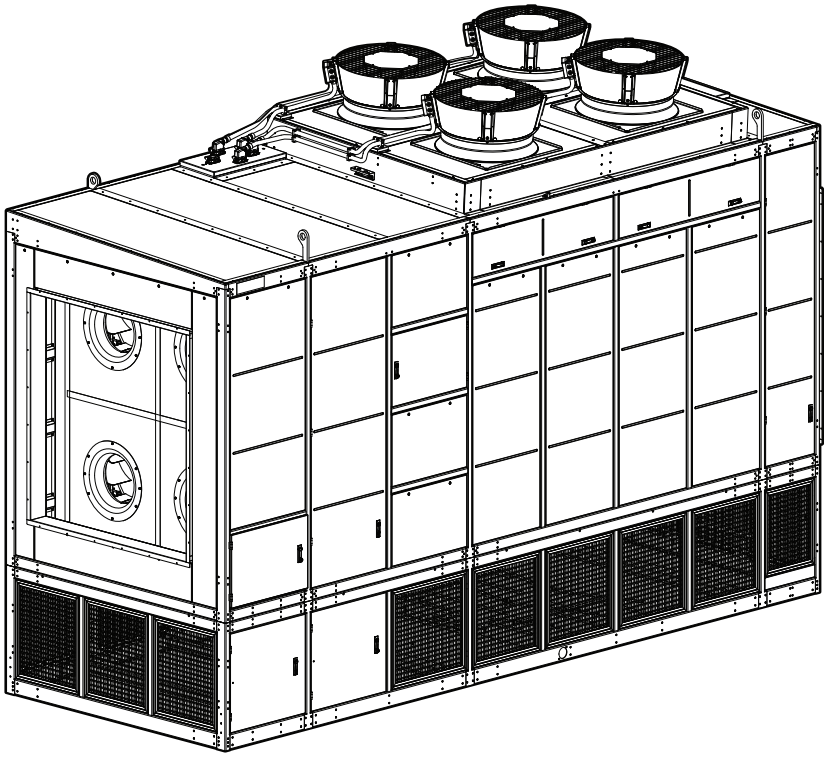
Indirect Air Economizer

Ecoflair™ Indirect Air Economizer

Installation Manual

990-9964C-001 / 06MM0350@00B0120
Release date: 05/2019



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Legal Information

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Safety

Important Safety Instructions — SAVE THESE INSTRUCTIONS

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

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

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

⚠DANGER

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

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

⚠WARNING

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

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

⚠CAUTION

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

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

NOTICE

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

Failure to follow these instructions can result in equipment damage.

Please Note

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

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

Safety During Installation

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- This equipment must be installed and serviced by qualified personnel only.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- If the power supply cord is damaged, it must be replaced by an equivalent cord or assembly available from the manufacturer or its service agent.

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

⚠⚠DANGER

ELECTRICAL HAZARD

Overcurrent protection for all incoming power feeds must be provided by the customer. See unit nameplate for equipment ratings.

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

⚠⚠WARNING

ELECTRICAL HAZARD

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

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

⚠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

PERSONAL PROTECTIVE EQUIPMENT REQUIRED

During installation, authorized personnel must wear approved personal protective equipment (PPE).

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

⚠WARNING

DAMAGE TO EQUIPMENT OR PERSONNEL

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

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

⚠CAUTION

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use R410A refrigerant only.
- Contents are under pressure: use caution when releasing pressure in the system or refilling.
- Charging and maintaining the refrigeration circuit must only be performed by qualified personnel.

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

⚠CAUTION

HEAVY OBJECT

- Use lifting aids or two person lift when installing and moving this equipment.
- Use proper lifting techniques.

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

NOTICE

PIPES FREEZING

External water piping must have adequate freeze protection and must be correctly applied based on local climatic conditions and best practices, such as electrically heat-traced and insulated (supplied by others).

Failure to follow these instructions can result in equipment damage.

General Information

Document Overview

The Ecoflair™ Indirect Air Economizer is used to control environments for telecom rooms, Internet hubs, and data processing centers.

This manual describes the cooling units with 400-V/ 3-phase/ 50-Hz power supply. It supplies general information, safety instructions, unit transportation, installation information, and necessary information on how to install the unit.

The descriptions and illustrations in this manual are owned by Schneider Electric. Schneider Electric reserves the right to make any alterations it sees fit in order to improve the product without having to update this document.

Save These Instructions

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

Manual Updates

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

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

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

Cross-Reference Symbol Used in This Manual

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

Abbreviations and Terminology

The following are abbreviations and terms used in this manual:

- IEC: Indirect evaporative cooling
- OA fans: Outdoor air fans
- EEV: Electronic expansion valve
- VFD/VSD: Variable-frequency drive/variable-speed drive
- DX: Direct expansion
- CW: Chilled water
- SCO: Source changeover
- BMS: Building management system
- HACS: Hot aisle containment system
- CACS: Cold aisle containment system
- RACS: Rack aisle containment system
- Main module: The display interface and this manual use the term “main module” to refer to the IAEC25*** section of an IAEC50*** unit that contains the display interface. If the unit is an IAEC25** unit only, the unit itself is the main module.
- Expansion module: The display interface and this manual use the term “expansion module” to refer to the IAEC25*** section of an IAEC50*** unit that does not contain the display interface. If the unit is only an IAEC25** unit, menus for an expansion module will not be available on the display interface.
- Module: The term “module” is used to refer to a IAEC25*** section of an IAEC50*** unit.

Receiving and Inspecting the Cooling Unit

The unit is covered with transparent film and may have rubber pads underneath the unit to prevent damage to the paint.

NOTE: The rubber pads need to be removed before installation.

Upon delivery, check to make sure the unit is intact and immediately notify the carrier in writing of any damage that can be attributed to careless or improper transportation.

Filing a Claim

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

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

Storing the Cooling Unit Before Installation

If storing the unit for a period of time, the following conditions must be met:

- The storage area must be dry (<85% R.H.) and protected against minimum storage temperatures –30°C (–22°F) and extreme storage temperatures 80°C (176°F).
- The unit should remain in its original packaging if stored for long periods of time.

Equipment Disposal

Waste Electrical and Electronic Equipment (WEEE) Disposal

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

Documentation Included with Unit

NOTE: Documentation included in the unit ship-loose kit will vary based on options selected.

- *Ecoflair Indirect Air Economizer Installation Manual*
- *Ecoflair Indirect Air Economizer Operation and Maintenance Manual*
- Electrical schematic
- Conductivity sensor manual
- Water treatment system manual
- Variable frequency drive manual

Moving the Unit

⚠WARNING

DAMAGE TO EQUIPMENT OR PERSONNEL

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

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

⚠WARNING

HEAVY EQUIPMENT

- Make sure the moving equipment is rated to lift the weight of the cooling unit.
- See *Weights, page 36* for weights.

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

NOTICE

EQUIPMENT DAMAGE

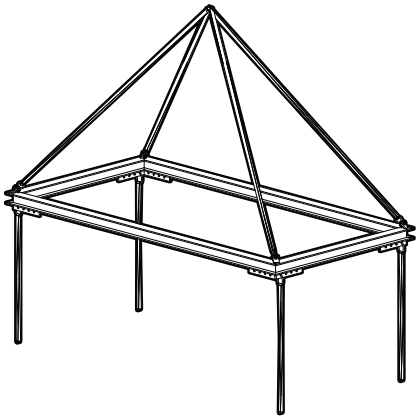
Sling and spreader bar should be aligned directly over lifting eyes to prevent damage to lifting lugs.

Failure to follow these instructions can result in equipment damage.

Required Tools

Crane

Sling and Spreader Bar

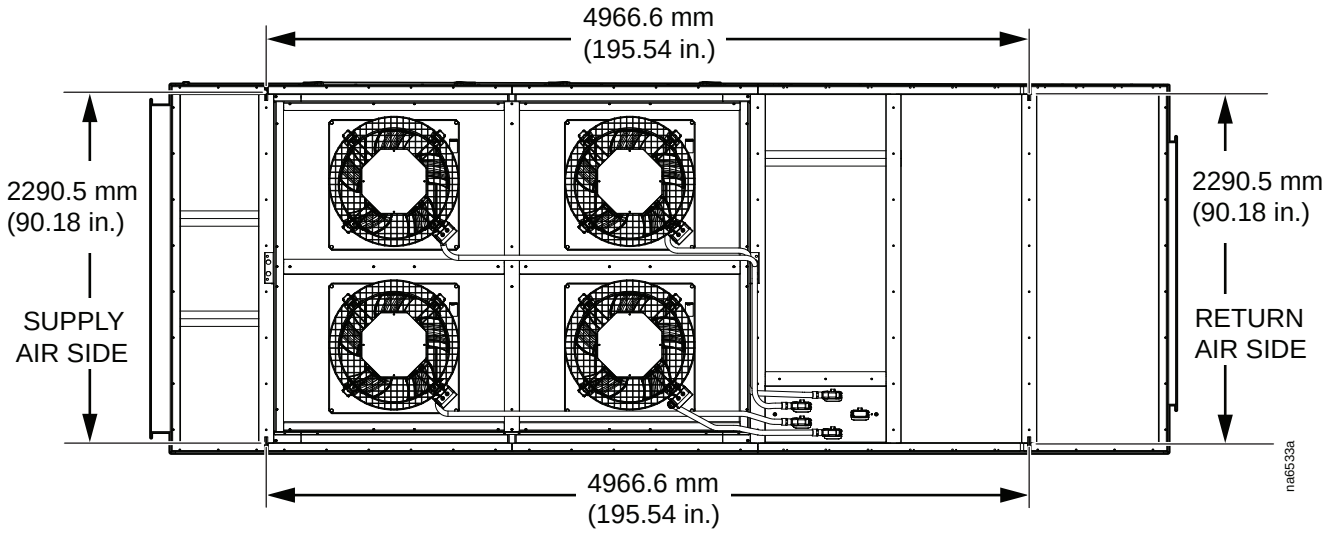


Lifting Configurations

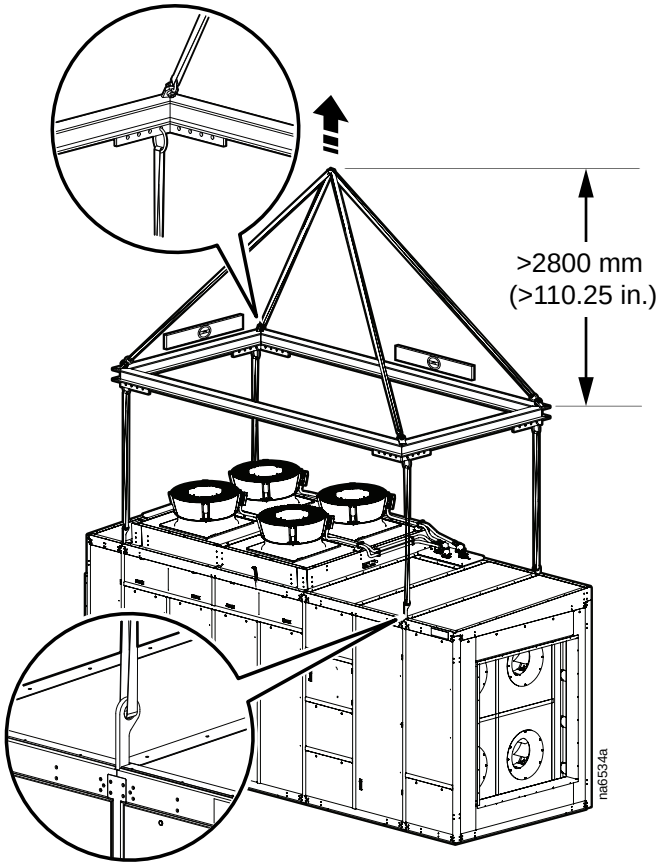
Upper Section Only

NOTE: Measurements are center-to-center for lifting lugs.

NOTE: Right-hand unit is shown. See *Weights, page 36* for weights.



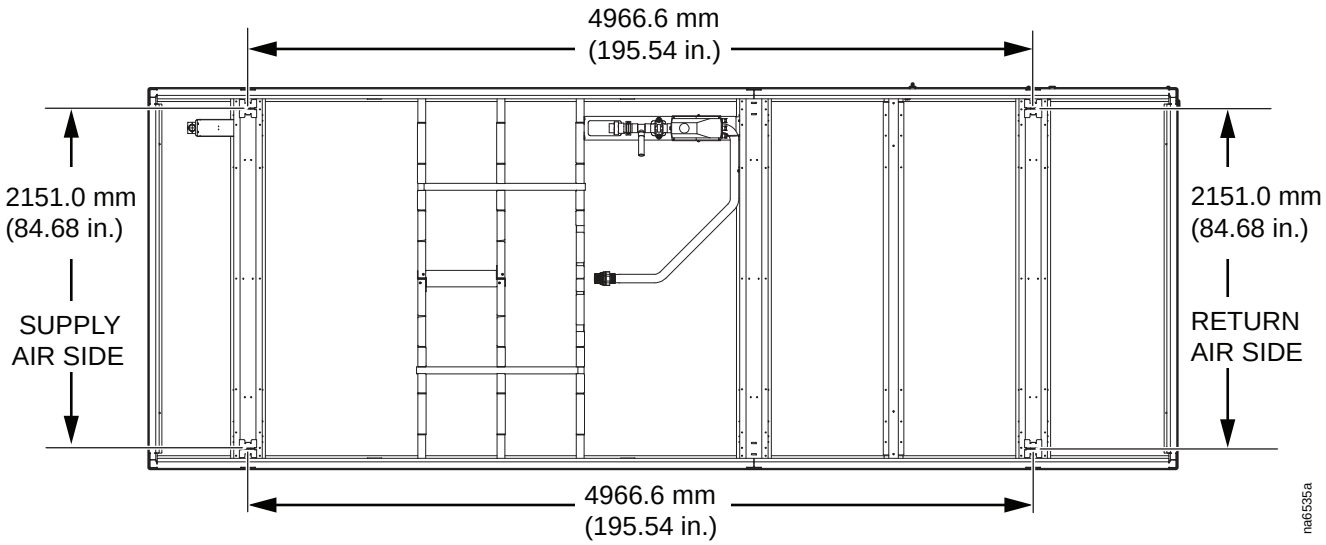
NOTE: Left-hand unit is shown.



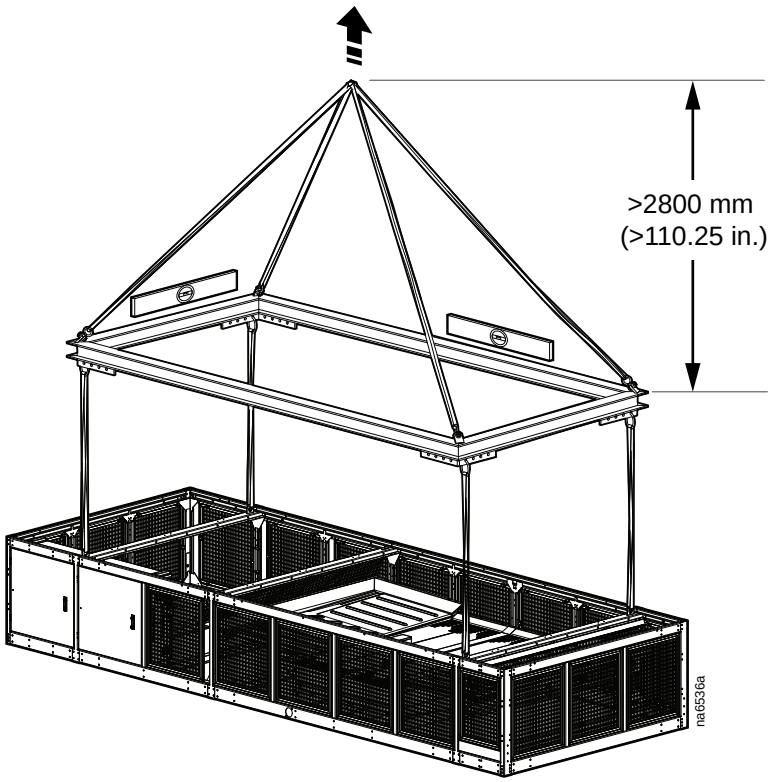
Lower Section Only

NOTE: Measurements are center-to-center for lifting lugs.

NOTE: Right-hand unit is shown. See *Weights, page 36* for weights.



