

Installation Manual

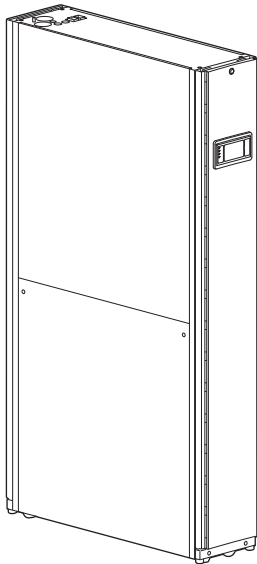
InRow™ Chilled Water Air Conditioners

InRow™ RC

ACRC301S, ACRC301H

990-4705B-001

Publication Date: November 2017



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Safety

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.

General Information

Inspecting the Cooling Unit

Inspect for missing components. All shipped loose components are identified in the “Inventory” on page 10 of this manual. Ensure each item is present before accepting delivery of the unit.

Filing a claim. If damage has occurred, or if shipped loose parts are missing, report it immediately to the delivering carrier. Failure to do so will result in replacement parts and repairs being billed to the customer.

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

Storing the Cooling Unit Before Installation

NOTICE
WEATHER DAMAGE Leaving the cooling unit uncovered and exposed to possible damage from the environment will void the factory warranty. Failure to follow these instructions can result in equipment damage.

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

Moving the Cooling Unit

⚠ WARNING
HEAVY EQUIPMENT - TIP HAZARD <ul style="list-style-type: none">• Ensure the lifting equipment has sufficient capacity for the load.• The equipment can be rolled to its final location using its casters if the floor is smooth and clean.• Be sure to use two people to move the equipment. Failure to follow these instructions can result in injury or equipment damage.

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

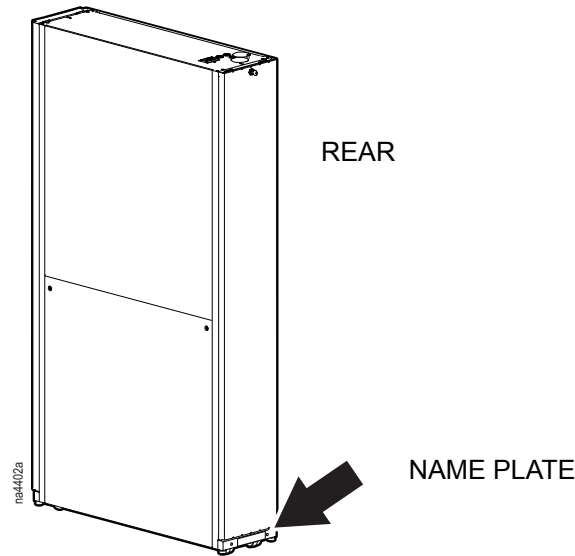
Pallet Jack

Forklift



Model Identification

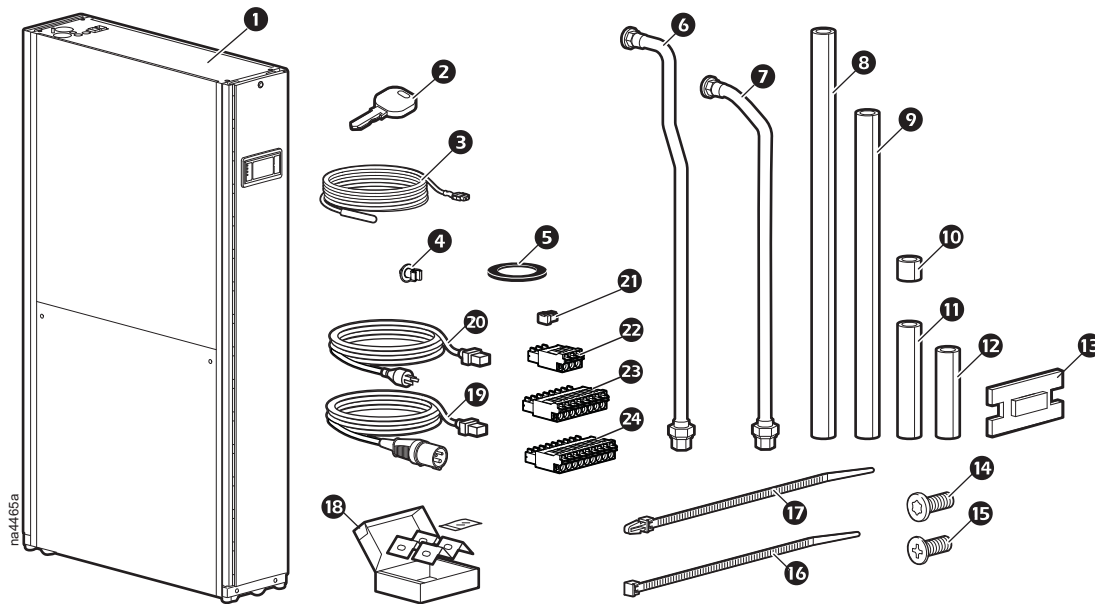
The model number can be found on the outside of the shipping crate and on the name plate located on the rear of the cooling unit as shown. Use the table below to verify that the equipment is the correct type and voltage.



Model	Width	Range of Capacity	Voltage	Phase	Frequency	Power Connection
ACRC301S	300 mm	Up to 45 kW	100–240V	1	50/60 Hz	NEMA L5-20P/ IEC 309-16A
ACRC301H	300 mm	Up to 60 kW	208–230V	1	50/60 Hz	HARDWIRED

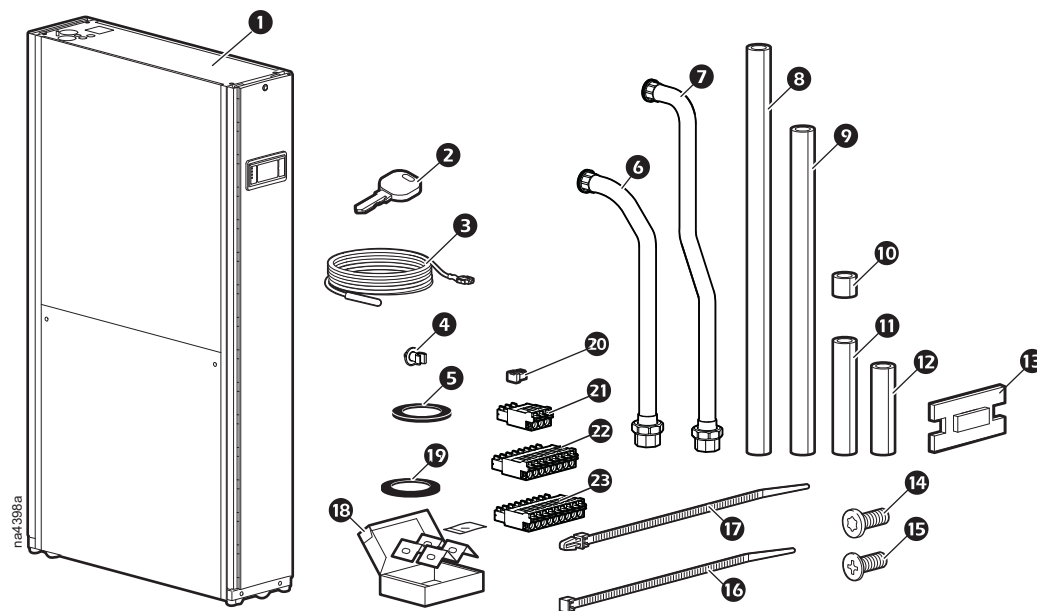
Inventory

Package contents—ACRC301S



Item	Description	Quantity	Item	Description	Quantity
1	InRow RC—ACRC301S	1	13	Insulation, bracket	2
2	Front and rear panel key	2	14	TORX screw	4
3	Remote temperature probe	1	15	Phillips screw, black	4
4	Remote temperature probe clip	3	16	Wire tie	3
5	Pipe gasket	4	17	Barb-type wire tie	3
6	Pipe, outlet	1	18	Bolt down kit	1
7	Pipe, inlet	1	19	Power cord, IEC 309-16A to C19	2
8	Insulation, outlet pipe (above clamp)	1	20	Power cord, NEMA L5-20P to C19	2
9	Insulation, inlet pipe (above clamp)	1	21	Terminator	1
10	Insulation, union	2	22	Terminal plug, 3-position	2
11	Insulation, outlet pipe (below clamp)	1	23	Connector, 8-tab	1
12	Insulation, inlet pipe (below clamp)	1	24	Connector, 9-tab	1

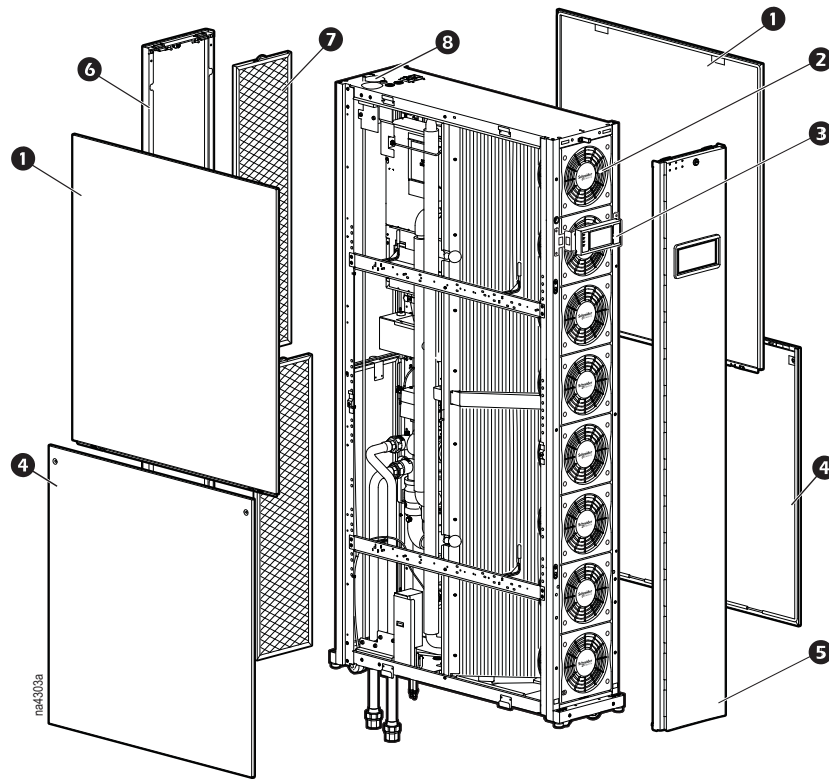
Package contents—ACRC301H



Item	Description	Quantity	Item	Description	Quantity
1	InRow RC—ACRC301H	1	13	Insulation, clamp	2
2	Front and rear panel key	2	14	TORX screw	4
3	Remote temperature probe	1	15	Phillips screw, black	4
4	Remote temperature probe clip	3	16	Wire tie	3
5	Pipe gasket, unit pipes	2	17	Barb-type wire tie	3
6	Pipe, inlet	1	18	Bolt down kit	1
7	Pipe, outlet	1	19	Pipe gasket, client connections	2
8	Insulation, outlet pipe (above clamp)	1	20	Terminator	1
9	Insulation, inlet pipe (above clamp)	1	21	Terminal plug, 3-position	2
10	Insulation, pipe unions	2	22	Connector, 8-tab	1
11	Insulation, inlet pipe (below clamp)	1	23	Connector, 9-tab	1
12	Insulation, outlet pipe (below clamp)	1			

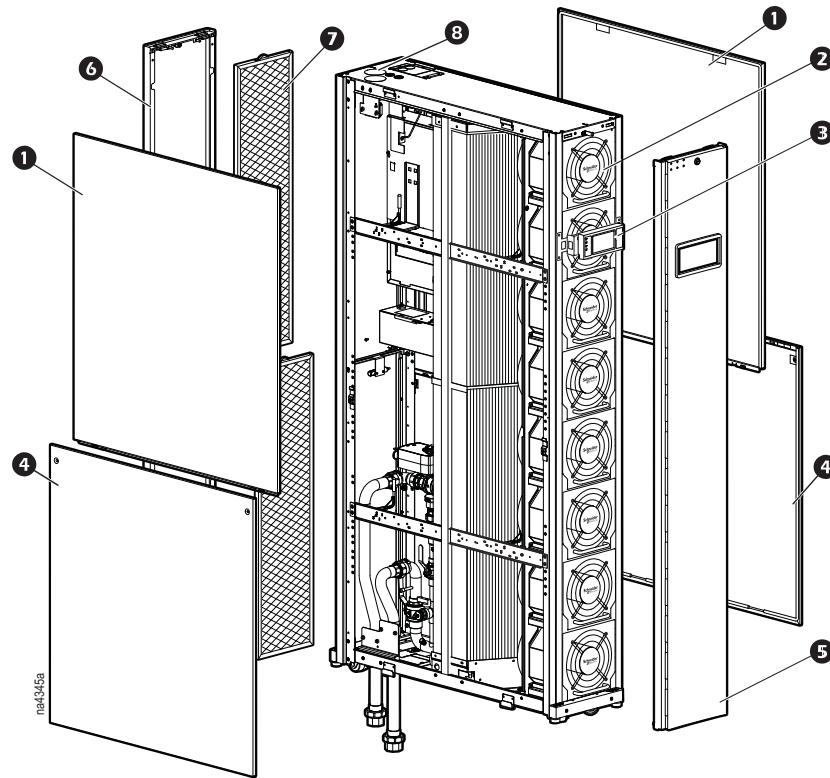
Component Identification

External components—ACRC301S



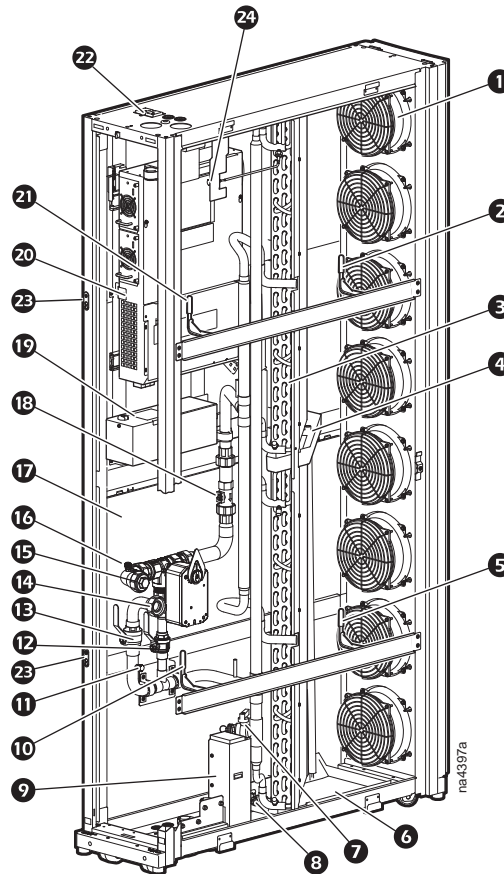
Item	Description
❶	Upper side panels
❷	Fans
❸	Display interface
❹	Lower side panels
❺	Front panel
❻	Rear panel
❼	Air filters
❽	Upper piping installation holes

