Operation and Maintenance Manual

InRow® Direct Expansion Cooling Units

InRow® RP

ACRP100, ACRP101, ACRP102

990-2682E-001

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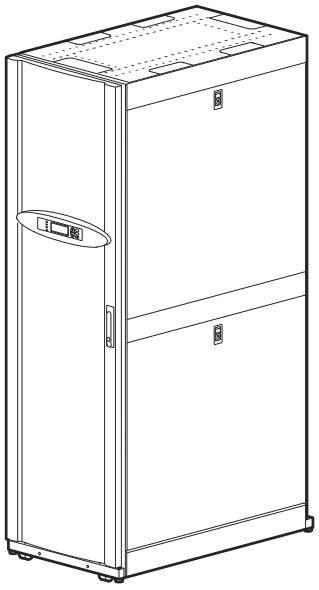

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Safety

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.

Safety During Operation

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

HAZARD OF EQUIPMENT FALLING OVER

- Use two or more persons 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 this equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower leveling feet to floor when this equipment is at rest.
- Lower leveling feet and attach joining brackets to adjacent racks when this equipment is in final position.

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

⚠ CAUTION

HAZARD TO EQUIPMENT OR PERSONNEL

The equipment operates under pressure (40–435 psig, 2.8–30 bar) and is charged with R-407C refrigerant. Take proper safety precautions when servicing the refrigerant loop and read the R-407C Material Safety Data Sheet (MSDS) for safe handling of the refrigerant.

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

⚠CAUTION

HAZARD TO EQUIPMENT OR PERSONNEL

All work must be performed by Schneider Electric qualified personnel.

Failure to follow these instructions can result in 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.

General Information

Overview

Cross-reference symbol used in this manual

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

Manual updates

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

Commissioning

After installation, verify that all components are working properly and the equipment is ready to begin operation.

1. Complete the following inspections:
   – Initial
   – Electrical
   – Mechanical
   – User interface
2. Completely charge the system with refrigerant.
3. Complete the following inspections:
   – Final
   – Start-up

Checklists

Initial Inspection Checklist

The initial inspection ensures that the equipment has been properly installed.

Ensure the:

❑	Installation procedure is complete according to the installation manual.
❑	Walls, floor, and ceiling are sealed with a vapor barrier.
❑	Equipment shows no signs of damage.
❑	Clearance around the equipment is in accordance with local and national codes and regulations as well as the installation manual.
❑	Equipment is leveled and joined to the adjacent racks.
❑	The equipment is not installed at the open end of a row.

Electrical Inspection Checklist

The electrical inspection verifies that all electrical connections are secure and correct and that the equipment is properly grounded

⚠ 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.

Ensure the:

❑	Incoming voltages match the phase and voltage listing on the nameplate.
❑	Electrical wiring complies with local and national codes and regulations.
❑	Equipment is properly grounded; do not use a water pipe ground.
❑	Front door is properly grounded.
❑	No loose connections in internal electrical components and terminal blocks.
❑	Electrical connections are tight, including contactors, terminal blocks, controllers, switches, relays, auxiliary devices, and field connections.
❑	Circuit breakers are correct and securely attached to the DIN rail.

Mechanical Inspection Checklist

The mechanical inspection verifies that all mechanical components and connections are secure and tight and ready for start-up and system charging. The inspection ensures that field piping is properly installed to promote oil return to the compressor.

⚠ CAUTION
HAZARD TO EQUIPMENT OR PERSONNEL The equipment is shipped from the factory with a nitrogen holding charge. Remove the nitrogen holding charge using the safety valves located on the internal refrigerant piping. **Failure to follow these instructions can result in injury or equipment damage.**

Ensure the:

❑	Condenser fans are turning freely and that the blades are not distorted or bent.
❑	Condensate drain line is at least the size of the drain connection.
❑	Humidifier water supply piping is connected and is the correct size.
❑	All piping joints are tight.
❑	Mechanical connections are tight, including compressor threaded ring seal connections. Also check that the humidifier cylinders are seated on the fill/drain block.
❑	Refrigerant piping size is correct according to the line size table in the installation manual.
❑	The vertical, horizontal, and total run lengths of the liquid, discharge, and suction lines are recorded.
❑	The number of 45- and 90-degree bends in the refrigerant piping are recorded.
❑	Field-installed traps and piping are in accordance with the installation manual and follow proper piping practices.
❑	Refrigerant piping is adequately supported and isolated when necessary.
❑	Field-installed service valves are open.
❑	Pressure relief valve is installed in accordance with the installation manual as well as local and national codes and regulations.
❑	Piping in the building and on the roof is properly insulated.
❑	All covers and guards are in place.

User Interface Inspection Checklist

The user interface inspection verifies that the sensors and internal communication links are installed properly. Check that the outdoor heat exchanger is connected to the cooling unit and to the other cooling units in the room if you are using cooling group controls.

Ensure that:

❑	An A-Link bus is connected and a terminator is plugged into the A-Link port at the final InRow RP of the group.
❑	Input contacts and output relays are connected correctly.
❑	The building management system is connected correctly and a terminator is wired into the final InRow RP between Modbus D0 and Modbus D1.
❑	Temperature and humidity sensors located on the front of the equipment are connected correctly.
❑	Rack temperature sensors are installed correctly.
❑	The network port is connected correctly and an IP address has been assigned to the equipment.

Final Inspection Checklist

The final inspection verifies that the system is clean, the installed options work properly, and the start-up form is sent to Schneider Electric.

Ensure the:

❑	System is clean and free from debris.
❑	Packaging materials are disposed of properly.
❑	Start-up form was sent to Schneider Electric.

Start-up Inspection Checklist

The start-up inspection ensures that the equipment is operating properly after its initial start-up. This inspection verifies that all modes of operation are working correctly and that the equipment is ready for normal operation.

⚠⚠ 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.

While the equipment is operating, ensure the:

❑	Sight glass moisture sensor is green.
❑	Current draw of fan motors, heater, compressor, humidifier, transformers, and fans for each mode of operation (cool, reheat, dehumidify, humidify) is within the ratings of the respective circuit breakers. 1. Record the current at the main power connection of the main circuit breaker. 2. Record all current draws on the load side of any circuit breakers used for each device. 3. Compare the circuit breaker setting for each device to the actual current measured and the full load amps of the device to verify that the current draws are acceptable.
❑	Compressor suction and discharge pressures are recorded.
❑	Equipment is free from malfunctions, including refrigeration leaks, water leaks, unusual vibrations, or other irregularities, in each mode of operation.
❑	High-pressure switch is operating correctly. 1. Shut down the condenser. 2. The head-pressure will rise until the high-pressure switch shuts down the compressor. 3. Record the shut-off point.
❑	Cool, reheat, dehumidification, and humidification cycles engage.
❑	Air filters are clean and free of debris. Air filters are only to be replaced with filters ordered from Schneider Electric.
❑	Clogged filter alarm is operating properly. Cover 1/3 of the filter area.

Charging With Refrigerant

Calculating R407C charge

Use the following table and formula when calculating the total R407C charge.

Condenser Model	SKU	Selected Ambient Temp. °C (°F)	Condenser Summer Charge kg (lb)	Condenser Flooded Charge for Different Minimum Outdoor Ambient Temperatures in kg (lb)				
				4°C (40°F)	-7°C (20°F)	-18°C (0°F)	-29°C (-20°F)	-40°C (-40°F)
LNE-S01-A009	ACCD75201 ACCD75204	35 (95)	4.5 (10)	9.7 (21.3)	10.7 (23.5)	11.2 (24.7)	11.6 (25.6)	12.7 (28.0)
LNE-S02-A015	ACCD75202 ACCD75205	40 (105)	6.8 (15)	14.2 (31.2)	15.6 (34.3)	16.4 (36.1)	17.0 (37.4)	18.6 (41.0)
LNE-S03-A027	ACCD75203 ACCD75206	46 (115)	13.6 (30)	28.0 (61.8)	30.8 (68.0)	32.4 (71.5)	33.6 (74.1)	36.8 (81.2)
KH1180.BDVES	ACCD75207	35 (95)	5.0 (11)	10.8 (23.7)	11.8 (26.1)	12.5 (27.5)	12.9 (28.5)	14.1 (31.2)
KH1280.ADVES	ACCD75208	40 (105)	6.8 (15)	14.4 (31.7)	15.8 (34.8)	16.6 (36.6)	17.2 (38.0)	18.9 (41.6)
KH1280.CDVES	ACCD75209	46 (115)	13.6 (30)	28.7 (63.3)	31.6 (69.6)	33.2 (73.3)	34.5 (76.0)	37.7 (83.2)

Total charge = Equipment charge + condenser summer charge + condenser flooded charge (for minimum possible ambient temperature) + liquid R407C in liquid pipe

Equipment charge: 9 kg (20 lb)

Quantity of R407C in liquid pipe: (area) x (length in ft) x (density): 0.00245 (ft^2) x L (ft) x 66.0 (lbm/ft^3)

Density of liquid R407C at 40.6°C (105°F) and 260 psig: 66.0 lbm/ft^3

Inside diameter of ACR copper tube (3/4 in. OD): 0.67 in.

Cross sectional area for 0.67 in. inside diameter pipe is 0.00245 ft^2

Liquid line charge for 3/4-in. ACR copper tube: 0.23 kg/m (0.16 lb/ft)

NOTE: Liquid line charge for the alternate 7/8-in. ACR copper tube: 0.32 kg/m (0.22 lb/ft)

Example:
Calculate the total R407C charge for an LNE-S01-A009 condenser with 25 ft of 3/4-in. liquid piping. Minimum outdoor design temperature is -20°F.

NOTE: Imperial units are used in this example.

