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

MRCOOL® Compact Refrigeration System

INSTALLATION & OWNER'S MANUAL

MODELS:
MMFDW12D

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.

Para consultar la versión en español, consulte el código QR en la contraportada de este manual.

Version Date: February 9, 2026
Please visit www.mrcool.com/documentation
to ensure you have the latest version of this manual.

MRCOOL®
COMFORT MADE SIMPLE

CONTENTS

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 the possibility of personal injury or loss of life.
CAUTION	Indicates the possibility of property damage or serious consequences.

SAFETY PRECAUTIONS

- This manual includes necessary information for proper installation, debugging, startup, and maintenance. Please keep this manual safe and carefully read it before installation and operation.
- The installation, startup, and maintenance of the equipment may pose risks. Operators need to have proficient knowledge and training before operating the equipment. If they do not have sufficient understanding of the working principle of the equipment, or do not have sufficient safety knowledge and have not taken relevant safety protection measures, please do not operate the machine in any way to avoid personal injury or equipment failure, which may lead to death or serious personal injury. When operating the equipment, pay attention to all the precautions in this manual and the warning and caution labels on the equipment.
- The unit strictly follows the design standards during production, ensuring that the unit provides high quality operating conditions, high reliability, and excellent adaptability.
- This appliance can be used by children ages 8 years and above, along with persons who have reduced physical, sensory or mental capabilities, or lack knowledge, if they have supervision or instruction concerning the use of the appliance in a safe way and understand the hazards involved. Children should not play with the appliance. Cleaning and user maintenance should not be performed by children without supervision.
- Failure to strictly follow the precautions may cause serious accidents such as personal injury or death.
- Before cleaning the equipment, stop the system's operation and power it off.
- The personnel responsible for installing the machine should ensure the safety of the installation process and be responsible for the installation of all refrigerant pipelines, waterways, electrical installation, and other necessary equipment.
- If you have any questions during the installation process, please contact MRCOOL® Customer Service at 270-366-0457 or at support@mrcool.com. MRCOOL® will not be liable for any personal injury or machine damage caused by improper installation, debugging, unnecessary maintenance, or failure to follow the provisions and guidance in this manual.

REFRIGERANT

- The equipment utilizes R-32, which is mildly flammable and odorless but under certain conditions can lead to explosion. The flammability of the refrigerant is low and can only be ignited by fire. The installation instructions for appliances that use flammable refrigerant will indicate that the appliance is to be installed in accordance with the Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15. The appliance has a refrigerant charge of more than 3 x LFL, so the appliance should not be installed in public corridors or lobbies.

A2L

DANGER

- Before touching electrical parts, verify power to the equipment is turned off.
- When the service panels are removed, live parts can be accidentally touched accidentally.
- Never leave the unit unattended during installation or servicing when the service panel is removed.
- Do not touch pipes during/immediately after operation, as the pipes may be hot and can cause burns. To avoid injury, give the piping time to return to its normal temperature or wear gloves.
- Do not touch any electrical components with wet hands, as it can cause electrical shock.
- Do not store explosive substances, such as aerosol cans, near your unit as it can ignite flammable propellants in the unit.

WARNING

- Prohibit installing the unit in a place with corrosive or flammable gas. If gas is leaking around the equipment, it may cause an explosion or other accidents.
- Do not use extension cords for electrical connections.
- Make sure electrical connections are well made, improper connections can lead to electric shock or fire.
- Use the specified type of wire for electrical connections between the wired controller and the equipment or auxiliary power devices and the equipment. Firmly clamp the wires so that their terminals receive no external stress. Wires with insufficient capacity, wrong wire connections, and insecure wire terminals may cause electric shock or fire.
- Make sure the equipment is grounded. Grounding resistance should comply with local laws and regulations.
- Incomplete grounding may cause electric shocks.
- Do not ground to gas pipes, lightning conductors, or telephone ground wires.
- Install the power cable at least 3ft (1m) away from televisions or radios to prevent interference and electrical noise. (Depending on the radio waves, a distance of 3ft (1m) may not be sufficient to eliminate the noise.)
- Do not wash the live parts of the unit. This may cause electric shock or fire. The appliance must be installed in accordance with national wiring regulations. If the power cord is damaged, it must be replaced by a qualified person in order to avoid hazards.
- Do not install the unit in the following areas:
  - Where there is a mineral oil mist, oil spray, or vapors. Plastic parts may deteriorate and cause issues.
  - Where corrosive gases (such as sulphuric acid gas) are produced which can cause corrosion of copper pipes or soldered parts and cause a refrigerant leak.
  - Where there is machinery that emits electromagnetic waves which can disturb the control system and cause equipment malfunction.
  - Where flammable gases may leak, such as airborne carbon fiber or ignitable dust, or where volatile flammable substances, such as paint thinner or gasoline, are handled. These gases can cause a fire.
  - Where the air contains high levels of salt, such as near the ocean.
  - Where voltage fluctuates, such as factories.
  - In vehicles or vessels.
  - Where acidic or alkaline vapors are present.
- The wiring must be performed by professional technicians in accordance with national wiring regulations, according to the diagram. An all-pole disconnection device with at least 3mm separation distance for all poles, and a residual current device (RCD) with the rating not exceeding 30mA, should be incorporated in the fixed wiring according to national codes.
- Before wiring, confirm the safety of the installation area (walls, floors, etc.) without hidden dangers such as water, electricity, and gas.
- Before installation, check whether the user's power supply meets the electrical installation requirements of the unit (including reliable grounding, leakage, wire gauge, etc.) If the electrical installation requirements of the product are not met, the installation of the product is prohibited until the problem is rectified.
- When installing multiple units in a centralized manner, please confirm the load balance of the three-phase power supply. Multiple units cannot be assembled into the same phase of the three-phase power supply.
- Product installation should be fixed firmly. Take reinforcement measures when necessary.

This equipment uses R-32 and must be repaired by professionals:

1. Transportation of Equipment Containing Flammable Refrigerants:
   See transport regulations.
2. Marking of Equipment Using Signs:
   See local regulations.
3. Disposal of Equipment Using Flammable Refrigerants:
   See national regulations.
4. Storage of Equipment/Appliances:
   The storage of equipment should be in accordance with MRCOOL® instruction.
5. Storage of Packed Equipment:
   Storage package protection should be constructed so that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.

WARNINGS, CONTD.

6. Qualification of Service Personnel:
   Any person who is involved with working on or repairing refrigeration circuits should possess a valid certificate issued by industry recognized assessment organizations certifying that they have the necessary qualifications required for handling refrigerants safely.
7. Checks to the Area:
   Prior to beginning work on the product that uses R-32, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions should be adhered to before conducting work on the system.
8. Work Procedure:
   Work should be done under a controlled procedure to minimize the risk of flammable gas or vapor being present while the work is being performed.
9. General Work Area:
   All maintenance staff and others working in the local area needs to be instructed on the nature of the work being carried out. Work in confined spaces should be avoided. To ensure safety, the area around the operating space needs to be sectioned off and combustible materials should be controlled.
10. Check for the Presence of Refrigerant:
    Check the area with an appropriate refrigerant detector prior to and during work, ensure the technician is aware of potentially flammable atmospheres. Be sure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe.
11. Presence of Fire Extinguisher:
    If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment needs to be readily available. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
12. No Ignition Sources:
    No person carrying out work in relation to a refrigerating system that involves exposing any pipe work that contains, or has previously contained flammable refrigerants, should use any sources of ignition in such a manner that it can 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, repair, removal, and disposal, during which refrigerant can be released into 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 should be displayed.
13. 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 that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
14. Checks to the Refrigerating Equipment:
    Where electrical components are being changed, they should fit the purpose and be to the correct specification. At all times, MRCOOL® maintenance and service guidelines should be followed. If in doubt, consult the MRCOOL® Customer Service at 270-366-0457 or at support@mrcool.com

The following checks need to be applied to the installation of products using R-32:

- The room size where the refrigerant-containing parts are being installed is in compliance with the refrigerant charge requirements.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuit should be checked for the presence of refrigerant.
- Markings on the product are clearly visible and legible. Markings and signs that are illegible should be corrected.
- Refrigeration pipe and electrical components are installed in a position where they are unlikely to be exposed to any substance that can corrode refrigerant-containing components, unless the electrical components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being corroded.

WARNINGS, CONTD.

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

Initial Safety Checks Include:

- That the capacitors are discharged. This should be done in a safe manner to avoid the possibility of sparking.
- That no live electrical components and accessories are exposed while charging, recovering, or purging the system.
- That there is continuity of earth bonding.

16. Repairs to Sealed Components:
    To repair sealed components, disconnect the product from power before opening any sealed cover.
    If power must be supplied during repair, continuous leak detection should be performed on the most dangerous parts to prevent potential dangers.
    Do not modify the protection level of the casing when repairing electrical components. Improper repair methods may lead to dangers such as damaged cables, an excessive number of connections, terminals not installed as originally specified, damaged seals, and seal covers not properly being installed. Ensure that the product is installed safely, and that the seals or sealing materials have not lost their capability to prevent flammable gases from entering due to aging. Replacement parts should meet MRCOOL® specifications.

Note: Silicon-containing sealants may affect the performance of leak detection equipment. There is no need to isolate intrinsically safe components before operation.

17. Repairs to Intrinsically Safe Components:
    If it cannot be ensured that the product will not exceed the permissible voltage and current limits during use, do not use any permanent inductive or capacitive load in the electrical circuit.
    Intrinsically safe components are the only ones that can continue to function in flammable gases. Ensure that the test instrument is configured to the correct setting.
    Only use the parts specified by MRCOOL® for replacement, as other parts may ignite the refrigerant that has been leaked into the air.
18. Cabling:
    Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check should also take into account the effects of aging or continual vibration from sources such as compressors or fans.
19. Detection of R-32 Refrigerant:
    Under no circumstances should potential sources of ignition be used in the search for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) should not be used.
20. Leak Detection Methods:
    The following leak detection methods are deemed acceptable for systems containing R-32 refrigerant:

- Electronic leak detectors may be used to detect R-32, but the sensitivity may be inadequate or may need re-calibration (detection equipment should be calibrated in a refrigerant-free area). Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant being used. Leak detection equipment should be set at a percentage of the lower flammability limit (LFL) of the refrigerant and should be calibrated to the refrigerant employed, and checked until the appropriate percentage of gas (25% maximum) is confirmed.
- Leak detection fluids should be suitable for use with most refrigerants but the use of solvents containing chlorine should be avoided as the chlorine can react with the refrigerant and corrode the copper pipework.
- If a leak is suspected, all naked flames should be removed or extinguished.
- If a refrigerant leak that requires brazing is found, all of the refrigerant should be recovered from the system, or isolated by means of shut-off valve in a part of the system apart from the leak. Before and during brazing, purge the entire system with oxygen-free nitrogen (OFN).

WARNINGS, CONTD.

21. Removal and Evacuation:

When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures should be used.

However, special attention should also be given to the flammability of the refrigerant. The following procedure needs to be adhered to:

a. Remove the refrigerant.
b. Purge the circuit with inert gas.
c. Evacuate.
d. Purge the circuit again with inert gas.
e. Cut or braze the circuit.

The refrigerant charge should be recovered into the correct recovery cylinders. Oxygen-free nitrogen should be used to purge the system to ensure safety. It may be necessary to repeat this process multiple times. Compressed air or oxygen should not be used for purging refrigerant systems.

Purging of the refrigerant circuit 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. This process should be repeated until no refrigerant is within the system. The system should be vented down to atmospheric pressure after the final filling of oxygen-free nitrogen, and then the system can be brazed. If brazing operations are needed, it is necessary to perform the above process.

Ensure that the outlet of the vacuum pump is not close to any potential ignition sources and that ventilation is available.

22. Refrigerant Charging Procedures:

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

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines should be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders should be kept upright.
- Ensure that the refrigerating system is grounded (earthed) before charging the system with refrigerant.
- Label the system after or before the completion of charging.
- Extreme care should be taken not to overfill the refrigerating system.
- Prior to recharging the system, it should be pressure-tested with oxygen-free nitrogen. The system should be leak-tested on completion of charging and prior to commissioning. A follow-up leak test should be carried out prior to leaving the site.

23. Decommissioning:

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all of its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample should be taken in case analysis is required prior to reusing the recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- Become familiar with the equipment and its operation.
- Isolate the system electrically.
- 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 correctly;
  The recovery process is supervised at all times by a competent person;
  Recovery equipment and cylinders conform to the appropriate standards.
- Pump down the refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that the cylinder has sufficient capacity before recovery takes place.
- Start the recovery machine and operate in accordance with 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, make sure that the cylinders and the equipment are removed from the site promptly and all isolation valves on the equipment are closed off.

WARNINGS, CONTD.

- Recovered refrigerant should not be charged into another refrigerating system unless it has been cleaned and checked.

24. Labeling:

Equipment should be labeled stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed. Ensure that there are labels on the equipment stating the equipment contains R-32 refrigerant.

25. Recovery:

When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designed 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 valves 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 good working order with a set of instructions concerning the equipment that is at hand and should be suitable for the recovery of flammable refrigerants.

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. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained, and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult MRCOOL® if in doubt.

The recovered refrigerant should be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerant in recovery units, especially not in cylinders. If compressor or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.

The evacuation process should be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body should be employed to accelerate this process. When oil is drained from a system, it should be carried out safely.

PRECAUTIONS

Inspection:

- When receiving the unit, it is necessary to immediately inspect for any possible damage that may have occurred during transportation. If there is obvious damage, it should be written down on the carrier's transport documents and then claimed according to the instructions on the notice. If there is damage to any part other than the surface, please immediately notify the carrier or MRCOOL® Customer Service at at 270-366-0457 or at support@mrcool.com.

Storage:

- If the unit is ready to be stored for a period of time before installation, some protective measures should be taken to prevent damage, rust, or wear.
- Ensure that all interfaces, such as pipe interfaces, are properly sealed.
- Storage environment temperature ranges between -40°F~131°F (-40°C~55°C), relative humidity must be less than 90%, and direct sunlight should be avoided.
- The air-cooled coil heat exchanger on the unit should be covered to prevent the fins from getting dirty and clogged, especially in construction areas where outdoor storage is not allowed.
- To reduce the possibility of accidental damage (such as being smashed, bumped, etc.), the unit should be stored in an area where this is least likely to occur.
- Regularly inspect during storage.

Application Climatic Class:

- The MRCOOL® Compact Refrigeration System can be applied with climatic classes of 0,1,2,3,4,5,6,7, and 8.
- This product can be used in the following climate types: SN/N/SN/T.

