Installation Manual

InRow® Direct Expansion Air Conditioners

InRow® RP DX

ACRP100, ACRP101, ACRP102

990-2696D-001

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Schneider Electric

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General Information

Important Safety Information

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain it. The following special 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 label 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 that follow this symbol to avoid possible injury or death.

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Safety Precautions While Installing This Equipment

Read and adhere to the following important safety considerations when working with this unit.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- 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.
- Always use a properly rated voltage sensing device to confirm power is off.
- 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 and can easily be tipped. For safety purposes, adequate personnel must be present when moving this equipment.

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

NOTICE

HAZARD TO EQUIPMENT

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

Failure to follow these instructions can result in equipment damage.

Overview

Save these instructions

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

Intended users

This manual is intended for Schneider Electric authorized personnel. It provides component specifications and instructions for installing the equipment.

General symbols that may be used in this manual

Discard indicated part or assembly.

Do not discard indicated part or assembly.

Cross-reference symbol used in this manual

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

Inspecting the Equipment

Your InRow air conditioner has been tested and inspected for quality assurance before shipment from Schneider Electric. Carefully inspect both the exterior and interior of the equipment immediately upon receipt to ensure that the equipment has not been damaged during transit.

Verify that all parts ordered were received as specified and that the equipment is the correct type, size and voltage.

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 Worldwide Customer Support at one of the numbers on the website 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.

In case of shipping damage, do not operate the equipment. Keep all packaging for inspection by the shipping company and contact Schneider Electric at one of the numbers on the website listed on the back cover of this manual.

Storing the Equipment Before Installation

If the equipment will not be installed immediately, store it in a safe place, protected from the weather.

NOTICE
HAZARD TO EQUIPMENT 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.**

Moving the Equipment

Moving the equipment to its final location

The recommended tools for moving the equipment **while it is still on the pallet** include the following:

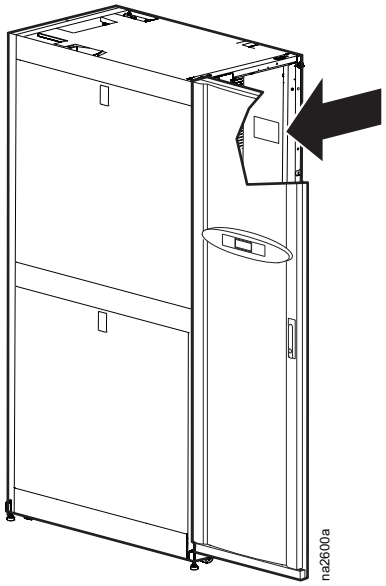
Pallet jack Forklift

The equipment can be rolled to its final location using its casters if the floor is smooth and clean.

Model Identification

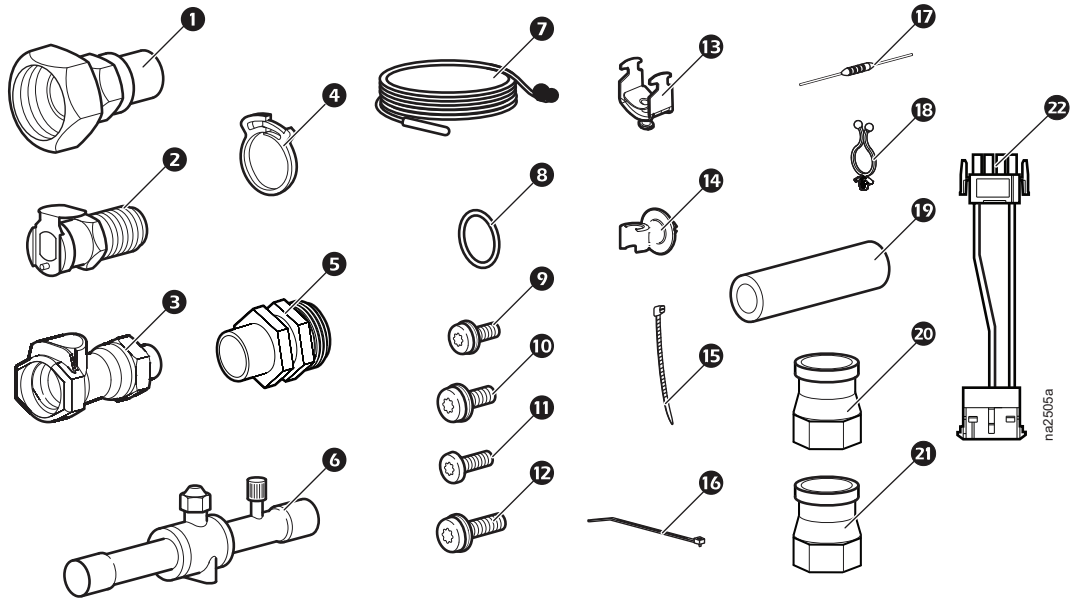
The model number can be found on the outside of the shipping crate and on the nameplate located inside the equipment as shown. Use the table below to verify that the equipment is the correct size and voltage.

Model	Configuration	Voltage	Reheat	Humidifier	Air Pattern
ACRP100	Air-cooled	200-240/3~/50-60 Hz	Electric	Steam canister (replaceable)	Back to front
ACRP101	Air-cooled	460-480/3~/60 Hz	Electric	Steam canister (replaceable)	Back to front
ACRP102	Air-cooled	380-415/3~/50-60 Hz	Electric	Steam canister (replaceable)	Back to front



Component Identification

Install kit inventory



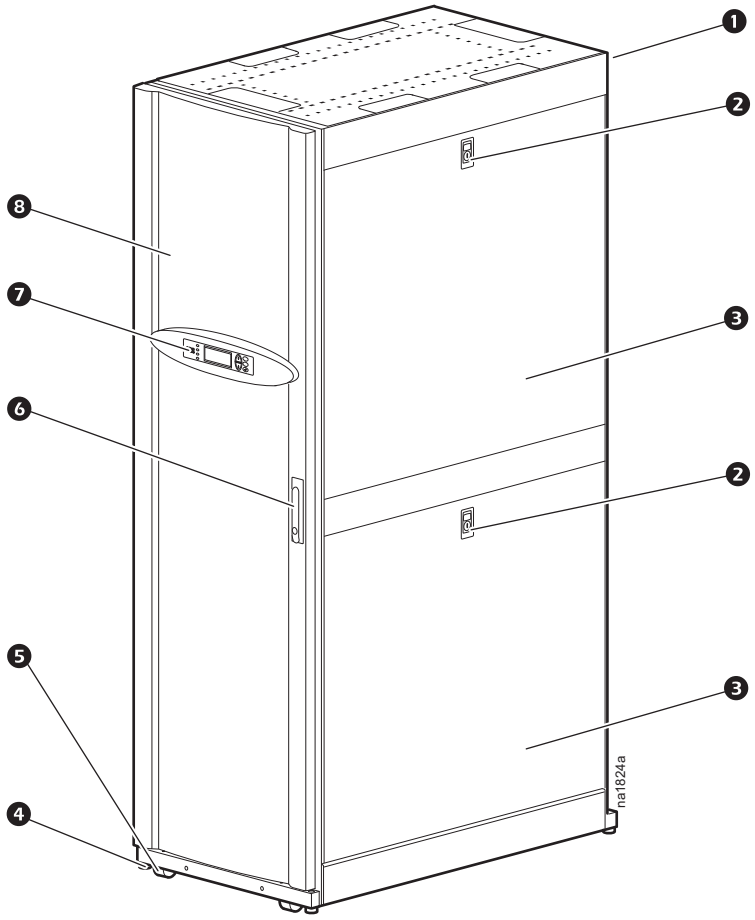
Item	Description	Quantity
❶	Threaded ring seal straight fitting, female, 1 1/4-in. to 3/4-in.* I.D.	4
❷	Humidifier inlet water connection, shutoff"	
	ACRP100: 1/4-in. NPT*** and 1/4-in. BSPT**	1 ea
	ACRP101: 1/4-in. NPT***	1
	ACRP102: 1/4-in. BSPT**	1
❸	Condensate drain outlet, shutoff, 3/8-in. BSPT**	1
❹	Condensate overflow hose adapter clamp, double snap	2
❺	Threaded ring seal male straight - 3/4-in.* I.D.	2
❻	Gas shutoff valve, 3/4-in. I.D.	2
❼	Temperature sensor	3
❽	Rotalock Teflon® gasket, 1 1/4-in	4
❾	M5 x 10-mm TORX® screw with washer	5
❿	M6 x 12-mm TORX screw with washer	5
⓫	M6 x 10-mm self-tapping Torx screw	5

*Standard wall thickness
**British Standard Pipe Thread

Item	Description	Quantity
⓬	M6 x 16-mm TORX screw with washer	5
⓭	Strain relief, metal (ACRP102 only)	2
⓮	Wire clip	9
⓯	Wire tie - 200 mm (8 in.)	10
⓰	Wire tie 390 mm (15.3 in.)	3
⓱	Resistor, 150 Ohm	1
⓲	Cable tie	10
⓳	Condensate overflow hose adapter	1
⓴	Reducer, 3/8-in. to 1/2-in. BSPT**	1
㉑	Reducer, 3/8-in. to 1/2-in. NPT***	1
㉒	Voltage jumper	****

***National Pipe Thread
****Quantity and wire connections vary depending on model number. See “Voltage selection” on page 41.

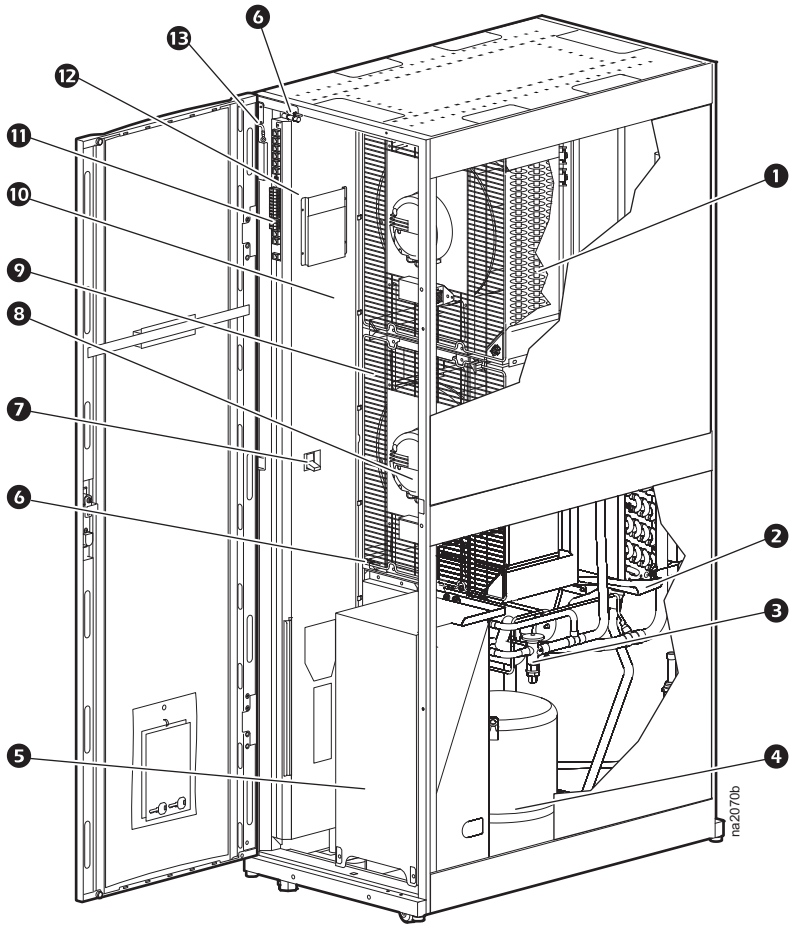
Exterior components



Item	Description
❶	Removable rear doors
❷	Side panel lock
❸	Removable side panel
❹	Adjustable leveling foot

