HEATCRAFT™ Worldwide Refrigeration

Installation and Operations Manual

H-IM-UC-A2L **March 2025** **Part No. 25012201(Rev. A)**

(Internal CVT)

A2L Unit Coolers

Table of Contents

A2L Unit Coolers

A2L unit coolers function in much the same way as standard A1 unit coolers with some exceptions. This manual describes recommendations and requirements unique to A2L unit coolers. For general unit cooler installation and operations, see manual H-IM-UC, part number 25008201.

Symbols

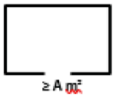
Listed below are the warning symbols and their meanings used on the A2L unit coolers

Heatcraft approved Refrigerant Detection System (RDS) is required in the unit cooler to comply with regulatory requirement for leak detection and mitigation.

The Refrigerant Detection System provided by Heatcraft must be factory or field installed before using A2L refrigerants, including R-454A, R-454C or R-455A.

WARNING:
Risk of fire/flammable materials

[symbol ISO 7000-1701 (2004-01)] pressure



[symbol IEC 60417-6412 (2019-03)]

WARNING: ***Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.***
The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.
Do not pierce or burn.
Be aware that refrigerants may not contain an odour.

In Canada, the French translation is

***MISE EN GARDE*:**
Ne pas utiliser de moyens autres que ceux recommandés par le fabricant pour accélérer le processus de dégivrage ou pour nettoyer l'appareil.
L'appareil doit être entreposé dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, appareil à gaz ou dispositif de chauffage électrique en fonctionnement, par exemple).
Ne pas percer ou brûler.
Attention, les fluides frigorigènes peuvent ne pas dégager d'odeur.

General Information

a) information for spaces where refrigerant pipes are allowed

i) 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 ANSI/ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed;

ii) the installation of pipe-work shall be kept to a minimum;

iii) pipe-work in the case of flammable refrigerants shall not be installed in an unventilated space, if that space is smaller than Amin in Annex 101.DVU of UL 60335-2-89, except for A2L refrigerants where the installed pipes comply with Clause 22.115DV. In case of field charge, the effect on refrigerant charge caused by the different pipe length shall be quantified;

iv) mechanical connections made in accordance with Clause 22.115DV shall be accessible for maintenance purposes;

v) provision shall be made for expansion and contraction of long runs of piping;

vi) 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;

vii) piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;

viii) steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;

ix) flexible pipe elements shall be protected against mechanical damage, excessive stress by torsion, or other forces, and that they should be checked for mechanical damage annually;

x) precautions shall be taken to avoid excessive vibration or pulsation;

xi) for appliances containing flammable refrigerants, the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula;

xii) 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:

1) 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.
2) The test pressure after removal of pressure source shall be maintained for at least one hour with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5 % of the test pressure.
3) During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 1500 microns within 10 minutes. The vacuum pressure level shall be specified in the manual, and shall be the lessor of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial, and industrial buildings.

xiii) field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The test method shall have a sensitivity of 5 grams per year of refrigerant or better. The test pressure should be at least the maximum working pressure of the unit times 0.25. As example, if the maximum working pressure of the unit is 400psi, then the test pressure would be at least 100psi. No leak shall be detected.

b) See the refrigerant charging instruction section in the condensing unit IO manual H-IM-CU to determine the REFRIGERANT CHARGE needed and how to complete the REFRIGERANT CHARGE on the label to note the resulting total refrigerant charge for each refrigerating system per clause. This label is located on the Condensing unit.

c) If ventilation airflow is required the minimum rated airflow shall be
Q = 30(mc- mmax) / LFL, not to exceed Qmin - 486 / LFL

Where:

Qmin is the minimum mechanical ventilation in m3/h;
mc is the refrigerant system charge in kg;
mmax Is the maximum charge as determined in Clause 101. DVU.1.6;
LFL is the lower flammability limit in kg/m3;
30 is a constant

Where mechanical ventilation is required, circulation airflow for the purpose of mixing the air in the room is also required. This is provided by the unit cooler fans which are turned on if a leak is detected by the refrigerant detection system.

d) Red tags are provided on schrader ports and TXVs. If these are removed they must be reapplied.

e) See **Correct Working Procedures Pg. 14** section for information on handling, installation, cleaning, servicing and disposal of refrigerant;

f) For A2L unit coolers using FLAMMABLE REFRIGERANTS, see the tables at the end of the A2L unit cooler section for the max releasable REFRIGERANT CHARGE mc and minimum room area of the space Amin

g) Warning to keep any required ventilation openings clear of obstruction;

h) Notice that servicing shall be performed only as recommended by Heatcraft

i) Warning that ducts connected to an appliance shall not contain a potential ignition source;

j) for appliances that require external ventilation, refer to the wiring diagram on the unit cooler for wiring external ventilation to the refrigerant detection system

k) Refrigerant leak sensors are installed on the unit cooler and should not be installed remotely

l) for appliances using A2L REFRIGERANTS, connected via an air duct system to one or 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;

m) the following information requirements apply for connecting piping in field erected systems:

i) Equipment piping in the occupied space shall be installed in such a way to protect against accidental damage in operation UL 60335-2-89 2nd edition.

n) Safety shut-off valves shall be located outside such that leaks upstream of the safety shut off valve shall not enter the internal volume of the partial unit. Safety shut off valves shall be positioned to enable access for maintenance by an authorized person. See diagram on pages 8 and 9.

Refrigerant Detection System (RDS)

The Refrigerant Detect System (RDS) is an A2L refrigerant sensing system which responds to pre-set concentrations of A2L refrigerants in the environment. When an A2L refrigerant leak is detected by the refrigerant sensors mounted in the unit cooler, mitigation actions are taken.

The RDS must be approved by Heatcraft for use in Heatcraft unit coolers. The RDS consists of these major components.

a) A2L Controller (1)

b) A2L Sensors (1 or 2)

c) Safety Shut Off Valve (1)

d) Safety Check Valve (1)

The A2L controller and A2L sensors can be factory installed or field installed in the unit cooler. The Safety Shut Off Valve and the Safety Check Valve must be field installed outside of the refrigerated space.

a) The Safety Shut Off Valve is field installed on the liquid line outside of the refrigerated space.

b) The Safety Check Valve is field installed on the suction line outside of the refrigerated space.

A separate 24v uninterrupted power supply is required for the RDS A2L Controller. Power supplied to the evaporator fans and heaters is cycled on and off during defrost and cannot be used to power the A2L Controller.

Listed below are the operation and required servicing measures for the RDS.

a) When the RDS is first powered up, it initializes the A2L Sensors for refrigerant leak detection. This process takes 5 minutes. A flashing green LED on the A2L controller indicates this process. After initialization, the LED turns solid green indicates normal operation.

b) When a refrigerant leak is detected by the refrigerant sensors mounted in the unit cooler and the refrigerant concentration reaches the predefined early warning level, the A2L Controller initiates early warning actions. The status LED will be blinking alternating yellow and white. An Early Warning output is provided Building Automation System (BAS) to provide advanced alert of a refrigerant leak. This allows the user to fix the leak before it reaches the higher mitigation level that stops refrigeration. The early warning output is the blue terminal on the A2L controller board labeled Alert. The Early Warning Alert Terminals consist a Normally Open (NO), a Normally Close (NC) and a Common (COM) terminal for field wiring. The relay output to the terminals is rated for 1A at 125VAC, SPDT.

c) When a refrigerant leak is detected and the refrigerant concentration reaches the Lower Flammability Limit defined by regulation, the A2L Controller initiates mitigation actions. The status LED will be blinking red and white. The Mitigation Alarm output takes the following actions:

   i. Close the Safety Shut Off Valve to stop the refrigerant flow entering the unit cooler and the refrigerated space.
   ii. Turn on unit cooler fans to provide air circulation.
   iii. Terminate defrost if the unit cooler is in defrost mode.
   iv. Turn on ventilation fan if it is required by the system's Mitigation Zone requirement.

d) When the RDS is in Mitigation mode, a service technician is required to fix the refrigerant leak and then manually reset the A2L controller by depressing the "Reset/Test" button on the control board for longer than 3 seconds.

