



Installation, Operation and Maintenance Manual Addendum for units with Flammable Refrigerants

ENGLISH INSTRUCTION MANUAL

How to Use this Manual:

This manual gives instructions to be used when installing or servicing Magic Aire units containing Flammable Refrigerants.

For more information refer to:

Installation, Operation, and Maintenance Manual for specific unit model. This manual gives general instructions regarding installation, operation and maintenance.

Catalog brochure for unit dimensions, weights, options, pipe connections, clearances, guide specifications and performance information.

Controls Guide for specific DDC Controls instructions and sequences of operation.

Unit Mounted Wiring Diagram and Label for all electrical connections. Follow NEC (National Electrical Code) and local codes.

NewMagic4 software for faster selection of new equipment.

Website www.magicaire.com for replacement parts guide, software downloads, product data and contact info for your local Magic Aire representative.

Safety Considerations:

Installation and servicing of this unit can be hazardous due to system pressure, electrical components and equipment. Only trained and qualified service personnel should perform all operations. When installing this unit, observe precautions in the literature, tags and labels attached to the equipment, and any other safety precautions that may apply.

WARNING

Personal Protective Equipment (PPE) Required!

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken. **ALWAYS** refer to appropriate MSDS sheets and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate MSDS sheets and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of arc or flash, technicians **MUST** put on all PPE in accordance with NFPA 70E or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit.

Failure to follow instructions could result in death or serious injury.

WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by and unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

Table of Contents and Safety Instructions

Table of Contents	Page	Safety Measures
IOM Intro and How to Use this Manual	1	Magic Aire units are manufactured according to the latest U.S. Safety Standards. Particular emphasis has been placed on the user's safety. Safety icons are explained below. These instructions should be retained throughout the lifetime of the unit. Before installing or operating an unit, read all safety information described in this manual carefully. The warnings and precautions outlined in this manual are relevant to your safety and should therefore be noted and cautioned. Give this manual together with the instruction manual to the customer and inform the customer to keep both manuals for future reference, such as when repositioning or repairing the unit. The manufacturer shall not be liable for damage caused by neglect to follow the instructions in this manual.
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Symbols Explanation

	WARNING RISK OF FIRE. FLAMMABLE REFRIGERANT USED.	This symbol applies to the A2L refrigerant, the type of which is on the label of the unit.
		In the case of this refrigerant, the A2L unit uses a flammable refrigerant.
		Yes, if this refrigerant leaks and is exposed to an open flame or a heated part.
		It may produce harmful gases and pose a fire hazard.

	AVERTISSEMENT RISQUE D'INCENDIE. RÉFRIGÉRANT INFLAMMABLE UTILISÉ.
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Table of Contents and Safety Instructions

Symbols Explanation

	Please read this instruction manual carefully before proceeding.
	Maintenance personnel should read this manual and installation and maintenance manual carefully before operation.
	More information can be found in installation and maintenance manual, control guides, unit wiring diagrams, and other product literature available.

	AVERTISSEMENT RISQUE D'INCENDIE. RÉFRIGÉRANT INFLAMMABLE UTILISÉ.	Consultez le manuel de réparation/le guide du propriétaire avant d'essayer de réparer le produit.
		Toutes les précautions de sécurité doivent être respectées.
		Suivez attentivement les instructions de manipulation conformément aux réglementations nationales. règlements.

Safety Instructions

Safety Icon Explanation



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.

Safety Instructions

WARNING	ELECTRICAL SHOCK HAZARD • Disconnect and lock out power before servicing. • Allow drive components to electrically discharge for a minimum of two minutes before servicing. • Use compressor with grounded system only. • Refer to original equipment wiring diagrams. • Failure to follow these warnings could result in serious personal injury.
WARNING	PRESSURIZED SYSTEM HAZARD • System contains A2L refrigerant and oil under pressure. • Remove refrigerant from both the high and low compressor side before removing compressor. • Never install a system and leave it unattended when it has no charge, a holding charge, or with the service valves closed without electrically locking out the system. • Use only approved refrigerants and refrigeration oils. • Personal safety equipment must be used. • Failure to follow these warnings could result in serious personal injury.
WARNING	BURN HAZARD • Do not touch the compressor until it has cooled down. • Ensure that materials and wiring do not touch high temperature areas of the compressor. • Use caution when brazing system components. • Personal safety equipment must be used. • Failure to follow these warnings could result in serious personal injury or property damage.
WARNING	COMPRESSOR HANDLING • Use the appropriate lifting devices to move compressors. • Personal safety equipment must be used. • Failure to follow these warnings could result in personal injury or property damage.
WARNING	• Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. • The unit shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heating). • Do not pierce or burn. • Be aware that refrigerants may not contain an odor.

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING	TRANSPORT OF EQUIPMENT CONTAINING FLAMMABLE REFRIGERANTS • Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. 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.
WARNING	MARKING OF EQUIPMENT USING SIGNS • Signs for similar appliances (containing flammable refrigerants) used in a work area generally are addressed by local regulations and give 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 instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs. The effectiveness of 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.
WARNING	DISPOSAL OF EQUIPMENT USING FLAMMABLE REFRIGERANTS • Compliance with national regulations
WARNING	STORAGE OF EQUIPMENT/APPLIANCES • The storage of equipment should be in accordance with the manufacturer's instructions.
WARNING	STORAGE OF PACKED (UNSOLD) EQUIPMENT • Storage package protection should be constructed such 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.

Safety Instructions

Precautions for using A2L refrigerant

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WARNING

INFORMATION ON SERVICING

- **Checks to the Area**
Checks to the area Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions should be complied with prior to conducting work on the system.
- **Work procedure**
Work shall be undertaken under a 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 shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
- **Checking for presence of Refrigerant**
The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
- **Presence of Fire Extinguisher**
If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO fire extinguisher adjacent to the charging area.
- **No ignition sources**
 - No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant 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 flammable 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 shall 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 air.

Safety Instructions

Precautions for using A2L refrigerant

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WARNING

INFORMATION ON SERVICING

- **Checks to Refrigeration Equipment**

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification.
- • At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the
- manufacturer's technical department for assistance.
- • The following checks shall be applied to installations using flammable refrigerants:
 - The charge size is in accordance with the room size within which the refrigerant containing parts are installed;
 - The ventilation machinery and outlets are operating adequately and are not obstructed;
 - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
 - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
 - 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.

- **Checks 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 possibility of sparking;
 - (2) That there no live electrical components and wiring are exposed while charging, recovering or purging the system;
 - (3) That there is continuity of earth bonding.

