

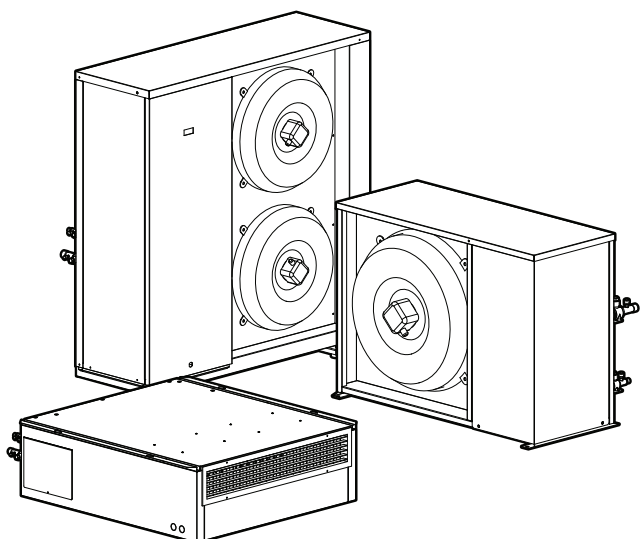
Uniflair™ SP

Uniflair™ UCF, MRA

Installation Manual

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Safety

Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠ DANGER

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

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

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

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury**.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety During Installation

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- This equipment must be installed and serviced by qualified personnel only.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

WARNING

HAZARD FROM MOVING PARTS

Keep hands, clothing, and jewelry away from moving parts. Check the equipment for foreign objects before closing the doors and starting the equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

WARNING

DAMAGE TO EQUIPMENT OR PERSONNEL

- The equipment is heavy. For safety purposes, adequate personnel must be present when moving this item.
- The load must always be solidly anchored to the bearing element of the lifting equipment and means of transport.
- No one should be near the suspended load, nor in the working area of the crane, forklift, truck, or any other lifting equipment or means of transport.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CAUTION

HAZARD FROM UNPROTECTED OUTPUT

Apply circuit protection to all outputs.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

STATIC ELECTRICITY HAZARD

Circuit boards contained within this unit are sensitive to static electricity. Use one or more electrostatic-discharge devices while handling the board.

Failure to follow these instructions can result in equipment damage.












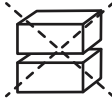

NOTICE

DAMAGE FROM EXPOSURE

Leaving the equipment uncovered and exposed to possible damage from the environment will void the factory warranty.

Failure to follow these instructions can result in equipment damage.

Symbols on Unit or Packaging

Symbol	Meaning	Symbol	Meaning
	Danger		Moving parts
	Important notice		Sharp surface
	High voltage: Risk of electric shock		This side up: Shows the correct orientation of the packed unit
	Fragile: Handle unit with care		Temperature limits: The packed unit must be stored in a place within the indicated limits
	Keep dry: The packed unit must be stored in a dry place		Do not use hooks: Do not lift packed unit with hooks
	Center of gravity: Shows the center of gravity of the packed unit		Do not stack: The packed units must not be stacked
	Keep away from the heat: The unit must be stored away from heat sources		

Intended Use

The cooling units provide air conditioning within the limits and methods described in this manual. This equipment must be installed and applied in accordance with the instructions provided. No modifications may be made to the units or their parts without explicit written consent from Schneider Electric. Any mechanical or electrical modification voids factory warranty.

General Information

Document Overview

The Uniflair SP cooling unit is a precision unit used to control environments for telecom rooms, internet hubs, and data processing centers.

This manual describes Unisplit air-cooled, direct expansion air conditioning units. It supplies general information, safety instructions, unit transportation, and necessary information on how to install the units.

Save These Instructions

This manual contains important instructions that must be followed during the installation of this equipment.

Manual Updates

Schneider Electric™ policy is one of continuous technological innovation and the company reserves the right to amend any data herein without prior notice. The images shown in this manual are for descriptive purposes only and they may differ from specific models that are selected.

NOTE: Unit images and component identification information are examples only. The final configuration of the unit may change according to the different options.

Check for updates to this manual on the Schneider Electric Web site, www.schneider-electric.com/support. Select the **Download Documents and Software** link under the **Support** tab and enter the manual part number or SKU for your equipment in the search field. See the back cover of this manual for the part number.

Cross-Reference Symbol Used in This Manual



See another section of this document or another document for more information on this subject.

Documentation Included with the Unit

Every Uniflair SP cooling unit is delivered with the following documentation enclosed:

- *Uniflair SP Operation and Maintenance Manual*
- *Uniflair SP Installation Manual*
- Refrigeration circuit diagrams
- Electrical diagrams
- List of spare parts
- Conditions of Warranty

Compliance

These units are intended for installation in a non-public location with restricted access, and with installation, use, and maintenance performed by professionally trained personnel.

The manufacturer declares that this product is compliant with the following standards:

- UL 1995
- CSA 22.2 No. 236-11
- FCC Part 15 Subpart B
- CSA ICES-003 Issue 5

The appliance operates safely in the areas of application for which it was intended, provided its installation, commissioning, and maintenance are performed in compliance with the documentation for the unit and with the labels affixed to the unit.

It is necessary to install a supply disconnect on the fixed wiring located near the unit to provide the safety shutdown and disconnection of the power supply. Follow local and national codes and regulations.

The installed mains power disconnect must do the following:

- Isolate the electrical equipment from the supply and have one OFF and one ON position.
- Be provided with a means for locking the device in the OFF (isolated) position with Lockout Tagout
- Have a breaking capacity sufficient to interrupt the rated current (see rated parameter on the unit nameplate or Technical Specifications)
- Be easily accessible and located between 0.6 m (2 ft) and 1.9 m (6 ft) above where the service personnel stands to service the unit

After unit installation, it is necessary to evaluate the fault-loop impedance and automatic protection coordination.

Receiving and Inspecting the Cooling Unit

NOTICE

DAMAGE TO EQUIPMENT

The indoor unit is shipped upside down. Use extreme caution when turning the unit right side up taking care to not bend the flanges.

Failure to follow these instructions can result in equipment damage.

The cooling unit is packaged in a wooden crate or anchored to a pallet and covered with transparent film.

Upon delivery, check to make sure the unit is intact and immediately notify the carrier in writing of any damage that can be attributed to careless or improper transportation. Check for any damage on the area upon which the display interface is mounted.

In case of shipping damage, do not operate the cooling unit. Keep all packaging for inspection by the shipping company and contact Schneider Electric Corporation.

Filing a Claim

If damage is identified on receipt of the equipment, note the damage on the bill of lading and file a damage claim with the shipping company. Contact Schneider Electric Worldwide Customer Support at one of the numbers listed on the Web page on the back page of this manual for information on how to file a claim with the shipping company. The shipping claim must be filed at the receiving end of the delivery.

NOTE: In case of shipping damage, do not operate the equipment. Keep all packaging for inspection by the shipping company and contact Schneider Electric.

Storing the Cooling Unit Before Installation

NOTICE
<p>DAMAGE FROM EXPOSURE</p> <p>Leaving the equipment uncovered and exposed to possible damage from the environment will void the factory warranty.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

If storing the unit for a period of time, the following procedures must be followed:

- The storage area must be dry (<85% R.H.) and protected against minimum storage temperatures -23°C (-10°F) and extreme storage temperatures 50°C (122°F).
- The unit should remain in its original packaging if stored for long periods of time.

Moving the Unit

⚠ WARNING
<p>DAMAGE TO EQUIPMENT OR PERSONNEL</p> <ul style="list-style-type: none"> • The equipment is heavy. For safety purposes, adequate personnel must be present when moving this item. • The load must always be solidly anchored to the bearing element of the lifting equipment and means of transport. • No one should be near the suspended load, nor in the working area of the crane, forklift, truck, or any other lifting equipment or means of transport. <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

Lifting and transporting the units must be carried out by qualified personnel as described in this manual.

Use all relevant safety standards to prevent any possible damage to people or objects.

Indoor Unit

The cooling unit is packaged in a wooden crate or anchored to a pallet and covered with transparent film. The recommended tools for moving and installing the equipment include the following:

Forklift



Pallet Jack



Outdoor Unit

The condensing unit is packaged in a wooden crate. The recommended tools for moving and installing the equipment include the following:

Pallet Jack



Forklift



Crane



Equipment Disposal

Waste Electrical and Electronic Equipment (WEEE) Disposal



Schneider Electric products comply with international directives on the Restriction of Hazardous Substances (RoHS) in electronic and electrical equipment and the disposal of Waste Electrical and Electronic Equipment (WEEE). Dispose of any waste electronic or electrical equipment with the appropriate recycling center. Contact Schneider Electric for assistance.

Radio Frequency Interference

The SKUs UCF0341I, UCF0481I, MRA0221I, and MRA0611D comply with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. These devices may not cause harmful interference.
2. These devices must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

California Proposition 65—Warning Statement for California Residents

⚠️ WARNING: This product can expose you to chemicals including lead and lead compounds, that are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Equipment Guidelines

Working Conditions and Environmental Limits

Limit Working Conditions	
Power supply	208 V, 1 Ph, 60 Hz 230 V, 1 Ph, 60 Hz
Voltage input tolerance	±10%*
Voltage imbalance	Maximum 3% for 3-phase units
Frequency input tolerance—continuously	±0.5 Hz
Frequency input tolerance—short time	±1 Hz
Maximum altitude	2000 m (6562 ft)
Room Conditions	
Temperature	18°C to 40°C (64.4°F to 104°F)
Humidity	Relative humidity: 30 to 70%RH
DX Operational Conditions	
Temperature	-23°C to 46°C (-10°F to 115°F)
Storage Temperature	
Temperature	-23°C to 50°C (-10°F to 122°F)

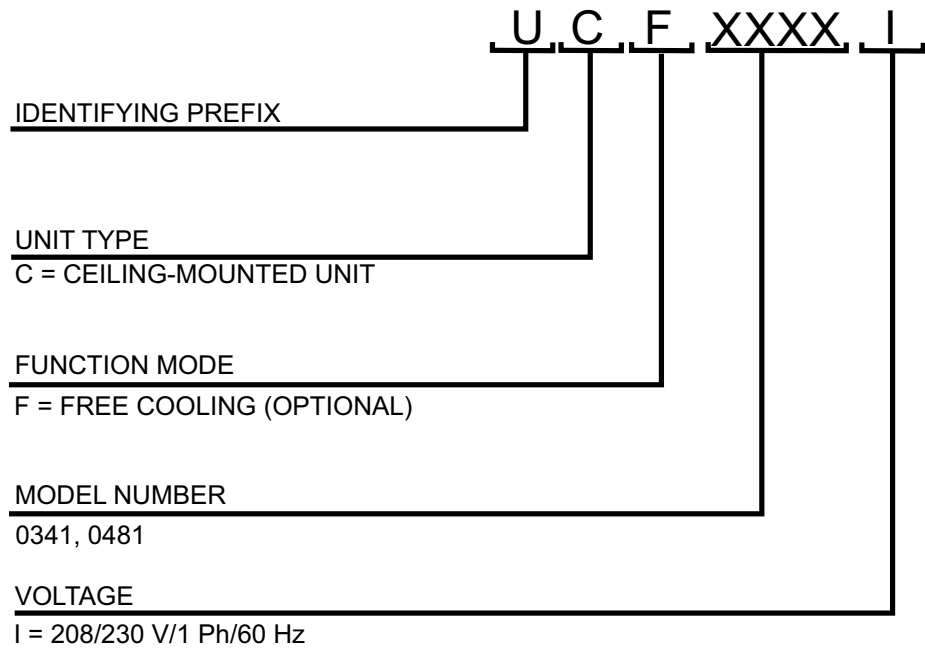
*MRA0221I is only -5%/+10%

Unit	Assembly	Power Supply
UCF0341I	Indoor	208 V, 1 Ph, 60Hz 230 V, 1 Ph, 60Hz
UCF0481I		208 V, 1 Ph, 60Hz 230 V, 1 Ph, 60Hz
MRA0221I	Outdoor	208 V, 1 Ph, 60Hz 230 V, 1 Ph, 60Hz
MRA0611D		208 V, 3 Ph, 60Hz 230 V, 3 Ph, 60Hz

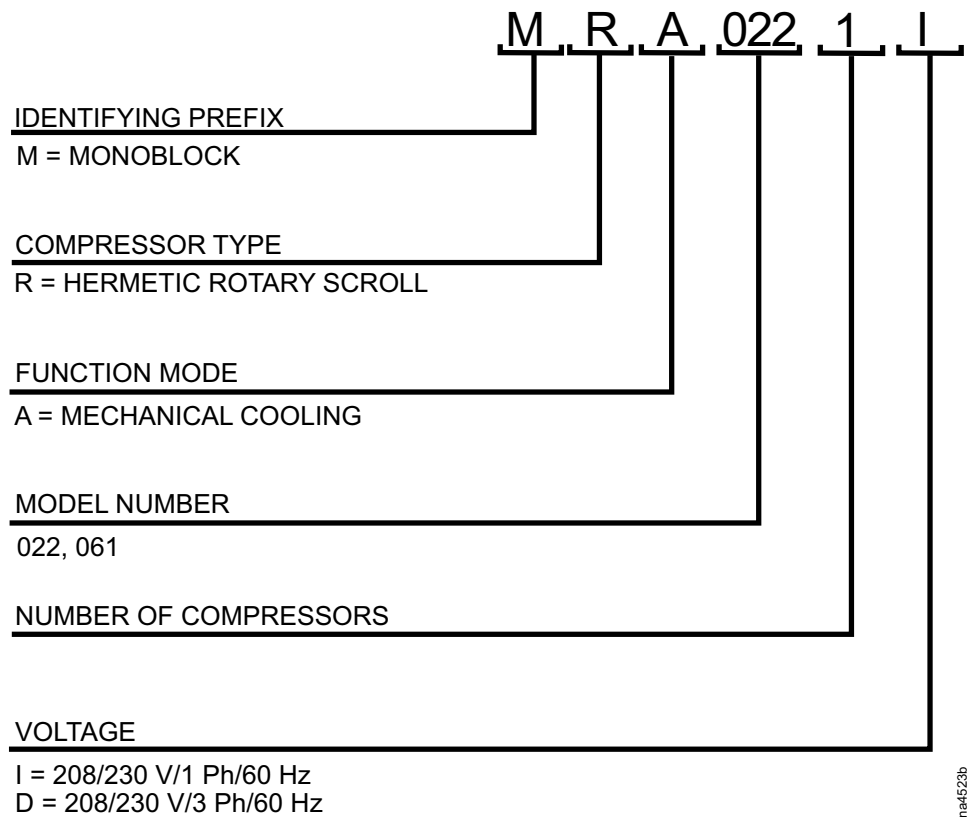
Unit Overview

Model Nomenclature

Indoor Units



Outdoor Units




Nameplate Example

The units can be identified by the nameplate, which is located in the electrical panel of the cooling unit. The model and any accessories that are installed are indicated by an 'X' in the corresponding box. The nameplate contains the following information:

- Model and series number of the unit
- Power supply type
- Power absorbed by the unit and individual components
- Current absorbed by the unit and individual components
- The setpoints of the air pressure switches
- Setpoints for the regulation and safety devices

Indoor Unit



Certification ID
 SERIAL NO.

MODEL/SKU: UCF0341I 4009332

ELECTRICAL RATING: 208/230 VAC, 1~, 60 Hz

FLA: 3.0 AMPS

MCA: 15 AMPS

MOP: 15 AMPS

FAN: FLA 1.5 H.P. 0.23 QTY. 2


REFRIGERANT: R410A DESIGNED UNIT CHARGE: 10 / 0.28 oz/kg

FACTORY CHARGE: 10 / 0.68 PSIG/Bar Nitrogen

DESIGN PRESSURE: 650 / 44.8 PSIG/Bar Low,High Side


REMOTE AIR-COOLED CONDENSER

Contains fluorinated greenhouse gases covered by the Kyoto protocol.
Foam blown with fluorinated greenhouse gases.


TAAD0563X3A

na7076a

Outdoor Unit



Certification ID
 SERIAL NO.

MODEL/SKU: MRA0221I 4009332

ELECTRICAL RATING: 208-230 VAC, 1~, 60 Hz

FLA: 16.4 AMPS

MCA: 19.6 AMPS

MOP: 30.0 AMPS

COMPRESSOR: RLA 12.8 LRA 64

FAN: FLA 3.6 H.P. 0.46 QTY. 1

REFRIGERANT: R410A DESIGNED UNIT CHARGE: 81.0 / 2.29 oz/kg


FACTORY CHARGE: 10 / 0.68 PSIG/Bar Nitrogen

DESIGN PRESSURE: 650 / 44.8 PSIG/Bar Low,High Side

OUTDOOR USE (UTILISATION À L'EXTÉRIEUR)

Contains fluorinated greenhouse gases covered by the Kyoto protocol.
Foam blown with fluorinated greenhouse gases.

SYSTEM CHARGE: _____ oz/kg

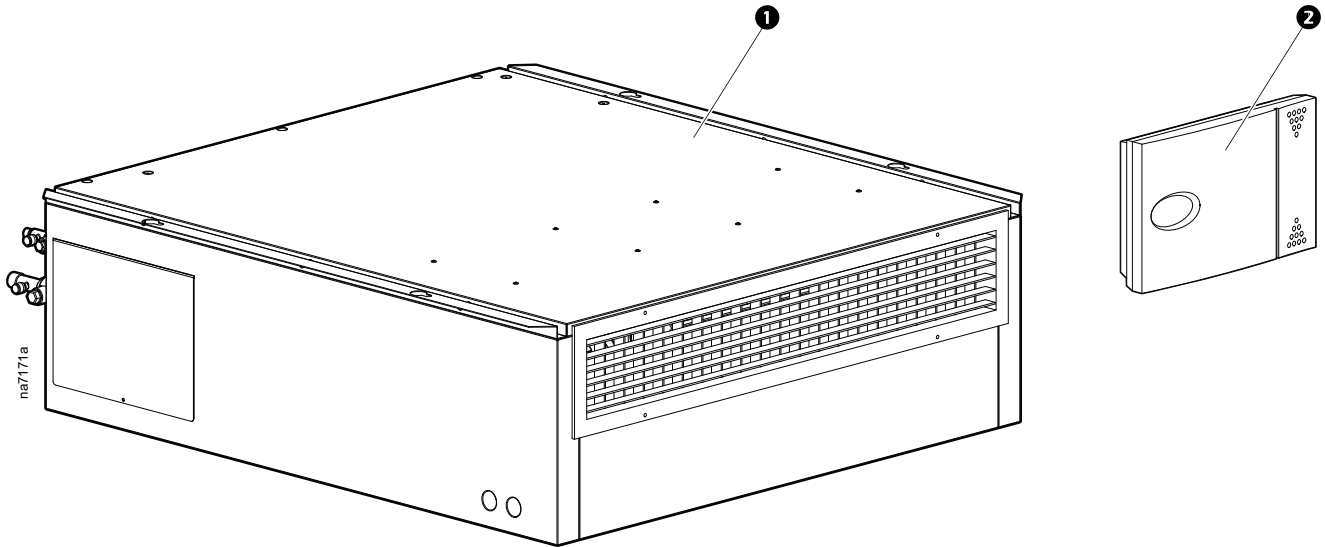

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Component Identification

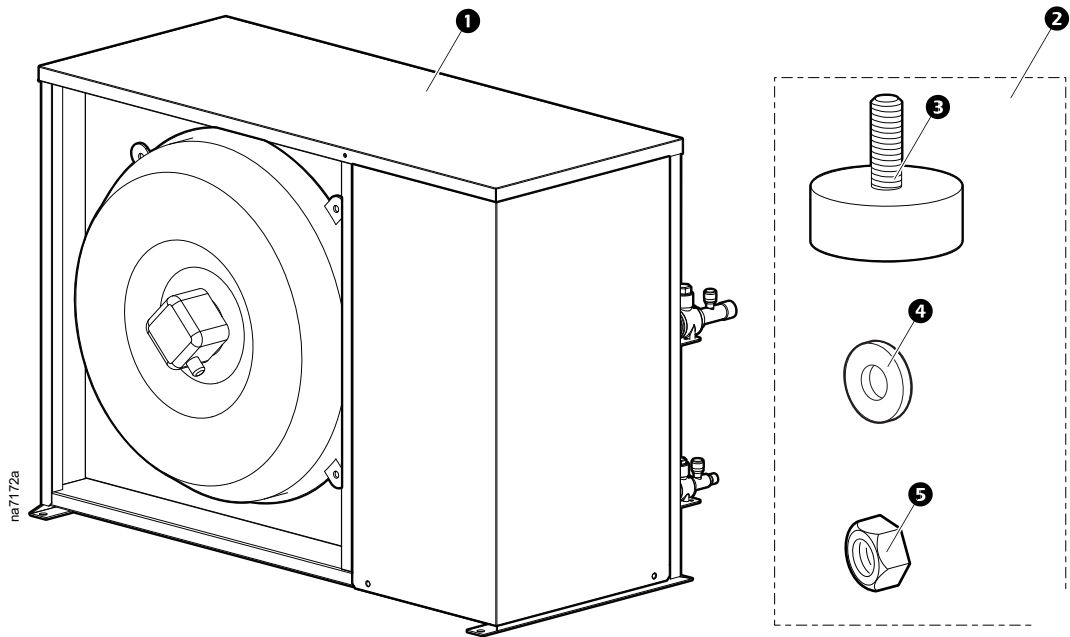
Inventory

UCF0341I and UCF0481I



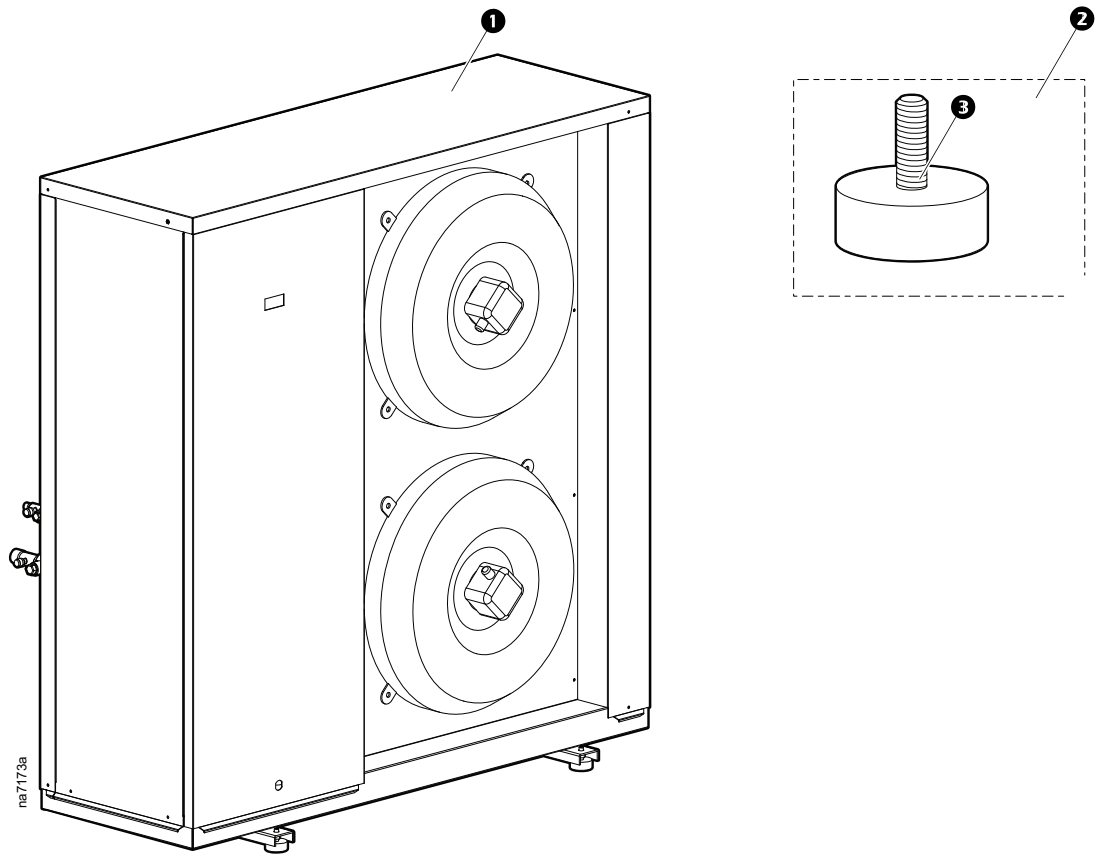
Item	Description	Quantity
1	UCF unit	1
2	Remote temperature sensor	1