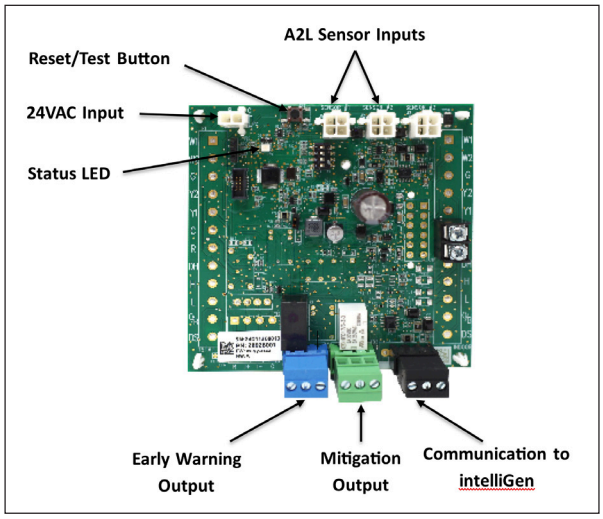
e) The RDS has expected life of 15 years. Service parts are available via Heatcraft's Interlink Service Parts. The replacement parts (A2L sensors, A2L controller, safety shut off valve and check valve) must be specified by Heatcraft. A2L sensors must be mounted using the correct predrilled holes and angled on the mounting brackets. Maximum torque specification for mounting the screws to attach the A2L sensor is 30lb-in.

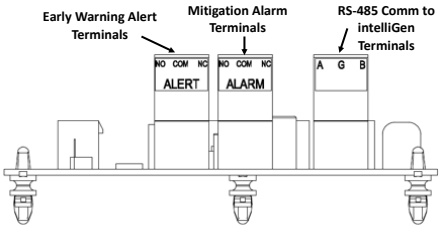
f) To test the RDS for actuation of the mitigation actions.

   i. Depress the "Reset/Test" button for >1 second. The test feature will trigger the controller to simulate a leak condition for verification of mitigation and early-warning actions.
   ii. The user test will last for 2 minutes. The mitigation relay will be deenergized and the early warning relay will be energized.
   iii. After completion of the 2-minute test, the controller will return to normal operation.
   iv. The user can exit test feature before the 2-minute has elapsed by depressing the "Reset/Test" button for longer than 3 seconds.

g) The RDS has communication capability to Heatcraft's intelliGen Refrigeration Controller via RS485 communication. The black terminal on the A2L Controller board labeled A G B can be connected to the RDS Com terminals on the intelliGen Controller board. intelliGen will provide mitigation alarm and early warning alert, and status reporting. The intelliGen controller has to be configured to use the A2L refrigerants (R-454A, R-454C or R-455A). See the intelliGen Instructions and Operation manual for more details.

h) A field installed Refrigerant Detection System kit is available from Heatcraft's Interlink Service Parts for each unit cooler product family. See the field installation instructions that comes with the kit for details.





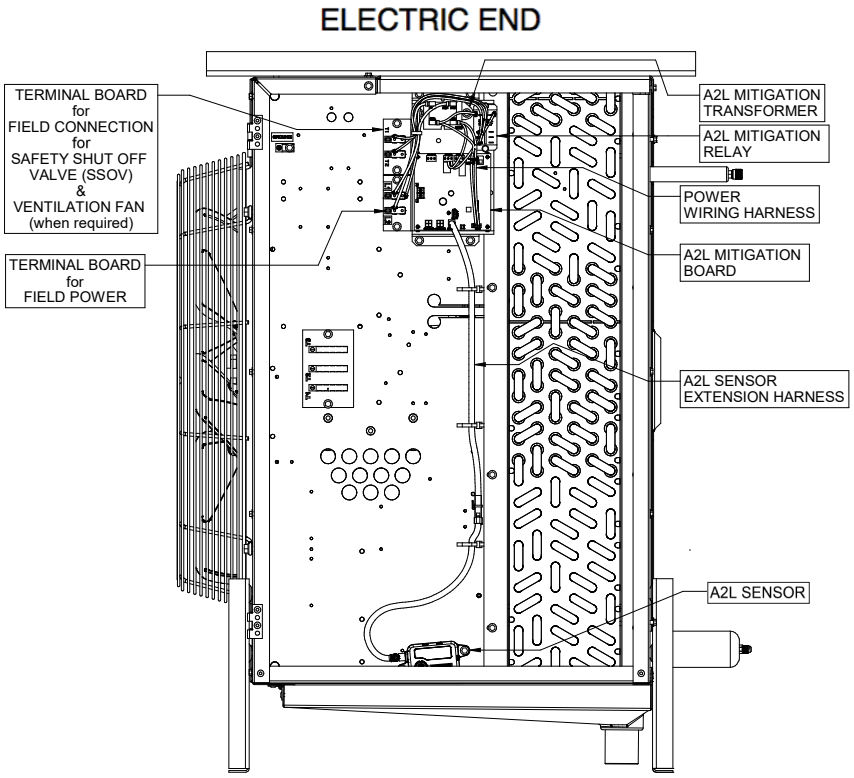
LED Pattern:	Status:
Flashing Green	Controller Initializing
Solid Green	Normal, Monitoring
Alternating Yellow and White*	Early Leak Warning
Alternating Red and White*	Mitigation Mode - Leak Detected
Alternating Red and Blue*	Service Mode - Sensor Fault
Solid Yellow	User Test

*White/Blue flash count indicates sensor # that is triggering the abnormal condition (e.g. red followed by two white flashes indicates that sensor #2 has sensed a leak; if multiple sensors are triggering the same condition then there will be 4 count flashes to indicate more than 1 sensor has the offending condition)

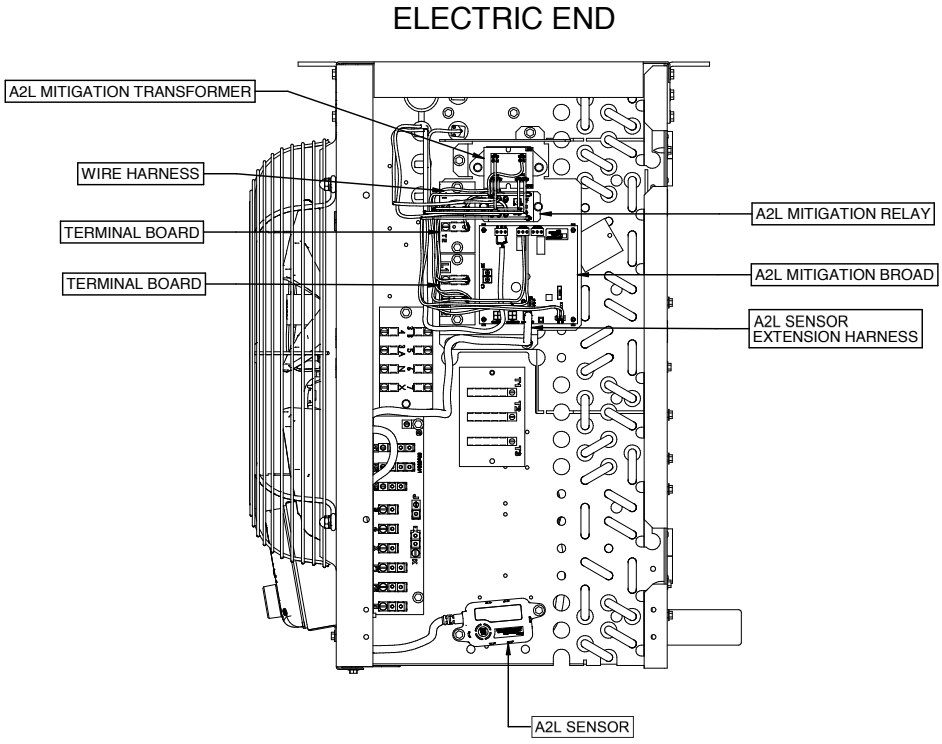
Notes:
1) While in Normal/Monitoring mode, pressing the push-button for >1 second will initiate "User Test" mode for two minutes so that mitigation outputs can be verified.
2) While in Mitigation or Service mode, pressing the push-button for >3 seconds will trigger a controller reset where the system will re-initialize and then enter "Normal/Monitoring" mode if they Mitigation and/or Service conditions have been resolved.