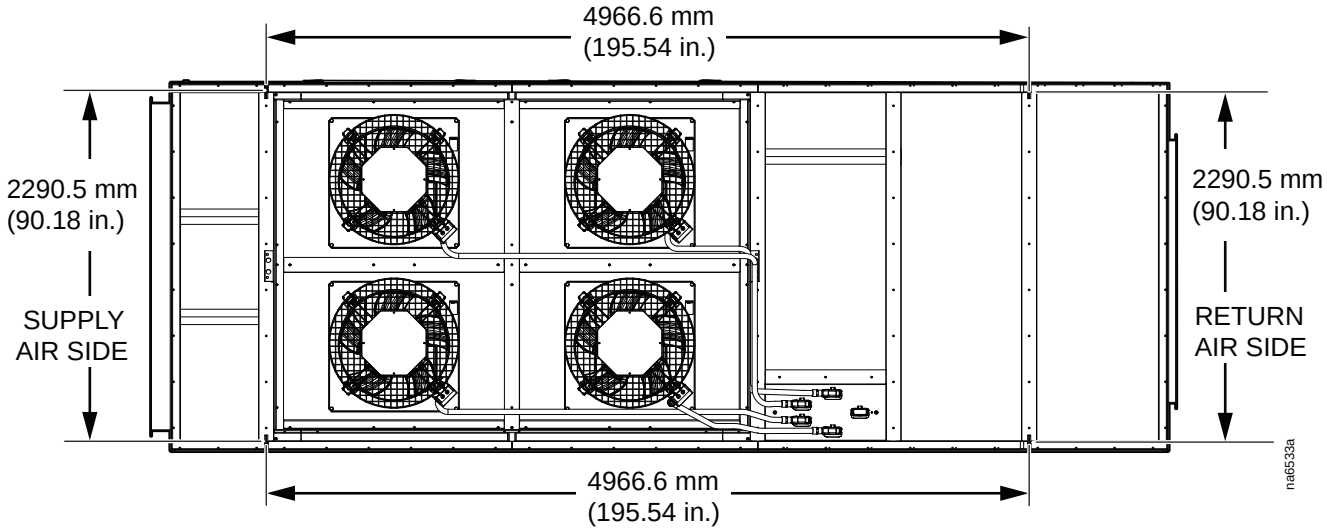
NOTE: Right-hand unit is shown.



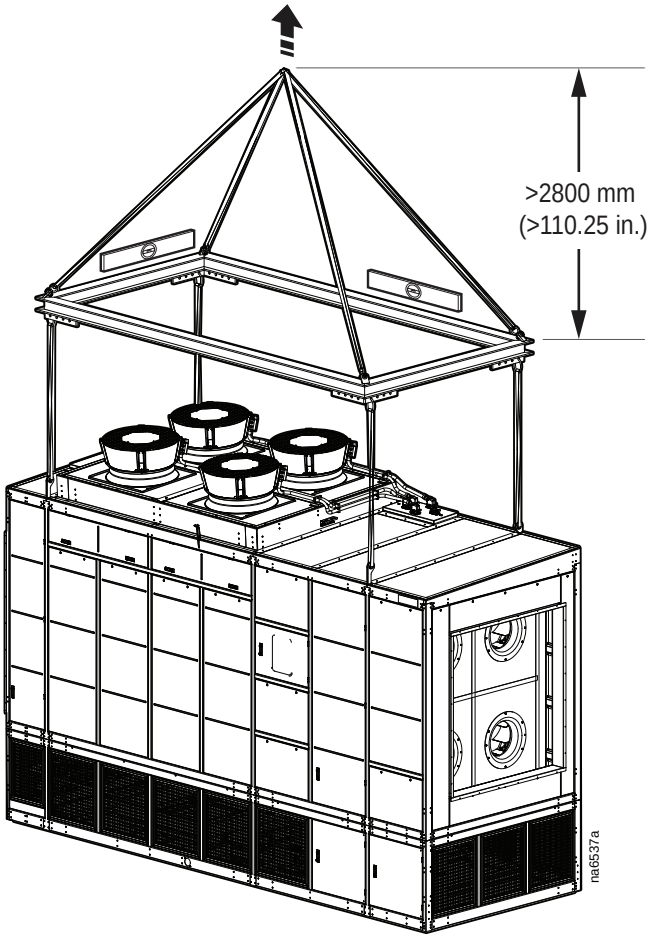
Full Unit

NOTE: Measurements are center-to-center for lifting lugs.

NOTE: Right-hand unit is shown. See *Weights, page 36* for weights.



NOTE: Left-hand unit is shown.



Equipment Guidelines

Working Conditions and Environmental Limits

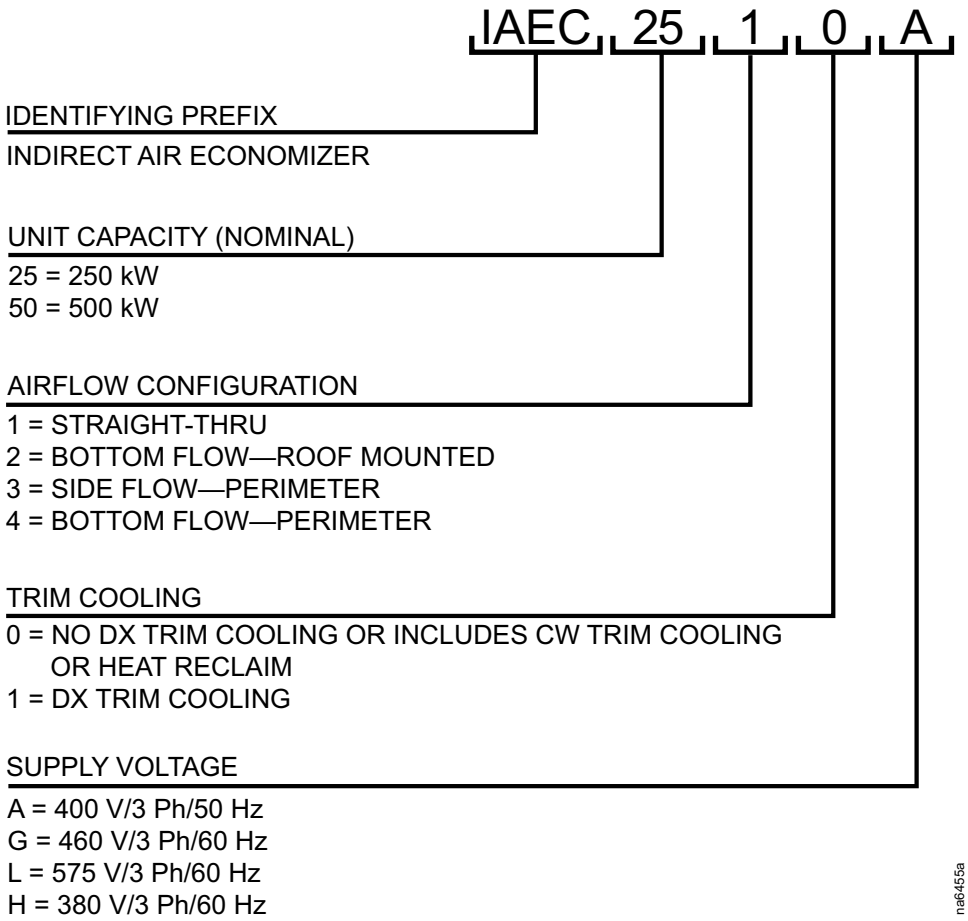
Limit Working Conditions	
Power supply	400 V/ 3 ph/ 50 Hz (TN) 460 V/ 3 ph/60 Hz 380 V/ 3 ph/60 Hz 575 V/ 3 ph/60 Hz
Lighting power supply	230 V/1 ph/50 Hz (TN) 115 V/1 ph/60 Hz
Refrigerant type	R410A
Compressor oil type	POE oil 160sz
Voltage input tolerance*	–5% / +10%
Ambient temperature**	–15°C to +50°C (5°F to +122°F) Optional: –40°C to +50°C (–40°F to +122°F)
Ambient %RH	0 to 100%RH
Altitude	–150 meters below to 3500 meters above sea level (–492 feet below to 11,483 feet above sea level)
IT room conditions (temperature/humidity)	Temperature: 18°C to 40°C (65°F to 104°F) Relative humidity: 30% to 70% and humidity ratio 5 to 12 grains/kg
Maximum inlet dew point	15°C (59°F)
Storage Conditions	
Temperature	–30°C (–22°F) to 80°C (176°F)
Humidity	<85%RH

*In accordance with the Standard Electromagnetic Compatibility (EMC): CEI EN 61000-4-11:2006-02, EN 61000-4-11:2004-08, IEC 61000-4-11:2004-03, FCC

**Maximum temperature for IT return air is 40°C (104°F).

Unit Overview

Model Nomenclature

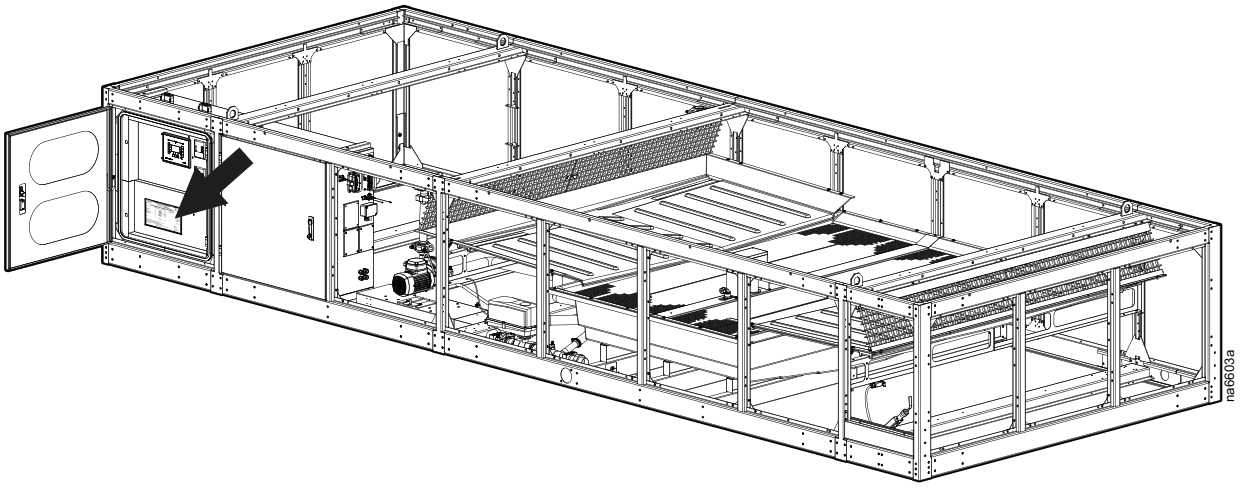


Nameplate

Lower Section

The nameplate in the lower section is located on the internal protective panel of the electrical panel and provides information on unit model, serial number, digit code, electrical ratings, power supply, and operating limits.

IMPORTANT: Make sure the unit power supply is the same as the power supply listed on the nameplate.



Schneider Electric

Viale della Tecnica, 2
35026 Conselve (Padova) ITALY

Serial Number: **C000000000000**
Model Number: **IAEC2511A**
Digit Code: **B1BF0A1A0A1B0AS**

IAEC NAMEPLATE TDM

Supply Voltage: **400V/3Ph/50Hz + 230V/1PH/50Hz** Electrical Diagram: **06SExxxx**

	No.	Voltage	FLA (/1)	kW TOT
Fan (Outdoor)	**4**	**400V/3PH**	**7.5** A	19.6 kW
Fan (IT)	**4**	**400V/3PH**	**7.6** A	20.0 kW
Pump	**1**	**400V/3PH**	**2.0** A	1.0 kW
Compressor	**2**	**400V/3PH**	**34.0** RLA	36.0 kW
Crankcase Heater	**2**	**400V/1PH**	**0.3** A	0.13 kW
Water Treatment	**1**	**230V/1PH**	**0.7** A	0.15 kW
Heat Trace	**1**	**24V/1PH**	**1.7** A	0.04 kW
				76.9 kW
Lighting	**2**	**230V/1PH**	**43** mA	**0.02 kW**

Max External Static Pressure (Max fan speed, Min Airflow) **160** Pa
Refrigerant Pressure Relief Valve (OPEN) **45** bar
High Head Pressure Cutout Switch (Manual Reset) **42** bar
Short Circuit Current: **Icu = 10kA** (CEI EN 60747-2)
Design Pressure: **23** bar (Low Side) **45** bar (High Side)
Charge (410A): **8.7** kg (ckt1) **9.1** kg (ckt2)
Max Water Inlet Temperature: **41** °C
Max Water Inlet Pressure: **550** kPa

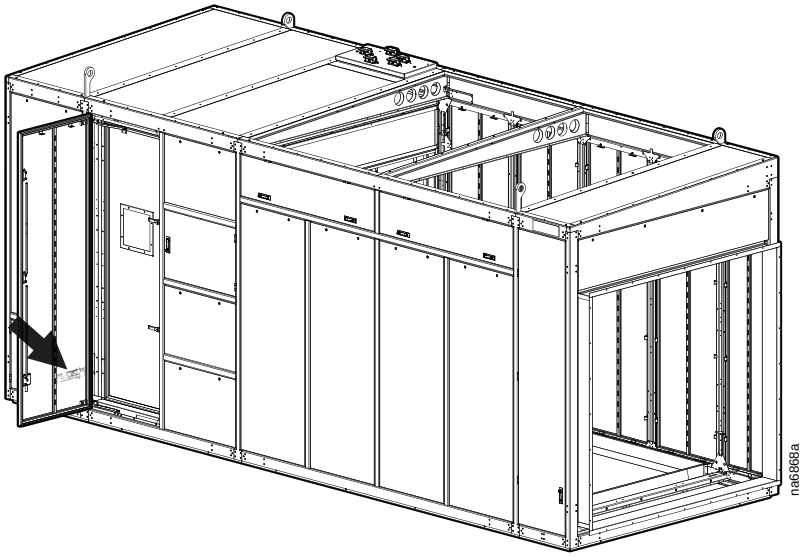
EXAMPLE

na6605a

Upper Section

The nameplate in the upper section is located on the inside of the service vestibule door and provides information on unit model, serial number, and digit code.

IMPORTANT: Make sure the digit codes are the same on the upper and lower sections before connecting the sections.



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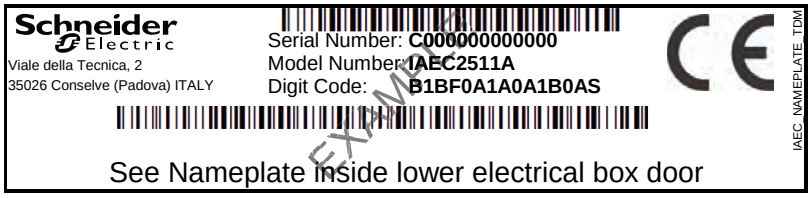

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Operational Overview

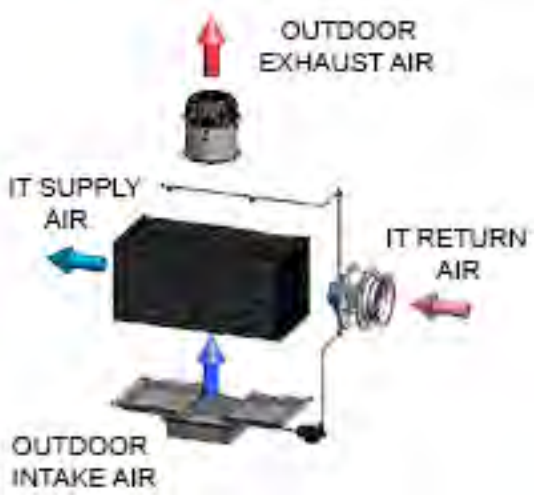
The Ecoflair Indirect Air Economizer is an indirect evaporative and air-to-air heat exchanger cooling solution. The Ecoflair Indirect Air Economizer has the ability to switch automatically between air-to-air and indirect evaporative heat exchange to consistently provide cooling to data centers in the most efficient way. The Ecoflair Indirect Air Economizer is able to reduce energy consumption by leveraging temperature differences between outside ambient air compared to IT return air to provide economized cooling to the data center. The Ecoflair Indirect Air Economizer meets ASHRAE 90.1/TC 9.9 requirements for efficiency and economization.

The Ecoflair Indirect Air Economizer is available in an individual nominal 250-kW main module or a main module combined with an expansion module to provide up to 500 kW of cooling capacity. Since the unit is located outside the perimeter of the data center, the Ecoflair Indirect Air Economizer takes up zero whitespace in the data center, enabling IT managers to utilize the space to increase capacity without needing to use any of that space for additional cooling units.