External components—ACRC301H



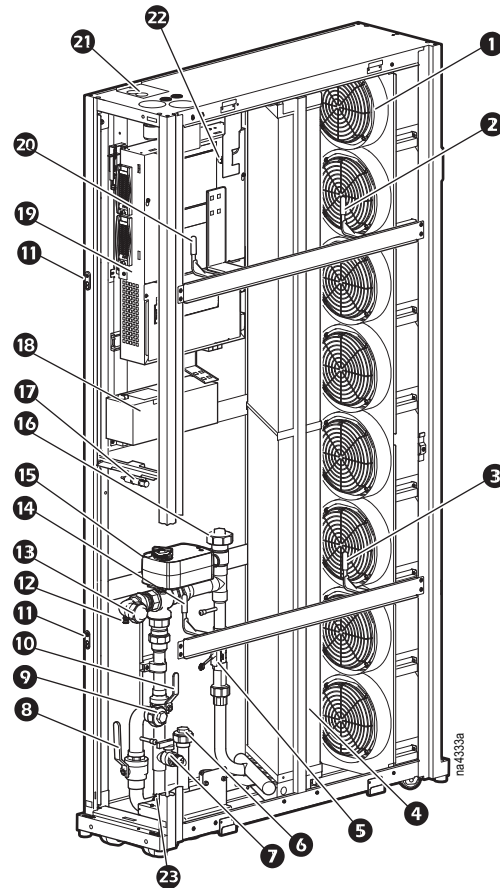
Item	Description
1	Upper side panels
2	Fans
3	Display interface
4	Lower side panels
5	Front panel
6	Rear panel
7	Air filters
8	Upper piping installation holes

Internal components—ACRC301S



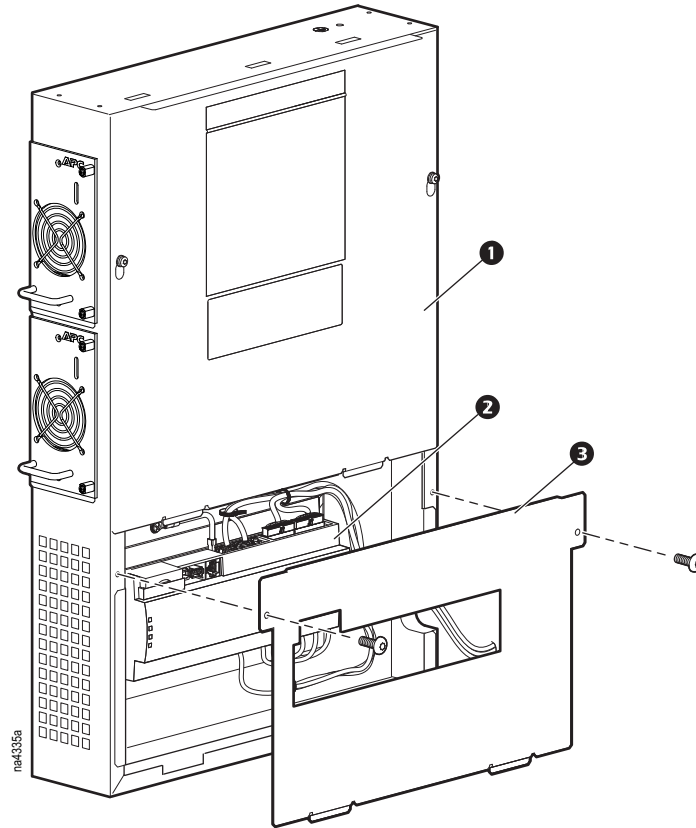
Item	Description	Item	Description
1	Fan	13	Inlet shutoff valve (1 in.)
2	Supply air temperature sensor, top	14	Pipe connection, water inlet
3	Coil	15	Pipe connection, water outlet
4	Condensate drain pan, top	16	Schrader valve (outlet water pressure test)
5	Supply air temperature sensor, bottom	17	3-way actuator valve
6	Condensate drain pan, bottom	18	Flow meter
7	Drain valve	19	Auto-transfer switch (ATS) box
8	Condensate drain pan float switch	20	Electrical box
9	Condensate pump	21	Return air temperature sensors
10	Return air temperature sensor, bottom	22	Power cord connections, top
11	Schrader valve (inlet water pressure test)	23	Rack joining brackets
12	2-way-(3/4-in.) bypass shut-off valve	24	Schrader valve (air purging)

Internal components—ACRC301H



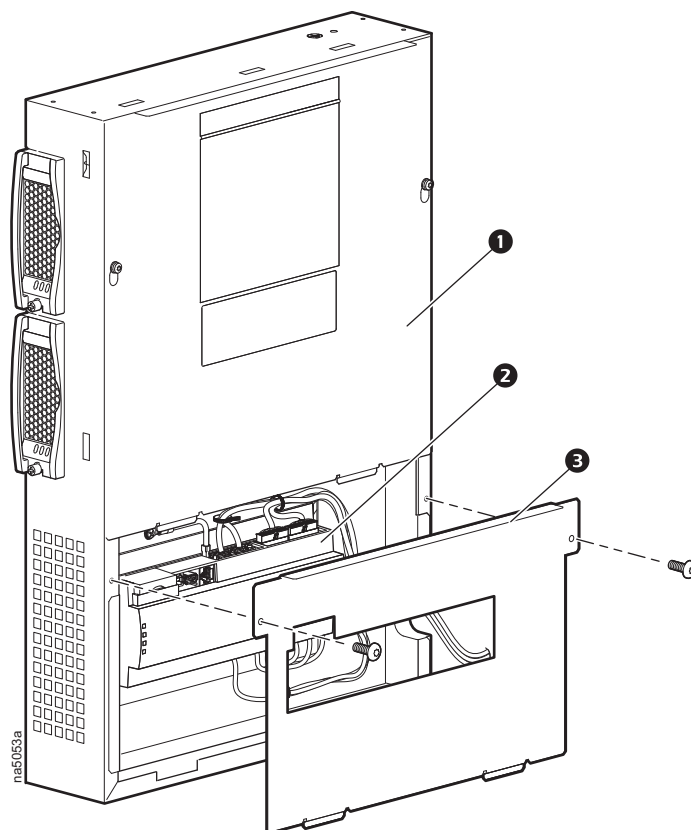
Item	Description	Item	Description
1	Fan	13	Pipe connection, water outlet
2	Supply air temperature sensor, top	14	Return air temperature sensor, bottom
3	Supply air temperature sensor, bottom	15	3-way valve actuator
4	Coil	16	Top pipe connection for optional recirculation pump
5	Flow meter	17	Humidity sensor
6	Bottom pipe connection for optional recirculation pump	18	Auto transfer switch (ATS) box
7	Drain valve	19	Electrical box
8	Inlet shutoff valve (1 1/4-in.)	20	Return air temperature sensor, top
9	Pipe connection, water inlet	21	Junction box, top position
10	2-way valve (1-in.) bypass shut-off	22	Schrader valve (air purging)
11	Rack joining brackets	23	Schrader valve (inlet water pressure test)
12	Schrader valve (outlet water pressure test)		

User interface connection panel—ACRC301S



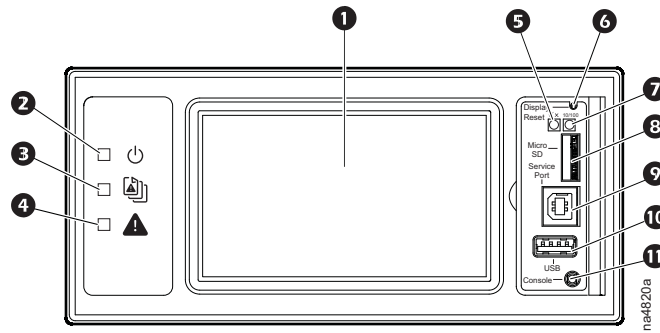
Item	Description
①	Upper electrical box cover
②	User interface connection panel
③	Control module cover

User interface connection panel—ACRC301H



Item	Description
①	Upper electrical box cover
②	User interface connection panel
③	Control module cover

Display interface



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

Location, Power, and Water Considerations

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.

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. Use the minimum required amount of fresh air for make up to comply with local and national codes and regulations. Fresh air imposes extreme load variation on the cooling equipment from summer to winter and causes increased operating costs.

The cooling unit is designed as a sensible cooling air conditioning unit for in-row use in data centers. The cooling unit does not have humidification or dehumidification control. Room humidity must be within acceptable operating conditions before starting the cooling unit. If operated in spaces where the humidity is in the unacceptable operating conditions section of the Operating Guidelines chart (see the *InRow RC Operation and Maintenance* manual), the cooling unit condenses excess water vapor from the air. For units that contain condensate pumps, this condition will exceed the pumps pumping capacity, causing the cooling unit to send an alarm and shut down to avoid overflowing the condensate pan. The condensate pump will run until the fluid level in the pan is reduced, and the alarm is automatically reset. The cooling unit self-regulates in this manner until normal operating conditions are present.

Incoming power supply requirements

See the name plate on the unit to determine the maximum possible current draw of the cooling unit. Provide either a single outlet circuit or a Power Distribution Unit (PDU) with sufficient capacity to handle all loads. Do not plug two InRow RC units into the same branch circuit or PDU.

The cooling unit must be grounded. Electrical service must conform to national and local electrical codes and regulations.

Chilled water temperature requirements

For ACRC301H units, the chilled water temperature needs to be higher than the dew point of the room. If the dew point is too high, an optional dew point control pump is available for installation in ACRC301H units. The InRow RC units are not designed for precision humidity control for the IT environment.

Model	Chilled Water Temperature Range
ACRC301S	5–15°C (41–59°F)
ACRC301H	10–22°C (50–72°F)

Cooling unit location

Refer to the floor layout drawing for the exact placement of the cooling unit in the row of IT equipment. This layout drawing can be found in the Configure To Order (CTO) report or the engineering specification drawings provided by the Consulting Engineer.

Due to potentially high noise levels during peak loads, the InRow RC is not intended to be used in an occupied office environment. It is recommended that ear protection be worn if prolonged exposure to the high noise level is expected.

Piping Diagrams

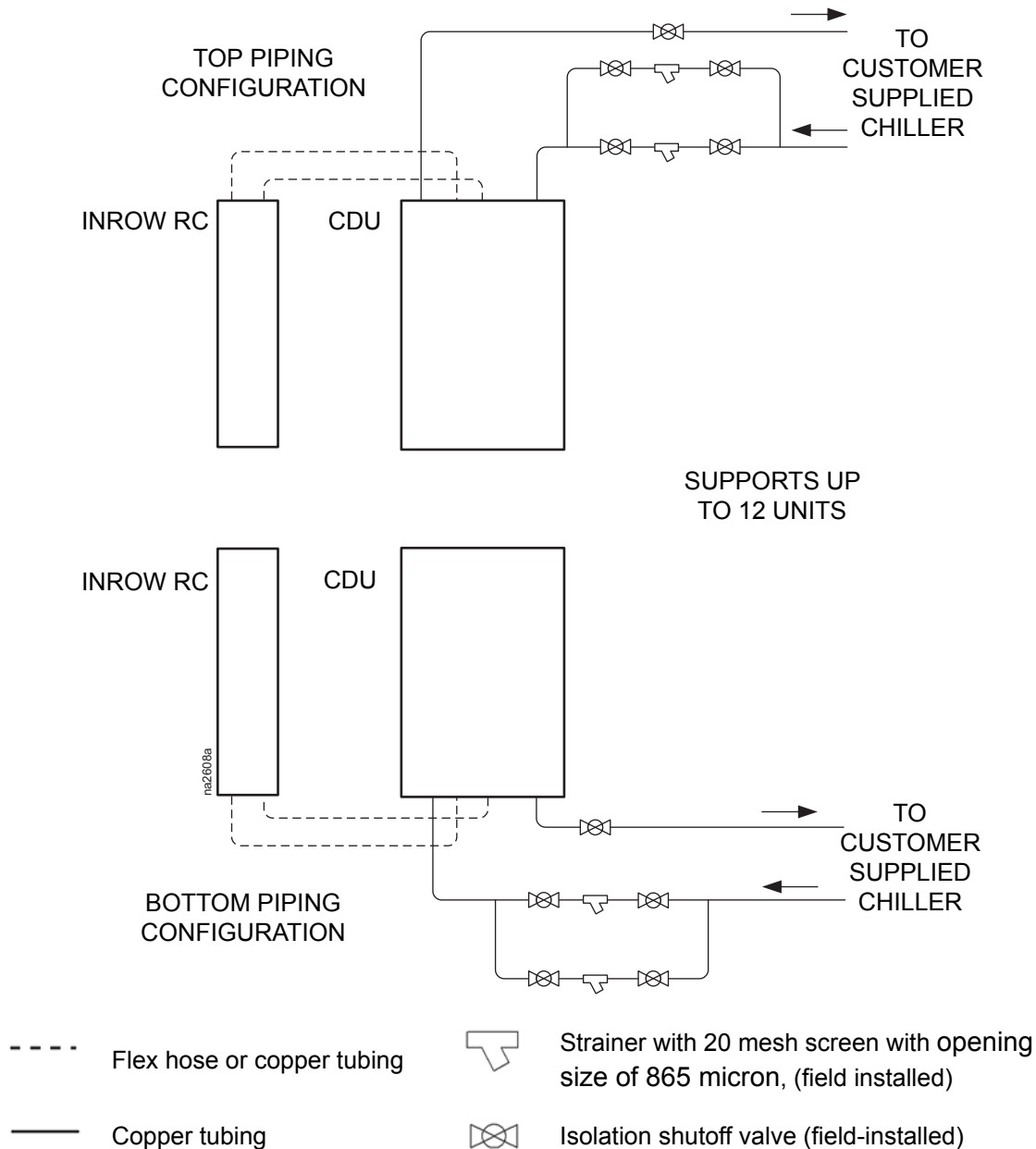
NOTE: Install isolation shutoff valves and particulate strainers in the supply line between the chiller and the CDU. If the system is to be set up as an isolated loop - a chiller and pipe layout, dedicated only to supplying InRow RC units and no other cooling unit - the strainer may be placed in the piping circuit before the pump.

NOTE: Thoroughly flush the system to remove all debris and process chemicals.

