor fan current detecting circuit error
11	AF	Fan PFC abnormality
12	AH	Fan DC busbar overvoltage protection
13	AJ	Outdoor fan non-synchronism protection
14	AL	Fan DC busbar undervoltage protection
15	An	Fan drive storage chip malfunction
16	AP	Fan AC input voltage abnormality
17	Ar	Fan driver board environment temperature sensor malfunction
18	AU	Fan charge circuit malfunction
19	b2	Subcooler gas inlet temperature sensor error
20	b3	Subcooler gas outlet temperature sensor error
21	b4	Subcooler liquid outlet temperature sensor error
22	C0	Communication error between indoor unit and wired controller
23	C1	Indoor ambient temperature sensor error
24	C3	Outdoor condenser middle pipe temperature sensor error
25	C4	ODU jumper cap error
26	C6	Discharge temperature sensor error
27	C8	Compressor DIP switch/jumper cap error
28	C9	Compressor drive storage chip error
29	CA	Inlet pipe temperature sensor of evaporator error
30	Cb	Outlet pipe temperature sensor of evaporator error

No.	Code	Error or Status
31	Cd	Abnormal electrical level of selected port
32	CE	Wired controller temperature sensor error
33	dJ	AC phase sequence protection (phase loss or phase reversal)
34	E0	Indoor fan error
35	e1	High pressure sensor error
36	E1	System high pressure protection
37	E2	Freeze protection
38	e3	Low pressure sensor error
39	E3	Refrigerant lacking protection or system low-pressure protection
40	E4	Discharge protection
41	EA	Refrigerant leakage
42	EE	Memory chip read and write error
43	EH	Electric heater operation error
44	EL	Emergency operation stop
45	F3	Outdoor ambient temperature sensor error
46	FE	Malfunction of refrigerant sensor
47	FJ	Air outlet temperature sensor error
48	H5	Module current protection
49	H7	Compressor non-synchronism
50	HC	PFC overcurrent error
51	L3	Outdoor fan 1 error
52	L4	Wired controller power supply circuit failure
53	L5	Wired controller power supply overcurrent protection
54	L6	Group-controlled IDU quantity inconsistency
55	LA	Outdoor fan 2 error
56	Lc	Startup failure
57	LE	Compressor Stalling
58	LF	Overspeed
59	oE	Other error of compressor
60	P0	Drive module reset

No.	Code	Error or Status
61	P5	Overcurrent of compressor phase current
62	P6	Drive board communication error
63	P7	Module temperature sensor circuit error
64	P8	Module temperature protection
65	P9	AC contactor protection
66	PA	ODU AC current protection
67	Pd	Sensor connection protection (current sensor hasn't been connected to the corresponding U phase or V phase)
68	PE	Temperature shifting protection
69	PF	Drive board ambient temperature sensor error
70	PH	High voltage protection of DC bus
71	PL	Low voltage protection of DC bus
72	PP	DC input voltage error
73	PU	Capacitor charging error
74	q0	Low voltage protection or voltage drop error of inverter indoor fan drive dc bus
75	q1	High voltage protection of inverter indoor fan drive DC bus
76	q2	Inverter indoor fan AC current protection (input side)
77	q3	Inverter indoor fan drive IPM module protection
78	q4	Inverter indoor fan drive PFC protection
79	q5	Inverter indoor fan startup failure
80	q6	Inverter indoor fan out-of-phase protection
81	q7	Inverter indoor fan drive module reset
82	q8	Inverter indoor fan overcurrent protection
83	q9	Inverter indoor fan power protection
84	qA	Inverter indoor fan drive current detecting circuit error
85	qb	Inverter indoor fan non-synchronism protection
86	qC	Main control and inverter indoor fan drive communication error
87	qd	Inverter indoor fan drive module high temperature protection
88	qE	Inverter indoor fan drive module temperature sensor error
89	qF	Inverter indoor fan drive storage chip error
90	qH	Inverter indoor fan drive charging circuit error

No.	Code	Error or Status
91	qL	Inverter indoor fan drive AC input voltage abnormal protection
92	qo	Inverter indoor fan drive electric box temperature sensor error
93	ap	Inverter indoor fan drive AC input zero-crossing protection
94	U1	Compressor phase current circuit detecting error
95	U2	Compressor phase loss/phase reversal/out of phase
96	U9	Fan AC contractor protection or input zero crossing error
97	UL	Outdooor fan overcurrent protection
98	UP	Fan power protection
99	08	Defrosting
100	09	Oil return

NOTE:

If several errors happen at the same time, error codes will show on the display repeatedly.