MRA0221I



Item	Description	Quantity
1	MRA unit	1
2	Ship-loose kit (attached to fan grille)	—
3	Mounting support foot	4
4	Washer	4
5	Nut	4

MRA0611D

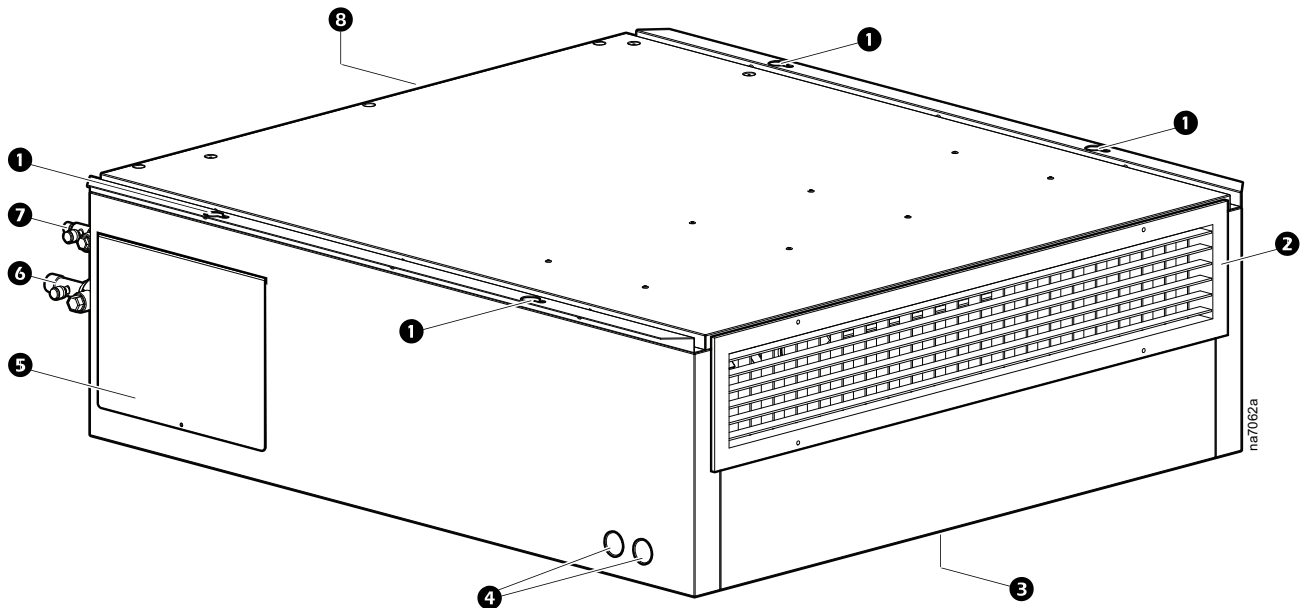


Item	Description	Quantity
1	MRA unit	1
2	Ship-loose kit (attached to fan grille)	—
3	Mounting support foot	4

External Components

Indoor Units

UCF0341I and UCF0481I



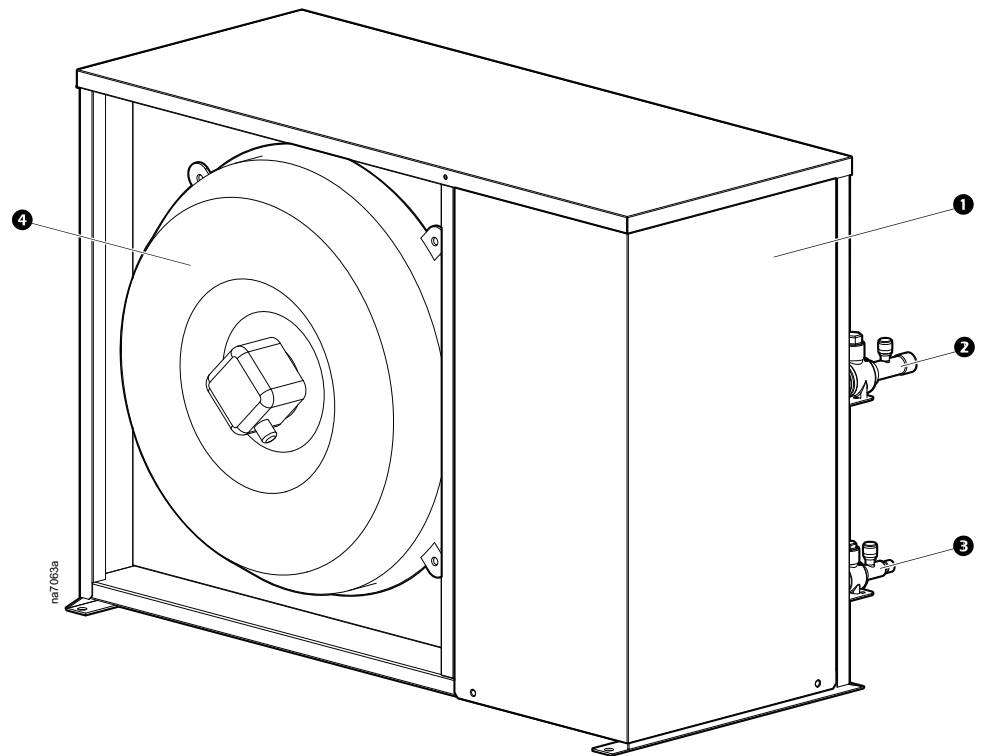
NOTE: Model shown is UCF0341I.

Item	Description	Item	Description
1	Mounting holes	5	Service panel
2	Fan protection grille	6	Suction line service valve
3	Electrical panel cover (on bottom of unit)	7	Liquid line service valve
4	Low-voltage conduit knock-out panels*	8	Damper connection cover panel (on rear of unit)

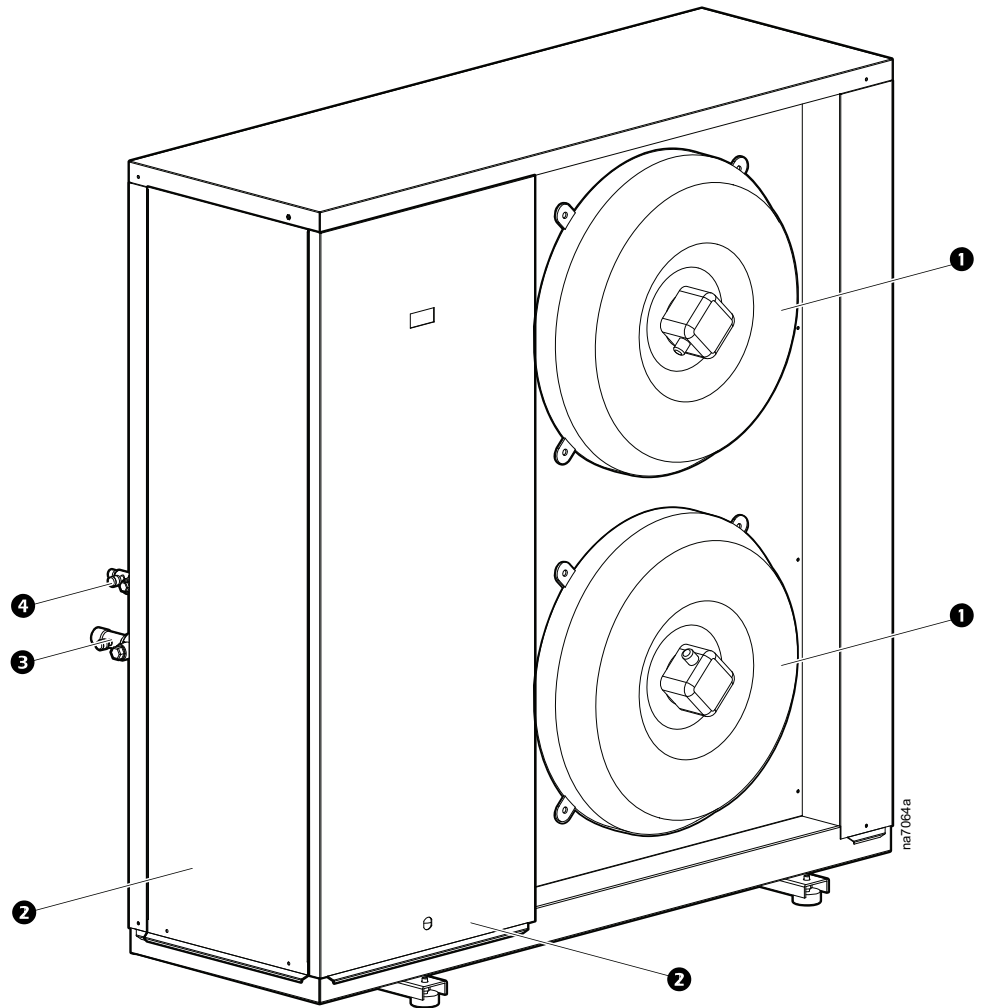
* High-voltage conduit knock-out panels are located on the opposite side.

Outdoor Units

MRA0221I



Item	Description
①	External panel
②	Suction line
③	Liquid line
④	Fan protection grille

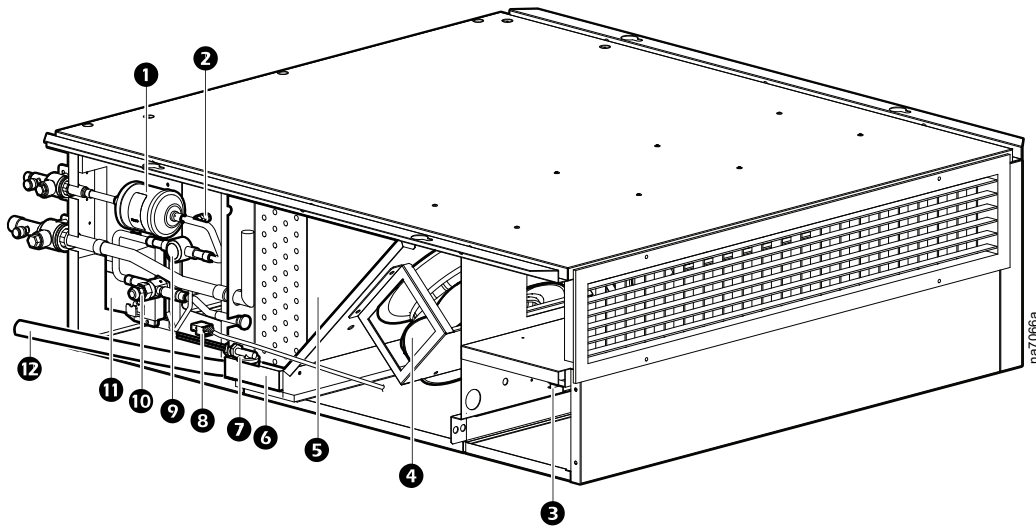
MRA0661D

Item	Description
❶	Fan protection grille
❷	External panels
❸	Suction line connection
❹	Liquid line connection

Internal Components

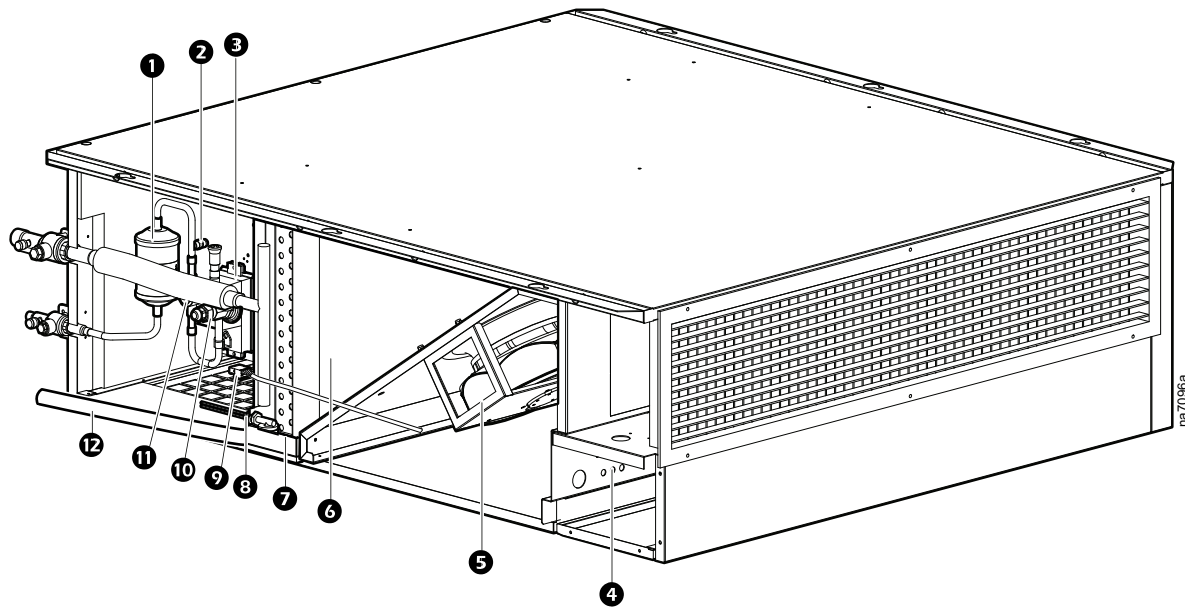
Indoor Units

UCF0341I



Item	Description	Item	Description
1	Filter drier	7	Float switch
2	Service port	8	Direct Air Economizer damper actuator connection (optional)
3	Electrical panel (facing bottom of unit)	9	Sight glass
4	Evaporative fans	10	Thermostatic expansion valve (TXV)
5	Evaporative coil	11	Motorized free-cooling damper actuator (optional with damper kit)
6	Condensate drain pan	12	Condensate drain hose

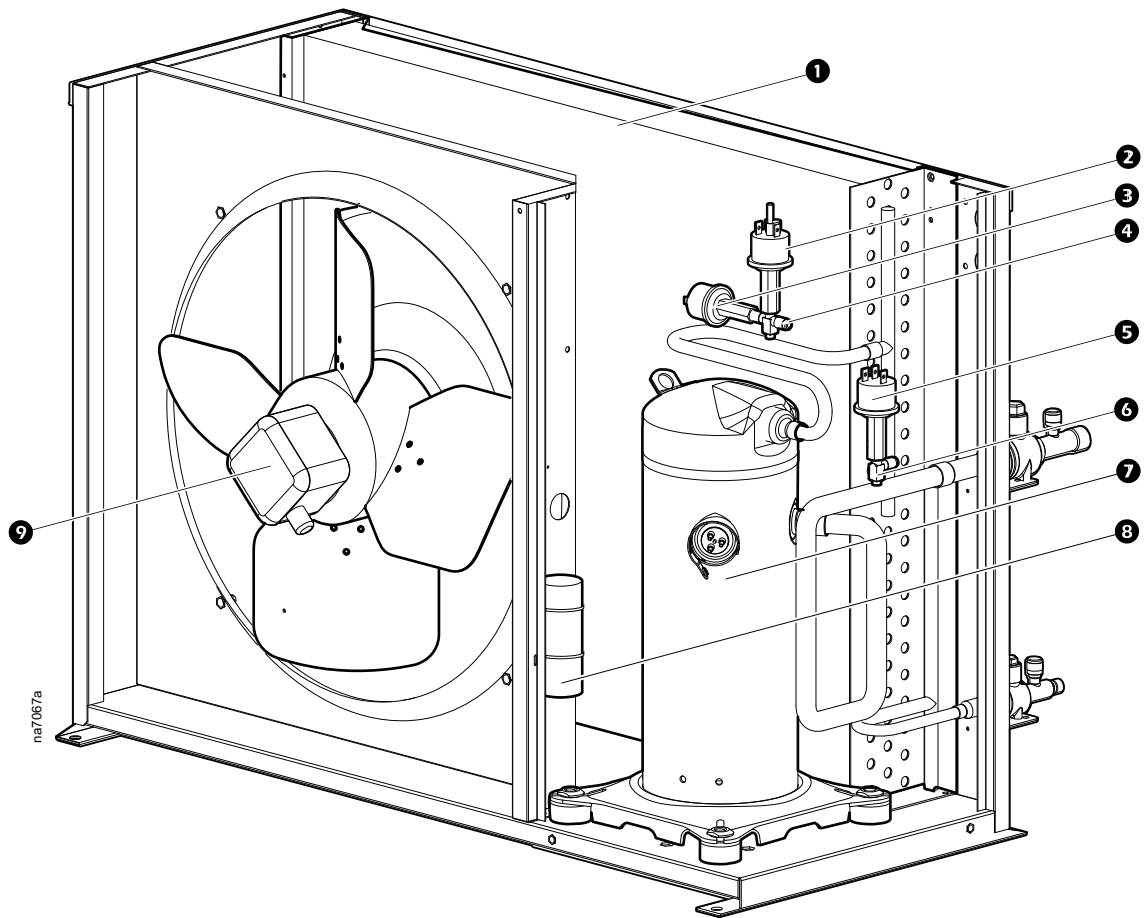
UCF0481I



Item	Description	Item	Description
1	Filter drier	7	Condensate drain pan
2	Service port	8	Float switch
3	Motorized free-cooling damper actuator (optional with damper kit)	9	Direct Air Economizer damper actuator connection (optional)
4	Electrical panel (facing bottom of unit)	10	Thermostatic expansion valve (TXV)
5	Evaporative fans	11	Sight glass
6	Evaporative coil	12	Condensate drain hose

Outdoor Units

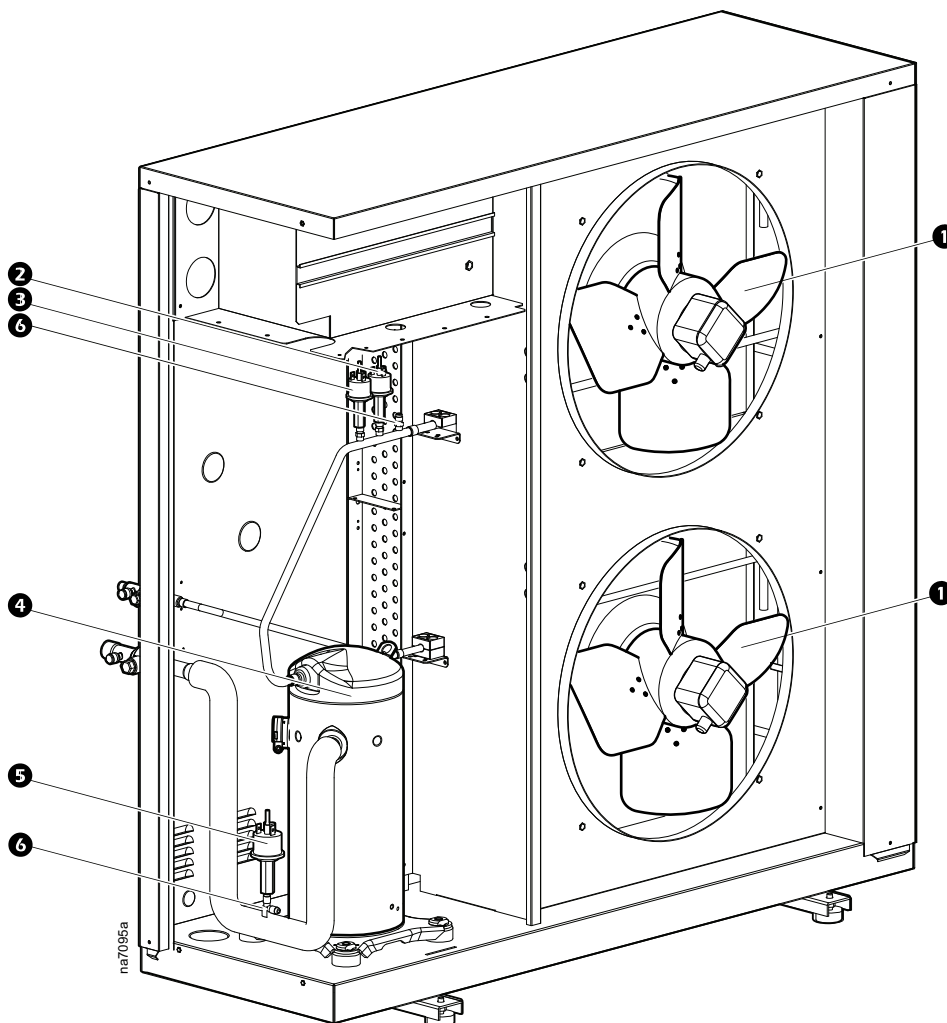
MRA0221I



Item	Description	Item	Description
1	Condensing coil	6	Suction service port
2	High-pressure switch	7	Scroll compressor
3	Pressure transducer	8	Capacitor
4	Discharge service port	9	Condensing fan
5	Low-pressure switch		

NOTE: Crankcase heater and compressor blanket are not shown.