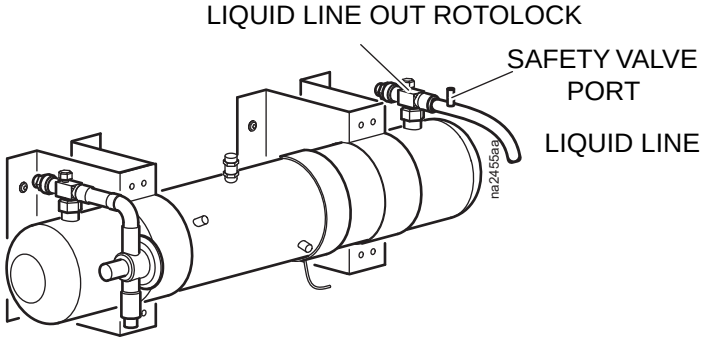
Total R407C charge: 20 + 10 + 25.6 + (25*0.16) = 59.6 lb.

⚠ 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.**

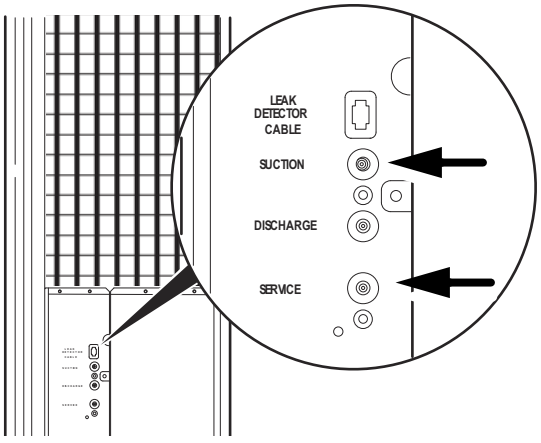
NOTICE
HAZARD TO EQUIPMENT A fast charge of liquid refrigerant through the suction port may damage the compressor. **Failure to follow these instructions can result in equipment damage.**

NOTICE
HAZARD TO EQUIPMENT Use only R407C refrigerant to charge this system. R407C is a mixed refrigerant. When charging equipment with mixed refrigerant, only liquid refrigerant must be charged. **Failure to follow these instructions can result in equipment damage.**

1. Ensure the two shutoff valves positioned in the back of the equipment are open.
2. Charge the calculated R407C liquid charge through the safety valve port (if installed on the liquid line of the flooded receiver).
   a. Front seat (close) the rotolock valve and charge the liquid directly into the suction line.
   b. Observe the refrigerant level in the sight gauges.



3. If no safety valve port is installed or it is not practical to charge the system from the roof, charge the liquid into the service port on the front of the equipment.
4. If the calculated liquid charge cannot be charged at once due to pressure equalization, start the equipment. See “Start the cooling unit” on page 17.
5. Charge the rest of the calculated liquid refrigerant very slowly through the suction port (shown).



Compressor Oil Charge

⚠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.

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NOTICE

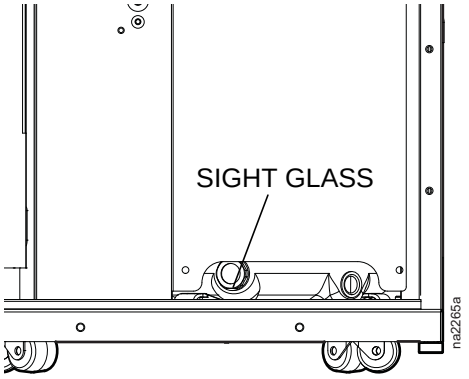
HAZARD TO EQUIPMENT

Charging the compressor with too much oil may cause damage to the compressor. The only way to drain oil from the compressor is to remove the compressor from the equipment, which cannot be done when the equipment is in the row.

Failure to follow these instructions can result in equipment damage.

You may need to add oil to air-cooled equipment, depending on the condenser size and the lengths of tube running between the equipment and the condenser.

Let the compressor run at full capacity for at least one hour and check the oil level in the oil sight glass. The level should be between 1/4 and 3/4 full, or within the limit shown on the oil level sticker. If the oil is not within the acceptable limit, perform the oil-charging procedure below.



Oil charging procedure

1. Calculate the approximate amount of additional oil needed using the following formula:

   (**R** x 0.022 x 16)–(**C** x 0.10) = **A**

- **R** — Refrigerant in the system (this amount should have been recorded during installation)
- **C** — Compressor oil charge (in fluid ounces)
- **A** — Amount of additional oil (in fluid ounces).

NOTE: The compressor used in this equipment comes with an internal oil charge of 1686 ml (57 fl oz). In the following example, there are 50 pounds of refrigerant in the system.

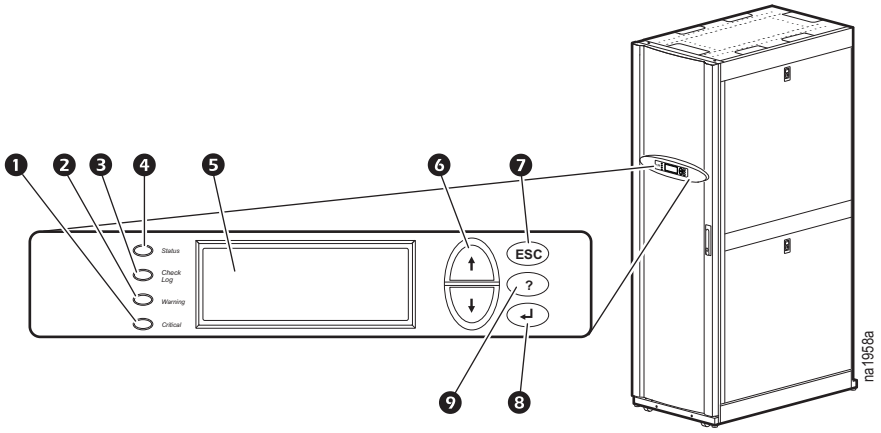
(**50** x 0.022 x 16)–(**57** x 0.10)
(17.6)–(5.7) = 11.9 fluid ounces of additional oil

2. Prepare to add oil:
   a. Use a new, sealed oil can and a manual oil pump. The pump hose must be sized for 1/4 in. flare fittings and must include a valve depressor at its end, which will open the valve on the safety valve service port of the compressor.
   b. At a minimum, use a quality POE oil with a viscosity of 32 cst, 160 sus at 40°C (104°F). Suggested oils: Danfoss Maneurop 160 PZ Polyolesteroil, the approved type of oil for this equipment. Approved alternative oil types:
      - CPI (Lubrizol) reference: CP-2931AH or CP-2931A or equivalent
      - ICI_UNIQUEMA reference: Emkarate RL32H or equivalent

3. Purge the pump and hose:
    a. Ensure that the oil pump is clean. Insert the pump in the oil container and make sure that the container is open to the atmosphere for as short a period of time as possible. When available, use a plug adapter kit to further reduce the exposure of the oil to the atmosphere.
    b. Bleed all air from the pump and hose with a few strokes of the pump. Purging the pump removes the moisture-saturated oil left inside the hose from previous usage.
    c. Connect the hose to the safety valve service port of the compressor immediately after purging to avoid moisture contamination.
4. While the equipment is running, charge the oil through the suction service port. Pump the oil very slowly.
5. Allow the compressor to run at full capacity for an adequate period of time after charging the oil, then re-check the oil level in the sight glass. The level should be between 1/4 and 3/4 full, or within the limit shown on the oil level sticker.
   NOTE: Dispose of the oil waste appropriately.

Operation

Display Interface



Item	Description	Function
❶	Critical Alarm LED (red)	When lit, a critical alarm condition exists and requires your immediate attention.
❷	Warning Alarm LED (yellow)	When lit, a warning alarm condition exists. Failure to correct this condition could cause a critical alarm.
❸	Check Log LED (yellow)	When lit, at least one new event has been logged since the last time the log was checked. Only events that pertain to the operation of the cooling unit will activate the LED.
❹	Status LED (green)	When lit, the cooling unit is receiving electrical power. When flashing green, the cooling unit is downloading firmware for the controller. This takes about one minute.
❺	Liquid Crystal Display (LCD)	View alarms, status data, and context-sensitive help, and modify configurable items.
❻	Up and down arrow keys	Select menu items and access information.
❼	ESC key	Return to previous screen or cancel current operation.
❽	Enter key	Open menu items and input changes to cooling group level and cooling unit level settings.
❾	Help key	Display context-sensitive help. Press the help key for information about each option on the screen and for instructions on performing tasks.

Using the Display

Every time you apply power to the cooling unit, the display interface initializes, causing the LEDs to cycle and the alarm-tone to activate.

Scrolling status screens

After start-up, the interface displays the firmware revision number of the display interface. The display interface then scrolls automatically and continuously through screens of status information.

Status Screen Name	Status Information Displayed
InRow RP	• On/Standby • Unit identifier • cooling unit name • cooling unit location
cooling group	• Alarms/No Alarms • Cool Output kW • Cool Setpoint °F (or °C) • Maximum Rack Temperature °F (or °C)
cooling unit	• Alarms/No Alarms • Cool Output kW • Max Rack Inlet °F (or °C) • Air Flow CFM (cubic feet per minute) or l/s (liters per second)

Press the UP or DOWN arrow key to interrupt the automatic scrolling and view a specific status screen. To return to the scrolling status screens, press ESC from one of the main menu screens.

Main menu screens

On any top-level status screen, press ENTER or ESC to open the first main menu screen.

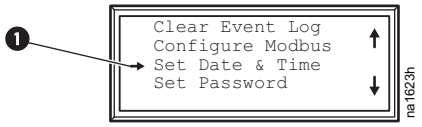
NOTE: If no keys are pressed for a preset time-out duration, the display interface returns to the scrolling status screens.

For information on setting the time-out duration, see “Password & timeout” on page 25.

All main menu choices are displayed on a series of six main menu screens, as shown.

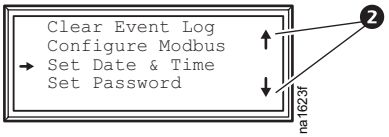
Navigating the main menu

Selector arrow: Press the UP or DOWN arrow key to move the selector arrow ❶ to a main menu option. Press ENTER to view the selected sub-menu screen. In the example shown below, the selector arrow points to the **Set Date and Time** setting. To select that item, press ENTER.