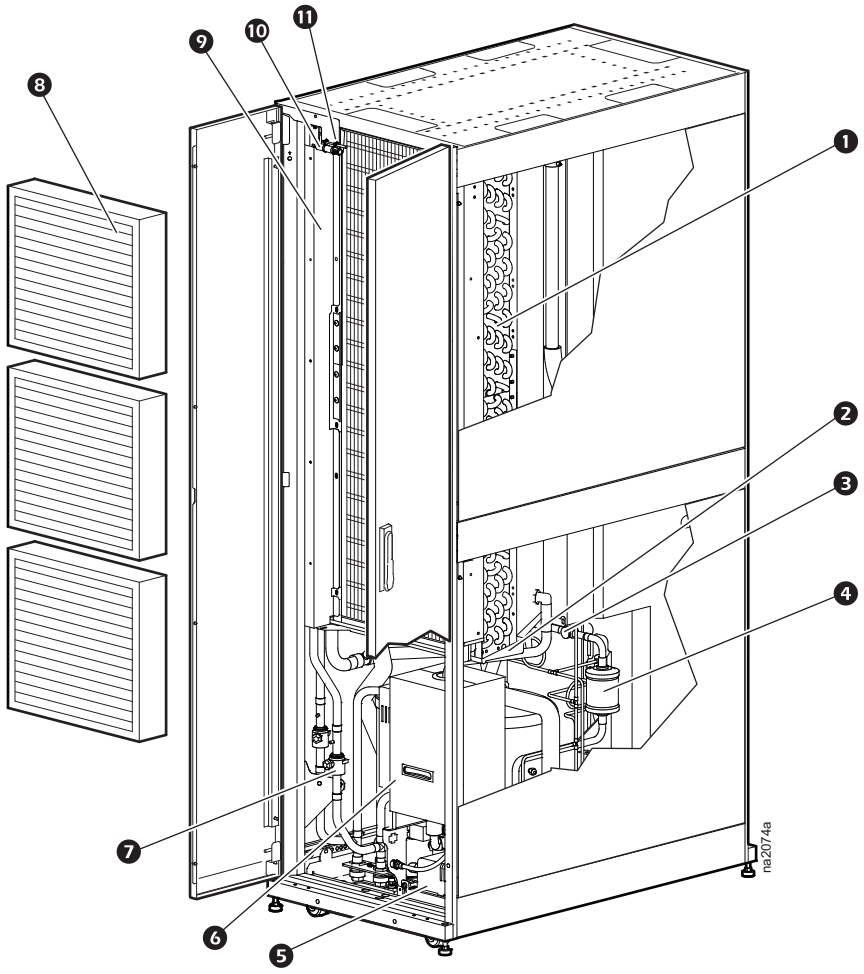
Item	Description
❺	Caster
❻	Door handle and lock
❼	Display interface
❽	Removable front door

Interior components (front)



Item	Description	Item	Description
❶	Electric heater	❽	Fan
❷	Condensate drain pan	❾	Fan guard
❸	Thermal expansion valve	❿	Electrical panel
❹	Compressor	⓫	Communication and external device connectors
❺	Variable Frequency Drive (for compressor)	⓬	Ground lug
❻	Supply air temperature sensor	⓭	Humidity sensor
❼	Main circuit breaker		

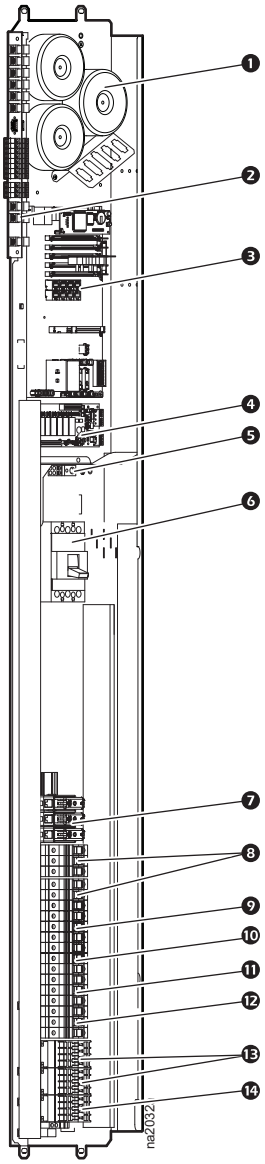
Interior components (rear)



Item	Description
❶	Evaporator coil
❷	Condensate drain pan
❸	Sight glass
❹	Filter dryer
❺	Condensate pump
❻	Humidifier

Item	Description
❼	Shutoff valves
❽	Air filters
❾	Pipe chase
❿	Humidity sensor
⓫	Return air temperature sensor

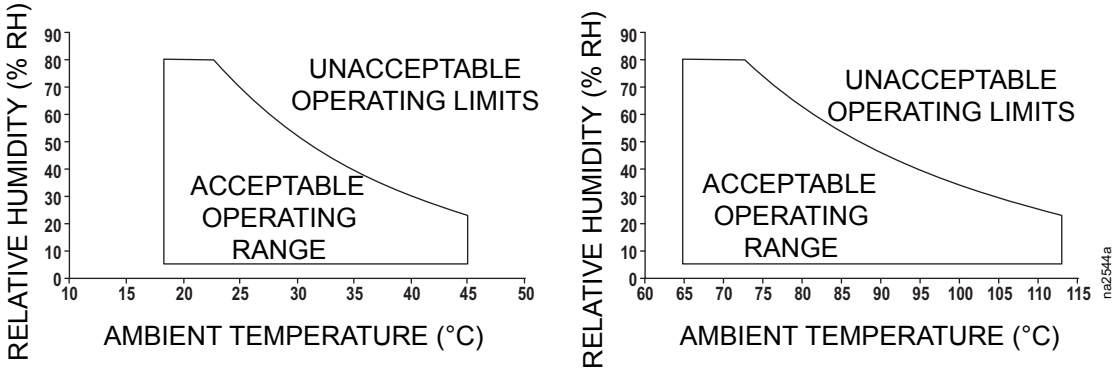
Electrical panel



Item	Description
❶	Transformers
❷	User interface connectors
❸	Main controller board
❹	Relay board
❺	Ground lug
❻	Main circuit breaker
❼	Compressor fuse block (ACRP100, ACRP101) Compressor circuit breaker (ACRP102)
❽	Fan circuit breakers
❾	Controller circuit breaker
❿	Humidifier circuit breaker
⓫	Heater circuit breaker
⓬	Heater contactors
⓭	Humidifier contactor

Room Preparation

During the design of the data center, consider ease of entry for the equipment, floor loading factors, and accessibility to piping and wiring. In addition, the room temperature and humidity combination should conform to the environmental operating envelope as defined in the following graphics.



Seal the room with a vapor barrier to minimize moisture infiltration. Polyethylene film is recommended for ceiling and wall applications. Apply rubber- or plastic-based paints to concrete walls and floors.

Insulate the room to minimize the influence of exterior heat loads. Reduce fresh air to the minimum required by local and national codes and regulations. Fresh air imposes extreme load variation on the cooling equipment from summer to winter and causes increased system operating costs.

Air distribution

The equipment distributes air in a back-to-front discharge pattern, removing hot air from a hot aisle and discharging cooled air into a cold aisle.

NOTE: The equipment is designed for free air discharge or for use with the Rack Air Containment System or Hot Aisle Containment System. The equipment is not intended to be connected to a duct system.

Incoming power supply requirements

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

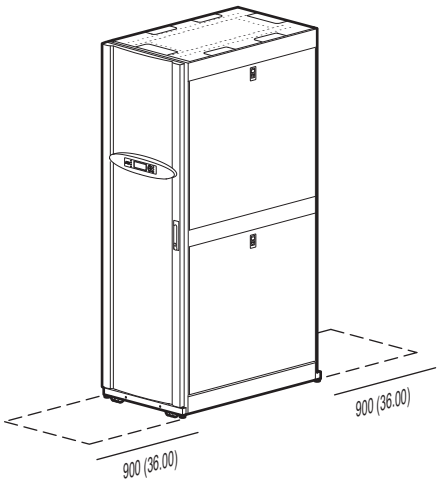
Failure to follow these instructions will result in death or serious injury.

Service access

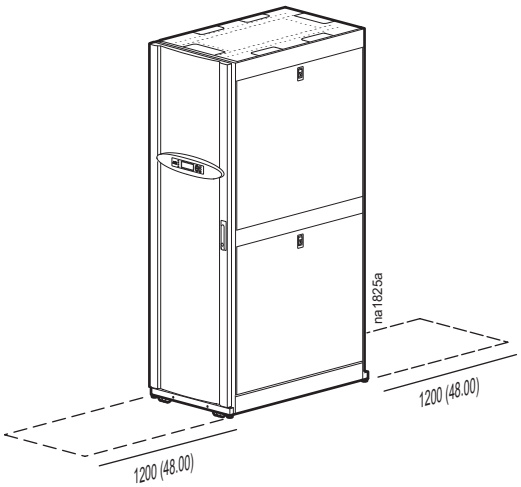
A minimum 900 mm (36 in.) of clear floor space in front of and behind the equipment is recommended for service. All required normal maintenance can be performed from the front or rear of the equipment.

Most of the cooling components in the equipment (e.g. filter dryer, sight glass, solenoid, and expansion valves) must be soldered for repair or replacement. These types of repairs can be performed using the service access guidelines when the equipment is inside the row. If the equipment must be removed from the row for these types of repairs then a minimum area of 1200 mm (48 in.) of clear floor space in front of or behind the equipment is recommended to roll the equipment out of the row. Use the casters on the equipment to move it for service.

NOTE: Check local and national codes and regulations for further service access requirements.