MRA0611D



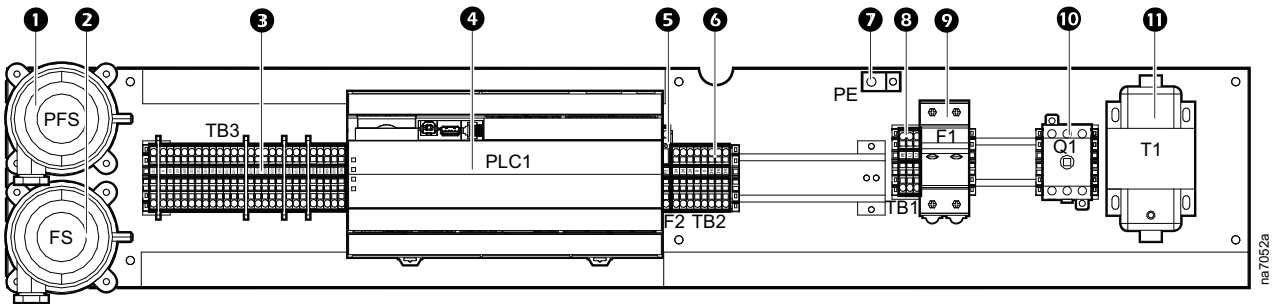
Item	Description	Item	Description
1	Condensing fans	4	Scroll compressor
2	High-pressure switch	5	Low-pressure switch
3	Pressure transducer	6	Service port

NOTE: Crankcase heater and compressor blanket are not shown.

Electrical Panels

Indoor Units

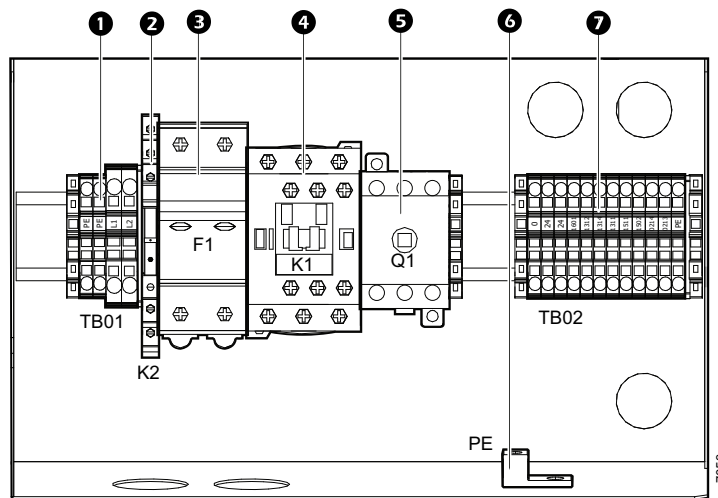
UCF0341I, UCF0481I



Item	Description	Item	Description
1	Clogged filter pressure switch (PFS)	7	Ground (PE)
2	Air flow pressure switch (FS)	8	Terminal block (TB1)
3	Terminal block (TB3)	9	Fuse (F1)
4	J5 controller (PLC1)	10	Internal power disconnect switch (Q1)
5	Fuse (F2)	11	Transformer (T1)
6	Terminal block (TB2)		

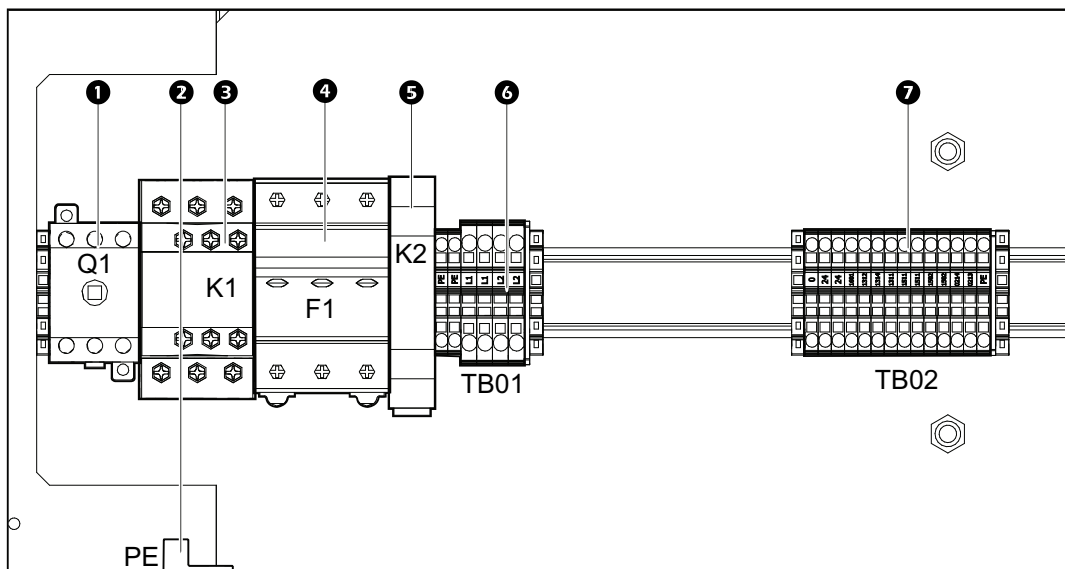
Outdoor Units

MRA0221I



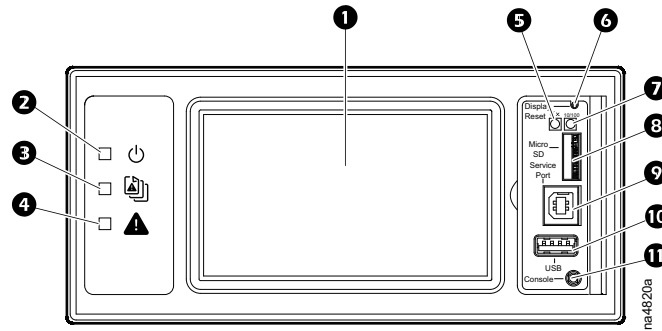
Item	Description	Item	Description
1	Terminal block (TB01)	5	Internal power disconnect switch (Q1)
2	Voltage presence relay (K2)	6	Ground (PE)
3	Fuse (F1)	7	Terminal block (TB02)
4	Compressor contactor (K1)		

MRA0611D



Item	Description	Item	Description
1	Internal power disconnect switch (Q1)	5	Voltage presence relay/3-phase monitor (K2)
2	Ground (PE)	6	Terminal block (TB01)
3	Compressor contactor (K1)	7	Terminal block (TB02)
4	Fuse (F1)		

Display Interface



Item	Description	Function
1	LCD Display	4.3-inch touch-screen color display
2	Power LED	The cooling unit is powered when the LED is illuminated. Unit firmware is updating when LED is blinking.
3	Check Log LED	When this LED is illuminated, a new entry has been made to the event log.
4	Alarm LED	Displays current alarm condition of unit.
5	Status LED	Displays current network management card status.
6	Display Reset button	Resets the display microprocessor. This has no effect on the air conditioner controller.
7	Link-RX/TX (10/100) LED	Displays current network link status.
8	Micro SD card slot	Memory card expansion slot.
9	Service port	USB-B port used only by service personnel.
10	USB-A port	Supports firmware upgrades.
11	Serial Configuration port	Connects the display to a local computer to configure initial network settings or access the command line interface (CLI).

Alarm LED

This LED indicates active alarms on the display.

Condition	Description
Off	No alarm
Solid yellow	Warning alarm
Solid red	Critical alarm

Status LED

This LED indicates the status of the display.

Condition	Description
Off	One of the following situations exist: <ul style="list-style-type: none"> The display is not receiving input power. The display is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display has valid TCP/IP settings.
Solid orange	A hardware malfunction has been detected in the display. Contact Schneider Electric Customer Support.
Flashing green	The display does not have valid TCP/IP settings.
Flashing orange	The display is making BOOTP requests.
Alternately flashing green and orange	If the LED is flashing slowly, the display is making DHCP requests. If the LED is flashing rapidly, the display is starting up.

Link-RX/TX (10/100) LED

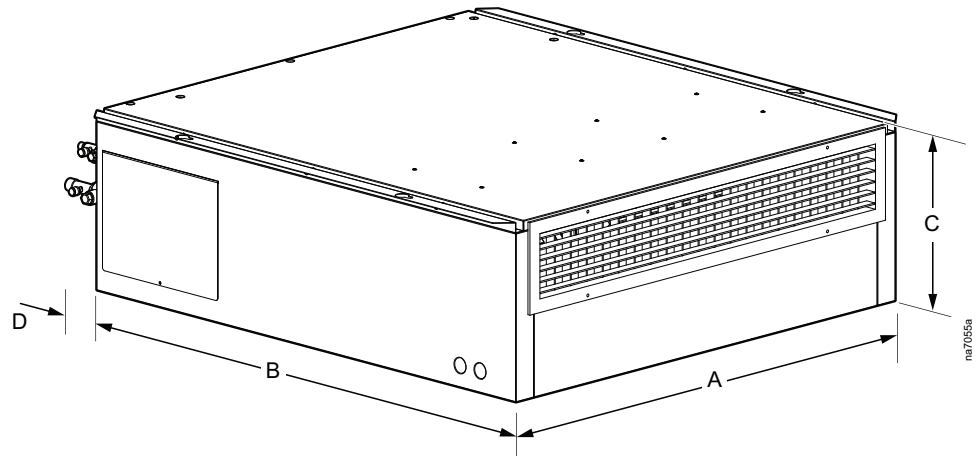
This LED indicates the network status of the display.

Condition	Description
Off	One or more of the following situations exist: <ul style="list-style-type: none"> The display is not receiving input power. The cable or device that connects the cooling unit to the network is disconnected or not functioning properly. The display itself is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display is connected to a network operating at 10 megabits per second (Mbps).
Solid orange	The display is connected to a network operating at 100 Mbps.
Flashing green	The display is receiving or transmitting at 10 Mbps.
Flashing orange	The display is receiving data packets at 100 Mbps.

Dimensions and Weights

Indoor Units

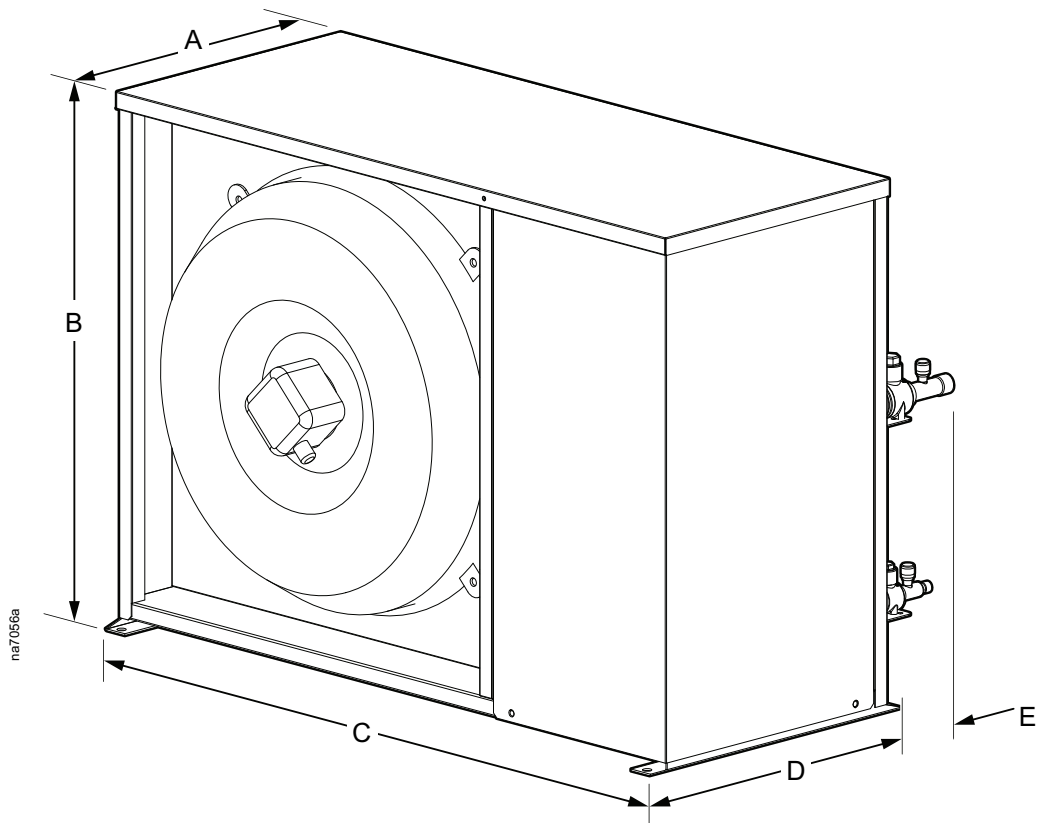
UCF0341I, UCF0481I



Model	Dimensions – mm (in.)				Net Weight – kg (lb)
	A	B	C	D	
UCF0341I	950 (37.4)	1050 (41.3)	330 (13.0)	125 (4.9)	75 (165.4)
UCF0481I	1150 (45.3)	1300 (51.2)	411 (16.2)	124 (4.8)	146 (321.9)

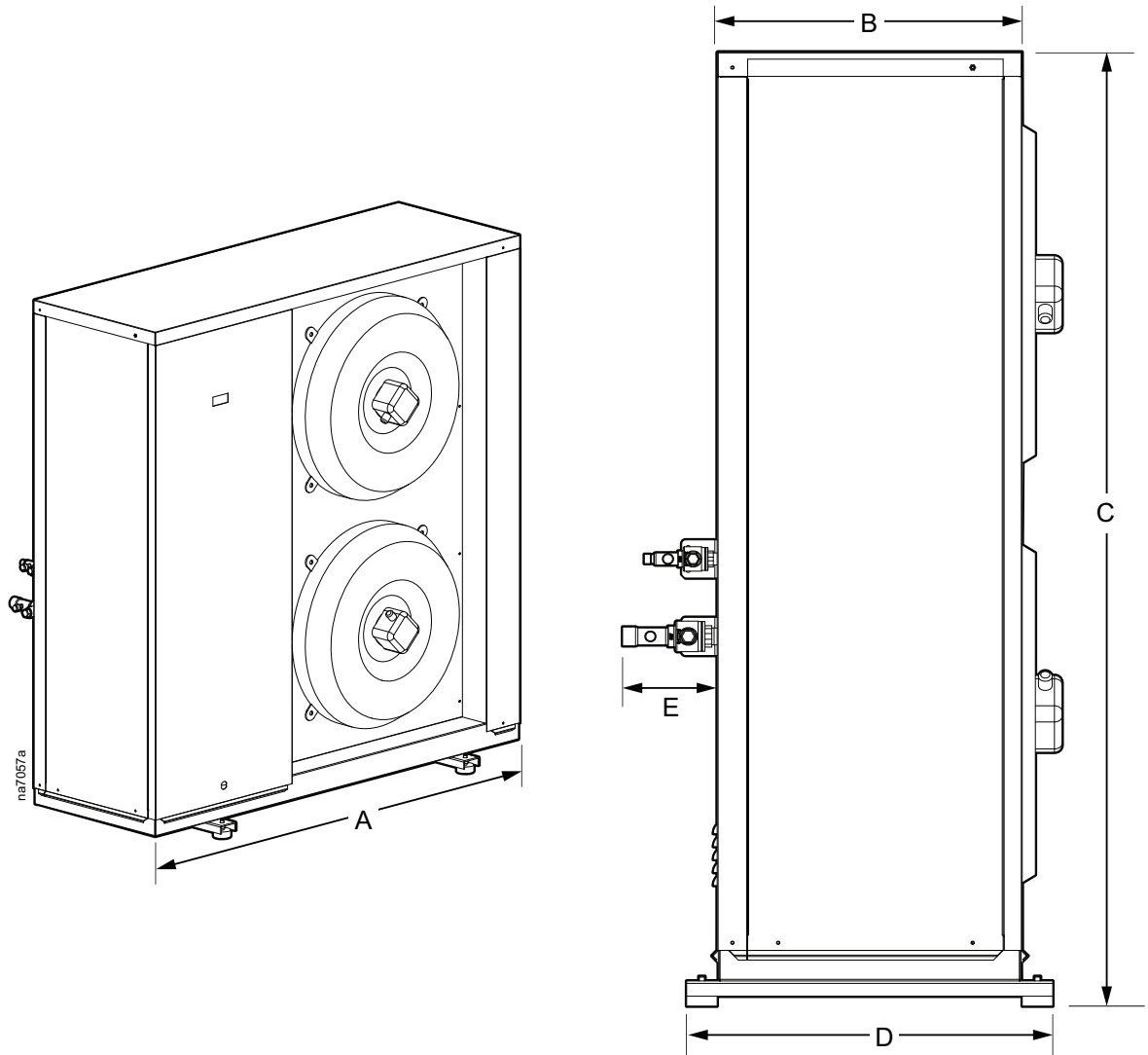
Outdoor Units

MRA0221I



Model	Dimensions – mm (in.)					Net Weight – kg (lb)
	A	B	C	D	E	
MRA0221I	349.0 (13.7)	610.1 (24.0)	854.0 (33.6)	390.0 (15.4)	125.0 (4.9)	105 (231.5)

MRA0611D

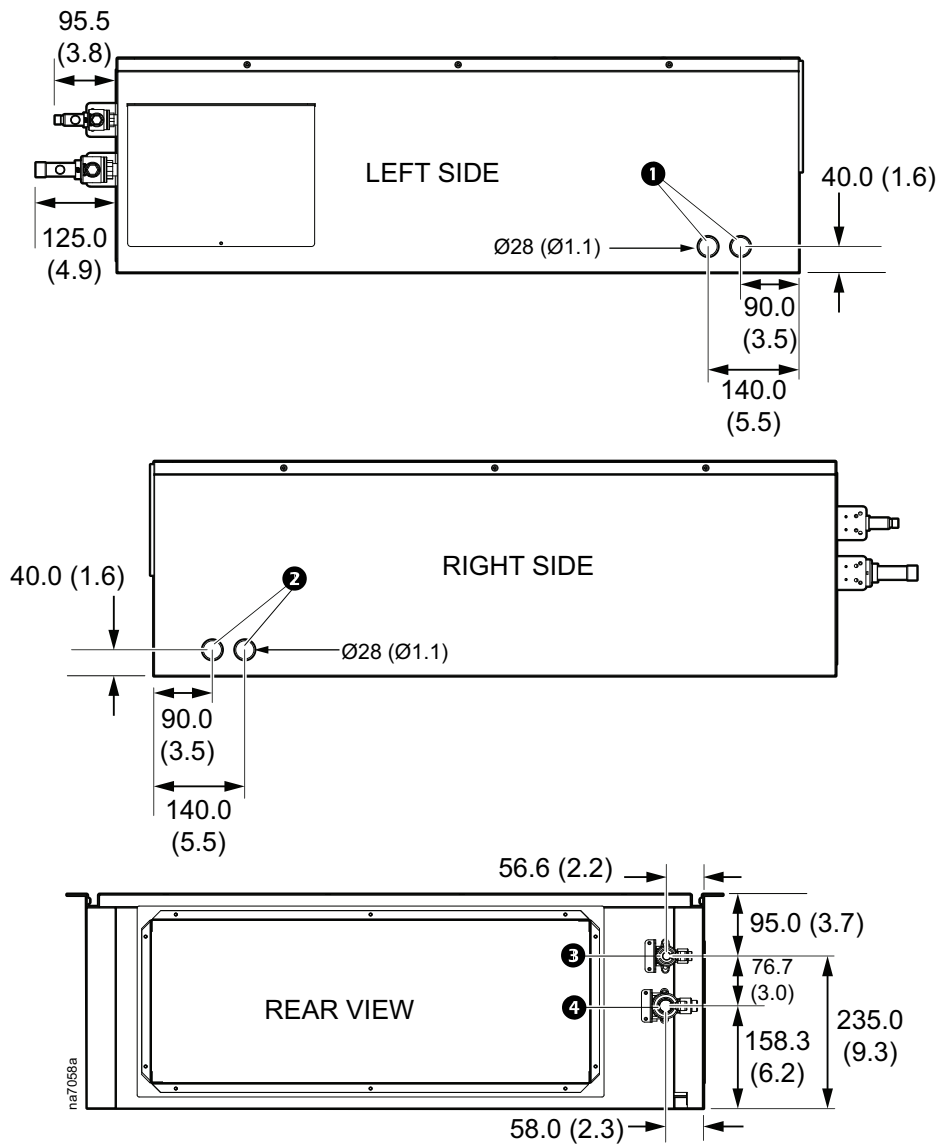


Model	Dimensions – mm (in.)					Net Weight – kg (lb)
	A	B	C	D	E	
MRA0611D	1200 (47.2)	400.0 (15.7)	1250.5 (49.2)	480.0 (18.9)	124.0 (4.9)	140 (308.7)