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING	SEALED ELECTRICAL COMPONENTS SHALL BE REPLACED
WARNING	INTRINSICALLY SAFE COMPONENTS MUST BE REPLACED

WARNING	CABLING • Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, 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.
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Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING	DETECTION OF FLAMMABLE REFRIGERANTS - Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. - A halide torch (or any other detector using a naked flame) shall not be used.
WARNING	LEAK DETECTION METHODS The following leak detection methods are deemed acceptable for systems containing flammable refrigerants: - Electronic leak detectors shall be used to detect flammable refrigerants, but 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 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. - If a leak is suspected, all naked flames shall be removed/ extinguished. - If a leakage of refrigerant is found which requires brazing, 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. - Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.
WARNING	REMOVAL AND EVACUATION - When breaking into the refrigerant circuit to make repairs – or for any other purpose –conventional procedures shall be used. - However, it is important that best practice is followed since flammability is a consideration. - The following procedure shall be adhered to: - Remove refrigerant; - Purge the circuit with inert gas; - Evacuate; - Purge again with inert gas; - Open the circuit by cutting or brazing. - The refrigerant charge shall be recovered into the correct recovery cylinders. - The system shall be “flushed” with OFN to render the unit safe. - This process may need to be repeated several times. - Compressed air or oxygen shall not be used for this task. - Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. ⇒ Continued on next page

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING	REMOVAL AND EVACUATION ⇒ Continued from last page • This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. • This operation is absolutely vital if brazing operations on the pipe-work are to take place. • Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.
WARNING	CHARGING PROCEDURES • In addition to conventional charging procedures, the following requirements shall be followed: • Ensure that contamination of different refrigerants does not occur when using charging equipment. • Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. • Cylinders shall be kept upright. • Ensure that the refrigeration system is earthed prior to charging the system with refrigerant. • Label the system when charging is complete (if not already). • Extreme care shall be taken not to overfill the refrigeration system. • Prior to recharging the system it shall be pressure tested with OFN. • The system shall be tested for leak on completion of charging but prior to commissioning. • A follow up leak test shall be carried out before leaving the site.
WARNING	DECOMMISSIONING Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all 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 shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced. a) Become familiar with the equipment and its operation. b) Isolate system electrically. ⇒ Continued on next page

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING	DECOMMISSIONING ⇒ Continued from last page c) 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. d) Pump down refrigerant system, if possible. e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system. f) Make sure that cylinder is situated on the scales before recovery takes place. g) Start the recovery machine and operate in accordance with manufacturer's instructions. h) Do not overfill cylinders. (No more than 80 % volume liquid charge). i) Do not exceed the maximum working pressure of the cylinder, even temporarily. j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off. k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.
WARNING	LABELING Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING

RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice 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 is available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall 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 shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall 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 manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note 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 that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

Safety Instructions

Precautions for using A2L refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING

QUALIFICATION OF WORKERS

The manual shall contain specific about the required qualification of the working personnel for maintenance, service and repair operations. Every working procedure that affects safety means shall only be carried out by competent persons.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

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

- Refrigerant compressors must be employed only for their intended use. Only qualified and authorized HVAC or refrigeration personnel are permitted to install, commission, and maintain this equipment.
- Electrical connections must be made by qualified electrical personnel.

Safety Instructions



- Install this device in accordance with the applicable local laws and regulations at the installation site and follow the procedures specified by the manufacturer.
- When moving or relocating the unit, consult an experienced maintenance person to remove and reinstall the unit.
- Young children should be controlled to ensure that they do not come to play with this appliance.
- This unit is not intended for use by persons (including children) with physical, sensory or mental impairments or lack of experience or knowledge, unless their use is supervised or directed by those responsible for their safety.
- The method of connection to the unit to the electrical supply and interconnection of separate components can be found in the Installation and Maintenance Manual of unit.
- Details of type and rating of fuses, or rating of circuit breakers can be found in the Installation and Maintenance Manual of unit.
- Maximum and minimum water or brine operating temperatures can be found in Installation and Maintenance Manual of the unit when applicable.
- Maximum and minimum water or brine operating pressures can be found in Installation and Maintenance Manual of the unit when applicable.
- Instructions for how the unit is to be fixed can be found in Installation and Maintenance Manual of the unit.
- Equipment piping in the occupied space shall be installed in such a way to protect against accidental damage in operation and service.
- Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping.
- Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris.
- Provision shall be made for expansion and contraction of long runs of piping.
- Piping in refrigerant systems shall be so designed and installed to minimize the likelihood the hydraulic shock damaging the system.
- Solenoid valves shall be correctly positioned in the piping to avoid hydraulic shock.
- Solenoid valves shall not block in liquid refrigerant unless adequate relief is provided to the refrigerant system low pressure side.
- Steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation.
- Flexible pipe elements shall be protected against mechanical damage, excessive stress by torsion, or other forces. They should be checked for mechanical damage annually.
- The indoor equipment and pipes shall be securely mounted and guarded such that accidental rupture of equipment cannot occur from such events as moving furniture or reconstruction activities.
- Where safety shut off valves are specified, the minimum area may be determined based on the maximum amount of refrigerant that can be leaked. See Installation and Maintenance Manual of the unit when applicable.

Safety Instructions



- Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 25% of the maximum allowable pressure. No leak shall be detected.
- For mechanical ventilation, the air extraction opening from the room shall be located equal or below the refrigerant release point. For floor mounted units, it shall be as low as practicable. The air extraction openings shall be located in a sufficient distance from the air intake openings to prevent re-circulation to the space.
- For appliances using A2L refrigerants, connected via an air duct system to one of more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct. Installation of pipe-work shall be kept to a minimum, that pipe-work shall be protected from physical damage and, in the case of flammable refrigerants, shall not be installed in a unventilated area.
- If the unventilated area is smaller than the minimum installation area, the unit should not be installed in this area.
- The installation height is the minimum installation height, that is, the minimum installation height of the cold air pipe or indoor unit, whichever is the lowest. For Minimum Room and Refrigerant packaging cost table, Please refer to unit Installation and Maintenance manual.
- For partial units, complying with partial unit requirements of Standard, they must be connected to units that comply to corresponding partial unit requirements of Standard, UL 60335-2-40/CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.
- For spaces where refrigerant pipes are allowed, including that pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical code, ICC International Mechanical Code, or CSA 852.
- All field joints shall be accessible for inspection prior to being covered or enclosed.
- For units containing flammable refrigerants, the minimum floor area of the room can be found in unit Installation and Maintenance Manual.
- After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
- Where addition of charge is required to complete installation, see Installation and Maintenance manual of unit to determine the additional refrigerant charge with Interconnecting refrigerant piping length and diameter shall be taken into consideration.
- For the minimum rated airflow see the Installation and Maintenance manual of unit.
- For information on handling, installation, cleaning, servicing and disposal of refrigerant, see national regulations.
- For units containing flammable refrigerants, the minimum installed height can be found in unit Installation and Maintenance Manual.
- For add on heat pumps with flammable refrigerants, see the manufacturers unit Installation and Maintenance Manual for critical-to-safety wiring connection of the leak detection sensor or leak detection system.
- For appliances with refrigerant detection systems, the function and operation and required servicing measures.

