



Vertiv™ CoolPhase Wall

System Design Catalog

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Vertiv recommends installing a monitored fluid detection system that is wired to activate the automatic closure of field installed coolant fluid supply and return shut off valves, where applicable, to reduce the amount of coolant fluid leakage and consequential equipment and building damage. Refer to local regulations and building codes relating to the application installation, and operation of this product. The consulting engineer, installer and/or end user is responsible for compliance with all applicable laws and regulations relating to the application, installation, and operation of this product.

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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1 Nomenclature and Components

In this document, the indoor unit refers to the Vertiv™ CoolPhase Wall unit, and the outdoor unit refers to the Vertiv CoolPhase Condensing Unit.

1.1 Vertiv CoolPhase Wall Unit Nomenclature

Table 1.1 Vertiv™ CoolPhase Wall Unit Digit Configuration Number

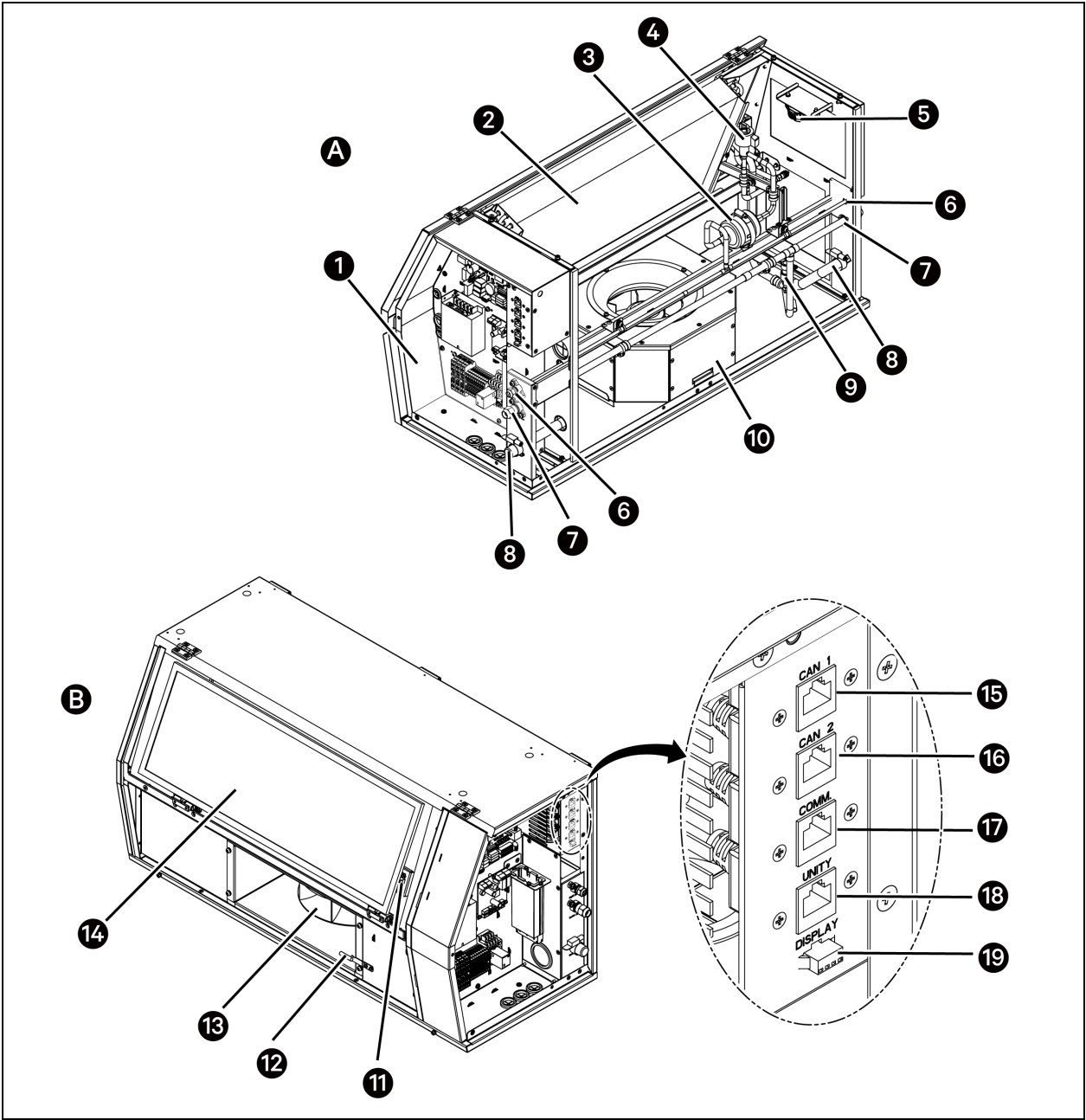
1	2	3	4	5	6	7
W	L	M	0	3	0	A

Table 1.2 Vertiv™ CoolPhase Wall Unit Model Number Digit Definitions

Digit	Description
Digits 1 - 3	Unit Family: WLM = Vertiv CoolPhase Wall
Digits 4 - 5	Size: 03 = 3.7 kW 07 = 7.0 kW 11 = 10.5 kW
Digit 6	Power Supply: 0 = 208/230 V, 1 Ph, 50/60 Hz
Digit 7	Revision: A = Revision A

1.2 Vertiv CoolPhase Wall Unit Components

Figure 1.1 Vertiv™ CoolPhase Wall Unit WLM030A Component Location



Item	Description	Item	Description
A	Rear view	10	Fan kit
B	Front view	11	Return air detection board
1	E-box	12	Supply air temperature sensor

Item	Description	Item	Description
2	Evaporator coil	13	Evaporator fan
3	Filter drier	14	Air filter
4	EEV	15	Teamwork control 1 port
5	Refrigerant detection sensor	16	Teamwork control 2 port
6	Liquid connector	17	Communication cable port
7	Suction connector	18	Unity card port
8	Drain connector	19	LCD display terminal block
9	Low pressure transducer		

NOTE: The WLM070A unit has two fans, while the WLM110A unit has three fans.