Piping and Electrical Access Locations

Indoor Units

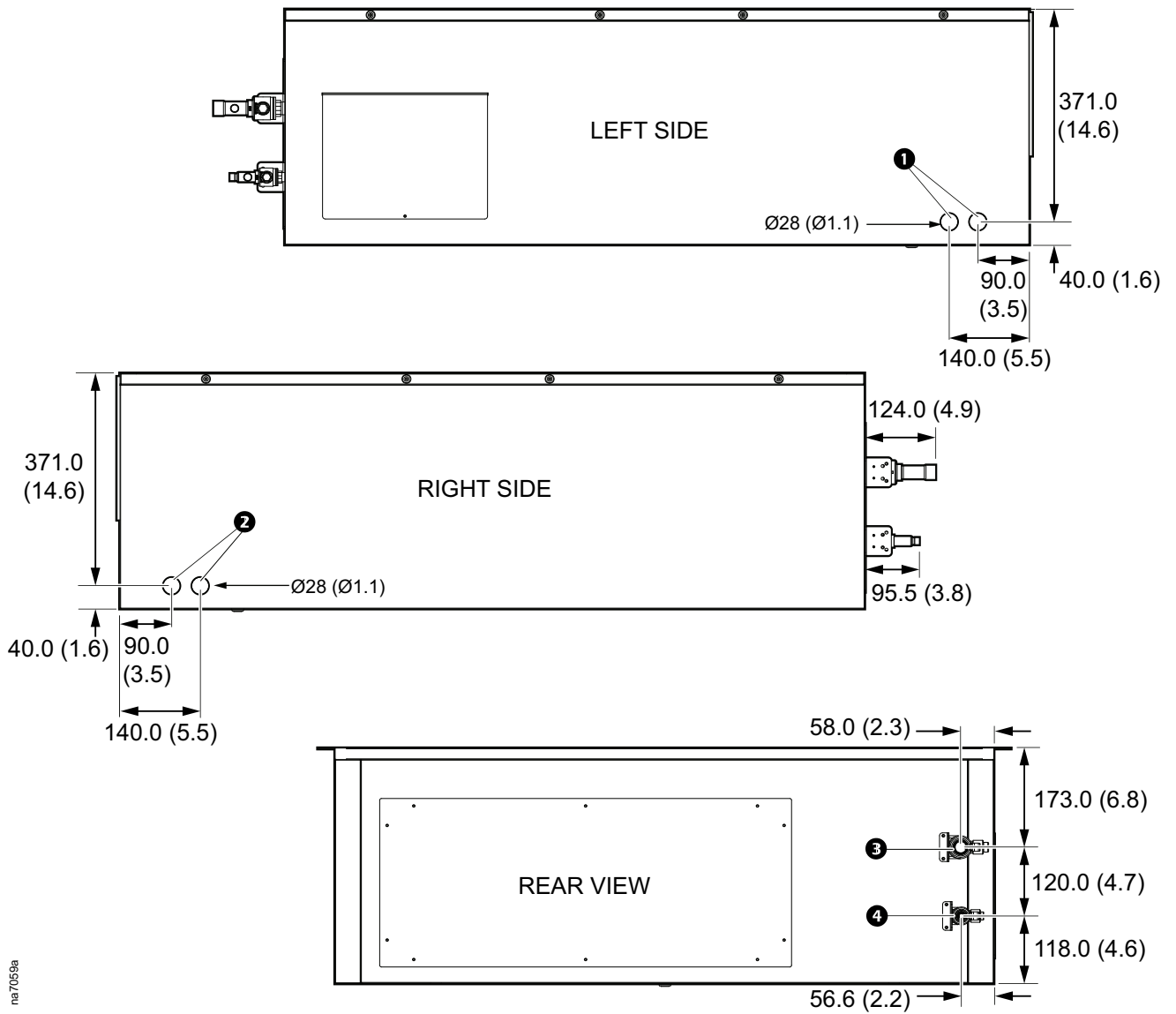
UCF0341I



NOTE: Dimensions shown in mm (in.).

Item	Description
1	Low-voltage conduit knock-out panel
2	High-voltage conduit knock-out panel
3	Liquid line
4	Gas line

UCF0481I



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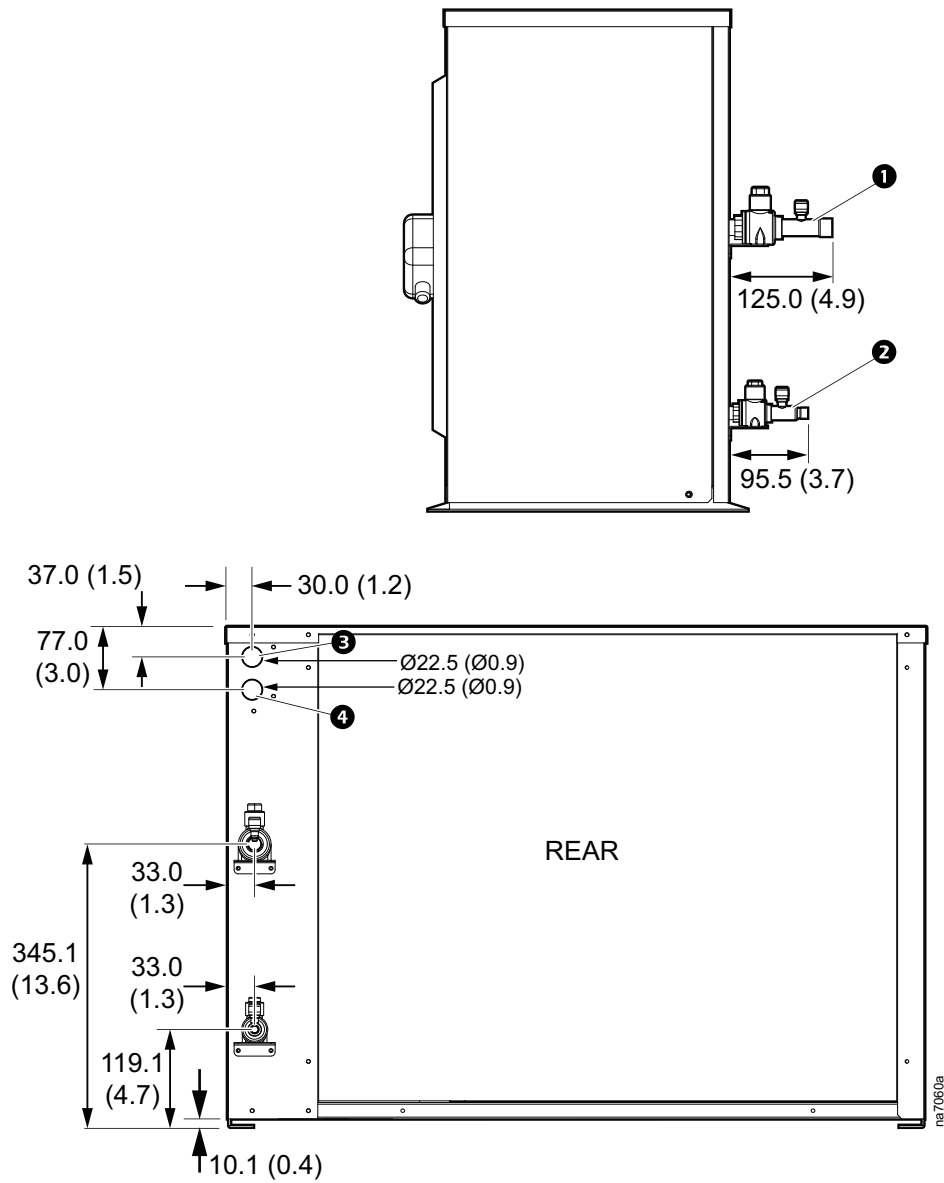
NOTE: Dimensions shown in mm (in.).

Item	Description
------	-------------

- | | |
|---|--------------------------------------|
| 1 | Low-voltage conduit knock-out panel |
| 2 | High-voltage conduit knock-out panel |
| 3 | Gas line |
| 4 | Liquid line |

Outdoor Units

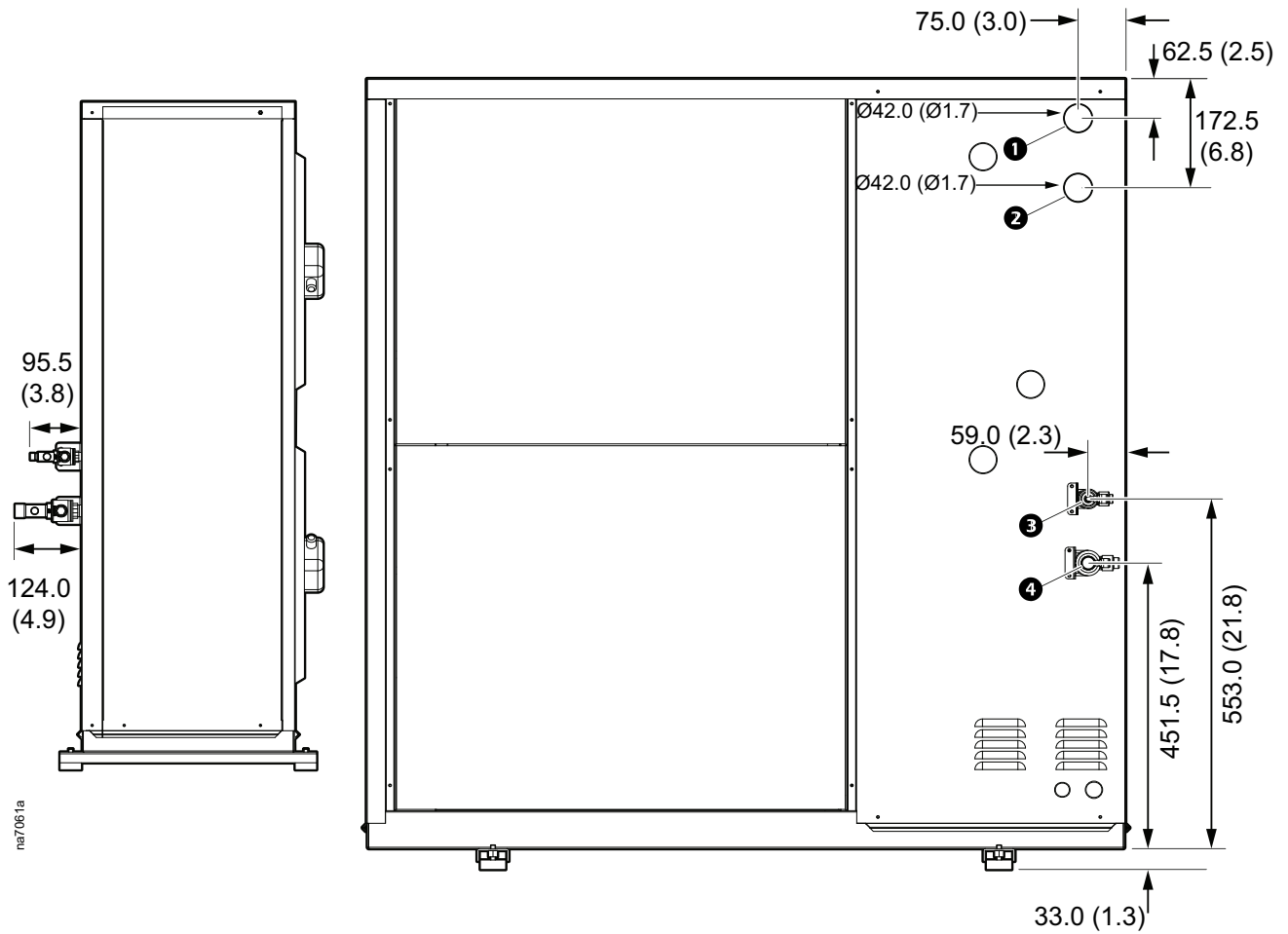
MRA0221I



NOTE: Dimensions shown in mm (in.).

Item	Description
1	Gas line
2	Liquid line
3	High-voltage conduit knock-out panel
4	Low-voltage conduit knock-out panel

MRA0611D



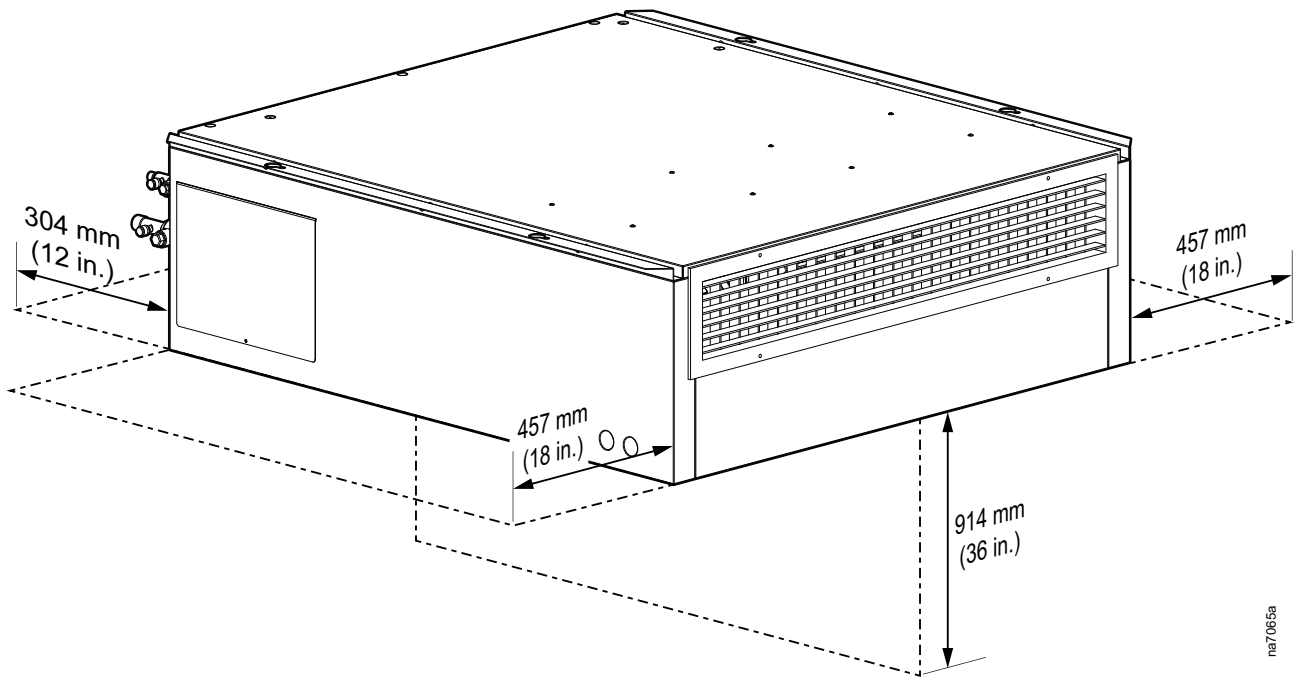
NOTE: Dimensions shown in mm (in.).

Item	Description
------	-------------

- | | |
|---|--------------------------------------|
| 1 | High-voltage conduit knock-out panel |
| 2 | Low-voltage conduit knock-out panel |
| 3 | Liquid line |
| 4 | Gas line |

Service Clearance

Indoor Units



Routine service and maintenance is performed from below the unit. Consider service accessibility when planning equipment positioning in the data center.

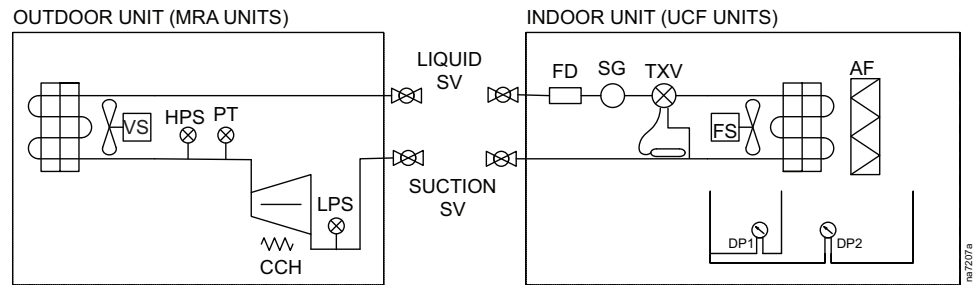
Location	Minimum Clearance	Recommended Clearance
Rear of unit	304 mm (12 in.)	—
Sides of unit	457 mm (18 in.)	914 mm (36 in.)
Below unit	914 mm (36 in.)	1981.2 mm (78 in.)

Outdoor Units

Location	Recommended Clearance
Rear of unit	152 mm (6 in.)
Top of unit	304 mm (12 in.)
Front of unit	914 mm (36 in.)
Service side of unit	508 mm (20 in.)
Non-service side of unit	152 mm (6 in.)

Diagrams

Refrigeration Piping Diagram



Item	Description	Item	Description
FS	Fixed speed fan	AF	Air filter
VS	Variable speed fan	FD	Filter drier
PT	Pressure transducer (variable speed fan control)	SG	Sight glass
HPS	High pressure switch, manual reset	TXV	Thermostatic expansion valve
LPS	Low pressure switch, auto reset	DP1	Air pressure sensor, indoor fan flow
CCH	Crankcase heater	DP2	Air pressure sensor, air filter
SV	Service valve, ball type		

Installation

Site Preparation

▲ WARNING
<p>HAZARD FROM MOVING PARTS</p> <p>Keep hands, clothing, and jewelry away from moving parts. Check the equipment for foreign objects before closing the doors and starting the equipment.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

NOTICE
<p>EQUIPMENT DAMAGE RISK</p> <p>Install the unit in an area that is protected from adverse conditions.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

NOTICE
<p>WATER DAMAGE</p> <p>Installing the unit on an uneven surface may result in overflow spilling from the condensate tray.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

Positioning Units

Internal Units (UCF)

NOTICE
<p>EQUIPMENT DAMAGE RISK</p> <p>Install the unit in an area that is protected from adverse conditions.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

UCF units must be attached to (or suspended from) the ceiling of the room by the side flanges; check that the ceiling is strong enough to support the weight of the unit.

When installing the unit, check that it is level.

The ceiling mount must be installed in accordance with local, regional, and national codes, and this *Installation Manual*.

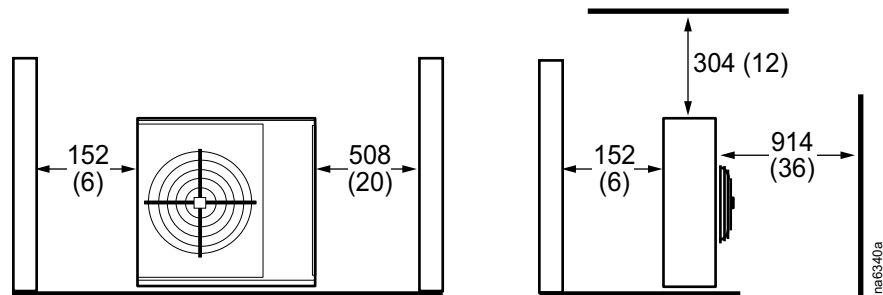
External Units (MRA)

This is an outdoor unit. Protect the unit from water flowing from drains or gutters. Do not expose the unit to air containing flammable or greasy substances.

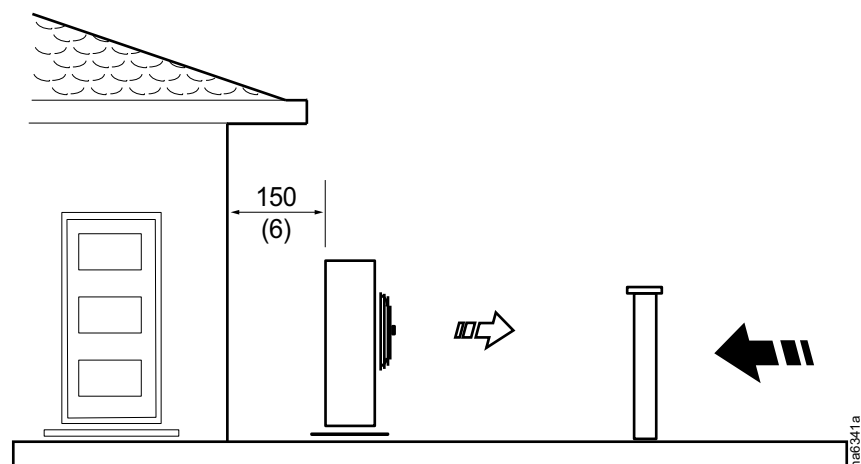
Do not obstruct intake airflow from the fans and through the condensing coil. Free airflow ensures efficiency of the unit and prevents compressor safety devices from ending unit operation.