ROOM SIZE FOR A2L

The unit is to be installed in accordance with the Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15, particularly with respect to the refrigeration concentration limits in the event the refrigerant charge leaks into a walk-in cooler. The minimum size or type of room with which the unit should be used, based on the refrigeration concentration limits found in ANSI/ASHRAE 15 and the refrigerant charge of the unit.
The unit is to be installed in a walk-in cooler having a minimum interior total volume of 735.25ft^3.(20.82m^3.). If the walk-in cooler does not have this volume, the unit can be installed if the unit is provided with refrigerant detectors and alarms, the electrical equipment in the walk-in cooler meets Class 1, Division 2, and all other requirements for refrigerating rooms in ANSI/ASHRAE 15 are met.
For group A2L refrigerants, as an alternative to Class 1, Division 2, ventilation and refrigerant detection in compliance with Sections 8.13.6.1 and 8.13.6.2 of ANSI/ASHRAE 15 may be used. Minimum interior total volume (V) shall be calculated by dividing the charge in lbs. by the refrigerant concentration limit (RCL) of the refrigerant in lb/Mcf Tables 4-1 and 4-2 of ANSI/ASHRAE 34, and multiplying by 1000.
The unit is to be installed in accordance with Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15, particularly with respect to refrigeration concentration limits in the event the refrigerant charge leaks into a walk-in cooler. The minimum size or type of room with which the unit should be used based on the refrigeration concentration limits found in ANSI/ASHRAE 15 and the refrigerant charge of the unit.
The unit is to be installed in a walk-in cooler having a minimum interior total volume (V) cubic ft. If the walk-in cooler does not have this volume, the unit can be installed if the unit is provided with refrigerant detectors and alarms, the electrical equipment in the walk-in cooler meets Class 1, Division 2, and all other requirements for refrigerating rooms in ANSI/ASHRAE 15 are met.
For group A2L refrigerants, as an alternative to Class 1, Division 2, ventilation and refrigerant detection in compliance with Sections 8.13.6.1 and 8.13.6.2 of ANSI/ASHRAE 15 may be used. Minimum interior total volume (V) shall be cal culated by dividing the charge in lbs. by the refrigerant concentration limit (RCL) of the refrigerant in lb/Mcf Tables 4-1 and 4-2 of ANSI/ASHRAE 34, and multiplying by 1000.

Symbols Displayed on Unit	
	Dangerous high voltage is present. Do not access a compartment with this symbol unless power is turned off.
	A pressurized liquid or gas is present. Do not puncture or heat up with a flame.
	A flammable chemical or gas is present. Do not use open flames to cut or solder unless the gas has been evacuated.
	Indicates the User Manual should be read before performing an operation.
	Pay attention to possible risks and take precautionary measures while using this product.
	Indicates the Install & Service Manual should be read before performing an operation.
	Grounding point.

2 INSTALLATION

2.1 Unit Introduction

The MRCOOL® Compact Refrigeration System is specifically designed for the renovation of walk-in cooler applications. It features an innovative integrated design that combines the evaporator, condenser, compressor, and all refrigeration components into a single cabinet. This design not only ensures a compact structure and small size, but also significantly simplifies the installation process, reducing complexity and saving time. With its efficient performance and convenient features, the unit meets diverse needs for cooler renovations and personalized cooler construction, making it a practical and reliable refrigeration solution.

Fig. 2-1 Front View

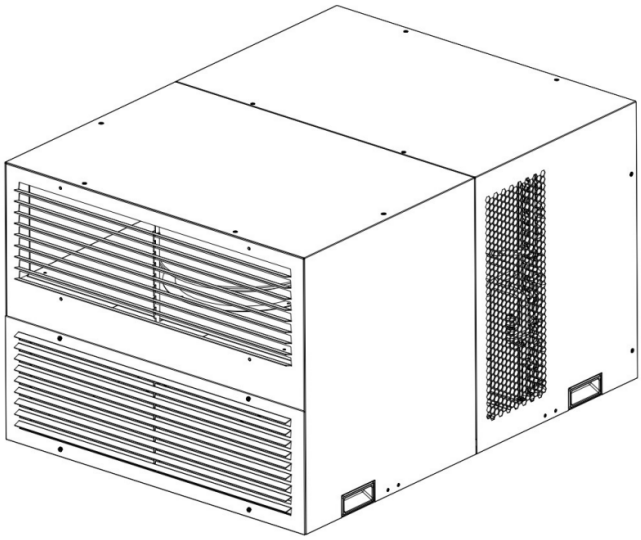
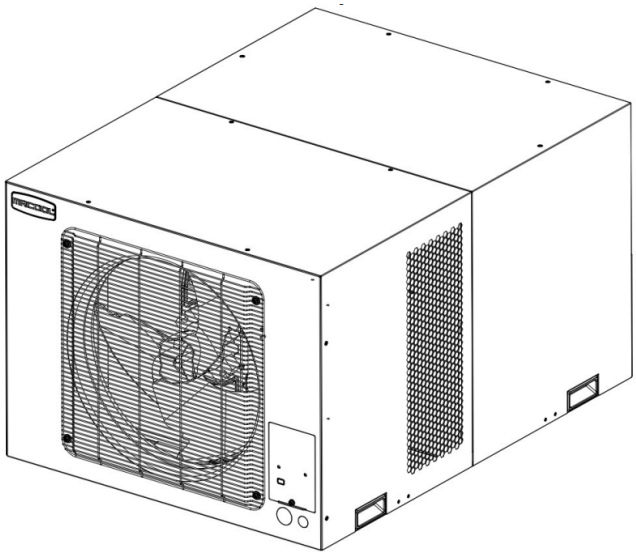


Fig. 2-2 Back View



Note: Actual product may be different from the above graphics, please refer to the actual equipment.

2.2 Benefits

- **High Efficiency Cooling**

Latest DC Inverter Technology:

The MRCOOL® Compact Refrigeration System uses the latest DC inverter technology combined with the HVAC variable frequency drive and control system, allowing the unit to have a small start-up current and a wide cooling capacity adjustment range, spanning from 20%~110%.

BLDC Centrifugal Fan and Axial Fan:

The indoor and outdoor fan uses BLDC technology, designed to increase energy efficiency reliability, and performance by utilizing a small start-up current and a broad cooling capacity adjustment range.

More Accurate Control:

Adopting an EEV, intelligent control system, and DC technology allows the MRCOOL® Compact Refrigeration System to provide more accurate cooling capacity as needed.

- **Compatible with Hybrid Power Supply**

The MRCOOL® Compact Refrigeration System is compatible with a hybrid power supply, such as 370VDC power from solar PV. It can provide auxiliary power or backup in case of a primary power failure, and can also help reduce electricity consumption.

- **Various Installation Methods**

The packaged design allows the unit to be installed more easily and supports both side-mounting and ground stand mounting. *(Note: ground stand mounting will require duct work).*

- **Allows up to 50ft (15.24m) of Ductwork Connection**

Equipped with a high pressure centrifugal fan that allows the unit to support a maximum of 50ft. (15.24m.) of ductwork (Supply + Return). (Max. External Static Pressure is about 0.2 in.wc. (50 Pa.)). *(Note: Lengths >30 ft. (9.14 m.) require a inducer fan).*

- **Simple Operation**

Wired Controller:

The MRCOOL® Compact Refrigeration System is controlled by a wired controller, providing easy access to cooling functions for refrigeration or freezing.

Wi-Fi Connectivity:

The MRCOOL® Compact Refrigeration System supports Wi-Fi connectivity that can be easily controlled via app (MRCOOL® CONNECT).

2.3 Preparation

Unpack the MRCOOL® Compact Refrigeration System carefully. A number of parts are packed loosely and will be free moving as the packaging is opened. Before discarding the box, check the packaging for any parts or documents inside. Refer to Table 2-1, on page 10, for the complete list of material shipped with the MRCOOL® Compact Refrigeration System.

Check that:

1. The supply voltage meets the requirements:
   - AC part: 208/230VAC~1{Ph~(50)60Hz;
   - Auxiliary power supply, DC part: 370VDC
2. The housing is clean on the inside, and free of excess dirt and dust.
   - A minimum clearance of 59in. (1.5m.) is between the supply air and any other obstruction is recommended. Any interference with airflow will adversely affect the efficiency of the unit.
3. Verify that you have all the items that are listed in Table 2-3 & 2-4 on page 12 & 13.
4. Installation and startup must be performed by an authorized technician.

CAUTION

All of the installation work must be performed by a skilled professional. Installation that does not comply with the instructions herein can result in the loss of warranty coverage. MRCOOL® will not be held liable for any damage caused to persons or objects due to the incorrect installation or incorrect operational use of the MRCOOL® Compact Refrigeration System.

WARNING

All of the wiring installation must comply with the local safety standards and building codes under all circumstances.
Outdoor use: The risk of electric shock can result in injury or death. Disconnect all remote electric power supplies before servicing.

2.4 Materials

Supplied Materials:

Table 2-1 lists all of the material supplied with the MRCOOL® Compact Refrigeration System. After opening the package, verify that all the items are accounted for. If any materials are missing, please contact MRCOOL® Customer Service at 270-366-0457 or at support@mrcool.com

Table 2-1: Supplied Material

Qty	Item Description	Comments
1	MRCOOL® Compact Refrigeration System MMFDW12D	Unit
1	Installation Manual	For equipment installation
1	Wired Controller Manual	
1	Wired Controller BSUF2CLN1	Controller, to be installed on-site
1	Wired Controller Cable	
1	Rain Hood Cover for Wired Controller & Seal	
4	Screws for Wired Controller Rain Hood Cover	
1	Drain Connector	For water drainage
1	Drain Pipe 6.56 ft. (2m.)	
2	Insulating Sleeve (L2600*W80)	Installation kit for side mounting (standard installation)
1	Foamed Elastomeric Insulation (L2600*W80)	
2	Installation Sleeve (Inner)	
2	Installation Sleeve (Outer)	
18	Screws for Securing Sleeves	
2	Support Bracket for Unit Installation (Bottom Accessory-Right Angled Brace)	
2	Support Bracket for Unit Installation (Bottom Accessory-Diagonal Brace)	
1	L-Bracket (Top Accessory)	
8	Screws (M8*50) for Securing L-Bracket & Support Brackets on the Wall	
8	Split Washer (M8) for Screw Fastening	
12	Bolts (M6*16) for Securing L-Bracket & Support Brackets on the Unit	
18	Washers for L-Bracket & Support Brackets Installation	
6	Lock Nuts for Securing the Right-Angled and Diagonal Brace of the Support Bracket	
1	Cutting Template Cardboard	Wall Cutting Guide

Note: Materials for installation of ductwork are optional and should be ordered separately.

Table 2-2: Optional Material

Item	Part #	Qty	Item Description	Comments
1	S11201142P	2	Duct Connector	Installation kit for ductwork (optional installation method)
	S15811187	2	Duct Connector Insulation Seal	
	S11201279P	2	Installation Bar	
	S60000078	10	Self-Tapping Screws for Installation Bar (ST5.5x25)	
	S60010040	10	Installation Screws for Duct Connector	
2	S34400027	1	Auxiliary Switch	Installed inside of the cold box to stop operation as needed
	S11230288P	1	Auxiliary Switch Installation Bracket	
	S6001000306	-	Installation Screws for Auxiliary Switch	
3	Y31200369	1	PV MPPT Box	Solar installation
	S60000078	6	Self-Tapping Screws for PV Box Fixing (ST5.5x25)	
	S6060001601	6	Washers for PV Installation	
	S3321000224	1	PV Box Communication Cable to the unit 9.8ft. (3m.)	
4	N/A	1	Induced Fan	Installed in duct once the total length is >30ft. (9.14m.)

Materials Needed:

Table 2-3 lists items required for installation that must be supplied by an authorized service technician. The wire length and gauge depends on site-specific conditions. However, recommendations are provided. Always abide by local and national codes.

Table 2-3: Materials Needed

Item	Part	Qty	Item Description	Comments
1	Power supply cable to the unit	1	208/230VAC/1Ph/(50)60Hz from power supply panel to the equipment	Recommended: Two wires, 14AWG
2	Auxiliary power supply cable to the unit	1	Auxiliary power 370VDC (Range: 200DC~420DC)	15A, Recommended: Two wires, 14AWG
3	Silicone sealant	As needed	Commercial grade outdoor silicone sealant	-
4	Nylon zip-tie	1	Small nylon zip-tie	For properly dressing cables and harnesses
5	Installation screws	As needed	Some screws for installation	-
6	Duct	As needed	Ducting insulation must be adequate	-

Table 2-4: Tools Needed

Tools	
Level	Leak Detector
Screw Driver	Torque Wrench
Impact Drill	Open-End Wrench
Drill Head	Volt Meter

2.5 Location

Installation Location:

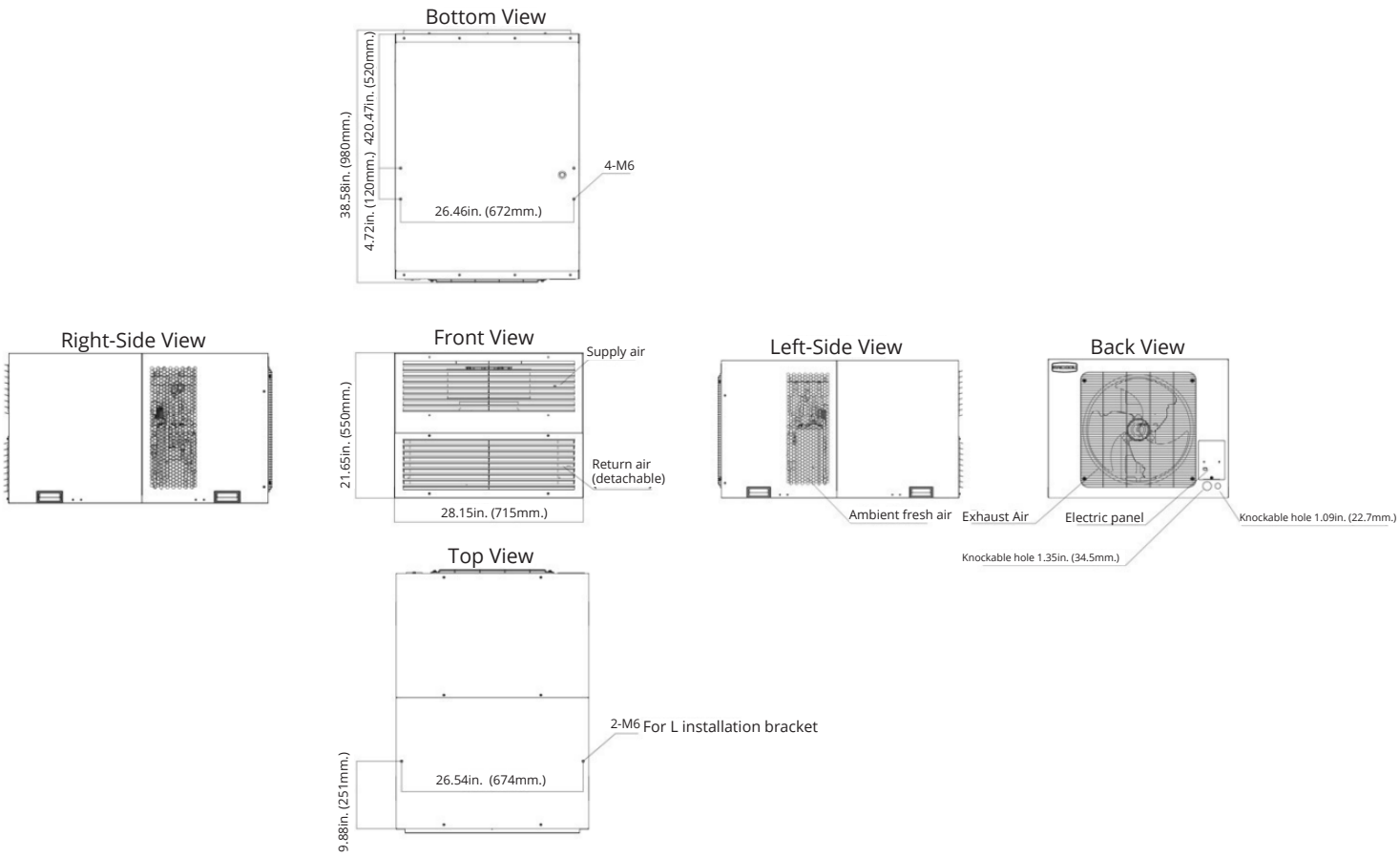
- The installation of the MRCOOL® Compact Refrigeration System must comply with the national and local safety regulations. The installation quality directly affects normal use. Installation and debugging must be performed by authorized technicians or professional installers according to this manual.
- Installation should be performed in accordance with the requirements of NEC and CEC by authorized personnel only.
- Be sure to disconnect the power supply before proceeding with any electric work.
- Do not connect the power before finishing installation.