Safety Instructions



- Refrigerant sensors for refrigerant detection systems shall only be replaced with sensors specified by the unit manufacture.
- For add on heat pumps with flammable refrigerants, see the manufacturers unit Installation and Maintenance Manual for critical-to-safety wiring connection of the leak detection sensor or leak detection system.
- For appliances with refrigerant detection systems, the function and operation and required servicing measures.
- Refrigerant sensors for refrigerant detection systems shall only be replaced with sensors specified by the unit manufacture.
- An unventilated area where the unit using flammable refrigerants is installed shall be so constructed that should any refrigerant leak, It will not stagnate so as to create a fire or explosion hazard.
- A non-fixed unit shall be stored in an area where the room size corresponds to the room area, or room volume if complying with as specified for operation in the unit Installation and Maintenance Manual.
- A non-fixed unit shall be stored in a room without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater, hot surfaces).
- If unit is connected via an air duct system to one or more rooms with A2L refrigerants and are installed in a room with an area less than A_{min} as determined in Installation and Maintenance manual or installed in a room with an effective dispersal volume less than the minimum as found in the Installation and Maintenance manual , that room shall be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (for e.g. an operating electric heater, hot surfaces).
- A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.
- For units using A2L refrigerants connected via an air duct system to one or more rooms, all approved auxiliary devices by manufacturer will be found in the unit Installation and Maintenance Manual.
- Non-duct connected appliances containing A2L refrigerants with the supply and return air openings in the conditioned space may have the body of the unit may be installed in open areas such as false ceilings not being used as return air plenums, as long as the conditioned air does not directly communicate with the air of the false ceiling.
- 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 unit and any external connections are also provided with a sensor immediately below the return air plenum duct joint.
- For equipment that requires connection to a water supply, see the unit Installation and Maintenance Manual for the quality of water that is required for this operation
- If a potable water source is used for the equipment's water supply, the source water supply shall be protected against back siphonage by the equipment.

Pre-Installation

Pre-Installation

Immediately inspect each unit for damage upon receipt. Inspect units for external and concealed damage immediately. File any damage claims in accordance with the Terms and Conditions of sale. Do not repair damaged units without written authorization. Protect stored units from damage.

Protect Units from Damage

To maintain warranty, protect units against adverse weather, theft, vandalism, and debris on jobsite. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor and fan wheels. If the equipment is stored for any length of time before installation, it should remain in its shipping container in a clean, dry, and climate controlled area. The warning label on the side of the unit must be observed. This label designates that at least two pallets must be used under the Unit when moving.

Prepare Jobsite for Unit Installation

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire, and duct connection requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their part of the installation. Installation must comply with all applicable local codes.

Identify and Prepare Units

1. Be sure power requirements match available power source. Refer to the unit nameplate and wiring diagram.
2. Remove front access panels from the unit. Retain the $\frac{5}{32}$ inch socket head fasteners and panels for reinstallation later.
3. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for shipping damage and fan obstructions.



Heavy Objects!

Always lift unit with fork trucks or other special lifting device following the recommended procedures. Failure to properly lift the unit as instructed, could result in death or serious injury.

Electrical Connections

Electrical Connections

Refer to unit serial plate for required supply voltage, amperage, and required circuit ampacities. Refer to unit wiring diagram for unit and field wiring. The unit should never be controlled by any device other than the factory supplied controls unless prior factory authorization is obtained.

All electrical connections should be made by qualified personnel and be in accordance with governing codes and ordinances. Any modification of unit wiring without factory authorization will invalidate all factory warranties and nullify any agency listings.

WARNING

Proper Field Wiring and Grounding Required! All field wiring must be performed by qualified personnel. Improperly installed and grounded field wiring poses Fire and Electrocutation hazards. To avoid these hazards, you must follow requirements for field wiring installation and grounding as described in **NEC** and your local/state electrical codes. Failure to follow code could result in death or serious injury.

WARNING

WARNING: Hazardous voltage. Only qualified personnel must install the electrical service. Disconnect and Lock Out all incoming power sources and ensure that all supply mains wiring is disconnected on all poles as allowed by the NEC and local codes before connecting, servicing, or installing unit.

WARNING: This appliance must be permanently grounded in accordance with the National Electrical Code and local code requirements. All field wiring must conform to the Class II temperature limitations described in the NEC.

Installation

Refer to unit Installation, Operation, and Maintenance Manual (IOM) for specific guidance for each unit with Maximum Refrigerant Charge and Minimum Room Area for specific unit in that unit's IOM. Or, Actual Refrigerant Charge and Minimum Room Area by installation type tables can be used based on installation type and start on page 21.

Refer to Submittal for unit dimensions, weights, options, pipe connections, clearances, guide specifications and performance information.

Refer to Controls Guide for specific DDC Controls instructions and sequences of operation including the sequence of operation for the leak detection system if installed.

Refer to Unit Mounted Wiring Diagram and Label for all electrical connections. Follow NEC (National Electrical Code) and local codes.

UL 60335

Magic Aire refrigerant products that include a A2L refrigerant coil comply with UL safety standard UL 60335, which defines safe design and use strategies for equipment using A2L refrigerants. This standard limits the refrigerant concentration in a space in the event of a refrigerant leak.

To meet the requirements, the UL standard defines minimum room area, refrigerant charge limit, and minimum ventilation airflow requirements and/or use of a unit refrigerant leak detection system.

Minimum Room Area Limits Equipment with R-454B charge amounts greater than 3.91 lb per circuit may require additional circulation or ventilation airflow mitigation strategies. If the room area is below the Amin threshold, continuous ventilation where the fan does not turn off except for service or a leak detection system must be used to remove refrigerant in the event of a leak.