Table 1.3 Vertiv™ CoolPhase Wall Unit Standard and Optional Feature Submittals

Document Number	Submittal Name
20000110	Standard features and options

1.3 Vertiv CoolPhase Condensing Unit Nomenclature

Table 1.4 Vertiv CoolPhase Condensing Unit Digit Configuration Number

1	2	3	4	5	6	-	7	8	9	10	11
C	U	D	1	1	1	-	E	0	0	0	A

Table 1.5 Vertiv CoolPhase Condensing Unit Model Number Digit Definitions

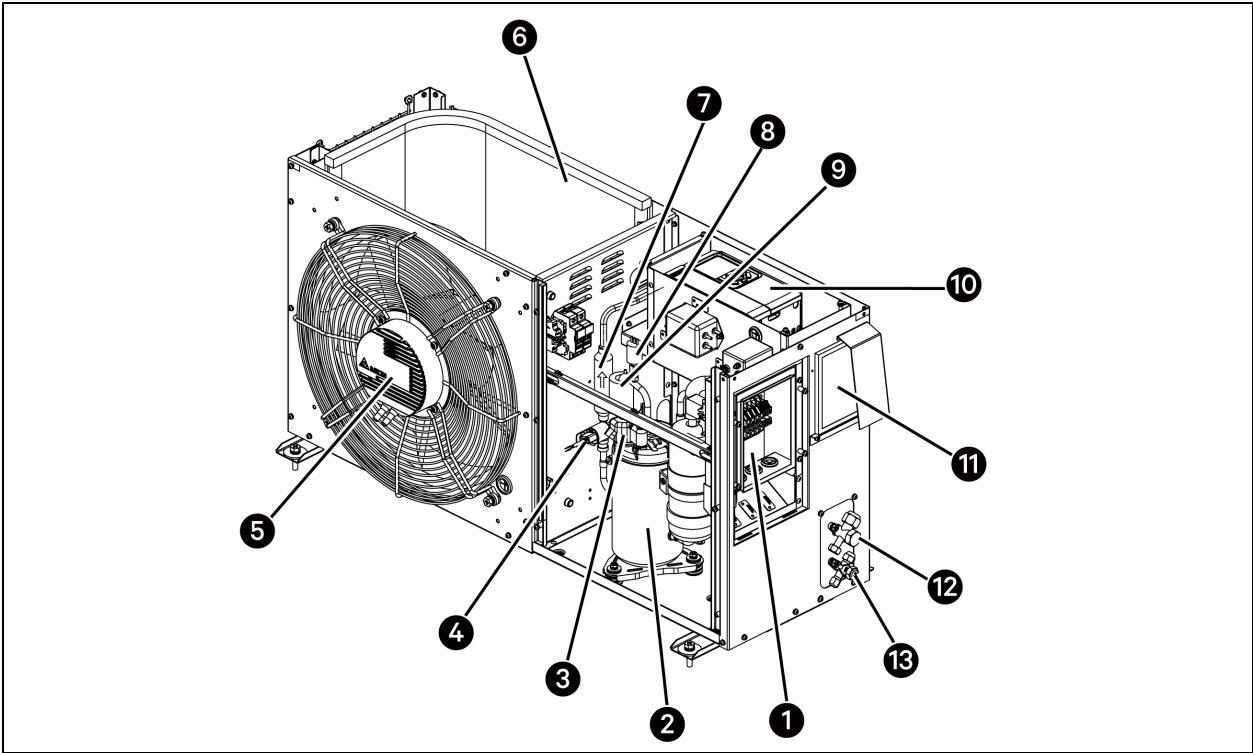
Digit	Description
Digits 1 - 2	Unit Family: CU = Vertiv CoolPhase Condensing Unit
Digit 3	Version: - D = Air-Cooled Standard Ambient - L = Air-Cooled Low Ambient
Digit 4 - 5	Nominal Capacity: 03 = 3.5 kW 07 = 7.0 kW 11 = 11 kW
Digit 6	Power Supply: 0 = 208/230 V, 1 PH, 50/60 Hz 1 = 208/230 V, 3 PH, 60 Hz (NAM) 2 = 230 V, 1 PH, 50/60 Hz (EMEA) 4 = 460 V, 3 PH, 60 Hz (NAM) 5 = 400 V, 3 PH, 50/60 Hz (EMEA)
7	Protection:

Table 1.5 Vertiv CoolPhase Condensing Unit Model Number Digit Definitions (continued)

Digit	Description
	E = E-coating (aggressive environments)
8	Free
9	Free
10	Free
11	Revision: - A = Revision A - B = Revision B