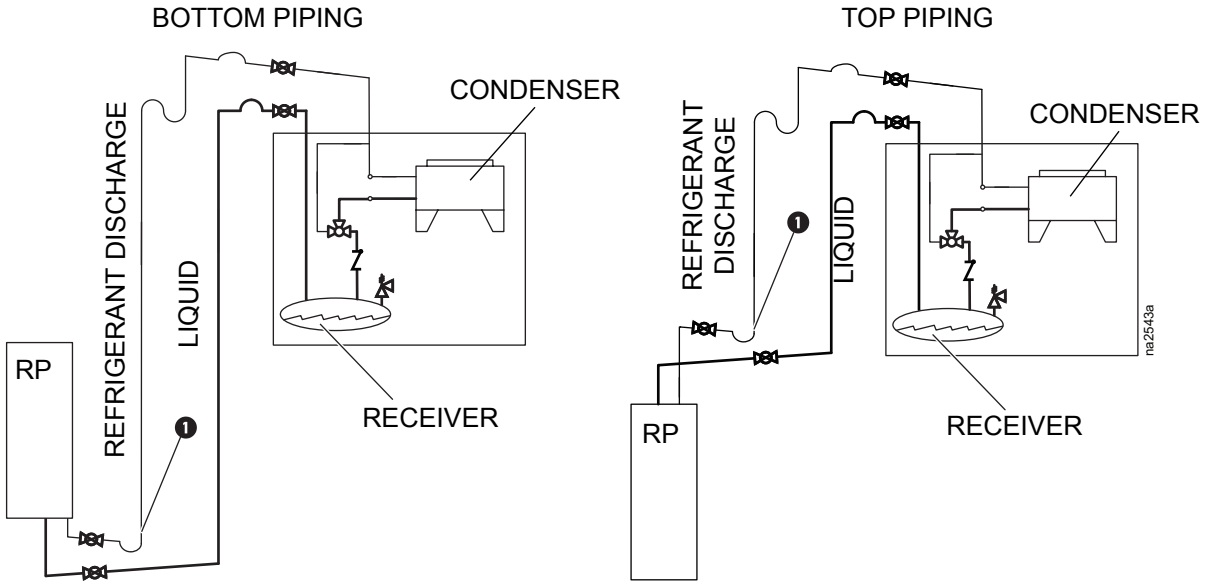
SERVICE ACCESS WHEN EQUIPMENT IS INSIDE THE ROW



FREE SPACE NEEDED TO MOVE EQUIPMENT OUTSIDE THE ROW

Dimensions are shown in mm (in.).

Refrigeration Piping Diagram



NOTE: Shutoff valves shown nearest to the condensers are not supplied by Schneider Electric.

NOTE: Pitch all lines in the direction of refrigerant flow; 4 mm per m (1/2-in. per 10 ft).

❶	Reduction of piping diameter for vertical piping run (if necessary)		Pressure relief valve
	Shutoff valves		P-trap
	Head pressure control valve		S-trap
	Check valve		Inverted P-trap

All lines are Type L copper tubing.

NOTE: Route piping through the top or bottom of the InRow RP cooling unit.

NOTE: Trap the vertical discharge line every 6 m (20 ft) to ensure proper oil return.

NOTE: Change the size of the pipe after the “P” trap. See the piping diagram created for your site.

NOTE: The maximum piping run is 61 m (200 ft) equivalent length. Size the piping pursuant to accepted refrigeration practice.

Do not install the air-cooled condenser below the indoor equipment. The condenser must be positioned above or at the same level as the equipment to ensure proper function.

Connections Overview

All connections to and from the equipment can be made through either the top or the bottom of the equipment. Once the corresponding connectors are brazed into place, the equipment can be disconnected without further brazing. See the following tables for information about the sizes and types of connectors.

Power connections

SKU	MCA	MOP	FLA	Compressor		Power (kW)
				LRA	RLA	
ACRP100: 200-240 V, 50/60 Hz	80.1	100	-	160	50	19
ACRP101: 460-480 V, 60 Hz	39.9	50	-	139	23.2	21
ACRP102: 380-415 V, 50 Hz	-	-	32	139	23.2	20

Note:Above data is based on maximum operating condition
Note:Installation must comply with national and/or local electrical codes.
Note:The compressor is powered by a VFD.
Note:MCA-Minimum Circuit Ampacity
Note:MOP-Maximum Overcurrent Protection
Note:LRA-Compressor Locked Rotor Amps
Note:RLA-Compressor Rated Load Amps
Note:FLA-Full Load Amps

Piping connections

Connection	Type	ACRP100	ACRP101	ACRP102
Refrigerant discharge	1-1/4-in. Rotalock*	3/4-in. ID	3/4-in. ID	3/4-in. ID
Refrigerant liquid	1-1/4-in. Rotalock*	3/4-in. ID	3/4-in. ID	3/4-in. ID
Humidifier water supply	Quick coupling	1/4-in. NPT or 1/4-in. BSPT	1/4-in. NPT	1/4-in. BSPT
Condensate drain	Quick coupling	1/2-in. female NPT or 1/2-in. female BSPT	1/2-in. female NPT or 1/2-in. female BSPT	1/2-in. female NPT or 1/2-in. female BSPT

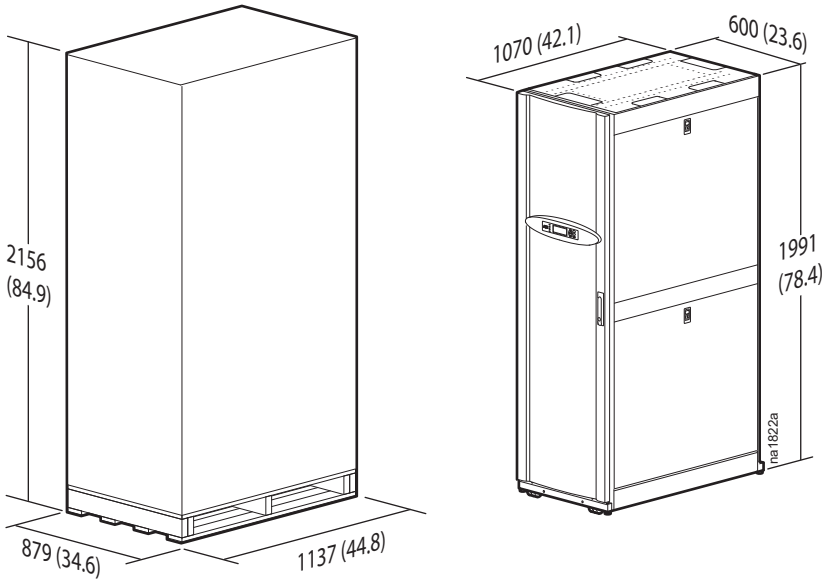
* Use new Teflon gasket (supplied) to ensure no leakage. Tighten Rotalock nut to 90 Nm (66 lb-ft).

Communication connections

Connection	Type	Wire Size		Torque
		Minimum	Maximum	
Rack temperature 1	RJ-45	-	-	-
Rack temperature 2	RJ-45	-	-	-
Rack temperature 3	RJ-45	-	-	-
A-Link IN	RJ-45	-	-	-
A-Link OUT	RJ-45	-	-	-
Network port	RJ-45	-	-	-
Console port	DB 9	-	-	-
Customer output, Normally Closed (NC)	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Customer output, Common (COM)	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Customer output, Normally Open (NO)	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Supply GND	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Supply 12 Vdc	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Supply 24 Vdc	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Customer input +	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Customer input -	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Modbus D1	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Modbus D0	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Modbus GND	Screw connector	AWG 24 (0.2 mm^2)	AWG 18 (0.75 mm^2)	0.6 Nm
Temperature sensor (front)	RJ-45	-	-	-
Humidity sensor (front)	RJ-45	-	-	-
Display interface	RJ-45	-	-	-

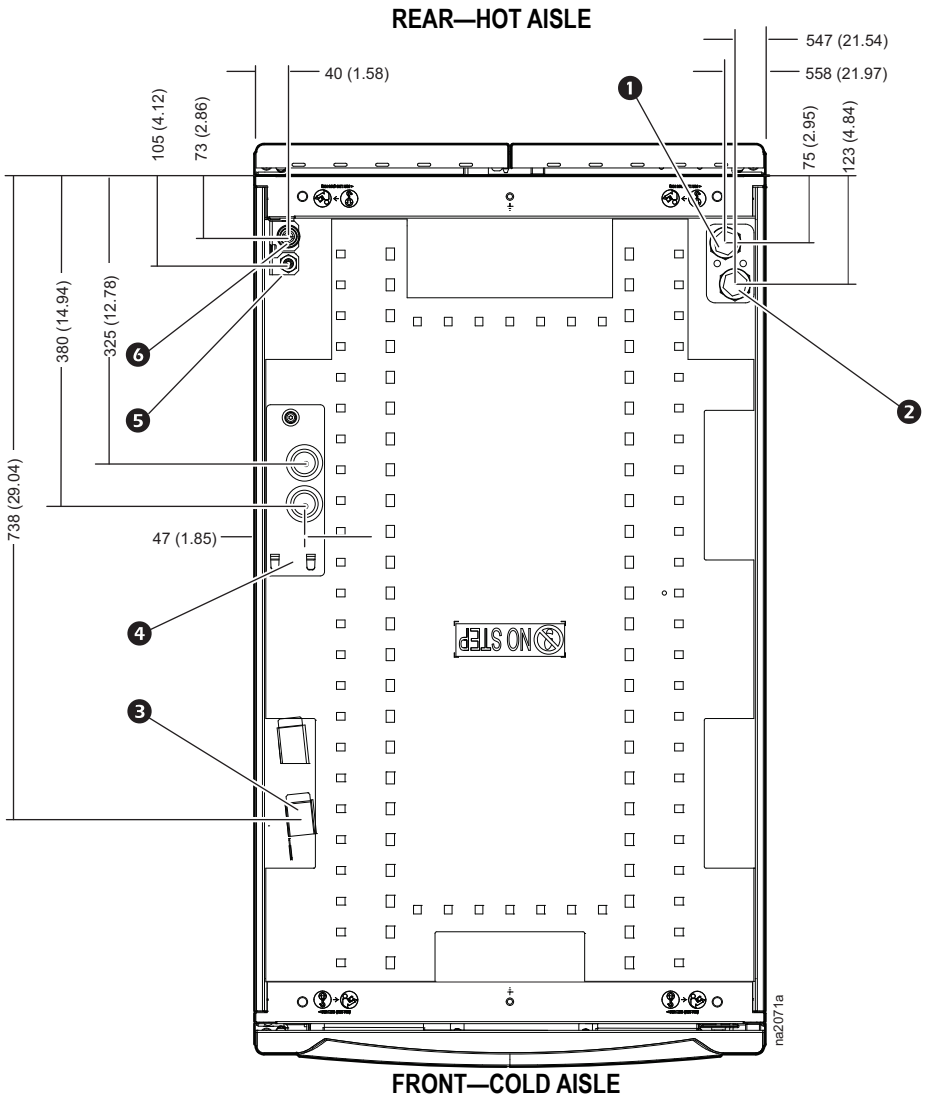
Weights and Dimensions

Model	Packed Weight	Unpacked Weight
ACRP100, ACRP101, ACRP102	488 kg (1,076 lb)	378 kg (833 lb)



Dimensions are shown in mm (in.).