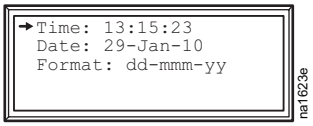
NOTE: If the selector arrow is on the top line of a main menu screen, press the UP arrow key to move the selector arrow to the top line of the previous screen.

Continue arrows: Continue arrows ❷ indicate that additional options or settings are available on a menu or status screen. Press the UP or DOWN arrow key to view the additional items.



Sub-menus

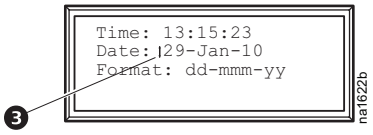
Selecting a main menu option displays the sub-menu screen for that option. In this example, the selector arrow is on the top line of the **Set Date and Time** sub-menu screen.



Use the UP or DOWN arrow key to move the selector arrow to an option, and press ENTER.

- **List of choices**. If the setting is a list of choices, an input arrow displays next to the setting. Press the UP or DOWN arrow key to select the menu option to change. Then press ENTER to exit the input mode and save the setting. Press ESC to exit without saving.
- **Numbers or text fields**. If the setting is a number or text field, use the arrow keys to select the value of the first character, and press ENTER to move to the next character. Press ENTER after the last character is set to exit the input mode and save the setting. Press ESC to exit without saving. If an invalid value is entered, the display interface beeps and restores the previous valid value to the field.

Input arrows: Input arrows ❸ next to a selected setting indicate that the setting can be modified by pressing the UP or DOWN arrow key. Press ENTER to save the change or ESC to cancel the change.



Using the Path statement

Select the main- and sub-menu options specified in the path statement to view or configure a setting. The path statement lists the main- and sub-menu items you select to navigate to the item to view or modify. The parts of the path statement are defined below:

Path: Main > Set Password > Change Passwords

Main: Your starting point is the main menu.

Set Password: Scroll to and select this option from the main menu.

Change Passwords: Scroll to and select this option from the sub-menu.

Subsequent options are listed and defined under the path statement.

Password entry

The InRow RP has two levels of password protection:

- **Device password** allows Device Users to change basic and environmental settings.
- **Admin password** allows all privileges granted for Device Users, and also allows the Administrator to modify settings that control the components in the cooling unit or change advanced options.

When you try to change a setting, the display interface prompts you to enter your Admin password. The default value for both the Device and Admin passwords is **apc** (lowercase). To enter your password, use the up or down arrow key to scroll through the available character set. Press ENTER to select the current character and move the cursor to the next character position. After selecting the last character of your password, press ENTER once more to submit your password.

Once the password is entered, it remains in effect until the period of inactivity exceeds the **Password Timeout** setting.

See “Password & timeout” on page 25.

NOTE: Passwords are case-sensitive.

Start the cooling unit

Path: Main > On/Standby > Operate

- Press ENTER to change the setting to **On**. The cooling unit will run according to the configured settings.

Stop the cooling unit

Path: Main > On/Standby > Operate

Press ENTER to change the setting to **Standby**. The cooling unit will enter Standby Mode.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The Standby option does not remove power from the cooling unit. Disconnect the power source to remove power.

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

General Configuration

The cooling group configuration options are set during the commissioning of the cooling units in the cooling group.

NOTE: Ensure all changes to settings are correctly made by qualified personnel.

Cooling unit configuration

Path: Main > Configure Unit > General

Capacity: Set the cooling capacity of the cooling unit:

- **Auto**: The cooling unit automatically controls its output under normal (default) conditions.
- **Max**: The cooling unit runs at full capacity. Heating, humidifying, and dehumidifying modes are disabled in Max mode.
  NOTE: Normal checks for cooling failures are disabled in the **Max** mode.

Start-up Dly: Enter a value for the delay. The start-up delay begins when the cooling unit is started and initialized. The cooling unit cannot begin operation until this delay expires. Use the start-up delay to restart equipment sequentially in your room after a scheduled downtime or a power outage.

Idle On Leak: Set the cooling unit to enter idle mode if a leak is detected.
NOTE: The leak sensor, Schneider Electric part number AP9325, is optional.

- Select **Yes** to enable the cooling unit to enter idle mode if a leak is detected. Select **No** to disable the cooling unit from entering idle mode if a leak is detected.

The following five alarms cause the cooling unit to enter idle mode:

- Condensate Pump Fault
- Cooling Failure
- Water Detection Fault
- Persistent High Head Pressure
- VFD Inverter Over Heated

See “Alarm messages and suggested actions” on page 30 for more information on alarms.

Idle On Fail: Set the cooling unit to enter idle mode if the cooling unit is unable to supply conditioned air.

- Select **Yes** to enable the cooling unit to enter idle mode when unable to supply conditioned air. Select **No** to disable the cooling unit from entering idle mode if a cooling failure is detected.

Role Over(ride): When selected this forces the cooling unit to be the primary cooling unit in the group.

- Set to **Disable**, allows the system to choose the role of the cooling unit.
- Choose **Enable** if you have **Runtime Balancing** enabled and you DO NOT want a particular unit in the group to become a backup unit.

Contacts

View the state of input and output contacts

Path: Main > Configure Unit > Discrete I/O

Each cooling unit supports a user-defined input contact and a user-defined output contact. Each contact monitors a sensor and responds to changes in the state of the sensor (open or closed).

In State: Indicates the actual state of the input contact (open or closed). A cooling unit is **On** when the state is normal and in **Standby** when the state is not normal.

Out State: Indicates the actual state of the output contact (open or closed). An alarm will cause the output contact to change from the normal state.

Edit the normal state of input and output contacts

Path: Main > Configure Unit > Discrete I/O > Normal State

You can set input contacts to cause alarm conditions based on a user-defined normal state. Output contacts can map internal alarms and events to outside devices.

Input Norm: Set the normal state of the contact (open or closed). The cooling unit changes its operating mode to **Standby** when the actual state differs from the normal state.

Output Norm: Set the normal state of the contact (open or closed). If the state of an alarm or event mapped to this contact changes from the normal state, the contact also changes state.

Output Src: Define the type of output source (alarm), either **Any Alarm** or **Critical**, that causes the output to change from its normal state.

Cooling Group Configuration

The cooling group configuration settings determine which components are available and how the cooling group should operate.

NOTE: Ensure all changes to settings are correctly made by qualified service personnel.

Configure the cooling group

Path: Main > Configure Group

The **Configure Group** menu contains settings that identify the number of cooling units installed in this cooling group and the physical arrangement of those cooling units.

Num Units: Enter the number of cooling units in this cooling group. Up to 12 cooling units can be joined together to work as a single cooling group.

Type: Set the rack deployment strategy for the cooling units of this cooling group.

- **In-Row:** Air flow is not ducted. Hot aisle air is cooled, then shared by all loads in the row.
- **RACS:** (Rack Air Containment System). Air flow in the enclosure is controlled by a ducting system fitted to the enclosure.
- **HACS:** (Hot Aisle Containment System). Air flow in the room is controlled by enclosing the hot air aisle. The loads share an enclosed common hot aisle.
- **CACS**: (Cold Aisle Containment System). Air flow in the room is controlled by enclosing the cold air aisle. The loads share an enclosed common cold aisle.

Max Fan Spd: The maximum fan speed of the group. The default is 100% and is adjustable to 60%.

Num Backups: The total number of desired backup cooling units. This value can range from zero to one less than Num Units.

Full RP Backups: The total number of desired backup cooling units that have advanced features (Humidification, dehumidification, reheat, heat assist) enabled. If you have a group of cooling units where some do not have advanced features you can use this control to reserve a number of cooling units with advanced features as backups. This value must not exceed **Num Backups**.

RT Bal (Runtime Balancing): When set to **Enabled**, the system maintains similar runtimes between units in the group. When the difference between the runtime hours of the cooling units in the system exceeds 72 hours, the system will automatically exchange modes between the longest running primary unit and the backup unit with equal or greater capability if available with the least runtime hours.

NOTE: The runtime balancing cap is not adjustable. Runtime hours are hours that the cooling unit is actually operating and NOT 72 consecutive hours (3 days) of time.

Load Asst (Load Assist): When set to **Enabled**, provides extra capacity via a backup cooling unit in the event that a primary unit is unable to service the demand. When the assistance is no longer needed, the unit will return to the backup state.

NOTE: Redundancy (backup units), runtime balancing and load assist modes are only supported in HACS, RACS, and CACS configuration.

Active Flow Control Lamp Test: When enabled, the Active Flow Controller(s) LEDs will cycle through a red, green, and blue illumination pattern (not on unit).

Number of Active Flow Controllers: Set the number of AFC units in the group (0 to 5).

Altitude: Set the altitude (in feet or meters) of the unit above sea level. This number is used to estimate the density of air and is a factor in pressure measurement.

Identify the cooling unit

Path: Main > Set Identification

The **Set Identification** menu contains settings that identify the name and location of the cooling unit.

Unit Id: Assign a unique identification number to this cooling unit. Range: 1 through 12.

User Defined Name: Assign a **Name** of up to 19 alpha-numeric characters to this cooling unit.

User Defined Location: Enter the **Location**, up to 19 alpha-numeric characters, of the cooling unit.

Configure Modbus

Path: Main > Configure Modbus

Use the **Configure Modbus** menu to set up communications between the cooling unit and the building management system.

Modbus: Enable or **Disable** Modbus.

Target Id: Each Modbus device must have a unique target identification number. Enter a unique number for this cooling unit.

Baud Rate: Set to either 9600 bps or 19200 bps.

Control the Environment

The cooling group controls the room environment by engaging one of four modes of operation: cool, dehumidify, reheat, or humidify.

The primary function of the cooling units to cool air from the hot aisle and deliver it to the cold aisle at the temperature setpoint. The control strategies employed by the cooling unit depend upon the deployment strategy of the cooling group.

In an in-row environment, the cooling unit supplies constant-temperature supply air to the common cold aisle. The fan speed is modulated to ensure that the desired volume of air reaches the IT equipment. The fan speed is determined by the difference between the cooling setpoint and the maximum rack air inlet temperature.