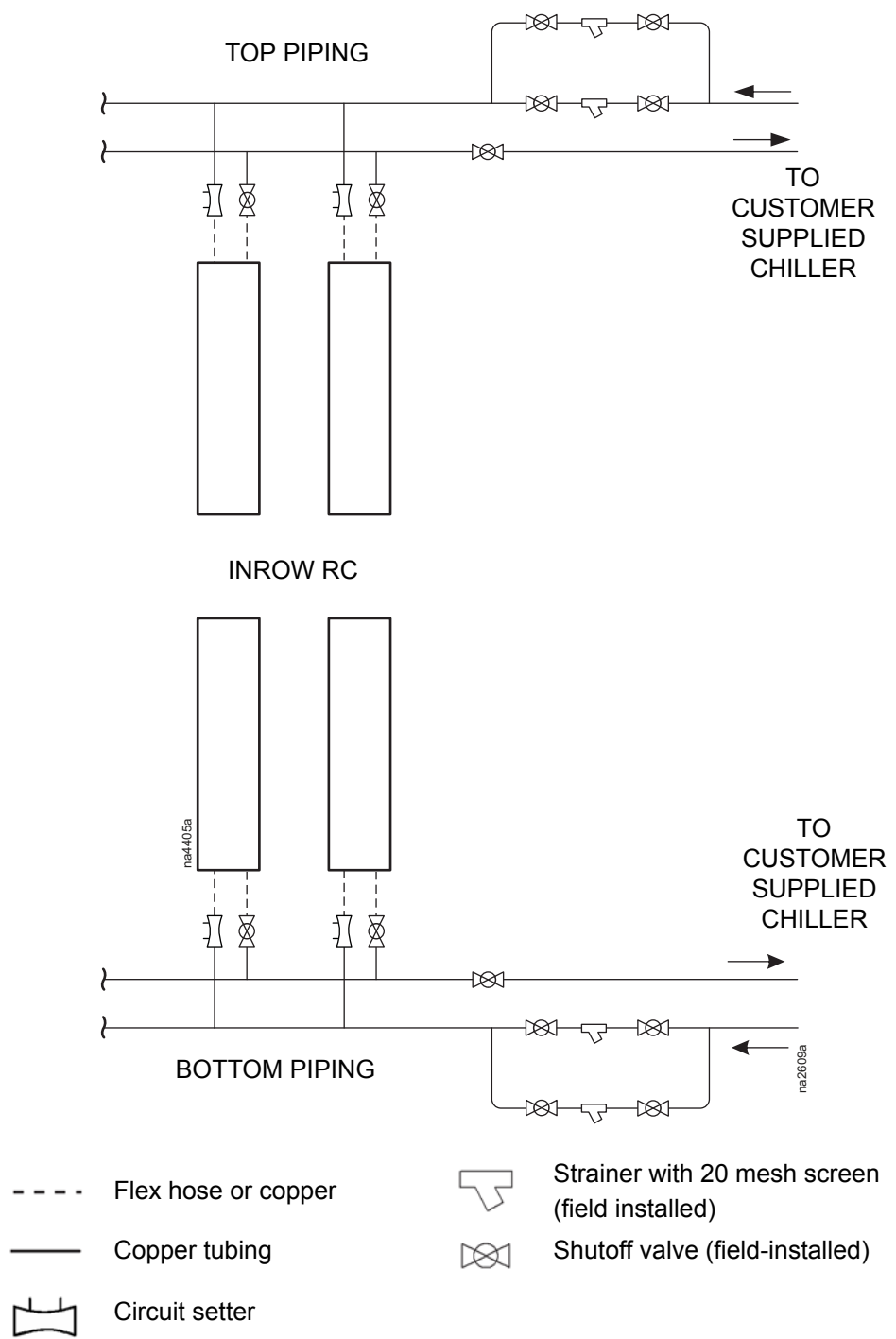
NOTE: Top or bottom entry can be chosen individually for each type of connection, i.e., power, condensate drain (ACRC301S), chilled-water supply, and chilled-water return. Top piping configurations have the same valves and strainers as bottom piping configurations.

With Cooling Distribution Unit (CDU)

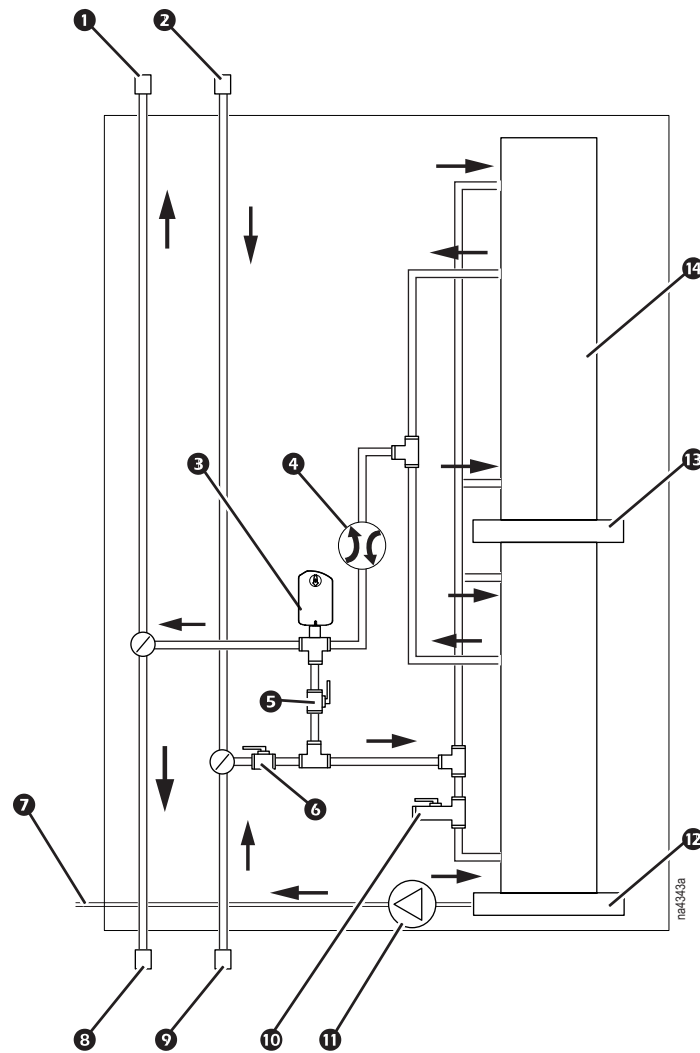
A CDU is only used with ACRC301S units.



Without CDU

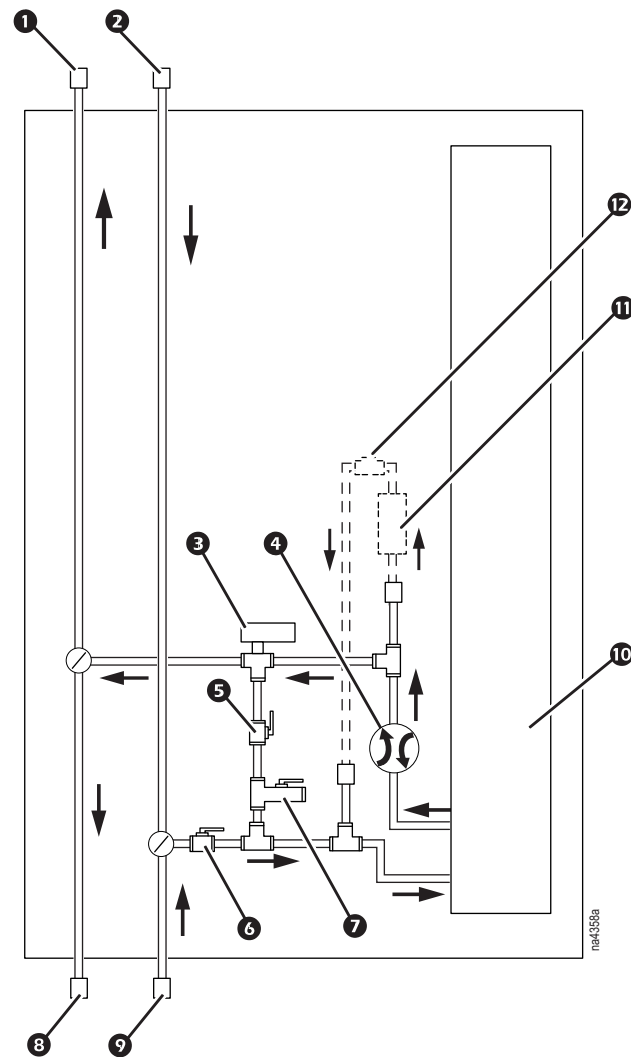


Internal piping diagram—ACRC301S



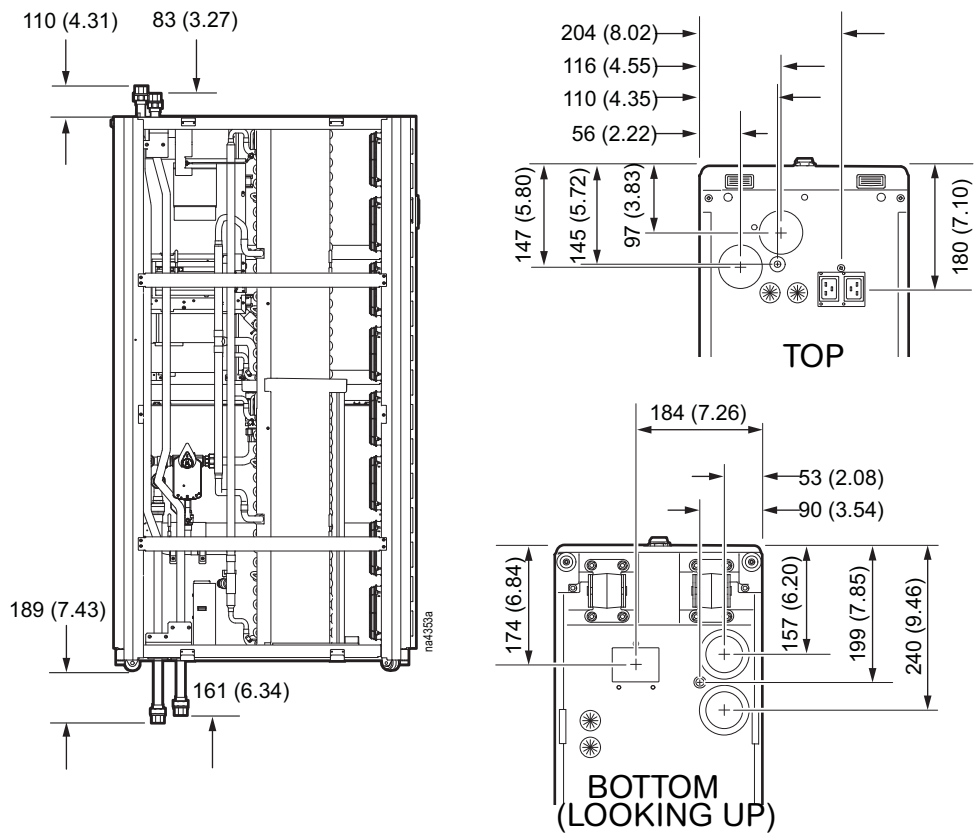
Item	Description	Item	Description
1	Outlet water union (top piping option)	8	Outlet water union (bottom piping option)
2	Inlet water union (top piping option)	9	Inlet water union (bottom piping option)
3	3-way actuator control valve—1 1/4 in.	10	Drain valve
4	Flow meter	11	Condensate pump
5	Bypass shutoff ball valve—3/4 in.	12	Bottom condensate pan
6	Inlet shutoff valve—1 in.	13	Top condensate pan
7	Condensate drain	14	Coil

Internal piping diagram—ACRC301H

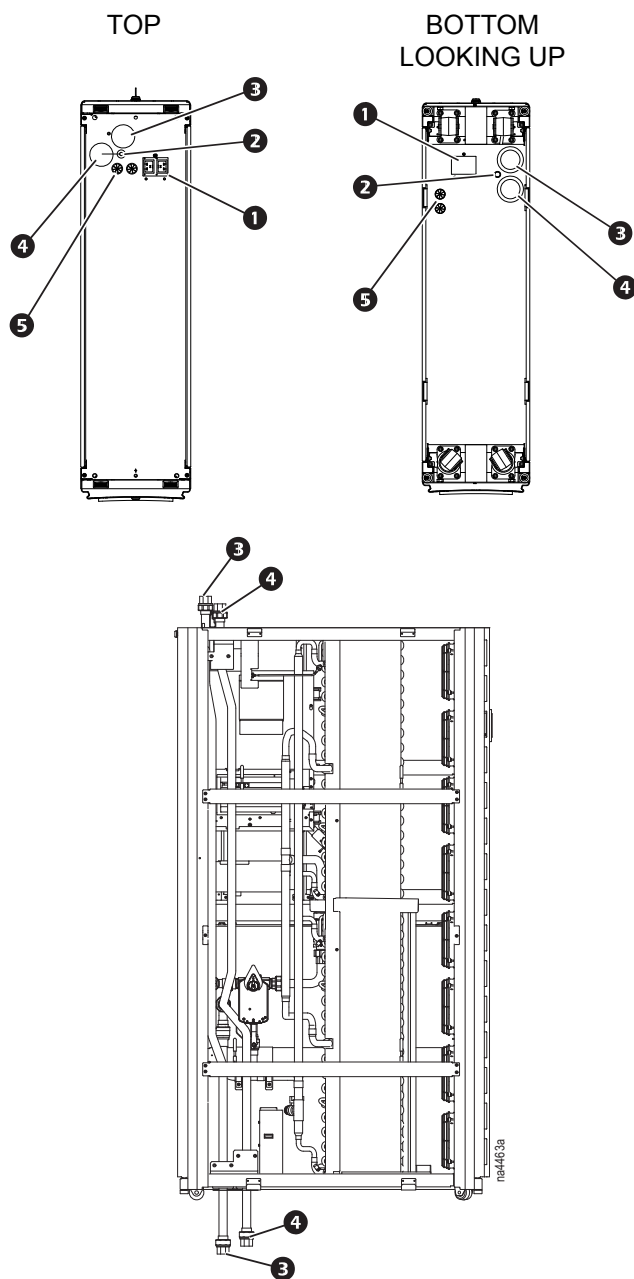


Item	Description	Item	Description
1	Outlet water union (top piping option)	8	Outlet water union (bottom piping option)
2	Inlet water union (top piping option)	9	Inlet water union (bottom piping option)
3	3-way actuator control valve—1 1/4 in.	10	Coil
4	Flow meter	11	Circulation pump (optional)
5	Bypass shutoff valve—1 in.	12	Circulation pump check valve (optional)
6	Inlet shutoff valve—1 1/4 in.		
7	Drain valve		

Piping and electrical access locations—ACRC301S

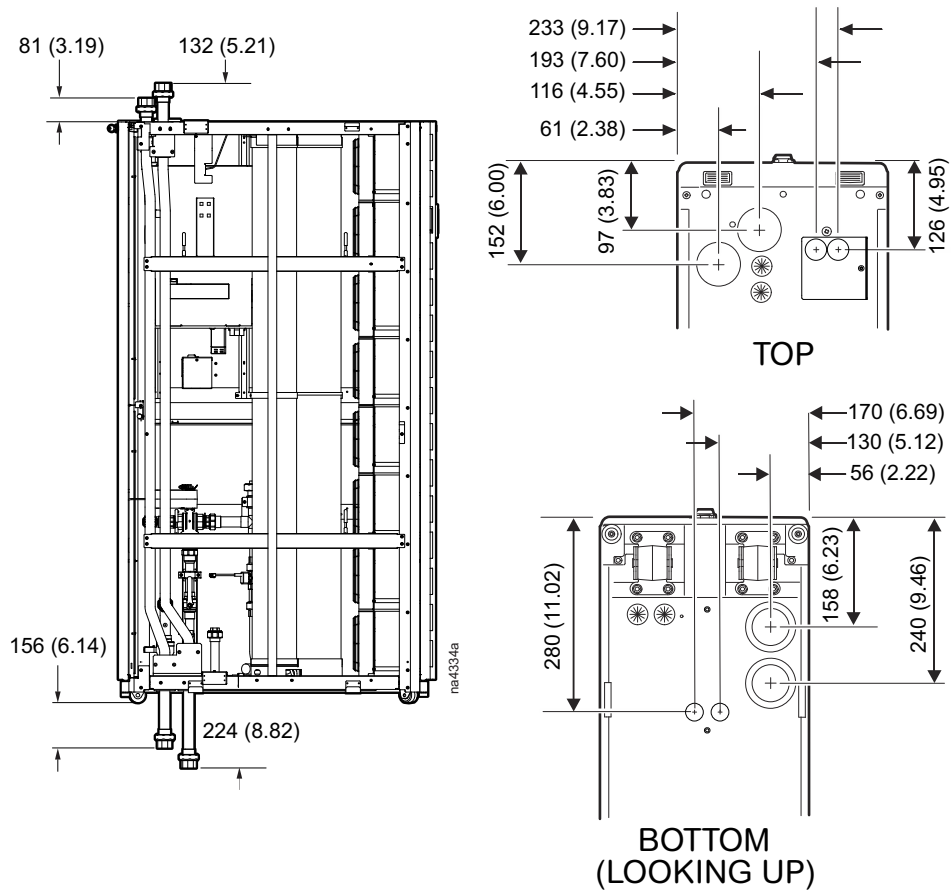


* Dimensions are shown in mm (in.).