Never direct the air-discharge side (the fan side) toward a wall. If the installation location is windy, install the unit in a sheltered position; the wind could obstruct the airflow through the cooling coil or make it excessive. If this is not possible, take adequate wind-protection measures.

Check that the load capacity of the surface under the unit is sufficient to support its weight.



NOTE: Dimensions are in mm (in.)



NOTE: Dimensions are in mm (in.)

External Air Free-Cooling–UCF Units

UCF units have the option to be converted for use with a free-cooling kit.



See the *Damper Kit Installation Instructions* for the requirements.

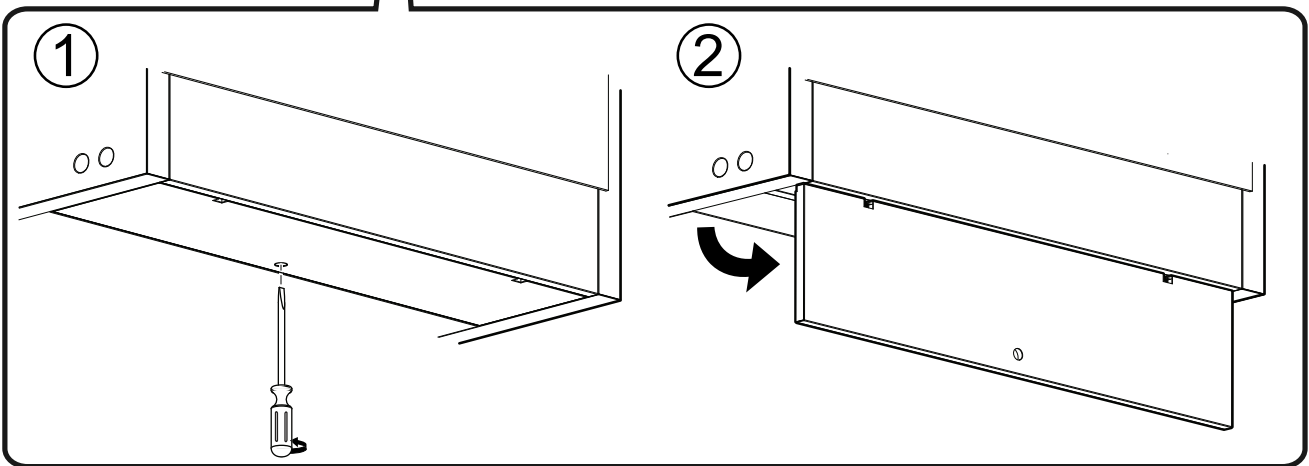
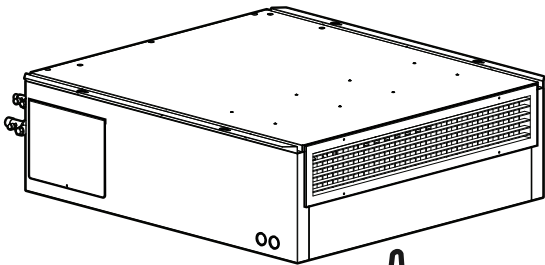
These free-cooling units have a butterfly damper that introduces external air when the outside temperature is low enough to dissipate the thermal load in the air-conditioned room.

Panel Removal

Indoor Units

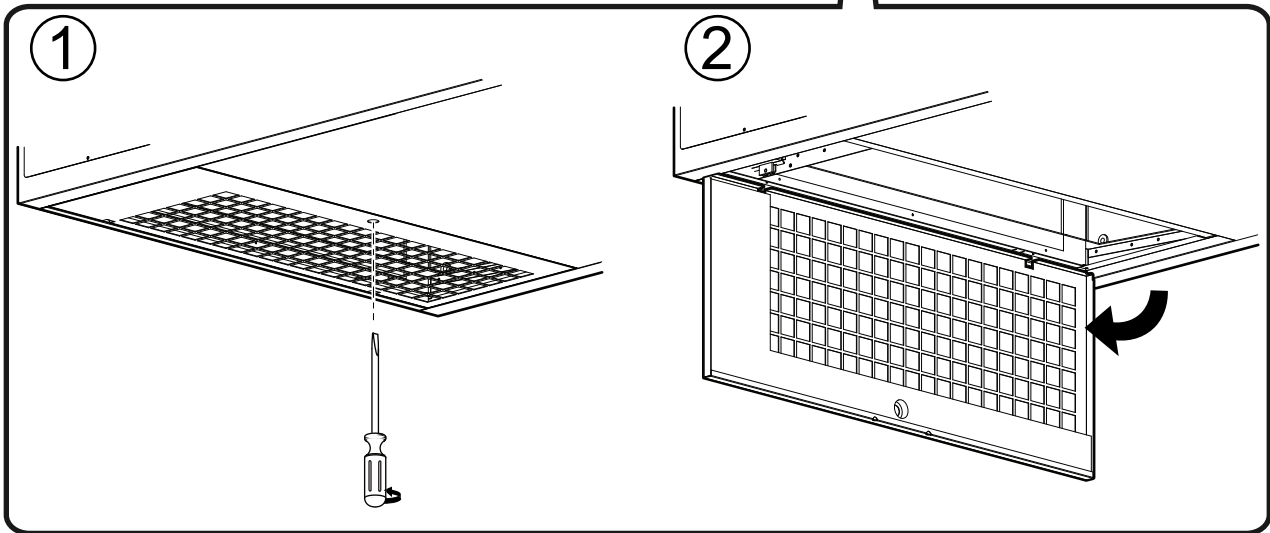
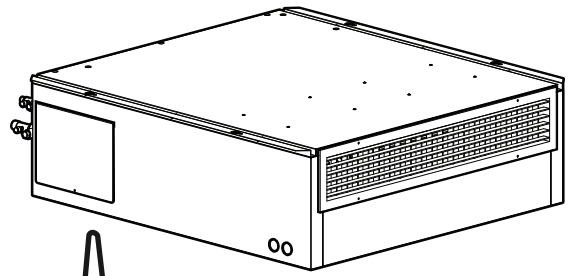
Normal installation operations require only the side and underside panels to be opened.

Electrical Panel Cover

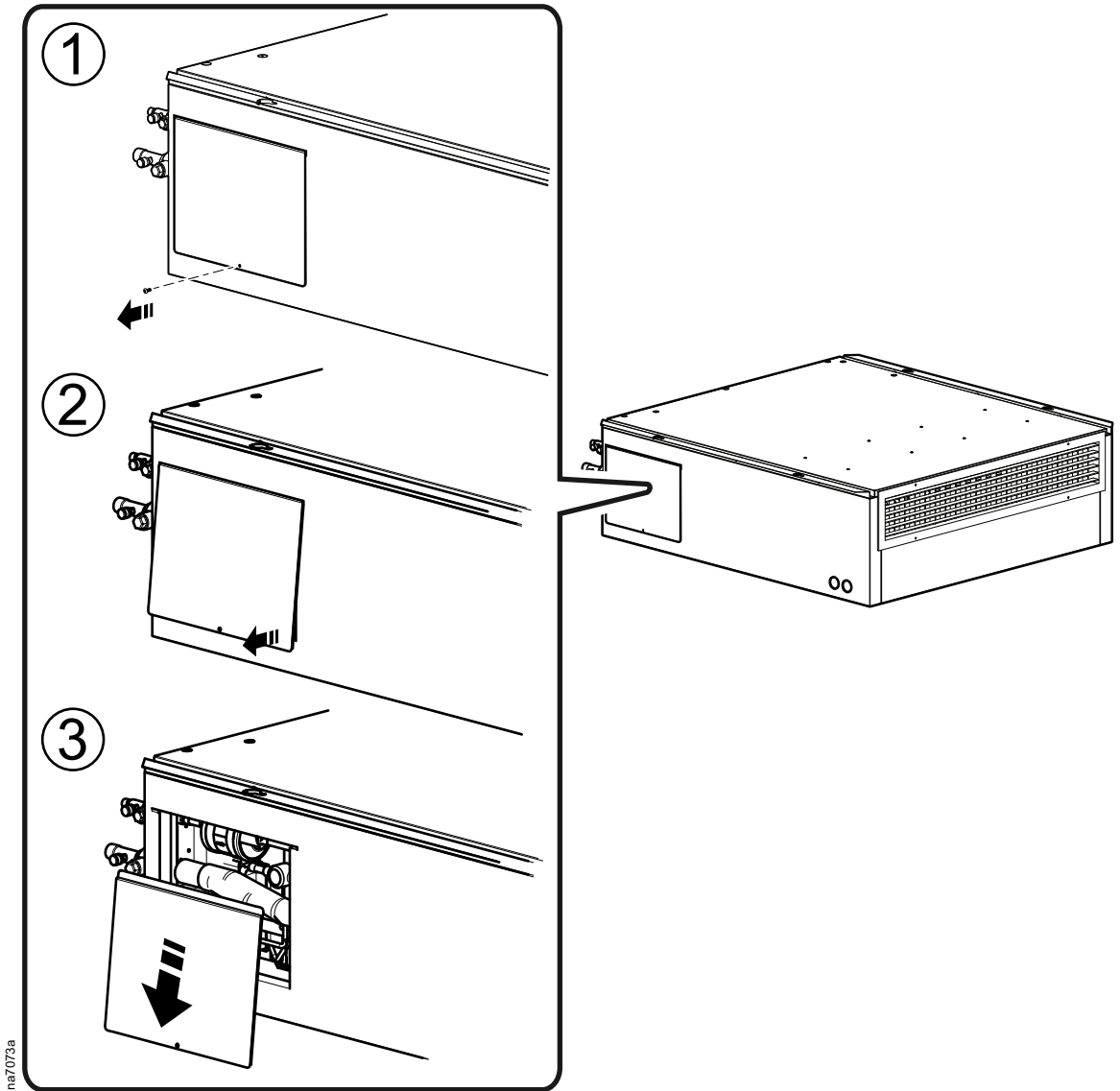


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Filter Access Panel

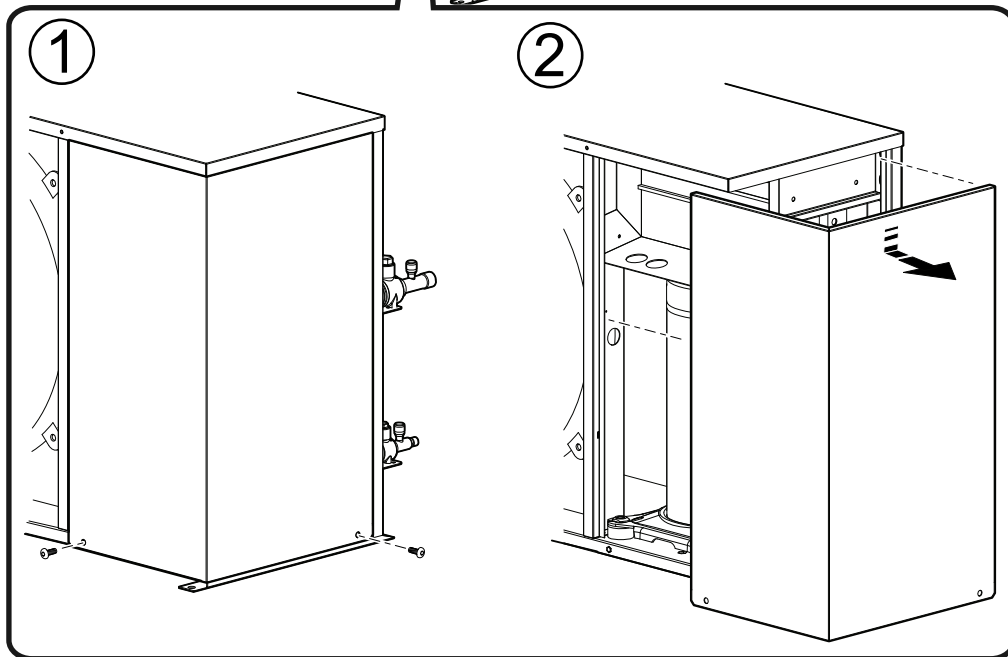
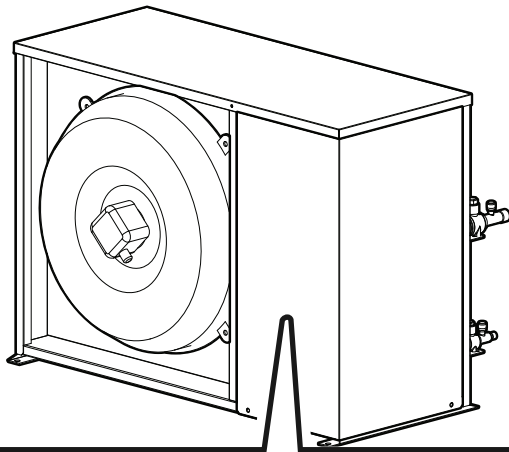


Service Access Panel

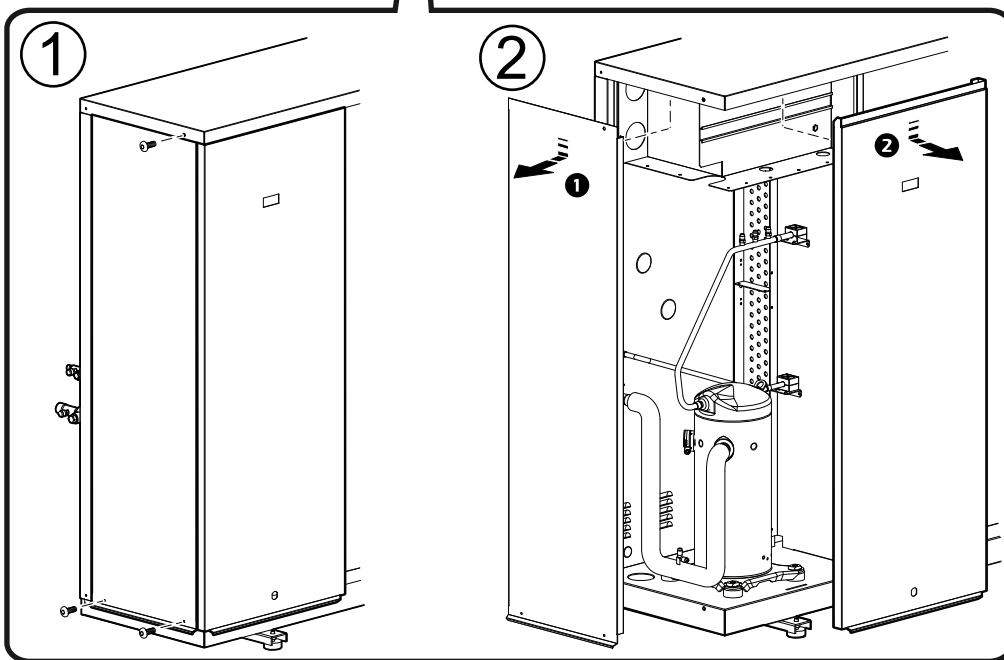
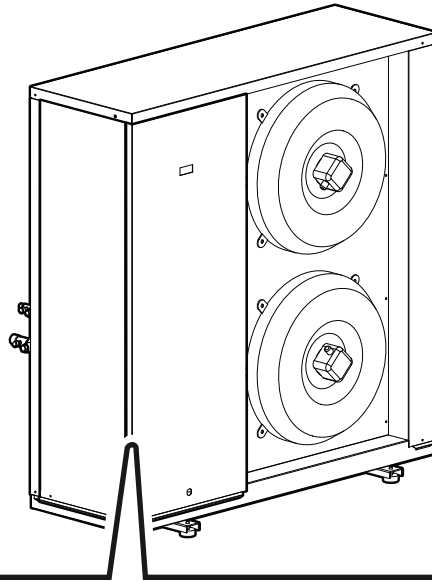


Outdoor Units

MRA0221I



MRA0611D



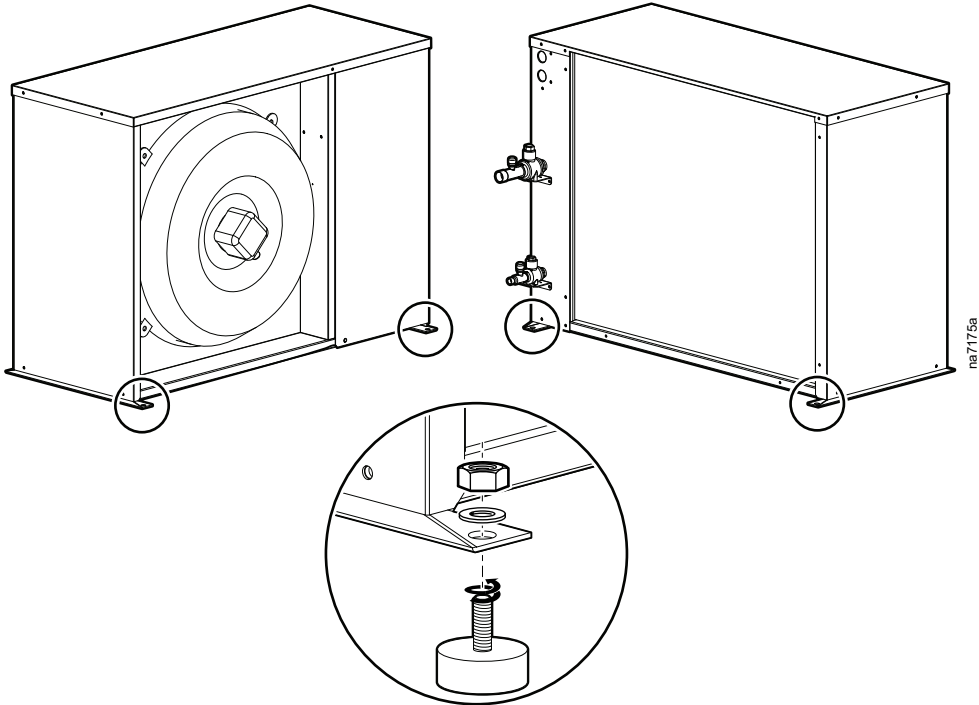
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Placing the Outdoor Unit

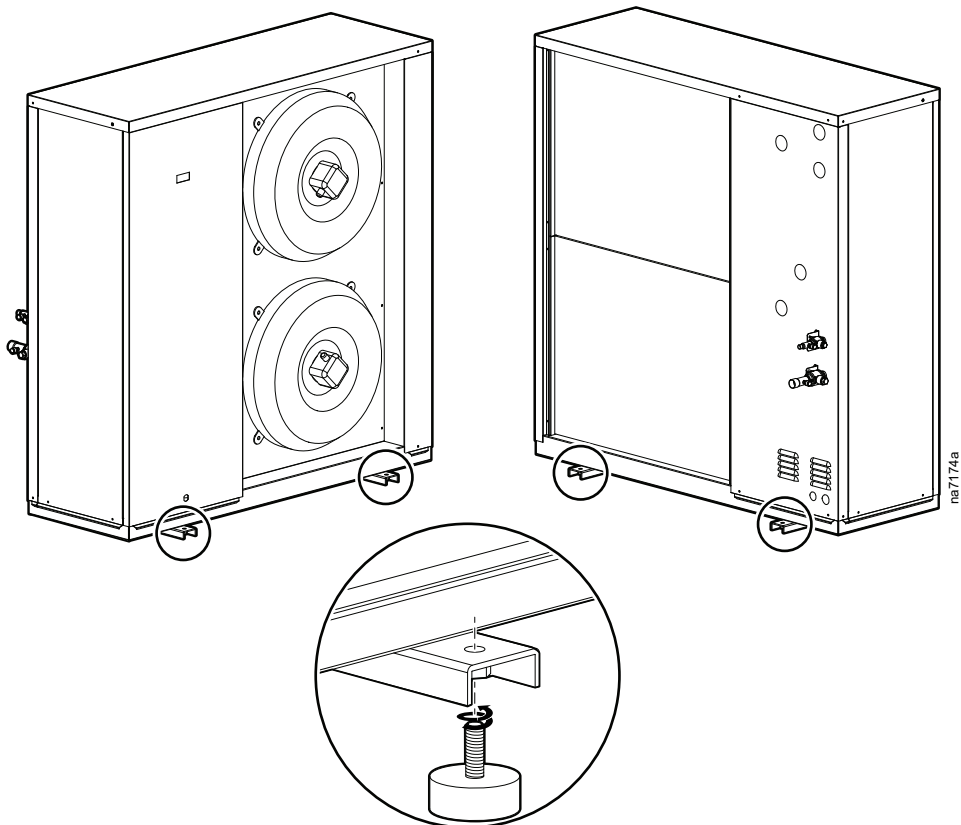
The mounting struts to attach the outdoor unit to the platform are field supplied.