How to Select the Installation Location:

- Where there is no direct sunlight.
- Where the top hanger, ceiling, and building structure is strong enough to withstand the weight of the MRCOOL® Compact Refrigeration System.
- Where the flow of the air inlet/outlet is not obstructed.
- Select a location that is not in a corrosive environment including: heavy dust, salty air, smog, moisture, sulfur gas (hot spring), near high frequency devices, etc.
- Do not install the unit under a window or between buildings. This prevents the normal running noise from entering the room.
- The unit should be installed where ventilation is in good condition to ensure the unit can take in and discharge enough air.
- Do not install the unit where there are flammable and explosive substances.
- No air-guiding pipe is allowed to be installed at the air inlet/outlet of the unit. Under defrosting mode, the condensate water will drip down from the base frame and will freeze when the outdoor ambient temperature is below 32°F (0°C).

2.6 External Dimensions

Fig. 2-3: Dimensions

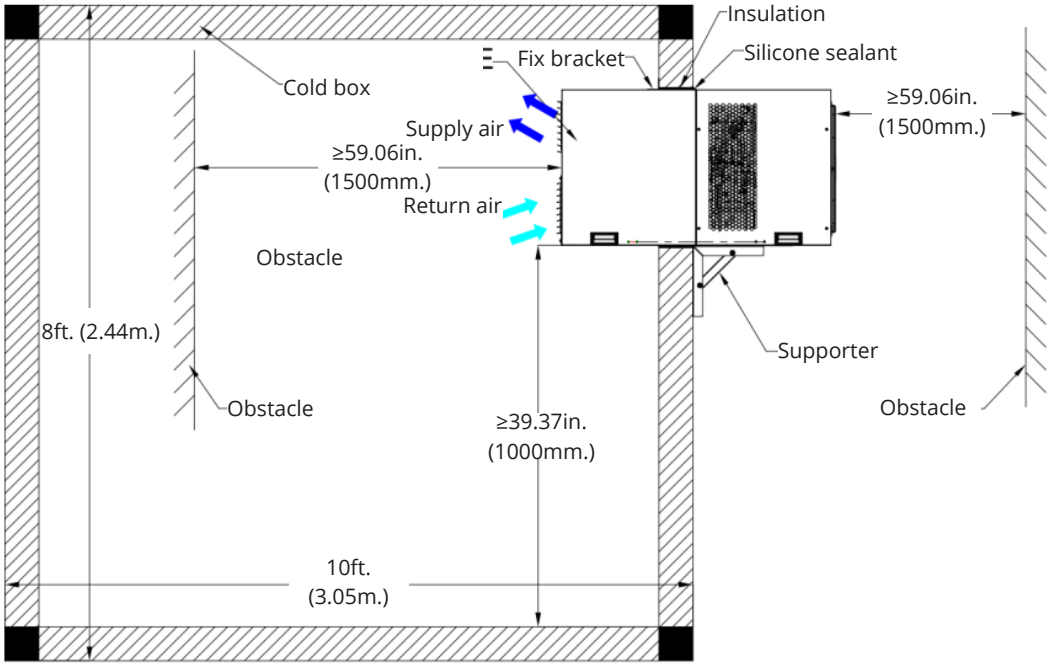


2.7 Installation Overview

The MRCOOL® Compact Refrigeration System supports side mounting installations (Fig. 2-4), as well as ducting applications (Fig. 2-5).

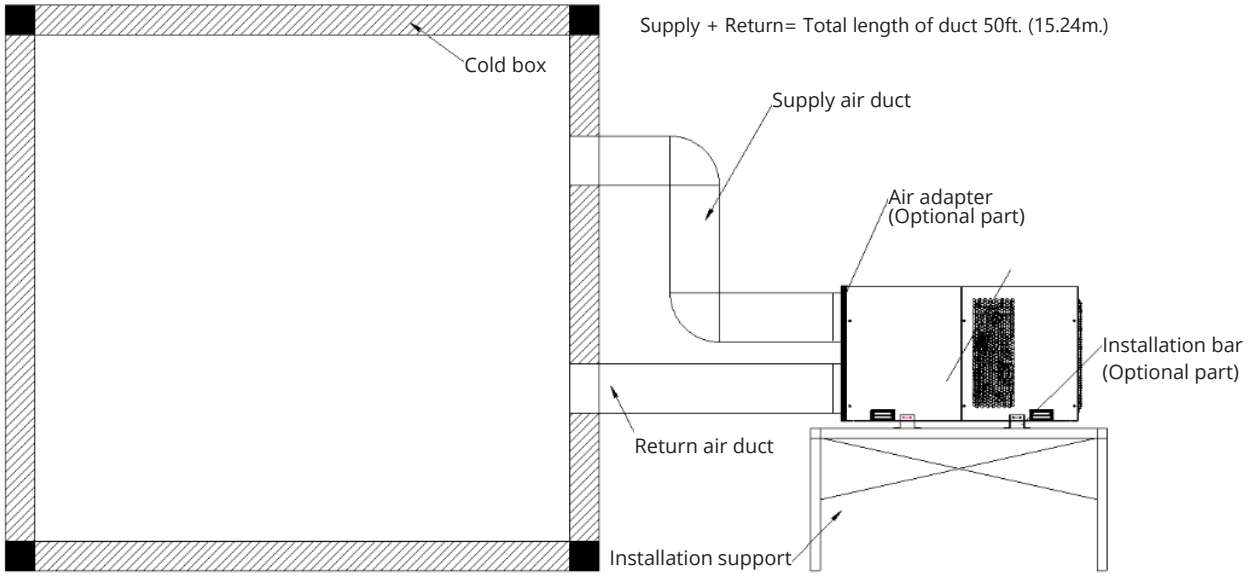
Note: If ductwork exceeds 30ft. (9.14m.), an induced fan (optional part) should be added, with a maximum length of 50ft. (15.24m.).

Fig. 2-4: Side Mount out of Cold Box



Note: For purposes of this installation manual the cold box displayed in the image is 10ft. (3.05m.) x 10ft. (3.05m.) x 8ft (2.44m).

Fig. 2-5: Side Mount with Ductwork in Remote Location



Note: For purposes of this installation manual the cold box displayed in the image is 10ft. (3.05m.) x 10ft. (3.05m.) x 8ft (2.44m).
**If duct length is >30ft. (9.14m.) an induced fan is required.*

The installation support of the unit must not use flat supports. It is recommended to use pure frame structures or perforated panels.

2.8 Side Mounting Procedure

Step 1: Cut the opening according to the template for the MRCOOL® Compact Refrigeration System on the installation wall as shown in Fig. 2-6 below.

Fig. 2-6: Side Installation Distance Requirement 1

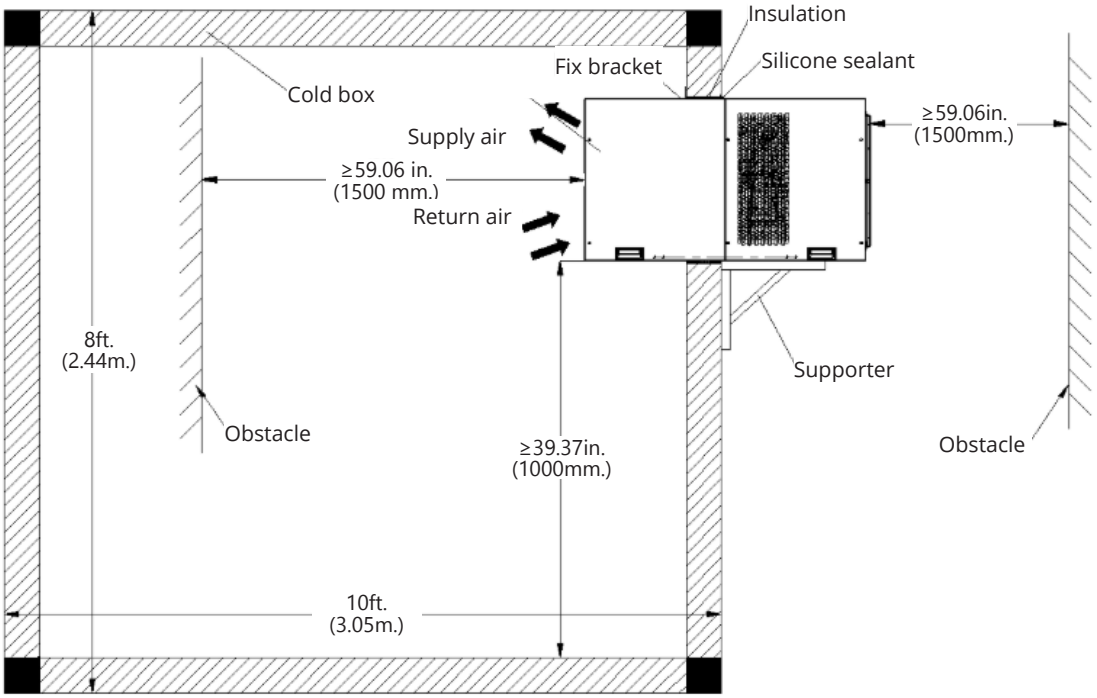
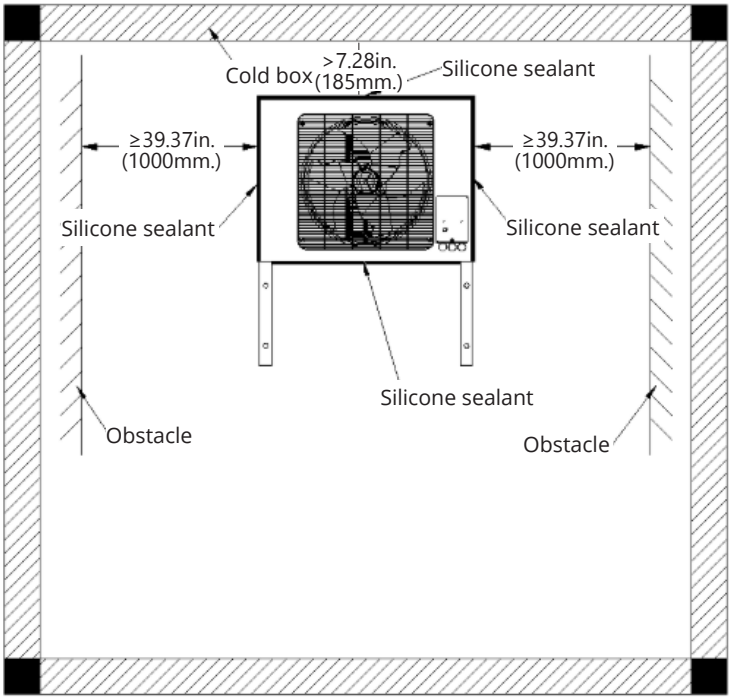
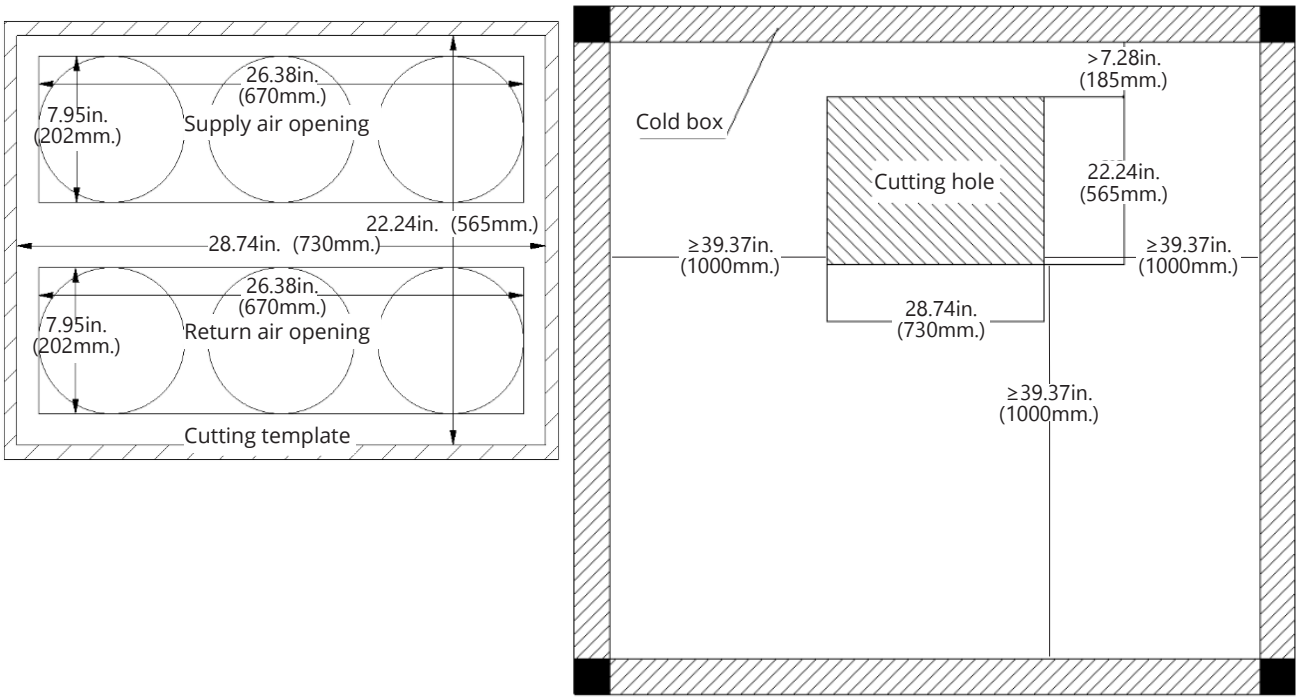