1.4 Vertiv CoolPhase Condensing Unit Components

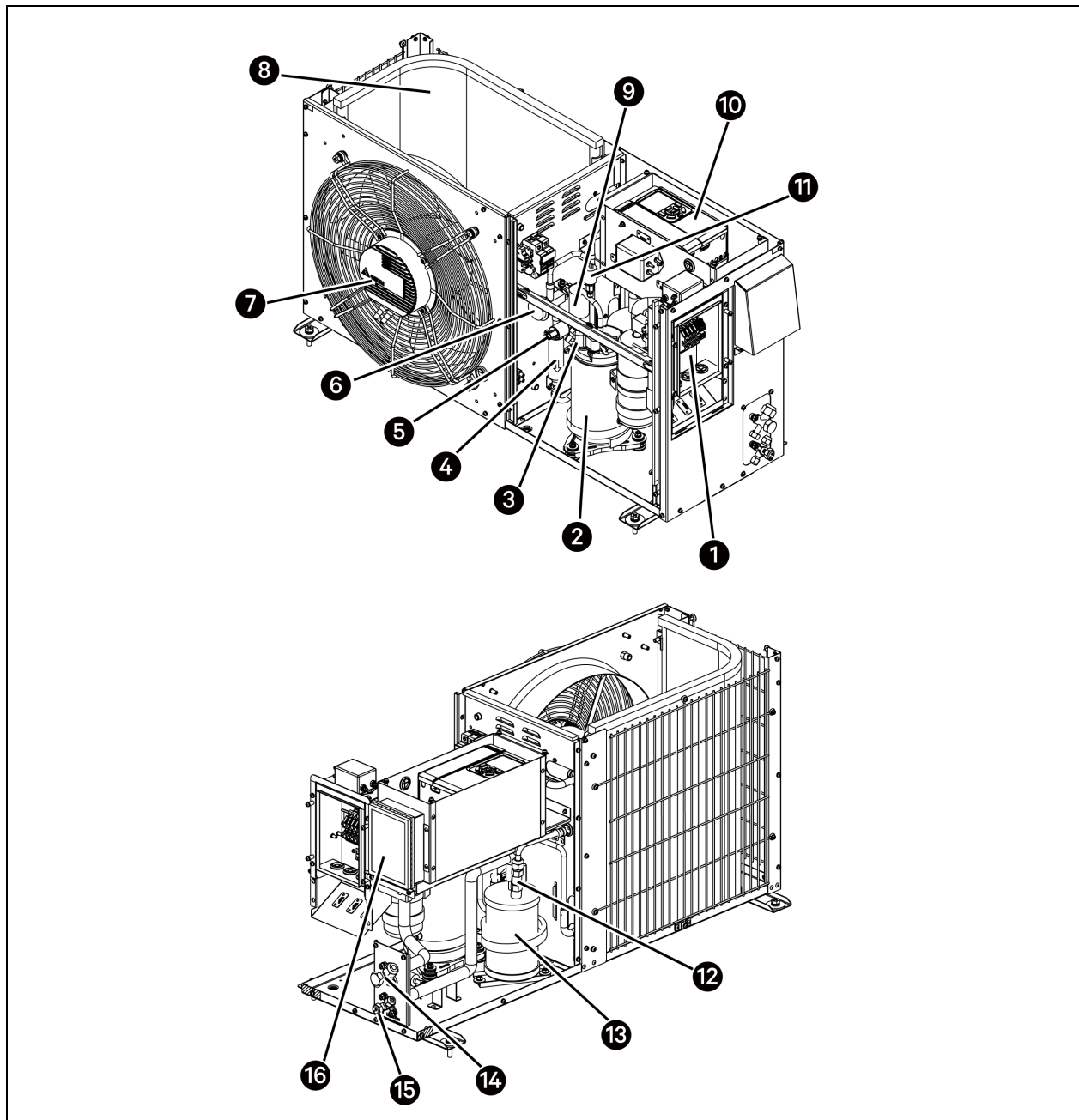
Figure 1.2 Standard Ambient Vertiv CoolPhase Condensing Unit Component Location



Item	Description	Item	Description
1	E-box	8	High pressure switch
2	Compressor	9	Discharge temperature sensor
3	Compressor cable	10	VFD
4	High pressure transducer	11	VFD box air filter

Item	Description	Item	Description
5	Condenser fan	12	Suction valve
6	Condenser coil	13	Liquid valve
7	Check valve		

Figure 1.3 Low Ambient Vertiv CoolPhase Condensing Unit Component Location



Item	Description	Item	Description
1	E-box	9	Discharge temperature sensor
2	Compressor	10	VFD
3	Compressor cable	11	High pressure switch
4	Check valve	12	Relief valve
5	High pressure transducer	13	Liquid receiver
6	Head pressure valve	14	Suction valve
7	Condenser fan	15	Liquid valve
8	Condenser coil	16	VFD box air filter

Table 1.6 Vertiv CoolPhase Condensing Unit Standard and Optional Feature Submittals

Document Number	Submittal Name
20000162	Standard features and options

1.5 System Controls

The Vertiv CoolPhase Wall unit and the Vertiv CoolPhase Condensing Unit are controlled by the Vertiv™ Liebert® iCOM Edge Controller.

The LCD display is field wired to the Vertiv™ Liebert® iCOM Edge Controller. The length of the factory-provided LCD display cable is 9.8 ft (3 m). The Vertiv CoolPhase Wall unit and the Vertiv CoolPhase Condensing Unit automatically restart after a power outage.

The controller general features and alarms are included in the submittals.