Split systems minimum room area requirements need to be determined after final field charging. Use the following tables and the largest final circuit charge to determine the systems Amin value. Record the final charge value on the label provided on the unit.

WARNING

Failure to install units in areas that meet these requirements could result in death or serious injury.

If unit is connected via an air duct system to one or more rooms with A2L refrigerants and are installed in a room with an area less than Amin as determined in Installation and Maintenance manual or installed in a room with an effective dispersal volume less than the minimum as found in the Installation and Maintenance manual, that room shall be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (for e.g. an operating electric heater, hot surfaces).

For units using A2L refrigerants connected via an air duct system to one or more rooms, all approved auxiliary devices by manufacturer will be found in the unit Installation and Maintenance Manual

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	FLOOR	0.11	0.25	0	0	0	0	0
R454B	FLOOR	0.23	0.50	0	0	0	0	0
R454B	FLOOR	0.34	0.75	0	0	0	0	0
R454B	FLOOR	0.45	1.00	0	0	0	0	0
R454B	FLOOR	0.57	1.25	0	0	0	0	0
R454B	FLOOR	0.68	1.50	0	0	0	0	0
R454B	FLOOR	0.80	1.75	0	0	0	0	0
R454B	FLOOR	0.91	2.00	0	0	0	0	0
R454B	FLOOR	1.02	2.25	0	0	0	0	0
R454B	FLOOR	1.14	2.50	0	0	0	0	0
R454B	FLOOR	1.25	2.75	0	0	0	0	0
R454B	FLOOR	1.36	3.00	0	0	0	0	0
R454B	FLOOR	1.48	3.25	0	0	0	0	0
R454B	FLOOR	1.59	3.50	0	0	0	0	0
R454B	FLOOR	1.70	3.75	0	0	0	0	0
R454B	FLOOR	1.82	4.00	31	332	108	20	220
R454B	FLOOR	1.93	4.25	35	375	115	22	234
R454B	FLOOR	2.05	4.50	39	420	122	23	248
R454B	FLOOR	2.16	4.75	43	468	129	24	262
R454B	FLOOR	2.27	5.00	48	518	136	26	275
R454B	FLOOR	2.39	5.25	53	572	142	27	289
R454B	FLOOR	2.50	5.50	58	627	149	28	303
R454B	FLOOR	2.61	5.75	64	686	156	29	317
R454B	FLOOR	2.73	6.00	69	746	163	31	331
R454B	FLOOR	2.84	6.25	75	810	169	32	344
R454B	FLOOR	2.95	6.50	81	876	176	33	358
R454B	FLOOR	3.07	6.75	88	945	183	35	372
R454B	FLOOR	3.18	7.00	94	1016	190	36	386
R454B	FLOOR	3.30	7.25	101	1090	197	37	399
R454B	FLOOR	3.41	7.50	108	1166	203	38	413
R454B	FLOOR	3.52	7.75	116	1245	210	40	427
R454B	FLOOR	3.64	8.00	123	1327	217	41	441
R454B	FLOOR	3.75	8.25	131	1411	224	42	455
R454B	FLOOR	3.86	8.50	139	1498	230	44	468
R454B	FLOOR	3.98	8.75	147	1588	237	45	482

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	FLOOR	4.09	9.00	156	1680	244	46	496
R454B	FLOOR	4.20	9.25	165	1774	251	47	510
R454B	FLOOR	4.32	9.50	174	1871	258	49	523
R454B	FLOOR	4.43	9.75	183	1971	264	50	537
R454B	FLOOR	4.55	10.00	193	2074	271	51	551
R454B	FLOOR	4.66	10.25	202	2179	278	52	565
R454B	FLOOR	4.77	10.50	212	2286	285	54	579
R454B	FLOOR	4.89	10.75	223	2396	291	55	592
R454B	FLOOR	5.00	11.00	233	2509	298	56	606
R454B	FLOOR	5.11	11.25	244	2624	305	58	620
R454B	FLOOR	5.23	11.50	255	2742	312	59	634
R454B	FLOOR	5.34	11.75	266	2863	319	60	647
R454B	FLOOR	5.45	12.00	277	2986	325	61	661
R454B	FLOOR	5.57	12.25	289	3112	332	63	675
R454B	FLOOR	5.68	12.50	301	3240	339	64	689
R454B	FLOOR	5.80	12.75	313	3371	346	65	703
R454B	FLOOR	5.91	13.00	326	3504	352	67	716
R454B	FLOOR	6.02	13.25	338	3640	359	68	730
R454B	FLOOR	6.14	13.50	351	3779	366	69	744
R454B	FLOOR	6.25	13.75	364	3920	373	70	758
R454B	FLOOR	6.36	14.00	378	4064	380	72	771
R454B	FLOOR	6.48	14.25	391	4211	386	73	785
R454B	FLOOR	6.59	14.50	405	4360	393	74	799
R454B	FLOOR	6.70	14.75	419	4511	400	76	813
R454B	FLOOR	6.82	15.00	433	4666	407	77	826
R454B	FLOOR	6.93	15.25	448	4822	414	78	840
R454B	FLOOR	7.05	15.50	463	4982	420	79	854
R454B	FLOOR	7.16	15.75	478	5144	427	81	868
R454B	FLOOR	7.27	16.00	493	5308	434	82	882
R454B	FLOOR	7.39	16.25	509	5475	441	83	895
R454B	FLOOR	7.50	16.50	524	5645	447	84	909
R454B	FLOOR	7.61	16.75	540	5818	454	86	923
R454B	FLOOR	7.73	17.00	557	5993	461	87	937
R454B	FLOOR	7.84	17.25	573	6170	468	88	950
R454B	FLOOR	7.95	17.50	590	6350	475	90	964