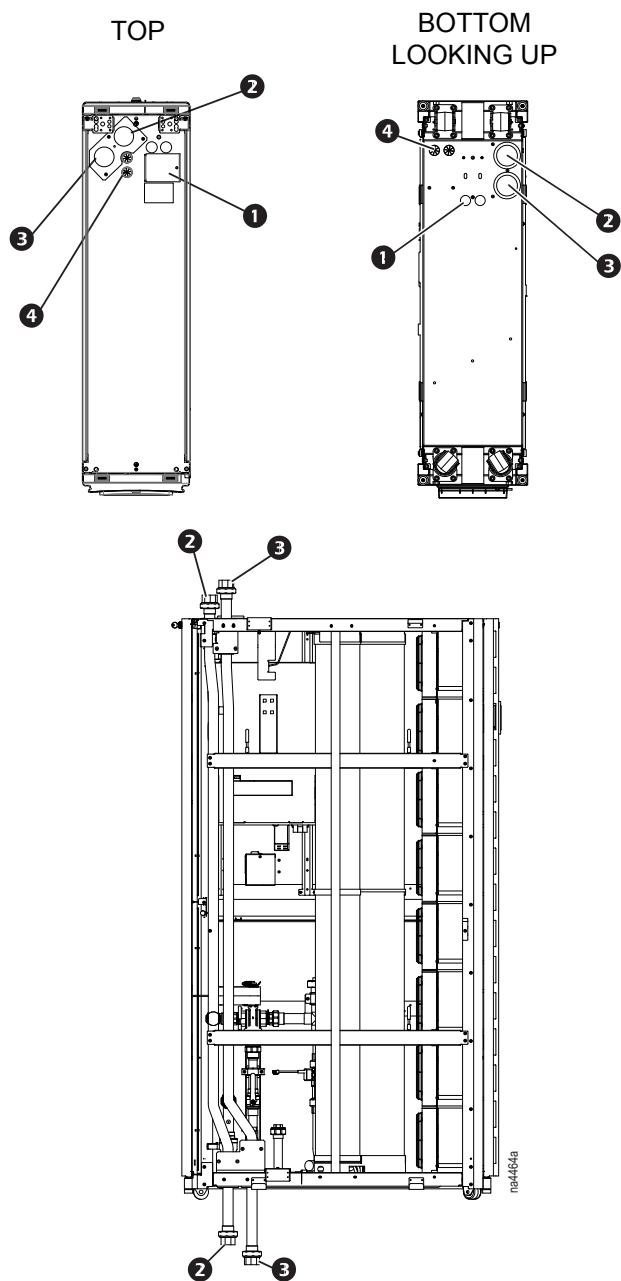


Item	Description
1	Power connections
2	Condensate line—0.25 in. ID/0.38 in. OD
3	1-in. NPT female return pipe (outlet)
4	1-in. NPT female supply pipe (inlet)
5	Low voltage input wiring.

Piping and electrical access locations—ACRC301H



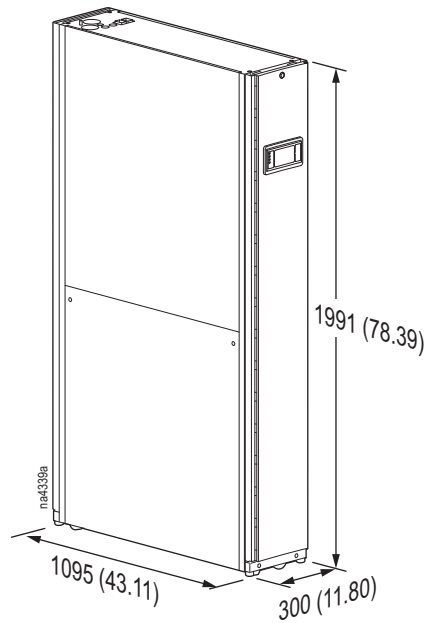
* Dimensions are shown in mm (in).



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

- | | |
|---|---|
| 1 | Power connections |
| 2 | 1 1/4-in. NPT female return pipe (outlet) |
| 3 | 1 1/4-in. NPT female supply pipe (inlet) |
| 4 | Low voltage input wiring |

Weights and dimensions



Net weight (cooling unit only)

ACRC301S = 184 kg (406 lb)

ACRC301H = 210 kg (463 lb)

Operating weight (cooling unit only)

ACRC301S = 192 kg (423 lb)

ACRC301H = 220 kg (485 lb)

* Dimensions are shown in mm (in.).

Installation

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying this equipment before working on the equipment. All electrical work must be performed by qualified personnel. Practice Lockout/Tagout procedures. Do not wear jewelry when working with electrical equipment.

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

⚠ WARNING

MOVING PARTS HAZARD

- Do not open doors and panels if the equipment is operating

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

⚠ 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.

⚠ WARNING

TIP HAZARD

- Use two or more people at all times to move or turn this equipment.
- Always push, pull, or turn while facing the front and rear of this equipment - never push, pull, or turn while facing the sides of the equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower leveling feet to the floor when this equipment is stationary.
- Lower the leveling feet and attach joining brackets to adjacent racks when the equipment is in its final location.

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

⚠ CAUTION

UNPROTECTED PARTS

Be careful when placing doors when removed from the equipment. Spring latches are easily damaged.

Failure to follow these instructions can result in equipment damage.

IMPORTANT: Before proceeding with the installation of the cooling unit, install the optional pump kit (ACRC301H) or upper piping kits. These optional items must be installed before placing the unit in-row.

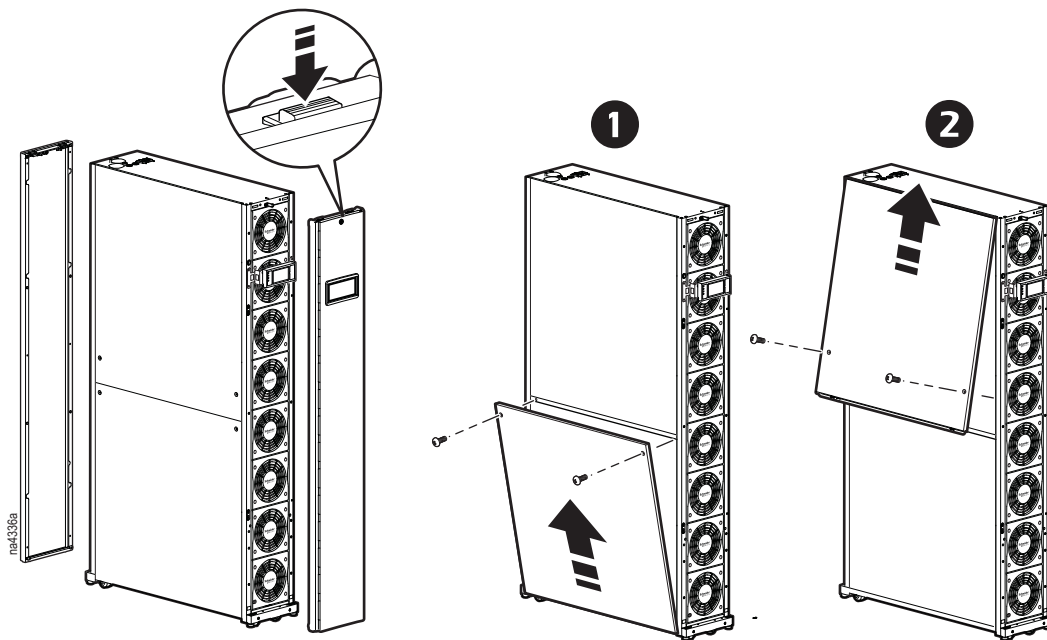
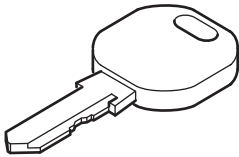


Refer to the documentation that is supplied with other equipment for instructions on how to install that equipment.

IMPORTANT: Ensure the unit is stable before installing any optional kits. When installing upper piping kits, make sure the electrical box wiring remains as is and do not hit the air temperature sensors with the piping.

How to Remove Cover Panels

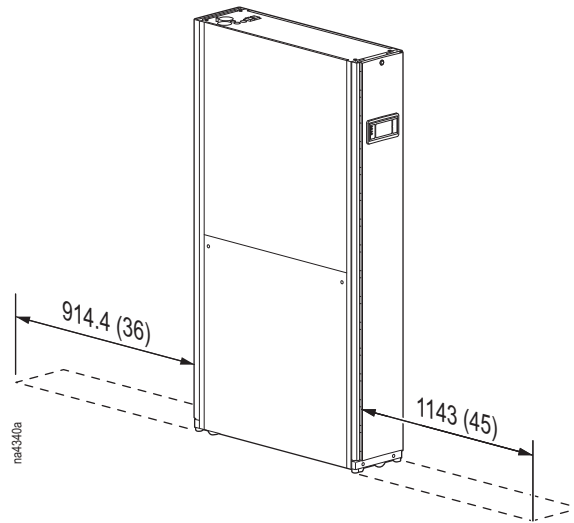
The front and rear panels must first be unlocked before they can be removed. Two keys are provided with the unit.



Positioning the Cooling Unit

Service access

An area of 1143 mm (45 in.) of clear floor space in front and 914.4 mm (36 in.) in the rear of the cooling units are required for service.



* Dimensions are shown in mm (in).

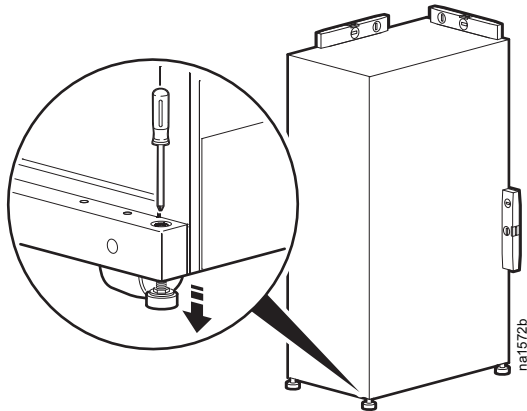
Leveling

The leveling feet provide a stable base if the floor is uneven but cannot compensate for a badly sloped surface.

Once the cooling unit is in its intended location, use a screwdriver to turn each leveling foot until it makes contact with the floor. Adjust each foot until the cooling unit is level and plumb.

The casters and leveling feet can be removed to allow the cooling unit to rest directly on the floor.

NOTE: Front and rear panels will need to be removed to access the leveling screw.



Stabilizing the Cooling Unit

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying this equipment before working on the equipment. All electrical work must be performed by qualified personnel. Practice Lockout/Tagout procedures. Do not wear jewelry when working with electrical equipment.

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

WARNING

TIP HAZARD

- Use two or more people at all times to move or turn this equipment.
- Always push, pull, or turn while facing the front and rear of this equipment - never push, pull, or turn while facing the sides of the equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower leveling feet to the floor when this equipment is stationary.
- Lower the leveling feet and attach joining brackets to adjacent racks when the equipment is in its final location.

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

Bolt-down kit

To prevent the cooling unit from moving (if it is not joined with an enclosure), use the included bolt-down kit (AR7701). Follow the installation instructions included with the kit.

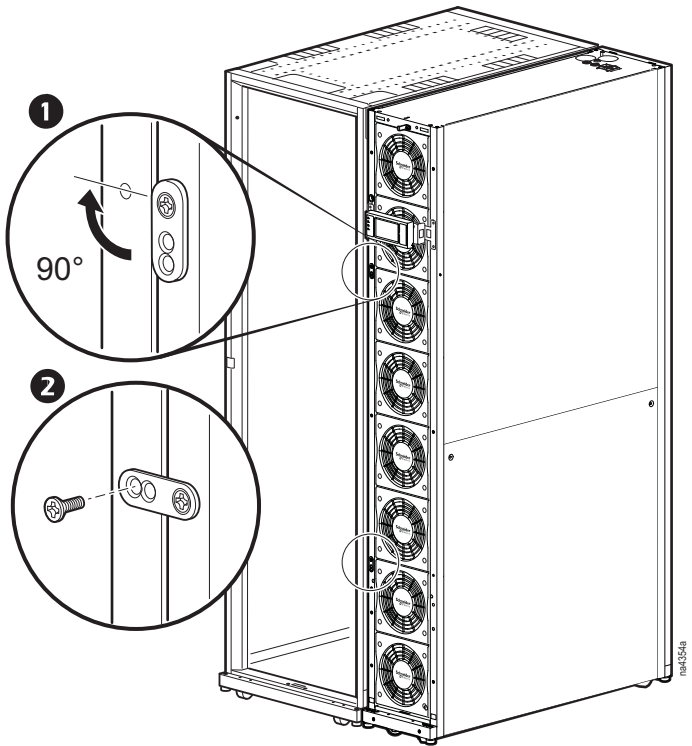
Joining the InRow RC to a NetShelter™ enclosure

For NetShelter SX enclosures:

Joining brackets are installed on the unit, two in the front and two on the rear. Each bracket is designed to accommodate both 24-in. or 600-mm enclosure spacing.

To install a joining bracket:

1. Loosen the attachment screw.
2. Rotate the brackets 90°.
3. Install a provided Phillips screw (M5 screw) through the bracket and into the adjoining enclosure.
4. Re-tighten the attachment screw.



Mechanical Connections

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying this equipment before working on the equipment. All electrical work must be performed by licensed electricians. Practice Lockout/Tagout procedures. Do not wear jewelry when working with electrical equipment.

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

WARNING

TIP HAZARD

- Use two or more people at all times to move or turn this equipment.
- Always push, pull, or turn while facing the front and rear of this equipment - never push, pull, or turn while facing the sides of the equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower leveling feet to the floor when this equipment is stationary.
- Lower the leveling feet and attach joining brackets to adjacent racks when the equipment is in its final location.

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

Piping

Ensure that coolant water quality complies with local water quality standards or at least with the guidelines below.