Air-to-Air Heat Exchange

The Ecoflair Indirect Air Economizer uses sensors to determine the ambient air temperature and automatically switch between dry mode and wet mode. Air-to-air heat exchange is the dry mode and only requires the power of the fans to move the air (extremely energy efficient). The energy efficient outside air fan modulates airflow across the heat exchanger to maintain the IT supply air setpoint.

- When ambient air drops below 4.4°C (40°F) the system water is drained to prevent freezing. The system water will also be drained if the water concentration is too high to be diluted to a usable state or if the water in the basin has been stagnant for a set period of time.
- Only the fans are required to move the air.
- Cool air passes over the outside of the heat exchanger channels, cooling the hot IT air flowing inside.



Indirect Evaporative Cooling (IEC)

The Ecoflair Indirect Air Economizer uses sensors to determine the ambient air temperature and automatically switch between dry mode and wet mode. Indirect evaporative cooling is the wet mode and allows for economizing in hot, dry climates. Unevaporated water is collected in the basin and recirculated through the water system. The conductivity meter in the basin maintains optimal water conditions.

- Heat is removed from the IT air by evaporating water on the outside of the heat exchanger channels.
- Water is supplied evenly over the heat exchanger channels via spray nozzles.
- The adjustable IT supply air setpoint is maintained.

Trim Cooling

The optional trim cooling circuit is available in two options: refrigerant system (DX) or chilled water system (CW).

DX System

If ambient conditions do not allow evaporative cooling to meet the supply air temperature setpoint, the Ecoflair Indirect Air Economizer equipped with a refrigeration system option can provide supplemental cooling to assist in reaching the supply air temperature setpoint. The DX trim cooling option is available in two options: one compressor on one circuit or two compressors on two circuits offering nominal cooling capabilities of up to 75 kW or 125 kW, respectively, in a proportional control method. When assistance from the refrigerant circuit is requested by the controller, the circuit will start at its lowest compressor speed of 25 Hz. If the system begins to overcool (supply air temperature is less than the supply air setpoint) at this compressor speed, the outdoor air (OA) fans will begin to slow down to regulate the supply air temperature. If the lowest compressor speed is not enough to sufficiently cool the air to the supply air setpoint, the OA fans will remain at maximum speed and the compressor speed will be increased incrementally until the supply air setpoint is met or the compressors reach their maximum speed.

NOTE: The unit always has two cooling coils.

- Brushless, variable-speed compressors allow for optimal efficiency
- Supplements evaporative cooling to maintain the supply air temperature setpoint
- Uses R410A refrigerant

If more information is required on the performance of the DX system in your application, contact you local Schneider Electric representative.

Chilled-Water System

The chilled water circuit is located downstream from the IEC heat exchanger.

- Available with a 2-way valve or 3-way valve configuration
- Internal piping and valves will be insulated in the factory
- Coil size can vary based on trim cooling need, inlet chilled water temperature, and water flow rate

If more information is required on the performance of the CW system in your application, contact you local Schneider Electric representative.

Water Saver

If **Water Saver** is enabled in the **Main > AC > Setup** screen, water system operation is suspended when dry operation is sufficient for the cooling demand. This may be a higher ambient air temperature than the usual 4.4°C (40°F) transition to dry mode. When **Water Saver** mode is enabled, the unit will not switch to wet mode until the **Wet Operate Temperature Setpoint** has been exceeded and the outdoor air (OA) fan speed exceeds 65% of the maximum fan speed for a length time that varies and is calculated by the controller.

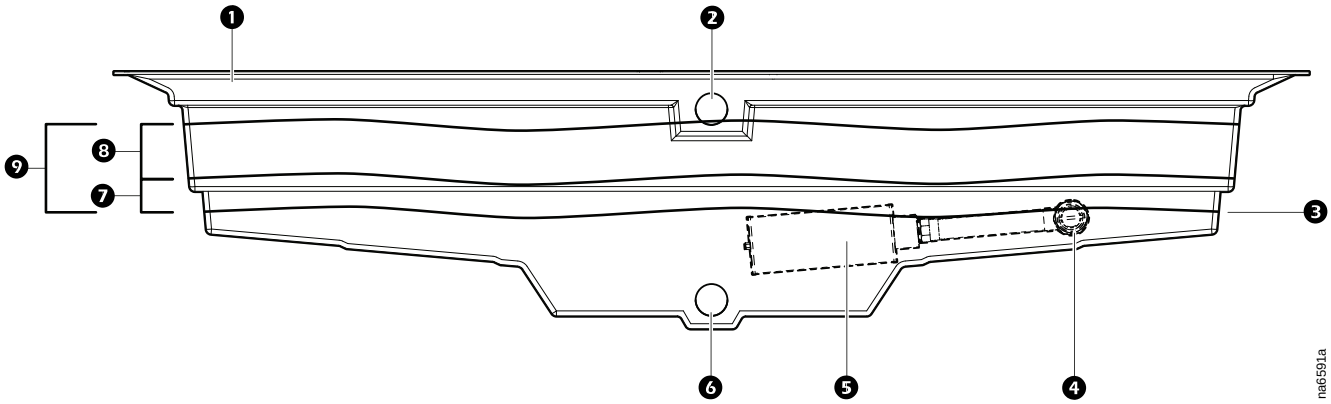
The consequence of using **Water Saver** mode is a higher OA fan speed with the resulting higher energy consumption. By default, **Water Saver** mode is disabled.

Water Operation Reserve Time

The **Water Operation Reserve Time** determines how much water is maintained in the water basin to provide continual wet operation of the Ecoflair Indirect Air Economizer in case of short-termloss of the main water supply. The user can select to maintain the water in the basin at a volume to provide between 0 and 30 minutes nominally of continuous wet operation if the water supply is lost. This is a volume of water that is always available for use even when the water supply is operational. **Water Operation Reserve Time** is set in the **Service** menus and should only be changed by qualified personnel.

Depending on the value set for **Water Operation Reserve Time**, the water level will be maintained between 337 l (89 gal) and 488 l (129 gal). The water volume at which the water circulation pump will stop operation is 261 l (69 gal). The volume of water maintained in the water basin is calculated by the volume difference of the minimum maintained level and the pump operation stop level based on a nominal water usage rate of 0.13 l/s (2 gpm). For example, if 10 minutes is entered for the **Water Operation Reserve Time** setting, then the basin will be maintained at a water reserve volume level of 76 l (20 gal) above the pump suction connection in order to be able to provide a nominal 10 minutes of wet operation during a loss of water supply.

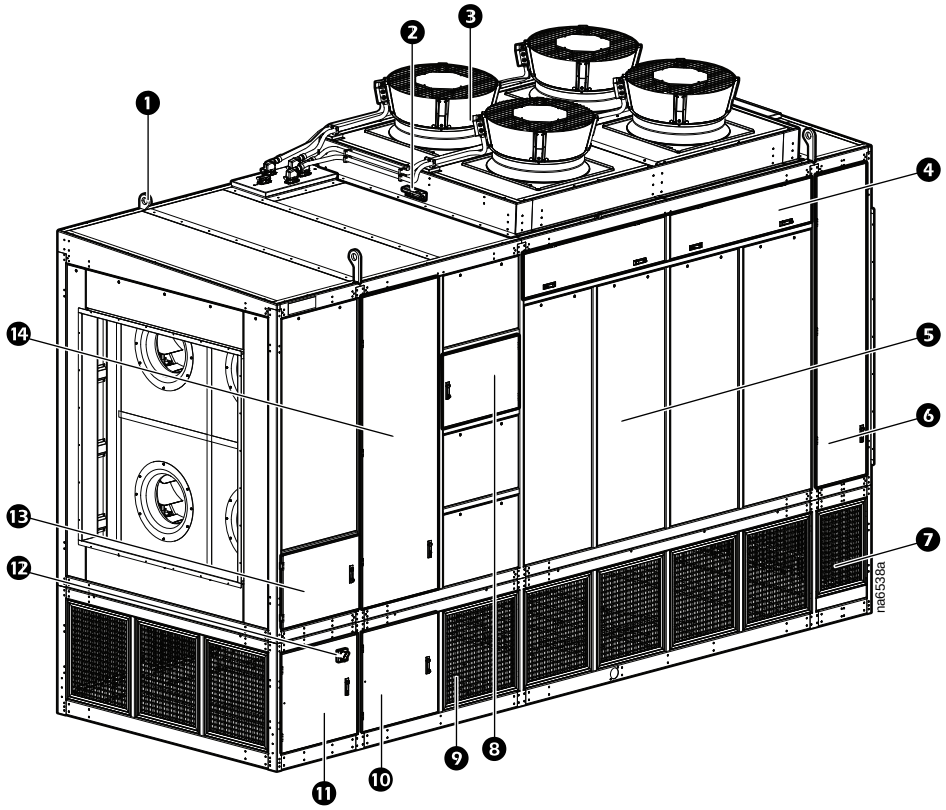
In wet mode, the water level is regulated between this calculated minimum level and the maximum capacity of the water basin.



Item	Description
1	Water basin
2	Water overflow port
3	Minimum required water level
4	Pump suction connection
5	Water strainers—#20 mesh
6	Drain port
7	Water reserve time volume (always available for use)
8	Operational water volume
9	Total usable water volume

Component Identification

External Components



Item	Description
1	Lifting lugs
2	Service personnel tie-off point (one on each side of OA fan section)
3	Outdoor air electronically commutated fans (OA EC fans)
4	Mist eliminator and evaporative spray nozzles access
5	External panels
6	Supply air section and DX trim cooling access (if DX trim cooling option is installed)
7	Air mesh panel—DX condensate drain hose connection and water connection access (if DX trim cooling option is installed)

Item	Description
8	Display interface access*
9	Air mesh panel or optional OA filters—upper-to-lower connections access • Water connection (grooved coupling) • Lighting power quick connection • Communication connection
10	Lower section power distribution and customer connections access
11	Main power connections
12	Power disconnect switch**
13	Main power quick connection access and main power disconnect switch
14	Service vestibule • VSD compressors • Electrical panel • Filters (optional) • IT fans

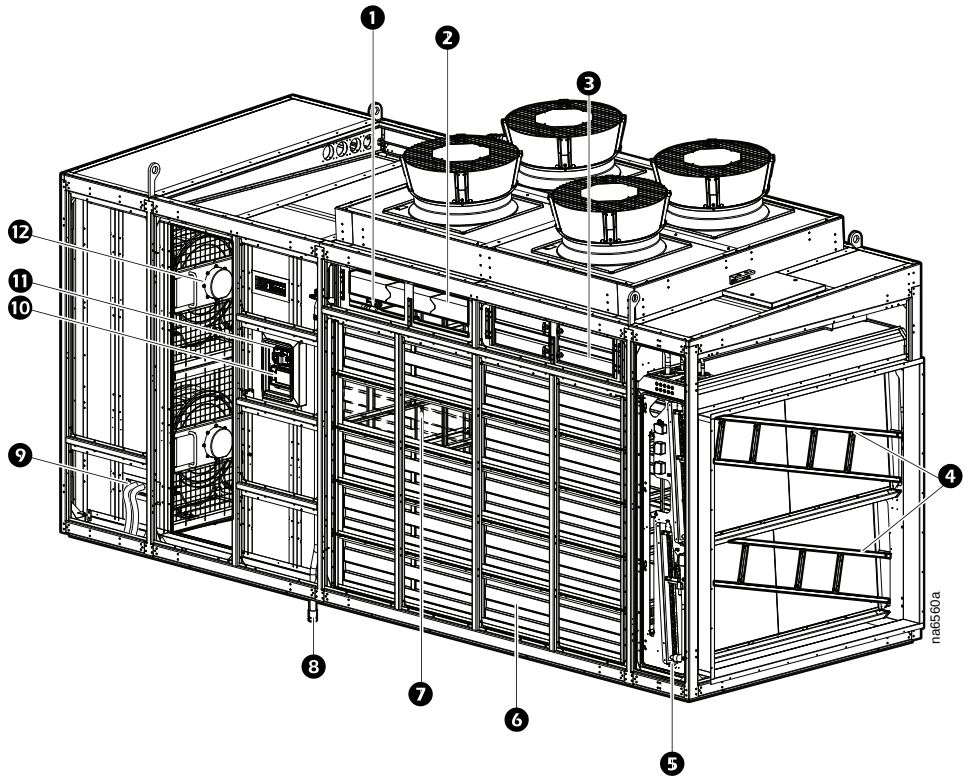
*For IAEC50*** units, the display interface will be on the main module only.

**Single power supply units only.

NOTE: A right-hand unit is shown: components are mirrored for a left-hand unit.

Internal Components

Upper Section

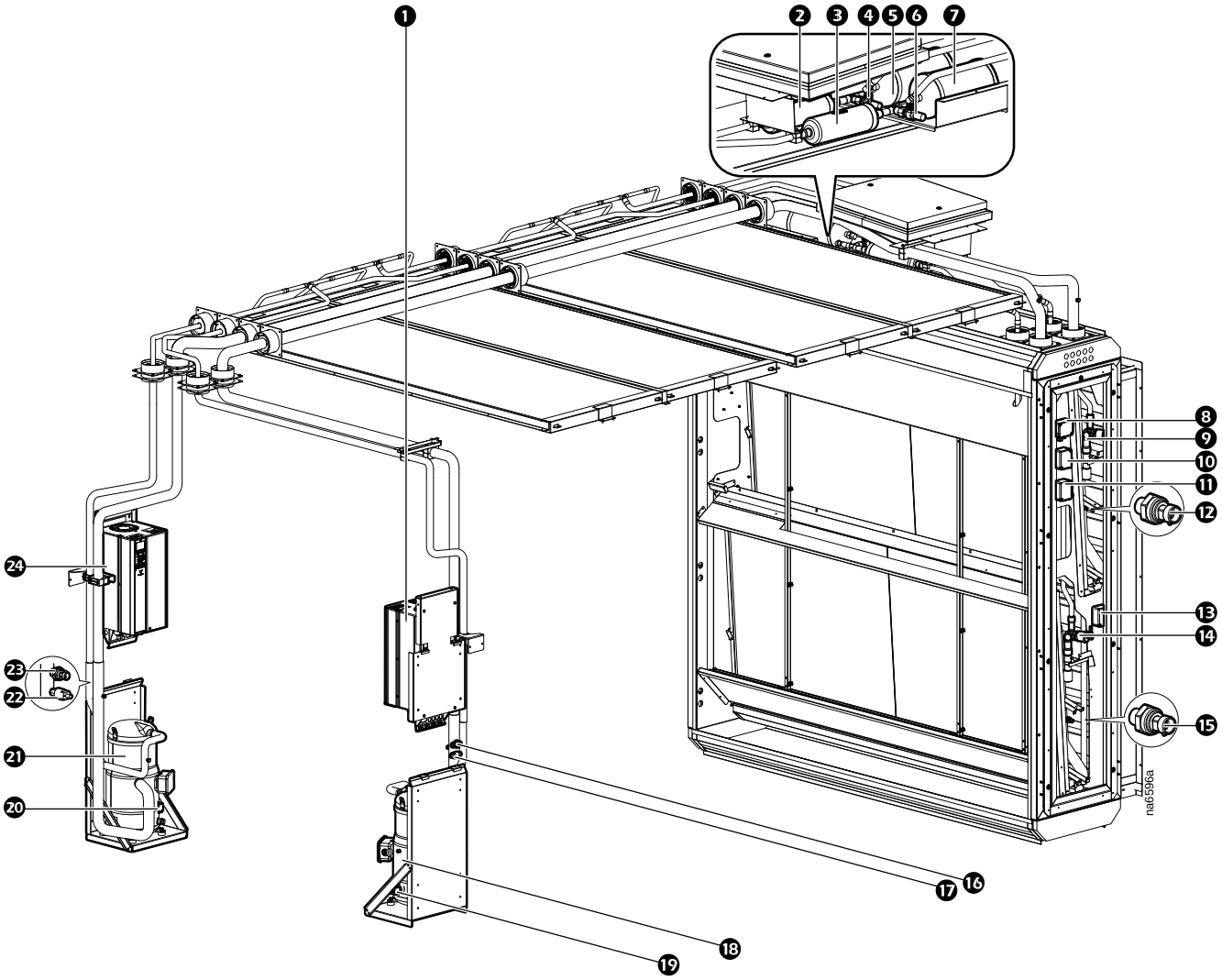


Item	Description	Item	Description
1	Spray nozzles	7	IT air filters (accessible from the service vestibule) (optional)
2	Mist eliminator	8	Upper-to-lower supply water connection
3	Mist eliminator and evaporative spray nozzle internal access panel	9	Upper-to-lower power connections (essential power connection and DX power connection if DX trim cooling option is installed)
4	Supply air sensor arrays	10	Display interface*
5	Trim cooling section (125-kW DX trim cooling is shown)	11	Low ambient temperature option
6	IEC core	12	IT fans

*For IAEC50*** units, the display interface will be on the main module only

NOTE: A right-hand unit is shown: components are mirrored for a left-hand unit.