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	FLOOR	8.07	17.75	607	6533	481	91	978
R454B	FLOOR	8.18	18.00	624	6718	488	92	992
R454B	FLOOR	8.30	18.25	642	6906	495	93	1006
R454B	FLOOR	8.41	18.50	659	7097	502	95	1019
R454B	FLOOR	8.52	18.75	677	7290	508	96	1033
R454B	FLOOR	8.64	19.00	695	7486	515	97	1047
R454B	FLOOR	8.75	19.25	714	7684	522	99	1061
R454B	FLOOR	8.86	19.50	733	7885	529	100	1074
R454B	FLOOR	8.98	19.75	751	8088	536	101	1088
R454B	FLOOR	9.09	20.00	771	8294	542	102	1102
R454B	FLOOR	9.20	20.25	790	8503	549	104	1116
R454B	FLOOR	9.32	20.50	810	8714	556	105	1130
R454B	FLOOR	9.43	20.75	829	8928	563	106	1143
R454B	FLOOR	9.55	21.00	850	9144	569	107	1157
R454B	FLOOR	9.66	21.25	870	9363	576	109	1171
R454B	FLOOR	9.77	21.50	890	9585	583	110	1185
R454B	FLOOR	9.89	21.75	911	9809	590	111	1198
R454B	FLOOR	10.00	22.00	932	10036	597	113	1212
R454B	FLOOR	10.11	22.25	954	10265	603	114	1226
R454B	FLOOR	10.23	22.50	975	10497	610	115	1240
R454B	FLOOR	10.34	22.75	997	10732	617	116	1253
R454B	FLOOR	10.45	23.00	1019	10969	624	118	1267
R454B	FLOOR	10.57	23.25	1041	11209	630	119	1281
R454B	FLOOR	10.68	23.50	1064	11451	637	120	1295
R454B	FLOOR	10.80	23.75	1087	11696	644	122	1309
R454B	FLOOR	10.91	24.00	1110	11944	651	123	1322
R454B	FLOOR	11.02	24.25	1133	12194	658	124	1336
R454B	FLOOR	11.14	24.50	1156	12447	664	125	1350
R454B	FLOOR	11.25	24.75	1180	12702	671	127	1364
R454B	FLOOR	11.36	25.00	1204	12960	678	128	1377
R454B	FLOOR	11.48	25.25	1228	13220	685	129	1391
R454B	FLOOR	11.59	25.50	1253	13483	691	131	1405
R454B	FLOOR	11.70	25.75	1277	13749	698	132	1419
R454B	FLOOR	11.82	26.00	1302	14017	705	133	1433
R454B	FLOOR	11.93	26.25	1327	14288	712	134	1446

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	FLOOR	12.05	26.50	1353	14562	719	136	1460
R454B	FLOOR	12.16	26.75	1378	14838	725	137	1474
R454B	FLOOR	12.27	27.00	1404	15116	732	138	1488
R454B	FLOOR	12.39	27.25	1430	15397	739	139	1501
R454B	FLOOR	12.50	27.50	1457	15681	746	141	1515
R454B	FLOOR	12.61	27.75	1483	15968	752	142	1529
R454B	FLOOR	12.73	28.00	1510	16257	759	143	1543
R454B	FLOOR	12.84	28.25	1537	16548	766	145	1557
R454B	FLOOR	12.95	28.50	1565	16842	773	146	1570
R454B	FLOOR	13.07	28.75	1592	17139	780	147	1584
R454B	FLOOR	13.18	29.00	1620	17439	786	148	1598
R454B	FLOOR	13.30	29.25	1648	17741	793	150	1612
R454B	FLOOR	13.41	29.50	1676	18045	800	151	1625
R454B	FLOOR	13.52	29.75	1705	18352	807	152	1639
R454B	FLOOR	13.64	30.00	1734	18662	813	154	1653
R454B	FLOOR	13.75	30.25	1763	18974	820	155	1667
R454B	FLOOR	13.86	30.50	1792	19289	827	156	1680
R454B	FLOOR	13.98	30.75	1822	19607	834	157	1694
R454B	FLOOR	14.09	31.00	1851	19927	841	159	1708
R454B	FLOOR	14.20	31.25	1881	20250	847	160	1722
R454B	FLOOR	14.32	31.50	1911	20575	854	161	1736
R454B	FLOOR	14.43	31.75	1942	20903	861	163	1749
R454B	FLOOR	14.55	32.00	1973	21233	868	164	1763
R454B	FLOOR	14.66	32.25	2004	21566	874	165	1777
R454B	FLOOR	14.77	32.50	2035	21902	881	166	1791
R454B	FLOOR	14.89	32.75	2066	22240	888	168	1804
R454B	FLOOR	15.00	33.00	2098	22581	895	169	1818

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	CEILING	0.11	0.25	0	0	0	0	0
R454B	CEILING	0.23	0.50	0	0	0	0	0
R454B	CEILING	0.34	0.75	0	0	0	0	0
R454B	CEILING	0.45	1.00	0	0	0	0	0
R454B	CEILING	0.57	1.25	0	0	0	0	0
R454B	CEILING	0.68	1.50	0	0	0	0	0
R454B	CEILING	0.80	1.75	0	0	0	0	0
R454B	CEILING	0.91	2.00	0	0	0	0	0
R454B	CEILING	1.02	2.25	0	0	0	0	0
R454B	CEILING	1.14	2.50	0	0	0	0	0
R454B	CEILING	1.25	2.75	0	0	0	0	0
R454B	CEILING	1.36	3.00	0	0	0	0	0
R454B	CEILING	1.48	3.25	0	0	0	0	0
R454B	CEILING	1.59	3.50	0	0	0	0	0
R454B	CEILING	1.70	3.75	0	0	0	0	0
R454B	CEILING	1.82	4.00	6	60	108	6	60
R454B	CEILING	1.93	4.25	6	64	115	6	64
R454B	CEILING	2.05	4.50	6	68	122	6	68
R454B	CEILING	2.16	4.75	7	71	129	7	71
R454B	CEILING	2.27	5.00	7	75	136	7	75
R454B	CEILING	2.39	5.25	7	79	142	7	79
R454B	CEILING	2.50	5.50	8	83	149	8	83
R454B	CEILING	2.61	5.75	8	86	156	8	86
R454B	CEILING	2.73	6.00	8	90	163	8	90
R454B	CEILING	2.84	6.25	9	94	169	9	94
R454B	CEILING	2.95	6.50	9	98	176	9	98
R454B	CEILING	3.07	6.75	9	101	183	9	101
R454B	CEILING	3.18	7.00	10	105	190	10	105
R454B	CEILING	3.30	7.25	10	109	197	10	109
R454B	CEILING	3.41	7.50	10	113	203	10	113
R454B	CEILING	3.52	7.75	11	116	210	11	116
R454B	CEILING	3.64	8.00	11	120	217	11	120
R454B	CEILING	3.75	8.25	12	124	224	12	124
R454B	CEILING	3.86	8.50	12	128	230	12	128
R454B	CEILING	3.98	8.75	12	131	237	12	131