In a HACS or RACS environment, the cooling unit neutralizes the heat accumulated in the common hot aisle and expels it back into the surrounding environmental space while maintaining the desired temperature in the cold aisle.

In a CACS environment, the cooling unit supplies constant temperature supply air to the enclosed cold aisle. The fan speed is modulated to ensure that the required volume of air reaches the IT equipment.

How the modes of operation work

Cool: The cooling unit uses a direct expansion coil, a variable speed compressor to modulate refrigerant flow through the coil, and a set of fans to control airflow through the coil. The cooling output is determined by the difference between the supply setpoint and the supply air temperature of the cooling unit.

The airflow control is varied based on configuration:

- InRow: The fan speed is controlled by comparing the rack inlet temperature to the cooling set point. As the rack temperature increases compared to the cooling set point the fans increase output to maintain the set point. As rack inlet temperature decreases compared to the cooling set point the fans decrease output to maintain the set point.
- RACS/HACS: When Active Flow Controller (AFC) devices are present, the controller utilizes differential pressure data supplied by the AFC(s) to supply the correct amount of airflow to the IT load. When AFC devices are not present the fan speed is controlled by the fan speed preference setting. The fan speed can be selected based on the temperature differential across the cooling unit. As return temperatures deviate from the fan speed preference setting, the fan speed increases to bring the temperature

difference back down to the setpoint or decreases fan output to increase the unit temperature differential. By maintaining the desired temperature differential, the system matches the airflow requirements of the load.

- CACS: When AFC devices are present, the controller utilizes differential pressure data supplied by the AFC(s) to supply the correct amount of airflow to the IT load. When AFC devices are not present the evaporator fan speed is controlled by comparing the rack inlet temperature to the cooling setpoint. As the rack temperature increases compared to the cooling setpoint the fans increase output to maintain the setpoint. As rack temperature decreases compared to the cooling set point the fans decrease output to maintain the setpoint.

The cooling unit is equipped with compressor cycling control that tries to minimize the number of times the compressor cycles on and off. The compressor will cycle off only when the rack inlet temperature drops below 15°C (59°F) whether or not the minimum compressor on time of three minutes has elapsed. The reheat and heat assist functions (see below) are used to keep the rack inlet temperature above that point, but in some instances the temperature may fall further. Once off, the compressor will not normally cycle on until the supply temperature reaches its setpoint and the minimum off time of two minutes has elapsed. However, if the rack inlet temperature reaches 25°C (78°F), the compressor will cycle on regardless of whether the minimum off time has elapsed.

Compressor cycles are monitored over a seven-day period. If the number of cycles average more than 12 per hour over that period, the Excessive Compressor Cycling alarm is set.

Humidify: The equipment contains an electric humidifier that injects steam into the air if the humidity is below the humidify setpoint. The controls use dew point as the process variable and select different setpoints based on configuration.

- InRow/CACS: The humidification setpoint and the cooling setpoint are used to calculate the dew point setpoint. A return air dew point is calculated from the return air temperature and humidity. The humidifier output is generated using a proportional controller using the return air dew point as the process variable. The proportionality constant is user programmable.
- RACS/HACS: This configuration uses a humidification setpoint and the supply air setpoint to calculate the dew point setpoint. A return air dew point is calculated from the return air temperature and humidity. The humidifier output is generated using a proportional controller using the return air dew point as the process variable. The proportionality constant is user programmable.

Dehumidify: The equipment removes humidity from the air passing through the cooling unit. A dehumidification demand is created when the return dew point temperature is greater than the dehumidification dew point setpoint plus a dead band and the fan speed is less than 80%. The dehumidification dew point setpoint is calculated using the user configurable dehumidifying setpoint %RH and either the Cooling set point temperature for InRow/CACS strategy or the Supply Air set point temperature for HACS/RACS strategy. The dehumidification mode of operation uses the heaters in stages to control the supply air temperature controller when the Reheat and Heat Assist are enabled. Otherwise, the dehumidification mode will use 62.0 F dew point temperature set point for the supply air temperature controller. The evaporator fans decrease to 40% output when in the dehumidification mode.

Reheat: When enabled, reheat is used as needed to provide stable cooling at a lower heat load than is possible with cooling alone. Reheat increases the heat load (up to 4 KW) to the cooling controller which allows the compressor to avoid cycling off. The return air temperature may be low while the unit is dehumidifying or if data center equipment is off and the environment is relatively cold. Reheat output is determined by the difference between the reheat setpoint and the cooling unit return air temperature (the reheat output increases as the return air temperature decreases).

Heat assist: Enabling heat assist in conjunction with reheat increases the reheat output when the compressor speed approaches its minimum cooling output. Without this additional heat load, the compressor cycles off, and won't return to service until its minimum off time has expired. The reheat output changes as needed to provide the minimum air temperature needed to keep the compressor from cycling off. If the heat load is low enough the compressor will cycle off but this occurs at a lower heat load than if heat assist (or reheat) were disabled.

Heat assist improves the performance of the dehumidification function by allowing the coils to stay colder than is needed for supply air, which increases condensation.

See “Supply Air:” on page 28 and “Return Air:” on page 28 for more information.

Setpoints

Path: Main > Set Group Setpoints

A setpoint is the target value that a cooling group tries to maintain in the rack. The default setpoints are appropriate for most cooling applications.

The setpoints for each mode must be within the following ranges:

- **Cool:** 18.0–32.2°C (64.4–90.0°F)
- **Supply Air:** 15.0–30.2°C (59.0–86.4°F)
- **Dehumid:** 35.0–80.0% RH
- **Dehumid DB:** (Dehumidify Deadband): 2.0–10.0%
- **Humidify:** 20.0–50.0% RH
- **Reheat:** 10.0–18.0°C (50.0–64.4°F)

The **Supply Air** setpoint must be at least 1.1°C (2.0°F) above the **Reheat** setpoint. The **Dehumidify** setpoint must be at least 5% above the **Humidify** setpoint.

NOTE: The **Supply Air** setting is defined by the field service representative when the cooling group is commissioned.

Fan Spd.: Set the fan speed preference that will give you the desired temperature difference (DT). Each fan speed provides an approximate DT between the supply air from the cooling unit and the air returned from the rack.

- Low = 16.7°C (30°F) DT
- Med-Low = 13.9°C (25°F) DT
- Med = 11.1°C (20°F) DT
- Med-High = 6.3°C (15°F) DT
- High = 5.6°C (10°F) DT

NOTE: The cooling group will automatically override this fan speed setting and adjust the fan speed to provide optimum cooling for the environment as needed.

Fan Ctrl: When **Automatic** is selected, the unit operates based on measured demand. When **Manual** is selected, the unit uses fixed fan speeds 60%, 70%, 80%, 90%, or 100% that corresponds to the **Fan Spd** setting.

Active Flow Control Bias: This setting is used to change the bias of the controller by adjusting the contained aisle pressure threshold. **Zero** is the default setting. Only qualified service personnel can make changes to these settings.

- Hot Aisle Containment (HACS)
  - If the cooling units seem to be under-cooling, select **Negative** or **Slightly Negative** to adjust the aisle pressure for additional cooling.
  - If the cooling units seem to be over-cooling, select **Positive** or **Slightly Positive** to adjust the aisle pressure for less cooling.
- Cold Aisle Containment (CACS)
  - If the cooling units seem to be under-cooling, select **Positive** or **Slightly Positive** to adjust the aisle pressure for additional cooling.
  - If the cooling units seem to be over-cooling, select **Negative** or **Slightly Negative** to adjust the aisle pressure for less cooling.

Setting	Blue LED – HACS Red LED – CACS	Setpoint Green LED	Red LED – HACS Blue LED – CACS
Positive	< –0.008 in. ±3%	0.004 ±0.0004 in.	> 0.016 in. ±3%
Slightly Positive	< –0.010 in. ±3%	0.002 ±0.0004 in.	> 0.014 in. ±3%
Zero	< –0.012 in. ±3%	0.000 ±0.0004 in.	> 0.012 in. ±3%
Slightly Negative	< –0.014 in. ±3%	–0.002 ±0.0004 in.	> 0.010 in. ±3%
Negative	< –0.016 in. ±3%	–0.004 ±0.0004 in.	> 0.008 in. ±3%

Active Flow Control Status: Displays the status of the Active Flow Control. This status indicates whether the correct amount of airflow is being provided to the load. This status is not configurable.
NOTE: AFC compatibility may require upgrading the cooling unit controller.

PID settings

Path: Main > Set Group PIDs

NOTE: Ensure all changes to settings are correctly made by qualified service personnel.

The PID loop is used to control the output of the cool and reheat modes of the cooling group.

Gain (P): The proportional multiplier (gain) for this mode or actuator. The proportional multiplier adjusts for the difference (error) between the measured value and the setpoint.

Rate (I): The integral multiplier (reset rate) for this mode or actuator. The integral multiplier adjusts for error measurement and the amount of time that the error has existed. The integral multiplier adds to or subtracts from the output in small increments to correct for the offset error caused by the proportional contribution.

Deriv (D): The derivative multiplier (derivative) for this mode or actuator. The derivative multiplier adjusts the output for rapid changes in the error, correcting for the rate of change of the error over time.

Humidify (Sensitivity): Set the percent relative humidity below the setpoint of the cooling group that causes the humidifier to run at 100% capacity.

Run hours

The cooling unit records the number of hours each of its components has operated. When a component is replaced, use the **Reset Run Hours** option to reset the run hours for the displayed component to zero.

NOTE: Replace air filters only with filters ordered from Schneider Electric (part number 875-2013).

Path: Main > View Run Hours

Components:

- **Air Filter**
- **Fans**
- **Heaters**
- **Condensate Pump**
- **Humidifier**
- **Compressor**
- **System**

Humidity control

Path: Main > Configure Unit > Humidity Control

- **Humidify: Enable** or **Disable** the **Humidify** function.
- **Control:** Select **Auto** to have the main controller control the humidifier. Select **Drain** to drain the humidifier and then turn it off.
- **Dehumidify: Enable** or **Disable** the **Dehumidify** function.