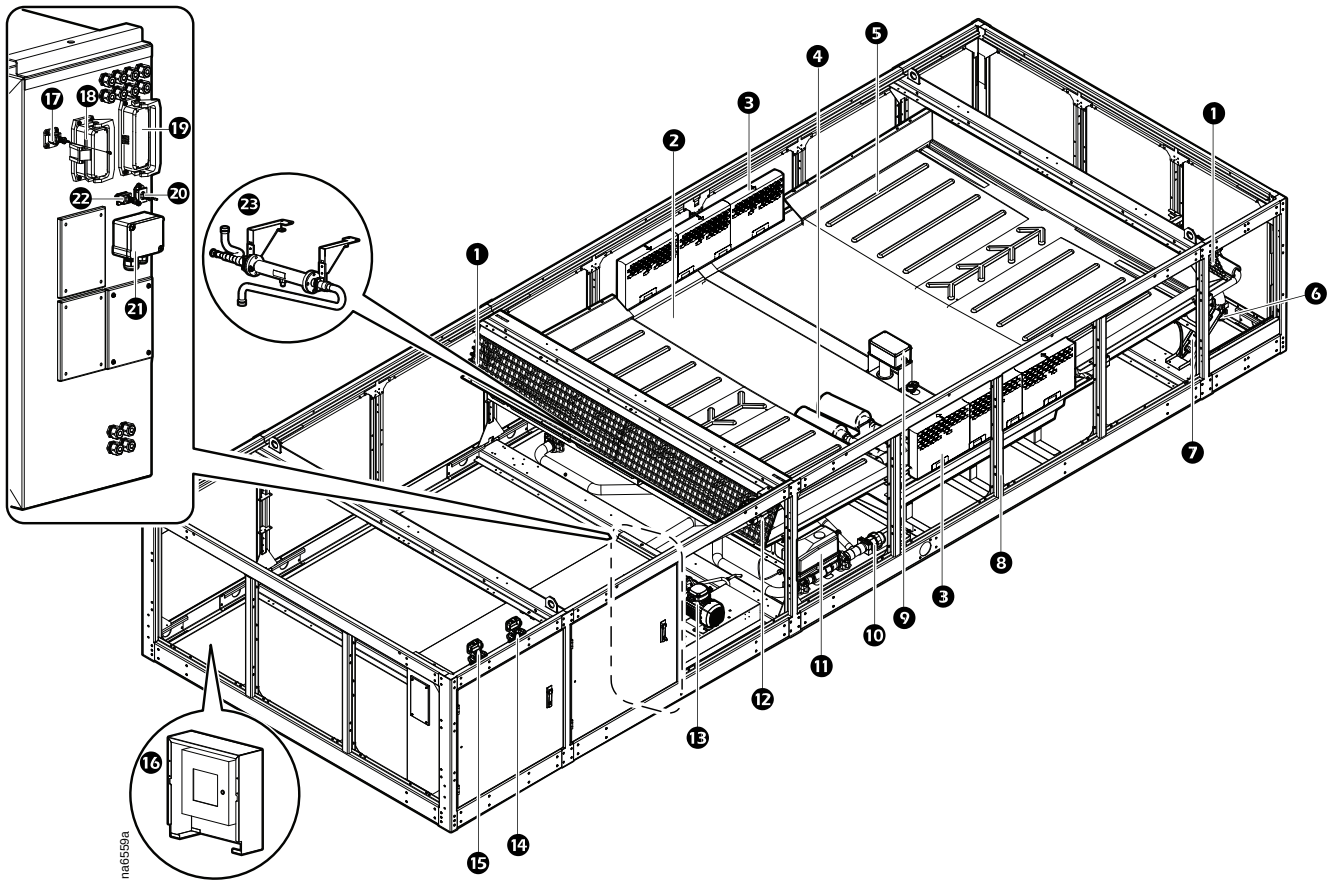
DX System (Optional)



Item	Description	Item	Description
1	Variable frequency drive (VFD) (circuit 2)	13	Supply air temperature sensor (circuit 2)
2	Filter drier (circuit 2)	14	Electronic expansion valve (EEV) (circuit 2)
3	Filter drier (circuit 1)	15	Suction pressure and temperature sensor (circuit 2)
4	Pressure relief valve (circuit 2)	16	Discharge pressure sensor (circuit 2)
5	Liquid receiver (circuit 2)	17	High head pressure switch (circuit 2)
6	Pressure relief valve (circuit 1)	18	Variable speed compressor (circuit 2)
7	Liquid receiver (circuit 1)	19	Oil injection solenoid (circuit 2)
8	Supply air temperature sensor (circuit 1)	20	Oil injection solenoid (circuit 1)
9	Electronic expansion valve (EEV) (circuit 1)	21	Variable speed compressor (circuit 1)
10	IEC supply air temperature sensor 1	22	High head pressure switch (circuit 1)
11	IEC supply air temperature sensor 2	23	Discharge pressure sensor (circuit 1)
12	Suction pressure and temperature sensor (circuit 1)	24	Variable frequency drive (VFD) (circuit 1)

NOTE: DX circuit 1 is always located on the side of the service vestibule with the electrical box. A right-hand unit is shown: components are mirrored for a left-hand unit.

Lower Section

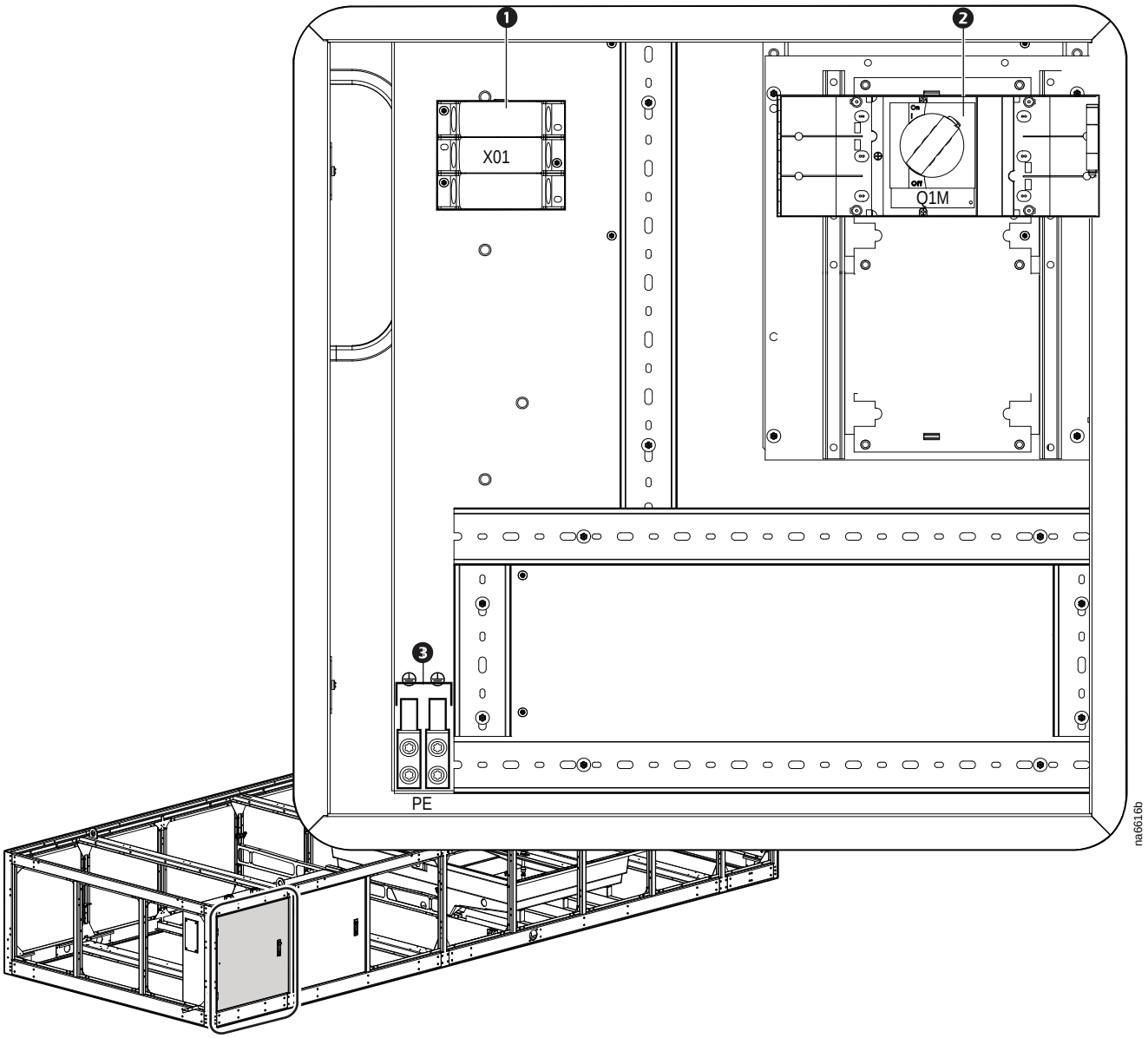


Item	Description	Item	Description
1	Water collection mesh panel	13	Evaporative water circulation pump
2	Water basin	14	Essential power connection
3	Inlet air louvers	15	DX power connection (optional)
4	Water basin strainers	16	Water treatment control panel (optional)
5	Water basin collection trays	17	Lighting connection to upper section
6	Water inlet connection	18	Communication connection to upper section
7	Heat trace	19	Communication connection to upper section
8	Removable cross member for basin servicing	20	RTU/energy meter/AFC connection to upper section
9	Basin water level sensor	21	Outdoor air temperature and humidity sensor
10	Basin drain connections	22	Ethernet connection to upper section
11	Basin drain actuator valve	23	Water treatment system (optional)
12	Upper-to-lower water connection (behind frame)		

NOTE: A right-hand unit is shown: components are mirrored for a left-hand unit.

Electrical Panels—Single Power Supply

Lower Section Electrical Panel—Power Connections

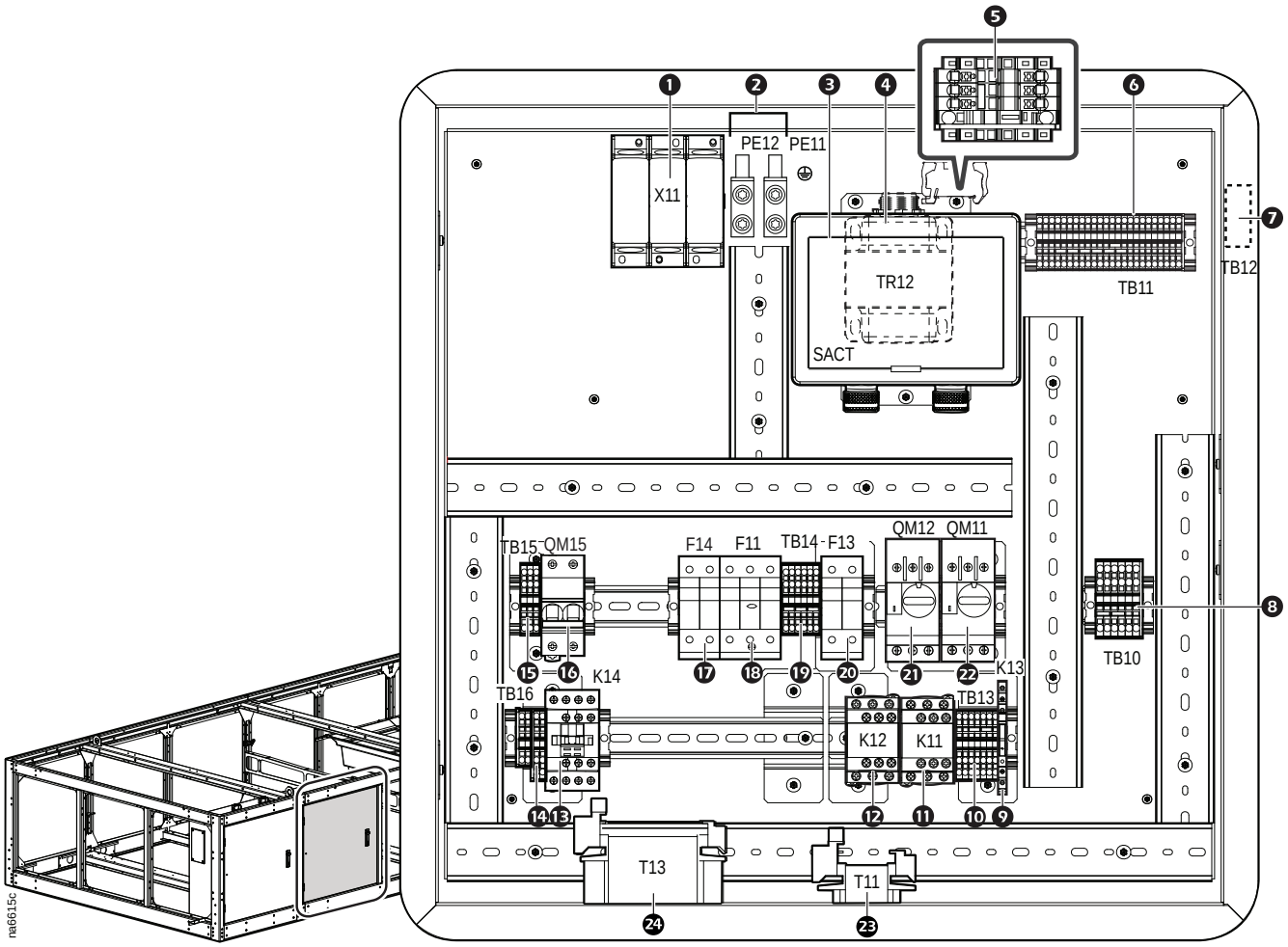


Item	Description
1	Power supply 1 connection (X01)*
2	Power supply 1 motorized disconnect/power supply 1 motor (Q1/Q1M)
3	Power supply ground (PE)

*Component, if present, is still live even when the power disconnect button is activated or if Q1M is in Lockout/Tagout state.

NOTE: Right-hand unit is shown above: panel location is mirrored in a left-hand unit.