Fig. 2-7: Side Installation Distance Requirement 2



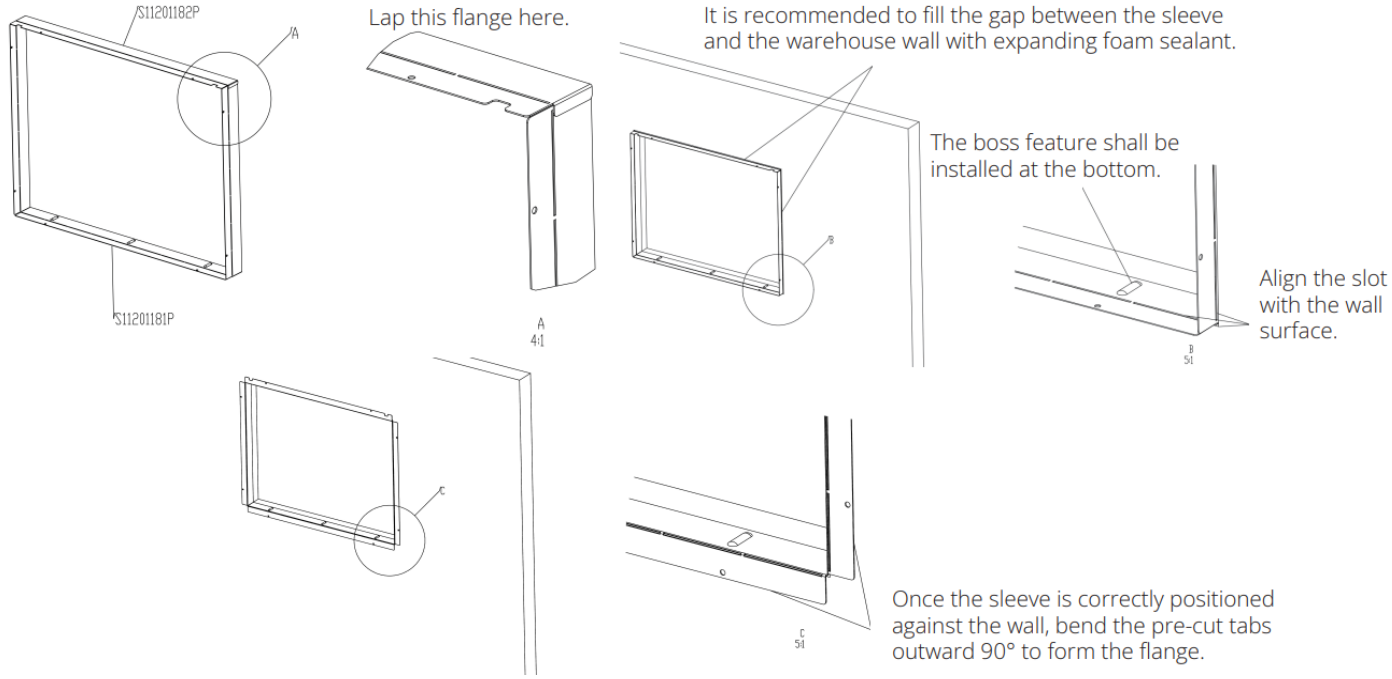
Step 2: Once the location is confirmed, cut the opening according to the unit's cutting template, as shown below in Figure 2-8.

Fig. 2-8: Cutting the Wall Opening



Step 3: After cutting the hole, attach the sleeve. Refer to the parts list for corresponding screw sizes.

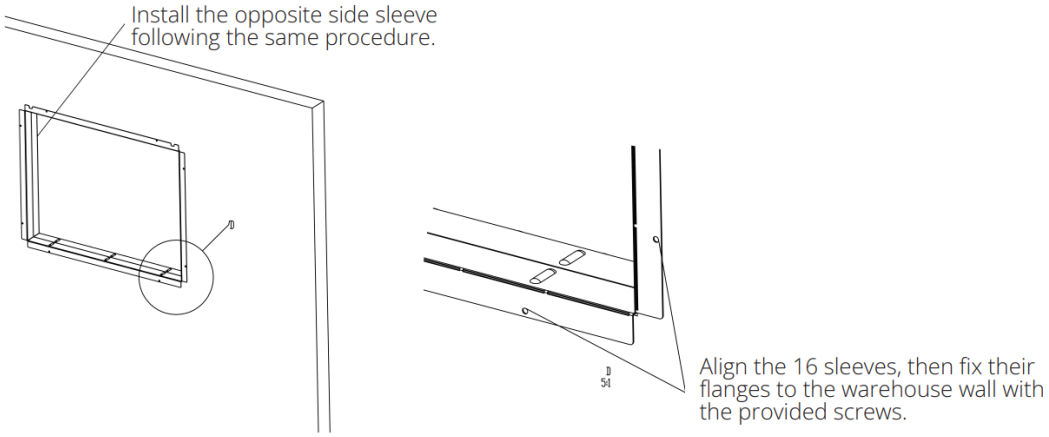
Fig. 2-9



Note:

- A single set of sleeves is sufficient for a wall thickness less than 3.14in (80mm).
- Two sets of sleeves must be used together for wall thickness between 3.14in (80mm) and 6.29in (160mm).
- Installation is not recommended for wall thickness exceeding 6.29in (160mm).

Fig. 2-10



Step 4: Place insulation around the sleeve as shown in Fig. 2-9, 2-10, and 2-11.

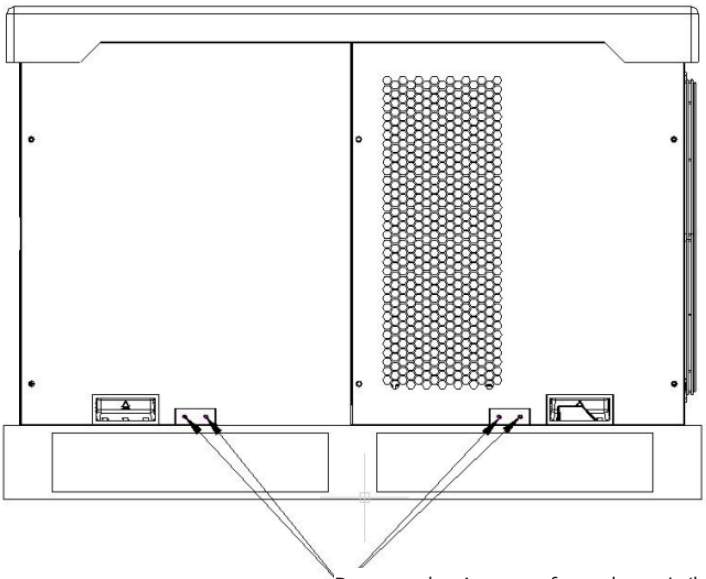
Note: If no insulation is placed around the unit, condensation can form and penetrate into the wall's inner-layer and impact the performance of the unit.

Fig. 2-11

Place insulation around the sleeve.

Step 5: Remove the 8 screws from the unit in order to detach it from the pallet. Refer to Fig. 2-12.

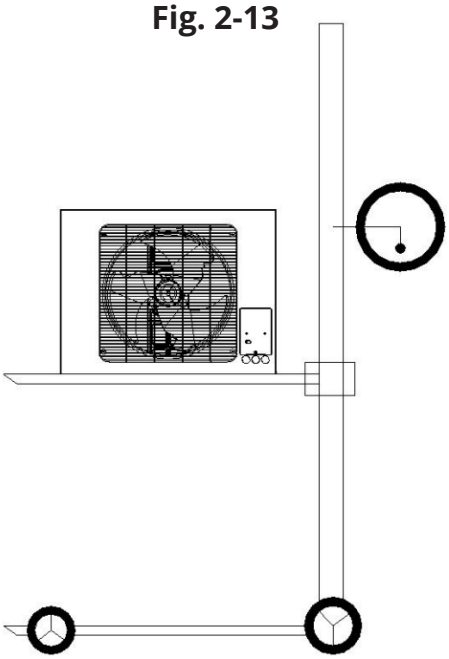
Fig. 2-12



Remove the 4 screws from the unit (both sides, total 8 screws)

Step 6: Use a forklift or lifting mechanism to align the MRCOOL® Compact Refrigeration System with the lower edge of the opening.

Fig. 2-13

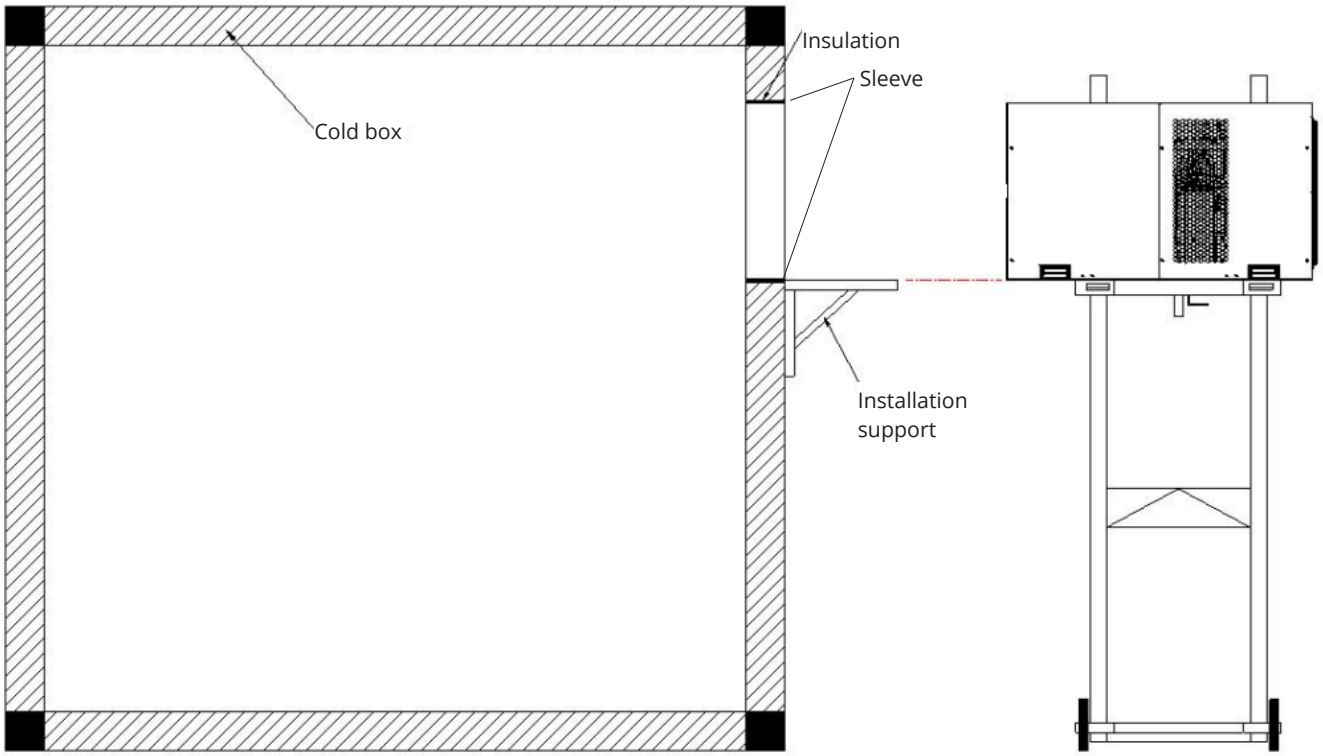


Step 7: Push or pull the MRCOOL® Compact Refrigeration System through the opening.

Note: If pulling the MRCOOL® Compact Refrigeration System from outside of the cold box, please follow the steps below for installation.

- Before pulling in the MRCOOL® Compact Refrigeration System through the opening, install the installation support first, then align the unit with the opening, refer to Fig. 2-14.

Fig. 2-14: Align the Unit with the Opening by Using a Forklift or Using Similar Tools from Outside.



- If you are only able to support installation from inside the cold box, push out the unit from inside the cold box, as shown in Fig. 2-15 and Fig. 2-16 below. Then, install the L bracket according to Fig. 2-15.

WARNING

The unit must not be tilted inward. It must be kept level or tilted outward. The angle of inclination must not exceed 5°. Refer to the parts list for corresponding screw sizes.

Fig. 2-15: Align the Unit with the Opening by using a Forklift or Similar Tools from the Inside.