22012801 REV -

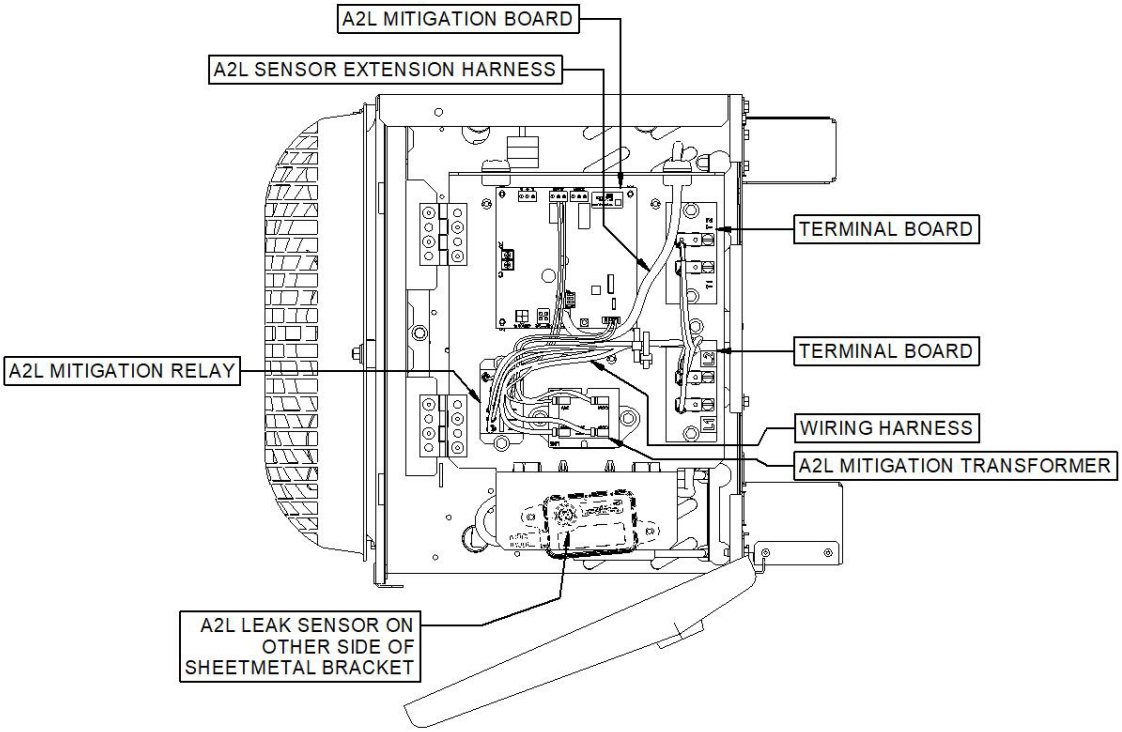
Large Unit Coolers



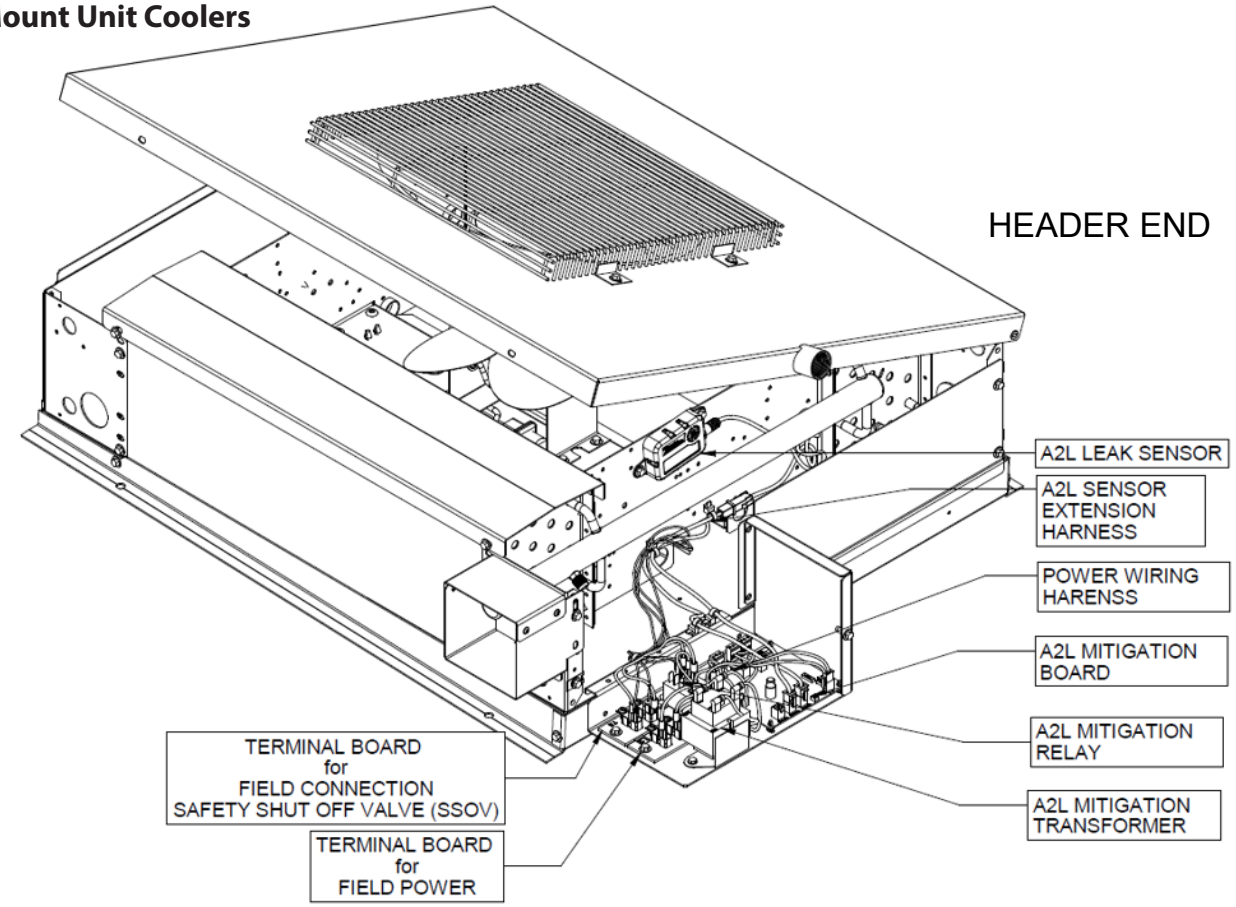
Medium Profile Unit Coolers



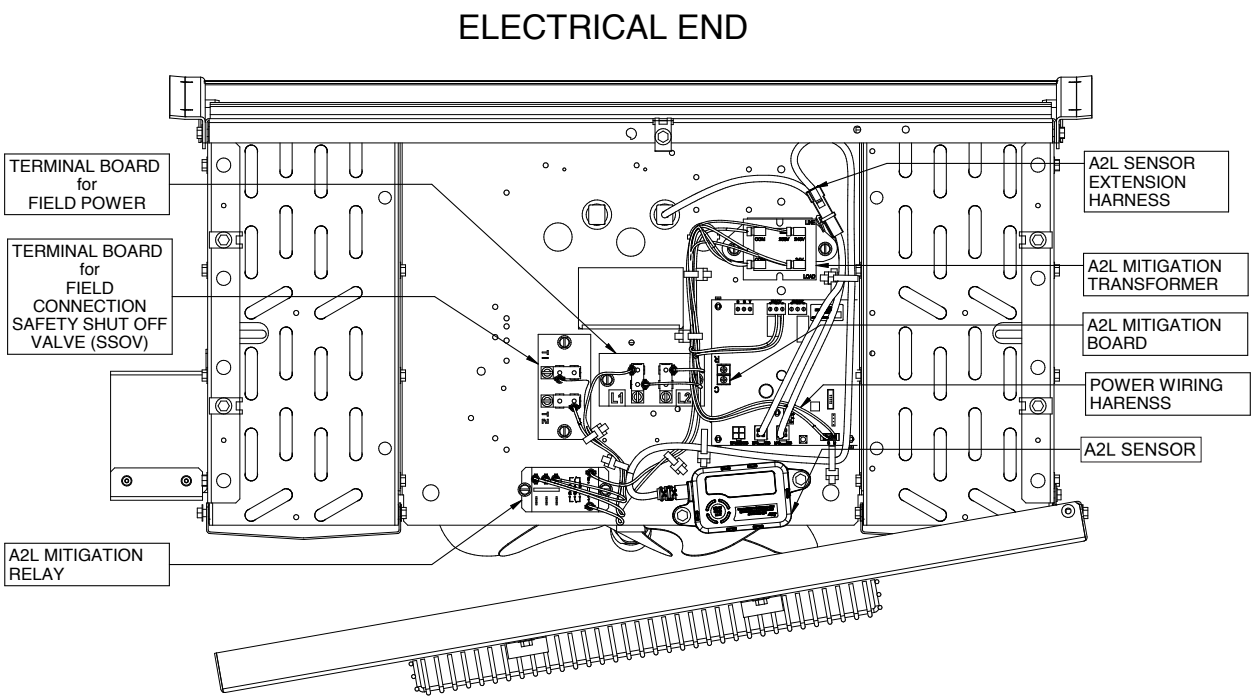
Low Profile Unit Coolers



Center Mount Unit Coolers



Low Velocity Center Mount Unit Coolers

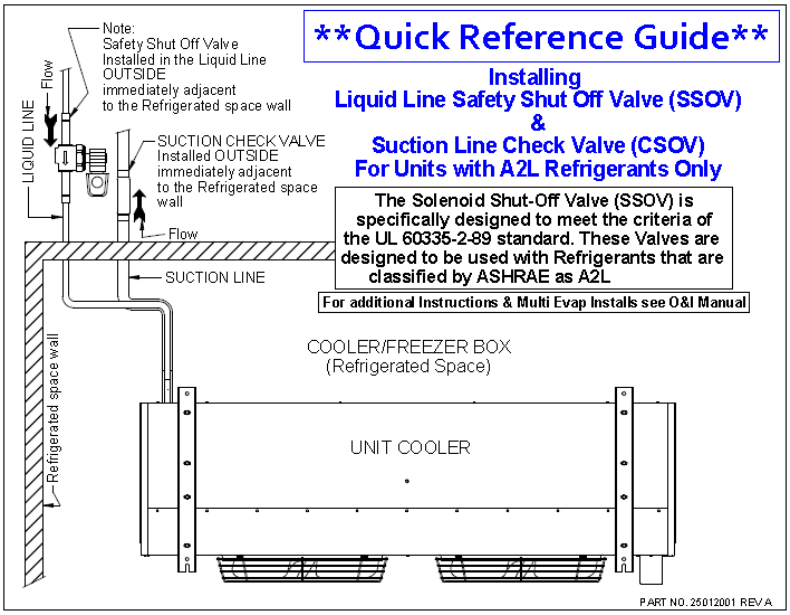


Safety Shut Off Valve and Check Valves

As a part of the Refrigerant Detection System (RDS), a Heatcraft approved Safety Shut Off Valve is required to field install on the liquid line and a Heatcraft approved Safety Check Valve is required to field install on the suction line, outside of the refrigerated space, immediately adjacent to the Refrigerated Space Wall. See **Piping Diagram 1** for a single A2L unit cooler system installation. In the event of the RDS is in mitigation mode, the A2L controller will close the Safety Shut Off Valve and Check Valve to stop the refrigerant flow into the unit cooler and the refrigerated space.

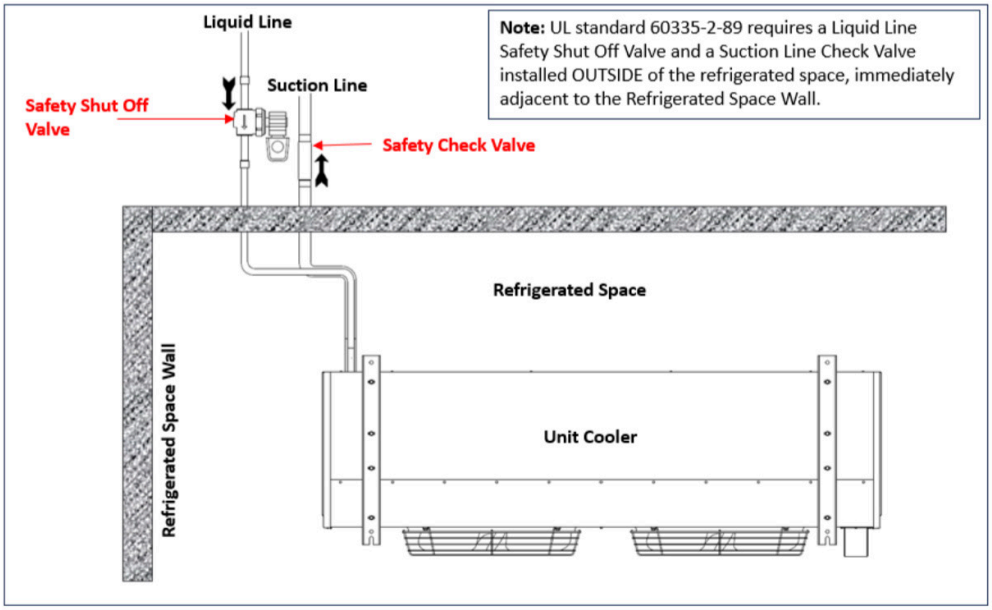