Physical Security

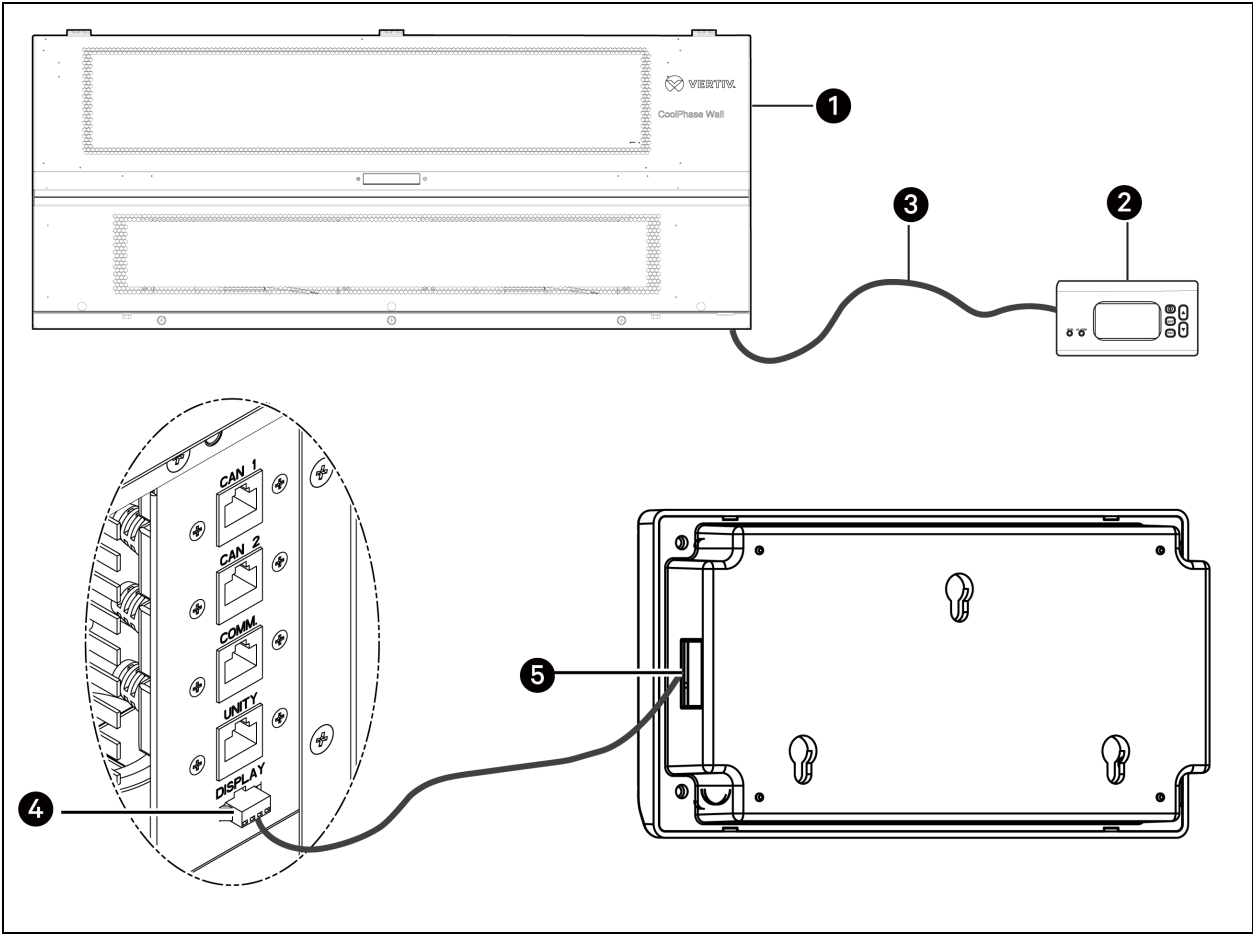
This product is designed and intended to be deployed and operated in a physically secure and network firewall-protected location. Vertiv recommends a review of the physical security and operating environment of the unit. Since an attacker or disgruntled user can cause serious disruption, below are some recommended best practices that include, but are not limited to:

- Restrict access to areas, racks, and units with encrypted card RFID/badges, unique multi-factor passcode authentication for access, man traps, and biometric scanners for physical access to the equipment.
- Have trusted and background-checked security guards with 24x7x365 physical presence and written logs to help document and note physical access to a data center, building, rack, and so on.
- Restrict physical access to telecommunications equipment and network cabling. Physical access to the telecommunications lines and network cabling should be restricted to protect against attempts to intercept or sabotage communications. Best practices include use of metal conduits for the network cabling running between equipment cabinets.
- All USB, RJ45, and/or any other physical ports should be restricted on the units.
- Do not connect removable media (such as USB devices, SD cards, and so on) for any operation (such as firmware upgrade, configuration change, or boot application change) unless the origin of media is known and trusted. Before connecting any portable device through a USB port or SD card slot, scan the device for malware and viruses.

Table 1.7 Vertiv™ Liebert® iCOM Edge Controller Submittals

Document Number	Submittal Name
20000115	iCOM edge general features and alarms

Figure 1.4 LCD Display Field Connection



Item	Description	Item	Description
1	Vertiv CoolPhase Wall unit	4	LCD interface terminal on the Vertiv CoolPhase Wall unit (enlarged view)
2	LCD display	5	Terminal on the LCD display (enlarged view)
3	Communication cable (3 m length) is supplied with the Vertiv CoolPhase Wall unit		

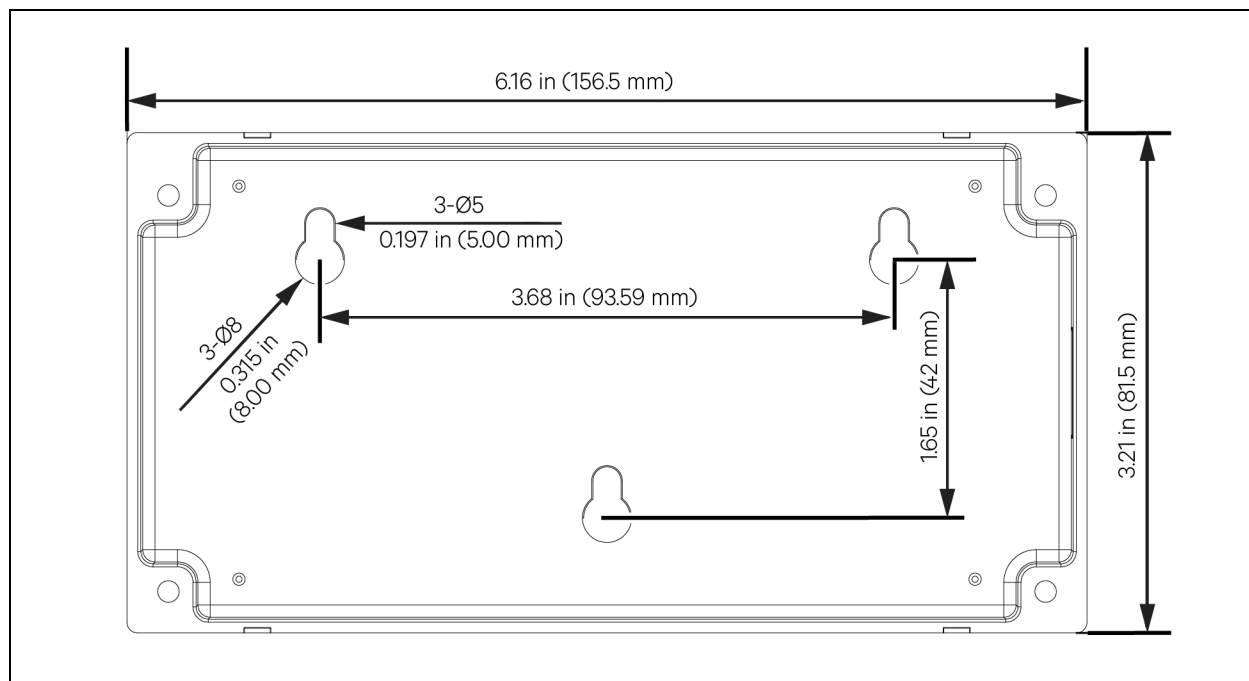
NOTE: Communication cable (3 m length) is supplied with the Vertiv CoolPhase Wall unit.