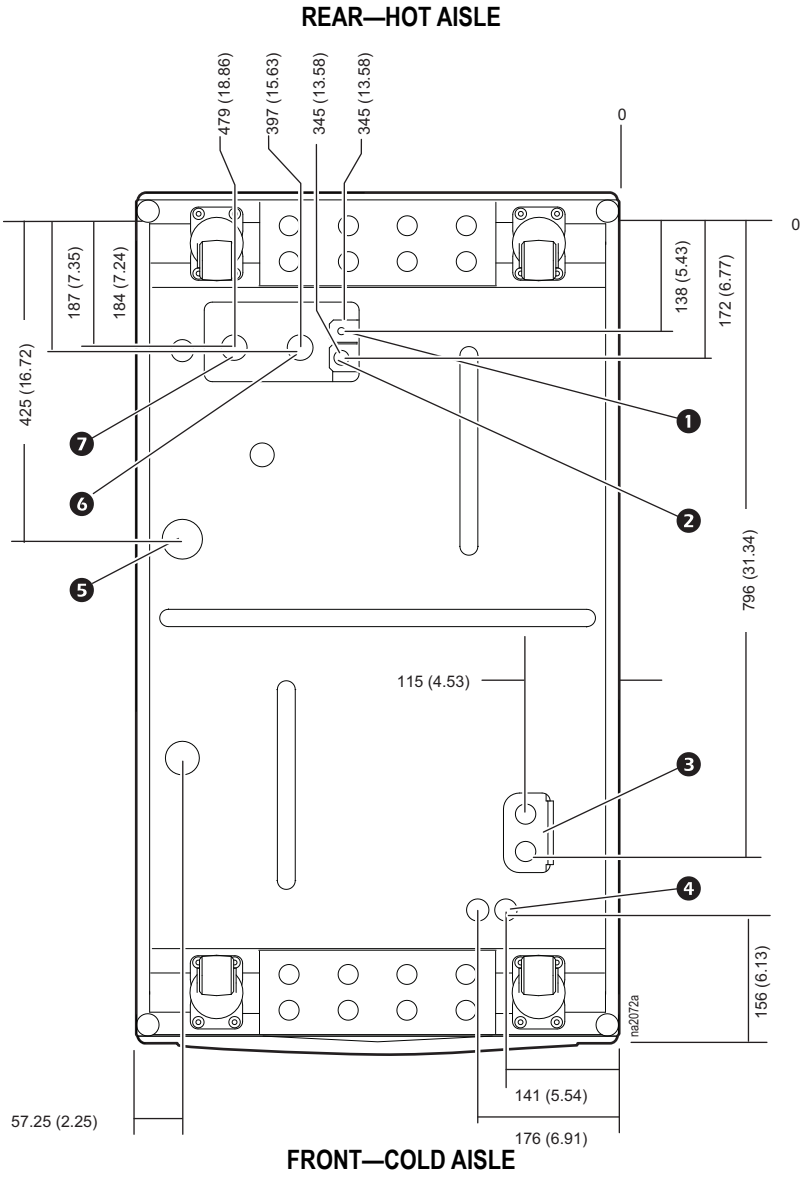
Top piping and power access locations (top view)



Dimensions are shown in mm (in.).

Item	Description
❶	Refrigerant discharge line
❷	Refrigerant liquid line
❸	Trough for communication cables
❹	Power connections
❺	Humidifier water supply
❻	Condensate drain

Bottom piping and power access locations (bottom view)



Dimensions are shown in mm (in.).

Item	Description
❶	Humidifier water supply
❷	Condensate drain
❸	Power connections
❹	Communication connections—27.80 mm (1.09 in.)
❺	Condensate overflow—50.00 mm (1.97 in.)
❻	Refrigerant discharge line
❼	Refrigerant liquid line

Removing the Doors and Panels

⚠WARNING

MOVING PARTS HAZARD

All doors and side panels must be locked during normal operation. Do not open the side panels while the fans are operating.

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

NOTICE

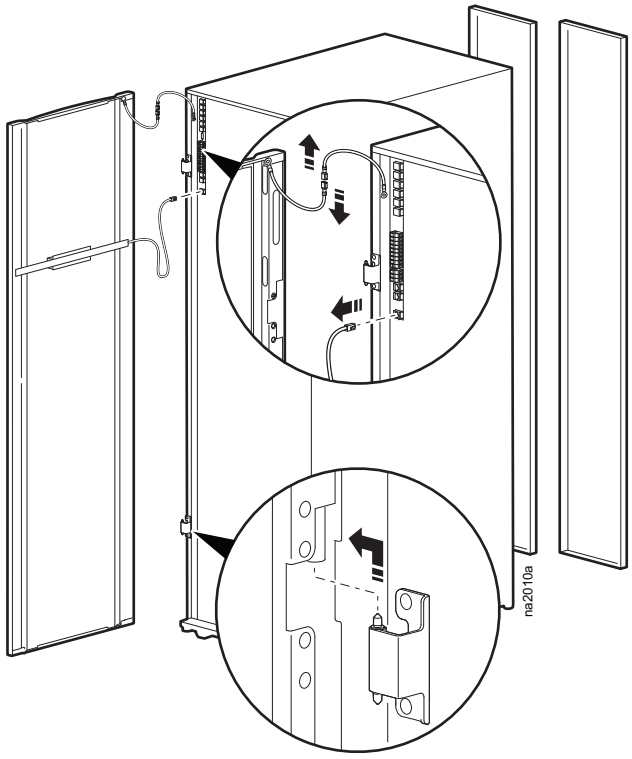
EQUIPMENT DAMAGE

- Unplug the display interface cables.
- Do not lean the doors against a wall with the side panel latches facing the wall. This can deform the latches and prevent them from properly working.

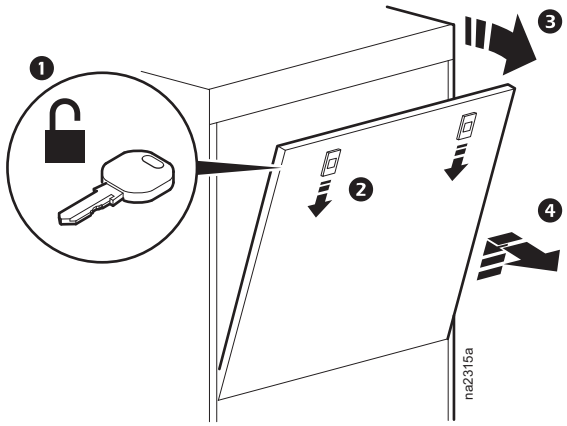
Failure to follow these instructions can result in equipment damage.

Removing the front and rear doors

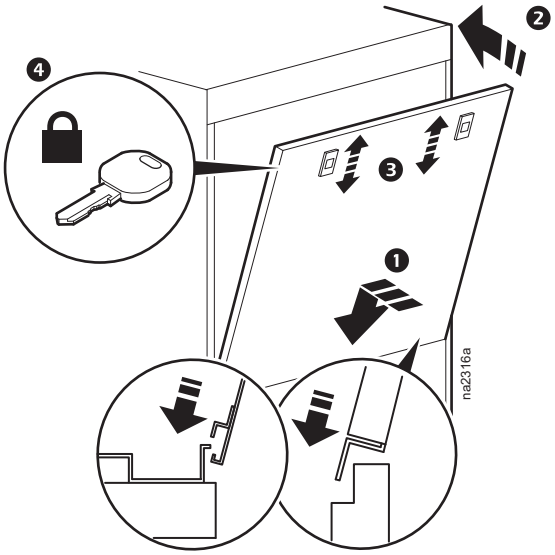
1. Unlock and open the door 90 degrees.
2. Unplug the ground wires and display connection cables.
3. Lift the door up and off the hinges.



Removing the side panel



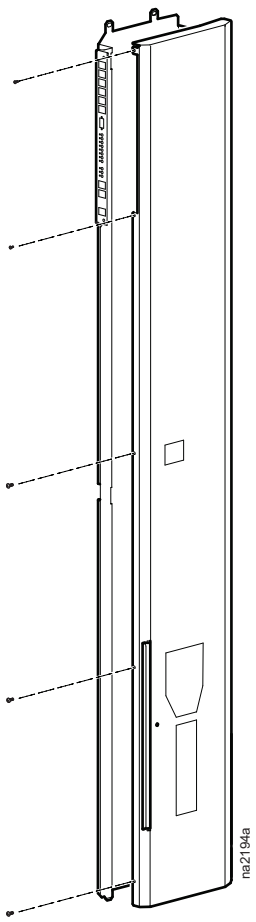
Installing the side panel



Removing the electrical panel cover

Remove the electrical panel cover to install the main power cable.

1. Remove the five M4 screws securing the cover.
2. Remove the cover by opening it and sliding it toward the front of the equipment.



⚠WARNING

ELECTRICAL HAZARD

Ensure all wiring is not energized before routing cables into this equipment. Only qualified service and maintenance personnel should work on this equipment.

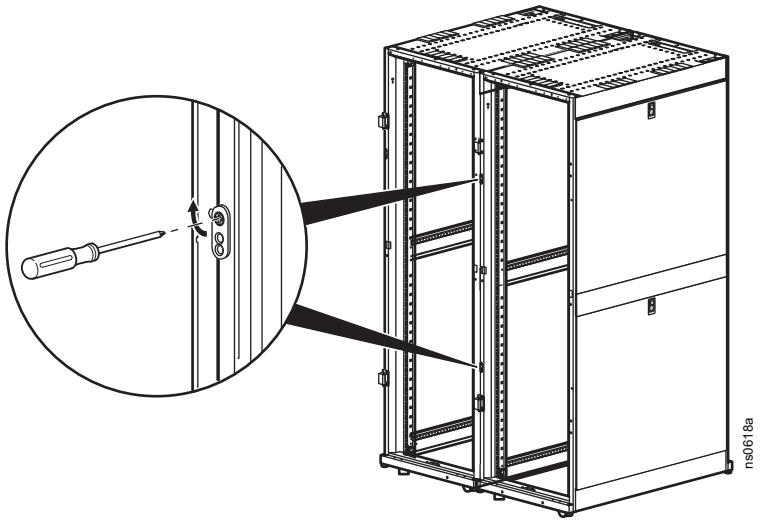
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Joining the Equipment to Enclosures

Joining to NetShelter® SX enclosures

The equipment comes with four joining brackets (two for the front and two for the rear).

1. Remove the front and rear doors. See “Removing the front and rear doors” on page 19.
2. Locate the four joining brackets. Rotate each bracket ninety degrees toward the adjoining enclosure so the bracket is parallel to the floor and install using the screws provided with the enclosure.



For more information, see the *Unpacking, Installation, and Customization* manual for the NetShelter SX Enclosure.

Joining to NetShelter VX and VS enclosures

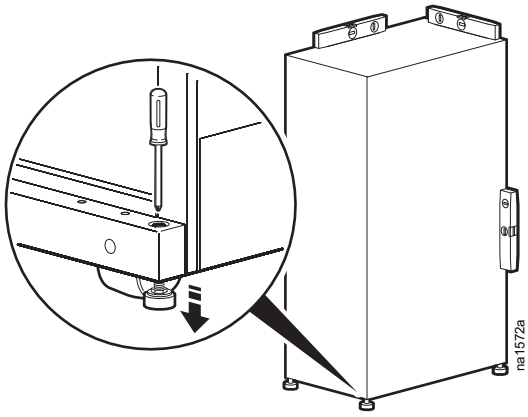
For information on joining the equipment to NetShelter VX and VS enclosures, see the installation sheet *NetShelter® Enclosure Accessories Joining Kits SX to VX/VS —AR7601, AR7602.*

Leveling the Equipment

NOTICE
WIRING HAZARD After re-installing the front door, reconnect all wires previously disconnected. **Failure to follow these instructions can result in equipment damage.**

NOTE: The leveling feet at the corners of the equipment provide a stable base if the floor is uneven, but they cannot compensate for a badly sloped surface.

1. Remove the front and rear doors.
   NOTE: Before removing the front door, unplug the ground wires and any other wire connections that may interfere with the removal of the doors.
2. For each leveling foot, insert a Phillips PH2 or slotted screwdriver into the screw above the leveling foot. Turn the screw clockwise to extend the leveling foot until it makes firm contact with the floor.
3. Re-install the front and rear doors.
   NOTE: Use a 13-mm open-ended wrench to level the equipment without removing the doors.



Mechanical Connections

Refrigeration piping

Use only ACR type L tubing (no soft copper).