For Heatcraft's standard equipment selection, the Safety Shut Off Valve and the Check Valve are configured based on the individual unit cooler model size, one Safety Shut Off Valve and one Check Valve for each unit cooler.

Warning: The standard Sporlan brand of Liquid Line Solenoid Valve (has blue tag) cannot be used in place of the Safety Shut Off Valve for the Refrigerant Detection System. The standard Liquid Line Solenoid Valve may not perform proper mitigation actions. A specified Safety Shut Off Valve (has yellow tag) is required.



Safety Shut Off Valve and Check Valves (cont.)

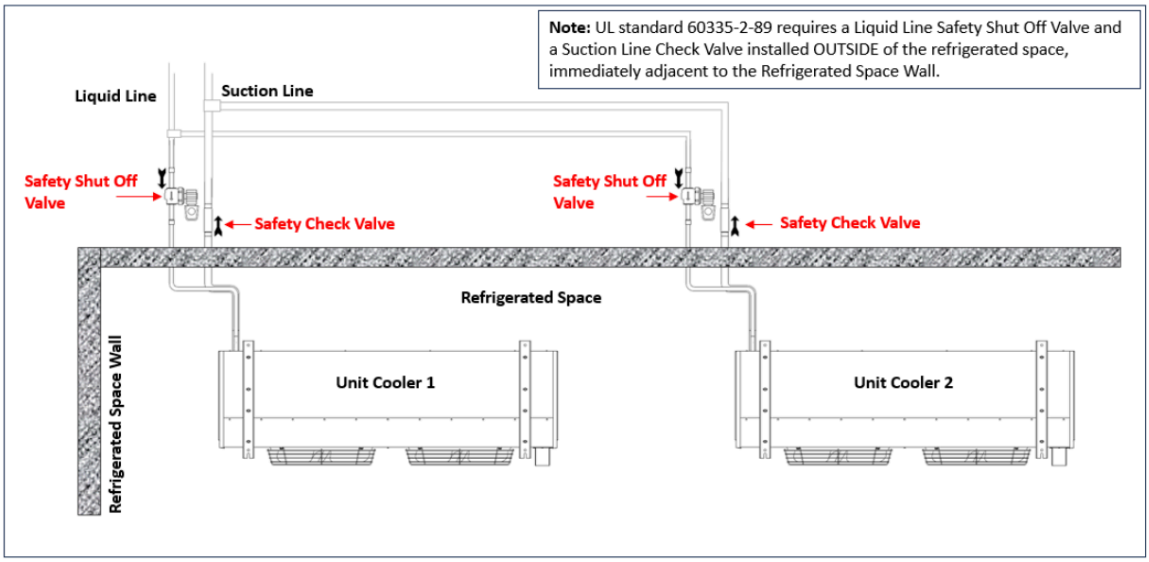
Piping Diagram 1: Single Unit Cooler System



For multiple unit coolers to one condensing unit systems, the standard Heatcraft design is one Safety Shut Off Valve and one Safety Check Valve for each unit cooler and field installed outside of the refrigerated space, immediately adjacent to the Refrigerated Space Wall.
See **Piping Diagram 2** as installation example.

For the scenario shown in **Piping Diagram 2**, the A2L refrigerant Releasable Charge Limit and the Minimum Room Area of each individual unit cooler determines the UL required mitigation zone.