9.1 Cleaning the Air Filter

1. Do not disassemble the air filter when cleaning it or unit failure can occur.
2. If the unit is used in a dusty environment, the air filter should be cleaned more frequently.

9.2 Drainage Pipe

Periodically check if the drainage pipe is blocked to allow for easy flow of the condensate water.

9.3 Cleaning the Heat Exchanger

- The heat exchanger should be cleaned regularly, at least every two months.
- Use a dust catcher with a nylon brush to clear the dust on the heat exchanger.
- If a compressed air source is available, it can also be used to clean the heat exchanger.
- Do not clean it with water.

9.4 Before Seasonal Use

- Check whether the air inlets and air outlets of the units are blocked.
- Check whether the ground connection is reliable or not.
- Check whether the air filter is properly installed.
- If the unit starts up after operating for a long time, it should be powered on for 8 hours before operation in order to preheat the outdoor compressor.
- Check whether the outdoor unit is securely installed. If there is any problem, contact the MRCOOL® Technical Department at (270) 366-0457.

9.5 After Seasonal Use

- Disconnect power to the entire system.
- Clean the air filter and outer case of both units.
- Clean away any dust and obstacles.
- If the unit has rust, apply rust resistant paint to prevent the rust from growing.

9.6 Parts Replacement

Parts and components can be obtained, contact the MRCOOL® Technical Department at (270) 366-0457.

Note: When you are conducting an air tightness test and leakage test, do not mix oxygen, C_2H_2, or other dangerous gases into the refrigerant circuit. Otherwise, it may lead to danger. Use nitrogen or refrigerant to conduct the test.

For appliances using A2L refrigerants, connected via an air duct system to one or more rooms, the supply and return air should be directly ducted into the space. Open areas such as false ceilings shall not be used as a return air duct field-made refrigerant joints indoors should be tightness tested. The test method must have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure.

9.7 After-Sale Service

If there's a quality defect or any other product-related issue, contact the MRCOOL® Technical Department at (270) 366-0457.

9.8 Unventilated Areas

If appliances with A2L refrigerant connected via an air duct system to one or more rooms are installed in a room with an area less than Amin, that room should have no continuously operating open flames (for example: an operating gas appliance) or other potential ignition sources (for example: an operating electric heater or hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.

Auxiliary devices that may be a potential ignition source should not be installed into the duct work. Examples of such potential ignitions sources are hot surfaces with a temperature exceeding 1198.4°F (648°C) and electric switching devices.

Only auxiliary devices approved by MRCOOL® or declared suitable with the refrigerant shall be installed in connecting ductwork.

9.9 Transportation & Marking

The following information is provided for units that employ Flammable Refrigerants.

Transport:

It is especially important to note that additional transportation regulations may exist with respect to equipment containing flammable gases. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

Marking:

Signs for similar appliances used in a work area are generally addressed by local regulations and given the minimum requirements for the provision of safety and/or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instructions and training on the meaning of appropriate safety signs, along with the actions that need to be taken in connection with these signs. The effectiveness of the signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.

For disposal, see national regulations.

Storage:

The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent. Storage protection should be constructed in such a way that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

9.10 Servicing

Checks to the Area:

Prior to beginning work on a system containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following steps must be completed prior to conducting work on the system.

Work Procedure:

Work should be undertaken using controlled procedure so as to minimize the risk of flammable gas or vapor being present while the work is being performed.

General Work Area:

All maintenance staff and others working in the local area must be instructed on the nature of the work being carried out. Work in confined spaces should be avoided.

Checking for Presence of Refrigerant:

The area must be checked with an appropriate refrigerant detector prior to and during work to make sure the technician is aware of potentially toxic or flammable atmospheres. Ensure the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe.

Presence of Fire Extinguisher:

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available. Have a dry powder or CO_2 Fire Extinguisher adjacent to the charging area.