LCD Display Installation

- 1. Install the M4 × 16 Phillips countersunk screws at the locations shown in the **Figure 1.5** on the next page.
- 2. Keep a 5 mm gap between the screw heads and the wall or mounting surface.

3. Hang the small display on the screws.

Figure 1.5 LCD Display Installation



2 System Data

Table 2.1 System Data

Vertiv CoolPhase Wall Unit Model		WLM030A	WLM070A	WLM110A
Vertiv CoolPhase Condensing Unit Model (The CoolPhase Condensing unit models listed under each CoolPhase Wall unit model are the only compatible options and must be used accordingly)		CUD030-E000A CUL030-E000A CUD032-E000B CUL032-E000B	CUD070-E000A CUL070-E000A CUD072-E000B CUL072-E000B	CUD111-E000A CUL111-E000A CUD115-E000A CUL115-E000A CUD115-E000B CUL115-E000B
Refrigerant		R32		
Liquid connector / valve in. (mm)		1/4 (6.35)	3/8 (9.52)	3/8 (9.52)
Suction connector / valve in. (mm)		1/2 (12.7)	1/2 (12.7)	5/8 (16)
Indoor: 80 °F (26.6 °C) RAT, 35% RH	Total, BTUH (kW)	12966 (3.8)	24566 (7.2)	36169 (10.6)
Outdoor: 95 °F (35 °C)	Sensible, BTUH (kW)	12624 (3.7)	23884 (7.0)	35828 (10.5)

Vertiv CoolPhase Wall Unit Model	WLM030A	WLM070A	WLM110A
Certification	CE, cETLus, UKCA		
Number of fans	1	2	3
Noise Data (SPL) dB(A) at 2 m	69	71	74
Maximum airflow CFM (CMH)	618 (1050)	1177 (2000)	1825 (3100)
Rated power(W),operating	145	265	450
Condensate drainpipe	16 mm ID (5/8 in. ID)		
NOTE: Noise data are measured in accordance with EN 13487.			

Vertiv CoolPhase Condensing Unit Model	CUD030-E000A CUL030-E000A	CUD032-E000B CUL032-E000B	CUD070-E000A CUL070-E000A	CUD072-E000B CUL072-E000B	CUD111-E000A CUL111-E000A	CUD115-E000A CUL115-E000A CUD115-E000B CUL115-E000B
Certification	cETLus	CE, UKCA	cETLus	CE, UKCA	cETLus	CE, UKCA
Number of fans	1					
Noise Data (SPL) dB(A) at 5 m	61		68		71	
Noise Data (SPL) dB(A) at 5 m, night mode	52		58		56	
Maximum airflow CFM (CMH), ESP = 0 Pa	1648 (2800)		2490 (4060)		3630 (6170)	

Vertiv CoolPhase Condensing Unit Model	CUD030-E000A CUL030-E000A	CUD032-E000B CUL032-E000B	CUD070-E000A CUL070-E000A	CUD072-E000B CUL072-E000B	CUD111-E000A CUL111-E000A	CUD115-E000A CUL115-E000A CUD115-E000B CUL115-E000B
External static pressure in H2O (Pa)	0.12 (30)					
NOTE: Some options or combinations of options may result in reduced air flow. Consult Vertiv support for recommendations.						
NOTE: Noise data are measured in accordance with EN 13487.						

Operating Conditions

The Vertiv CoolPhase Wall unit and the Vertiv CoolPhase Condensing Unit must be operated in a conditioned space within the envelope:

- Indoor unit operating range: 68 °F to 86 °F (20 °C to 30 °C), 15% RH to 70% RH @ 86 °F (30 °C)
- Standard ambient condensing unit operating range (with wind baffle): -4 °F to 118 °F (-20 °C to 48 °C)
- Standard ambient condensing unit operating range (without wind baffle): 23 °F to 118 °F (-5 °C to 48 °C)
- Low ambient condensing unit operating range: -31 °F to 118 °F (-35 °C to 48 °C)

3 Electrical Requirements

The Vertiv CoolPhase Wall unit can connect to the power supply directly or connect to the Vertiv CoolPhase Condensing Unit, so the electrical requirements are different.

Table 3.1 Vertiv™ CoolPhase Wall Unit Electrical Data

Model	MCA (A)	MOP (A)	FLA (A)
WLM030A	3	15	2
WLM070A	4	15	3
WLM110A	5	15	5

Table 3.2 Vertiv CoolPhase Condensing Unit Electrical Data

Model	FLA	MOP	MCA
CUD030-E000A, CUD032-E000B	17	35	21
CUL030-E000A, CUL032-E000B	17	35	21
CUD070-E000A, CUD072-E000B	23	50	28
CUL070-E000A, CUL072-E000B	23	50	28
CUD111-E000A	21	40	25
CUL111-E000A	21	40	25
CUD115-E000A, CUD115-E000B	15	30	18
CUL115-E000A, CUL115-E000B	15	30	18

NOTE: If the Vertiv CoolPhase Wall Unit is powered by the Vertiv CoolPhase Condensing Unit, then the electrical specification for the Vertiv CoolPhase Condensing Unit should be based on **Table 3.3** below.