Piping Diagram 2: Multiple Unit Coolers System, One Safety Shut Off Valve and One Check Valve Per Each Unit Cooler

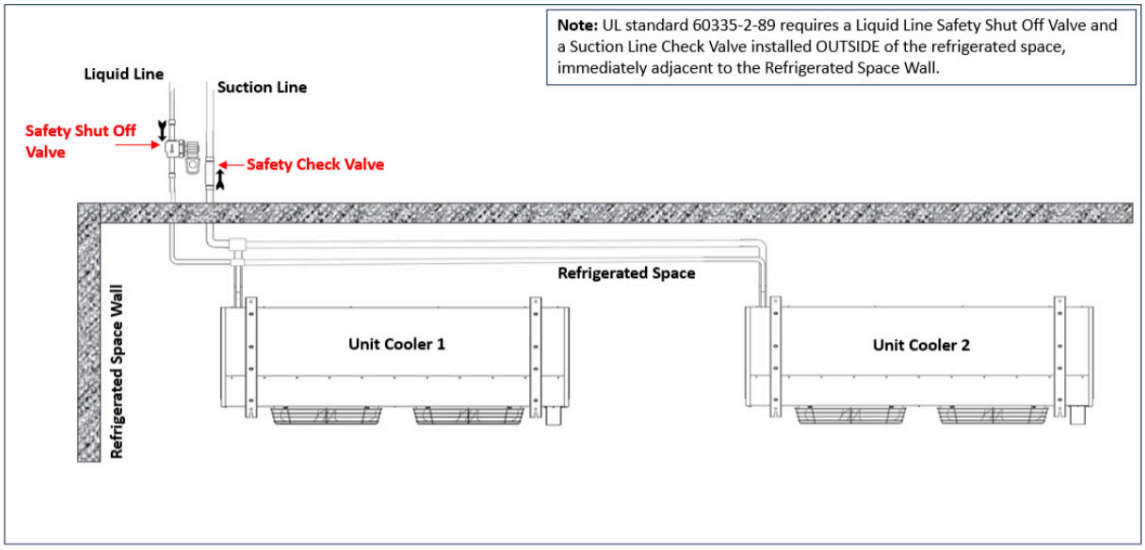


Safety Shut Off Valve and Check Valves (cont.)

For multiple unit coolers to one condensing unit systems, if the field piping scheme is different from the individual unit cooler isolation piping scheme, the Safety Shut Off Valve and the Check Valve needs to be checked and resized. See **Piping Diagram 3** as example. The total A2L refrigerant Releasable Charge amount includes all connected unit coolers and piping.

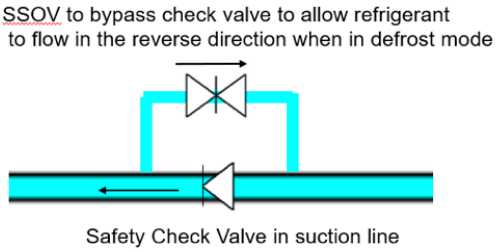
The Minimum Room Area requirement must be calculated combining all connected unit coolers and piping. The total Releasable Charge amount and the new Minimum Room Area determine the proper mitigation zone. Contact a Heatcraft representative for assistance to determine the proper UL mitigation requirement for the installation.

Piping Diagram 3: Multiple Unit Coolers System, One Safety Shut Off Valve and One Check Valve for All Unit Coolers



Hot Gas Reverse Cycle and Mohave Systems

a) An additional safety shut off valve will be needed for hot gas reverse cycle and Mohave systems where the refrigerant flows in the reverse direction during defrost to bypass around the safety check valve in the suction line.



Safety Check Valve in suction line

b) Piping that is exterior to the cabinet is field installed for A2L hot gas reverse cycle and Mohave unit coolers like shown in figures on the right, Mohave Field Installed Piping Diagrams

c) Valves, tees and elbows needed will be shipped loose to the field. The install contractor will provide the straight lengths of tubing needed and cut to fit in the field.

d) For Mohave systems, refer to the Mohave Hot Gas Defrost I&O manual for additional information.

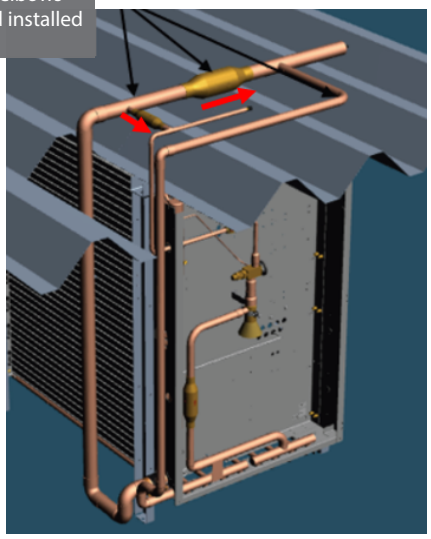
Circulation and Ventilation Mitigation Zones

For the systems that are in the Circulation mitigation zone, the circulation fans on the units coolers are required to turn on when the Refrigerant Detection System (RDS) is in mitigation mode. The unit cooler is wired to turn on the circulation fans. See the wiring diagram in the unit cooler for reference.

For the systems that are in the Ventilation mitigation zone, an exhaust fan is required to exhaust the air to outside when the RDS is in mitigation mode. See the wiring diagram in the unit cooler for reference to field connect the exhaust fan to the RDS system. The field installer is responsible for the proper exhaust fan selection and installation.

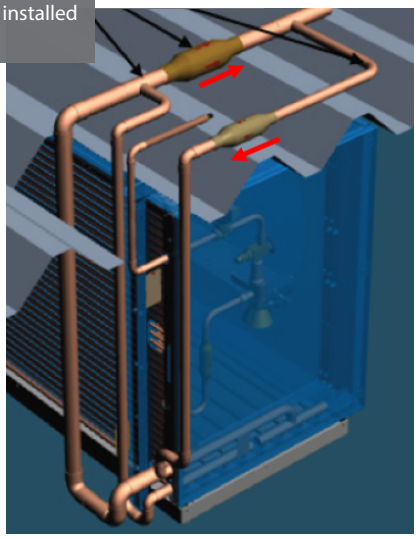
Mohave Field Installed Piping

Check valves, tees and elbows shipped loose and field installed outdoors



Hot Gas Reverse Cycle Field Installed Piping

Check valves, tees and elbows shipped loose and field installed outdoors



Unventilated areas

See the below warnings for appliances in an unventilated area containing more than m1 for any refrigerating circuit

a) **Warning:** the non-FIXED APPLIANCE shall be stored in an area where the room size corresponds to the room area as specified for operation;
b) **Warning:** the non-FIXED APPLIANCE 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).

Qualification of workers

Working personnel for maintenance, service, and repair operations should be trained and qualified to work on A2L refrigeration systems. Personnel should have the appropriate technical training and experience necessary to be aware of hazards to which he or she is exposed in performing a task and of measures necessary to minimize the danger to themselves or other persons. Every working procedure that affects safety means shall only be carried out by competent persons according to Annex 101.DVT in UL 60335-2-89

Examples for such working procedures are

a) breaking into the refrigerating circuit;
b) opening of sealed components;
c) opening of ventilated enclosures.

General Information for Service Personnel

The below sections contain specific information for service personnel

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, Sections listed below for service personnel shall be completed prior to conducting work on the system.

Work procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour 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.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry chemical or CO2 fire extinguisher should be adjacent to the charging area.

No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Cell phones are to be turned off. Prior to work taking place, the area around the equipment shall 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 atmosphere.

Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the maintenance and service guidelines shall be followed. If in doubt, consult Heatcraft's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

a) the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
b) the ventilation machinery and outlets are operating adequately and are not obstructed;
c) if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
d) marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
e) refrigerating 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:

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

Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that the apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with Heatcraft's specifications.

Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by Heatcraft. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.

NOTE: ***The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.***

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.

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.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity might not be adequate, or might need re- calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

NOTE: ***Examples of leak detection fluids are***
- Bubble Method
- Fluorescent Method Agents

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. Removal of refrigerant shall be according to instructions under Removal and Evacuation.

Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

a) safely remove refrigerant following local and national regulations;
b) purge the circuit with inert gas;
c) evacuate (optional for A2L);
d) purge with inert gas (optional for A2L);
e) open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall 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 atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

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

Charging procedures

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

a) 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.
b) Cylinders shall be kept in an appropriate position according to the instructions.
c) Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
d) Label the system when charging is complete (if not already).
e) Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

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

Charging procedures (cont.)

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

a) Only the following A2L refrigerants R454A, R454C and R455A can be used in these unit coolers. The following A1 refrigerants R404A, R507A, R407A/C/F, R448A and R449A can also be used in these unit coolers.

b) A Heatcraft approved refrigerant detection system must be installed if an A2L refrigerant is used.

c) The condensing unit must be labeled with the refrigerant that the system is charged with.

d) The unit cooler can only be connected to an appliance that is suitable for the same refrigerant

e) The maximum operating pressure must be considered when connecting to any condenser, condensing, or compressor unit.

Decommissioning

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

a) Become familiar with the equipment and its operation.

b) Isolate the system electrically.

c) Before attempting the procedure, ensure that:

  i) mechanical handling equipment is available, if required, for handling refrigerant cylinders;

  ii) all personal protective equipment is available and being used correctly;

  iii) the recovery process is supervised at all times by a competent person;

  iv) 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 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 REFRIGERATING SYSTEM unless it has been cleaned and checked.