Lower Section Electrical Panel—Customer Connections



Item	Description	Item	Description
1	Power splicer block (X11)	13	Water system contactor (K14)**
2	Ground (PE11, PE12)	14	Terminal blocks (TB16)
3	Water conductivity sensor display (SACT)	15	Terminal blocks (TB15)**
4	Customer I/O isolation transformer (TR12)	16	Water system contactor (QM15)**
5	Terminal blocks (TB17)	17	Water system fuse (F14)**
6	Terminal blocks for customer digital I/O (TB11)	18	Power distribution fuse (F11)
7	Terminal blocks (TB12)	19	Terminal blocks (TB14)
8	Terminal blocks for customer lighting power feed (TB10)*	20	Heat trace fuse (F13)
9	Heat trace relay (K13)	21	Pump 2 motor contactor (QM12) (available if two pumps are installed)
10	Terminal blocks (TB13)	22	Pump 1 motor contactor (QM11)
11	Pump 1 contactor (K11)	23	Heat trace transformer (T11)
12	Pump 2 contactor (K12) (available if two pumps are installed)	24	Water treatment system transformer (T13)**

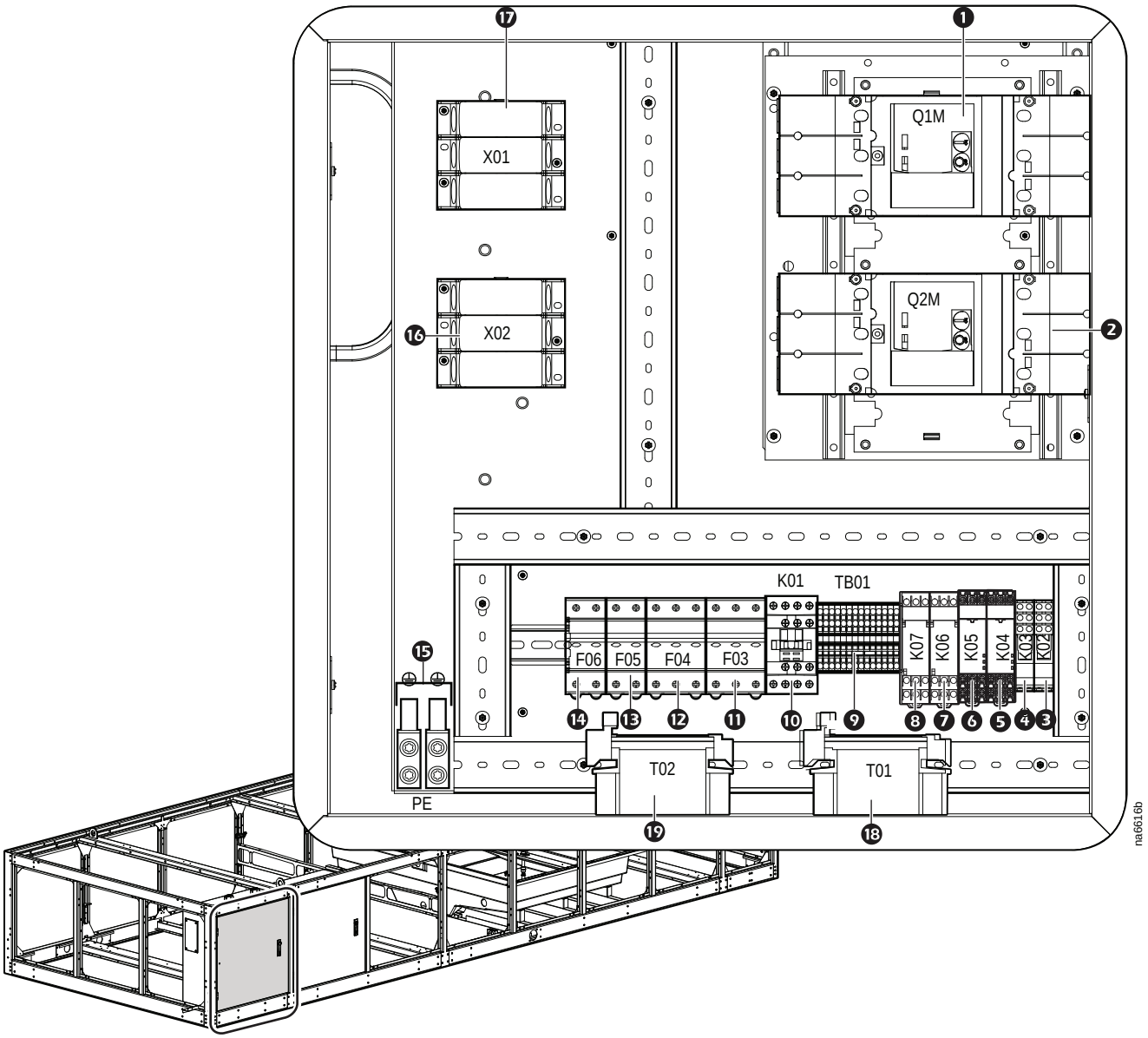
*Component, if present, is still live even when the power disconnect button is activated or if Q1M is in Lockout/Tagout state.

**Components are present if the water treatment option is installed.

NOTE: Right-hand unit is shown above: panel location is mirrored in a left-hand unit.

Electrical Panels—Dual Power Supply with Source Changeover

Lower Section Electrical Panel—Power Connections



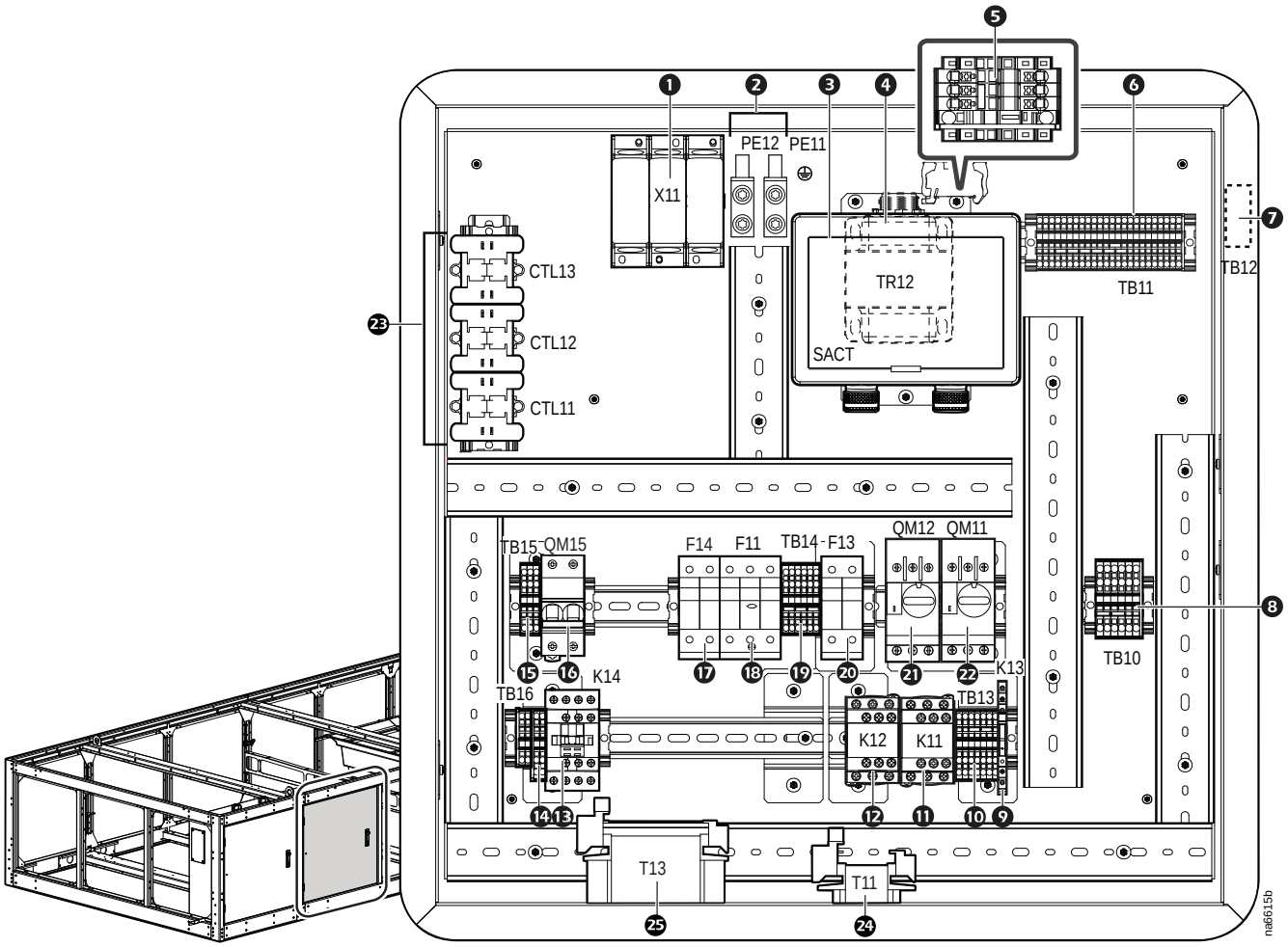
Item	Description
❶	Power supply 1 motorized disconnect/power supply 1 motor (Q1/Q1M)
❷	Power supply 2 motorized disconnect/power supply 2 motor (Q2/Q2M)
❸	Q1 primary selection relay (K02)*
❹	Q2 primary selection relay (K03)*
❺	Q1 timer relay (K04)*
❻	Q2 timer relay (K05)*
❼	Power supply 1 phase monitoring relay (K06)*
❽	Power supply 2 phase monitoring relay (K07)*
❾	Terminal blocks (TB01)*
❿	SCO motor relay (K01)*

Item	Description
⓫	Power supply 1 safety fuse (F03)*
⓬	Power supply 2 safety fuse (F04)*
⓭	Power supply 1 SCO motor fuse (F05)*
⓮	Power supply 2 SCO motor fuse (F06)*
⓯	Power supply 1/2 ground (PE)*
⓰	Power supply 2 connection (X02)*
⓱	Power supply 1 connection (X01)*
⓲	Power supply 1 motor transformer (T01)*
⓳	Power supply 2 motor transformer (T02)*

*Component, if present, associated with the SCO function is still live even when the power disconnect button is activated or if Q1M and Q2M are in Lockout/Tagout state.

NOTE: Right-hand unit is shown above: panel location is mirrored in a left-hand unit.

Lower Section Electrical Panel—Customer Connections



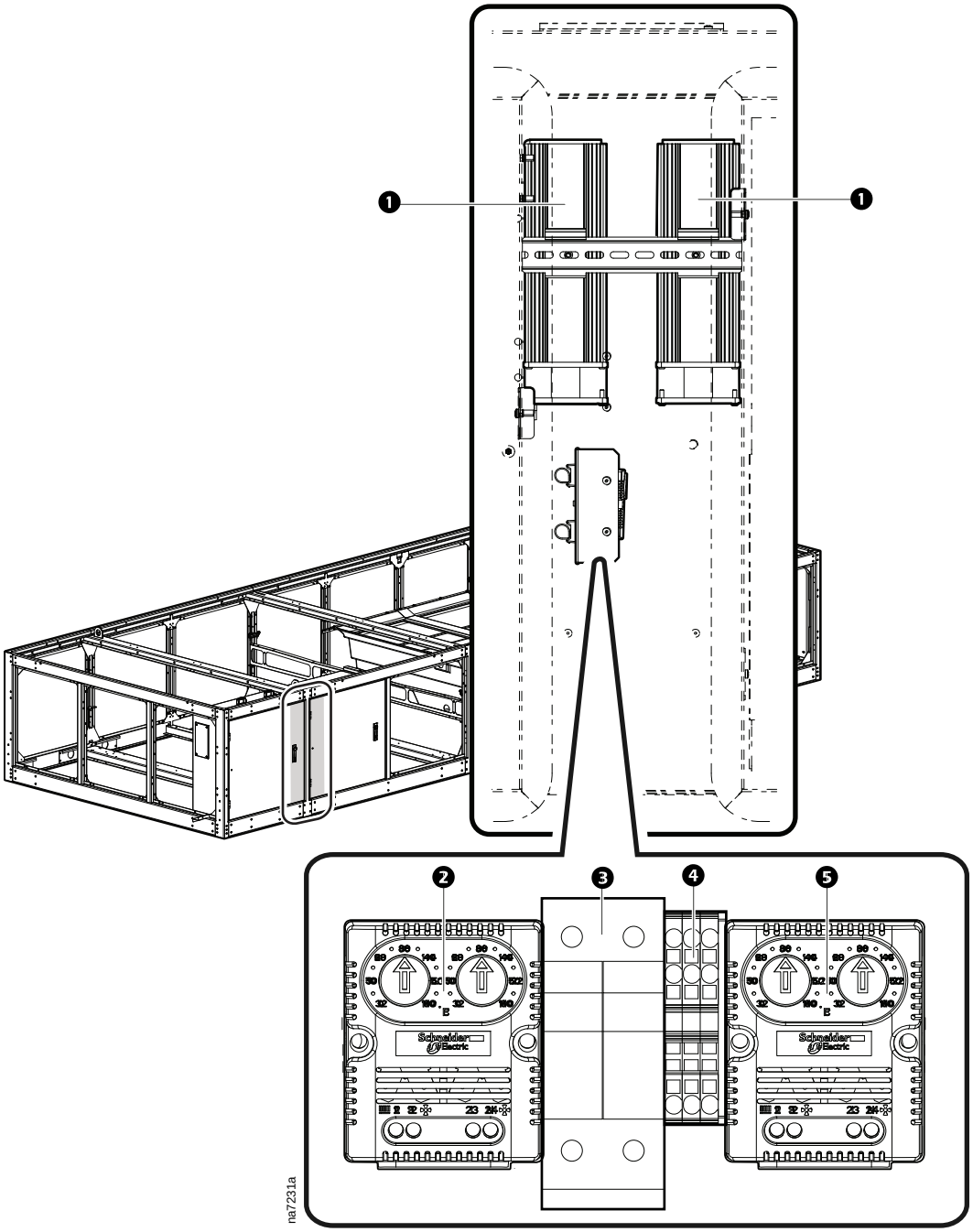
Item	Description
1	Power splicer block (X11)
2	Ground (PE11, PE12)
3	Water conductivity sensor display (SACT)
4	Customer I/O isolation transformer (TR12)
5	Terminal blocks (TB17)
6	Terminal blocks for customer digital I/O (TB11)
7	Terminal blocks (TB12)
8	Terminal blocks for customer lighting power feed (TB10)*
9	Heat trace relay (K13)
10	Terminal blocks (TB13)
11	Pump 1 contactor (K11)
12	Pump 2 contactor (K12) (available if two pumps are installed)
13	Water system contactor (K14)**
14	Terminal blocks (TB16)
15	Terminal blocks (TB15)**
16	Water system contactor (QM15)**
17	Water system fuse (F14)**
18	Power distribution fuse (F11)
19	Terminal blocks (TB14)
20	Heat trace fuse (F13)
21	Pump 2 motor contactor (QM12) (available if two pumps are installed)
22	Pump 1 motor contactor (QM11)
23	Current transformer (CTL11, CTL12, CTL13) (optional)
24	Heat trace transformer (T11)
25	Water treatment system transformer (T13)**

*Component, if present, associated with the SCO function is still live even when the power disconnect button is activated or if Q1M and Q2M are in Lockout/Tagout state.

**Components are present if the water treatment option is installed.

NOTE: Right-hand unit is shown above: panel location is mirrored in a left-hand unit.

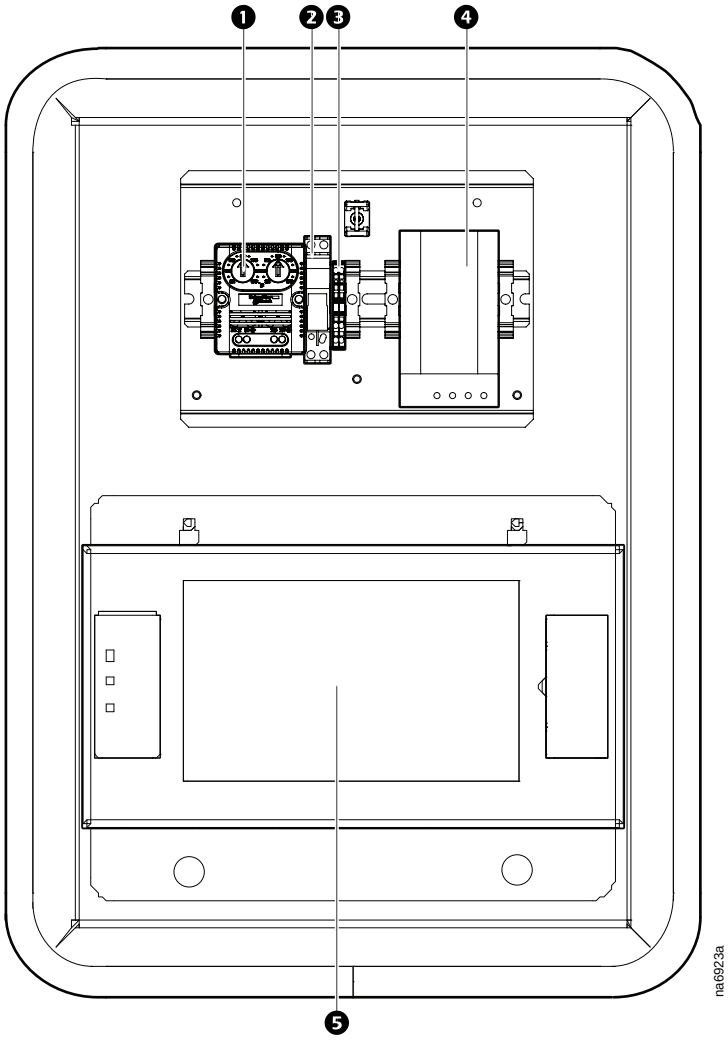
Lower Electrical Panel—Low Ambient Temperature Option



Item	Description
1	Heater (RQE01/RQE02)
2	Thermostat (TQE01)
3	Heater fuse (F16)

Item	Description
4	Terminal block (TB02)
5	Thermostat (TQE02)

Display Interface Panel—Low Ambient Temperature Option

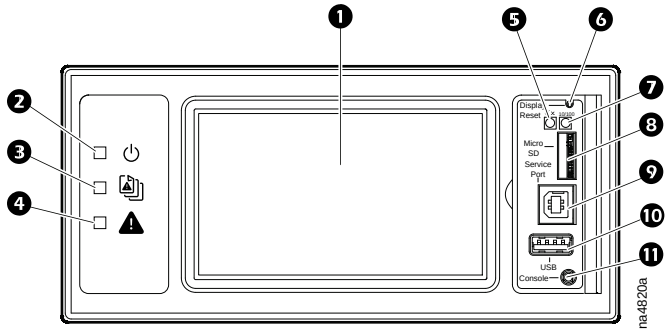


Item	Description	Item	Description
1	Thermostat (TQE)*	4	Heater (RQE)*
2	Heater relay (K28)*	5	Seven-inch display interface
3	Terminal blocks (TB40)*		

*Components included if low ambient temperature option is installed.