Table 3.3 Electrical Data for Vertiv™ CoolPhase Wall Unit Connecting to Vertiv CoolPhase Condensing Unit

Compatible Indoor Unit	Condensing Unit Model	MCA (A)	MOP (A)	FLA (A)
WLM030A	CUD030-E000A, CUD032-E000B, CUL030-E000A, CUL032-E000B	24	35	19
WLM070A	CUD070-E000A, CUD072-E000B, CUL070-E000A, CUL072-E000B	32	50	26
WLM110A	CUD111-E000A, CUL111-E000A	30	45	26
WLM110A	CUD115-E000A, CUD115-E000B CUL115-E000A, CUL115-E000B	23	35	20

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4 Planning Data and Guidelines

The unit dimensions and pipe connection location are described in the submittals.

NOTE: For the Vertiv CoolPhase Wall unit, confirm that the clearance is enough for maintenance and service.

NOTE: Ensure the Vertiv CoolPhase Condensing Unit is positioned with careful consideration of its distance and elevation relative to the connected Vertiv CoolPhase Wall Unit, as well as adequate clearance from surrounding walls to maintain proper airflow and piping requirements.

NOTE: When application do not meet or exceed any of these specifications, contact Vertiv™ support.

Table 4.1 Submittals of Planning Dimensions, Unit Weight Data, and Shipping Data

Document Number	Submittal Name
Vertiv CoolPhase Wall unit	
20000111	Cabinet dimensional data
Vertiv CoolPhase Condensing Unit	
20000159	Dimensional data
20000159	Clearance space

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5 Piping and Refrigerant Requirements

Table 5.1 Primary Connection Locations Submittals

Document Number	Submittal Name
Vertiv CoolPhase Wall unit	
20000113	Primary connection locations
Vertiv CoolPhase Condensing Unit	
20000160	Primary connection locations

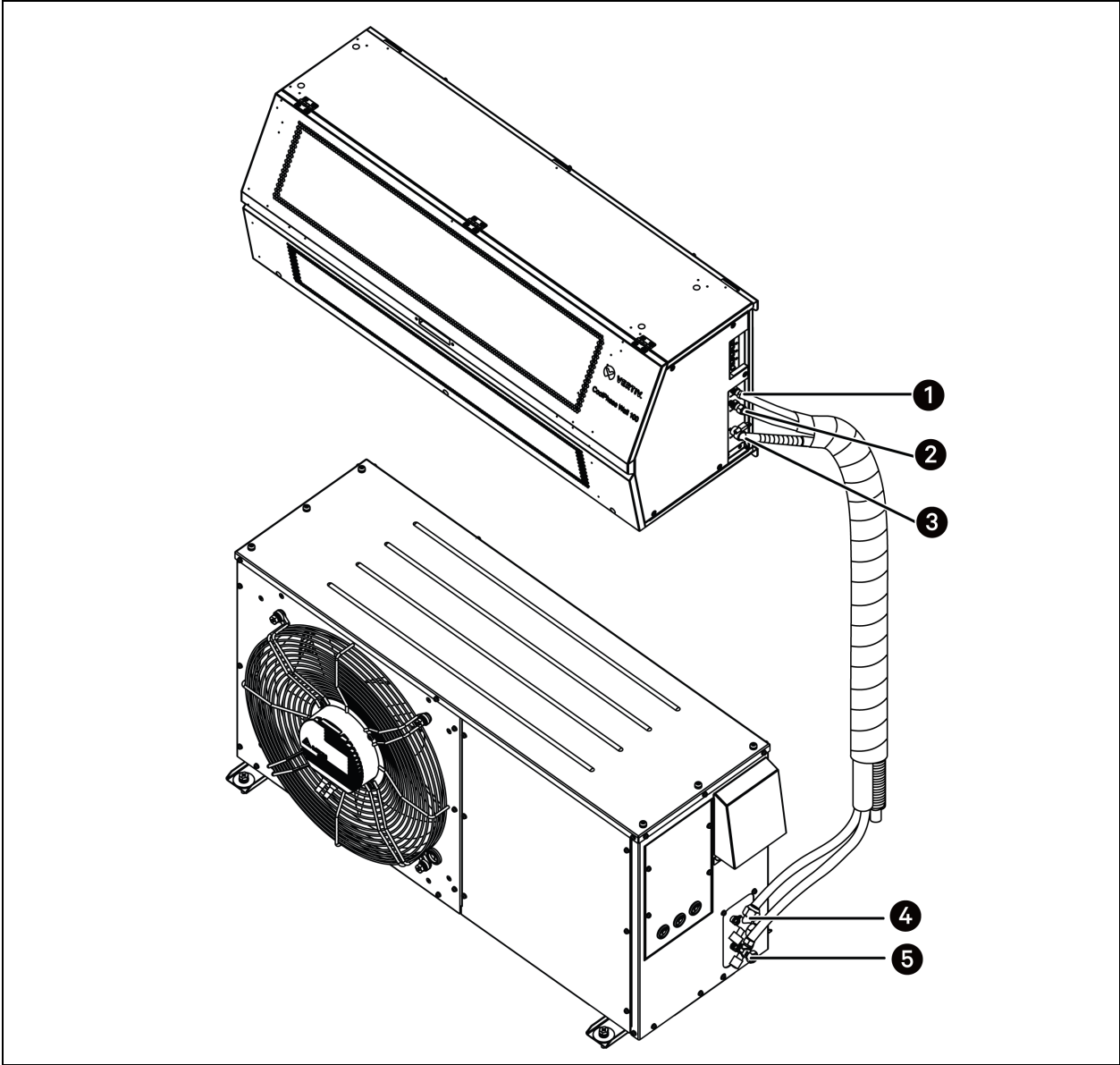
5.1 Refrigerant Line Size and Equivalent Lengths