Labeling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended 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 all appropriate refrigerants including, when applicable, 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 Heatcraft 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.

l) Pump down refrigerant system, if possible.

m) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

n) Make sure that cylinder is situated on the scales before recovery takes place.

o) Start the recovery machine and operate in accordance with instructions.

p) Do not overfill cylinders (no more than 80 % volume liquid charge).

q) Do not exceed the maximum working pressure of the cylinder, even temporarily.

r) 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.

s) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Correct working procedures:

Commissioning

i) Ensure that the floor area is sufficient for the REFRIGERANT CHARGE or that the ventilation duct is assembled in a correct manner.

ii) Connect the pipes and carry out a leak test before charging with refrigerant.

iii) Check safety equipment before putting into service.

Maintenance

i) Portable equipment is to be repaired outside or in a workshop specially equipped for servicing units with FLAMMABLE REFRIGERANTS.

ii) Ensure sufficient ventilation at the repair place.

iii) Be aware that malfunction of the equipment can be caused by refrigerant loss and a refrigerant leak is possible.

iv) Discharge capacitors in a way that won't cause any spark. The standard procedure to short circuit the capacitor terminals usually creates sparks.

v) Reassemble sealed enclosures accurately. If seals are worn, replace them.

vi) Check safety equipment before putting into service.

Repair

i) Portable equipment is to be repaired outside or in a workshop specially equipped for servicing units with FLAMMABLE REFRIGERANTS.

ii) Ensure sufficient ventilation at the repair place.

iii) Be aware that malfunction of the equipment can be caused by refrigerant loss and a refrigerant leak is possible.

iv) Discharge capacitors in a way that won't cause any spark.

v) When brazing is required, the following procedures shall be carried out in the following order:

1) Safely remove the refrigerant following local and national regulations. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
2) Purge the refrigerant circuit with oxygen free nitrogen.
3) Evacuate the refrigerant circuit.
4) Purge the refrigerant circuit with nitrogen for 5 min (not required for A2L refrigerants).
5) Evacuate again (not required for A2L refrigerants).
6) Remove parts to be replaced by cutting or brazing.
7) Purge the braze point with nitrogen during the brazing procedure required for repair.
8) Carry out a leak test before charging with refrigerant.

vi) Reassemble sealed enclosures accurately. If seals are worn, replace them.

vii) Check safety equipment before putting into service.

Decommissioning

i) If the safety is affected when the equipment is putted out of service, the REFRIGERANT CHARGE is to be removed before decommissioning.

ii) Ensure sufficient ventilation at the equipment location.

iii) Be aware that malfunction of the equipment can be caused by refrigerant loss and a refrigerant leak is possible.

iv) Discharge capacitors in a way that will not cause any spark.

v) Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.

vi) When FLAMMABLE REFRIGERANTS except A2L REFRIGERANTS are used,

1) Evacuate the refrigerant circuit.
2) Purge the refrigerant circuit with nitrogen for 5 min.
3) Evacuate again.
4) Fill with nitrogen up to atmospheric pressure.
5) Put a label on the equipment that the refrigerant is removed.

Disposal

i) Ensure sufficient ventilation at the working place.

ii) Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.

iii) When FLAMMABLE REFRIGERANTS are used,

1) Evacuate the refrigerant circuit.
2) Purge the refrigerant circuit with oxygen free nitrogen.
3) Evacuate again (not required for A2L refrigerants).
4) Cut out the compressor and drain the oil.

iv) Cut out the compressor and drain the oil.

Maximum Releasable Charge and Minimum Room Area Tables

Minimum Room Areas are calculated base on a maximum room height of 7.2 feet defined by regulatory requirement. For room height that is less than 7.2ft, the minimum room area needs to be recalculated with formula (7.2ft / room height ft) X 37sq.ft. = Amin____sq.ft.

Large Unit Coolers (LUC)

LUC Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EH0570	239	22	23	N/A	N/A	23	369	34	23
*EH0700	239	22	23	N/A	N/A	23	369	34	23
*EH0755	283	26	27	N/A	N/A	27	438	41	27
*EH0900	300	28	29	N/A	N/A	29	464	43	29
*EH1080	300	28	29	N/A	N/A	29	464	43	29
*EH1245	350	32	34	N/A	N/A	34	1,082	100	34
*EH1445	375	35	36	N/A	N/A	36	1,158	108	36
*EH1655	441	41	43	N/A	N/A	43	1,363	127	43
*EH0620	178	17	17	264	24	17	276	26	17
*EH0730	284	26	28	421	39	28	439	41	28
*EH0840	284	26	28	421	39	28	439	41	28
*EH1250	299	28	29	443	41	29	463	43	29
*EH1470	1,059	98	51	1,569	146	51	1,637	152	51
*EH1870	419	39	41	1,239	115	41	1,296	120	41
*EH2200	1,503	140	73	2,227	207	73	2,325	216	73
*EH0540	232	22	22	344	32	23	358	33	22
*EH0630	279	26	27	414	38	27	432	40	27
*EH0805	296	27	29	439	41	29	458	42	29
*EH0925	346	32	34	1,025	95	34	1,070	99	34
*EH1125	376	35	36	1,114	103	37	1,163	108	36
*EH1210	421	39	41	1,245	116	41	1,300	121	41
*EH0480	232	22	22	344	32	23	358	33	22
*EH0565	279	26	27	414	38	27	432	40	27
*EH0730	296	27	28	439	41	28	458	42	28
*EH0845	346	32	34	1,025	95	34	1,070	99	34
*EH1010	376	35	36	1,114	103	37	1,163	108	36
*EH1085	421	39	41	1,245	116	41	1,300	121	41
*EH1340	370	34	36	1,096	102	36	1,143	106	36
*EH1560	438	41	42	1,296	120	43	1,352	126	42
*EH1820***E	1,491	139	72	2,210	205	72	2,306	214	72
*EH1820***H	1,612	150	78	2,389	222	78	2,490	231	78
*EH2330***E	1,985	184	96	1471*	136.6*	96	1534*	142.5*	96
*EH2330***H	2,177	202	105	1614*	149.9*	106	1682*	156.2*	105
*EH0540 w/ HG DP	302	28	29	447	41	29	466	43	29

Note: Minimum Room Area number with * indicates ventilation is required for the refrigerated space.
N/A - Model does not meet minimum AWEF.

Maximum Releasable Charge and Minimum Room Area Tables

Large Unit Coolers (LUC)

LUC Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EH0630 w/ HG DP	349	32	34	1,034	96	34	1,079	100	34
*EH0805 w/ HG DP	376	35	36	1,113	103	37	1,161	108	36
*EH0925 w/ HG DP	426	40	41	1,261	117	41	1,316	122	41
*EH1125 w/ HG DP	466	43	45	1,378	128	45	1,439	134	45
*EH1210 w/ HG DP	510	47	49	1,510	140	50	1,576	146	49
*EH0480 w/ HG DP	302	28	29	447	41	29	466	43	29
*EH0565 w/ HG DP	349	32	34	1,034	96	34	1,079	100	34
*EH0730 w/ HG DP	376	35	36	1,113	103	37	1,161	108	36
*EH0845 w/ HG DP	426	40	41	1,261	117	41	1,316	122	41
*EH1010 w/ HG DP	466	43	45	1,378	128	45	1,439	134	45
*EH1085 w/ HG DP	510	47	49	1,510	140	50	1,576	146	49
*EH1340 w/ HG DP	486	45	47	1,438	134	47	1,501	139	47
*EH1560 w/ HG DP	1,126	105	55	1,668	155	55	1,740	162	55
*EH1820 w/ HG DP	1,743	162	84	2,582	240	85	1347*	125.1*	84
*EH2330 w/ HG DP	2,256	210	109	1672*	155.2*	110	1744*	162*	109
EH0553	169	16	16	250	23	16	260	24	16
EH0723	204	19	20	302	28	20	315	29	20
EH0743	178	16	17	264	24	17	275	26	17
EH0933	213	20	21	316	29	21	330	31	21
EH1053	301	28	29	445	41	29	465	43	29
EH1313	350	32	34	1,036	96	34	1,082	100	34
EH1333	373	35	36	1,103	102	36	1,152	107	36
EH1623	374	35	36	1,106	103	36	1,156	107	36
EH1873	434	40	42	1,287	120	42	1,342	125	42
EH2203	1,491	138	72	2,209	205	72	2,305	214	72
EH2553	1,687	157	82	2,500	232	82	2,609	242	82
EH2883	1,990	185	96	1474*	136.9*	97	1538*	142.8*	96
*EH2513	1,599	148	77	2,370	220	78	2,470	229	77
*EH2953	1,781	165	86	2,639	245	87	1377*	127.9*	86
*EH3283	1,994	185	97	1477*	137.2*	97	1541*	143.1*	97
EH0423	166	15	16	246	23	16	257	24	16
*EH0513**6	203	19	20	300	28	20	313	29	20
EH0573	174	16	17	258	24	17	269	25	17
EH0713	209	19	20	310	29	20	323	30	20
EH0763	375	35	36	1,111	103	36	1,159	108	36
EH0963	419	39	41	1,241	115	41	1,295	120	41
EH0373	166	15	16	246	23	16	257	24	16
EH0473	203	19	20	300	28	20	313	29	20

Note: Minimum Room Area number with * indicates ventilation is required for the refrigerated space.