Reheat control

Path: Main > Configure Unit > Reheat

- **Enable** or **Disable** the **Reheat** function.

Heat assist

Path: Main > Configure Unit > HeatAssist

- **Enable** or **Disable** the **Heat assist** function.

Thresholds

Set alarms to alert you to threshold violations.

Path: Main > Set Unit Threshlds

When the monitored input violates the unit threshold, an alarm will occur. Set thresholds for the following sensors:

- **Rack Inlet:** The temperature of the air entering the rack at the rack inlet sensor.
- **High Humid:** The relative humidity at which the high threshold alarm occurs.
- **Low Humid:** The relative humidity at which the low threshold alarm occurs.
- **Supply Air:** The average temperature of the air output from the cooling unit, measured by the upper and lower supply air temperature sensors.
- **Return Air:** The temperature of the air entering the cooling unit at the temperature sensor.

Service intervals

Path: Main > Service Intervals

The service interval depends on environmental cleanliness. Each component interval setting has an alarm. If enabled, the alarm will sound when the component interval has elapsed. The alarm is cleared by selecting **Clear Alarms** in the main menu. Set the number of weeks to service the following:

- **Air Filter Interval:** The default is 18 weeks.
- **Humidifier Interval:** The default is 26 weeks.
- **Heater Interval:** The default is 52 weeks.
- **Compressor Interval:** The default is 52 weeks.
- **Condensate Pump Interval**: The default is 52 weeks.
- **Fan Interval:** The default is 52 weeks.

NOTE: The **Air Filter** and **Humidifier** interval alarms are enabled by default. The **Heater**, **Condensate Pump**, **Fan**, and **Compressor** interval alarms are disabled by default.

Display

Set display interface settings, including time and date, units, passwords, and time-out. You can also adjust the contrast, key click, beeper volume, and beep on alarm settings.

Password & timeout

Path: Main > Set Password

NOTE: The default user password is **apc** (lowercase). See “Password entry” on page 16 for more information on how to enter the password.

Change passwords: Set the Admin and Device passwords.

1. Move the selector arrow to the **Change Passwords** option and press ENTER.
2. If there has not been a key-press and the **Password timeout** has elapsed, you will be prompted to enter your current Admin password. Press ENTER. You will return to the **Change Password** screen. Press ENTER.
3. Select the password to change (either **Admin Password** or **Device Password**).
4. Enter a new password (up to 8 characters).
5. Press ENTER to confirm.

Timeout: Set the period during which settings can be changed after the password is entered. After the period has elapsed without a key-press, password entry is required and the display interface returns to the scrolling status screens.

Invalidate: Override the password timeout and require password entry again with the **Invalidate NOW** option.

Date and time

Path: Main > Set Date & Time

Set the date: Enter the day, month, and year, and press ENTER. The **Date** is displayed on some status screens and is also used in the alarm and event logs to date-stamp events.

Set the time: Enter the correct time, and press ENTER. The **Time** is displayed on some status screens and is also used in the alarm and event logs to time-stamp events.

Set the format: Use the UP or DOWN arrow key to select the date **Format**.

Adjust display

Path: Main > Configure Display

Contrast: Adjust the visibility of the screen text. Lower numbered settings provide darker text; higher numbers provide lighter text. Settings range from 0–7.

Key Click: **Enable** or **Disable** an audible tone every time a key is pressed on the display interface.

Beeper Volume: Set the volume of the display interface alarm tone, and for the audible tone that sounds every time a key is pressed on the display interface.

Beep On Alarm: Set the cooling unit to sound an audible tone every 30 seconds when a new alarm occurs. Silence the audible tone by pressing any key on the display interface. When the alarm clears itself, the tone will stop on its own.

Display units

Path: Main > Set Display Units

Set the units of measure for the cooling unit to either **US** or **Metric**.

Network Configuration

The cooling unit is shipped with a Network Management Card (NMC) that enables you to manage the cooling unit over your network. Configure the network settings for the cooling unit Network Management Card from the display interface. The management card allows remote control and configuration of the equipment.

Configure the network

Path: Main > Configure Network

MAC Address: Displays the unique network identifier assigned to the Network Management Card of the cooling unit installed in the cooling unit at the factory.

Boot Mode: Set the method by which the Network Management Card of the cooling unit will acquire its network settings.

- **Manual:** Enter the IP Address, subnet mask, and default gateway. See “Path: Main Menu > Configure Network > IP” on page 27.
- **BootP:** Set the Network Management Card of the cooling unit to obtain its network settings from a BootP server.
- **DHCP:** Set the Network Management Card of the cooling unit to obtain its network settings from a DHCP server.
- **BootPDHCP:** Set the Network Management Card of the cooling unit to search for its network settings from either a BootP or a DHCP server.

By default, DHCP requires an Schneider Electric cookie before it will accept an IP address. See “DHCP:” on page 36 for more information.

Path: Main Menu > Configure Network > IP

You will be prompted to enter an Admin password. Enter the password and press ENTER to return to the **IP** screen. Press ENTER again to change the following settings.

IP: Enter the IP address assigned to the Network Management Card of the cooling unit (Manual boot mode only).

SM: Enter the subnet mask for the Network Management Card of the cooling unit (Manual boot mode only).

GW: Enter the default gateway for the Network Management Card of the cooling unit (Manual boot mode only).

View Status Readings

The display interface has several options for viewing the status of the cooling unit, the cooling group to which the cooling unit belongs, and the environment being controlled. The status readings for the cooling unit are available under the **View Unit Status** option in the main menu, and status readings for the cooling group are available under the **View Group Status** option on the main menu or on the scrolling status screens.

Scrolling status screens

When the display interface is idle, it scrolls through screens of status information. Press the UP or DOWN arrow key to interrupt the automatic scrolling and view a specific status screen.

Cooling unit status

Path: Main > View Unit Status

View information specific to this cooling unit.

Op Mode: The cooling unit is in one of the following modes:

- **On:** The cooling unit is cooling.
- **Standby:** The cooling unit is receiving power but not enabled for cooling.
- **Idle:** The cooling unit is not operating in normal mode due to active alarms.
- **Assist:** A Backup unit is operating due to a request for cooling assistance.
- **Backup:** The unit has been designated as a backup unit and is in the standby state.

For more information, see “Idle On Leak:” on page 17.

Cool Outpt: The actual cooling output of the cooling unit.

Cool Demnd: The amount of cooling that the heat load currently requires.

Supply Air: The average temperature of the air leaving the cooling unit, as measured by the upper and lower supply air temperature sensors.

Return Air: The temperature of the air entering the cooling unit.

Max Rack In: The highest reading of the three rack inlet temperature sensors determines the rack temperature.

Rack In #n: The temperature of the air entering the rack at the remote temperature sensor.

Air Flow: The amount of air required to maintain the setpoint temperature.

Fan Speed: The speed of the fans that regulate the air flow through the cooling unit.

Filter DP: The filter differential pressure.

Sply Humid (Supply Humidity): The humidity of the air leaving the cooling unit.

Retn Humid (Return Humidity): The humidity of the air entering the cooling unit.

Humidify Dmd (Humidify Demand): The percent of maximum humidification that the rack currently requires.

Humid Outpt (Humidity Output): The actual percent of maximum humidification output of the cooling unit.

Dehumid Dmd (Dehumidify Demand): The percent of maximum dehumidification that the rack currently requires.

Dehum Outpt (Dehumidify Output): The actual percent of maximum dehumidification output of the cooling unit.

Reheat Dmd (Reheat Demand): The percent of maximum reheating that the rack currently requires.

Reheat Outpt (Reheat Output): The actual percent of maximum reheating output of the cooling unit.

Suct Pres (Suction Pressure): The pressure at the compressor inlet.

Disc Pres (Discharge Pressure): The pressure at the compressor outlet.

Humidifier Current: The current draw from the humidifier canister.

Humidifier Conduct: The conductivity of the water in the humidifier canister.

Compressor Drive: Speed: The compressor speed.

Compressor Drive: Power: The compressor power consumption.

Compressor Drive: Voltage: The compressor voltage.

Compressor Drive: Current: The compressor current draw.

Compressor Drive: DC Link: The compressor internal direct current (DC) link voltage.

Compressor Drive: Heat Sink: The compressor heat sink temperature.

Compressor Drive: Ctrl Card (Control Card): The compressor control card temperature.

Compressor Drive: Warn Stat: The compressor warning word used for diagnostics (in hex).

Compressor Drive: Alrm Stat: The compressor alarm word used for diagnostics (in hex).

Cooling group status

Path: Main > View Group Status

View information about the cooling group.

Cool Output: The combined output of the cooling group.

Cool Demand: The cooling output required to meet the current heat load of the conditioned space.

Cool Setpt: The temperature you set to maintain the room environment.

Max Rack: The highest rack temperature reported by any cooling unit in the cooling group.

Min Rack: The lowest rack temperature reported by any cooling unit in the cooling group.

Air Flow: The combined airflow output of the cooling units in the cooling group.

Humid Dmd: The percent of maximum humidification that is currently required.

Humid Act: The actual percent of maximum humidification output of the cooling group.

Dehum Dmd: The percent of maximum dehumidification that is currently required.

Dehum Act: The actual percent of maximum dehumidification output of the cooling group.

Reheat Dmd: The percent of maximum reheating that is currently required.

Reheat Act: The actual percent of maximum reheating output of the cooling group.

Dewpoint Temperature: The average group dew point temperature.

About the cooling unit

Path: Main > About InRow RP

View identifying information that is helpful when obtaining service:

- **Model:** Model number
- **S/N:** Serial number
- **F/W:** Display interface firmware revision
- **H/W:** Hardware revision
- **Made:** Date of manufacture
- **RP APP:** Application version
- **AOS Ver:** Operating system version

Event Log

The event log saves status information and a message each time a change in the cooling group is detected. Alarms and events are recorded in the log and displayed on the active alarms screen. Status events (informational) and system configuration changes are only displayed in the event log.