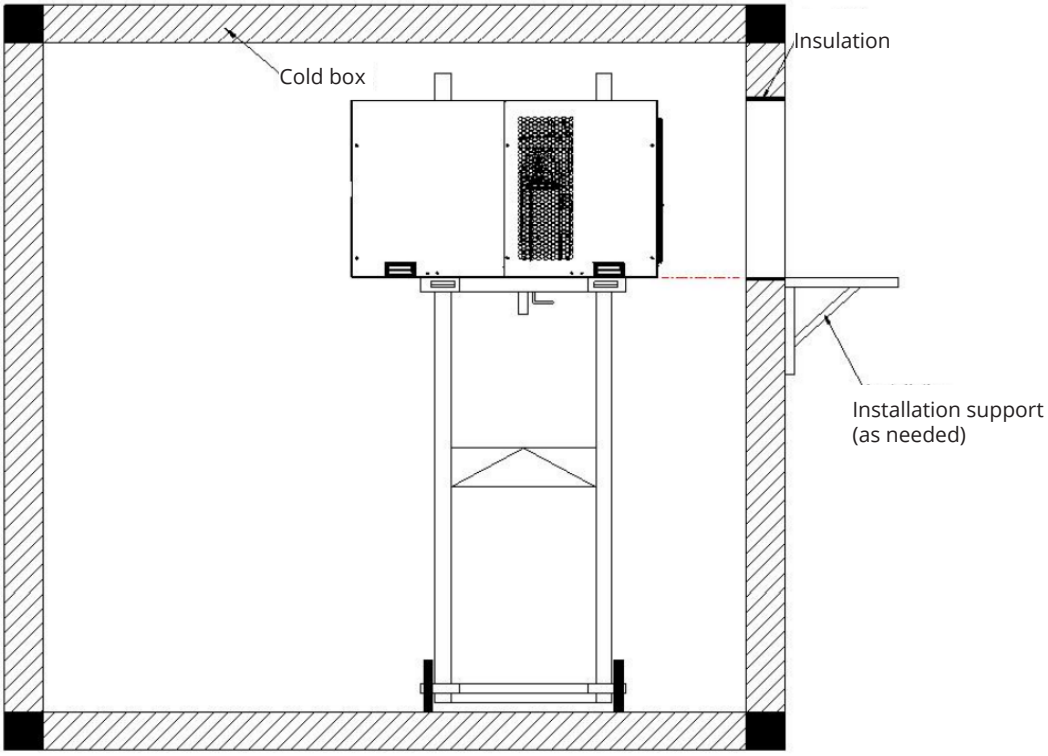
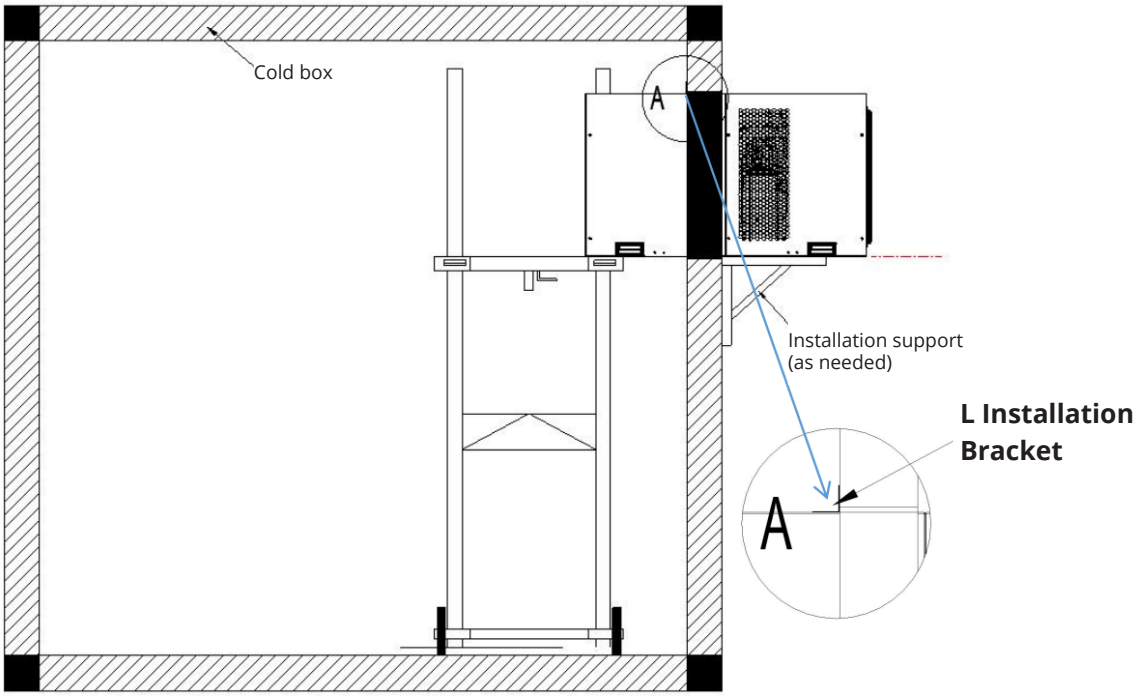
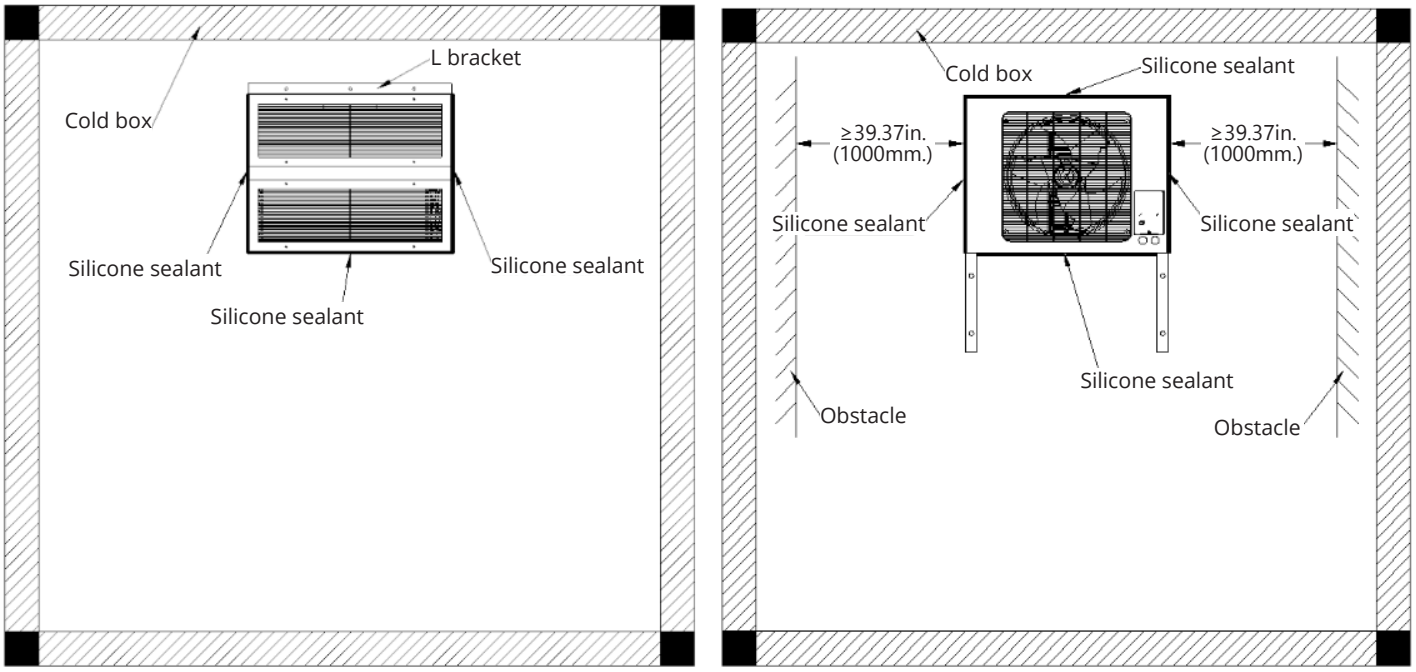


Fig. 2-16: Install the L Bracket



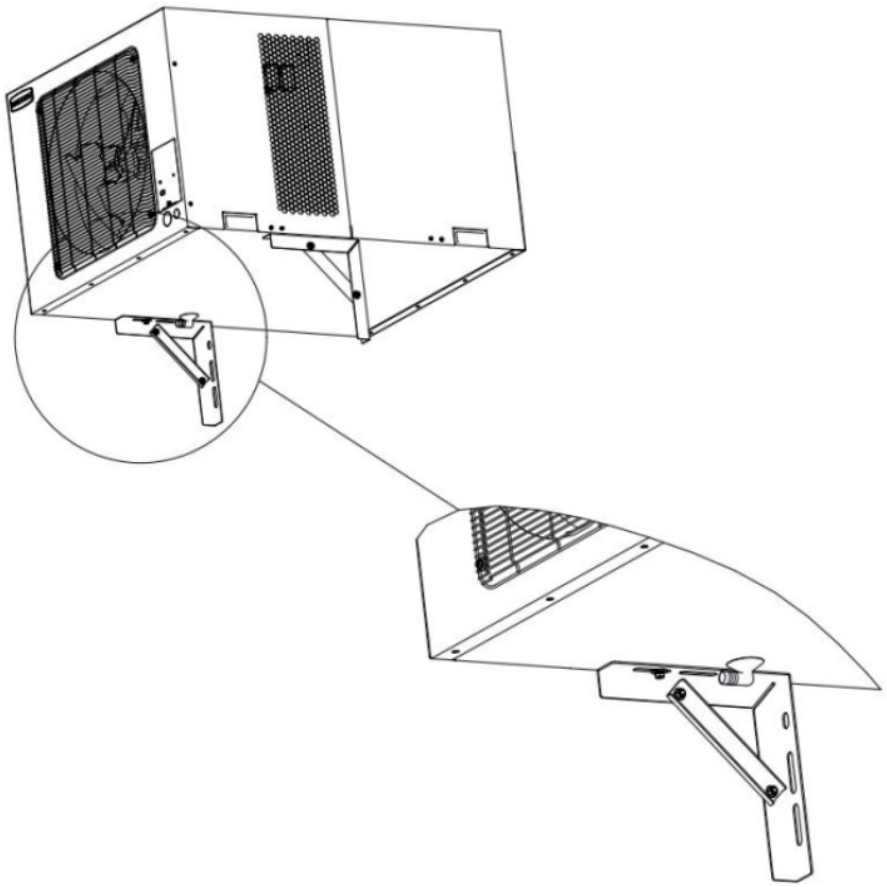
Step 8: After the L bracket and installation support are installed, remove the forklift and seal the gaps. Refer to the parts list for screw sizes.

Fig. 2-17: Seal Gaps between the Unit and the Opening



Step 9: Install the drain connector after the MRCOOL® Compact Refrigeration System is secured.

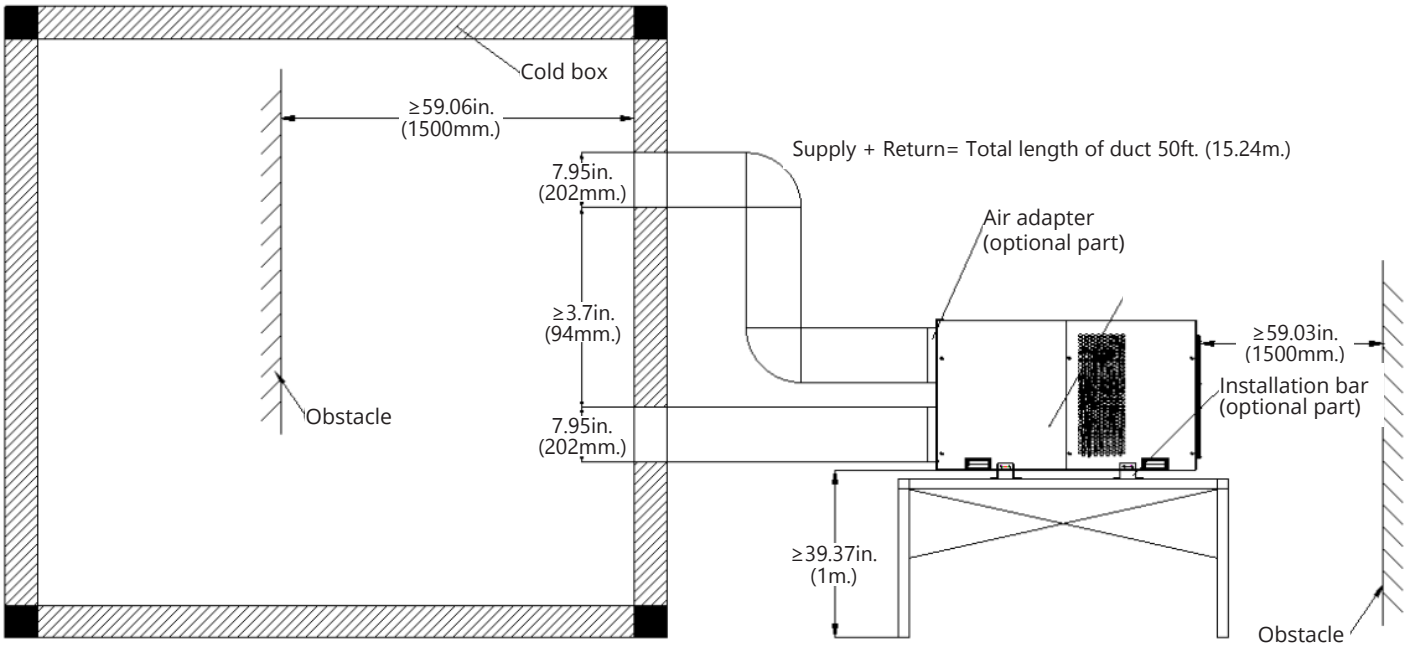
Fig. 2-18 Install the Drain Connector



2.9 Optional Mounting Procedure

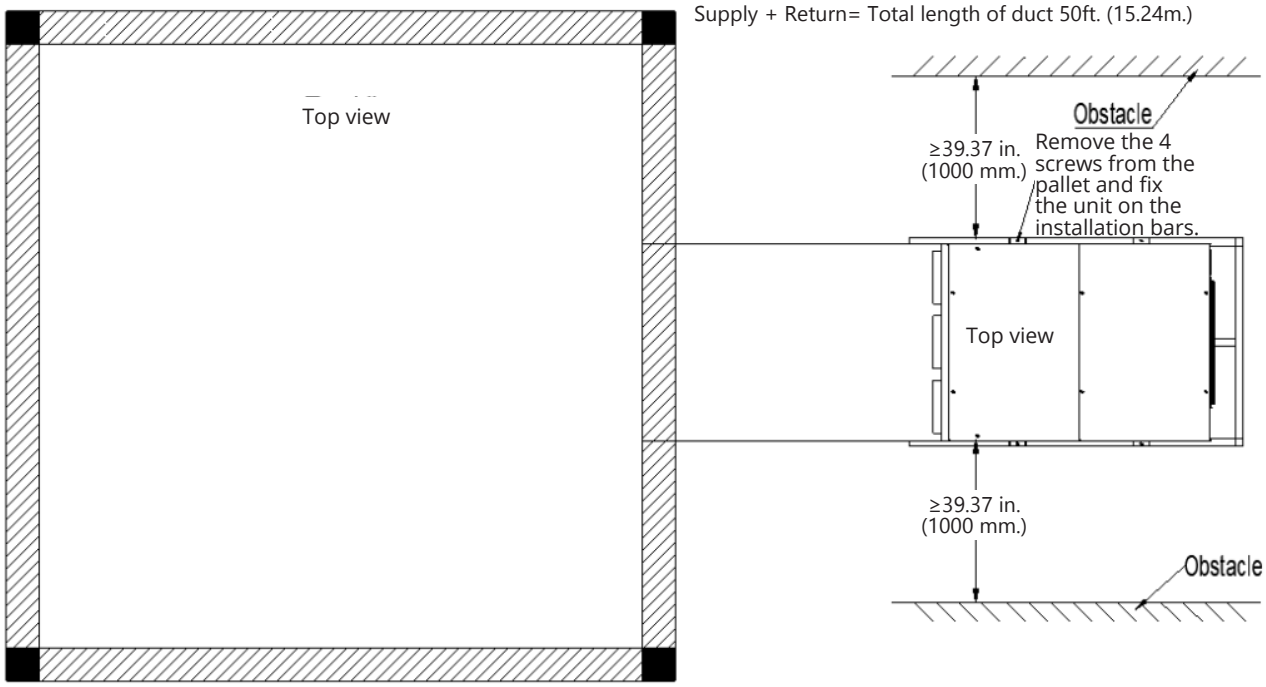
Step 1: Choose an appropriate installation location according to the mounting procedure shown in Fig. 2-19 and Fig. 2-20 below.