Maximum Releasable Charge and Minimum Room Area Tables

Large Unit Coolers (LUC)

LUC Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EH0513**4	174	16	17	258	24	17	269	25	17
EH0653	209	19	20	310	29	20	323	30	20
EH0693	375	35	36	1,111	103	36	1,159	108	36
EH0883	419	39	41	1,241	115	41	1,295	120	41
EH1123	369	34	36	1,092	101	36	1,140	106	36
*EH1343**6	370	34	36	1,096	102	36	1,143	106	36
EH1563	439	41	43	1,300	121	43	1,356	126	43
*EH1823***E	1,491	138	72	2,209	205	72	2,305	214	72
*EH1823***H	1,608	149	78	2,384	221	78	2,485	231	78
*EH2333**E	1,982	184	96	1469*	136.4*	96	1,532*	142.3*	96
*EH2333**H	2,172	202	105	1610*	149.6*	106	1,677*	155.7*	105
EH0983	369	34	36	1,092	101	36	1,140	106	36
EH1163	370	34	36	1,096	102	36	1,143	106	36
*EH1343**4	436	40	42	1,292	120	42	1,348	125	42
*EH1583***E	1,488	138	72	2,206	205	72	2,301	214	72
*EH1583***H	1,603	149	78	2,376	221	78	2,476	230	78
*EH2053***E	1,909	177	92	1,414*	131.3*	93	1,476*	137.1*	92
*EH2053***H	2,025	188	98	1,501*	139.4*	98	1,565*	145.4*	98
EH0423 w/ HG DP	236	22	23	350	32	23	365	34	23
*EH0513**6 w/ HG DP	272	25	26	404	37	26	421	39	26
EH0573 w/ HG DP	254	24	25	376	35	25	392	36	25
EH0713 w/ HG DP	289	27	28	428	40	28	446	41	28
EH0763 w/ HG DP	464	43	45	1,375	128	45	1,435	133	45
EH0963 w/ HG DP	508	47	49	1,505	140	49	1,571	146	49
EH03 w/ HG DP	236	22	23	350	32	23	365	34	23
EH0473 w/ HG DP	272	25	26	404	37	26	421	39	26
*EH0513**4 w/ HG DP	254	24	25	376	35	25	392	36	25
EH0653 w/ HG DP	289	27	28	428	40	28	446	41	28
EH0693 w/ HG DP	464	43	45	1,375	128	45	1,435	133	45
EH0883 w/ HG DP	508	47	49	1,505	140	49	1,571	146	49
EH1123 w/ HG DP	485	45	47	1,435	133	47	1,498	139	47
*EH13**6 w/ HG DP	486	45	47	1,438	134	47	1,501	139	47
EH1563 w/ HG DP	1,066	99	52	1,579	147	52	1,649	153	52
EH1823 w/ HG DP	1,856	172	90	1,376*	127.8*	90	1,435*	133.2*	90
EH2333 w/ HG DP	2,253	209	109	1,670*	155.1*	110	1,742*	161.8*	109
EH0983 w/ HG DP	485	45	47	1,435	133	47	1,498	139	47
EH1163 w/ HG DP	486	45	47	1,438	134	47	1,501	139	47
*EH13**4 w/ HG DP	1,063	99	52	1,575	146	52	1,644	153	52
EH1583 w/ HG DP	1,851	172	90	1,372*	127.4*	90	1,430*	132.8*	90
EH2053 w/ HG DP	2,180	202.5	105.6	1,615*	150*	105.9	1,686*	156.6*	105.6

Note: Minimum Room Area number with * indicates ventilation is required for the refrigerated space.

Maximum Releasable Charge and Minimum Room Area Tables

Medium Profile Unit Coolers (MP)

MP Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EM0125*Y6E*	159	14.8	7.7	236	21.9	7.7	247	22.9	7.7
*EM0135*Y6E*	170	15.8	8.3	253	23.5	8.3	265	24.6	8.3
*EM0250*Y6E*	275	25.5	13.3	408	37.9	13.4	428	39.8	13.4
*EM0300*Y6E*	370	34.4	17.9	550	51.1	18.0	576	53.5	18.0
*EM0370*Y6E*	388	36.0	18.8	577	53.6	18.9	604	56.1	18.9
*EM0475*Y6E*	338	31.4	16.4	501	46.5	16.4	525	48.8	16.4
*EM0595*Y6E*	541	50.3	26.2	803	74.6	26.3	841	78.1	26.3
*EM0735*Y6E*	547	50.8	26.5	812	75.4	26.6	850	79.0	26.6
*EM0850*Y6E*	598	55.6	29.0	887	82.4	29.1	929	86.3	29.1
*EM0125*Y4E*	170	15.8	8.3	253	23.5	8.3	265	24.6	8.3
*EM0225*Y4E*	275	25.5	13.3	408	37.9	13.4	428	39.8	13.4
*EM0250*Y4E*	370	34.4	17.9	550	51.1	18.0	576	53.5	18.0
*EM0325*Y4E*	388	36.0	18.8	577	53.6	18.9	604	56.1	18.9
*EM0420*Y4E*	338	31.4	16.4	501	46.5	16.4	525	48.8	16.4
*EM0490*Y4E*	541	50.3	26.2	803	74.6	26.3	841	78.1	26.3
*EM0620*Y4E*	547	50.8	26.5	812	75.4	26.6	850	79.0	26.6
*EM0720*Y4E*	598	55.6	29.0	887	82.4	29.1	929	86.3	29.1
*EM0250*YH6*	272	25.3	13.2	405	37.6	13.3	424	39.4	13.3
*EM0300*YH6*	370	34.4	17.9	550	51.1	18.0	576	53.5	18.0
*EM0370*YH6*	388	36.0	18.8	577	53.6	18.9	604	56.1	18.9
*EM0475*YH6*	338	31.4	16.4	501	46.5	16.4	525	48.8	16.4
*EM0595*YH6*	541	50.3	26.2	803	74.6	26.3	841	78.1	26.3
*EM0735*YH6*	547	50.8	26.5	812	75.4	26.6	850	79.0	26.6
*EM0225*Y4H*	272	25.3	13.2	405	37.6	13.3	424	39.4	13.3
*EM0250*Y4H*	370	34.4	17.9	550	51.1	18.0	576	53.5	18.0
*EM0325*Y4H*	388	36.0	18.8	577	53.6	18.9	604	56.1	18.9
*EM0420*Y4H*	338	31.4	16.4	501	46.5	16.4	525	48.8	16.4
*EM0490*Y4H*	541	50.3	26.2	803	74.6	26.3	841	78.1	26.3
*EM0620*Y4H*	550	51.1	26.5	815	75.7	26.6	852	79.2	26.6
*EM0185*Y8A*	235	21.8	11.4	349	32.4	11.4	365	33.9	11.4
*EM0225*Y8A*	345	32.1	16.7	512	47.6	16.8	536	49.8	16.8
*EM0405*Y8A*	445	41.3	21.6	660	61.3	21.6	691	64.2	21.6
*EM0475*Y8A*	167	15.5	8.1	248	23.0	8.1	260	24.2	8.1
*EM0575*Y8A*	191	17.7	9.3	284	26.4	9.3	297	27.6	9.3
*EM0675*Y8A*	207	19.2	10.0	308	28.6	10.1	322	29.9	10.1
*EM0775*Y8A*	250	23.2	12.1	371	34.5	12.1	388	36.0	12.1
*EM0975*Y8A*	363	33.7	17.6	538	50.0	17.6	563	52.3	17.6
*EM1115*Y8A*	463	43.0	22.4	686	63.7	22.5	718	66.7	22.5

Maximum Releasable Charge and Minimum Room Area Tables

Low Profile Unit Coolers (LOP)