Attaching the Mounting Feet

MRA0221 I



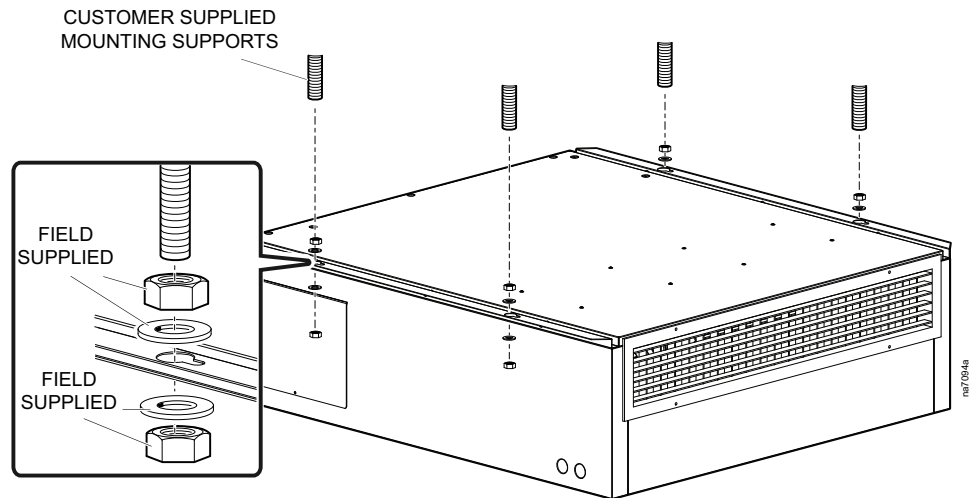
MRA0611D



Unit Connections

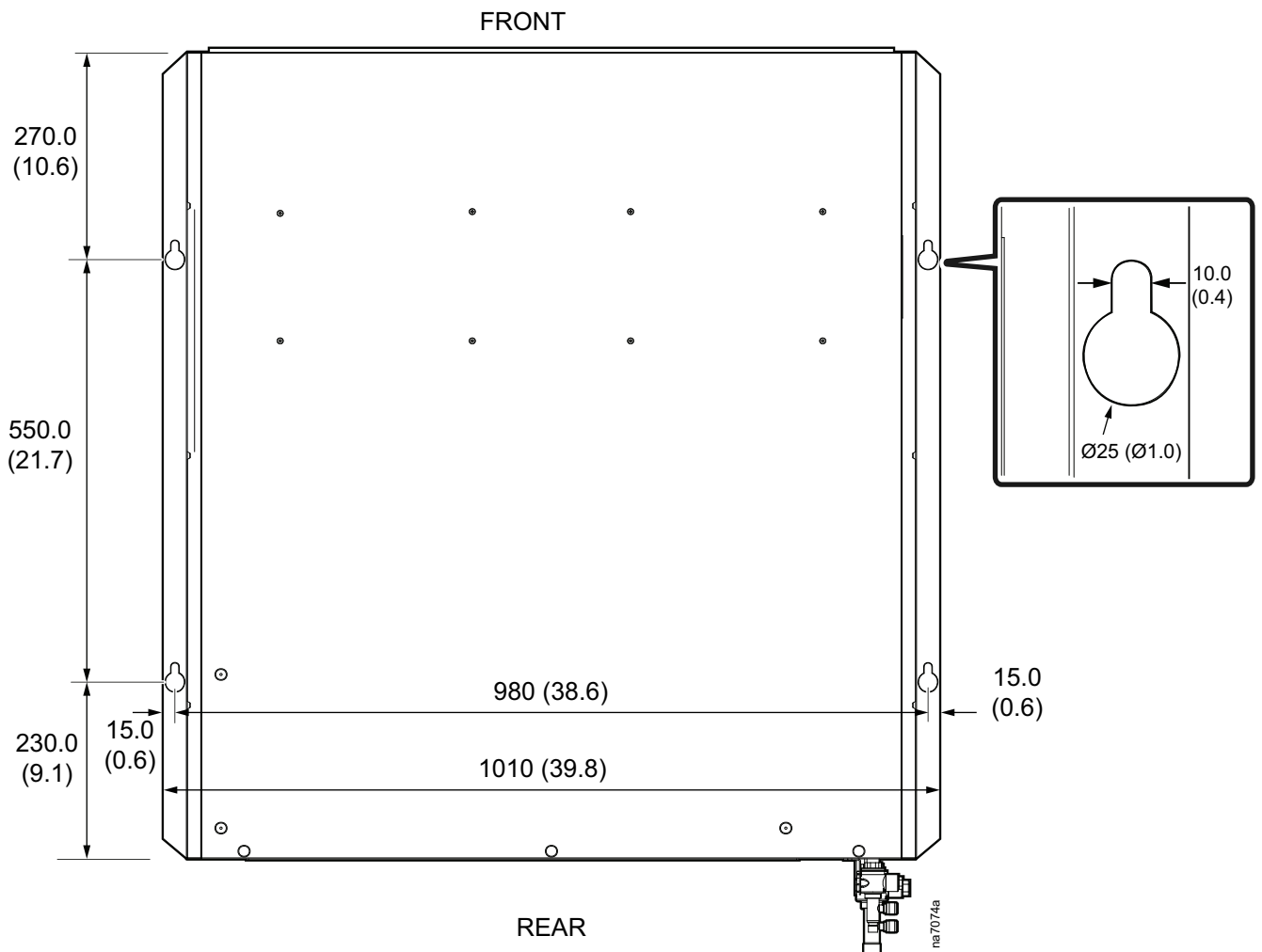
Mechanical Connections

Mounting the Indoor Unit to the Ceiling

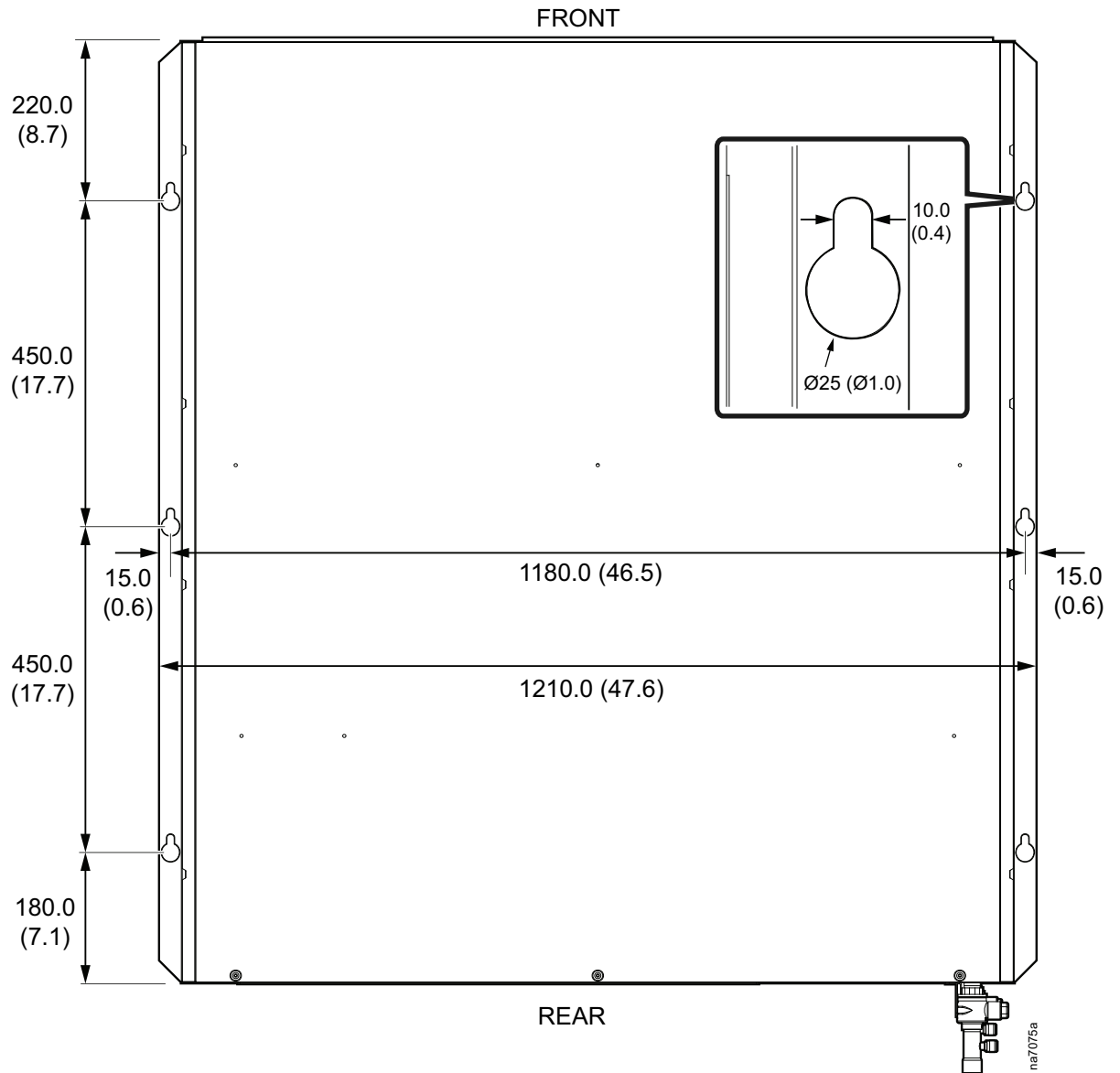


NOTE: Framing systems may also be used to suspend the unit.

Dimensions for Mounting Holes—UCF0341



Dimensions for Mounting Holes–UCF0481



Installing the Display Interface

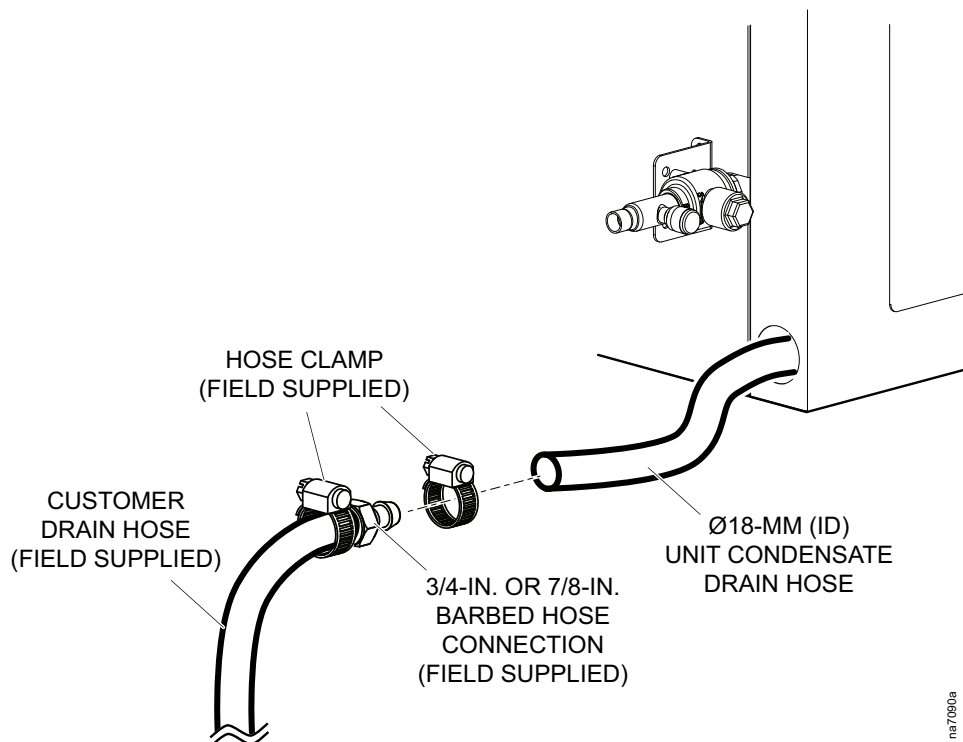
NOTE: The display interface is not for use with external power supply.



See the installation instructions packed with the display interface.

Connecting the Condensate Drain

Condensation drains from the drain pan under the coil through a Ø18 mm (ID) flexible hose to the rear of the indoor unit. Use a 3/4 in. or 7/8 in. diameter hose barb fitting and hose clamp (both field supplied) to connect the drain line under the refrigerant service valves. Horizontal sections of the condensate drain lines should have a slope of 6.4 mm (1/4 in.) to 12.7 mm (1/2 in.) per 0.3 m (1 ft). Vertical sections of gravity drains should include an S- or P-trap at the top of the riser. Size gravity drain piping for a maximum capacity of 100 lb/hr (12 gph).



These units only support the use of an external condensate pump. If a condensate pump is required for the application, a field-supplied unit may be installed in the condensate drainage piping system. The pump should have its own water reservoir located below the condensate drain pan of the unit and should be independently mounted and supported. Do not attach the pump to the exterior sheet metal of the indoor UCF units. The piping between the UCF unit and the pump should maintain the gravity drain system requirements noted above.

Refrigerant Piping

The indoor and outdoor units must only be connected and installed as a matched set. Systems may not be mixed with equipment from other manufacturers or aftermarket components except as detailed in these instructions. Install all refrigerant lines in accordance with these instructions and applicable industry guidelines. All refrigerant piping must comply with local, regional, and national codes and regulations.

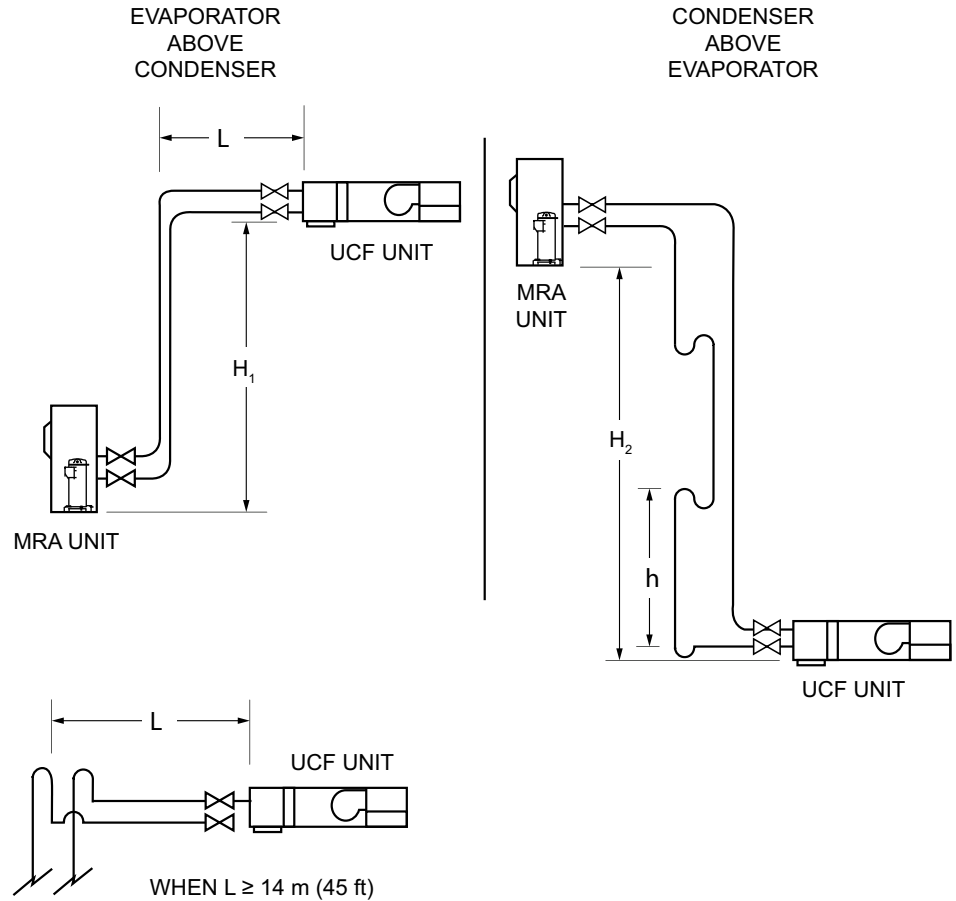
Before installation of the equipment piping, create a piping plan based on the installation location, equipment elevations, and actual distances between the equipment. Calculate an equivalent length based on the actual length of the run, including valves and fittings. Construct all piping runs from hard-drawn, Type ACR or Type L copper piping rated for HVAC/R service in accordance with ASTM B280.

Make all refrigerant lines as short and direct as possible. All pipe fittings should have long-radius bends to minimize the line-set pressure drop. Piping should be properly supported and isolated from structural surfaces using vibration clamps. All horizontal lines must be sloped in the direction of flow. Suction lines must be pitched downward at a minimum of 4 mm per m (1/2 in. per 10 ft) in the direction of flow to aid in oil return. Suction lines must be insulated for their entire length. Insulation should have a 13 mm (1/2 in.) wall thickness or at a minimum, have an R-value of 3 (ft²*°F*hr/Btu). When possible, place piping supports on the exterior of the piping insulation.

Piping Connection Sizes		
Model	Liquid Line	Suction Line
UCF0341I MRA0221I	3/8 in. ODF	3/4 in. ODF
UCF0481I MRA0611D	3/8 in. ODF	7/8 in. ODF

For equipment installed with the evaporator above the condenser, if the compressor is expected to operate at ambient conditions below freezing, the system must include inverted piping loops to protect the compressor from liquid flood-back during off cycles. The bottom of the inverted piping loops must be at least 25 mm (1 in.) above the top of the evaporator coil. Other system setups may also require inverted piping loops: the following sections provide more information for these configurations.

Piping between the indoor and outdoor units should minimize any elevation changes between the units. Depending upon installation type, the maximum recommended elevation between units is shown in the image below with the recommendations listed in the table.



na37091a

Maximum Recommended Unit Elevations	
Evaporator above Condenser	Condenser above Evaporator
4.7 m (15.5 ft)*	13.7 m (45 ft)**

*For applications where $L \geq 13.7$ m (45 ft) and the actual piping length is 19.8 m (65 ft) or longer, the liquid and suction risers should include inverted piping loops to protect the compressor from liquid flood-back during off cycles. Additionally, the suction piping loop should contain a P-trap for oil control.

**For applications that exceed 4.8 m (16 ft) of elevation, one oil trap should be included in the riser for every 4.5 m (15 ft) of elevation. All risers should include a P-trap at the base of the riser.

See the tables below for the recommended piping sizes that can be used for most applications assuming a maximum differences in elevation of up to 8.5 m (28 ft). Suction risers should also conform to the unit connection size of the suction line.



See the *Piping Connection Sizes* table.

Minimum Interconnecting Suction Pipe Sizes			
Equivalent Length	0-12 m (0-40 ft)	12.4-22.8 m (41-75 ft)	23.2-30.4 m (76-100 ft)
UCF0341I MRA0221I	3/4 in. ACR	7/8 in. ACR	7/8 in. ACR*

* Applications with significant elevation between units may require horizontal sections to be increased to 1 1/8 in. ACR

Minimum Interconnecting Suction Pipe Sizes			
Equivalent Length	0-6.0 m (0-20 ft)	6.4-22.8 m (21-75 ft)	23.2-30.4 m (76-100 ft)
UCF0481I MRA0611D	3/4 in. ACR	7/8 in. ACR	1 1/8 in. ACR

Applications of 22.8 m (75 ft) or less use 3/8 in. ACR for liquid lines.

NOTE: Install all piping in accordance with applicable industry guidelines as well as local and national codes and regulations.

Consult with your installation contractor for the following conditions:

- Elevations greater than 8.5 m (28 ft)
- Refrigerant piping noise is a concern

Connect Refrigerant Lines

NOTICE

COMPLIANCE REQUIREMENT

Install all refrigerant lines in accordance with these instructions and applicable industry guidelines. All refrigerant piping must comply with local, regional, and national codes and regulations.

Failure to follow these instructions can result in equipment damage.



See *Refrigerant Piping*, page 50 for more information.

Before making the piping connections, dry fit the piping section together and verify that the actual piping constructed meets the piping plan layout and applicable sections of this manual. Then prepare the units and piping for joining. Only use joining techniques approved for HVAC/R service and that meet or exceed the rated, high-side pressure of the equipment. For equipment using R-410A refrigerant, the high-side pressure is typically rated for 4481.6 kPa (650 psig).



See the equipment nameplate for the pressure requirement.

Construct refrigerant piping systems to minimize the contamination of the refrigeration system during the brazing process.

When brazing copper piping joints, always do the following:

- Use a dry nitrogen gas (or other inert gas) to purge the air from the piping system.
- Use a high silver content BCuP brazing material (15% is recommended).
- Properly clean, prepare, and deburr each joint.
- If a flux is used, always ensure that it is matched for the brazing material, application, and temperature of the joint. Do not over-apply flux to the joint. Always clean excess flux from both the interior and exterior of the joint after brazing.

NOTE: For field-installed copper refrigeration lines, failure to use a nitrogen purge during brazing voids the compressor warranty. A properly applied nitrogen purge at 1-2 cfm prevents the formation of copper oxides (black scale) inside the piping during brazing operations. Always maintain the flow of the nitrogen purging gas while the joint is cooling. Allow the purge gas to continue until the joint has reached the ambient temperature.

Before brazing any joints near the equipment or at the service valves, always protect the equipment from the brazing operation. Remove the service valve caps (1) and valve cores (2) to protect the seals that can be removed. Use a heat-sink compound or wet rags to protect the internal seals of the ball valve that cannot be removed. Additionally, place heat shields on the equipment to protect the exterior panels and paint coating from flame damage.

Pressure Testing

1. After all piping joints have been made, and cooled if they were brazed, pressure test the piping with nitrogen to ensure that all joints are secure.
2. Pressurize both lines to a minimum of 1723.7 kPa (250 psig) and isolate for at least 15 minutes.
The line-set should not lose any pressure during this time.
3. If the system passes the initial pressure test, increase the pressure in each pipe to its specific design pressure.
4. Allow the system to hold the nitrogen charge for at least another 30 minutes.
5. While this pressure testing is being conducted, inspect all joints and fittings in the system for leaks with a soap and water solution.
The system pressure should not change.
6. If any leaks are present, isolate the line with the leak, and repair the leak.
7. Perform the pressure testing again after all repairs have been made.
8. If a leak is present and cannot be located with a soap and water solution, remove the nitrogen charge and perform a helium leak test using a quality instrument.
9. Once the leak has been located, repair it, and perform the nitrogen pressure test again.
10. Once the line-set has passed the pressure test, install remaining piping insulation and supports as necessary.