Table 5.2 Refrigerant Line Size and Equivalent Lengths

SKU	Length (ft)	Length (m)	Liquid Line		Suction Line	
			Diameter (in)	Diameter (mm)	Diameter (in)	Diameter (mm)
WLM030A + CUD030-E000A WLM030A + CUL030-E000A	≤33	≤10	1/4"	6.35	1/2"	12.7
WLM030A + CUD032-E000B WLM030A + CUL032-E000B	33 to 197	10 to 60	3/8"	9.52	1/2"	12.7
WLM070A + CUD070-E000A WLM070A + CUL070-E000A	≤33	≤10	3/8"	9.52	1/2"	12.7
WLM070A + CUD072-E000B WLM070A + CUL072-E000B	33 to 115 115 to 197	10 to 35 35 to 60	3/8" 1/2"	9.52 12.7	5/8" 5/8"	16 16
WLM110A + CUD111-E000A WLM110A + CUL111-E000A	≤66	≤20	3/8"	9.52	5/8"	16
WLM110A + CUD115-E000A WLM110A + CUL115-E000A	66 to 148	20 to 45	1/2"	12.7	3/4"	19.05
WLM110A + CUD115-E000B WLM110A + CUL115-E000B	148 to 197	45 to 60	1/2"	12.7	7/8"	22.23

5.2 Piping Connection Between Vertiv CoolPhase Wall Unit and Vertiv CoolPhase Condensing Unit

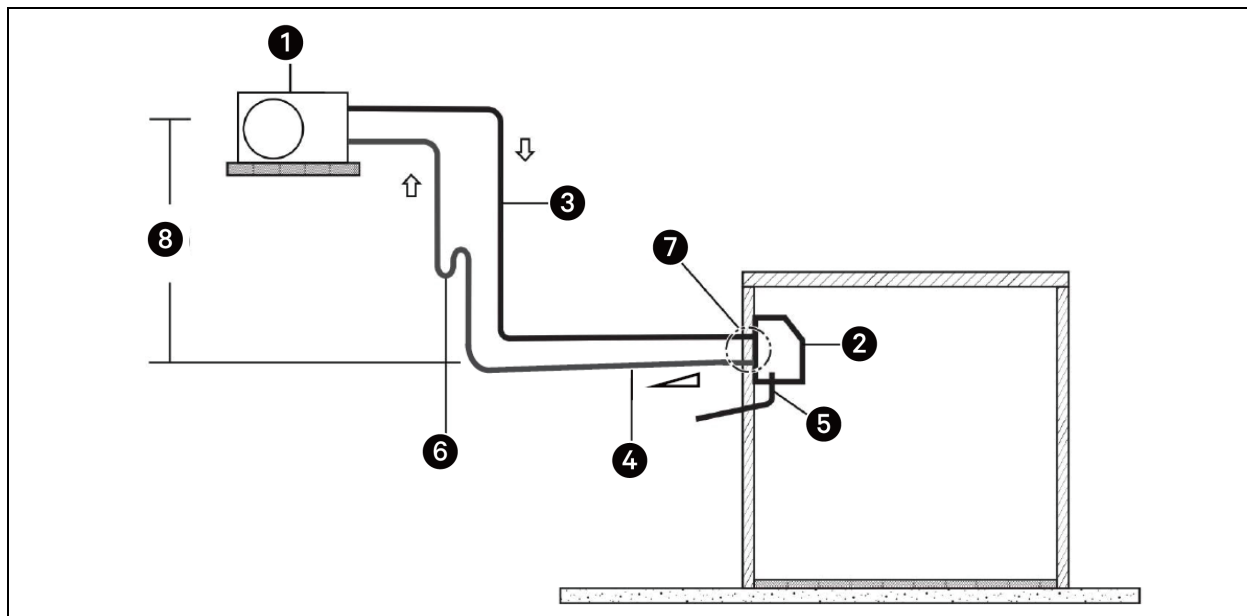
Figure 5.1 Piping Connection Between Vertiv™ CoolPhase Wall Unit and Vertiv CoolPhase Condensing Unit



Item	Description	Item	Description
1	Liquid connector	4	Suction valve
2	Suction connector	5	Liquid valve
3	Drain connector		

5.3 Piping Configuration When Vertiv CoolPhase Condensing Unit Is Above or Below Vertiv CoolPhase Wall Unit

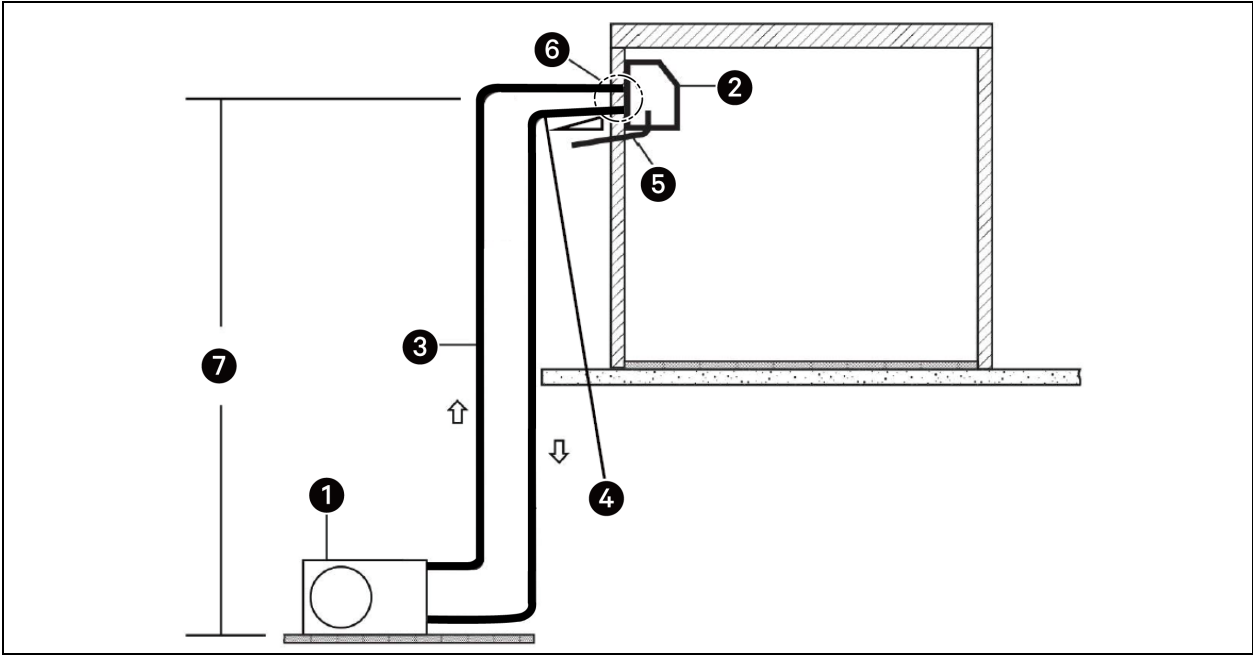
Figure 5.2 Piping Configuration When Vertiv CoolPhase Condensing Unit Is Above the Vertiv™ CoolPhase Wall Unit