View event log

Path: Main > View Event Log

The event log keeps a record of all alarms and events. The screen displays the following:

- The name of the event.
- The time and date the event occurred.

Use the arrow keys to scroll through the list of events and display the date and time for each event.

Clear event log

Path: Main > Clear Event Log

A confirmation screen is displayed when you select this option. Enter the Admin password to erase the log. Select **YES** to erase all of the events in the log. Select **NO** to return to the main screen.

Respond to Alarms

When an alarm is triggered, the cooling unit alerts you through the display by the following methods:

- Active alarm screen entry on scrolling status screens
- LEDs on the front panel display
- An optional audible alarm, if enabled, every 30 seconds

View active alarms

Path: Main > View Alarms

The **View Alarms** screen provides the number of alarms, the severity, and a brief description of the alarm. Press the arrow keys to view the rest of the list.

Clear active alarms

Path: Main > Clear Alarms

A confirmation screen is displayed when you select this option. Enter the Admin password to clear the alarm list. Select **YES** to clear all of the alarms in the list. Select **NO** to return to the main screen. If the conditions that caused the alarm still exist, those conditions cause the alarm to be regenerated.

Alarm messages and suggested actions

Severity definitions

- Critical: A fault that prevents the unit from operating at its rated cooling capacity.
- Warning: A fault that requires your attention and could jeopardize the unit if its cause is not addressed.

Displayed Alarm Message	Severity	Action Required
Active Flow Controller Sensor Fault	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Air Filter Clogged	Warning	• Clean or replace the air filter. • If the problem persists, contact Schneider Electric Customer Support.
Air Filter Run Hours Violation	Warning	• Reset the Air Filter Run Hours after the air filter is cleaned or replaced.
A-Link Isolation Relay Fault	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Check Condensate Management System	Warning	• For assistance, contact Schneider Electric Customer Support.
Compressor Drive Communication Fault	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Compressor Drive Fault	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Compressor Drive Locked	Critical	• Resolve the VFD fault. Power cycle the unit to reset. • If the problem persists, contact Schneider Electric technical support.
Compressor Drive Warning	Warning	• For assistance, contact Schneider Electric Customer Support.
Compressor High Pressure Alarm	Critical	• For assistance, contact Schneider Electric Customer Support.
Compressor Run Hours Violation	Warning	• At the display interface, make sure the **Compressor** run hours setting is correct in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Condensate Pan Full	Critical	• For assistance, contact Schneider Electric Customer Support.

Displayed Alarm Message	Severity	Action Required
Condensate Pump Run Hours Violation	Warning	• At the display interface, reset the **Condensate Pump** run hours in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Cooling Failure	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Discharge Pressure Sensor Fault	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
EcoAisle Door Open	Warning	• Verify the EcoAisle door is shut properly. If the problem persists, contact Schneider Electric technical support.
Excessive Compressor Cycling	Warning	• For assistance, contact Schneider Electric Customer Support.
External Communication Fault	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Fan #n Fault	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Fan #n Run Hours Violation	Warning	• At the display interface, reset the **Fans** run hours in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
Filter Sensor Fault	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Frequent Humidifier Faults	Warning	• For assistance, contact Schneider Electric Customer Support.
Group Communication Fault	Warning	• Make sure the number of cooling units in the group is configured properly, and the A-Link connections between cooling units are correct. • Make sure the system is receiving power and is connected properly. • If the problem persists, contact Schneider Electric Customer Support
Heater #n Fault	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
Heater #n Run Hours Violation	Warning	• At the display interface, reset the **Heaters** run hours in the **View Run Hours** screen after the appropriate maintenance for the device has been performed.
High Discharge Pressure Alarm	Warning	• Check the condenser for obstructions. • If the problem persists, contact Schneider Electric Customer Support.
Low Suction Pressure Fault Alarm	Warning	• Check the air filter and evaporator for obstructions. • If the problem persists, contact Schneider Electric Customer Support.
High Suction Pressure Fault Alarm	Warning	• Make sure fan speed preferences are correct and heat load is within range of the equipment. • If the problem persists, contact Schneider Electric Customer Support.
Humidifier Communication Fault	Warning	• A hardware failure exists. Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidifier Cylinder Full When Unit Off	Warning	• Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidifier Drain Fault	Warning	• A hardware failure exists. Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidifier Excessive Output Reduction Alarm	Warning	• A hardware failure exists. Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.

Displayed Alarm Message	Severity	Action Required
Humidifier Low Water Level Alarm	Warning	• Make sure the water line to the humidifier is connected, and the water supply is turned on. • If the problem persists, consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidifier Run Hours Violation	Warning	• Replace the humidifier cylinder. • Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidifier Water Conductivity Too High	Warning	• Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Humidity High Violation	Warning	• Make sure the humidity alarm limits are set correctly in the **Set Unit Threshlds** screen.
Humidity Low Violation	Warning	• Make sure the humidity alarm limits are set correctly in the **Set Unit Threshlds** screen.
Replace Humidifier Cylinder Alarm	Warning	• Replace the humidifier cylinder. • Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Insufficient Airflow	Warning	• Verify the air ports are clear of obstructions and there is sufficient cooling capacity for the load. • If the problem persists, contact Schneider Electric technical support.
Internal Communication Fault	Critical	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.
On Standby: Input Contact Fault	Warning	• At the display interface, make sure the **Input Normal State** is defined correctly in the **Set Unit Threshlds** screen. • Clear the problem that caused the input contact switch to change from its normal state. • If the problem persists, contact Schneider Electric Customer Support.
Persistent High Head Pressure	Critical	• Indicates there were four Compressor High Pressure shut downs in 30 minutes. For assistance, contact Schneider Electric Customer Support.
Rack Inlet #n High Temperature Violation	Critical	• Make sure the temperature sensor is connected and placed properly. • Make sure the **Rack Inlet** threshold is set correctly in the **Set Unit Threshlds** screen. • If the problem persists, contact Schneider Electric Customer Support.
Rack Inlet #n Temperature Sensor Fault	Critical	• Make sure the sensors are connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric Customer Support.
Return Air High Temperature Violation	Warning	• Make sure the **Return Air** threshold is set correctly in the **Set Unit Threshlds** screen. • If the problem persists, contact Schneider Electric Customer Support.
Return Air Sensor Fault	Critical	• Make sure the sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric Customer Support.
Return Humidity Sensor Fault	Warning	• Make sure the sensor is connected properly. • For assistance, contact Schneider Electric Customer Support.
Suction Pressure Sensor Failure	Warning	• A hardware failure exists. For assistance, contact Schneider Electric Customer Support.

Displayed Alarm Message	Severity	Action Required
Supply Air High Temperature Violation	Warning	• Make sure the temperature sensor is connected properly. • Make sure the **Supply Air** threshold is set correctly in the **Set Unit Threshlds** screen. • If the problem persists, contact Schneider Electric Customer Support.
Supply Humidity Sensor Fault	Warning	• Make sure the sensor is connected properly. • For assistance, contact Schneider Electric Customer Support.
Supply Air Sensor Fault (upper or lower)	Critical	• Make sure the faulty sensor is connected properly. • If the problem persists, replace the sensor, or contact Schneider Electric Customer Support.
Unexpected Number of Active Flow Controllers	Warning	• Verify physical number of AFC units matches the number shown in the Number of Active Flow Controllers setting. • If the problem persists, contact Schneider Electric technical support.
VFD Inverter Over Heated	Critical	• The VFD will restart once the inverter cools. • If the problem persists, contact Schneider Electric technical support.
Water Detection Fault	Warning	• Identify the source of the leak. • Isolate the leak by shutting off the main water supply valve. • For assistance, contact Schneider Electric Customer Support.
Water Detection Shutdown	Critical	• For assistance, contact Schneider Electric Customer Support.
No Backup Units Available	Warning	• Check to make sure cooling units in the group are set to **Configure Unit > General > Roll Over > Disable** and that cooling units are available (not in a failed state). • For assistance, contact Schneider Electric Customer Support.

Network Management Card

Quick Configuration

The included Network Management Card enables you to manage the InRow RP over your network. You must set up the Network Management Card to control the cooling unit through a network.

Overview

You must configure the following TCP/IP settings before the cooling unit can operate on a network:

- IP address
- Subnet mask
- Default gateway

NOTE: Never use the loopback address (127.0.0.1) as the default gateway address for the Network Management Card of the cooling unit. Doing so will disable the card and will require you to reset TCP/IP settings to their defaults using a local serial login.

If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the Network Management Card of the cooling unit and that is usually running. The Network Management Card of the cooling unit uses the default gateway to test the network when traffic is very light.

See “Watchdog Features” in the “Introduction” of the cooling unit *User Guide* for more information about the watchdog role of the default gateway.

TCP/IP configuration methods

Use one of the following methods to define the basic TCP/IP settings needed by the Network Management Card of the cooling unit:

- Device IP Configuration Wizard (See “Device IP Configuration Wizard” on page 35.)
- BootP or DHCP server (See “BootP & DHCP configuration” on page 36.)
- Networked computer (See “Remote access to the control console” on page 37.)

Device IP Configuration Wizard

The Device IP Configuration Wizard is used to discover and configure Network Management Cards that do not have IP addresses assigned. The Device IP Configuration Wizard runs on Microsoft® Windows® 2000, Windows Server® 2003, Windows Server 2012, and on 32- and 64-bit versions of Windows XP, Windows Vista, Windows 2008, Windows 7, and Windows 8 operating systems.

The Device IP Configuration Wizard supports cards that have firmware version 3.0.x or higher and is for IPv4 only.

NOTE: Most software firewalls must be temporarily disabled for the Wizard to discover Network Management Cards that are not configured.

To configure one or more Network Management Cards from a user configuration file, see the User Guide available on the Schneider Electric Web site: **www.schneider-electric.com**.

1. Download the Device IP Configuration Wizard from the Schneider Electric Web site: **www.schneider-electric.com**.
2. Install and run the Device IP Configuration Wizard.
3. Follow the on-screen instructions.