Initial Evacuation, Line-Set

1. When the piping system construction has been completed, evacuate the line-set to less than 1000 microns.
Use a vacuum gauge to perform this measurement, a standard refrigeration gauge set is not accurate enough for this operation.
2. Install the vacuum gauge on the opposite end of the equipment line-set from the vacuum pump.
Only use high quality equipment and hoses that are rated for vacuum operations.
NOTE: Test the equipment independently of the line-set for its ability to hold a vacuum before installing it on the line-set.
3. Once the line-set has been evacuated to below 1000 microns, isolate the line-set from the vacuum pump and allow the line-set to hold a vacuum for at least 10 minutes.
The vacuum micron level may increase slightly once it is isolated from the pump. This is normal.
4. As long as the reading stabilizes at or below 2500 microns, proceed to the next step.
If a leak is present, or if an excessive amount of condensibles are in the line-set, the vacuum micron level may not stabilize on any micron reading within 20 minutes and may even quickly return to atmospheric pressure.
If this is the case, inspect the line-set with a helium leak tester.
5. If a leak is present, find and repair the leak.
6. Perform the pressure testing and evacuation of the line-set again.

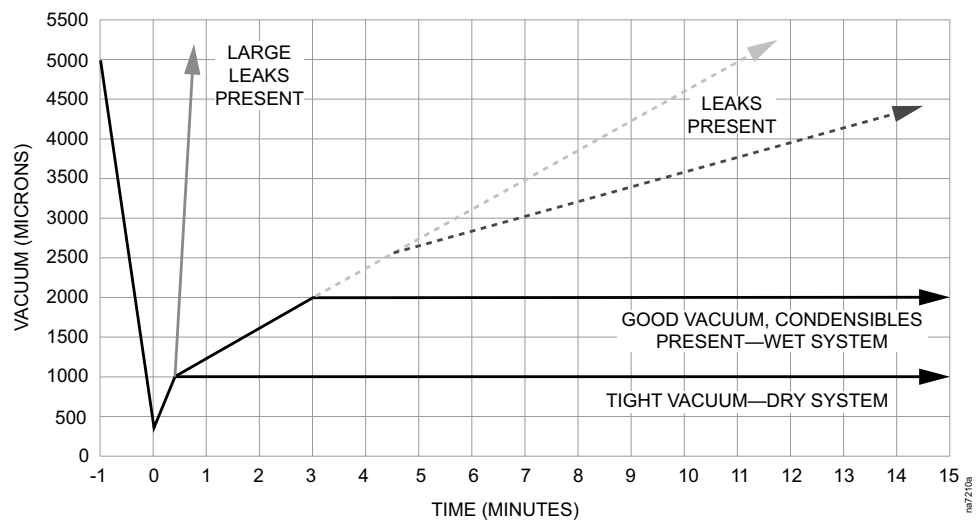
Final Evacuation, System

If the line-set stabilizes on a micron reading of less than 2500 and holds this reading steady for more than 10 minutes, open the equipment service valves. These split systems have been dehydrated at the factory and are shipped with a 68.9 kPa (10 psig) holding charge of nitrogen.

1. Open the valves in the following order:
 - Open both valves on the indoor unit.
 - Open the suction valve on the outdoor unit.
 - Open the liquid service valve on the outdoor unit.

This opening procedure prevents oil that is trapped on the pressure side of the compressor scroll plate from being blown into the system.

2. Bleed the system pressure down to 6.9 kPa (1 psig) with a gauge set, and restart the vacuum pump.
3. Evacuate the system to 350 microns.
4. Once 350 microns has been attained, isolate the system from the vacuum pump and allow it to hold a vacuum for at least 10 minutes.
5. The system should stabilize on a value of 1000 microns or less before the equipment can be charged with refrigerant.
6. See the chart below for examples of different conditions that may be encountered during the final evacuation.



Electrical Connections

WARNING

ELECTRICAL HAZARD

- Electrical service must conform to local and national electrical codes and regulations.
- The equipment must be grounded.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

WARNING

ELECTRICAL HAZARD

Ensure that all electrical connections are unplugged before you introduce water into the unit.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

WARNING

SHARP EDGES

When using power tools be sure to read and follow the rules that come with that tool.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

HAZARD FROM SHARP EDGES

- Edges of the knock-out panel may be sharp.
- Use a grommet, bushing, or other protective covering for the section of power cable routed through the knock-out panel.

Failure to follow these instructions can result in equipment damage.

Power Supply

NOTICE

EQUIPMENT DAMAGE

Power supply cables must conform to local and national electrical codes and regulations.

Failure to follow these instructions can result in equipment damage.

Power supply cables are field supplied and must be sized by the installer.

The power cable must be selected according to the following conditions:

- The length and type of laying
- The maximum current absorbed by the conditioning unit

Power Connections

1. Check that the mains voltage and frequency correspond to those of the unit. Compare them with the nameplate inside the electric panel.

The power cables (and the control circuit cables) can pass through the pre-drilled holes on the unit.

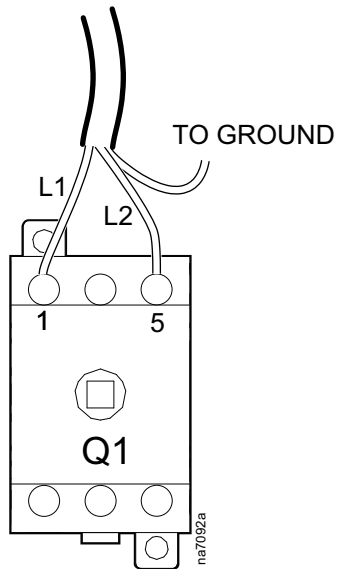
2. Open the door of the electrical panel and perform connections as indicated in the wiring diagram attached to the documentation of the unit.
3. Tighten the screws.



See the installation drawings included with the unit for more information.

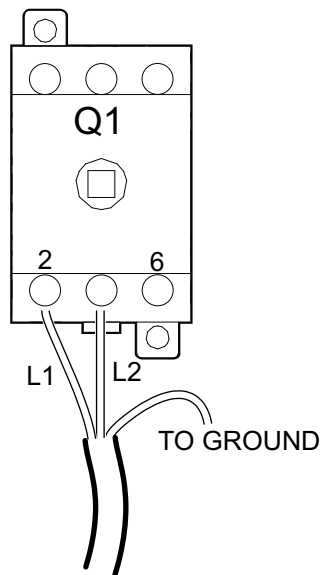
Indoor Units

UCF0341I
UCF0481I

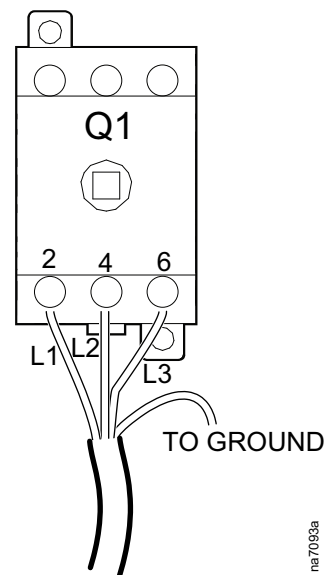


Outdoor Units

MRA0221I



MRA0611D



Electrical Data

Indoor Units

Overall Unit

Model	UCF0341I	UCF0481I
Voltage	208 V, 1 Ph, 60 Hz 230 V, 1 Ph, 60 Hz	
FLA (A)	3.0	4.5
MCA (A)	4.5	6.4
MOP (A)	15	15

FLA: Full Load Amps

MCA: Minimum Circuit Amps

MOP: Maximum Overcurrent Protection

Fans

Model	UCF0341I	UCF0481I
Quantity	2	3
FLA (A)	1.5	1.5

FLA: Full Load Amps

Outdoor Units

Overall Unit

Model	MRA0221I	MRA0611D
Voltage	208 V, 1 Ph, 60 Hz 230 V, 1 Ph, 60 Hz	208 V, 3 Ph, 60 Hz 230 V, 3 Ph, 60 Hz
FLA (A)	16.4	23.1
MCA (A)	19.6	27.0
MOP (A)	30.0	40.0

FLA: Full Load Amps

MCA: Minimum Circuit Amps

MOP: Maximum Overcurrent Protection

Compressor

Model	MRA0221I	MRA0611D
Quantity	1	1
LRA (A)	64.0	110.0
RLA (A)	12.8	15.9

LRA: Locked Rotor Amps

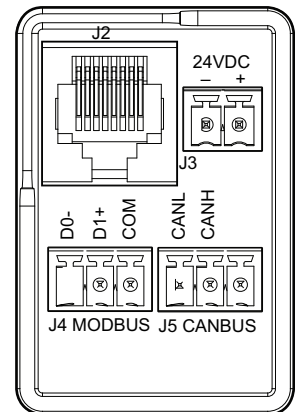
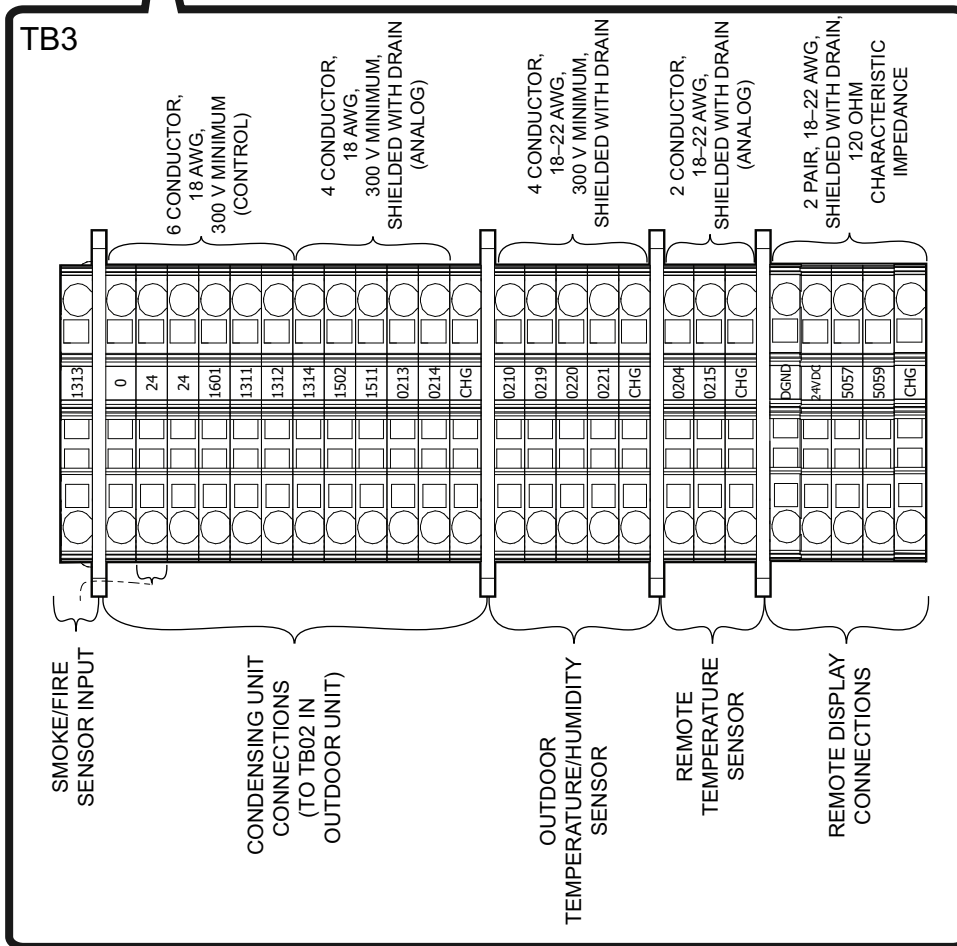
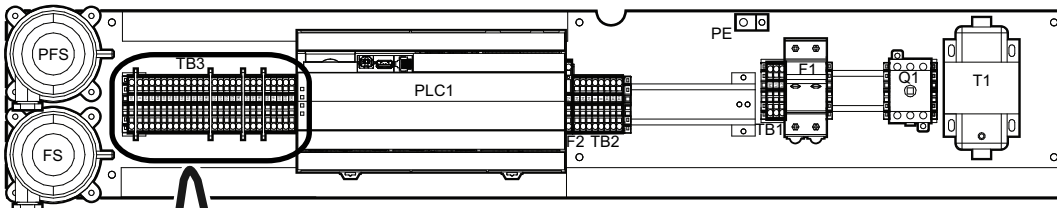
RLA: Rated Load Amps

Axial Fans

Model	MRA0221I	MRA0611D
Quantity	1	2
FLA (A)	3.6	3.6

FLA: Full Load Amps

Communication Connections



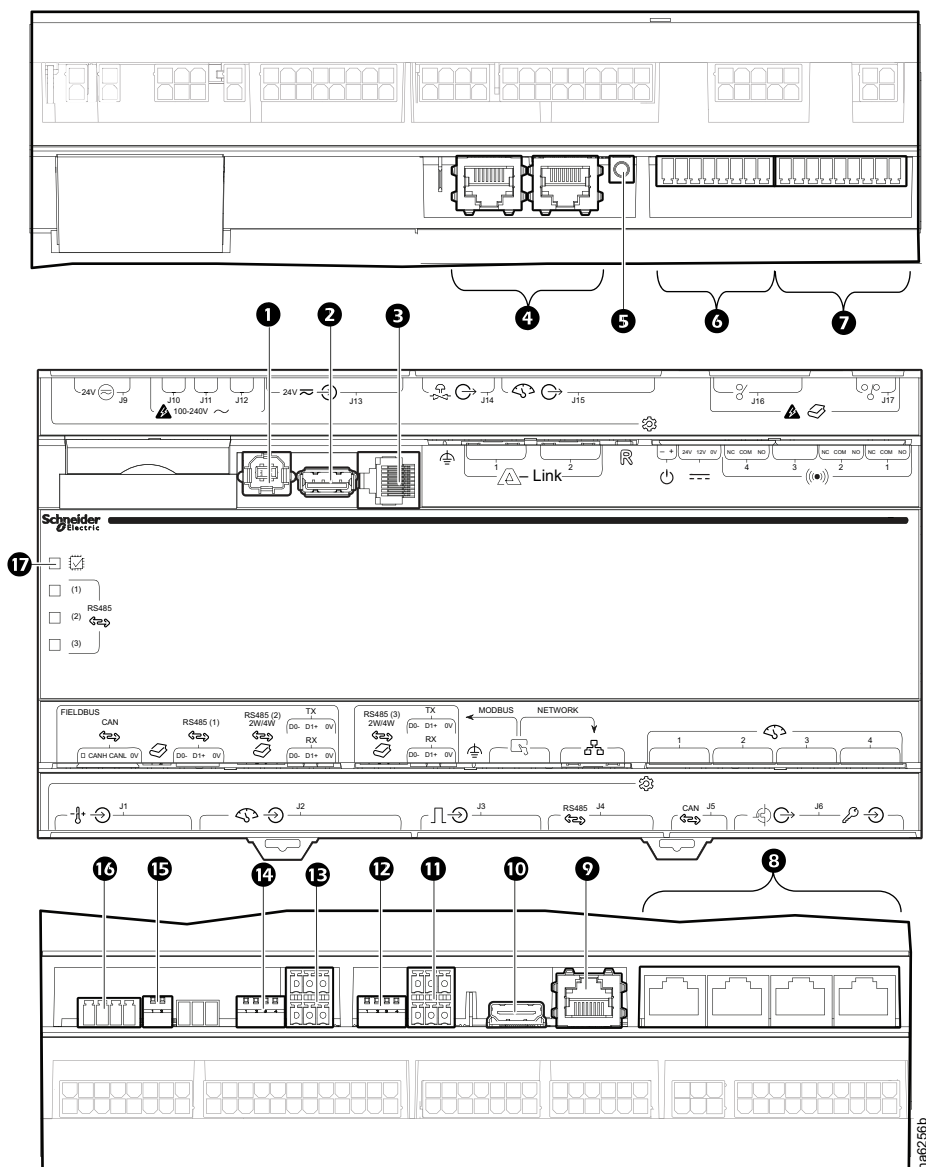
CONNECTIONS ON REMOTE DISPLAY



See the electrical schematics for more information.

na7/089a

Interface Connections



Item	Description	Item	Description
1	USB device port	10	Touch screen display connection
2	USB host port	11	Modbus connection
3	Serial port	12	Modbus configuration switches
4	A-Link ports	13	Fieldbus Modbus connection
5	Reset button	14	Fieldbus Modbus configuration switches
6	Output relay 4/standby input	15	Fieldbus CANbus configuration switches
7	Output relay 1–3	16	Fieldbus CANbus connection
8	Universal sensor ports	17	Processor status LED
9	Network connection		

A-Link Ports

NOTICE

CAT 5 PINOUT

Devices connected on the A-Link ports should use a standard pin-out (1-1, 2-2, 3-3, 4-4, 5-5, 6-6, 7-7, 8-8) CAT5 cable only.

Failure to follow these instructions can result in equipment damage.

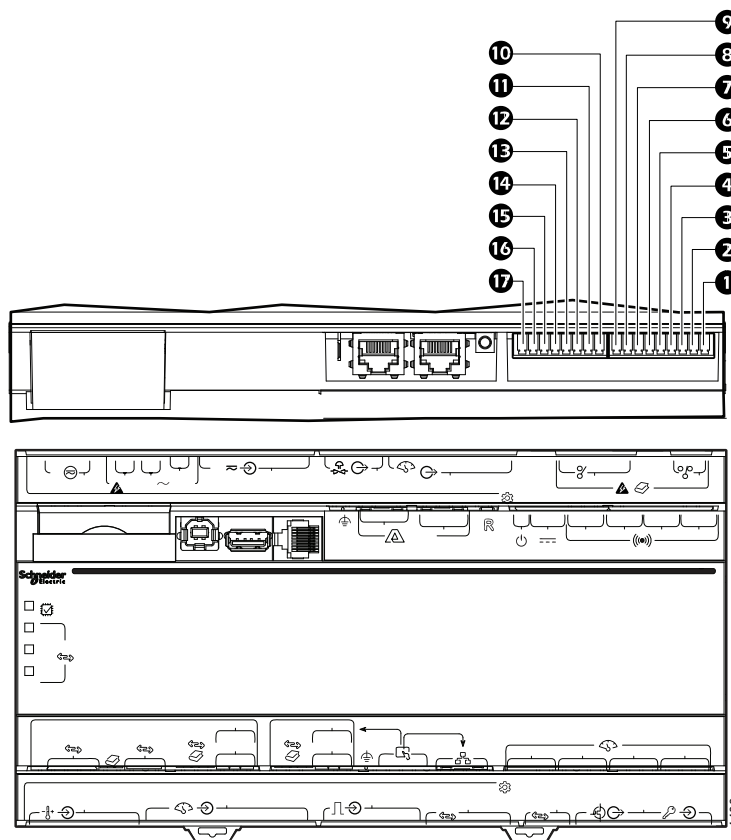
NOTE: All input and output connections should be wired as Class 2 circuits.

The A-Link bus connection allows a maximum group of twelve units to communicate with one another.

To enable the units to function as a group, link them together using a standard pin-out CAT-5 cable with RJ-45 connectors. The A-Link bus must be terminated at the first and last unit installed in the group. See example below. An A-Link terminator is supplied with the unit.

NOTE: The maximum wire length for the entire group must not exceed 305 m (1,000 ft).

Output Relays and Standby Input



Item	Name	Description
1	Output relay 1 N.O.	Normally Open contact
2	Output relay 1 COM	Common contact
3	Output relay 1 N.C.	Normally Closed contact
4	Output relay 2 N.O.	Normally Open contact
5	Output relay 2 COM	Common contact
6	Output relay 2 N.C.	Normally Closed contact
7	Output relay 3 N.O.	Normally Open contact
8	Output relay 3 COM	Common contact
9	Output relay 3 N.C.	Normally Closed contact
10	Output relay 4 N.O.	Normally Open contact
11	Output relay 4 COM	Common contact
12	Output relay 4 N.C.	Normally Closed contact
13	Ground	Ground reference, typically connected to the negative connection of Standby Input, when using the 12 VDC or 24 VDC power supply.
14	12 VDC	Standby input 12 VDC supply current limited to 20 mA
15	24 VDC	Standby input 24 VDC supply current limited to 20 mA
16	Standby Input +	Positive connection used for Standby Input
17	Standby Input -	Negative connection used for Standby Input. Typically connected to ground.

Output Relays

Four output relay connections are available. These relays can be configured, through the user interface, to various alarms detecting normal or abnormal conditions.

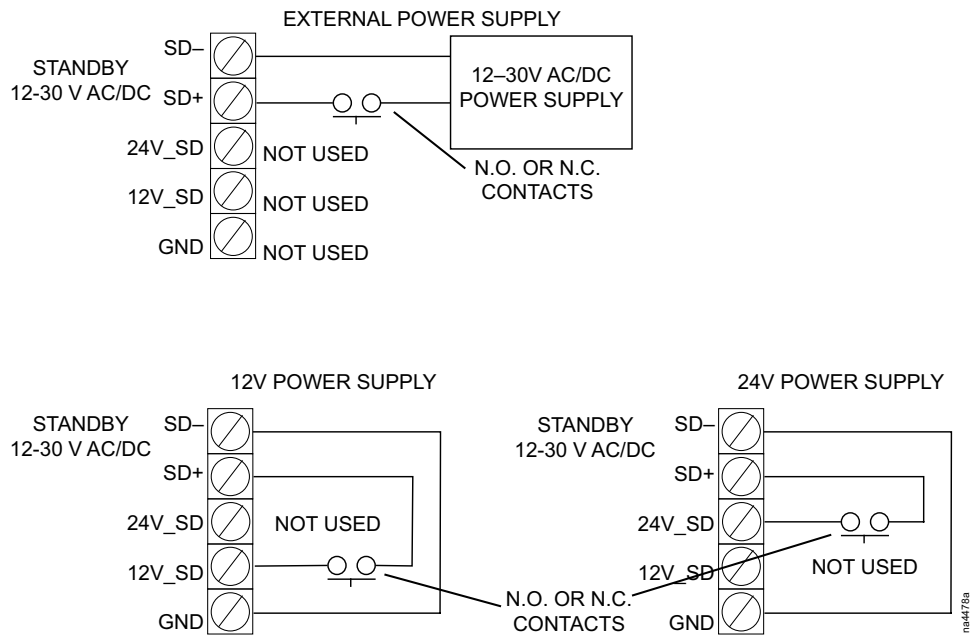
Output relays are Form C type, having a Normally Open (N.O.), Normally Closed (N.C.), and Common (COM) contacts.