The equipment must be connected to a condenser—either a remote outdoor condenser or an indoor centrifugal condenser. Systems with remote outdoor or indoor centrifugal condensers must have discharge and liquid lines from the equipment to the condenser. Install all refrigerant lines in accordance with applicable industry guidelines as well as local and national codes and regulations.

To size lines, see “Recommended line sizes” on page 25.

Calculate an equivalent length based on the actual linear length of the run, including valves and fittings.
NOTE: All fittings should be long-radius to minimize pressure drop.

Discharge lines are sized such that velocity in vertical lines is between 5 m/s (1000 ft/min) and 15 m/s (3000 ft/m). Velocity in horizontal lines should be limited to 2.5 m/s (500 ft/min). The refrigerant velocity must be high enough to keep oil entrained in the flow. If it is too low, oil will not return to the compressor. If the refrigerant velocity is too high, both the noise level and pressure drop will increase. The acceptable pressure drops in discharge lines are up to 68.9 kPa (10 psi).

NOTE: Fully loaded, the nominal cooling capacity of the equipment is 29 kW. At its lowest speed, the equipment cooling capacity is approximately 10 kW.

NOTE: Give consideration to the loaded and unloaded state of the compressor to ensure that the operational range stays within these limits.

NOTE: Change the size of the pipe before the P-trap. See “Refrigeration Piping Diagram” on page 13.

Make all refrigerant lines as short and direct as possible. Horizontal discharge 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. Trap vertical discharge lines approximately every 6 m (20 ft) to ensure proper oil return. Traps are normally not necessary at the base of discharge lines; however, loop the line to the floor before running it vertically to prevent the drainage of oil back to the compressor during shutdown periods.

Isolate piping from structural surfaces using vibration clamps.

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

ASHRAE standards for equivalent piping lengths of fittings and valves

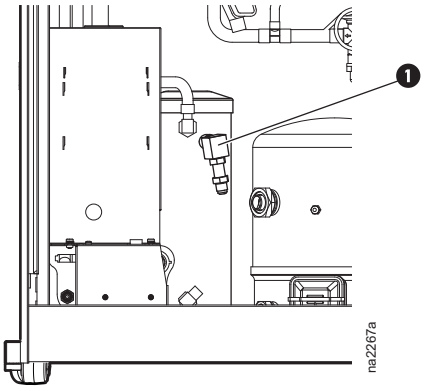
Type of fitting or valve—Equivalent length of pipe in m (ft)						
Nominal Pipe Size	**ACR Tubing Size**	**Gate Valve**	**Standard Elbow 90°**	**Reduced Coupling**	**Side Outlet "T"**	**Angle Valve**
3/4 in.	7/8 in.	0.27 (0.89)	0.61 (2.0)	0.61 (2.00)	1.22 (4.00)	2.74 (8.99)
1 in.	1-1/8 in.	0.30 (0.98)	0.79 (2.6)	0.79 (2.59)	1.52 (4.99)	3.66 (12.00)
1 1/4 in.	1-3/8 in.	0.45 (1.48)	1.00 (3.3)	1.00 (3.28)	2.13 (6.99)	4.57 (14.99)
1 1/2 in.	1-5/8 in.	0.15 (0.49)	1.22 (4.00)	0.15 (0.49)	2.13 (6.99)	0.15 (0.49)

Recommended line sizes

Equivalent length m (ft)	Line type	ACRP100, ACRP101, ACRP102
15 (50)	Discharge line (horizontal)	1 1/8 in.
	Discharge line (vertical)	1 1/8 in.
	Liquid line	7/8 in.
30 (100)	Discharge line (horizontal)	1 1/8 in.
	Discharge line (vertical)	1 1/8 in.
	Liquid line	7/8 in.
46 (150)	Discharge line (horizontal)	1 3/8 in.
	Discharge line (vertical)	1 1/8 in.
	Liquid line	7/8 in.
61 (200)	Discharge line (horizontal)	1 3/8 in.
	Discharge line (vertical)	1 1/8 in.
	Liquid line	7/8 in.

NOTE: Limit the refrigerant piping run to 61 equivalent m (200 equivalent ft) to ensure proper operation of the refrigeration system.

Connect refrigerant lines

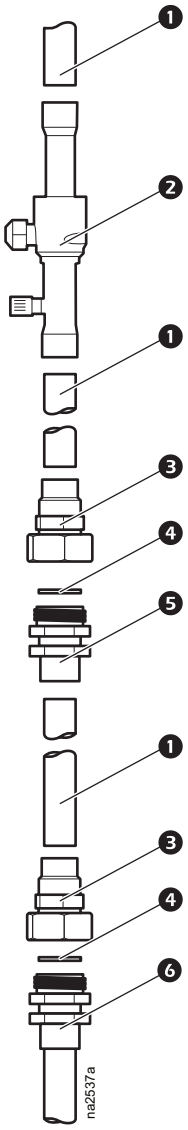


Be sure to use only clean, refrigerant-grade (ACR) pipe and follow standard procedures for pipe size selection for air-cooled equipment. The maximum allowable equivalent length between the evaporator and condenser is 61 equivalent m (200 equivalent ft). Vertical runs (hot gas) require a trap every 6 m (20 ft) of rise. All refrigerant piping joints must be made by brazing only; do not solder. Recommended brazing alloy is AWS A5.8 BCuP-5.

NOTE: When brazing field-installed copper refrigeration lines, use a nitrogen purge to minimize contamination of the refrigeration system during the brazing process.

The air-cooled equipment has been dehydrated at the factory and is shipped with a holding charge of 207 kPa (30 psig) nitrogen. Test refrigerant connections for leaks before replacing the holding charge.

Connect both refrigerant lines to the equipment, using all fittings as shown. See “Install kit inventory” on page 6.



Item	Description
❶	3/4-in. copper tubing (field-supplied and installed)
❷	Ball valve (supplied)
❸	3/4-in. female Rotalock connector (supplied)
❹	Gasket (supplied)
❺	3/4-in. male connector (supplied)
❻	3/4-in. male connector (factory-installed inside the equipment)

Condenser

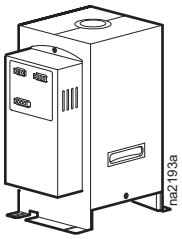
Install and pipe the condenser in accordance with the provided instructions.

Flooded receiver

Install the flooded receiver in accordance with the instructions included with the kit.

Humidifier

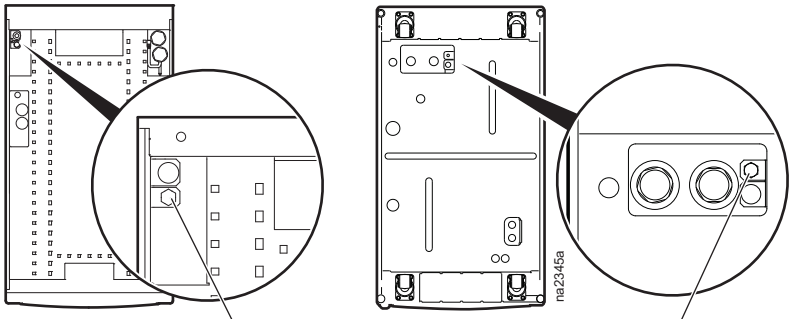
The humidifier water supply line is routed to the unit in flexible tubing (or alternative tubing approved by local building codes) that will allow the humidifier water supply line connector to be moved approximately 25 mm (1 in.) away from the equipment. This facilitates removing the equipment from a row.



A factory-installed quick-connector for connecting the tubing to the equipment is supplied. The quick connector has a male 1/4-in. NPT or male 1/4-in. BSPT to connect to a compression fitting. The quick-connector has a shut-off function, so no separate shut-off valve is necessary.

The humidifier water supply line can be connected through either the top or the bottom of the equipment as shown. Male quick-connectors are positioned in both the top and the bottom of the equipment.

Water pressure should be between 100 and 800 kPa (15 and 115 psi) for proper humidifier operation. Dirty water must be filtered before it is supplied to the humidifier. Water temperature must be between 1ºC and 40°C (34ºF and 104°F). Do not use softened, de-mineralized, or de-ionized water.

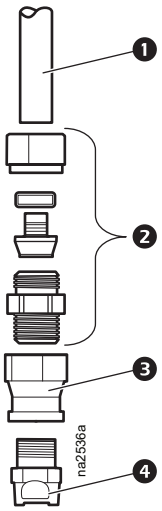


See the manual included with the humidifier for more information about water quality, mineral content, hardness, and minimum/maximum levels for conductivity.

NOTE: Before making any connections, clear any debris that may have accumulated during assembly from the humidifier water supply line.
NOTE: It is recommended that a solenoid water valve be installed in the humidifier supply line, connected to a leak detector.
NOTE: Perform all piping in accordance with applicable industry guidelines as well as local and national codes and regulations.

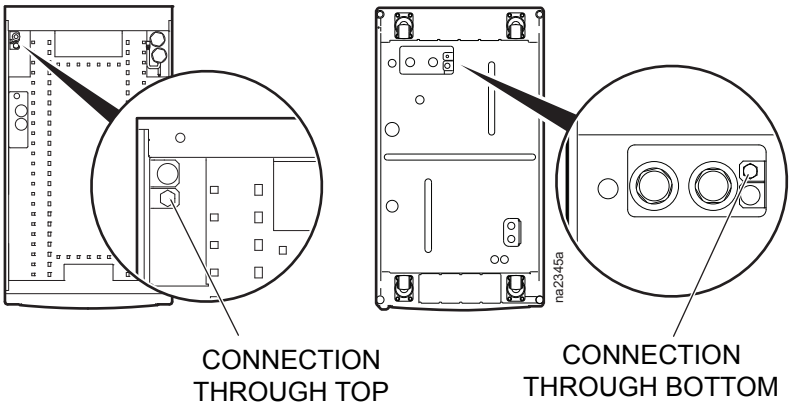
Connect the fittings to the humidifier water supply line as shown, then connect the water supply line quick-connector to the top or bottom humidifier input.

Item	Description
❶	Flexible tubing (field supplied and installed)
❷	Compression fitting (field supplied and installed)
❸	Straight reduction (field supplied and installed)
❹	Quick-connector (supplied)

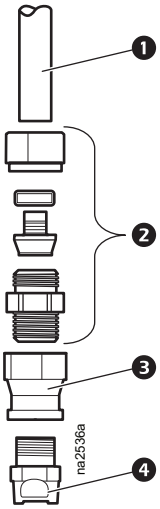


Condensate pump

The pump is factory-wired and piped internally to the condensate drain pan and humidifier outlet. The pump can move liquid a maximum of 18 m (60 ft), which may include a maximum lift of 3.5 m (11.5 ft) at a flow rate of 87 l/hr (23 gph). For example, if your lift is 3 m (10 ft), you will have 15 m (50 ft) of usable run remaining. The pump uses an on-board condensate high level float switch wired into the equipment for alarm capabilities.



The condensate drain line can be connected through either the top or the bottom of the equipment using factory-installed male quick connectors and tubing approved by local building codes that will allow the drain line connector to be moved approximately 25 mm (1 in.) away from the equipment. This facilitates removing the equipment from a row. Female quick connectors and reduction fittings are supplied with the equipment. Connect the fittings as shown, then connect the drain line quick connector to the top or bottom condensate pump output line.



Item	Description
❶	Tubing (field supplied and installed)
❷	1/2-in. male NPT or 1/2-in. male BSPT fitting (field supplied and installed)
❸	Straight reduction (supplied)
❹	Quick connector (supplied)

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

NOTICE

WATER DAMAGE

• Failure to properly route the condensate pump drain line before operation could result in water damage.