NOTE: If you leave the option Start a Web browser when finished enabled, you can use apc (the default) for both the user name and password.

.ini file utility: You can use the .ini file export utility to export .ini file settings from configured Network Management Cards to one or more Network Management Cards that are not configured.

BootP & DHCP configuration

TCP/IP Configuration, which you access by selecting the **Administration** tab, the **Network** option on the top menu bar, and **TCP/IP** on the left navigation menu, identifies how the TCP/IP settings will be defined. The possible settings are **Manual**, **DHCP**, **BootP**, and **DHCP & BootP** (the default setting).

The **DHCP & BootP** setting assumes that a properly configured DHCP or BootP server is available to provide TCP/IP settings to Network Management Cards.

With the **TCP/IP Configuration** setting **DHCP & BootP**, the Network Management Card attempts to discover a properly configured server. It first searches for a BootP server, then a DHCP server, and repeats this pattern until it discovers a BootP or DHCP server.

See “BootP:” on page 36 or “DHCP:” on page 36.

BootP: You can use an RFC951-compliant BootP server to configure the TCP/IP settings for the Network Management Card.

The **BootP** setting assumes that a properly configured BootP server is available to provide TCP/IP settings to Network Management Cards.

1. Enter the Network Management Card MAC and IP addresses, the subnet mask and default gateway settings, and an optional bootup file name in the BootPTAB file of the BootP server.

NOTE: For the MAC address, look on the nameplate of the cooling unit. The MAC address is also available on the display interface: **Path: Main > Configure Network**

2. When the Network Management Card reboots, the BootP server provides it with the TCP/IP settings.
   - If you specified a bootup file name, the Network Management Card attempts to transfer that file from the BootP server using TFTP or FTP. The Network Management Card assumes all settings specified in the bootup file.
   - If you did not specify a bootup file name, the Network Management Card can be configured remotely by using the control console or the Web interface. User name and password are both **apc**, by default.

To create the bootup file, see your BootP server documentation.

DHCP: You can use a RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the Network Management Card.

This section briefly summarizes the Network Management Card communication with a DHCP server. For more detail about how a DHCP server is used to configure the network settings for a Network Management Card, see “DHCP Configuration” in the *InRow RP User Guide*.

1. A Network Management Card sends out a DHCP request that uses the following to identify itself:
   – A Vendor Class Identifier (APC by default)
   – A Client Identifier (by default, the Network Management Card MAC address value)
   – A User Class Identifier (by default, the identification of the Network Management Card application firmware)
2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the Network Management Card needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). By default, the Network Management Card will ignore DHCP offers that do not encapsulate the APC cookie in the Vendor Specific Information option using the following hexadecimal format:

   ```
   Option 43 = 01 04 31 41 50 43
   ```

   where
   – the first byte (`01`) is the code
   – the second byte (`04`) is the length
   – the remaining bytes (`31 41 50 43`) are the APC cookie

   See your DHCP server documentation to add code to the Vendor Specific Information option.

   To change the control console **DHCP Cookie Is** setting, use the **Advanced** option in the TCP/IP menu. See “Remote access to the control console” on page 37.

   To change the Web interface setting **Require vendor specific cookie to accept DHCP Address**, which is enabled by default, first choose **DHCP** under the **TCP/IP Configuration** heading by selecting the **Administration** tab, the **Network** option on the top menu bar, and **TCP/IP** on the left navigation menu. To disable the Schneider Electric cookie requirement, click **Next** to access the **DHCP Configuration** page, and de-select the checkbox “Require vendor specific cookie to accept DHCP Address.”

Remote access to the control console

From any computer on the same subnet as the Network Management Card, you can use ARP and Ping to assign an IP address to a Network Management Card, and then use Telnet to access that Network Management Card control console and configure the needed TCP/IP settings.

NOTE: After the Network Management Card has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that Network Management Card.

1. Use ARP to define an IP address for the Network Management Card, and use the Network Management Card MAC address in the ARP command. For example, to define an IP address of 156.205.14.141 for a Network Management Card that has a MAC address of 00 c0 b7 63 9f 67, use one of the following commands:
   – Windows command format:

   ```
   arp -s 156.205.14.141 00-c0-b7-63-9f-67
   ```

   – LINUX command format:

   ```
   arp -s 156.205.14.141 00:c0:b7:63:9f:67
   ```

NOTE: For the MAC address, look on the nameplate of the cooling unit. The MAC address is also available on the display interface at: **Path: Main > Cooling Unit > Network**.

1. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For the IP address defined in step 1, use one of the following Ping commands:
   – Windows command format:

     ```
     ping 156.205.14.141 -l 113
     ```

   – LINUX command format:

     ```
     ping 156.205.14.141 -s 113
     ```

2. Use Telnet to access the Network Management Card at its newly assigned IP address. For example:

   ```
   telnet 156.205.14.141
   ```

3. Use **apc** for both user name and password.
4. See “Control console” on page 38 to finish the configuration.

Control console

After you log on at the control console, as described in “Remote access to the control console” on page 37:

1. Choose **Network** from the **Control Console** menu.
2. Choose **TCP/IP** from the **Network** menu.
3. If you are not using a BootP or DHCP server to configure the TCP/IP settings, select the **Boot Mode** menu. Select **Manual boot mode**, and then press ESC to return to the **TCP/IP** menu. (Changes will take effect when you log out.)
4. Set the **System IP**, **Subnet Mask,** and **Default Gateway** address values.
5. Press CTRL+C to exit to the **Control Console** menu.
6. Log out (option 4 in the **Control Console** menu).

How to Access a Configured Unit

Overview

After the cooling unit is running on your network, you can use the interfaces summarized in this section to access the cooling unit.

For more information on the interfaces, see the *InRow RP User Guide* on the Schneider Electric Web site: **www.schneider-electric.com**.

Web interface

As your browser, you can use Microsoft® Internet Explorer® 5.5 and higher (on Windows operating systems only), Firefox® 1.*x* by Mozilla® (on all operating systems), or Netscape® 7.*x* and higher (on all operating systems) to access the Management Card through its Web interface. Other commonly available browsers also may work but have not been fully tested by Schneider Electric.

To use the Web interface to configure cooling unit settings or to view the event log, you can use either of the following:

- The HTTP protocol (enabled by default) provides authentication by user name and password but no encryption.
- The more secure HTTPS protocol provides extra security through Secure Sockets Layer (SSL) and encrypts user names, passwords, and data being transmitted. It also provides authentication of Network Management Cards by means of digital certificates.

To access the Web interface and configure the security of your device on the network:

1. Address the Network Management Card by its IP address (or DNS name, if configured).
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User).
3. Select and configure the type of security you want. (This option is available only for Administrators.) On the **Administration** tab, select **Network** on the top menu bar and the **access** option under the **Web** heading on the left navigation menu to enable or disable the HTTP or HTTPS protocols.

For more information on selecting and configuring network security, see the UPS Network Management Card Security Handbook, available at http:// www.apc.com/site/support/. Click on “User Manuals” on the right side and search for “UPS Network Management Cards.”

Telnet/SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. (An Administrator can enable these access methods in the Web interface by selecting the **Administration** tab, then **Network** on the top menu bar, and the **access** option under the **Console** heading on the left navigation menu.) By default, Telnet is enabled. Enabling SSH automatically disables Telnet.

Telnet for basic access: Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. To use Telnet to access the Network Management Card control console from any computer on the same network:

1. At a command prompt, use the following command line, and press ENTER:

   `telnet` *`address`*

   As `address`, use the Network Management Card IP address (or DNS name, if configured).
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User).

SSH for high-security access: If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the control console. SSH encrypts user names, passwords, and transmitted data.

The interface, user accounts, and user access rights are the same whether you access the control console through SSH or Telnet, but to use SSH, you must first configure SSH and have a SSH client program installed on your computer.

See the *User Guide* for more information on configuring and using SSH.

NOTE: The menu structure for administration and device management in the control console differs from the menu structure for these areas in the Web interface. See the *User Guide* for an overview of the control console menus.

Simple Network Management Protocol (SNMP)

SNMPv1 only: After you add the PowerNet® MIB to a standard SNMP MIB browser, you can use that browser to access the cooling unit. All user names, passwords, and community names for SNMP are transferred over the network as plain text. The default read community name is public; the default read/write community name is private.

SNMPv3 only: For SNMP GETs, SETs, and trap receivers, SNMPv3 uses a system of user profiles to identify users. An SNMPv3 user must have a user profile assigned in the MIB software program to perform GETs and SETs, browse the MIB, and receive traps.

NOTE: To use SNMPv3, you must have a MIB program that supports SNMPv3. The cooling unit supports only MD5 authentication and DES encryption.

SNMPv1 and SNMPv3: To use StruXureWare Data Center Expert to manage the cooling unit on the public network of a StruxureWare system, you must have SNMPv1 enabled in the cooling unit interface. To enable or disable SNMP access, you must be an Administrator. Select the **Administration** tab, select the **Network** menu on the top menu bar, and use the **access** option under **SNMPv1** or **SNMPv3** on the left navigation menu.

NOTE: If you enable SSL and SSH for their high-security authentication and encryption, disable SNMP. Allowing SNMP access to the cooling unit compromises the high security you implemented by choosing SSL and SSH. To disable SNMP, you must be an Administrator; on the **Administration** tab, select **Network** on the top menu bar then select the **access** option under the **SNMP** heading on the left navigation menu.

FTP/SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer downloaded firmware files to the cooling unit. You can also access a copy of the cooling unit .ini file (*config.ini*), event log (*event.txt*), or data log (*data.txt*). SCP provides the higher security of encrypted data transmission and is enabled automatically when you enable SSH.

NOTE: If you enable SSL and SSH for their high-security authentication and encryption, disable FTP. Allowing file transfers through FTP compromises the high security you implement by choosing SSL and SSH. To disable FTP, you must be an Administrator; on the **Administration** tab, select **Network** on the top menu bar and **FTP Server** on the left navigation menu.