See *Display Interface, page 34* for more information about the display interface.

Display Interface



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

Alarm LED

This LED indicates active alarms on the display.

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

Status LED

This LED indicates the status of the display.

Condition	Description
Off	One of the following situations exist: • The display is not receiving input power. • The display is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display has valid TCP/IP settings.
Solid orange	A hardware malfunction has been detected in the display. Contact Schneider Electric Customer Support.
Flashing green	The display does not have valid TCP/IP settings.
Flashing orange	The display is making BOOTP requests.
Alternately flashing green and orange	If the LED is flashing slowly, the display is making DHCP requests. If the LED is flashing rapidy, the display is starting up.

Link-RX/TX (10/100) LED

This LED indicates the network status of the display.

Condition	Description
Off	One or more of the following situations exist: • The display is not receiving input power. • The cable or device that connects the cooling unit to the network is disconnected or not functioning properly. • The display itself is not operating properly. It may need to be repaired or replaced. Contact Schneider Electric Customer Support.
Solid green	The display is connected to a network operating at 10 megabits per second (Mbps).
Solid orange	The display is connected to a network operating at 100 Mbps.
Flashing green	The display is receiving or transmitting at 10 Mbps.
Flashing orange	The display is receiving data packets at 100 Mbps.

Dimensions and Weights

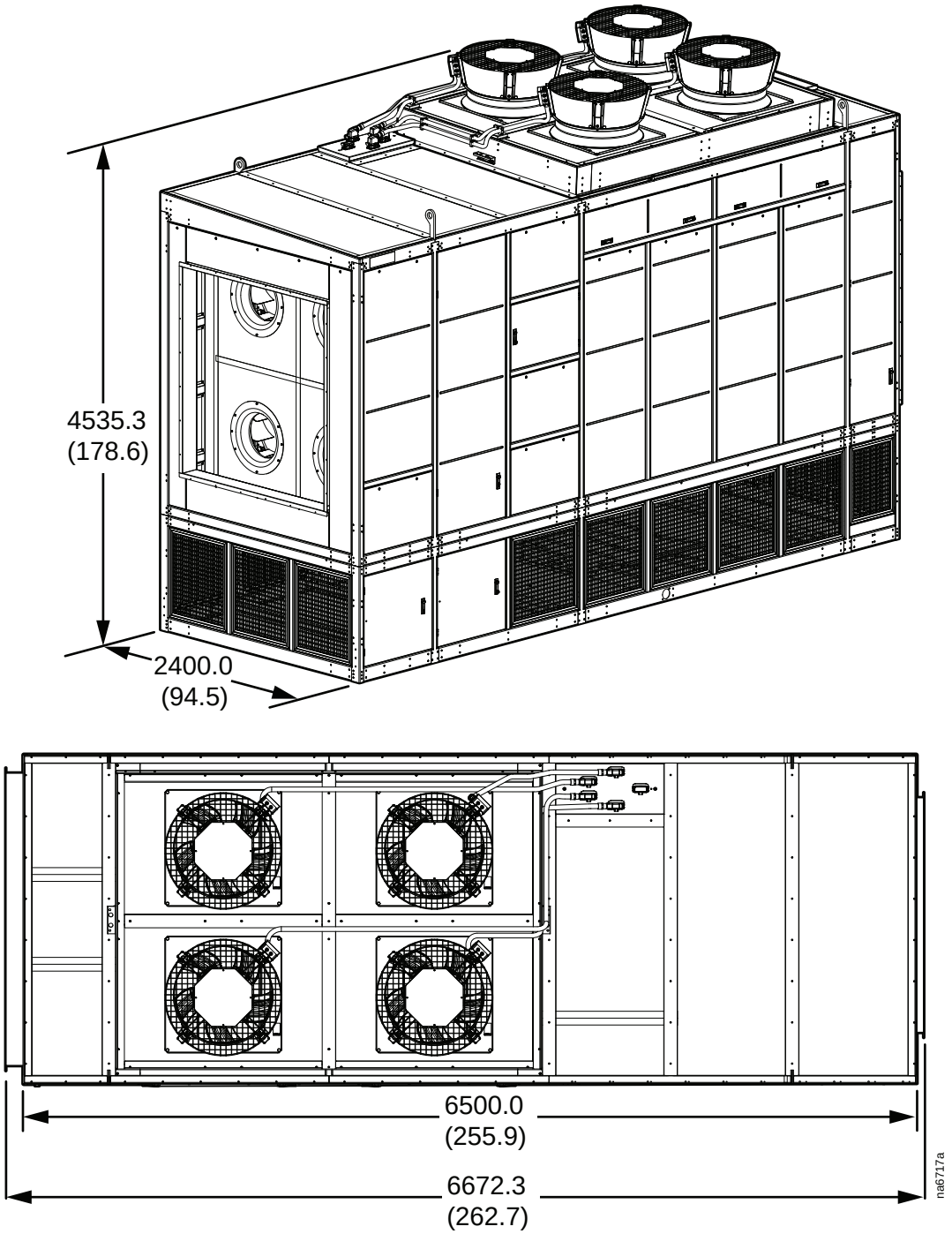
Weights

NOTE: This is preliminary data.

Unit	Straight-Thru Airflow Configuration	
	IAEC25***	IAEC50***
Dry Weight—Installed		
Default Unit with No Options – kg (lb)	6800 (14,991)	13 600 (29,983)
150-kW DX Trim Cooling – kg (lb)	700 (1543)	1400 (3086)
Water Treatment Option – kg (lb)	43 (95)	86 (190)
Operational Weight		
Default Unit with No Options – kg (lb)	7525 (16,590)	15 050 (33,180)
150-kW DX Trim Cooling – kg (lb)	700 (1543)	1400 (3086)
Water Treatment Option – kg (lb)	43 (95)	86 (190)
Shipping Weight—Upper Section		
Default Unit with No Options – kg (lb)	5825 (12,842)	11 650 (25,684)
150-kW DX Trim Cooling – kg (lb)	700 (1543)	1400 (3086)
Water Treatment Option – kg (lb)	–	–
Shipping Weight—Lower Section		
Default Unit with No Options – kg (lb)	1025 (2260)	2050 (4520)
150-kW DX Trim Cooling – kg (lb)	–	–
Water Treatment Option – kg (lb)	43 (95)	86 (190)

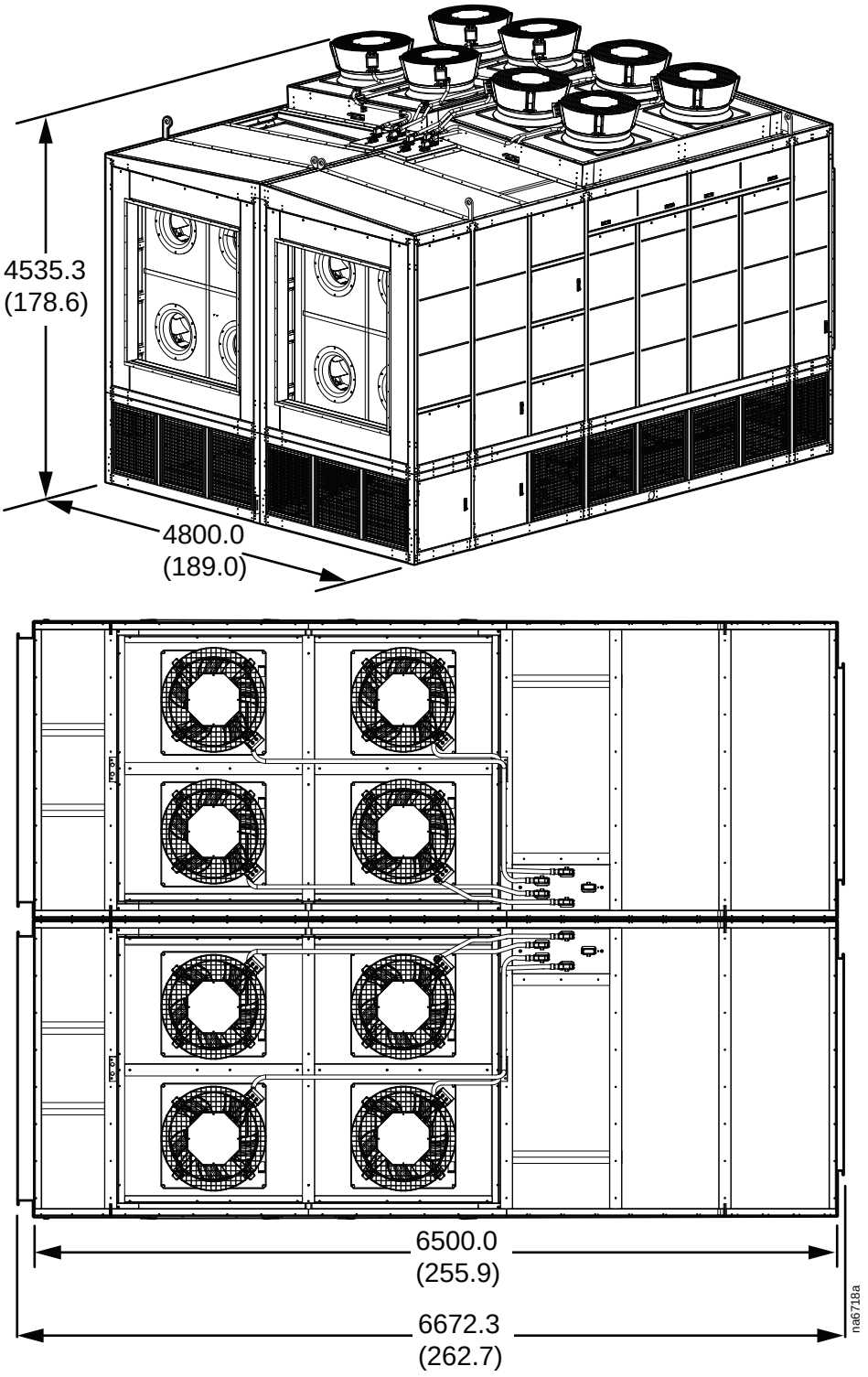
Dimensions

IAEC25*** Unit—Straight-Thru Airflow



NOTE: Dimensions are shown in mm (in.).

IAEC50*** Unit—Straight-Thru Airflow



NOTE: Dimensions are shown in mm (in.).

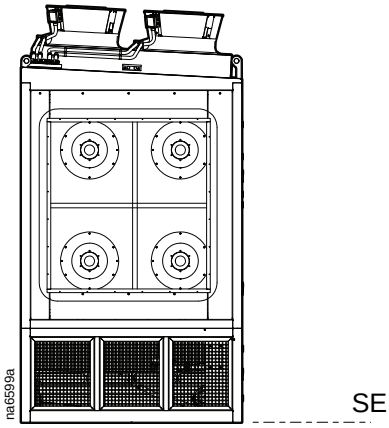
Installation and Service Access

The Ecoflair Indirect Air Economizer requires 1.6 m (63 in.) of installation and service clearance on the front sides of the unit. Clearance during installation on the return air and supply air sides is what is required by local and national codes for the installer to make duct installation connections safely.

NOTE: The front side of the unit is the side containing the display interface.

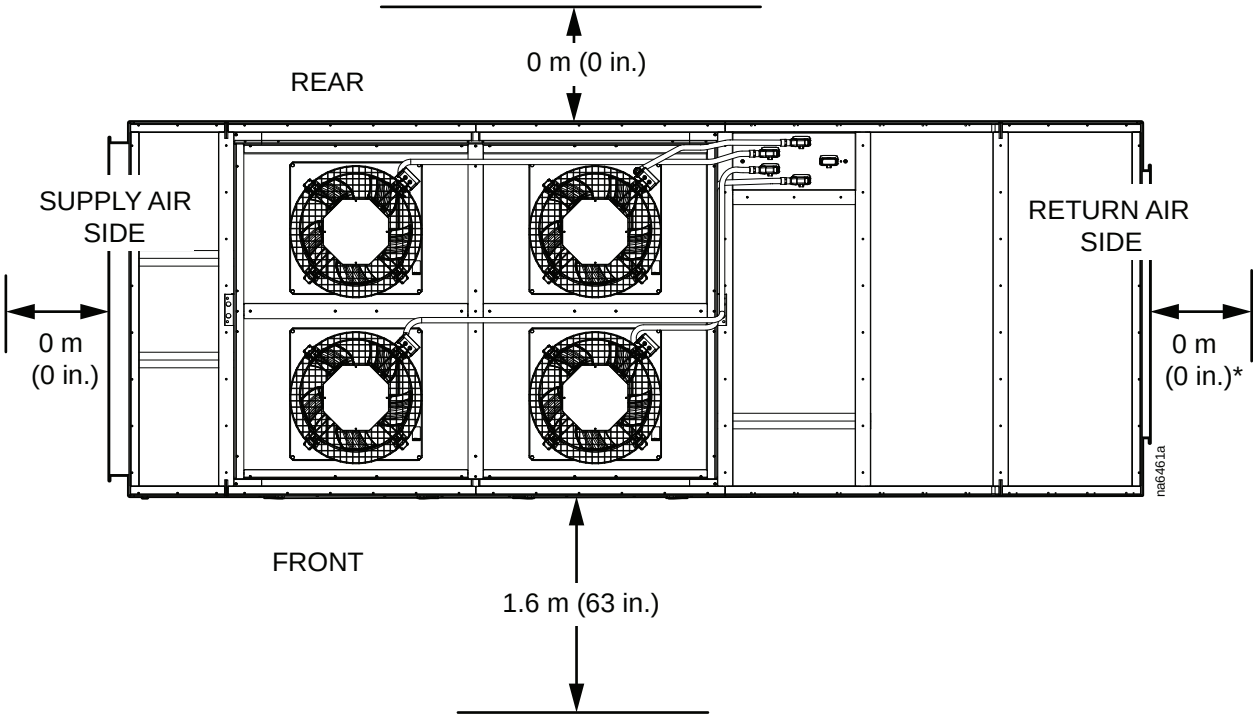
Service Level

Servicing level for the unit is even with the base of the lower section.