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.
4. Ceiling height defined as 2.2 meters or 87 inches. This will include any ductwork minimum height.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	CEILING	4.09	9.00	13	135	244	13	135
R454B	CEILING	4.20	9.25	13	139	251	13	139
R454B	CEILING	4.32	9.50	13	143	258	13	143
R454B	CEILING	4.43	9.75	14	147	264	14	147
R454B	CEILING	4.55	10.00	14	154	271	14	150
R454B	CEILING	4.66	10.25	15	162	278	14	154
R454B	CEILING	4.77	10.50	16	170	285	15	158
R454B	CEILING	4.89	10.75	17	178	291	15	162
R454B	CEILING	5.00	11.00	17	187	298	15	165
R454B	CEILING	5.11	11.25	18	195	305	16	169
R454B	CEILING	5.23	11.50	19	204	312	16	173
R454B	CEILING	5.34	11.75	20	213	319	16	177
R454B	CEILING	5.45	12.00	21	222	325	17	180
R454B	CEILING	5.57	12.25	22	231	332	17	184
R454B	CEILING	5.68	12.50	22	241	339	17	188
R454B	CEILING	5.80	12.75	23	251	346	18	192
R454B	CEILING	5.91	13.00	24	261	352	18	195
R454B	CEILING	6.02	13.25	25	271	359	18	199
R454B	CEILING	6.14	13.50	26	281	366	19	203
R454B	CEILING	6.25	13.75	27	292	373	19	207
R454B	CEILING	6.36	14.00	28	302	380	20	210
R454B	CEILING	6.48	14.25	29	313	386	20	214
R454B	CEILING	6.59	14.50	30	324	393	20	218
R454B	CEILING	6.70	14.75	31	336	400	21	222
R454B	CEILING	6.82	15.00	32	347	407	21	225
R454B	CEILING	6.93	15.25	33	359	414	21	229
R454B	CEILING	7.05	15.50	34	371	420	22	233
R454B	CEILING	7.16	15.75	36	383	427	22	237
R454B	CEILING	7.27	16.00	37	395	434	22	240
R454B	CEILING	7.39	16.25	38	407	441	23	244
R454B	CEILING	7.50	16.50	39	420	447	23	248
R454B	CEILING	7.61	16.75	40	433	454	23	252
R454B	CEILING	7.73	17.00	41	446	461	24	255
R454B	CEILING	7.84	17.25	43	459	468	24	259
R454B	CEILING	7.95	17.50	44	472	475	24	263

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.
4. Ceiling height defined as 2.2 meters or 87 inches. This will include any ductwork minimum height.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	CEILING	8.07	17.75	45	486	481	25	267
R454B	CEILING	8.18	18.00	46	500	488	25	270
R454B	CEILING	8.30	18.25	48	514	495	25	274
R454B	CEILING	8.41	18.50	49	528	502	26	278
R454B	CEILING	8.52	18.75	50	542	508	26	282
R454B	CEILING	8.64	19.00	52	557	515	27	286
R454B	CEILING	8.75	19.25	53	572	522	27	289
R454B	CEILING	8.86	19.50	54	586	529	27	293
R454B	CEILING	8.98	19.75	56	602	536	28	297
R454B	CEILING	9.09	20.00	57	617	542	28	301
R454B	CEILING	9.20	20.25	59	632	549	28	304
R454B	CEILING	9.32	20.50	60	648	556	29	308
R454B	CEILING	9.43	20.75	62	664	563	29	312
R454B	CEILING	9.55	21.00	63	680	569	29	316
R454B	CEILING	9.66	21.25	65	696	576	30	319
R454B	CEILING	9.77	21.50	66	713	583	30	323
R454B	CEILING	9.89	21.75	68	730	590	30	327
R454B	CEILING	10.00	22.00	69	746	597	31	331
R454B	CEILING	10.11	22.25	71	764	603	31	334
R454B	CEILING	10.23	22.50	73	781	610	31	338
R454B	CEILING	10.34	22.75	74	798	617	32	342
R454B	CEILING	10.45	23.00	76	816	624	32	346
R454B	CEILING	10.57	23.25	77	834	630	32	349
R454B	CEILING	10.68	23.50	79	852	637	33	353
R454B	CEILING	10.80	23.75	81	870	644	33	357
R454B	CEILING	10.91	24.00	83	888	651	34	361
R454B	CEILING	11.02	24.25	84	907	658	34	364
R454B	CEILING	11.14	24.50	86	926	664	34	368
R454B	CEILING	11.25	24.75	88	945	671	35	372
R454B	CEILING	11.36	25.00	90	964	678	35	376
R454B	CEILING	11.48	25.25	91	983	685	35	379
R454B	CEILING	11.59	25.50	93	1003	691	36	383
R454B	CEILING	11.70	25.75	95	1023	698	36	387
R454B	CEILING	11.82	26.00	97	1043	705	36	391
R454B	CEILING	11.93	26.25	99	1063	712	37	394

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.
4. Ceiling height defined as 2.2 meters or 87 inches. This will include any ductwork minimum height.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	CEILING	12.05	26.50	101	1083	719	37	398
R454B	CEILING	12.16	26.75	103	1104	725	37	402
R454B	CEILING	12.27	27.00	104	1124	732	38	406
R454B	CEILING	12.39	27.25	106	1145	739	38	409
R454B	CEILING	12.50	27.50	108	1166	746	38	413
R454B	CEILING	12.61	27.75	110	1188	752	39	417
R454B	CEILING	12.73	28.00	112	1209	759	39	421
R454B	CEILING	12.84	28.25	114	1231	766	39	425
R454B	CEILING	12.95	28.50	116	1253	773	40	428
R454B	CEILING	13.07	28.75	118	1275	780	40	432
R454B	CEILING	13.18	29.00	121	1297	786	40	436
R454B	CEILING	13.30	29.25	123	1320	793	41	440
R454B	CEILING	13.41	29.50	125	1342	800	41	443
R454B	CEILING	13.52	29.75	127	1365	807	42	447
R454B	CEILING	13.64	30.00	129	1388	813	42	451
R454B	CEILING	13.75	30.25	131	1411	820	42	455
R454B	CEILING	13.86	30.50	133	1435	827	43	458
R454B	CEILING	13.98	30.75	135	1458	834	43	462
R454B	CEILING	14.09	31.00	138	1482	841	43	466
R454B	CEILING	14.20	31.25	140	1506	847	44	470
R454B	CEILING	14.32	31.50	142	1530	854	44	473
R454B	CEILING	14.43	31.75	144	1555	861	44	477
R454B	CEILING	14.55	32.00	147	1579	868	45	481
R454B	CEILING	14.66	32.25	149	1604	874	45	485
R454B	CEILING	14.77	32.50	151	1629	881	45	488
R454B	CEILING	14.89	32.75	154	1654	888	46	492
R454B	CEILING	15.00	33.00	156	1680	895	46	496