Fig. 2-19: Installation with Duct Distance Requirement 1



Note: For purposes of this installation manual the cold box displayed in the image is 10ft. (3.05m.) x 10ft. (3.05m.) x 8ft (2.44m).
**If duct length is >30ft. (9.14m.) an induced fan is required.*

Fig. 2-20: Installation with Duct Distance Requirement 2



Note: For purposes of this installation manual the cold box displayed in the image is 10ft. (3.05m.) x 10ft. (3.05m.) x 8ft (2.44m).
**If duct length is >30ft. (9.14m.) an induced fan is required.*

Step 2: Cut the supply and return air openings on the cold box according to the template on the carton.

Fig. 2-21

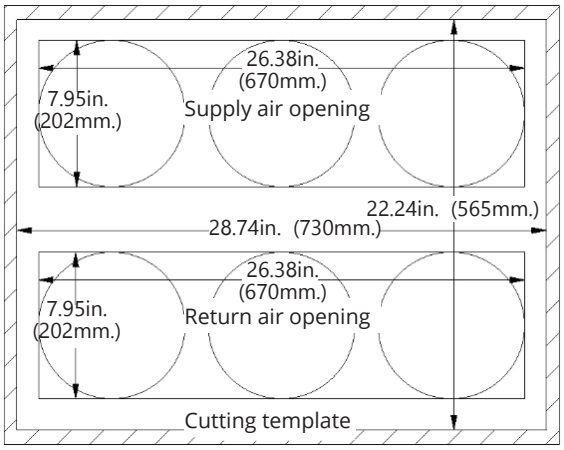


Fig. 2-22

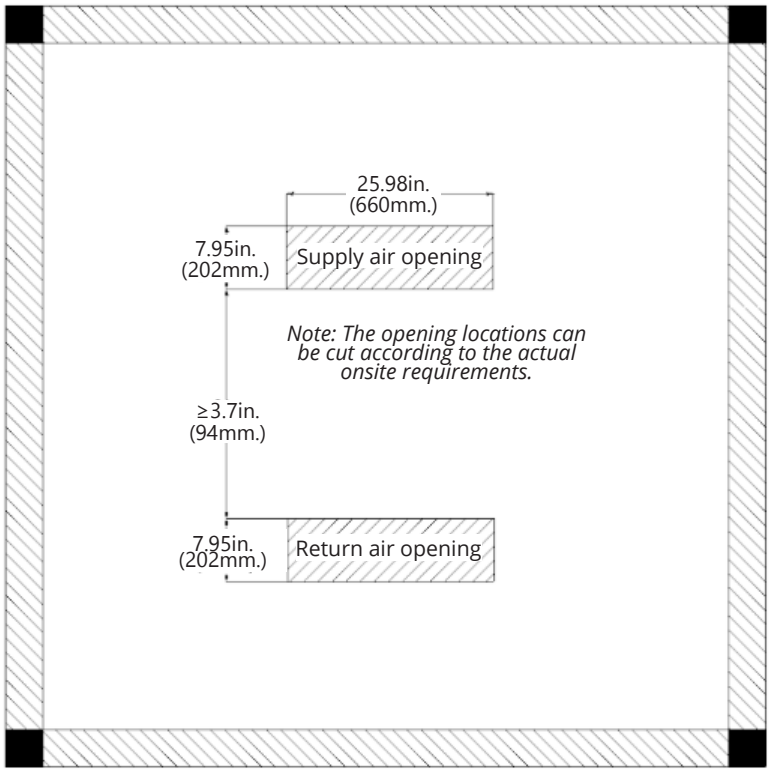
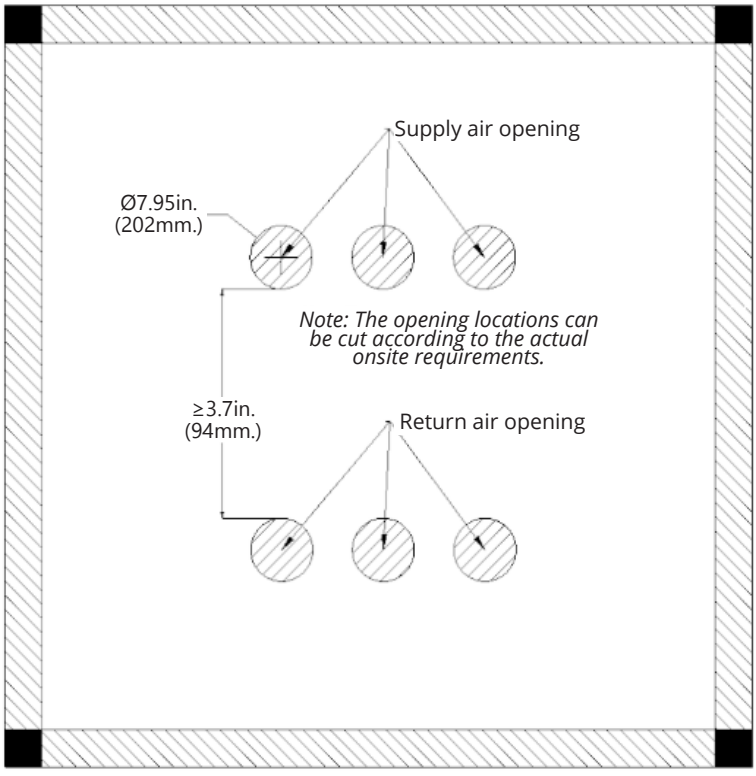


Fig. 2-23



Step 3: Prepare install supports and fix installation bar on the installation supports.

Fig. 2-24

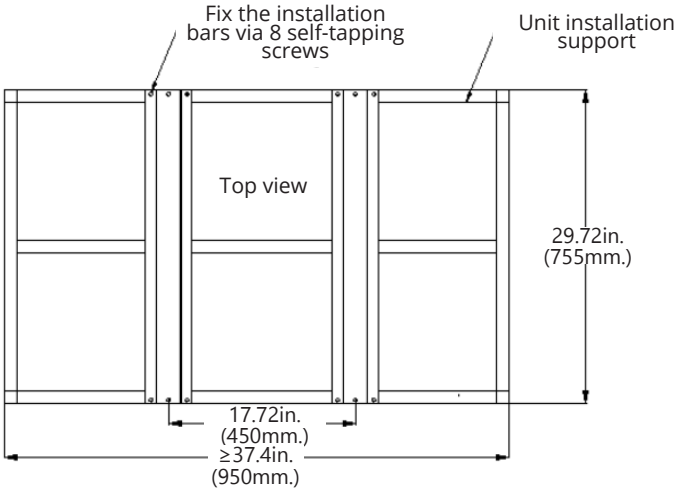
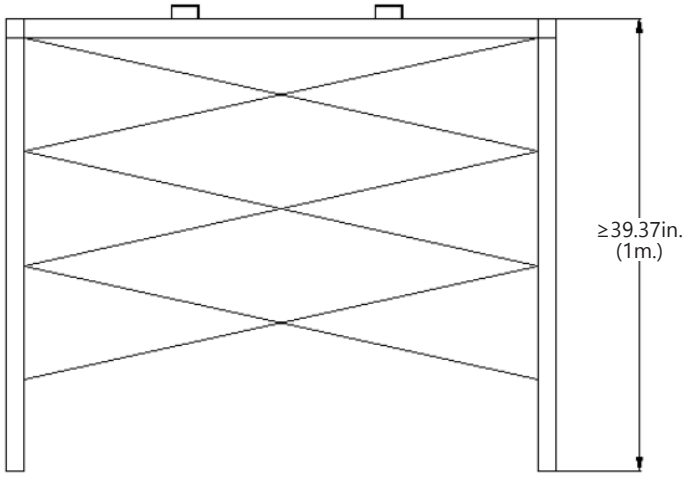


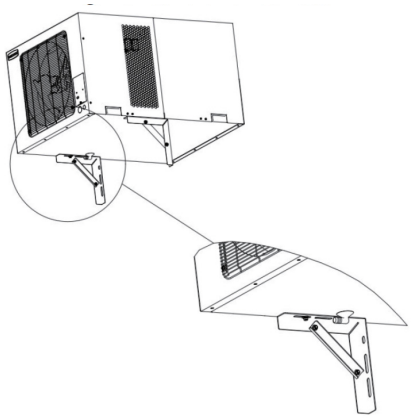
Fig. 2-25



Note: The installation support of the unit must not use flat supports. It is recommended to use pure frame structures or perforated panels.

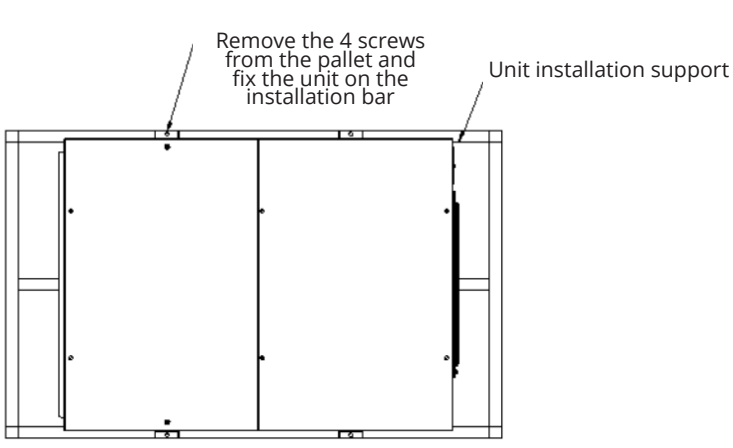
Step 4: Install the drain connector before installing the unit.

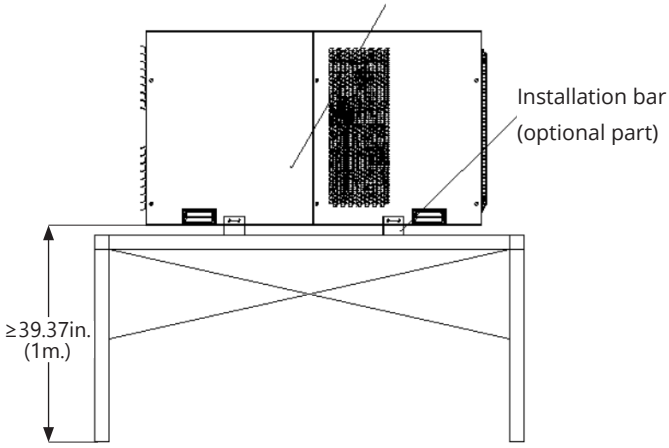
Fig. 2-26



Step 5: Install and fix the unit on the installation bar at the top of the installation supports.

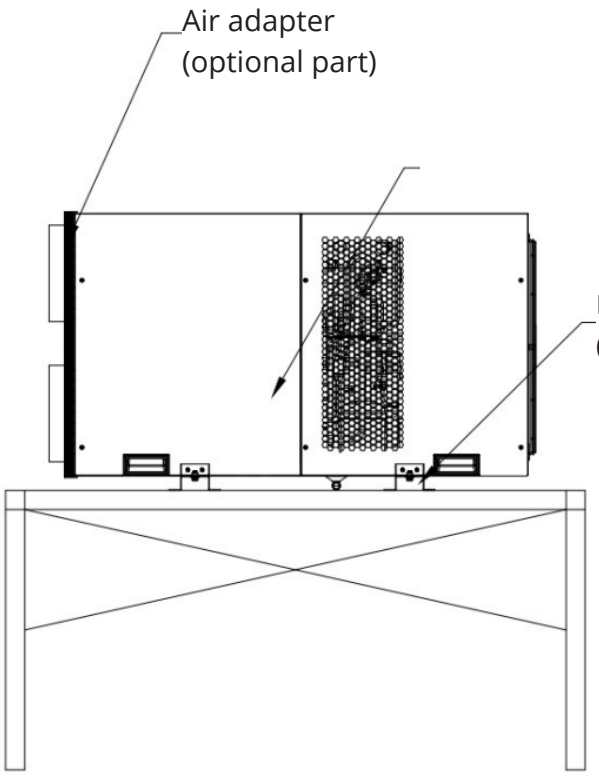
Fig. 2-27: Fix the Unit on the Installation Bar

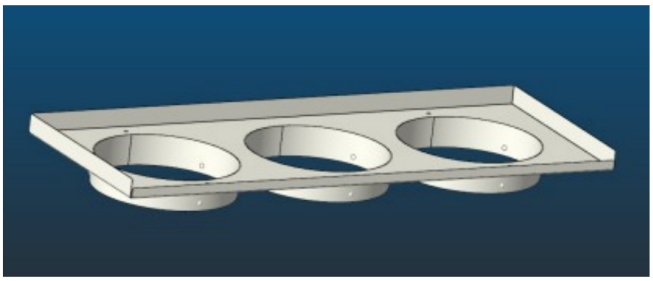


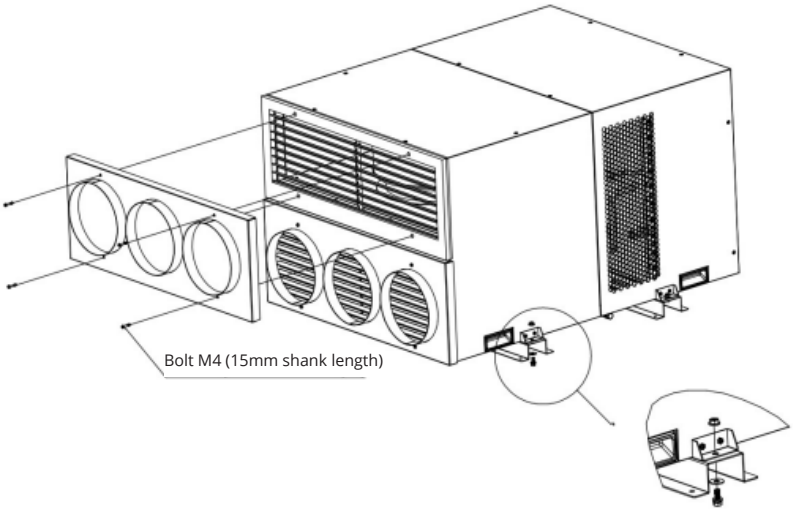


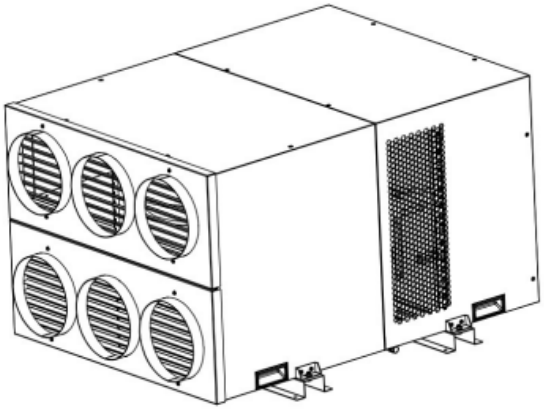
Step 6: Install and fix the air adapter on the front of the unit.