Cooling Water Quality Guidelines for APC Cooling Units

1 ppm = 1 mg/kg = 1 mg/l, CFU - colony forming unit

Water Characteristics	Range	Water Characteristics	Range
Alkalinity (HCO_3^-)	70 – 300 ppm	Hardness as CaCO_3	30 – 200 ppm
Hydrogen Carbonate		Hydrogen Sulfide (H_2S)	< 0.05 ppm
Alkalinity / Sulfate: $\text{HCO}_3^- / \text{SO}_4^{2-}$	>1.0	Iron (Fe)	< 0.2 ppm
Aluminum (Al)	< 0.2 ppm	Magnesium (Mg)	< 50 ppm
Ammonia (NH_3)	< 2 ppm	Manganese (Mn)	< 0.1 ppm
Ammonium (NH_4)	< 2 ppm	Molybdenates (MoO_4^{2-})	< 30 ppm
Bacteria: aerobic	< 1000 CFU/ml	Nitrate (NO_3)	< 100 ppm
anaerobic	< 1000 CFU/ml	Oil and grease	< 1 ppm
heterotrophic colony count	< 100,000 CFU/ml	Oxygen	< 0.02 ppm
legionella species	< 10 CFU/ml	Particles: size	< 25 microns
sulfate reducing	< 10 CFU/ml	weight	< 10 ppm
pseudomonas	< 10 CFU/100 ml	pH: Acid-Alkaline balance	7 – 9
Calcium (Ca)	< 50 ppm	Phosphate (PO_4^{3-})	< 10 ppm
Carbon Dioxide (CO_2): free	< 5 ppm	Potassium (K)	< 10 ppm
(aggressive)		Sodium (Na)	< 10 ppm
Carbon acid, free	< 20 ppm	Softness: $[\text{Ca}^{2+}, \text{Mg}^{2+}]/[\text{HCO}_3^-]$	> 0.5
Chloride (Cl^-)	< 300 ppm	Silica (SiO_2) Silicon Dioxide	< 50 ppm
Chlorine, free (CL_2)	< 1 ppm	Sulfate (SO_4^{2-})	< 50 ppm
Copper (Cu)	< 1.0 ppm	Sulfide (S^{2-})	0 ppm
Electrical conductivity	50 – 500 $\mu\text{S/cm}$		

Water

Install shutoff valves for routine service and emergency isolation of the cooling unit. When a CDU is not used, it is recommended that you install circuit setters to regulate the chilled water flow for each InRow RC air conditioner. Refer to the piping diagram in this document.

Layout and Piping Considerations

Fluid pipes are not allowed directly above electrical cooling units and must be kept separate from any electrical runs or wiring. All fluid piping must be installed above the aisles as shown in the diagram below. If any piping makes a turn, or must be routed over electrical equipment, there must be a drip tray under the pipe that will protect the equipment from condensation and leaks.

Insulation

Insulate water lines to protect personnel, protect components from condensate, and to minimize condensation.



See “Insulation” on page 40 for insulation locations.

Supply and Return Piping

NOTE: This section covers a bottom piping configuration only. The ACRC301S model is shown in the illustrations; the process will be the same for ACRC301H units.

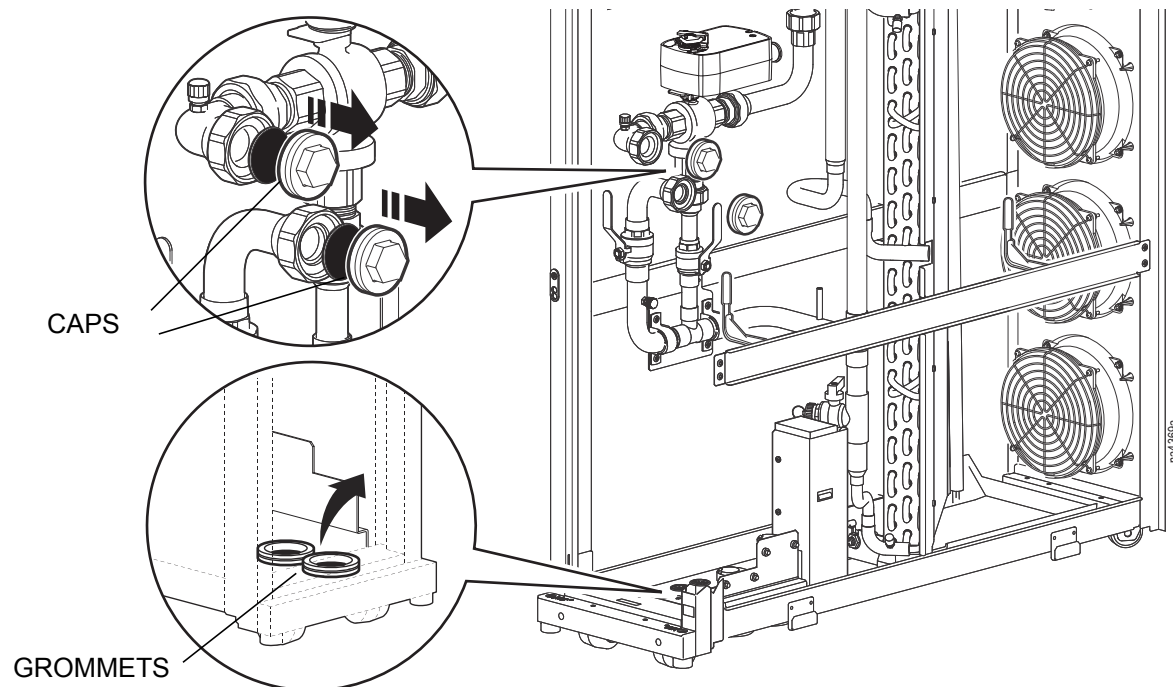


IMPORTANT: Before installing pipes, use the Schrader valves to discharge gas from the unit. For Schrader valve locations, see “Internal components—ACRC301S” on page 14 or “Internal components—ACRC301H” on page 15.



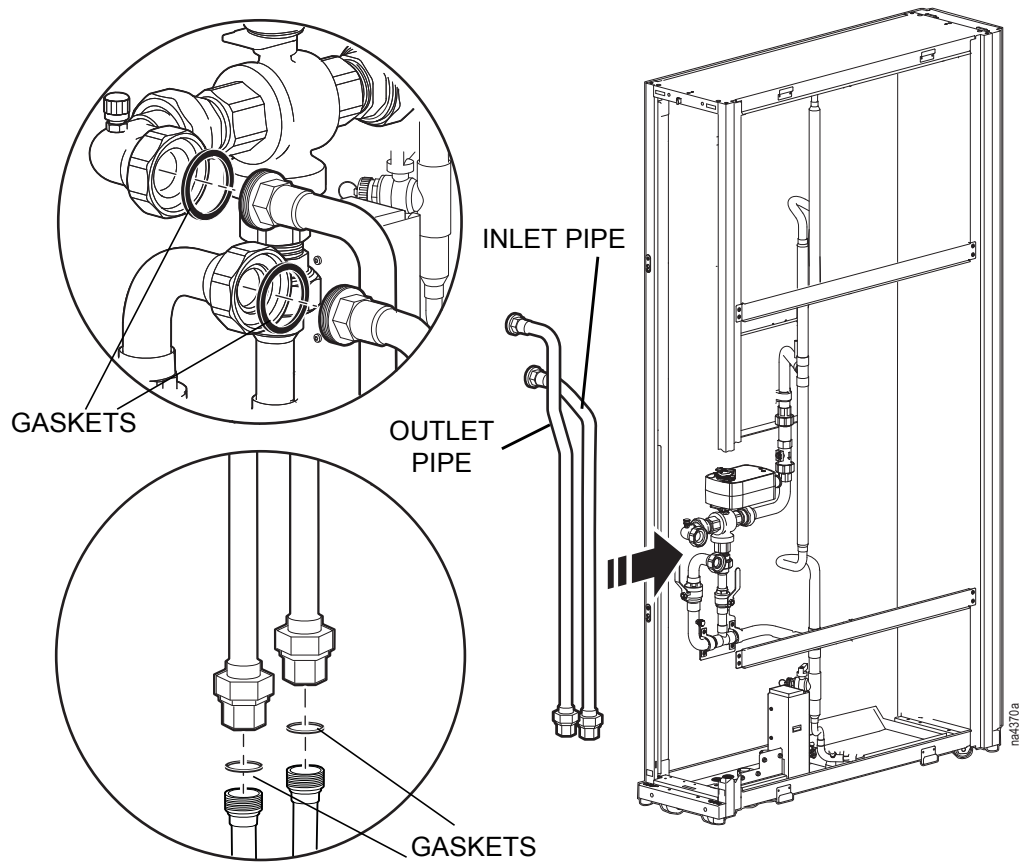
For upper piping configurations, refer to the instructions that come with the upper piping kit.

1. Remove the pipe connection caps and grommets from the bottom pipe connections.

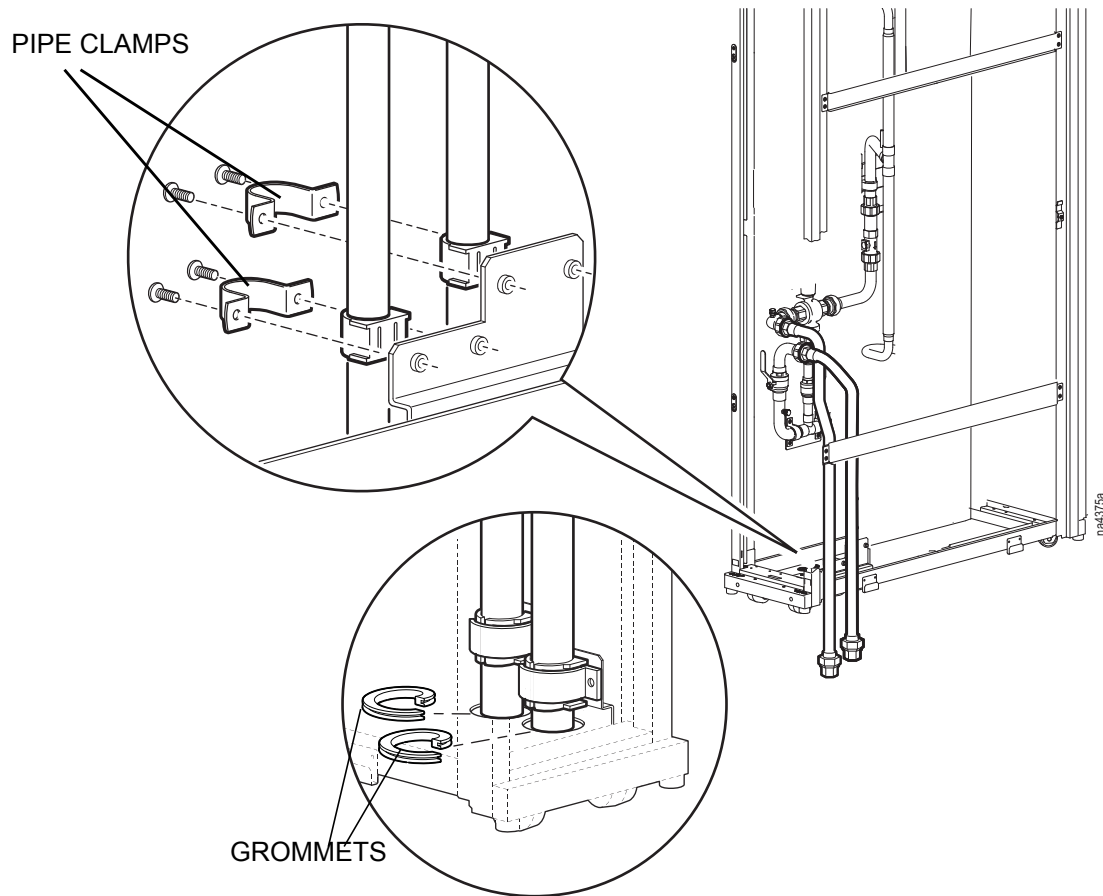


2. Place the lower piping insulation on the pipes.

3. Install the provided pipe gaskets and piping. Tighten connections to 40 N*m (29 ft/lbs).
NOTE: Install the inlet pipe first..



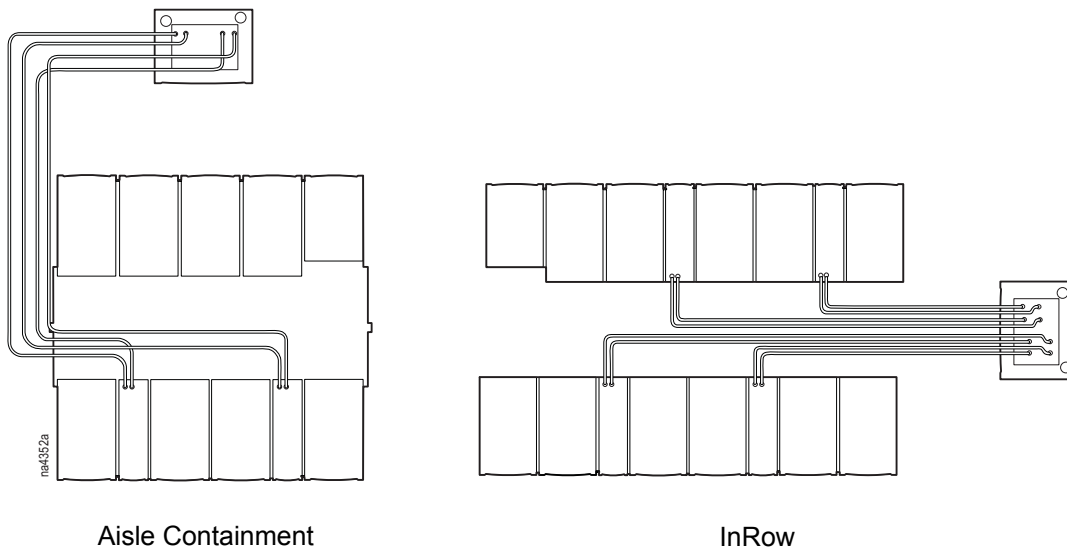
4. Install lower pipe clamps and re-install the grommets around the pipes.



5. Install the insulation around the pipe clamps.

Main Water Connections

Top piping system diagram



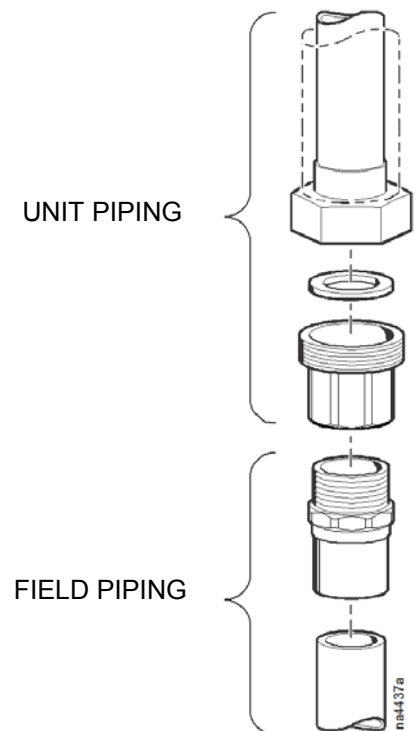
1. Route all piping to the cooling unit. Be sure to follow all local and national codes.

NOTE: Circuit setters are recommended to regulate the flow of chilled water to each cooling unit. When a CDU is used in conjunction with the cooling unit, circuit setters are not required as the CDU provides the flow-regulating function.

NOTE: The figure shows field piping installation with a field-supplied PEX fitting. Rigid pipe fittings are handled similarly.

2. Make the connection on the entering and exiting water lines:
 - Use thread sealant and thread sealing tape in accordance with local and national codes.
 - Use two properly-sized open end wrenches to tighten the connections.