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.
4. Ceiling height defined as 2.2 meters or 87 inches. This will include any ductwork minimum height.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	ROOF	0.11	0.25	0	0	0	0	0
R454B	ROOF	0.23	0.50	0	0	0	0	0
R454B	ROOF	0.34	0.75	0	0	0	0	0
R454B	ROOF	0.45	1.00	0	0	0	0	0
R454B	ROOF	0.57	1.25	0	0	0	0	0
R454B	ROOF	0.68	1.50	0	0	0	0	0
R454B	ROOF	0.80	1.75	0	0	0	0	0
R454B	ROOF	0.91	2.00	0	0	0	0	0
R454B	ROOF	1.02	2.25	0	0	0	0	0
R454B	ROOF	1.14	2.50	0	0	0	0	0
R454B	ROOF	1.25	2.75	0	0	0	0	0
R454B	ROOF	1.36	3.00	0	0	0	0	0
R454B	ROOF	1.48	3.25	0	0	0	0	0
R454B	ROOF	1.59	3.50	0	0	0	0	0
R454B	ROOF	1.70	3.75	0	0	0	0	0
R454B	ROOF	1.82	4.00	6	60	108	6	60
R454B	ROOF	1.93	4.25	6	64	115	6	64
R454B	ROOF	2.05	4.50	6	68	122	6	68
R454B	ROOF	2.16	4.75	7	71	129	7	71
R454B	ROOF	2.27	5.00	7	75	136	7	75
R454B	ROOF	2.39	5.25	7	79	142	7	79
R454B	ROOF	2.50	5.50	8	83	149	8	83
R454B	ROOF	2.61	5.75	8	86	156	8	86
R454B	ROOF	2.73	6.00	8	90	163	8	90
R454B	ROOF	2.84	6.25	9	94	169	9	94
R454B	ROOF	2.95	6.50	9	98	176	9	98
R454B	ROOF	3.07	6.75	9	101	183	9	101
R454B	ROOF	3.18	7.00	10	105	190	10	105
R454B	ROOF	3.30	7.25	10	109	197	10	109
R454B	ROOF	3.41	7.50	10	113	203	10	113
R454B	ROOF	3.52	7.75	11	116	210	11	116
R454B	ROOF	3.64	8.00	11	120	217	11	120
R454B	ROOF	3.75	8.25	12	124	224	12	124
R454B	ROOF	3.86	8.50	12	128	230	12	128
R454B	ROOF	3.98	8.75	12	131	237	12	131

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	ROOF	4.09	9.00	13	135	244	13	135
R454B	ROOF	4.20	9.25	13	139	251	13	139
R454B	ROOF	4.32	9.50	13	143	258	13	143
R454B	ROOF	4.43	9.75	14	147	264	14	147
R454B	ROOF	4.55	10.00	14	154	271	14	150
R454B	ROOF	4.66	10.25	15	162	278	14	154
R454B	ROOF	4.77	10.50	16	170	285	15	158
R454B	ROOF	4.89	10.75	17	178	291	15	162
R454B	ROOF	5.00	11.00	17	187	298	15	165
R454B	ROOF	5.11	11.25	18	195	305	16	169
R454B	ROOF	5.23	11.50	19	204	312	16	173
R454B	ROOF	5.34	11.75	20	213	319	16	177
R454B	ROOF	5.45	12.00	21	222	325	17	180
R454B	ROOF	5.57	12.25	22	231	332	17	184
R454B	ROOF	5.68	12.50	22	241	339	17	188
R454B	ROOF	5.80	12.75	23	251	346	18	192
R454B	ROOF	5.91	13.00	24	261	352	18	195
R454B	ROOF	6.02	13.25	25	271	359	18	199
R454B	ROOF	6.14	13.50	26	281	366	19	203
R454B	ROOF	6.25	13.75	27	292	373	19	207
R454B	ROOF	6.36	14.00	28	302	380	20	210
R454B	ROOF	6.48	14.25	29	313	386	20	214
R454B	ROOF	6.59	14.50	30	324	393	20	218
R454B	ROOF	6.70	14.75	31	336	400	21	222
R454B	ROOF	6.82	15.00	32	347	407	21	225
R454B	ROOF	6.93	15.25	33	359	414	21	229
R454B	ROOF	7.05	15.50	34	371	420	22	233
R454B	ROOF	7.16	15.75	36	383	427	22	237
R454B	ROOF	7.27	16.00	37	395	434	22	240
R454B	ROOF	7.39	16.25	38	407	441	23	244
R454B	ROOF	7.50	16.50	39	420	447	23	248
R454B	ROOF	7.61	16.75	40	433	454	23	252
R454B	ROOF	7.73	17.00	41	446	461	24	255
R454B	ROOF	7.84	17.25	43	459	468	24	259
R454B	ROOF	7.95	17.50	44	472	475	24	263

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	ROOF	8.07	17.75	45	486	481	25	267
R454B	ROOF	8.18	18.00	46	500	488	25	270
R454B	ROOF	8.30	18.25	48	514	495	25	274
R454B	ROOF	8.41	18.50	49	528	502	26	278
R454B	ROOF	8.52	18.75	50	542	508	26	282
R454B	ROOF	8.64	19.00	52	557	515	27	286
R454B	ROOF	8.75	19.25	53	572	522	27	289
R454B	ROOF	8.86	19.50	54	586	529	27	293
R454B	ROOF	8.98	19.75	56	602	536	28	297
R454B	ROOF	9.09	20.00	57	617	542	28	301
R454B	ROOF	9.20	20.25	59	632	549	28	304
R454B	ROOF	9.32	20.50	60	648	556	29	308
R454B	ROOF	9.43	20.75	62	664	563	29	312
R454B	ROOF	9.55	21.00	63	680	569	29	316
R454B	ROOF	9.66	21.25	65	696	576	30	319
R454B	ROOF	9.77	21.50	66	713	583	30	323
R454B	ROOF	9.89	21.75	68	730	590	30	327
R454B	ROOF	10.00	22.00	69	746	597	31	331
R454B	ROOF	10.11	22.25	71	764	603	31	334
R454B	ROOF	10.23	22.50	73	781	610	31	338
R454B	ROOF	10.34	22.75	74	798	617	32	342
R454B	ROOF	10.45	23.00	76	816	624	32	346
R454B	ROOF	10.57	23.25	77	834	630	32	349
R454B	ROOF	10.68	23.50	79	852	637	33	353
R454B	ROOF	10.80	23.75	81	870	644	33	357
R454B	ROOF	10.91	24.00	83	888	651	34	361
R454B	ROOF	11.02	24.25	84	907	658	34	364
R454B	ROOF	11.14	24.50	86	926	664	34	368
R454B	ROOF	11.25	24.75	88	945	671	35	372
R454B	ROOF	11.36	25.00	90	964	678	35	376
R454B	ROOF	11.48	25.25	91	983	685	35	379
R454B	ROOF	11.59	25.50	93	1003	691	36	383
R454B	ROOF	11.70	25.75	95	1023	698	36	387
R454B	ROOF	11.82	26.00	97	1043	705	36	391
R454B	ROOF	11.93	26.25	99	1063	712	37	394