Fig. 2-28: Fix the Air Adapter



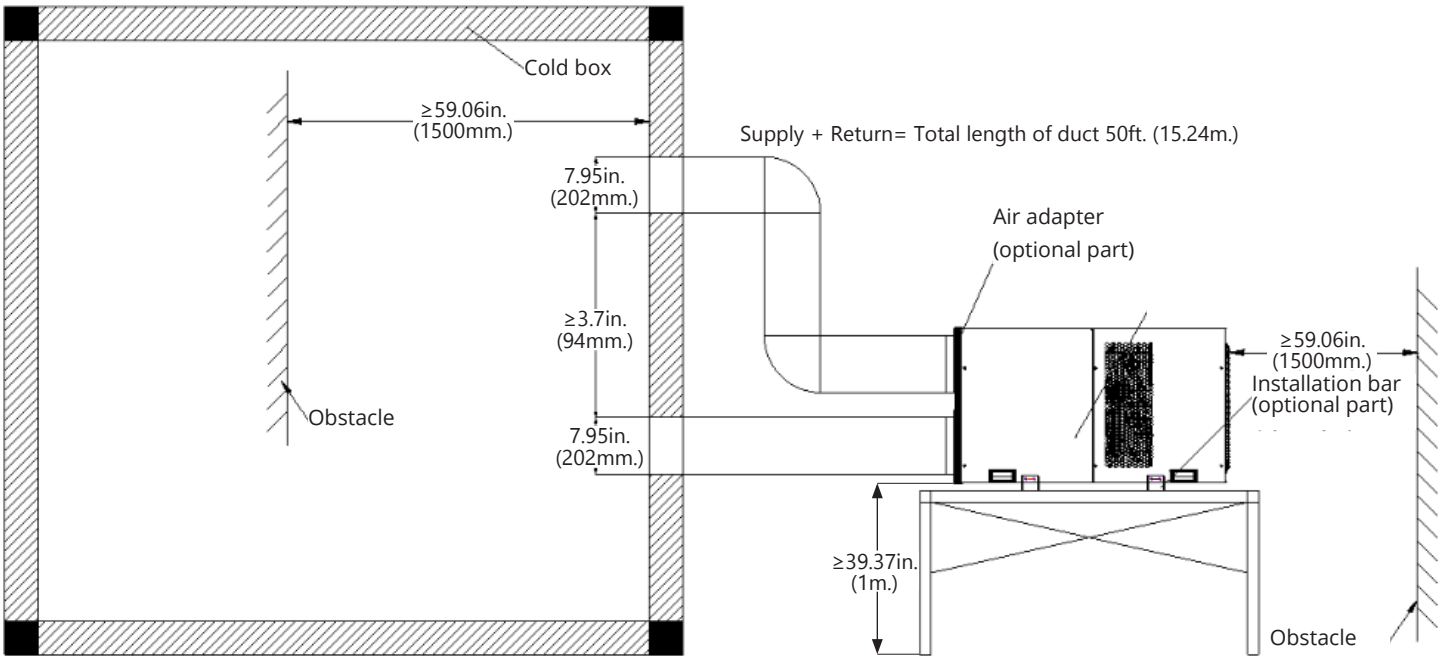






Step 7: Make the air duct connection to the cold box and seal any gaps.

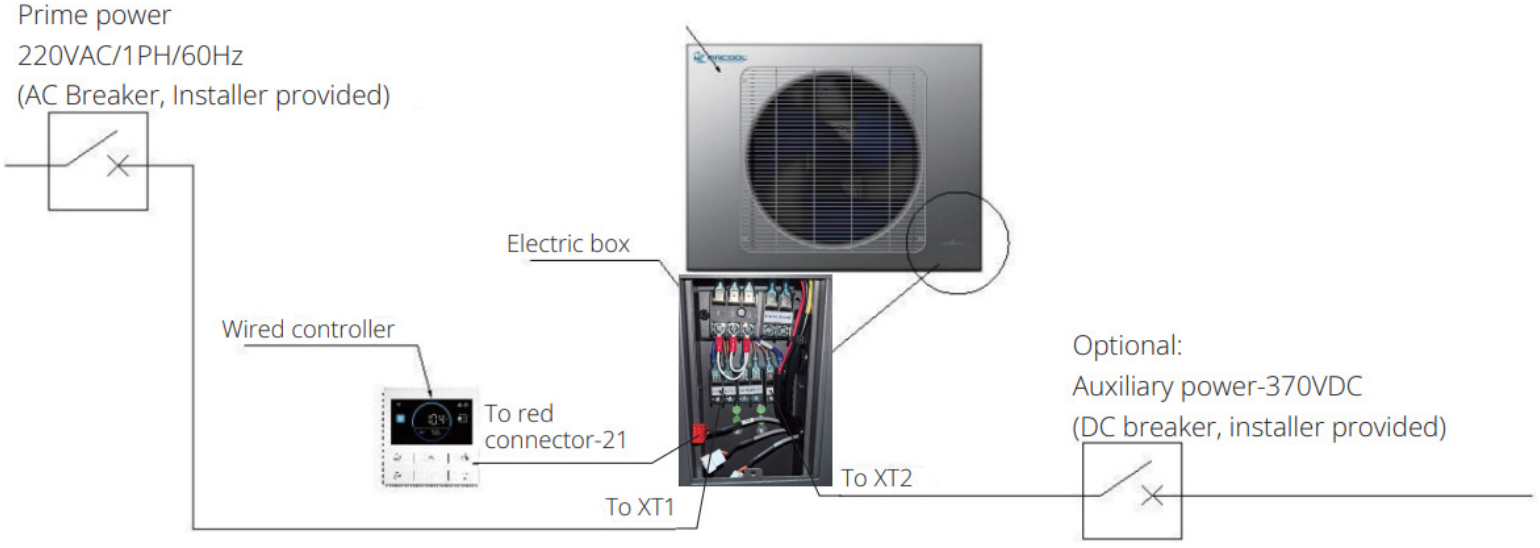
Fig. 2-29: Establish the Duct Work Connections to the Cold Box



Note: For purposes of this installation manual the cold box displayed in the image is 10ft. (3.05m.) x 10ft. (3.05m.) x 8ft (2.44m).
**If duct length is >30ft. (9.14m.) an induced fan is required.*

3.1 Wiring Overview

Fig. 3-1



Note: A disconnect is required to be installed for the prime power supply.

3.2 Electrical Data

Table 3-1: Unit Information

Unit Electrical Data						
Power Supply	Compressor	Supply Fan	Condenser Fan	MCA	MOP	Breaker Size
208/230VAC~1Ph~60Hz	10 A	2.5 A	0.7 A	17 A	25 A	AC: 25A
370Vdc	6 A	0.83 A	0.2 A	9 A	10 A	DC: 10A

Fig. 3-2

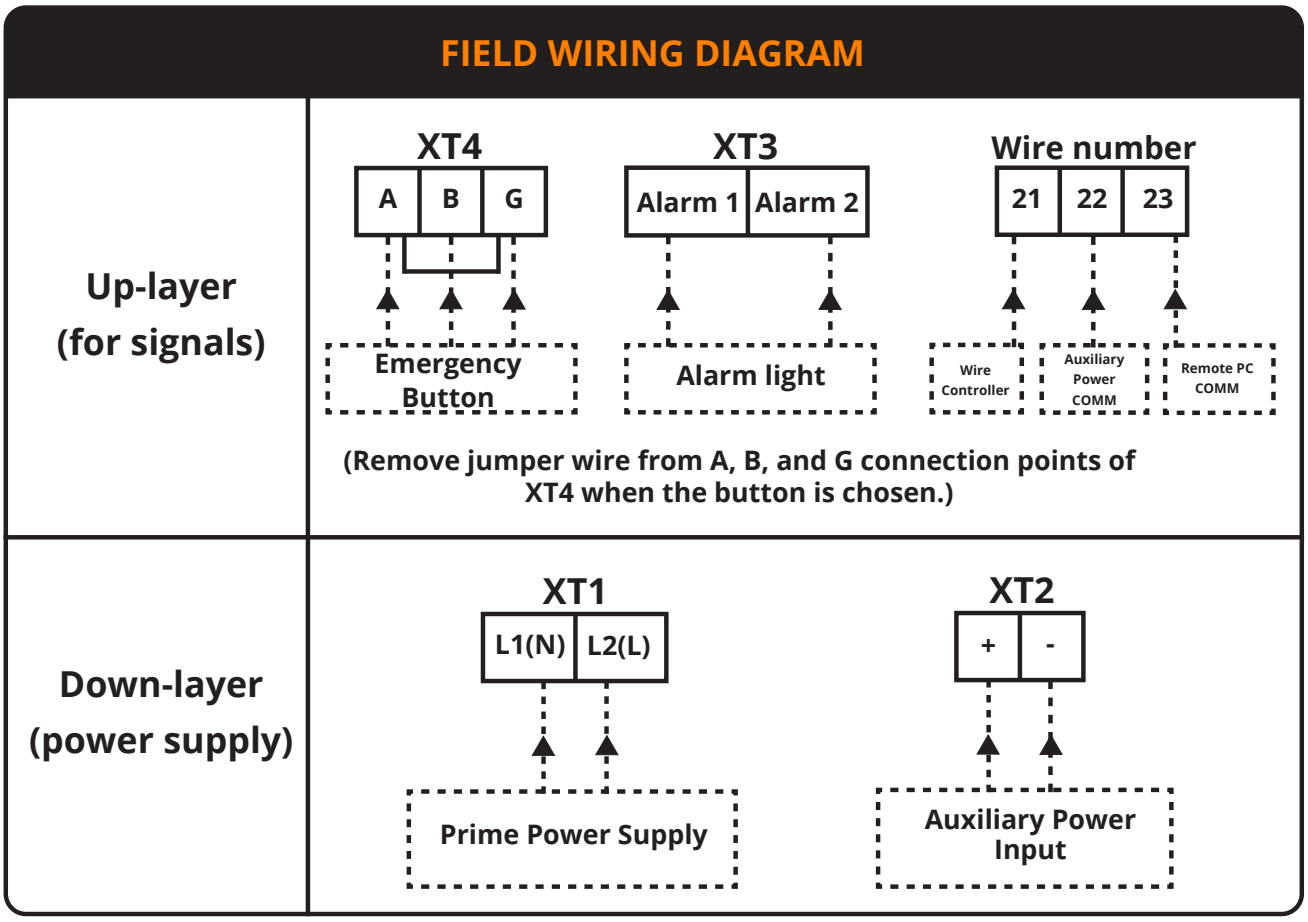


Fig. 3-3

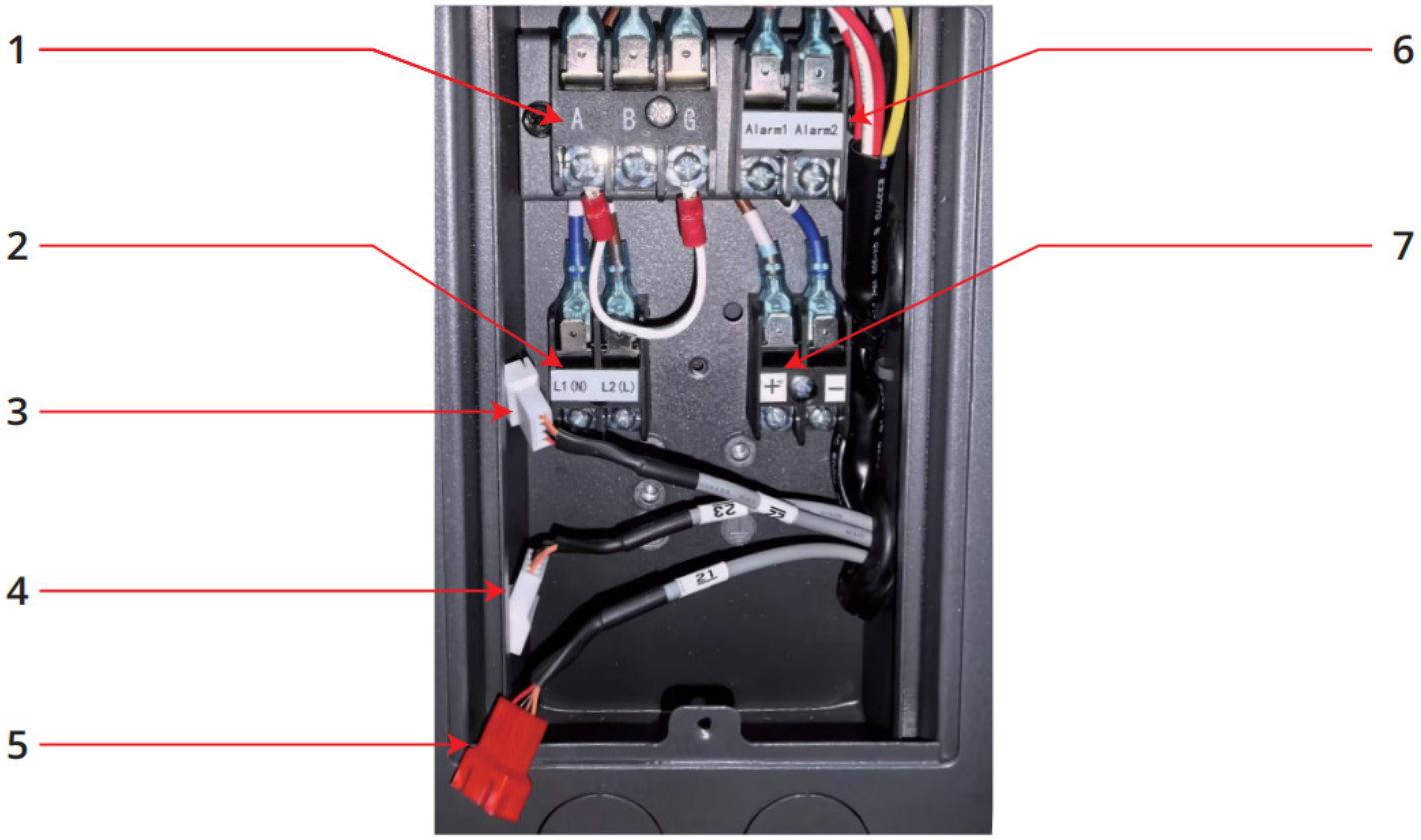
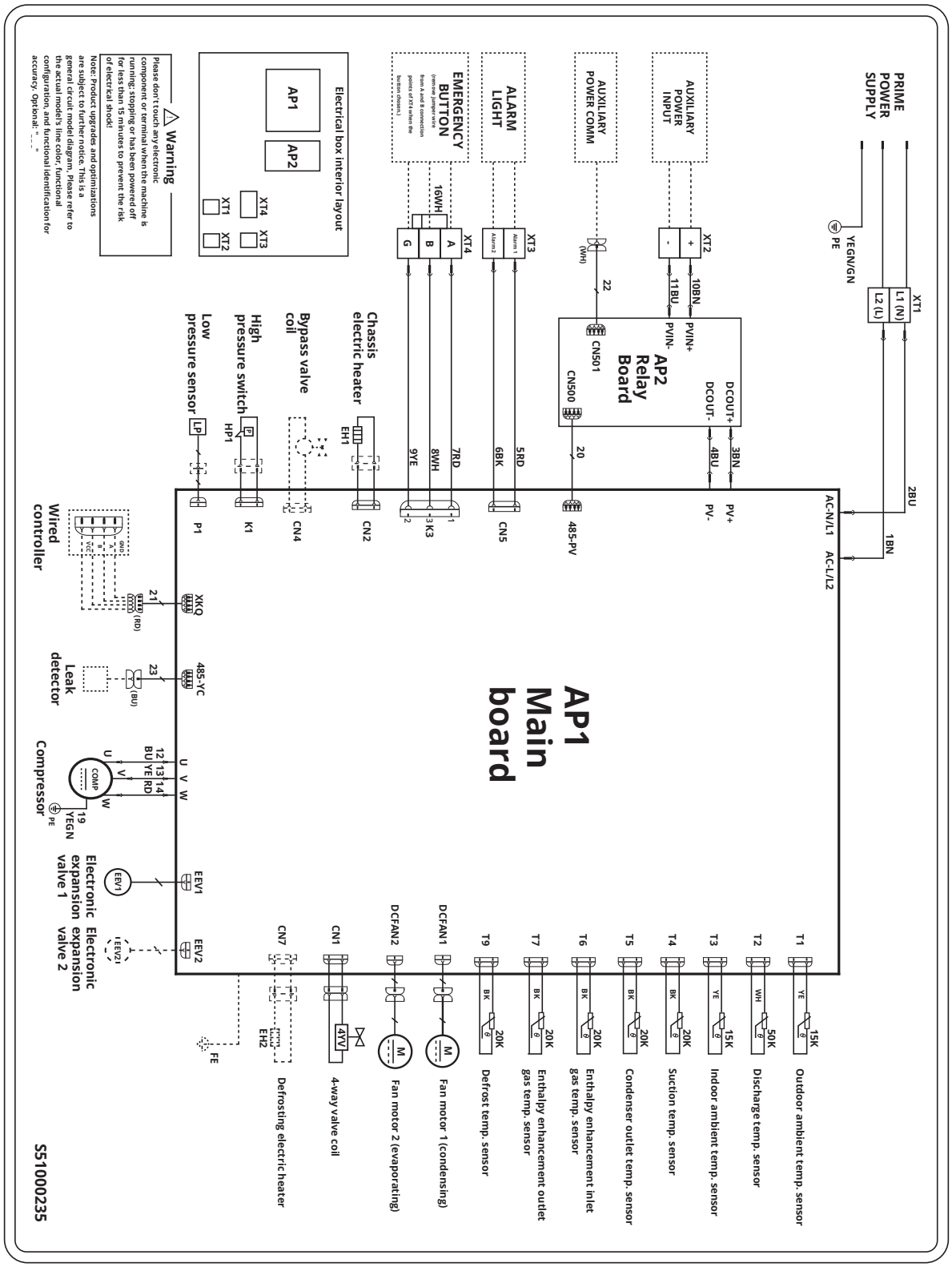