To access the Network Management Card through FTP or SCP, the default user name and password are **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User. In the command line, use the IP address of the unit.

See the *User Guide* to use FTP or SCP to transfer firmware files to or to retrieve log files from the Network Management Card.

How to Recover From a Lost Password

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

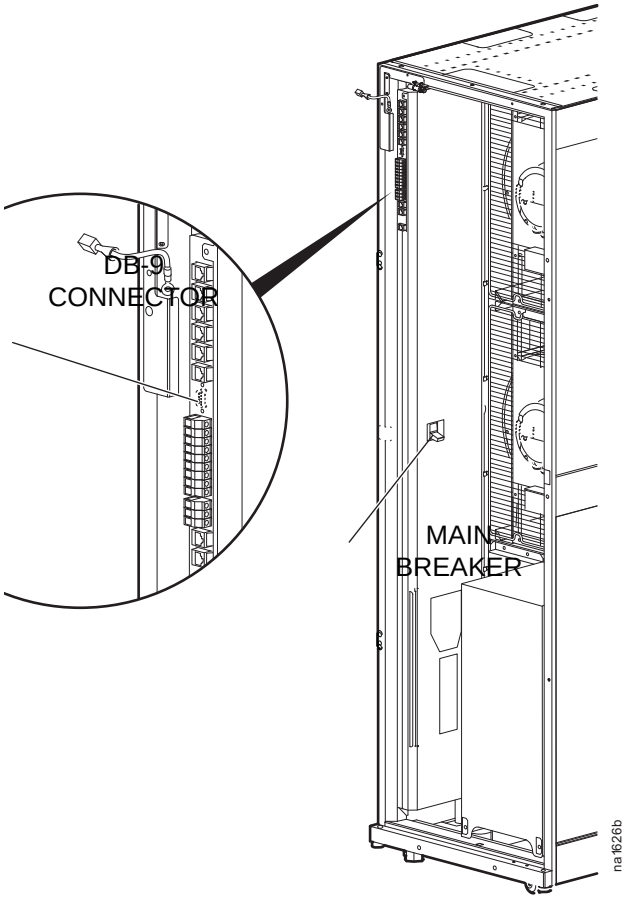
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must be installed and serviced by qualified personnel only.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use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

You can use a local computer, a computer that connects to the Network Management Card or other device through the serial port to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the Schneider Electric modem cable (part number 940-0103) to the selected port on the computer and to the serial port at the cooling unit (use the DB-9 connector on the front of the electrical panel).
3. Run a terminal program (such as HyperTerminal) and configure the selected port as follows:
   - 9600 bps
   - 8 data bits
   - none parity
   - 1 stop bit
   - none flow control
4. Press ENTER on the computer, repeatedly if necessary, to display the **User Name** prompt.

   If you are unable to display the **User Name** prompt, verify the following:
   - The serial port is not in use by another application.
   - The terminal settings are correct as specified in step 3.
   - The correct cable is being used as specified in step 2.



5. Switch the main breaker to OFF**.** Wait one second. Switch the main breaker to ON**.**
   NOTE: If you wait too long to return power to the cooling unit, you must repeat step 5.
6. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc,** for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)
7. From the **Control Console** menu, select **System**, then **User Manager**.
8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**. Select **Accept Changes** to store the new user name and password values.
9. Press CTRL+C, log off, reconnect any serial cable you disconnected, restart any service you disabled, reinstall the lower air filter, and replace the rear panel.

Monthly Preventive Maintenance

The following pages can be photocopied and used during the maintenance procedures. After they have been filled out, save them for future reference.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Environment

- ❑ In what type of room is the cooling unit located?
  _____
- ❑ Is the cooling unit maintaining the temperature setpoint?
  _____

  Temperature setpoint _____
- ❑ Is there visible damage to the cooling unit (dents, scratches)?
  _____
  _____
  _____
  _____
- ❑ Check for environmental damage (dirt, dust, debris, liquid stains) around the installation area.
  _____
  _____
  _____
- ❑ Record the room temperature/humidity near the return of the cooling unit.

  Temperature _____
- ❑ Record the alarm history from last month.
  _____
  _____
  _____
  _____

Cleanliness

- ❑ Check the condition of the return air filters. Clean or replace if necessary.
- ❑ Check the condition of the drain pan and accumulation of debris in the pan. Clean as required.

Mechanical

⚠ ⚠ 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.

- ❑ Check the fans. All components should be moving freely with no signs of binding or damages.
- ❑ Verify that the condensate line is flowing freely.
- ❑ Verify the chilled water supply temperature for the cooling unit.

  Chilled water supply temperature_____

Electrical

⚠ ⚠ 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.

- ❑ Before checking the electrical connections, shut off and lock out the power to the cooling unit.
- ❑ Inspect the electrical panel for tight connections or overheated connections from loose contact terminals
- ❑ Confirm the incoming main power matches the requirements listed on the cooling unit nameplate. The measurement should be within 10% of the nameplate listing.

Quarterly Preventive Maintenance

* Perform all the Monthly Preventive Maintenance items **and** the items below.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Mechanical

Verify that the fan hardware is tight.

⚠⚠ 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.

- ❑ Clean/replace filters.
- ❑ Clean condensate drain line.
- ❑ Remove any debris from condensate floats.
- ❑ Clean dust from door perforations.
- ❑ Clean dust from fan bezels.

Functional tests

- ❑ Verify the cooling operation mode.

Semi-Annual Preventive Maintenance

* Perform all the Monthly/Quarterly Preventive Maintenance items **and** the items below.

Prepared By: _____

Model Number: _____

Serial Number: _____

Date: _____

Cleanliness

❑ Check the cleanliness of the evaporator coil. Clean if required.

Troubleshooting

Problem	Possible Cause	Corrective Action
Controls erratic or inoperative	• Inlet temperature to cooling unit is higher than rated maximum temperature	• Reduce the load or add additional cooling equipment.
Fans fail to start	• Power supplies are not operating properly	• Confirm that the power supplies are seated properly and fully engaged. This is indicated by a green LED. • Confirm that the cooling unit is plugged in and is receiving power.
	• Failed power supply	• Replace the power supply if the LED is red.
	• cooling unit shutdown due to an external command	• Temporarily remove the input contact cable, if it is connected.
	• Single fan fails to start	• Verify that the fan circuit breaker is ON.
cooling unit cannot obtain setpoint	• Improper placement of remote temperature sensor	• Verify that the remote temperature sensor is properly located in the cold aisle.
	• Dirty filter	• Clean the filter.
	• Dirty coil	• Clean the coil.
	• Application error	• Contact Schneider Electric at a number located on the rear of this manual.
	• Heat load is too far away	• Place the cooling unit closer to the heat load.
Water carryover	• Improper fan speed selected	• RACS and HACS only: Select the next-highest fan speed setting. For example, change the fan speed setting from Med/Low to Low.
	• Room humidity is too high	• Adjust setpoint on dehumidifying equipment. • Add additional dehumidifying equipment.
	• Room humidity is too high/low	• Adjust setpoint on humidifying or dehumidifying equipment. • Improve room sealing.
Temperature control not tight enough	• Improper placement of remote temperature sensor	• Verify that the remote temperature sensor is properly located in the cold aisle.
Water on outside of cooling unit	• Condensate drain hose is not connected or not properly routed outside the cooling unit	• Verify that the condensate drain hose is properly connected to the pump and properly routed outside of the cooling unit. • Verify that the condensate drain line does not exceed 3.5 m (11.5 ft) lift and 18.0 m (60.0 ft) horizontal run.
	• Leak in drain system	• Locate and repair the leak.
	• cooling unit not leveled properly	• Adjust the leveling feet of the cooling unit.
	• Damaged piping insulation	• Identify damaged area and repair the insulation.

Problem	Possible Cause	Corrective Action
Display interface not operational, but cooling unit operates	• Display interface not connected properly	• Verify that the display interface cable is connected properly.
Incorrect air pressure	• False filter clogs	• Verify that the ends of the clear plastic air tubes are not obstructed. • Verify that the clear plastic air tubes are connected to the controller. • Verify that the clear plastic air tubes are not pinched.
Alarms do not show up on monitoring equipment (Customer Output Contact)	• External monitoring equipment is not receiving power or is not functioning properly	• Confirm that power, if required, is being supplied to the external equipment. • If the cooling unit (+12 V or +24 V) is providing power to the external equipment, verify that the external equipment is ≤50 mA. • Test the external equipment by bypassing the customer output contact. • Verify Customer Output Contact settings. See “Contacts” on page 18.
cooling unit does not shut down on command	• Drive voltage	• Verify that there is a drive voltage entering the input of the cooling unit. You may use the available +12 V or +24 V. You must also use the ground. • Verify Customer Input Contact settings. See “Contacts” on page 18.
No communication with building management system (BMS) port	• Improper connection	• Confirm that the cooling unit is connected to the BMS port and not to the Control port. • Make sure that the wire polarity is correct. Using a DC voltmeter, test the signal with no transmissions in progress. Expect the voltage at pin 2 to be greater than at pin 1 by at least 200 mV. Measure the cooling unit with the cable disconnected, and then measure it again with the cable connected. If the signal is less than 200 mV, the cooling unit may be reverse-wired. • Make sure that every cooling unit has either two sets of wires in its connector OR one set of wires and a 150 Ohm, 1/4 watt terminating resistor.
cooling units are not communicating with each other	• A-Link	• Verify that the first and last cooling units have one cable and a terminator. • Verify that every other cooling unit has two cables. • Confirm that the A-Link cables are connected to the A-Link ports and that a network cable is connected to the network port.
Humidifier not operating	• Circuit breaker tripped • Spent cylinder	• Reset circuit breaker. If the problem persists, consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support. • Replace the cylinder. Consult the humidifier manual. For further assistance, contact Schneider Electric Customer Support.
Output air is 17°C (62°F) and fans are running at a very high rate of speed.	• Upper or lower supply air sensor	• Either upper or lower supply air temperature sensor has a fault. Verify that both supply air temperature sensors are installed and working properly.

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.