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Actual Refrigerant Charge and Minimum Room Area

A2L	Installation	Actual System Charge Wt (kg)	Actual System Charge Wt (lb)	Area Min (sqm)	Area Min (sqft)	Min CFM	Area Min (sqm) Sensor or Continuous Ventilation	Area Min (sqft) Sensor or Continuous Ventilation
R454B	ROOF	12.05	26.50	101	1083	719	37	398
R454B	ROOF	12.16	26.75	103	1104	725	37	402
R454B	ROOF	12.27	27.00	104	1124	732	38	406
R454B	ROOF	12.39	27.25	106	1145	739	38	409
R454B	ROOF	12.50	27.50	108	1166	746	38	413
R454B	ROOF	12.61	27.75	110	1188	752	39	417
R454B	ROOF	12.73	28.00	112	1209	759	39	421
R454B	ROOF	12.84	28.25	114	1231	766	39	425
R454B	ROOF	12.95	28.50	116	1253	773	40	428
R454B	ROOF	13.07	28.75	118	1275	780	40	432
R454B	ROOF	13.18	29.00	121	1297	786	40	436
R454B	ROOF	13.30	29.25	123	1320	793	41	440
R454B	ROOF	13.41	29.50	125	1342	800	41	443
R454B	ROOF	13.52	29.75	127	1365	807	42	447
R454B	ROOF	13.64	30.00	129	1388	813	42	451
R454B	ROOF	13.75	30.25	131	1411	820	42	455
R454B	ROOF	13.86	30.50	133	1435	827	43	458
R454B	ROOF	13.98	30.75	135	1458	834	43	462
R454B	ROOF	14.09	31.00	138	1482	841	43	466
R454B	ROOF	14.20	31.25	140	1506	847	44	470
R454B	ROOF	14.32	31.50	142	1530	854	44	473
R454B	ROOF	14.43	31.75	144	1555	861	44	477
R454B	ROOF	14.55	32.00	147	1579	868	45	481
R454B	ROOF	14.66	32.25	149	1604	874	45	485
R454B	ROOF	14.77	32.50	151	1629	881	45	488
R454B	ROOF	14.89	32.75	154	1654	888	46	492
R454B	ROOF	15.00	33.00	156	1680	895	46	496

Notes:

1. After system charge, record actual charge weight on area label provided on unit.
2. See charge weight table and record minimum area on label provided on unit.
3. Area Min is without leak sensors. If the units do not have leak sensors, then the minimum area applies. If the unit does have leak sensors, then minimum area does not apply and the minimum ventilation area and minimum ventilation CFM are required.

Example Unit Labels

 WARNING 		
Unit shall be installed, and operated in a room with a floor area larger than _____ ft ² for max refrigerant charge of _____ lbs per circuit.		
Unit Model: DUC20F4CS5BBCM	Unit Serial Number: W250250695	A2LArea1 - 0225

 AVERTISSEMENT 		
L'unité doit être installée et utilisée dans une pièce avec une superficie au sol supérieure à _____ m ² pour une charge maximale de réfrigérant de _____ kg par circuit.		
Unit Model: DUC20F4CS5BBCM	Unit Serial Number: W250250695	A2LArea2 - 0225

Note:
Sample label of Split system where minimum room area requirements need to be determined after final field charging. Use the tables on pages 21-32 and find the largest final circuit charge to determine the systems Amin value. Record the final charge value on the label provided on the unit.

Example Unit Labels

Model: MASCC241GAB413M171DDJAAAA4A					Tag:		
Manufactured By: MagicAire					Serial Number: W250352399		
Catalog Number: MASCC2-2W-4B							
Compressor	Quantity	Volts AC	Phase	Hertz	RIC		Refrig. Wt
	1	460	3 ~	60	6.8		6.4 lbs/2.9 kg
Max Allow Pressure: 625 PSIG (4309 kPa)					Factory Charged: R-454B		
Loads	Quantity	Volts AC	Phase	Hertz	FLA	HP	kW Out
Indoor Motor	1	460	~	60	1.7	0.5	
Outdoor Motor	1	460	~	60	2.3	0.5	
Power Supply	Volts AC	Phase	Hertz	Permissible Voltage at Unit: 432 VAC Min, 504 VAC Max			
	460	3 ~	60	Short-Circuit Current: 5 kA RMS Symmetrical, 460 VAC MAX			
Minimum Circuit Amps: 12.5				Max Overcurrent Protection Device Amps: 15			
Max Allow Heating Water Pressure: 150 Psig (1034 kPa)				Max Water Temperture: 180°F (82°C)		Indoor Use Only Fan Coil Conforms to UL Standard: 60335-1 and 60335-2-40 Certified to CSA Standards: C22.2 #60335-1 and 60335-2-40  Intertek 52439	
Minimum Power Conductor Size is 14 AWG. Minimum Ground Conductor Size is 14 AWG. Use Only Copper Conductors Suitable for at least 75°C. Maximum Outlet Air Temperature is 200°F (93°C) Maximum External Static Pressure of 0 in W.C. (0 Pa). Zero Clearance From Unit, Connected Duct and/or Plenum to Combustible Materials. Charge System Per Installation Instructions.							
							
501 Galveston Street; Wichita Falls, Tx 76301							

⚠ WARNING ⚠

LEAK DETECTION SYSTEM installed.
Unit must be powered except for service.

Model: MASPB3G1RAB413F1723AAAAAH5A Serial Number: W241050695

Sensor - 0225

Note:

Sample labels of a Factory charged unit.

Notes:

ENGLISH INSTRUCTION MANUAL



035-000099-001

3/31/2025