• Do not route drain or supply lines above computer equipment, Uninterruptible Power Supply (UPS) units, Power Distribution Units (PDUs), or light fixtures.

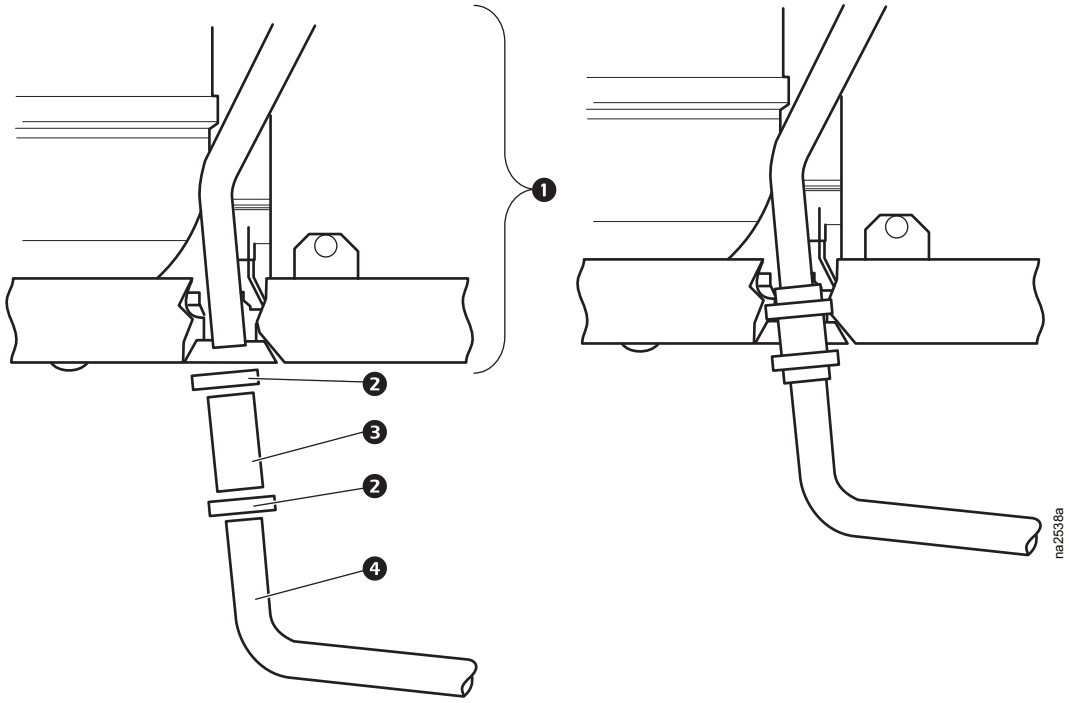
Do not install water lines in areas subject to freezing temperatures.

Failure to follow these instructions can result in equipment damage.

Condensate overflow

NOTICE
WATER DAMAGE Failing to perform the following procedure may result in condensate pan overflow and possible damage to the data center. **Failure to follow these instructions can result in equipment damage.**

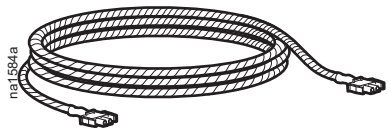
Connect the equipment condensate overflow line to an external drain using the fittings, as shown.



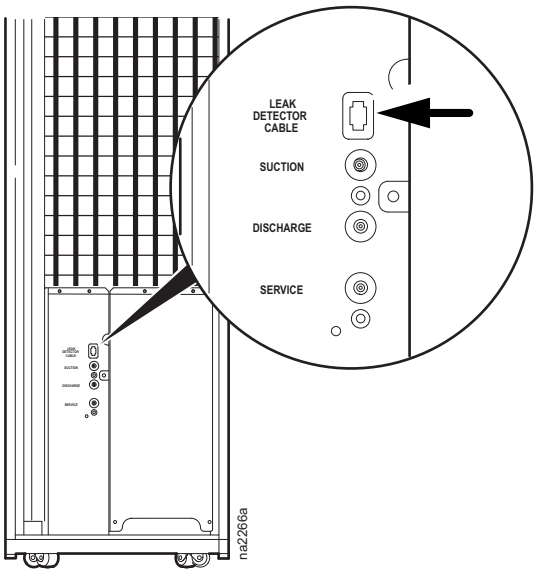
Item	Description
❶	InRow RP
❷	Hose adapter clamp (supplied)
❸	Hose adapter (supplied)
❹	7/8-in. copper tubing (field supplied and installed)

Leak sensor (optional)

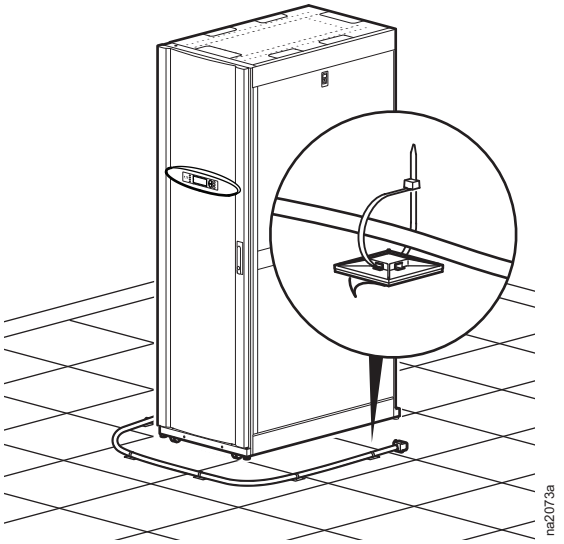
Install up to four leak sensors (AP9326) in series, as needed.



1. Connect the leak sensor to the equipment using the plug located on the service bracket, as shown.



2. Position the leak sensor inside or outside the equipment.
   NOTE: Install leak sensors on a clean surface, and do not allow them to touch metal that is in an air stream.
3. Route the leak sensor to the outside through either the bottom plate or the door.
4. Secure the leak sensor wire to surfaces using cable ties and cable tie holders (provided with the leak detector).



Electrical Connections

The electrical connections required in the field are the following:

- Controls (user interface, Network Management Card)
- Communication (A-Link, Building Management System)
- Power to InRow RP (3-phase plus ground)
- Power to flooded receiver heater
- Power to the air cooled condenser

All electrical connections must be in accordance with applicable industry guidelines as well as local and national codes and regulations.

See the equipment nameplate for voltage and current requirements.

Make all low-voltage connections, including data and control connections, with properly insulated wires. Insulation of low-voltage wiring must be rated for at least the voltage of any adjacent wiring.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- 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.
- Always use a properly rated voltage sensing device to confirm power is off.
- 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.

Three-phase electrical service is required. Electrical service must conform to local and national electrical codes and regulations. The equipment must be grounded. Check the equipment nameplate for correct ratings.

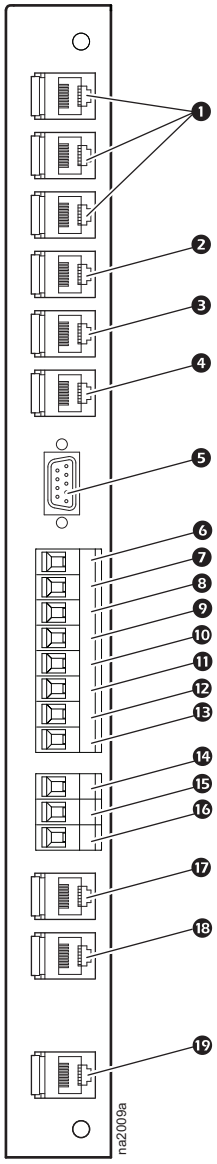
Use a voltmeter to ensure that power is turned off before making any electrical connections.

Control connections

NOTE: Wire all input and output connections as Class 2 circuits.

Depending on the configuration, additional control connections may be required for the A-Link remote communications through Network Management Card support or traditional equipment-monitoring software.

User interface connections



Item	Description
❶	Rack inlet temperature sensors 1, 2, 3
❷	A-Link IN
❸	A-Link OUT
❹	Network port
❺	Console port
❻	Customer output, NC (normally closed)
❼	Customer output, COM (common)
❽	Customer output, NO (normally open)
❾	Supply GND (Ground)
❿	Supply 12 Vdc (current limit: 20 mA)
⓫	Supply 24 Vdc (current limit: 20 mA)
⓬	Customer input + (12–30 Vac/Vdc, 24 Vdc @ 11 mA)
⓭	Supply COM
⓮	Modbus D1
⓯	Modbus D0
⓰	Modbus GND
⓱	Supply air temperature sensor (front)
⓲	Supply air humidity sensor (front)
⓳	Display interface

NOTE: For a top installation, route control wiring through the wire channel located at the top left hand corner just above the user interface connectors.

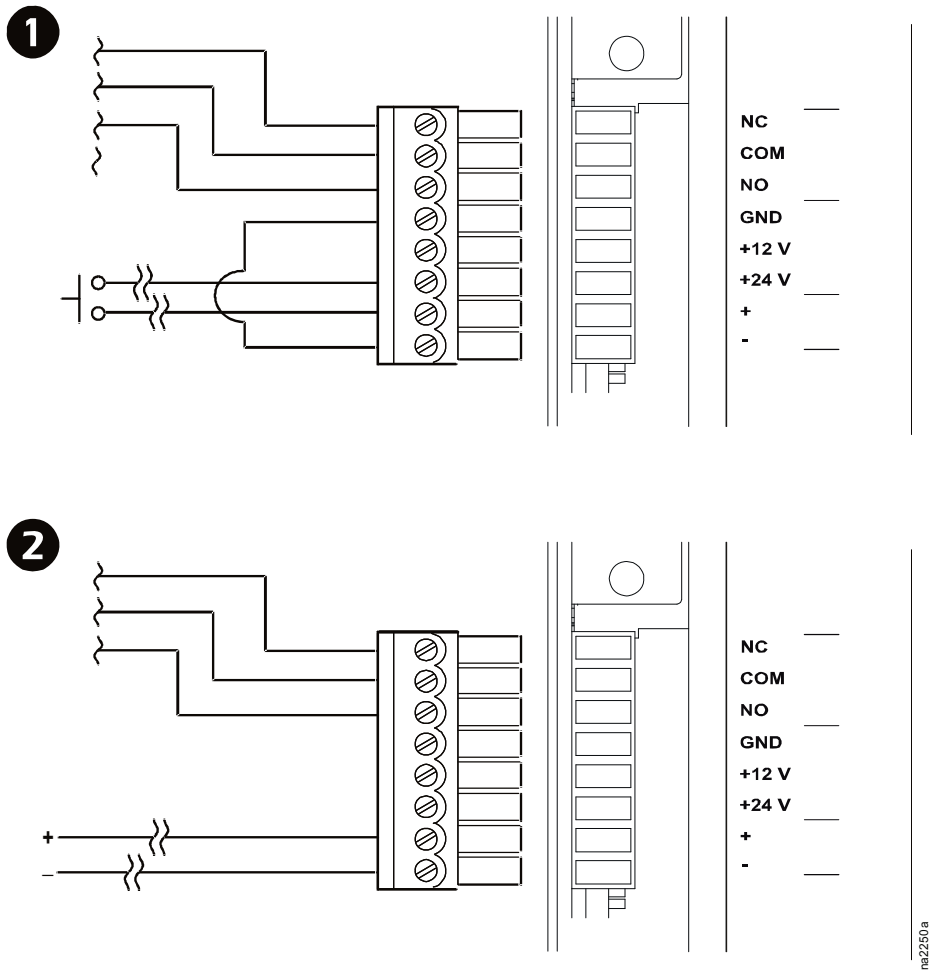
For a bottom installation, route the control wiring to the customer access hole in the bottom of the equipment through wire clamps from the interface connectors. Then, route the wiring down along the electrical panel and secure with wire clamps.