BOTTOM PIPING SHOWN

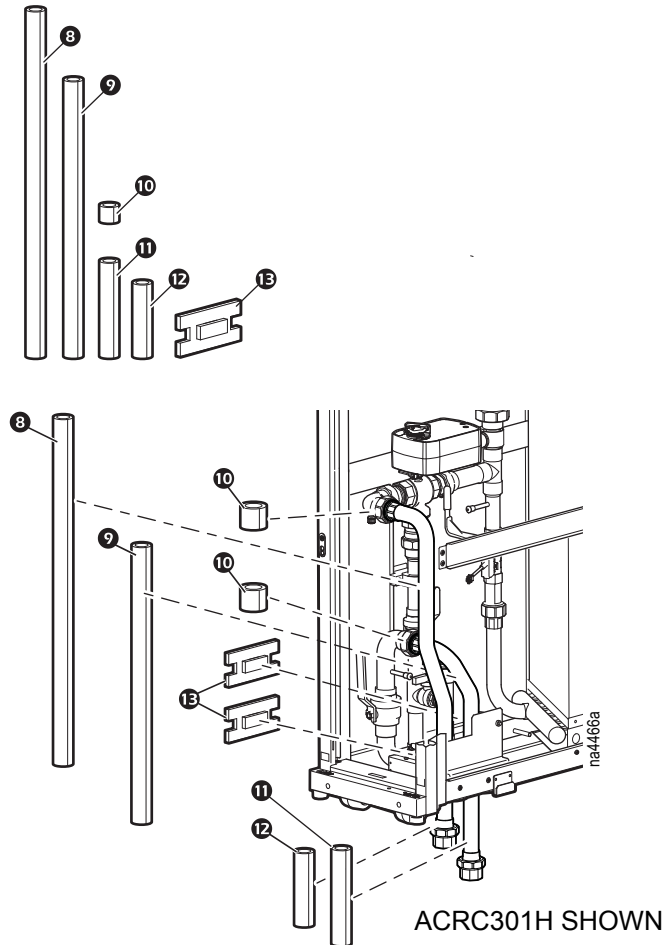


Insulation

Use only approved insulation (closed cell elastomeric insulation with sealing seams). Insulation should be 9.52 mm (3/8 in.) wall thickness. All horizontal insulation sections must be installed with seams facing up. Each section of insulation must be glued to the adjacent section. Any insulation sections that must be fitted around piping support clamps (other than supplied clamps) must be glued together to prevent condensation.



See “Package contents—ACRC301S” on page 10 and “Package contents—ACRC301H” on page 11 for locations of insulation pieces.



Condensate pump and drain line—ACRC301S

The condensate pump is factory-wired, piped internally to the lower condensate pan, and is capable of moving liquid a maximum of 15.2 m (50 ft), including a maximum lift of 4.9 m (16 ft).

NOTE: Sufficient drain line is supplied to route the drain to the outside of the cooling unit. To route the drain line to a remote drain, an additional drain line may need to be provided.

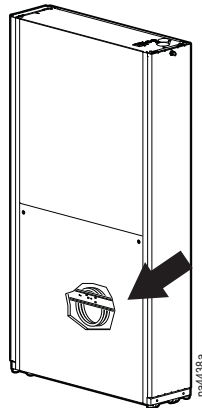
An on-board condensate high-level float switch is wired into the InRow RC controller for local and remote alarm capabilities.

⚠ CAUTION
CONDENSATE DAMAGE <ul style="list-style-type: none">• Do not exceed the lift or the run length of the drain system.• To prevent equipment damage from condensate, do not leave the condensate drain line coiled inside the cooling unit. Route the condensate drain line out the top or bottom of the cooling unit before operation. Failure to follow these instructions can result in equipment damage.

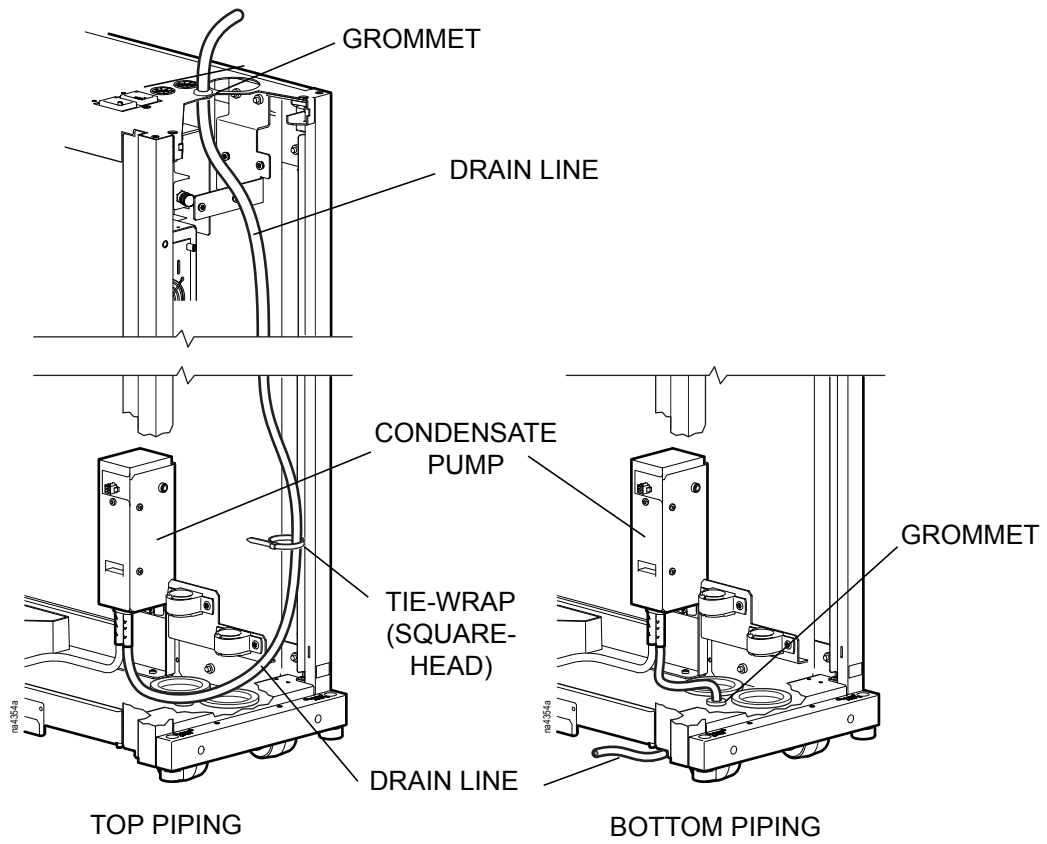
NOTE: Comply with all local codes when installing the condensate drain line to the proper drain system.

To route the pump drain line:

1. Remove the drain line from the side of the unit.



2. Route the drain line through the top or bottom of the unit. Use the provided rubber grommets.
3. Secure the drain line with tie wraps.



Additional Equipment

Chiller

There are three types of chillers to which the cooling unit can be connected:

- APC size-matched chiller/thermal storage system
- Building chilled-water system
- Existing dedicated chiller



See the chiller documentation: (installation, operation, and maintenance manuals) for proper installation procedures.

CDU



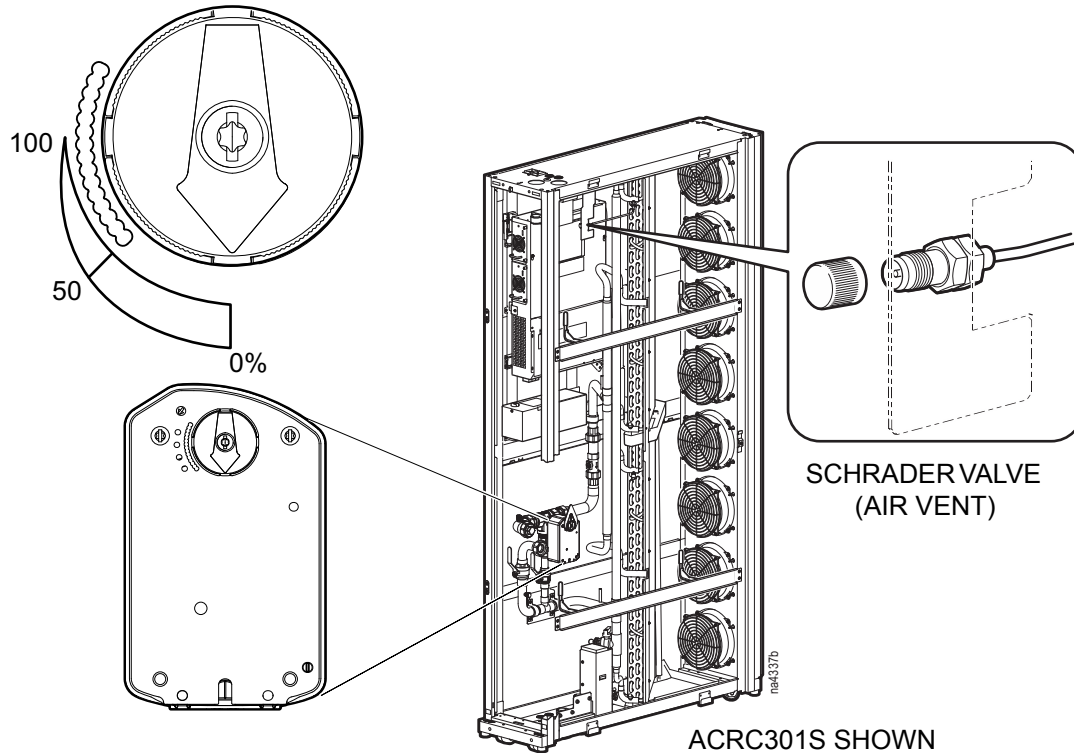
See the CDU *Installation Manual* for proper installation procedures.

Filling and Purging

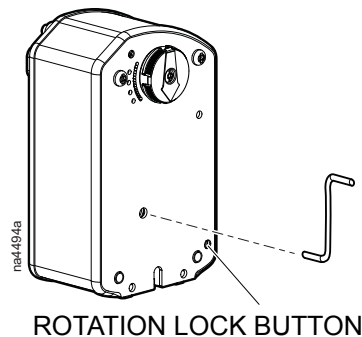
When the installation of the piping is complete, begin the filling process.

1. Open all isolation valves and allow water to flow through the cooling unit.
2. In ACRC301S and ACRC301H units, manually rotate the chilled water control valve stem to the fully open position.

NOTE: To manually reposition a spring-return actuator from a locked position, turn the crank 1/8 of a turn to the right, then remove the crank to release.



- a. Insert the attached crank into the hole located on the front of the actuator.



- b. Rotate the crank in the direction indicated on the label until the valve is in the required position.
 - c. Hold the crank in place and, using a Phillips screwdriver, turn the rotation lock button in the direction indicated on the label.
 - d. Hold the screwdriver in place, remove the crank, then remove the screwdriver.
3. Open the cap of the Schrader valve and slightly press the needle.
 4. Close the cap of the Schrader valve when water begins flowing out of the vent.

At the water supply:

1. Open all valves (no greater than 108 l/m [28.5 gpm] for ACRC301S units and 144 l/m [38 gpm] for ACRC301H units), allowing the water supply to reach the highest possible flow to the cooling unit for 45 seconds.
2. Close the valves to a 3.8–11.4 l/m (1–3 gpm) flow for 60 seconds.
3. Open the valves to maximum flow for another 45 seconds.
4. Balance the system to provide the designed flow rate to all cooling units.

Electrical Connections

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying this equipment before working on the equipment. All electrical work must be performed by qualified personnel. Practice Lockout/Tagout procedures. Do not wear jewelry when working with electrical equipment.

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

⚠ ⚠ 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.

The following electrical connections are required in the field:

- Primary and secondary feeds
- A-Link
- Network Management
- Rack inlet temperature sensor
- Communication (building management system)



See the electrical schematic (located on the lid of the electrical box) for all electrical connections.



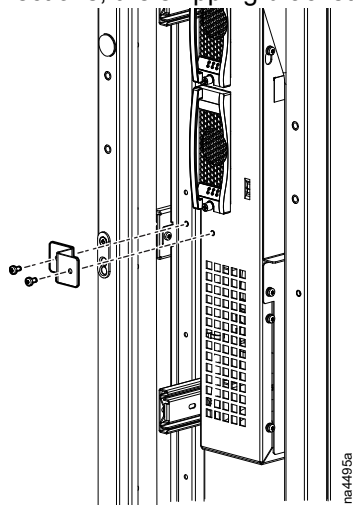
See the InRow RC name plate for voltage and current requirements.

A power disconnect is required to isolate each InRow RC unit for maintenance and service.

All low-voltage connections, including data and control connections, must be made with properly insulated wires. The low-voltage connections must have 300-V minimum insulation.

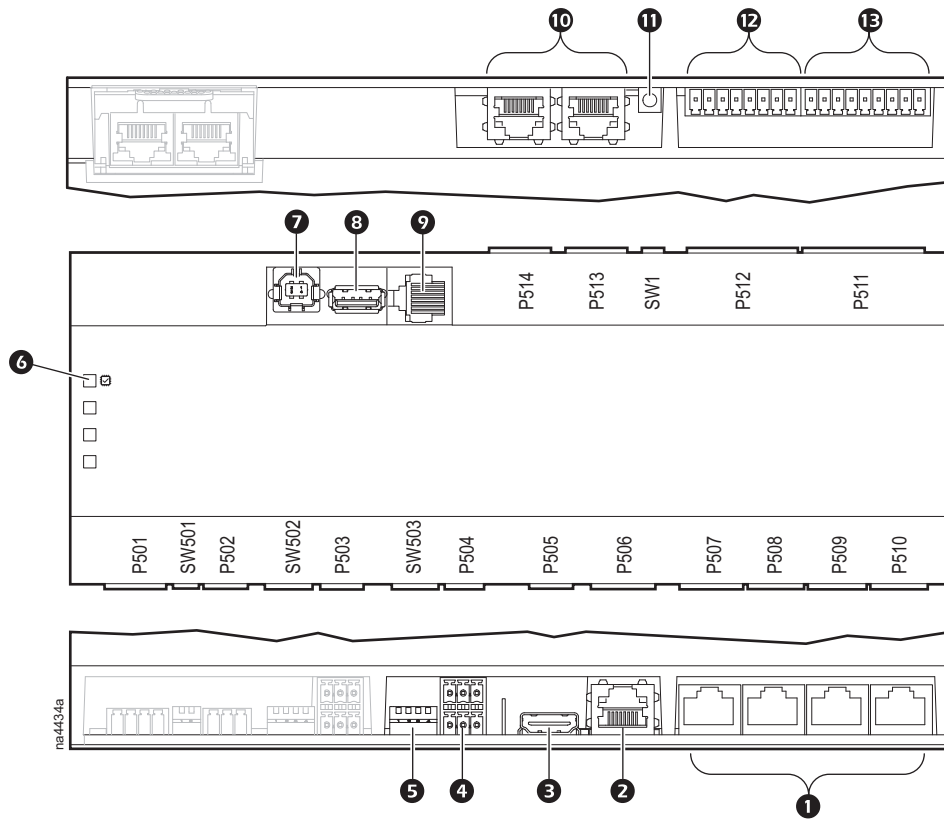
NOTE: Single phase service is required. Electrical service must conform to national and local electrical codes. The InRow RC unit is grounded through the power cord.

Before making any electrical connections, the shipping bracket must be removed from the electrical box.



Communication Connections

Interface connection



Item	Description	Item	Description
①	Universal sensor ports	⑧	USB host port
②	Network connection	⑨	Serial port
③	Touchscreen display connection	⑩	A-Link port
④	ModBus connection	⑪	Reset button
⑤	ModBus configuration switches	⑫	Output relay 4/standby input
⑥	Processor status LED	⑬	Output relay 1–3
⑦	USB device port		

A-Link ports

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

The A-Link bus connection allows a maximum group of twelve InRow ACRC units (ACRC301H or ACRC301S) to communicate with one another.

To enable the InRow RC ACRC301x 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 each unit.