Table 3-2: Terminal Identification

S.N	Terminal Name	Description	Remarks
1	XT4 (A,B,G)	Emergency button connection terminals. A,B,&G are factory jumped. Please remove the jumper wire if installing an emergency switch; A&G connected to auxiliary button NC (Normally Closed) B&G connected to auxiliary button NC (Normally Closed)	Optional
2	XT1 L1(N),L2(L)	Prime power supply, 208/230~1Ph~50(60)Hz	Standard
3	Connector #22	Communication connector for auxiliary power supply monitoring if auxiliary power has RS485 connector port	White Color
4	Connector #23	PC connector for monitoring and control	Blue Color
5	Connector #21	Wired controller connector	Red Color
6	XT3 (Alarm1, Alarm2)	Alarm light connection terminals, default: NO	Optional
7	XT2 (+,-)	Auxiliary power supply connection terminals, 370VDC	Optional

3.3 Wiring Diagram

Fig. 3-4



3.4 Wiring Connections

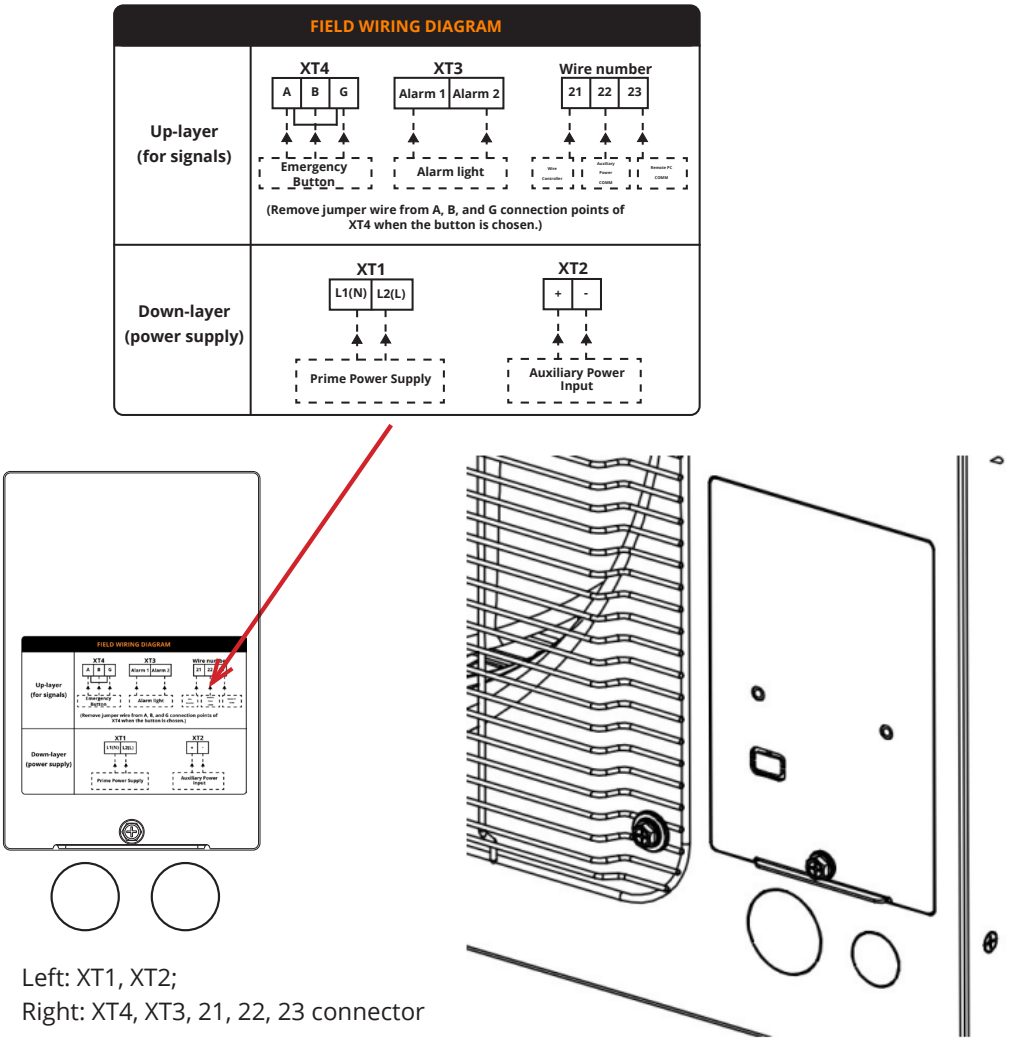
Main Connection:

- Ensure the on site power supply for the MRCOOL® Compact Refrigeration System meets the requirements specified in the electrical parameters on the nameplate, wiring diagram, and within the installation manual.
- If necessary, install branch circuits with sufficient capacity in visible and accessible locations around the unit.
- The default power supply is 208/230VAC/1Ph/(50)60Hz.
- Refer to the current, wire gauge, and protector requirements in this section. Wires must use copper conductors rated for a temperature of 167°F (75°C) or higher. The protector can be a fuse or a circuit breaker.

Wired Controller Connection:

Remove the field wiring sticker to reveal two press-fit nut holes and knockout holes. (The control connection cable is provided by MRCOOL®).

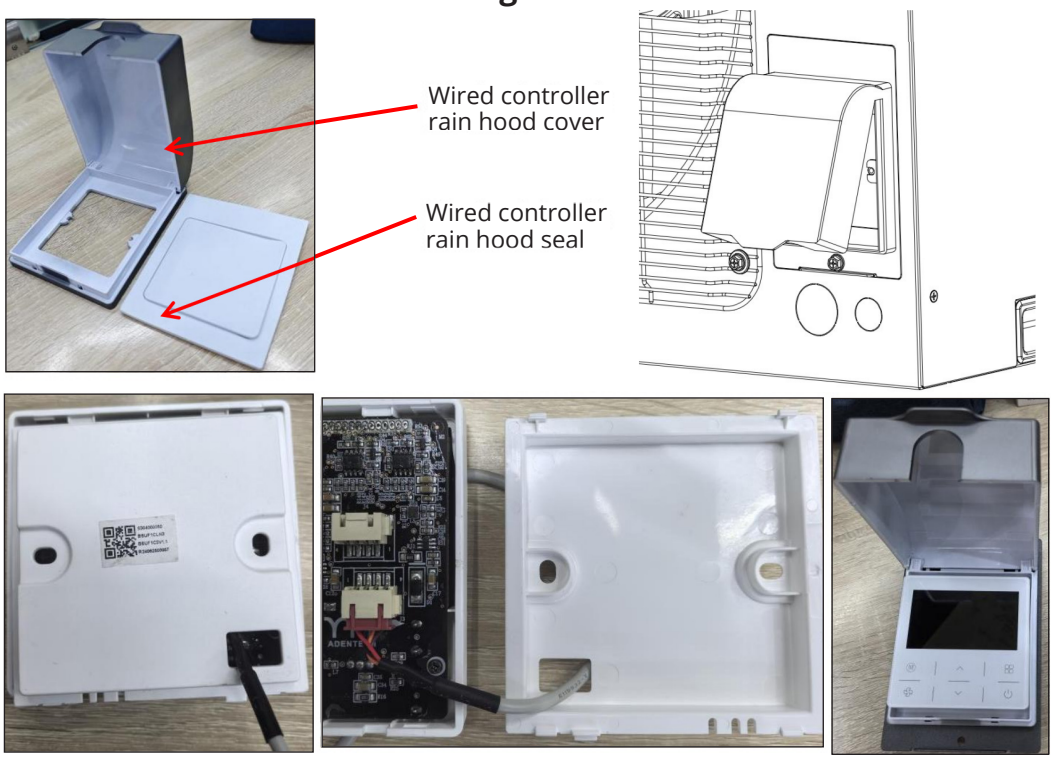
Fig. 3-5



Left: XT1, XT2;
Right: XT4, XT3, 21, 22, 23 connector

The rain hood cover, seal, and wired controller should be installed on the back of the unit via two press-fit nuts, then insert the control cable through the knock out hole to connector #21 (Red).

Fig. 3-6



-Commissioning

After finishing the installation and wiring, the MRCOOL® Compact Refrigeration System should be powered on to verify operation.

- Power the breaker ON,
- Press the ON/OFF button on the wired controller to turn the unit on.

Note: If the unit is installed with ductwork, you will need to set the fan speed through the wired controller according to Table 4-1.

Table 4-1: Fan Speed Adjustment

Fan Speed Adjustment						
Fan Speed	1	2	3	4	5	6
ESP (External Static Pressure), i.n.wc. (Pa.)	0 (0)	0.04 (10)	0.08 (20)	0.12 (30)	0.16 (40)	0.2 (50)
Suggested Equivalent Length of Duct ft. (m.)	0	10 (3.05)	15 (4.57)	20 (6.10)	25 (7.62)	30 (9.14)

- For more information on controls operation and app connection, refer to the unit's wired controller manual.

5.1 Error Codes

! CAUTION

If any of the following conditions occur, turn off the unit immediately.

- The wire is damaged or abnormally warm.
- You smell a burning odor.
- The unit emits loud or abnormal sounds.
- A power fuse blows or the circuit breaker frequently trips.
- Water or other objects fall into or out of the unit.

DO NOT ATTEMPT TO FIX THESE YOURSELF! CONTACT AN AUTHORIZED SERVICE PROVIDER IMMEDIATELY.

When the unit encounters a recognized error, an error code will be displayed; the error codes are described in the tables below:

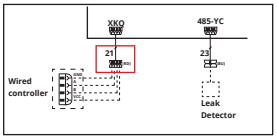
Table 5-1: Errors Codes

Display	Error Information
E0	Indoor Ambient Temperature Sensor Fault
E1	Defrost Temperature Sensor Fault
E2	Outdoor Ambient Temperature Sensor Fault
E3	Condenser Outlet Temperature Sensor Fault
E4	Compressor Discharge Temperature Sensor Fault
EP	Suction Temperature Sensor Fault
C2	Supply Fan Fault
C9	Wired Controller Communication Fault
HA	Enthalpy Enhancement Inlet Gas Temperature Sensor Fault
H0	High Discharge Temperature Fault
H1	System Overload Fault
H4	High Pressure Fault
H5	Low Pressure Fault
H9	Enthalpy Enhancement Outlet Gas Temperature Sensor Fault
L8	Condenser Fan Fault
L9	Prime Power Lost
LU	Drive (VFD) Fault
D5	Four-Way Valve Fault
A5	Auxiliary Breaker Fault
db	Low Pressure Fault
En	Indoor Temperature Fault
LJ	Prime Power Lost

5.2 Uncoded Faults

These faults are not displayed on the wired controller of the unit. The faults and their troubleshooting methods are mentioned in the following parts. *Note: contacting a certified technician is recommended.*

Table 5-2: Faults

Fault	Unit Status	Component to Check	Recommended Action
Power supply	Wired controller is not responding	Power Supply Source	1. Inspect the power supply cable to ensure it is in good condition with no surface damage to the wiring harness, and verify that both ends are securely connected. 2. Use a multimeter to measure the supply voltage. If the measured voltage is outside the range specified on the nameplate, investigate and rectify the power supply abnormality.
Wired Controller Connection		-	1. Replace the connection cable between the wired controller and the unit with the standard communication cable supplied with the unit, and ensure that the cable is intact. 2. Verify that both ends of the cable are connected. 3. Power OFF the unit. 4. Open the wired controller back panel by hand.  5. Reposition the wired controller connection to the location shown below.  6. Close the wired controller panel. 7. Open the electrical junction box/ terminal. 8. Connect the unit's wiring to the adapter labeled as wire/connector number 21.  9. Close the electrical junction box/ terminal.
Integrated drive and control board overload		Integrated Drive and Control Board; Unit	1. If the power supply is confirmed to be normal and the integrated drive and control board fuse is intact, but the integrated drive and control board shows no flashing or indicator LED, it is likely that another component has overloaded and triggered the integrated board overload protection. 2. In this case, allow the system to remain powered OFF for 30 minutes before powering up again.

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