NOTE: Output Relays are rated at 24 VDC, 0.6 A maximum.

Standby Input

Standby input allows the cooling unit to be remotely placed in Standby mode. Standby mode is configured through the user interface and can be set as a normally “active” or “not active” input.

NOTE: Standby Input is rated at 12/24-V AC DC. If using field supplied voltage, the Standby Input consumes 10 mA maximum at 24 VDC.



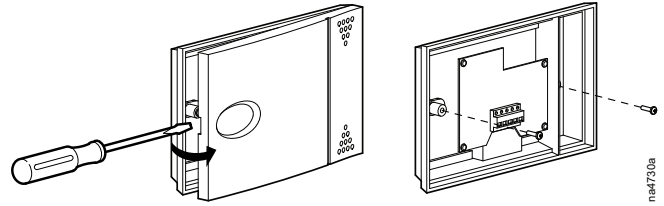
*Normally open contacts shown.

Temperature Sensor



See unit wiring diagrams for more information.

1. Insert a screwdriver in the slot and release the front cover of the sensor.
2. Remove the lid and fasten the screws inside the sensor to the mounting location.
3. Connect the shielded cable to the two terminals on the sensor, using the electrical diagram in the unit as reference.



Charging the Refrigeration System

Calculating R410A Charge

To calculate the initial charge requirement of the equipment, see the piping plan layout for the actual lengths of the equipment line-set.



See *Refrigerant Piping*, page 50 for more information.

Verify that the actual piping matches the planned layout. If necessary, measure the actual lengths of piping used for traps and loops to get the total pipe length.

Using the table below, find the installed liquid and suction line sizes and look up the R410A multiplier for your application. The table provides the amount of R410A, in ounces per foot for different combinations of suction and liquid line sizes (ACR tubing only). Multiply the value in the table by the length of the line-set to provide the total ounces of R410A for the line-set.

Line-Set Charge Adjustment, Initial Charge, Ounces of R410A/Foot (Grams of R410A/Centimeter)		
Suction Line Size	Liquid Line Size	
	3/8 in. ACR	1/2 in. ACR
3/4 in. ACR	14.0 g (0.62 oz)	N/A
7/8 in. ACR	18.7 g (0.66 oz)	32.3 g (1.14 oz)
1-1/8 in. ACR	20.9 g (0.74 oz)	34.5 g (1.22 oz)

Charge amount is based on the actual line-set length.

Look up the equipment charge in the table. A standard line-set is sized to the service valve sizes of the equipment.

Initial R410A Charge Weight Calculation	
Unit	Indoor and Outdoor Units Only Charge
UCF0341I MRA0221I	2.5 kg (5 lb 10 oz)
UCF0481I MRA0611D	4.9 kg (10 lb 15 oz)

NOTE: Always verify the equipment charge amount listed on the nameplates. If the nameplate charge differs from that listed in these instructions, use the nameplate value.

Add the “Indoor and Outdoor Units Only” charge amount to the calculated line-set charge. This is the initial charge for the equipment before start-up.

Total charge = Outdoor Equipment charge + Indoor Equipment charge + Line-set charge



See *R410A Refrigerant Charging Charts*, page 66.

Charging the Equipment

⚠ WARNING

HAZARD TO EQUIPMENT OR PERSONNEL

All work must be performed by Schneider Electric qualified personnel.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

HAZARD OF HIGH PRESSURE REFRIGERANT OR EQUIPMENT DAMAGE

- Use R410A refrigerant only.
- The unit display should be used to obtain pressure readings.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

DAMAGE TO EQUIPMENT OR PERSONNEL

POE oil is highly hygroscopic and can attract more moisture from surroundings and the atmosphere. Do not use any POE oil that has been left in an unsealed or improperly sealed container for any length of time. This could lead to problems with the equipment or lead to acid formation in the equipment.

Failure to follow these instructions can result in equipment damage.

Before installing the initial refrigerant charge always complete a system evacuation.



See *Connect Refrigerant Lines*, page 52 for more information.

When first commissioning a system, weight in the calculated, initial refrigerant charge before equipment start-up. If a POE oil charge is also required, charge the oil before equipment startup. Charge with oil through any of the service ports on the discharge line located in the outdoor unit. Always use a high quality POE oil approved for use by the compressor manufacturer. These units should use Copeland Ultra 32-3MAF, Copeland Ultra22 CC, or an approved equivalent.



See *Calculating R-410A Charge*, page 64 for details on calculating the initial charge amount.

After the initial refrigerant and oil charge (if necessary) has been weighted in, the equipment may be started if all other install steps are completed. Always verify the equipment charge upon startup with the charging chart provided in these instructions. If the equipment does not meet the charging chart requirements, adjust the equipment charge in accordance with the instructions on the charging chart.

Compressor Oil Charge

Oil Charging Procedure

NOTICE	
DAMAGE TO EQUIPMENT	
Do not charge the compressor with too much oil: compressor damage could result. The only way to drain oil from the compressor is to remove the compressor from the equipment. The following system damage could also occur:	
<ul style="list-style-type: none"> • Failure of valves and pistons due to oil slugging. • Excessive oil carryover. • Loss of evaporator performance due to oil level build-up in the low-pressure side of the system. 	
Failure to follow these instructions can result in equipment damage.	

Calculating POE Oil Charge

If the total R410A refrigerant charge for the system exceeds 9 kg (20 lb), use the chart to determine the appropriate POE oil charge required.

Final System R410A Charge	9–11 kg (20–25 lb)	11–13 kg (25–30 lb)	13–16 kg (30–35 lb)
POE Oil Addition Requirements	0.02 kg (1 oz)	0.06 kg (2 oz)	0.08 kg (3 oz)

R410A Refrigerant Charging Charts

⚠ CAUTION	
HAZARD OF HIGH PRESSURE REFRIGERANT OR EQUIPMENT DAMAGE	
<ul style="list-style-type: none"> • Use R410A refrigerant only. • Contents are under pressure: use caution when releasing pressure in the system or refilling. • Charging and maintaining the refrigeration circuit must only be performed by qualified personnel. 	
Failure to follow these instructions can result in injury or equipment damage.	

The equipment comes factory supplied with a dry nitrogen holding charge.

The unit charging charts shown below are only intended to be used with the listed indoor and outdoor equipment matches as shown in the titles of the charts (MRA0611D and UCF0481I) and (MRA0221I and UCF0341I) and should not be used for any other equipment.

The charging charts are only intended for final verification of the unit charge. When first commissioning a unit during installation, always weigh in the proper equipment charge to the listed nameplate value plus the proper line-set adjustment.



See the previous sections of this *Installation Manual* for additional details.

Do not operate a compressor system that has a serious undercharge condition for more than 60 seconds.

Ensure that the TXV in the indoor unit has been properly adjusted prior to starting the unit.



See *Thermostatic Expansion Valve Adjustment*, page 69.

Before using the charging charts below, ensure that the compressor circuit is energized and operating stably. If the system has not been running or requires the technician to start it up, allow the equipment to operate for at least 10 minutes before using the charts for charge adjustment.

These charts are valid for a wide variety of indoor and outdoor temperature ranges and unit loads however, for best results, the ambient temperature should be in the range of 15.5; 37.7°C (60–100°F) with the outdoor fan(s) operating at 100% and the indoor unit return air temperature should be between 21.1–26.6°C (70–80°F) with the rated IT air flow rate.

Do not allow the outdoor unit fans to vary their speed when using these charts to inspect the charge. Use the maintenance menu commands to lock the outdoor fans to 100% speed, evaporator fan speed set to the rated IT air flow rate of the unit, and the compressor **ON** for the duration of the inspection and charge adjustment period.

If the installed equipment is operating with an extreme under-voltage condition, do not use these charts for charge adjustment until after the under-voltage condition has been corrected. Ensure the required clearances for proper operation are satisfied, the condenser coil is clean, and the condenser fan is operating at full load.

How to Use R410A Refrigerant Charging Charts

1. Use quality instruments, measure the liquid line pressure and temperature at the outdoor unit service port.
2. Find the measured liquid pressure on the bottom axis and follow it up to the equipment charging line.
3. Read the corresponding liquid temperature from the charging chart and compare to the measured value.
4. If the measured temperature value is larger than the chart value, add charge to the equipment. If less, remove charge from the equipment.
5. After charge adjustment, collect new measurements and repeat steps 1–4 as necessary.
6. Adjust the equipment charge until the measured values are either on the line or that the measured liquid line temperature is no more than 0.6°C (1.0°F) lower than the chart value for the measured liquid pressure.
7. Record the final refrigerant system charge in the service documentation for future reference.

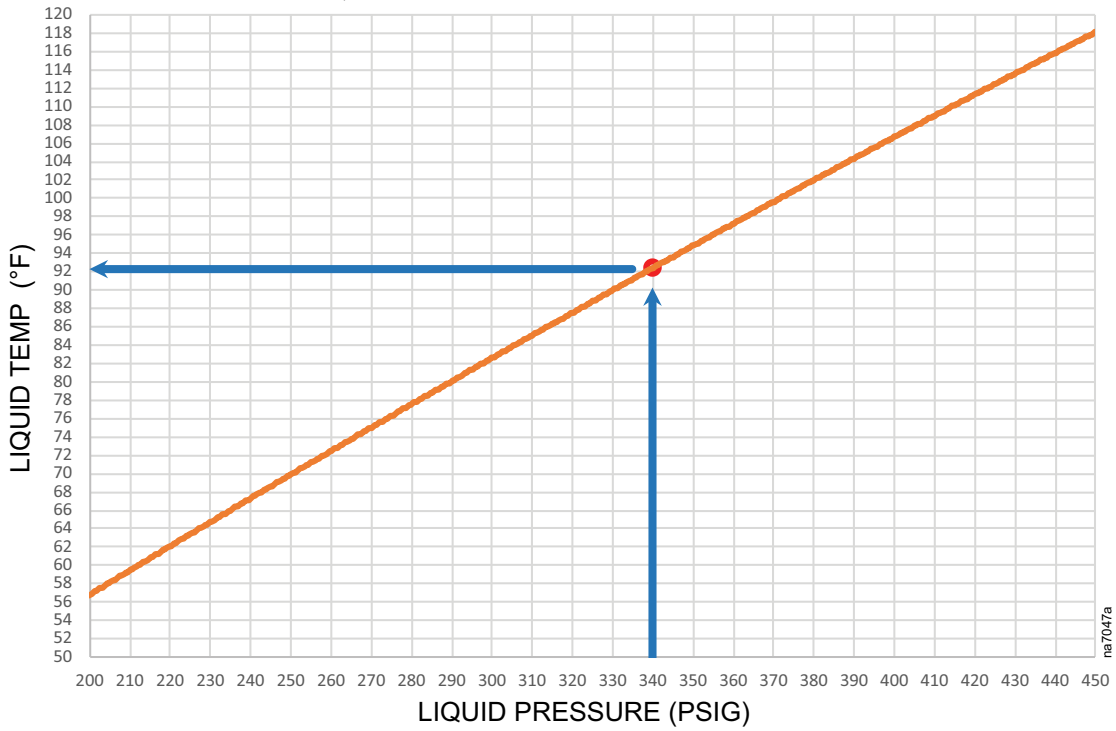
When using these charts to inspect a system that has been in operation for some time, follow these guidelines:

- If the measured liquid temperature is more than 1.1°C (2.0°F) higher than the chart value for the measured liquid pressure, inspect the system for leaks.
- When repairing system leaks, always use a dry nitrogen or other inert gas to protect the system piping.
- Always replace the refrigerant filter-drier when repairing refrigerant piping systems or exposing the piping system to moist air.
- Once all repairs are complete, perform a pressure test on the system, then evacuate the system to 350-500 microns and weight in the proper refrigerant charge based on the unit nameplate and line-set adjustment.



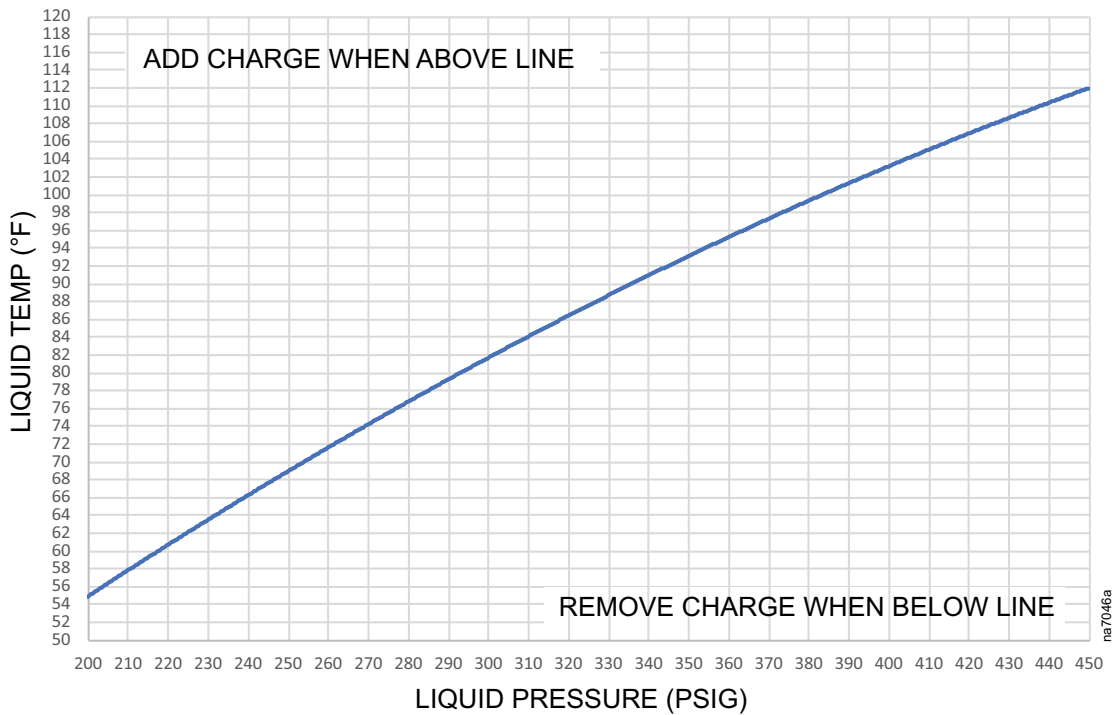
See the installation instructions included with the unit before use.

LIQUID DATA CHARGING CHART EXAMPLE

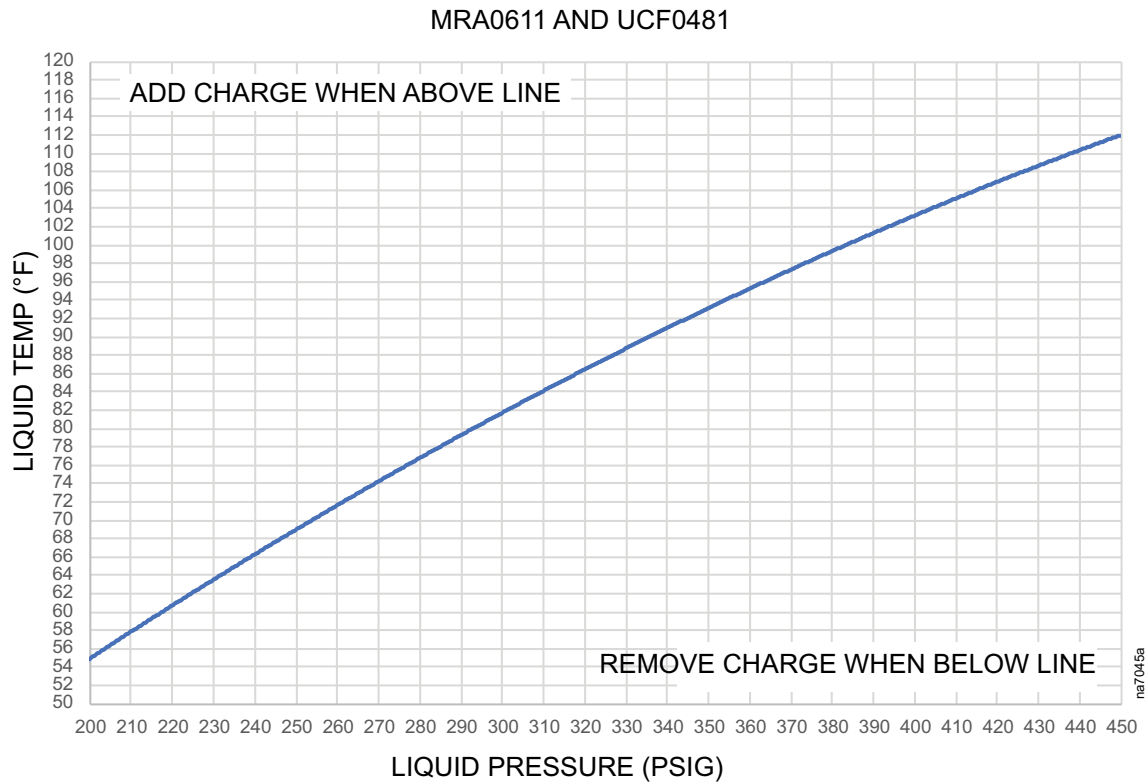


R410A Refrigerant Charging Chart for MRA0221I and UCF0341I

MRA0221 AND UCF0341



R410A Refrigerant Charging Chart for MRA0611D and UCF0481I



Thermostatic Expansion Valve Adjustment

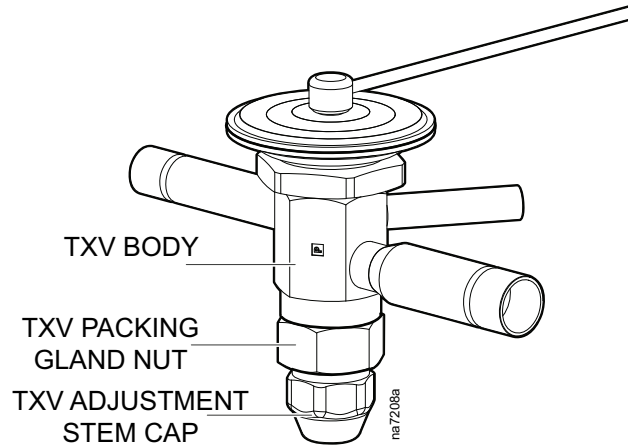
NOTICE

DAMAGE TO THERMOSTATIC EXPANSION VALVE

- Always read through the entire set of instructions and warnings provided before starting the task.
- Always use a backup wrench on the TXV packing nut when removing or installing the adjustment stem cap.
- Never apply excess torque to the adjustment stem of the TXV. Only a light pressure is required to make an adjustment to the TXV setting. If the stem does not turn under a light pressure, the adjustment has reached its stop.

Failure to follow these instructions can result in equipment damage.

The equipment has been provided with adjustable, balanced port, thermostatic expansion valves (TXVs). These valves come factory-supplied with the adjustment stem positioned near the middle of their travel and are required to be adjusted to the proper position for each unit before start-up.



The table provides information on the proper setpoint for the TXV for each unit.

1. To apply the initial adjustment to the valve, open the lower access door and remove the service panel.



See *Indoor Units*, page 41 for more information.

2. Place a back-up wrench onto the TXV packing nut and remove the adjustment stem cap.
3. Once exposed, open the TXV fully by turning the adjustment stem (as viewed when looking at the stem) until the end-stop has been reached.
4. Count the number of full revolutions that is required to open the valve to the stop.
5. If desired, mark one of the four corners on the adjustment stem with a permanent marker and use it as a reference for the adjustment.

NOTE: As a general rule a TXV has approximately 9 full turns of adjustment from full closed to full open. The manufacturer sets the air pressure near the center of their adjustment but that is not necessarily the exact halfway point of the available travel.

6. Once the valve has been adjusted to the full open position, close the valve by turning to the right by the number of full turns noted in the table for the applicable unit.
7. Once complete, replace the adjustment cap back onto the TXV and thread by hand until hand tight.
8. Place the backup wrench on the packing nut, and tighten the adjustment cap by turning it 60 degrees past hand-tight.
Do not over-tighten the cap.
9. Record the TXV adjustment setting used on the inside of the side access panel.
10. Close the unit access doors and replace the access panels.

Unit	TXV	Initial Setting*
UCF0341I	BBIZE-1.5-GA	3.5 turns closed from full open
UCF0481I	BBIZE-3-GA	0.5 turns closed from full open

*1 turn = 360 degrees

Worldwide Customer Support

Customer support for this or any other product is available at no charge in any of the following ways:

- Visit the Schneider Electric Web site to access documents in the Schneider Electric Knowledge Base and to submit customer support requests.

- **www.schneider-electric.com** (Corporate Headquarters)

Connect to localized Schneider Electric Web sites for specific countries, each of which provides customer support information.

- **www.schneider-electric.com/support/**

Global support searching Schneider Electric Knowledge Base and using esupport.

- Contact the Schneider Electric Customer Support Center by telephone or e-mail.

Local, country-specific centers: go to www.schneider-electric.com/support/contact **www.schneider-electric.com > Support > Operations around the world** for contact information.

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