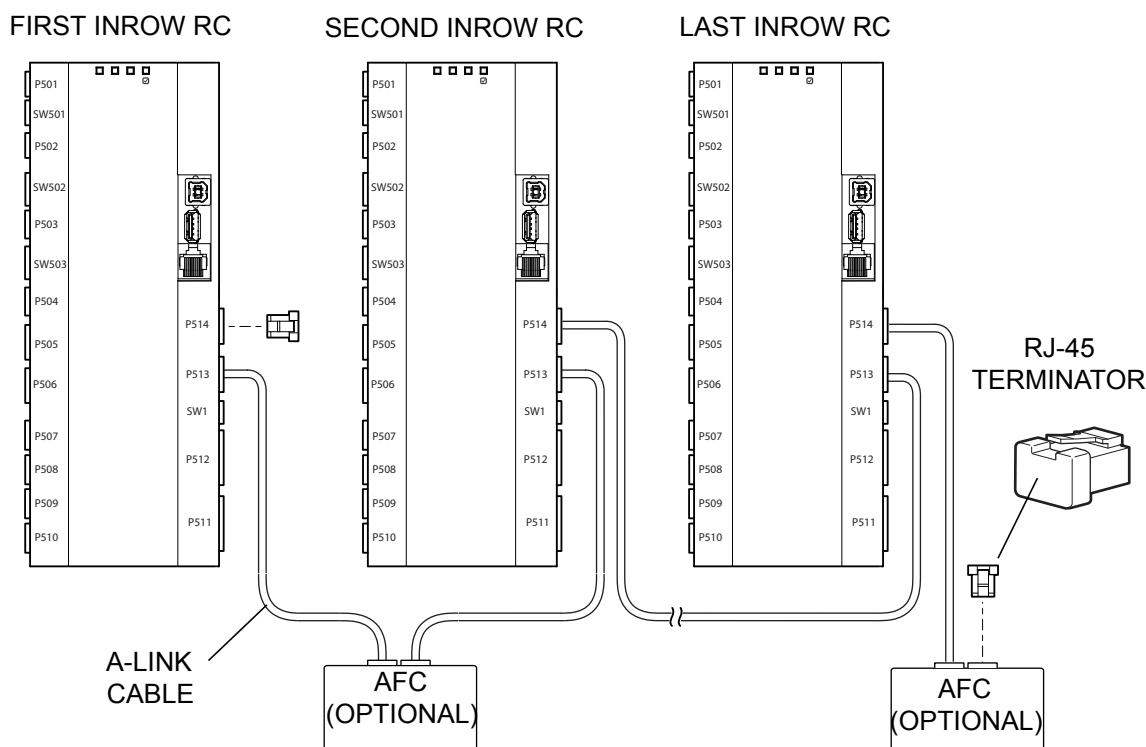
NOTE: The maximum wire length for the entire group must not exceed 305 m (1,000 ft).

Active Flow Controllers (AFC): If AFC units are installed in the row, they are connected to the A-Link bus as shown.

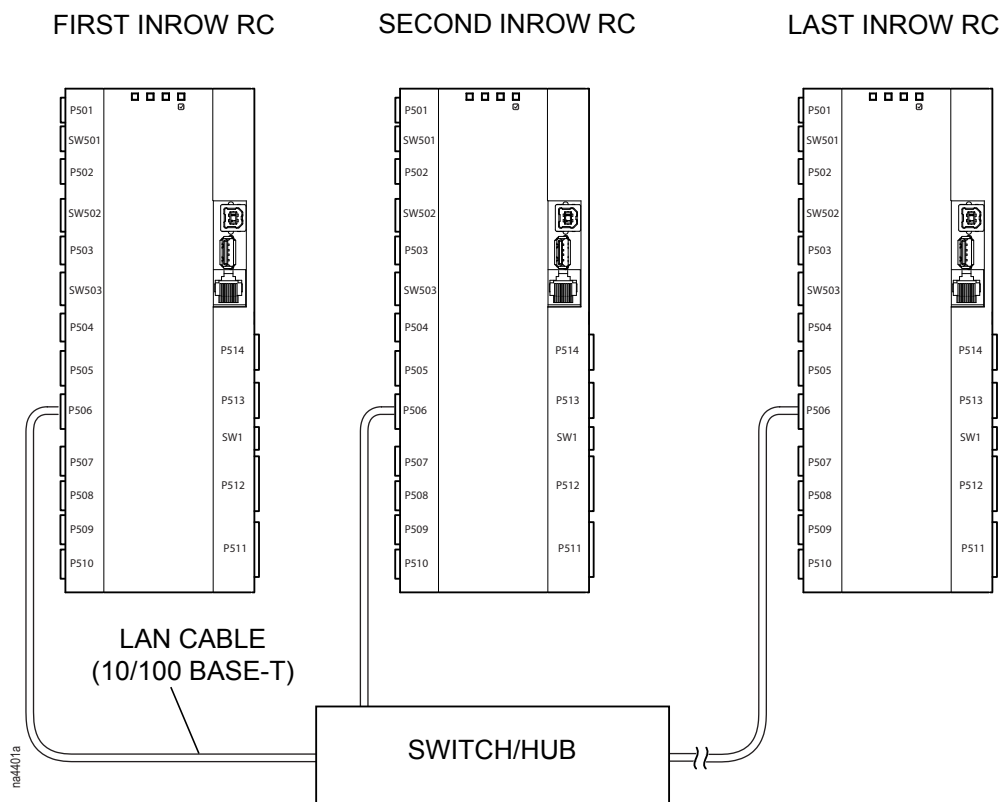
⚠ CAUTION
CAT 5 PINOUT
Devices connected on the A-Link ports should use a standard pin-out (1-1, 2-2, 3-3, 4-4, 5-5, 6-6, 7-7, 8-8) CAT5 cable only.
Failure to follow these instructions can result in equipment damage.



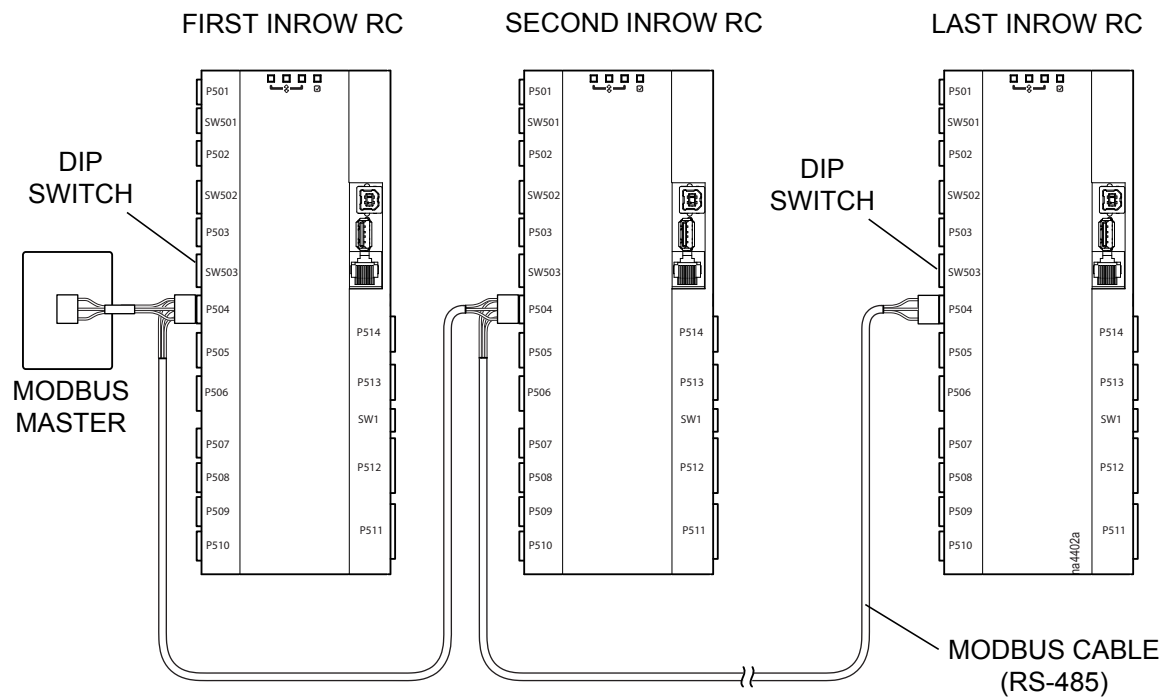
See the AFC installation manual for more information.



Network port



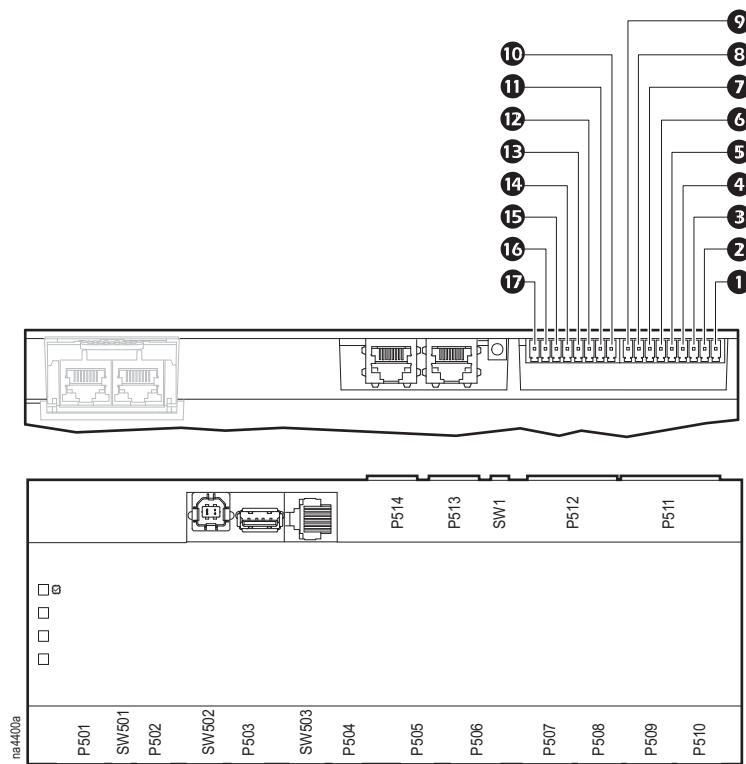
Modbus



Modbus configuration—DIP switch SW503

Position	Status	Dip Switches	Mode
1 and 2	Open (up)		4-wire Modbus (needs TXD0-, TXD1+, RXD0-, RXD0+, and COM connected to Modbus master)
1 and 2	Closed (down)		2-wire Modbus (needs TXD0-, TXD1+, and COM, or RXD0, RXD0+, and COM)
3 and 4	Open (up)		2-wire or 4-wire Modbus (no termination)
3 and 4	Closed (down)		4-wire Modbus (termination enabled)
3	Closed (down)		2-wire Modbus (termination enabled, position 4 must remain in the Open (up) position in 2-wire mode, or double termination will occur)

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	12VDC	Standby input 12 VDC supply current limited to 20 mA
15	24VDC	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

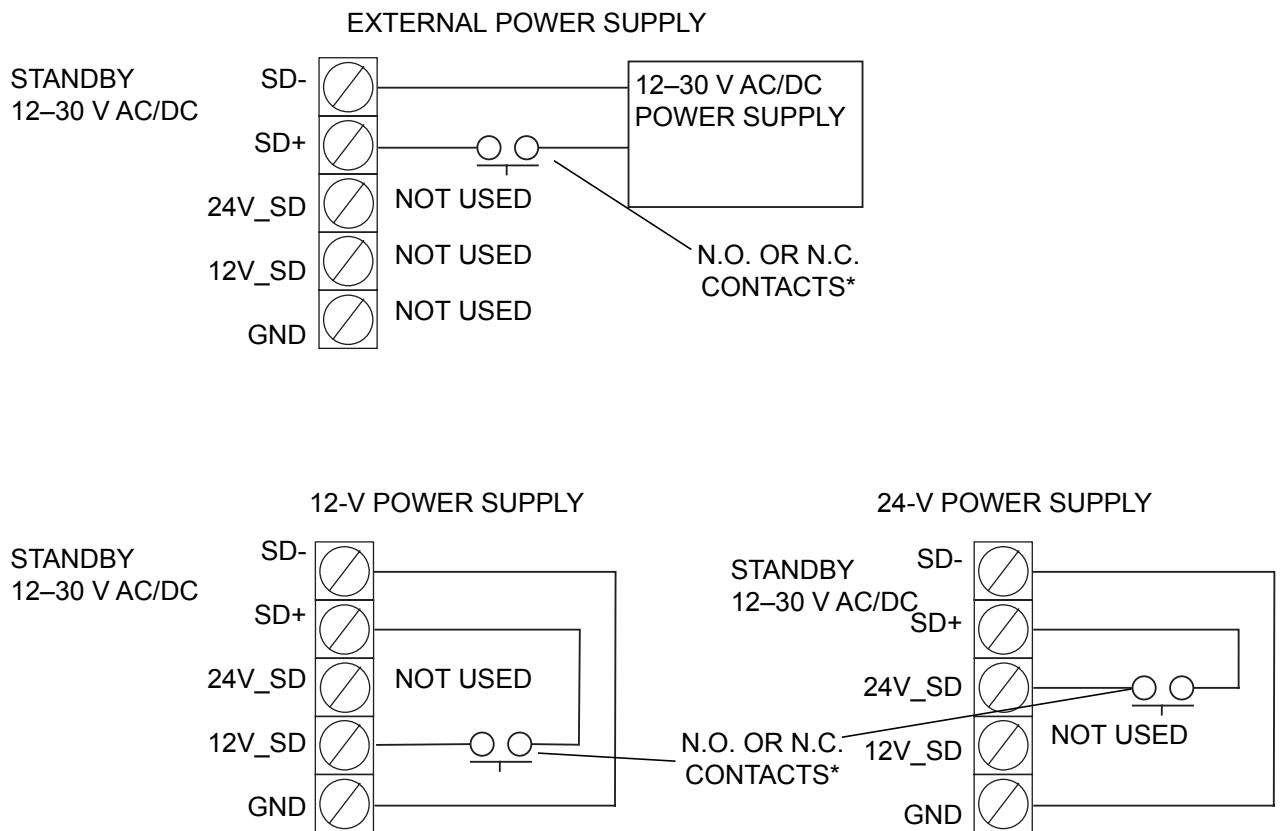
Output relays are Form C type, having a Normally Open (N.O.), Normally Closed (N.C.), and Common (COM) contacts.

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

STANDBY INPUT

Standby input allows the InRow 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 or DC. If using field supplied voltage, the Standby Input consumes 10 mA maximum at 24 VDC.



*Normally open contacts shown.

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Leak detector—optional

The leak rope detector (NBES0308) connects to the Universal Sensor Port connection using the supplied cable in the leak detector kit. Route the leak detector cable through one of the low voltage wiring openings.



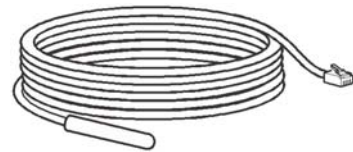
NOTE: The total length of the rope leak sensor can be extended up to 24.4 m (80 ft) using a Rope Leak Sensor Extension kit (NBES0309).



See the documentation supplied with the kit for installation information.

Temperature sensor

The remote temperature sensor (AP9335T) monitors the room temperature surrounding the cooling unit, ensuring the area is being cooled at the correct temperature.