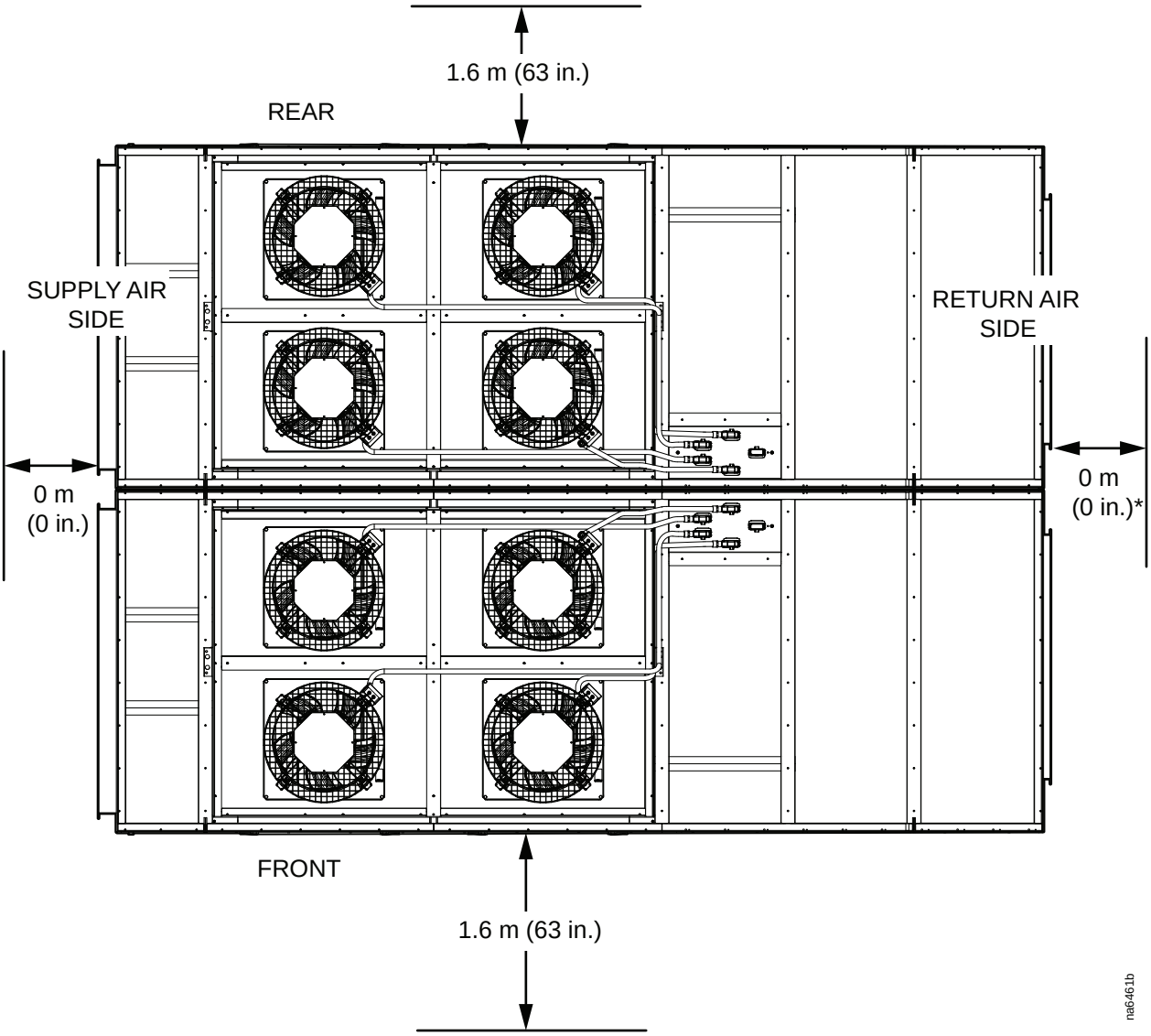
Service Access—IAEC25*** Unit

NOTE: Left-hand unit is shown.



NOTE: *If power is routed through the rear or side of the electrical panel or if a water treatment system is installed, a minimum of 1 m (39 in.) of clearance is required on the return air side.

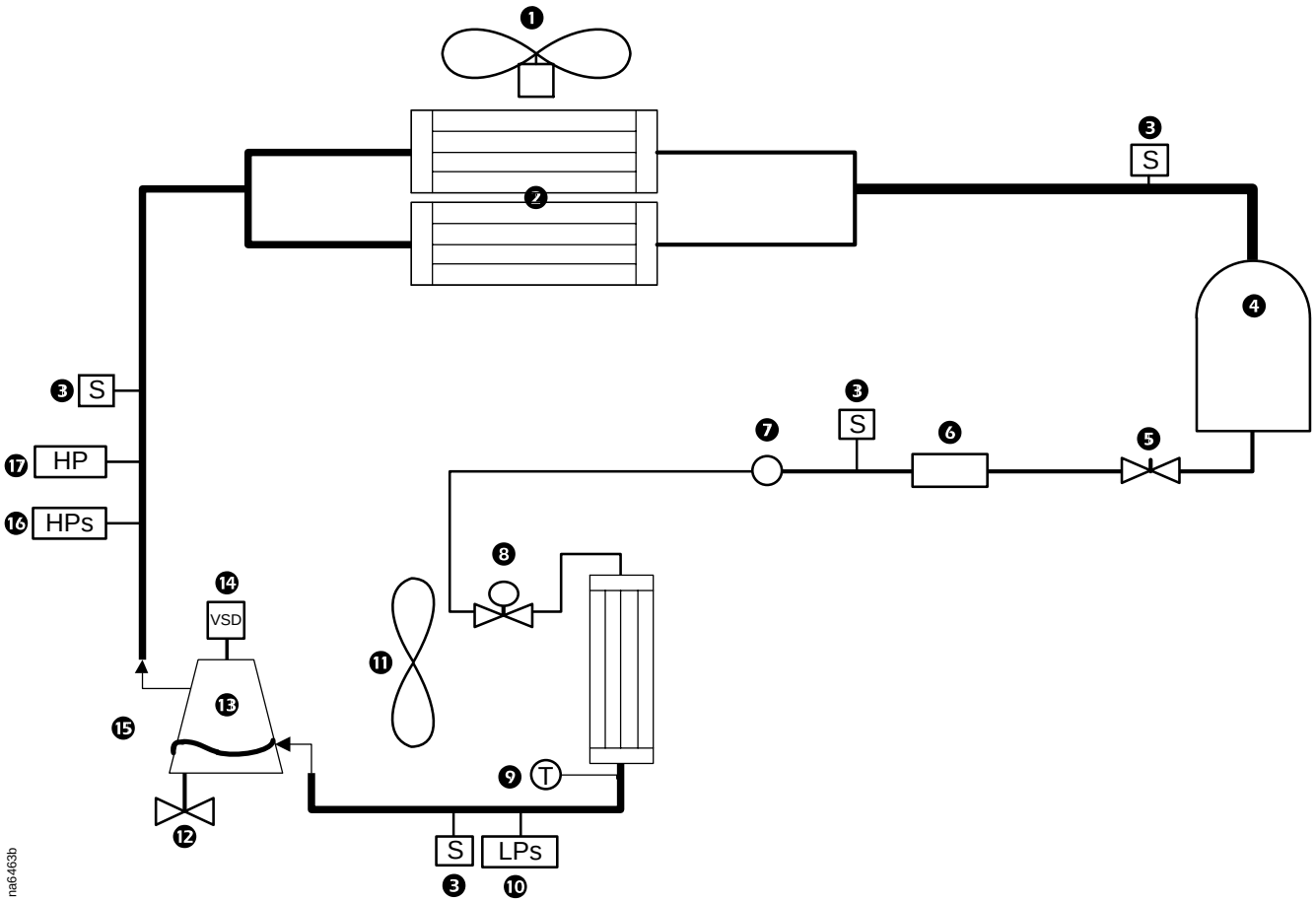
Service Access—IAEC50*** Unit



NOTE: *If power is routed through the rear or side of the electrical panel or if a water treatment system is installed, a minimum of 1 m (39 in.) of clearance is required on the return air side.

Diagrams

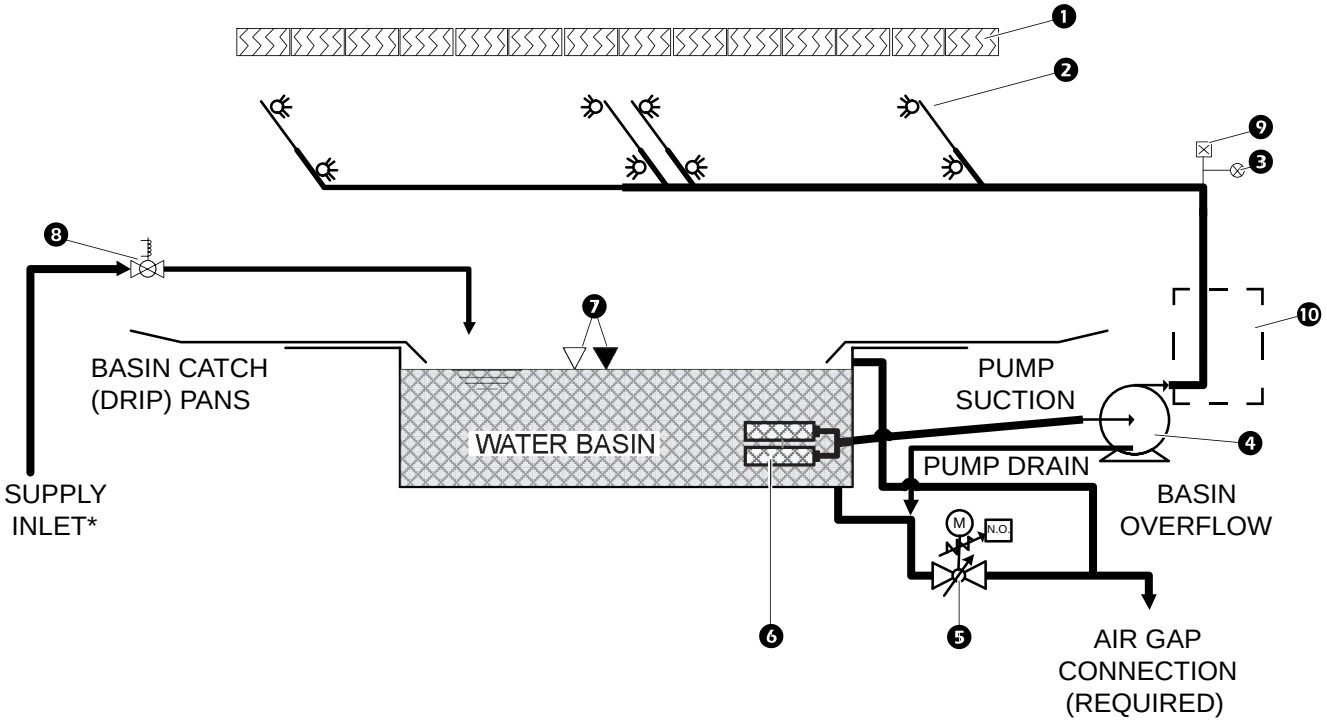
Refrigerant System Diagram—IAEC25*** Unit

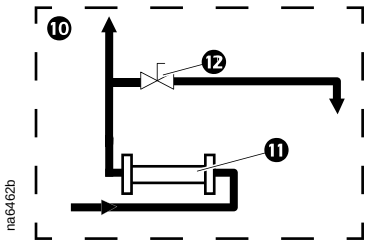


Item	Description
1	Outdoor air (OA) fans
2	Condenser coil
3	Service port
4	Receiver
5	Pressure relief valve
6	Filter drier
7	Sight glass
8	Electronic expansion valve
9	Temperature sensor

Item	Description
10	Low pressure sensor
11	IT fans
12	Oil control solenoid
13	Compressor
14	Variable-speed drive
15	Crankcase heater
16	High pressure sensor
17	High pressure switch
18	Evaporator coil

Water System Diagram—IAEC25*** Unit



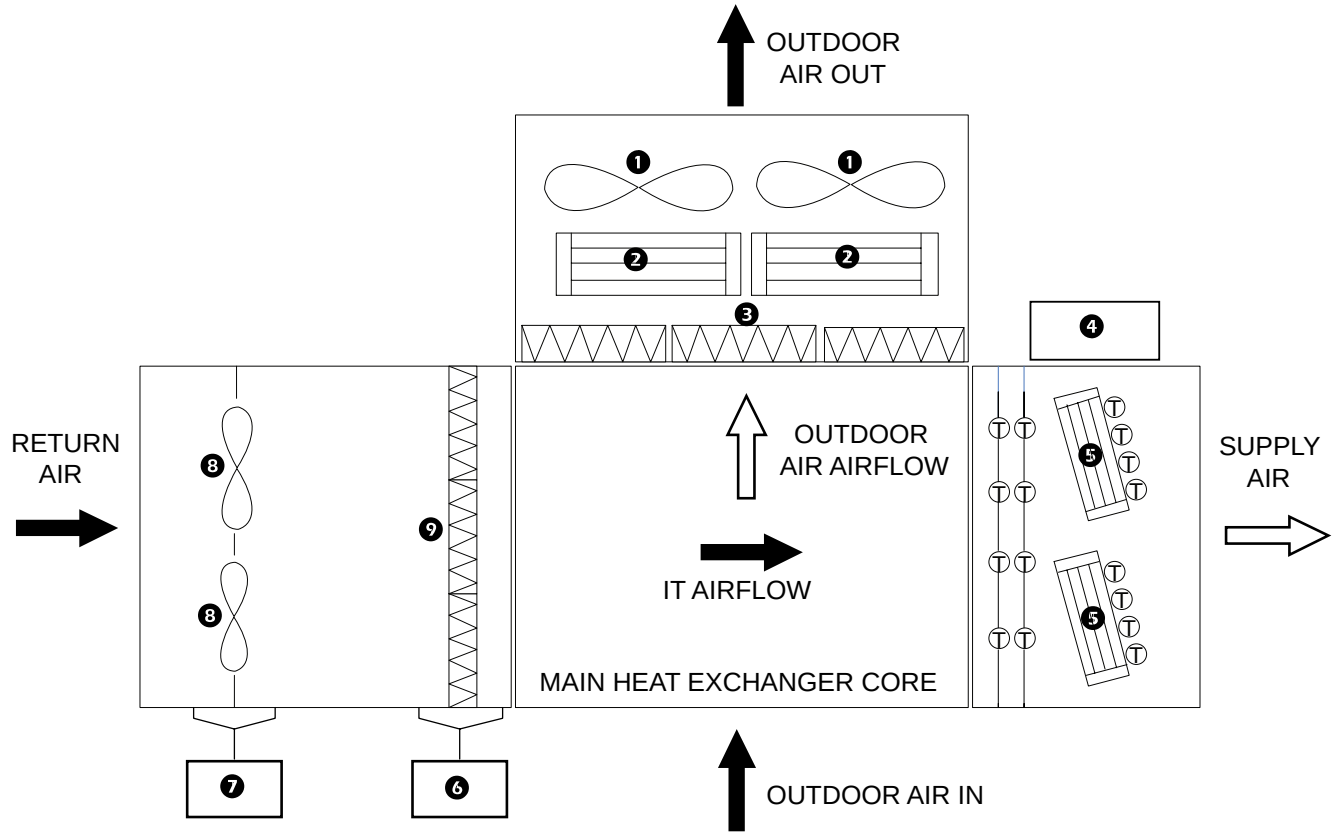


Item	Description
1	Mist eliminator
2	Spray nozzle
3	Pressure switch
4	Circulation pump
5	Basin drain valve
6	Basin strainers

Item	Description
7	Water level and conductivity sensors
8	Water fill valve
9	Air vent
10	Water treatment system option
11	Water treatment system
12	Sampling valve

*Recommended supply requirements: 25–30 GPM flow rate (approximately 10 minutes to fill); maximum 80 PSIG inlet pressure.

Air System Diagram—IAEC25*** Unit



na6464b

Ⓣ = TEMPERATURE AVERAGING SENSOR

Item	Description	Quantity
❶	OA fans	4
❷	Condenser coil (optional)	—
❸	Mist eliminator	—
❹	Trim cooling (optional)	—
❺	Evaporator coil/chilled-water coil	—
❻	Filter differential pressure switch (optional)	—
❼	Fan differential pressure switch	—
❽	IT fans	4
❾	Filter (optional)	12

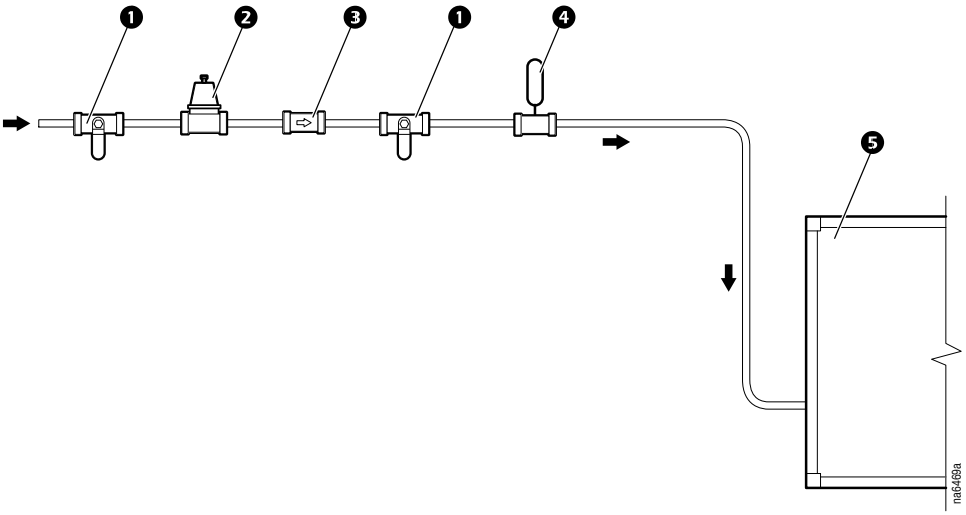
External Water Piping

NOTICE

COMPLIANCE REQUIREMENT

The installation must comply with local plumbing codes.

Failure to follow these instructions can result in equipment damage.



Item	Description
❶	Shut-off valve
❷	Water pressure reducing valve (if necessary)
❸	Backflow preventer (if required)
❹	Water hammer arrestor
❺	Ecoflair

NOTE: All plumbing components shown are field supplied and installed.