Description of user interface connectors

Item	Description	Function
❶	Rack temperature sensors 1, 2, 3	Three temperature sensors which must be installed on the cold aisle side of the server racks. See “Rack temperature sensors” on page 35.
❷	A-Link IN	In and out connections for A-Link. The terminators supplied with the equipment must be plugged into the first A-link port and the final A-Link port for the system.
❸	A-Link OUT	

Item	Description	Function
❹	Network port	10/100 Base-T Network port. Connects the equipment to the network; Status and Link LEDs indicate network traffic. • • Status LED—blinks orange and green at startup; indicates the status of the network connection (solid green—IP address established; blinking green—attempting to obtain an IP address). • • Link LED—blinks to indicate network traffic (green—operating at 10 mbps; orange—operating at 100 mbps).
❺	Console port	RS-232 communication port used for local service access to the equipment. Use configuration cable (Schneider Electric part number 940-0103) to connect to this port.
❻	Customer output, Normally Closed (NC)	Customer-configurable output relay which can be activated for all types of alarms or critical alarms. The relay can be connected to external equipment using 30 Vac/dc, 2 A.
❼	Customer output, Common (COM)	
❽	Customer output, Normally Open (NO)	
❾	Supply GND	Can be used for customer input and output interface.
❿	Supply 12 Vdc	Can be used for customer input and output interface. Current limit is 20 mA.
⓫	Supply 24 Vdc	Can be used for customer input and output interface. Current limit is 20 mA.
⓬	Customer input +	Used for remote shutdown of the InRow RP. Voltage is applied from the internal power supply or by using an external power supply.
⓭	Customer input -	Ground connection point for remote shutdown supply source.
⓮	Modbus D1 (RXTX+)	Connections for Building Management System. Wire a 150 Ohm terminator resistor (supplied) into the final InRow RP, between Modbus D0 and Modbus D1.
⓯	Modbus D0 (RXTX–)	
⓰	Modbus GND	
⓱	Supply air temperature sensor (front)	Temperature sensor installed on the front of the equipment.
⓲	Supply air humidity sensor (front)	Humidity sensor installed on the front of the equipment.
⓳	Display interface	Connection for the display interface installed on the front door of the equipment.

Form C alarm contacts and shutdown input

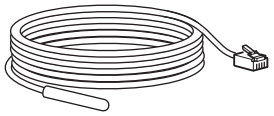


See items 6 through 13 in “Control connections” on page 31. A relay internal to the user interface is controlled by a user-defined alarm (for example, malfunctioning fans). Before an alarm condition, the signal on the COM (common) terminal is routed to the NC (normally closed) terminal. When the alarm is activated, the relay is energized, causing the signal on the COM terminal to be routed to the NO (normally open) terminal. The NO and NC terminals could be connected to remote indicator lights, a warning buzzer, or another device to alert an operator to the presence of an alarm condition.

The equipment may be remotely disconnected by supplying a voltage to the shutdown inputs as shown above. Option ❶ shows a remote switch that uses internal +12 Vdc or +24 Vdc supply to manually stop operation. Option ❷ shows how any local source of +12 Vdc or +24 Vdc may be connected to the shutdown input.

Rack temperature sensors

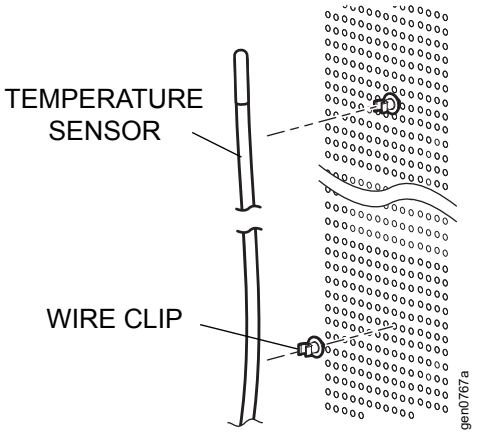
The rack temperature sensors control the equipment airflow and ensure adequate supply of cooling air to the server racks in the data center.



The equipment is supplied with three external rack temperature sensors. See “Install kit inventory” on page 6. These sensors, along with cable ties and wire clips, are included in the installation kit shipped with the equipment.

How to install the rack temperature sensors

1. Insert the rack temperature sensor connector in the temperature sensor port at the user interface. See “Depending on the configuration, additional control connections may be required for the A-Link remote communications through Network Management Card support or traditional equipment-monitoring software.” on page 31.
    a. For a top installation, push the rack temperature sensor through the wire channel located at the top of the equipment in the left hand side just above the user interface connectors.
    b. For a bottom installation, route the sensor through the wire clamps along the electrical panel and then push the sensor through the customer access hole in the bottom of the equipment.
2. Route the sensor through either the top or the bottom of the adjacent server rack.
3. Secure the temperature sensor cable to the front door of the adjacent server rack at multiple locations using the provided wire clips as shown. See “Install kit inventory” on page 6.



NOTE: Remote rack temperature sensors must be installed for proper operation.

The sensors must be installed where lack of sufficient cooling air is most likely. The optimum position of the rack temperature sensors will vary from installation to installation, but should be located in the airflow to allow accurate readings.
Servers most likely to have insufficient or inadequately cooled cooling air due to the recirculation of hot air from the hot aisle include:

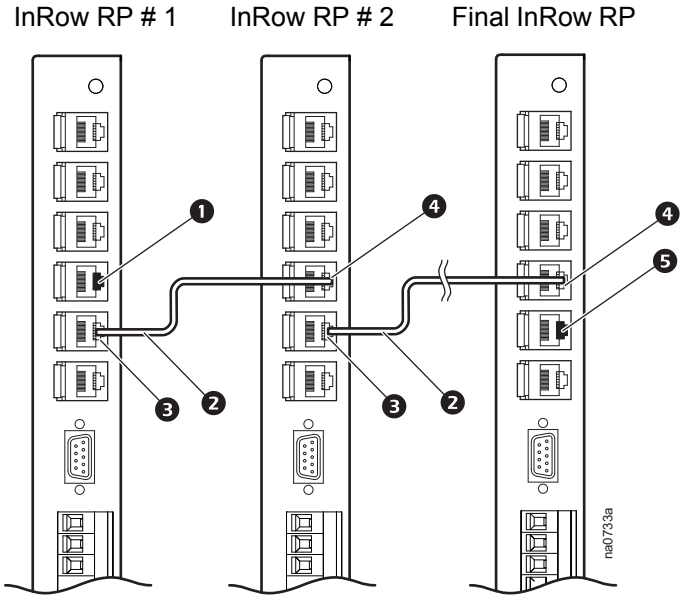
a. Servers positioned at the top of a rack.
b. Servers positioned at any height in the last rack at an open end of a row.
c. Servers positioned behind flow-impairing obstacles such as building elements.
d. Servers positioned in a bank of high-density racks.
e. Servers positioned next to racks with Air Removal Units (ARU).
f. Servers positioned very far from the equipment.
g. Servers positioned very close to the equipment.

Communication connections

A-Link connections: The A-Link bus connection allows multiple InRow RP equipment (up to twelve) to communicate with one another. Only one InRow RP unit needs to be defined through the display; other InRow RP units are numbered automatically.

To enable the InRow RP units to work as a group, link them using CAT-5 cables with RJ-45 connectors. A supplied terminator (150 Ohm, 1/4 W) is factory installed in the A-Link port, and must remain inserted into the A-Link ports of the first and final InRow RP units only.

The maximum wire length for the entire group may not exceed 1000 m (3,280 ft).



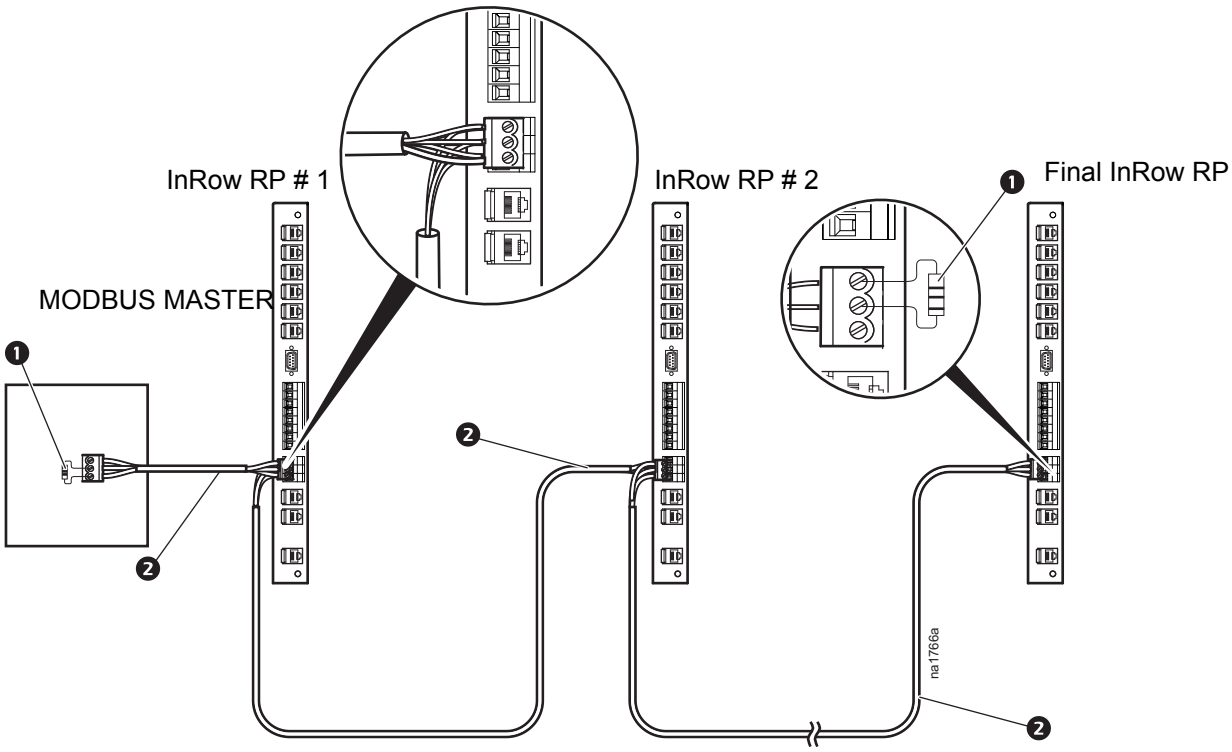
Item	Description
❶	A-Link in (with provided RJ-45 terminator)
❷	A-Link cable (CAT-5 ethernet cable)
❸	A-Link out

Item	Description
❹	A-Link in
❺	A-Link out (with provided RJ-45 terminator)

Building Management System (BMS): The Modbus interface allows each InRow RP cooling unit to communicate with the BMS. Use a three-wire cable to connect each InRow RP unit in turn. Wire a terminator resistor (150 Ohm, 1/4 W) into the Modbus master and the final InRow RP unit between Modbus D0 and Modbus D1. This terminator is included in the installation kit (see “Install kit inventory” on page 6).