No Ignition Sources:

No person carrying out work in relation to a refrigerating system that involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

Ventilated Area:

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation should continue during the period in which the work is carried out. The ventilation should safely disperse any released refrigerant and preferable expel it externally into the atmosphere.

Checks to the Refrigerating Equipment:

Where electrical components are being changed, the area should be fit for its intended purpose and abide by the correct specification. At all times MRCOOL® maintenance and service guidelines shall be followed. If in doubt, consult MRCOOL® technical support for assistance. The following checks shall be applied to installations using Flammable Refrigerants:

1. The actual refrigerant charge is in accordance with the room size where the refrigerant-containing parts are installed;
2. The ventilation machinery and outlets are operating adequately and are not obstructed;
3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
4. Markings made to the equipment continues to be visible and legible. Markings and signs that are illegible must be corrected;

5. Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Check to Electrical Devices:

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

1. That capacitors are discharged: this shall be done in a safe manner to avoid the possibility of sparking;
2. That no live electrical components and wiring are exposed while charging, recovering, or purging the system;
3. That there is continuity of earth bonding.

Only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork for duct connected appliances, false ceilings, or drop ceilings may be used as a return air plenum if a Refrigerant Detection System is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint.

Cabling:

Check that cabling will not be subject to wear, corrosion, excessive pressure, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of Flammable Refrigerants:

Under no circumstances shall potential sources of ignition be used in the search of or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) should not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of Flammable Refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area). Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

1. Bubble method.
2. Fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a refrigerant leak which requires brazing is found, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Removal & Evacuation:

When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. However, for flammable refrigerants, it is important that the best practice be followed since flammability is a consideration. The following procedure shall be adhered to: The refrigerant charge should be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.

- Safely remove refrigerant following local and national regulations;
- Evacuate;
- Purge the circuit with inert gas (optional for A2L);
- Continuously flush or purge with inert gas when using a flame to open the circuit;
- Open the circuit.

For appliances containing flammable refrigerants, refrigerant purging should be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum (optional for A2L). This process must be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system needs to be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump should not be close to any potential ignition sources, and ventilation should be available.

Charging Procedures:

In addition to conventional charging procedures, the following requirements should be followed.

1. Ensure that contamination of different refrigerants does not occur when using charging equipments.
2. Hoses or lines should be as short as possible to minimize the amount of refrigerant contained in them.
3. Cylinders should be kept in an appropriate position according to the instructions.
4. Ensure the Refrigerating System is earthed prior to charging the system with refrigerant.
5. Label the system when charging is complete (if not already).
6. Extreme care should be taken to not overfill the Refrigerating System.

Prior to recharging the system, it should be pressure-tested with the appropriate purging gas. The system must be leak-tested on completion of charging but prior to commissioning. A follow-up leak test shall be carried out prior to leaving the site.

Decommissioning:

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended and good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation and isolate the system electrically.
2. Before attempting the procedure, ensure that:
   - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
   - All personal protective equipment is available and being used properly;
   - The recovery process is supervised at all times by a competent person;
   - Recovery equipment and cylinders conform to the appropriate standards.
   - If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
   - Make sure the cylinder is situated on the scales before recovery takes place.
   - Start the recovery machine and operate in accordance with the instructions.
   - Do not overfill cylinders (no more than 80% volume liquid charge).
   - Do not exceed the maximum working pressure of the cylinder, even temporarily.
   - When the cylinders have been filled correctly and the process completed, ensure the cylinders and equipment are removed from the site promptly and all isolation valves on the equipment are closed off.

Labeling:

Equipment should be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing Flammable Refrigerants, ensure there are labels on the equipment stating the equipment contains Flammable Refrigerant.

Recovery:

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended all refrigerants be removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders should be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment should be in a good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, MRCOOL® should be consulted. In addition, a set of calibrated weighing scales should be available and in good working order. Hoses should be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant should be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer not arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain flammable refrigerant does not remain within the lubricant. The compressor body should not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.



MRCOOL® DC Inverter Rooftop Packaged Unit

Installation & Owner's Manual

The design and specifications of this product and/or manual are subject to change without prior notice.
Consult with the sales agency or manufacturer for details.