NOTE: Customer is responsible for providing freeze protection on field-installed piping.

Site Preparation

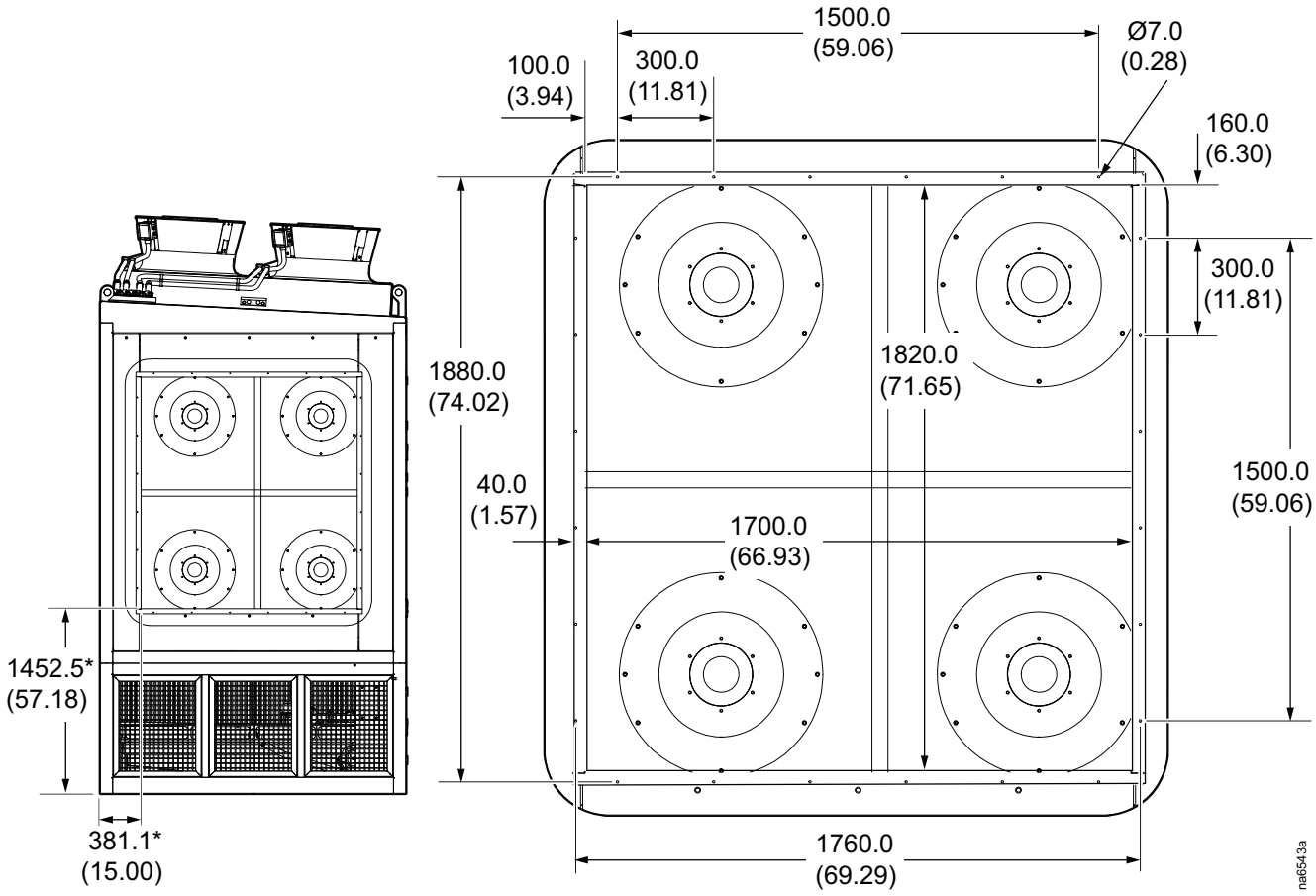
Ducting

Provide supply and return ducting at the site to connect to the supply and return ducting connections on the Ecoflair Indirect Air Economizer. Duct connection gaskets, hardware, and insulation are the responsibility of the customer. The following are recommendations for ducting:

NOTE: Providing ducting is the responsibility of the customer.

- Ducting should be double walled with a minimum of 50 mm (2 in.) of insulation.
- The minimum turning radius of the ducting should be 1.5 m (4.9 ft).
- Ducting should incorporate turning vanes within the turning radius to minimize pressure drop.
- Supply ducting internal dimensions should be no less than 1.5 m (4.9 ft) in height.
- Gaskets should be installed between duct connections to prevent air leakage.
- For units connected to shared supply and return ducts, isolation dampers should be used at the return and supply air of each Ecoflair Indirect Air Economizer to isolate the unit for servicing or during off cycles to prevent air short-cycling within the system.

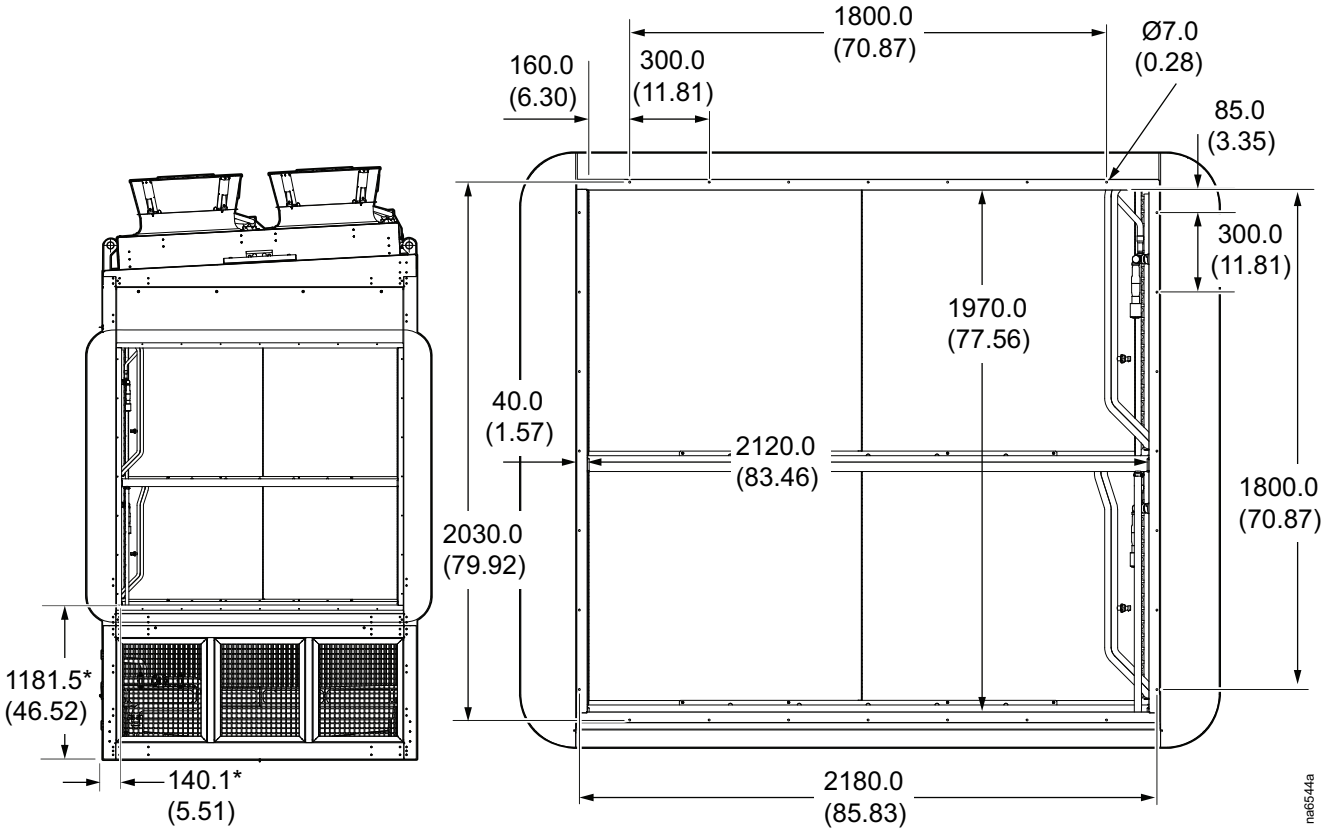
Return Air



NOTE: Dimensions are shown in mm (in.).

*Dimensions are to the inside of the duct opening.

Supply Air



NOTE: Dimensions are shown in mm (in.).

*Dimensions are to the inside of the duct opening.

Water Supply Requirements

The water supply must be clean, potable water. The inlet water pressure provided to the unit must be between 207 and 552 kPa (30 and 80 psig). If the water pressure available is less than 207 kPa (30 psig), a booster pump (not supplied) may be needed to operate the equipment properly. If the water pressure available is higher than 552 kPa (80 psig), use an external pressure regulator (not supplied).

The temperature of the water supplied to the unit should be lower than the ambient air temperature and is ideally near the wet bulb temperature or cooler. If the temperature of the water supplied to the unit is significantly higher than the ambient air temperature, the cooling capacity of the unit could be reduced.

NOTE: The supply water should be part of the site water monitoring program.

Water Quality

The quality of the water used for the Ecoflair™ Indirect Air Economizer evaporative cooling system can impact both the system performance and maintenance requirements. While it may be possible to utilize an alternative water source when combined with an appropriate treatment strategy, Schneider Electric does not provide guidance in this regard.

The Ecoflair™ Indirect Air Economizer unit has been extensively tested by Schneider Electric for use with domestic, potable water supplies, and the materials selected for construction in the wet areas were specifically selected to sustain prolonged wet operational periods if proper maintenance of the water supply is performed. The use of diluted mixtures of chlorine (free chlorine maintained from 0.5 to 2.0 ppm for supply water with pH ≤ 8) is acceptable and will not affect the life expectancy of this equipment. The use of other oxidizing or non-oxidizing biocides has not been tested by Schneider Electric.

Any other chemical or water treatment used should be safe for use with the following materials used in the Ecoflair wet areas:

- PVC, Polypropylene, ABS
- Stainless steel 304
- Stainless steel 316
- Painted and zinc coated steel

Each Ecoflair™ Indirect Air Economizer unit should be enrolled in a water monitoring program by the customer for the life of the equipment. The proper establishment of a water monitoring program is the responsibility of the customer and may be governed under local, state or federal laws. The Ecoflair™ Indirect Air Economizer operates in the same manner as an Open–Recirculating Cooling Tower. The following 3rd party resources can be used in the creation of a water-monitoring program.

1. Cooling Tower Institute

   www.CTI.org

   - Guidelines for Evaluation of Cooling Tower Treatment Effectiveness—WTG-130
   - Application of Oxidizing Biocides—WTP-141
   - Corrosion Testing Procedures—STD-149
   - Legionellosis—WTB-148

2. NSF International (formerly National Sanitation Foundation)

   - NSF P453: Cooling Towers—Treatment, Operation, and Maintenance to Prevent Legionellosis

3. ASHRAE

   Standard 188P—Prevention of Legionellosis Associated with Building Water Systems

4. Association of Water Technologies

www.awt.org

IMPORTANT: Schneider Electric does not own, operate, or endorse any of these independent companies and organizations. This resource is provided only for the convenience of the customer and should not be considered “all inclusive.”

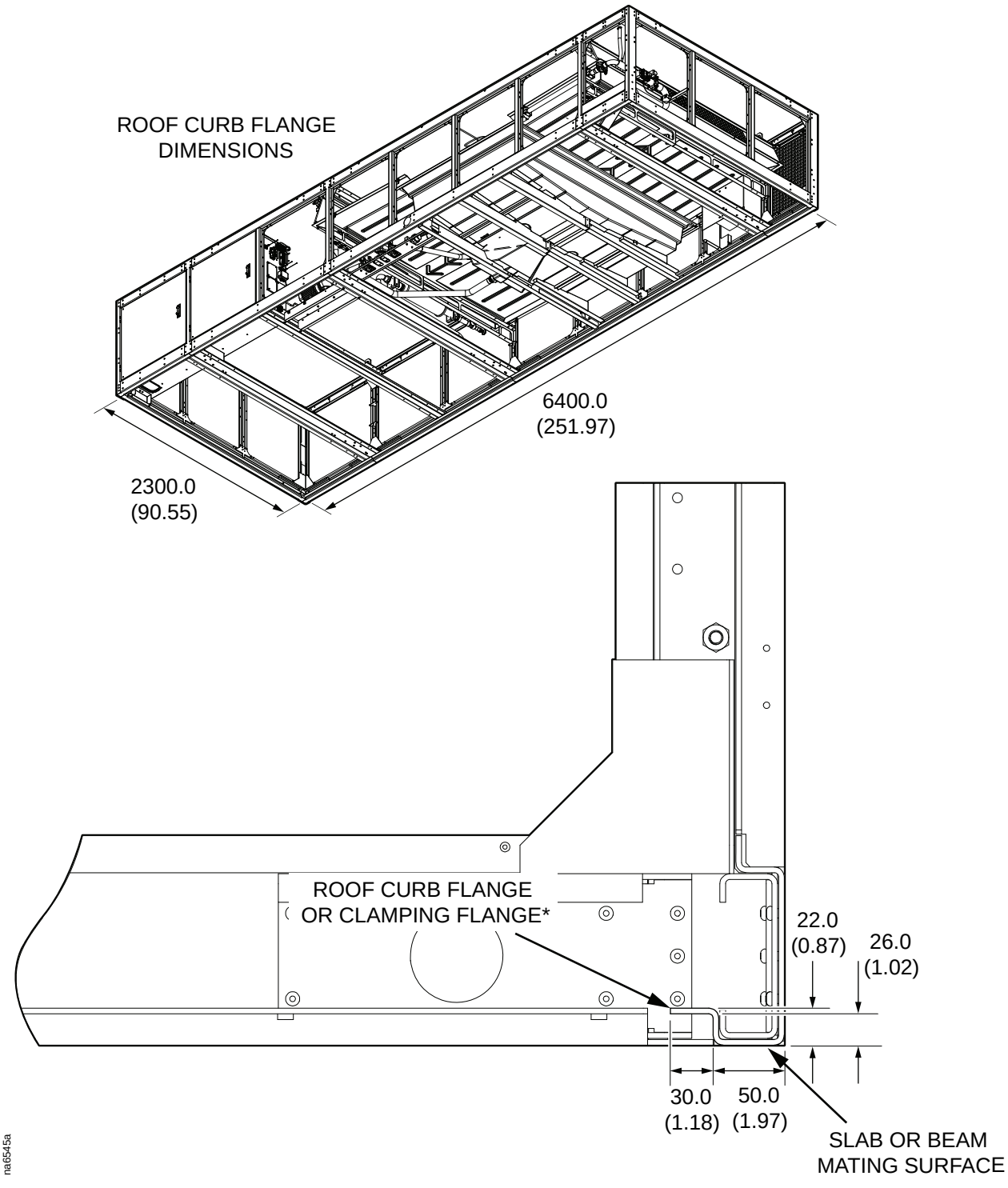
General Recommendation for Quality of Inlet Water from Potable Source

Contaminant	US EPA Secondary Standard (SMCL)	Recommended Best Practices for Potable Make-Up Water Quality
pH – ppm	6.5–8.5	6.8-7.8
Total Dissolved Solids (TDS) – ppm	500	100
Total Hardness – ppm as $CaCO_3$	–	80-100
Chlorides – ppm	250	20-30
Sulfates – ppm	250	30-40
Silica – ppm	–	<5
Other Metals (Iron, Aluminum, etc.)	*	Should not exceed regulated limits
Turbidity	–	Zero

*See *www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemical*.

Foundation

Provide a foundation for the Ecoflair Indirect Air Economizer as recommended in the submittal package. The Ecoflair Indirect Air Economizer can be mounted on a roof curb, slab, or beams or on a platform around the building perimeter.



NOTE: Dimensions are shown in mm (in.).

*Contact Schneider Electric for more information if the Ecoflair Indirect Air Economizer is being installed on a roof curb.

Refrigeration

The Ecoflair Indirect Air Economizer contains its own closed refrigeration circuit: no field piping connections are required.

Environment

Installing the Ecoflair Indirect Air Economizer in areas with increased airborne debris may result in more frequent service intervals.

Service Platform

If a permanent service platform is being installed for easier access to the service vestibule, it must meet the following conditions:

- Conform to local and national codes
- Not impede access to compartments ❾, ❿, and ⓫ shown in *External Components, page 24*.