Each InRow RP unit has a three-wire Modbus terminal on the user interface. A connector with screw terminals is used to allow wiring to be attached. See “Depending on the configuration, additional control connections may be required for the A-Link remote communications through Network Management Card support or traditional equipment-monitoring software.” on page 31 for specific layout of the user interface.

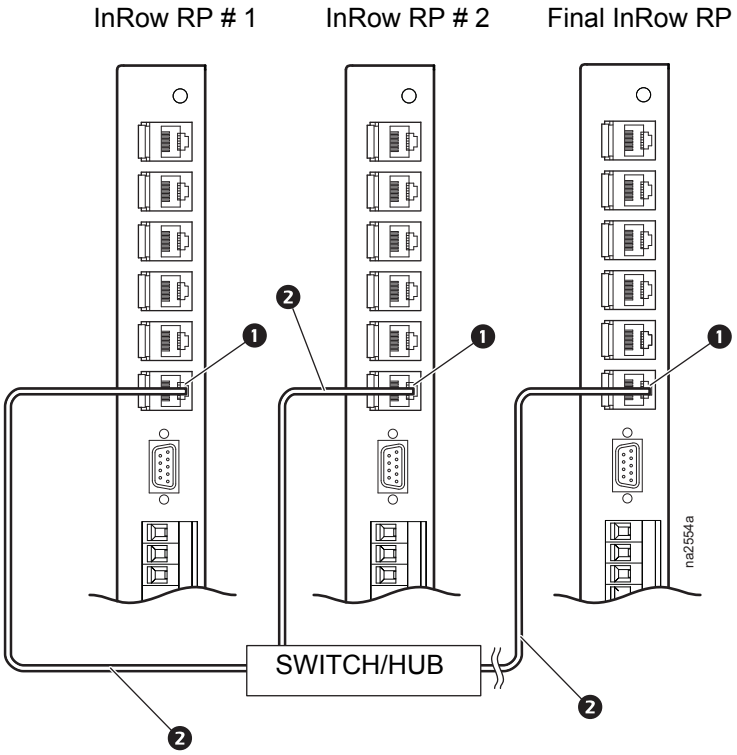
For information on setup of Modbus parameters, see the *InRow RP Operation and Maintenance* manual.



Item	Description
❶	Termination resistor (provided)
❷	Modbus cable (RS-485)

Network port

The Network port allows communication from the InRow RP cooling unit to the network.



Item	Description
❶	Network port
❷	LAN cable (10/100 Base-T)

Power Connections

Wiring configurations

Route incoming power from the PDU or electrical service panel to the electrical panel located in the left side of the equipment. Route power either through the top or the bottom of the equipment.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

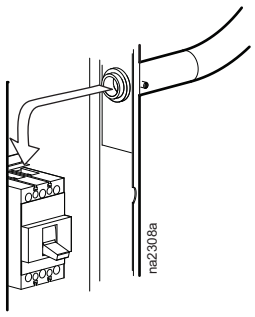
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must be installed and serviced by qualified personnel only.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- 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.

NOTE: To ease installation and later removal of the equipment for repairs, use flexible conduit for the power wiring.

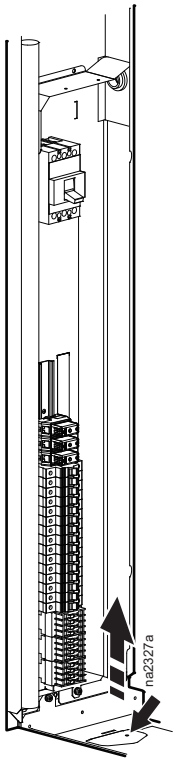
Top routing

1. Remove the electrical panel cover. See “Removing the electrical panel cover” on page 21.
2. Locate the power connection plate at the top of the equipment. See “Top piping and power access locations (top view)” on page 17.
3. Loosen the screw securing the connection plate, and remove the plate.
4. Attach the conduit connector using the pilot hole in the connection plate.
5. Route the cabling to the main breaker as shown.
6. Connect the power wiring to the top of the main circuit breaker using the torque specified on the breaker. Connect the phases as marked next to the terminals.
7. Connect the ground wire to the ground terminal block located above the main circuit breaker.
8. Reinstall the connection plate and the electrical panel cover.



Bottom routing

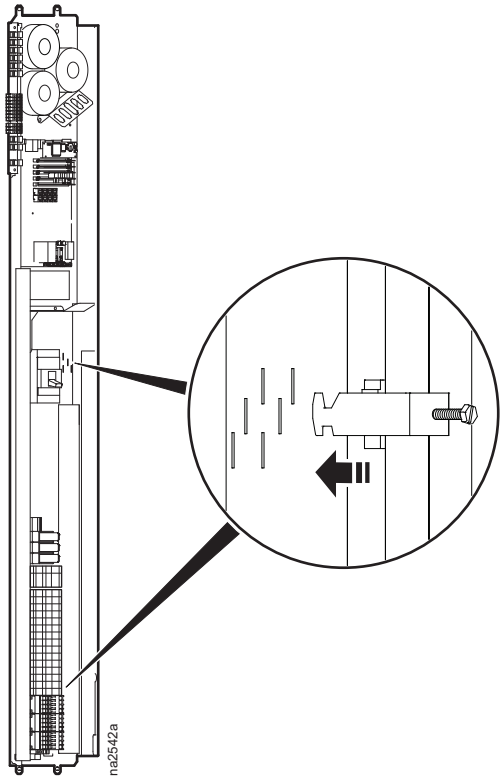
1. Remove the electrical panel cover. See “Removing the electrical panel cover” on page 21.
2. Locate the power connection plate in the bottom of the equipment. See “Bottom piping and power access locations (bottom view)” on page 18.
3. Loosen the screw securing the connection plate, and remove the plate.
4. Attach the conduit connector using the pilot hole in the connection plate.
5. For ACRP102, perform the steps in “Strain relief (ACRP102 only)” on page 40.
6. Route the cabling to the main circuit breaker as shown.
7. Connect the power wiring to the top of the main circuit breaker using the torque specified on the breaker. Connect the phases as marked next to the terminals.
8. Connect the ground wire to the ground terminal block located just above the main circuit breaker.
9. Fasten the cabling inside the equipment with the provided wire ties. See “Install kit inventory” on page 6.
10. Reinstall the connection plate and the electrical panel cover.



Strain relief (ACRP102 only)

Adjustable metal strain reliefs are provided. See “Install kit inventory” on page 6.

1. Hook one strain relief into a pair of slots in each of the two locations shown.
2. Route the electrical cable up from the bottom of the equipment, passing through the strain reliefs.
3. Tighten the screws on the strain reliefs to capture the electrical cable, taking the weight off of the inner conductors.
4. Continue connecting electrical wiring to the circuit breaker.



Flooded receiver heater

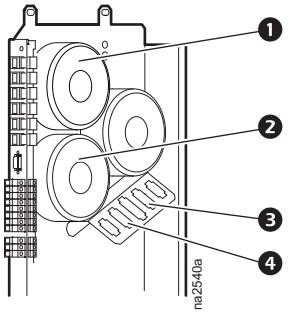
The flooded receiver is equipped with a heater to keep the refrigerant warm during extremely cold weather conditions. If your location is subject to subfreezing temperatures for extended periods of time, you must connect the self-regulating heater to a convenient source of electrical power. If you are not sure your location or application requires the heater, contact Customer Support.

See the documentation included with the flooded receiver for more information on voltage requirements.

Make electrical connections in accordance with all local and national codes.

Voltage selection

Your equipment can operate at various supply voltages, provided the proper voltage jumpers are connected to the input transformers. Read the part number on the jumpers connected at the factory and compare that number to the table below. If the correct jumpers for your input voltage are not connected, remove them and connect the proper jumper. See “Install kit inventory” on page 6.



Jumper Connections

1. Transformer B connected to J51 (3)
2. Transformer A connected to J50 (4)

SKU	Input Voltage	Use Jumper Part Number
ACRP100	208 (50/60 Hz)	0W2540 (default)
	230 (50/60 Hz)	0W2541
ACRP101	460 (60 Hz)	0W2545
	480 (60 Hz)	0W2546 (default)
ACRP102	380 (50/60 Hz)	0W2542
	400 (50/60 Hz)	0W2543 (default)
	415 (50/60 Hz)	0W2544

Adding a holding charge

1. Open the two shutoff valves positioned in the rear of the equipment. See “Interior components (rear)” on page 9. Do not close the valves unless there is a need to remove the top piping.
2. Pressurize the system to 1724 kPa (250 psi) with nitrogen. Leave the system pressurized for 24 hours (recommended), and check the gauges for a drop in pressure.
   NOTE: Due to the refrigeration components used such as check valves and solenoid valves, be sure to pull the vacuum from the suction, discharge and service port when evacuating the refrigeration system.
3. Use a deep vacuum pump and pull the first vacuum down to 750 microns. Wait for an hour (vacuum should not rise above 1500 microns) and then break the vacuum with nitrogen.
4. Pull a final vacuum down to 300 microns for a minimum of 2 hours.

NOTICE
DAMAGE TO MICRON GAUGE Install a ball valve before the micron gauge to prevent damage to the micron gauge during charging. **Failure to follow these instructions can result in equipment damage.**

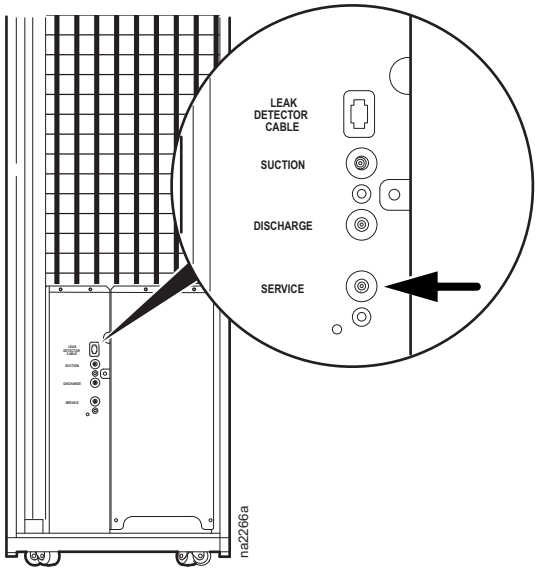
NOTICE
HAZARD TO EQUIPMENT Charge the system with R-407C liquid refrigerant only. **Failure to follow these instructions can result in equipment damage.**

NOTE: The installing contractor is responsible for providing sufficient refrigerant for a complete system charge during start-up.

5. Charge with liquid R-407C until the system pressure equalizes with the refrigerant canister.
   a. Apply the charge into the service port on the equipment service bracket.
   b. Purge the refrigerant hoses and manifold set.

Adding compressor oil

Depending upon piping run lengths, the system may require an additional charge of oil at start-up. The installing contractor shall provide adequate compressor oil. Use a quality POE oil with a viscosity of 32 cst, 160 SUS at 40°C (104°F).



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 e-support.
- Contact the Schneider Electric Customer Support Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.schneider-electric.com > Support > Operations around the world** for contact information.

For information on how to obtain local customer support, contact the representative or other distributors from whom you purchased your product.