Location considerations

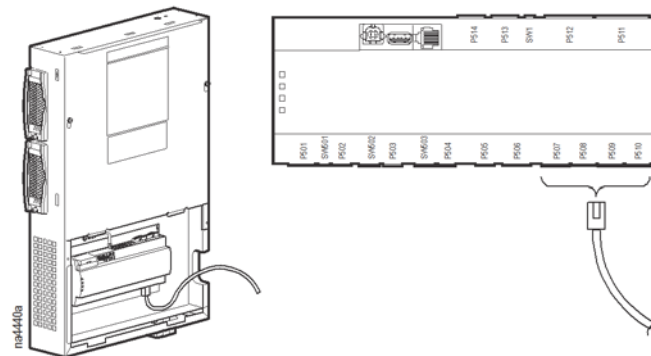
IMPORTANT: Different locations of the remote temperature sensors can result in different operational behavior of the cooling unit. The optimal position of the temperature sensors will vary from installation to installation, but should be located in an active rack air flow stream to allow accurate readings. It is not recommended to place remote sensors in front of areas with little or no active rack air flow (e.g., in front of blanking panels).

Servers most likely to have insufficient cooling air or inadequately cooled air due to the recirculation of hot air from the hot aisle include the following:

- Servers positioned at the top of a rack
- Servers positioned at any height in the last rack at an open end of a row
- Servers positioned behind flow-impairing obstacles such as building elements
- Servers positioned in a bank of high-density racks
- Servers positioned next to racks with Air Removal Units (ARU)
- Servers positioned very far from or very close to the cooling unit

NOTE: For proper operation, the temperature sensor must be installed as shown below.

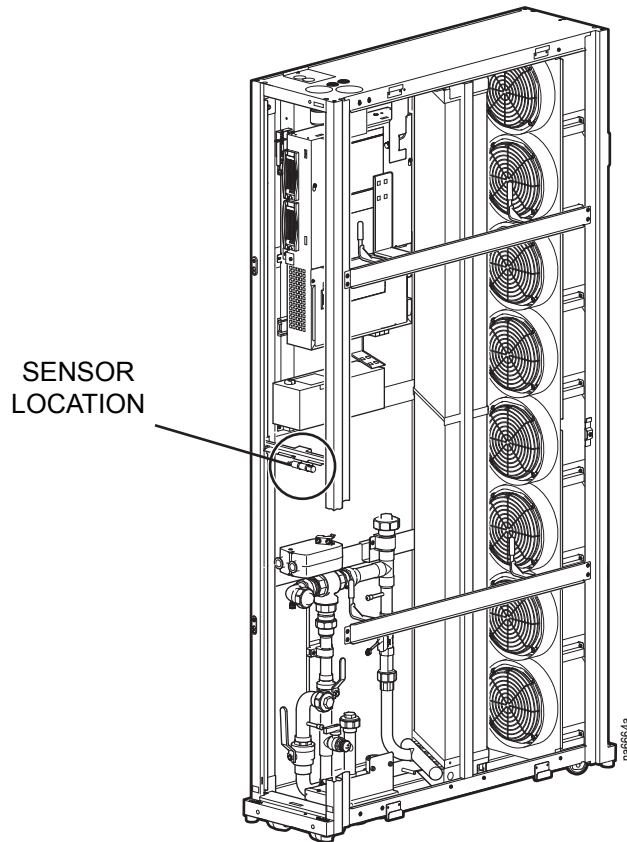
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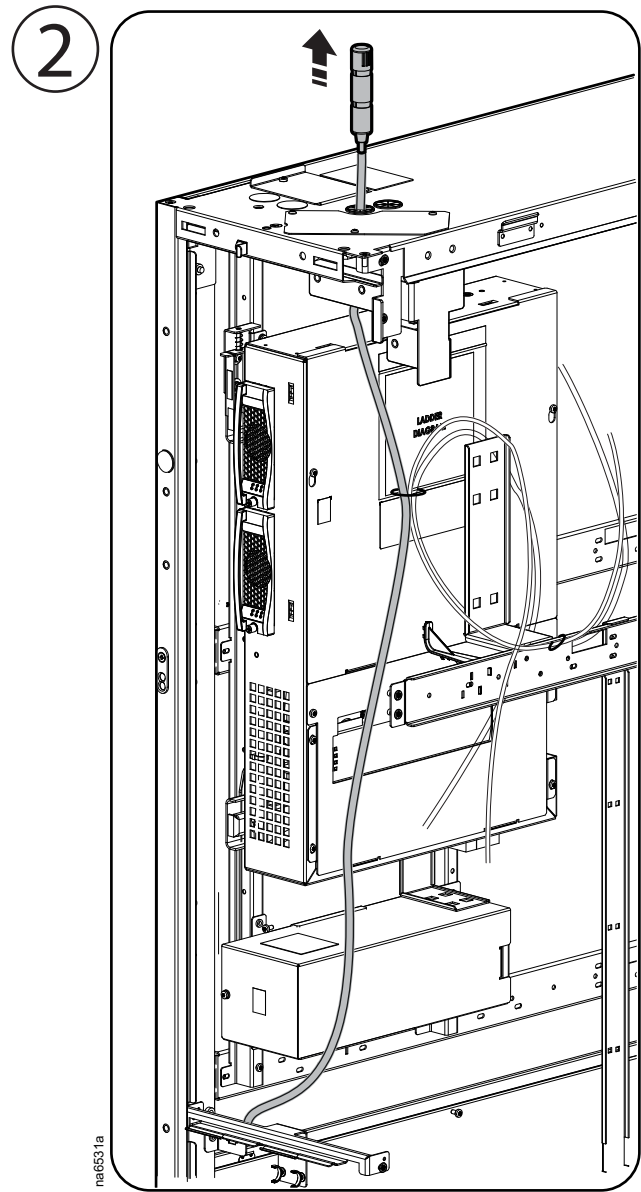
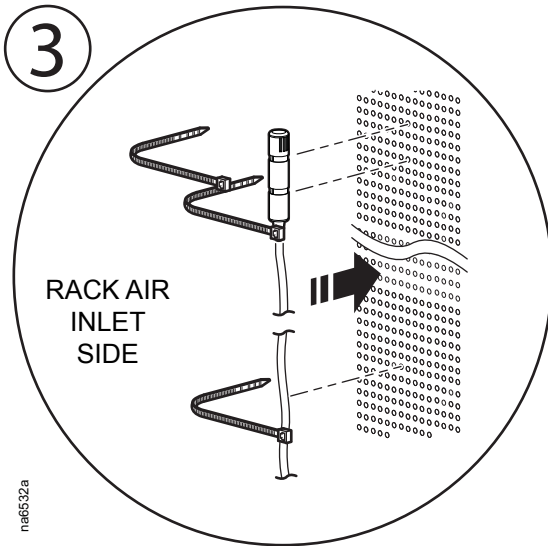
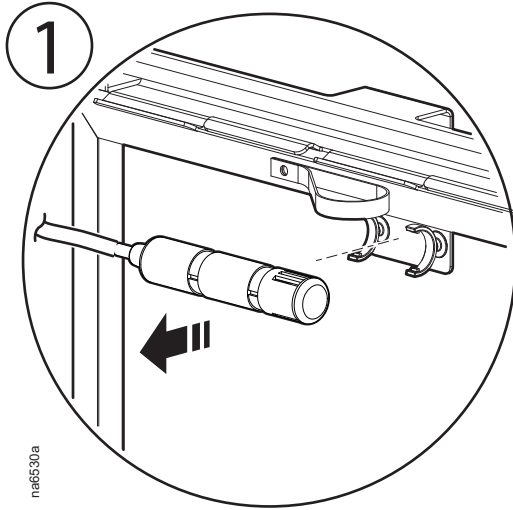
Temperature and humidity sensor—ACRC301H

Installation considerations: The temperature and humidity sensor located in the middle of the rear of the ACRC301H cooling unit is used to calculate the dew point. It is recommended to relocate the sensor to the front of a rack in the cold aisle (rack air inlet side). It is not recommended to place the sensor in front of areas with little to no active rack air flow.

NOTE: The sensor will still operate properly if it is not relocated; however, the readings will not be as accurate.



Installation

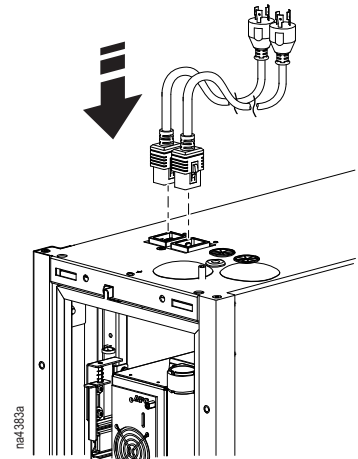


Power Connections

Power cords may be connected at the top of the cooling unit (standard) or at the bottom (optional).

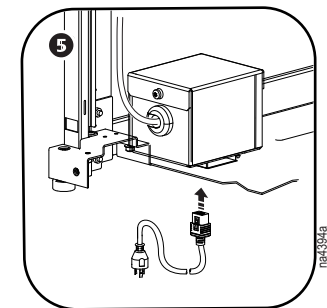
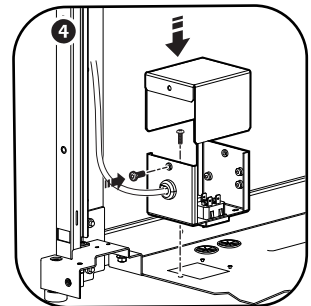
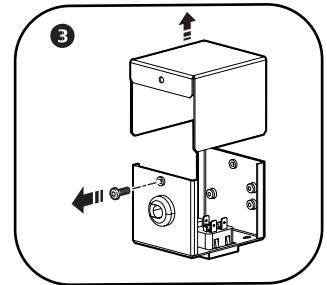
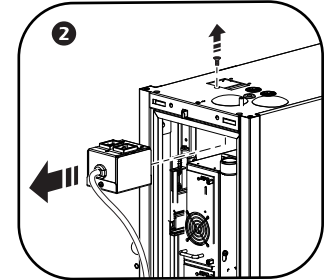
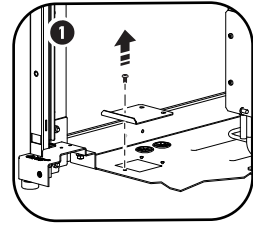
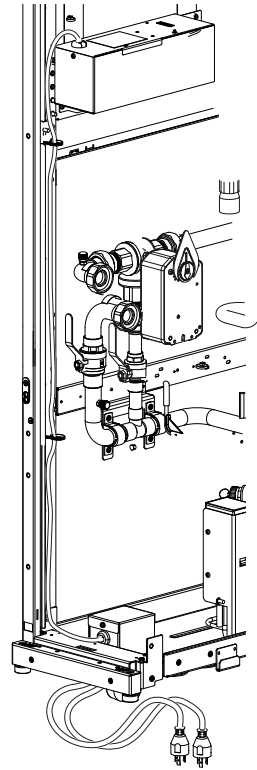
Top configuration—ACRC301S

Plug the power cords (supplied) into the electrical outlet located at the top of the cooling unit.



Bottom configuration (optional)—ACRC301S

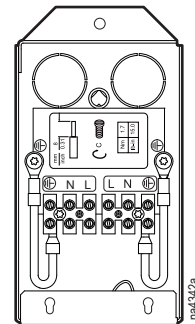
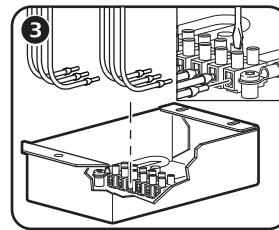
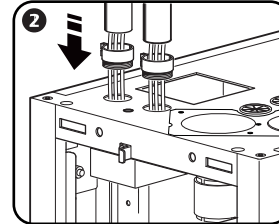
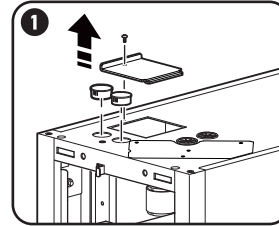
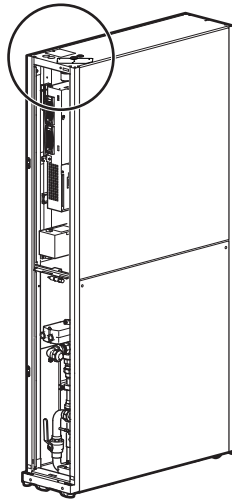
1. Remove the cover plate located at the bottom of the cooling unit. The screw attaching the cover plate will be used to attach the junction box to the bottom of the unit.
2. Remove the junction box from the top of the unit.
3. Remove the cover from the junction box.
4. Relocate the junction box from the top of the cooling unit to the bottom and replace the junction box cover.
5. Plug the power cords (supplied) into the electrical outlets.
NOTE: Left outlet is secondary power supply; right outlet is the primary power supply (when viewing from the rear of the unit).
6. Place the cover plate on the top of the unit.



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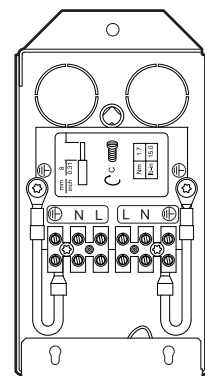
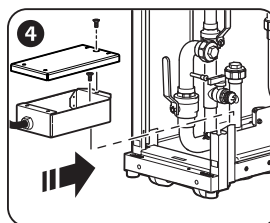
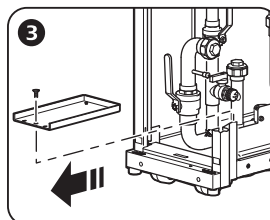
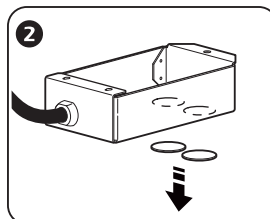
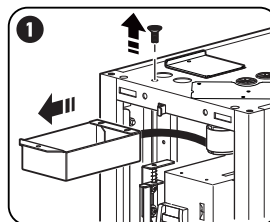
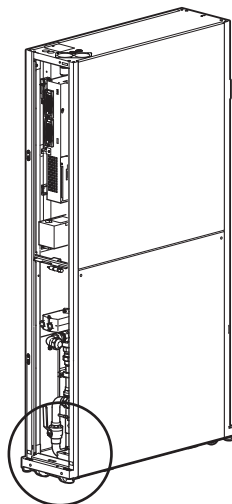
Top configuration—ACRC301H

1. Remove the cover plate and hole plugs from the top of the unit.
2. Route the power connections through the holes in the top of the unit.
3. Plug-in the connections.



Bottom configuration—ACRC301H

1. Remove the screw that fastens the box to the top of the unit. Cut and remove wire ties as needed to allow the power cord to be repositioned for bottom power feed connection.
2. Remove the plugs from the holes in the bottom of the junction connection box.
3. Remove the cover plate located at the bottom of the cooling unit. The screw attaching the cover plate will be used to attach the junction box to the bottom of the unit.
4. Attach the junction box to the bottom of the unit. Attach the cover plate to the top of the junction box.
5. Route the power connections through the bottom of the unit.



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Primary and secondary power feeds

The equipment is capable of receiving power through one of two separate feeds: primary feed or secondary feed. Use the display interface to configure the unit to receive power through the primary feed, the secondary feed, or both). The equipment receives power through the primary feed regardless of whether the secondary feed is receiving power. If power is removed from the primary feed, the secondary feed takes over and supplies power to the equipment (if a secondary feed is connected).

Connect the primary feed and secondary feed input cables to individual, breaker-controlled branch circuits or to PDUs backed by separate Uninterruptible Power Supplies (UPS).

NOTE: The primary and secondary feeds must not use the same branch circuit, PDU, or UPS.



For more information on configuring power input feeds, see the *InRow Chilled Water Air Conditioners Operation and Maintenance Manual*.

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.

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.
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