LP Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EL0045#Y6A$A	33	3.1	3.2	49	4.6	3.2	51	4.7	3.2
*EL0055#Y6A$A	35	3.3	3.5	53	4.9	3.5	55	5.1	3.5
*EL0060#Y6A$A	35	3.3	3.5	53	4.9	3.5	55	5.1	3.5
*EL0095#Y6A$A	38	3.5	3.7	56	5.2	3.7	58	5.4	3.7
*EL0105#Y6A$A	39	3.6	3.8	58	5.4	3.8	61	5.7	3.8
*EL0115#Y6A$A	44	4.1	4.3	65	6.0	4.3	68	6.3	4.3
*EL0125#Y6A$A	44	4.1	4.3	65	6.0	4.3	68	6.3	4.3
*EL0155#Y6A$A	49	4.6	4.7	72	6.7	4.8	75	7.0	4.7
*EL0190#Y6A$A	57	5.3	5.5	84	7.8	5.6	88	8.2	5.5
*EL0250#Y6A$A	64	5.9	6.3	96	8.9	6.3	100	9.3	6.3
*EL0295#Y6A$A	72	6.7	7.0	107	9.9	7.1	112	10.4	7.0
*EL0350#Y6A$A	75	7.0	7.3	112	10.4	7.4	117	10.9	7.3
*EL0380#Y6A$A	81	7.5	7.9	121	11.2	7.9	126	11.7	7.9
*EL0045#Y4E$A	39	3.6	3.8	51	4.7	3.4	54	5.0	3.4
*EL0070#Y4E$A	42	3.9	4.1	57	5.3	3.7	59	5.5	3.7
*EL0090#Y4E$A	47	4.4	4.6	63	5.9	4.2	66	6.1	4.1
*EL0135#Y4E$A	54	5.0	5.3	81	7.5	5.3	83	7.7	5.3
*EL0180#Y4E$A	62	5.8	6.1	92	8.5	6.1	95	8.8	6.0
*EL0220#Y4E$A	69	6.4	6.8	103	9.6	6.8	106	9.8	6.7
*EL0275#Y4E$A	77	7.2	7.5	114	10.6	7.5	117	10.9	7.4
*EL0040#Y6E$A	33	3.1	3.3	49	4.6	3.3	51	4.7	3.2
*EL0045#Y6E$A	35	3.3	3.5	53	4.9	3.5	55	5.1	3.5
*EL0065#Y6E$A	39	3.6	3.8	58	5.4	3.8	61	5.7	3.8
*EL0080#Y6E$A	39	3.6	3.8	58	5.4	3.8	61	5.7	3.8
*EL0100#Y6E$A	44	4.1	4.3	65	6.0	4.3	68	6.3	4.3
*EL0130#Y6E$A	46	4.3	4.5	68	6.3	4.5	71	6.6	4.5
*EL0155#Y6E$A	57	5.3	5.6	85	7.9	5.6	88	8.2	5.6
*EL0170#Y6E$A	56	5.2	5.5	83	7.7	5.5	86	8.0	5.4
*EL0205#Y6E$A	65	6.0	6.3	96	8.9	6.3	100	9.3	6.3
*EL0240#Y6E$A	73	6.8	7.1	108	10.0	7.1	112	10.4	7.1
*EL0255#Y6E$A	69	6.4	6.7	102	9.5	6.7	106	9.8	6.7
*EL0310#Y6E$A	81	7.5	7.9	120	11.1	7.9	125	11.6	7.8

Maximum Releasable Charge and Minimum Room Area Tables

Center Mount Unit Coolers (CM)

CM Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EC0065^Y7AMA	49	4.6	4.7	72	6.7	4.7	75	7.0	4.7
*EC0095^Y7AMA	62	5.8	6.0	92	8.5	6.0	96	8.9	6.0
*EC0130^Y7AMA	62	5.8	6.0	92	8.5	6.0	96	8.9	6.0
*EC0175^Y7AMA	76	7.1	7.4	113	10.5	7.4	118	11.0	7.3
*EC0200^Y7AMA	77	7.2	7.4	113	10.5	7.4	118	11.0	7.4
*EC0225^Y7AMA	85	7.9	8.2	126	11.7	8.2	131	12.2	8.2
*EC0250^Y7AMA	87	8.1	8.4	129	12.0	8.4	135	12.5	8.4
*EC0285^Y7AMA	98	9.1	9.5	145	13.5	9.5	152	14.1	9.5
*EC0360^Y7AMA	112	10.4	10.8	165	15.3	10.8	172	16.0	10.8
*EC0050^Y6EMA	49	4.6	4.6	72	6.7	4.6	75	7.0	4.6
*EC0075^Y6EMA	57	5.3	5.4	84	7.8	5.4	87	8.1	5.4
*EC0120^Y6EMA	68	6.3	6.5	100	9.3	6.5	104	9.7	6.4
*EC0135^Y6EMA	76	7.1	7.3	112	10.4	7.3	117	10.9	7.3
*EC0180^Y6EMA	98	9.1	9.4	146	13.6	9.4	152	14.1	9.4
*EC0255^Y6EMA	112	10.4	10.7	165	15.3	10.7	172	16.0	10.7
*EC0280^Y6EMA	112	10.4	10.7	165	15.3	10.7	172	16.0	10.7

Maximum Releasable Charge and Minimum Room Area Tables

Low Velocity Center Mount Unit Coolers (LVCM)

LVCM Model	R-455A			R-454C			R-454A		
	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)	Min. Room Area (sq ft)	Min. Room Area (sq m)	Max Releasable Charge (lb)
*EV0055^Y6AMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0080^Y6AMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0125^Y6AMA	64	5.9	6.2	95	8.8	6.2	99	9.2	6.2
*EV0160^Y6AMA	84	7.8	8.1	124	11.5	8.1	130	12.1	8.1
*EV0180^Y6AMA	88	8.2	8.5	130	12.1	8.5	136	12.6	8.5
*EV0215^Y6AMA	102	9.5	9.8	151	14.0	9.8	157	14.6	9.8
*EV0245^Y6AMA	101	9.4	9.8	150	13.9	9.8	156	14.5	9.8
*EV0290^Y6AMA	120	11.1	11.5	177	16.4	11.6	185	17.2	11.5
*EV0360^Y6AMA	138	12.8	13.3	204	19.0	13.3	213	19.8	13.3
*EV0055^Y6EMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0080^Y6EMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0125^Y6EMA	64	5.9	6.2	95	8.8	6.2	99	9.2	6.2
*EV0160^Y6EMA	84	7.8	8.1	124	11.5	8.1	130	12.1	8.1
*EV0180^Y6EMA	88	8.2	8.5	130	12.1	8.5	136	12.6	8.5
*EV0215^Y6EMA	102	9.5	9.8	151	14.0	9.8	157	14.6	9.8
*EV0245^Y6EMA	101	9.4	9.8	150	13.9	9.8	156	14.5	9.8
*EV0290^Y6EMA	120	11.1	11.5	177	16.4	11.6	185	17.2	11.5
*EV0360^Y6EMA	138	12.8	13.3	204	19	13.3	213	19.8	13.3
*EV0055^Y6HMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0080^Y6HMA	55	5.1	5.3	82	7.6	5.3	85	7.9	5.3
*EV0125^Y6HMA	64	5.9	6.2	95	8.8	6.2	99	9.2	6.2
*EV0160^Y6HMA	84	7.8	8.1	124	11.5	8.1	130	12.1	8.1
*EV0180^Y6HMA	88	8.2	8.5	130	12.1	8.5	136	12.6	8.5
*EV0215^Y6HMA	102	9.5	9.8	151	14.0	9.8	157	14.6	9.8
*EV0245^Y6HMA	101	9.4	9.8	150	13.9	9.8	156	14.5	9.8
*EV0290^Y6HMA	120	11.1	11.5	177	16.4	11.6	185	17.2	11.5
*EV0360^Y6HMA	138	12.8	13.3	204	19	13.3	213	19.8	13.3

NOTES

NOTES

Please visit https://www.heatcraftrpd.com/resources/literature/
for our complete Refrigeration Systems Installation and Operation Manual H-IM-UC and H-IM-UC-A2L

- Defrost Thermostat
- Expansion Valves & Nozzles
- Refrigerant Oils
- Recommended Refrigerant Piping Practices
- Line Sizing Charts
- Hot Gas Defrost Systems
- Evacuation and Leak Detection
- Refrigerant Charging Instructions
- System Balancing — Compressor Superheat
- General Sequence and Operation
- Troubleshooting Guides
- Preventive Maintenance Guidelines
- Typical Wiring Diagrams

Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.

The name behind the brands you trust.™

HEATCRAFT Worldwide Refrigeration

BOHN · CLIMATE CONTROL · InterLINK Commercial Refrigeration Parts · CHANDLER REFRIGERATION · LARKIN

H-IM-CU-A2L0325