Item	Description	Item	Description
1	Vertiv CoolPhase Condensing Unit	5	Condensate pipe
2	Indoor unit	6	Oil trap
3	Liquid pipe	7	The gap between the pipe and the wall needs to be sealed
4	Suction pipe with 1% downward gradient	8	Maximum 50 ft (15 m)

NOTE: Install an oil trap every 24.6 ft (7.5 m) along the vertical suction or gas pipe.

Figure 5.3 Piping Configuration When Vertiv CoolPhase Condensing Unit Is Below the Vertiv™ CoolPhase Wall Unit



Item	Description	Item	Description
1	Vertiv CoolPhase Condensing Unit	5	Condensate pipe
2	Vertiv CoolPhase Wall unit	6	The gap between the pipe and the wall needs to be sealed
3	Liquid pipe	7	Maximum 16.4 ft (5 m)
4	Suction pipe with 1% downward gradient		

5.4 Refrigerant and Lubricating Oil Charge

NOTE: Due to the use of R-32 refrigerant classified as A2L, all units with a refrigerant charge above 4.0 lb (1.8 kg) shall be installed in a location with a minimum room area. See the **Table 5.3** below for more details as applicable.

NOTE: The low ambient condensing unit shouldn't be installed in the plenum.

Table 5.3 Refrigerant and Lubricating Oil Charge

Model / Capacity	Length ft (m)	Liquid Line Diameter ANSI (DIN)	Suction Line Diameter ANSI (DIN)	Total Ref Charge: unit with Standard Ambient Condensing Unit lb (kg)	Total Ref Charge: Unit with Low Ambient Condensing Unit lb (kg)	Extra Lubricant Oil: Unit with Standard Ambient Condensing Unit fl oz (mL)	Extra Lubricant Oil: Unit with Low Ambient Condensing Unit fl oz (mL)	Minimum Room Floor Area ft ² (m ²)
WLM030A be paired with CUD030-E000A, CUL030-E000A, CUD032-E000B, CUL032-E000B	16.4 (5)	1/4 (6.35)	1/2 (12.7)	1.65 (0.75)	2.76 (1.25)	0.00 (0)	0.00 (0)	48.70 (4.52)
	32.8 (10)	1/4 (6.35)	1/2 (12.7)	1.90 (0.86)	3.00 (1.36)	0.00 (0)	0.00 (0)	52.98 (4.92)
	49.2 (15)	3/8 (9.52)	1/2 (12.7)	2.67 (1.21)	3.77 (1.71)	0.00 (0)	1.69 (50)	66.62 (6.19)
	65.6 (20)	3/8 (9.52)	1/2 (12.7)	3.17 (1.44)	4.28 (1.94)	0.00 (0)	3.38 (100)	75.58 (7.02)
	82 (25)	3/8 (9.52)	1/2 (12.7)	3.68 (1.67)	4.78 (2.17)	1.69 (50)	5.07 (150)	84.54 (7.85)
	98.4 (30)	3/8 (9.52)	1/2 (12.7)	4.19 (1.9)	5.29 (2.40)	3.38 (100)	6.76 (200)	93.50 (8.69)
	114.8 (35)	3/8 (9.52)	1/2 (12.7)	4.70 (2.13)	5.80 (2.63)	5.07 (150)	8.45 (250)	102.46 (9.52)
	131.2 (40)	3/8 (9.52)	1/2 (12.7)	5.20 (2.36)	6.31 (2.86)	6.76 (200)	10.14 (300)	111.42 (10.35)
	147.6 (45)	3/8 (9.52)	1/2 (12.7)	5.71 (2.59)	6.81 (3.09)	8.45 (250)	11.83 (350)	120.38 (11.18)
	164 (50)	3/8 (9.52)	1/2 (12.7)	6.22 (2.82)	7.32 (3.32)	10.14 (300)	13.53 (400)	129.34 (12.02)
	180.4 (55)	3/8 (9.52)	1/2 (12.7)	6.72 (3.05)	7.83 (3.55)	11.83 (350)	15.22 (450)	138.30 (12.85)
	196.8 (60)	3/8 (9.52)	1/2 (12.7)	7.23 (3.28)	8.33 (3.78)	13.53 (400)	16.91 (500)	147.26 (13.68)
WLM070A be paired with CUD070-E000A, CUL070-E000A, CUD072-E000B, CUL072-E000B,	16.4 (5)	3/8 (9.52)	1/2 (12.7)	2.09 (0.95)	3.20 (1.45)	0.00 (0)	0.00 (0)	56.49 (5.25)
	32.8 (10)	3/8 (9.52)	1/2 (12.7)	2.60 (1.18)	3.70 (1.68)	0.00 (0)	0.00 (0)	65.45 (6.08)
	49.2 (15)	3/8 (9.52)	5/8 (15.88)	3.11 (1.41)	4.21 (1.91)	0.00 (0)	3.38 (100)	74.41 (6.91)
	65.6 (20)	3/8 (9.52)	5/8 (15.88)	3.62 (1.64)	4.72 (2.14)	0.00 (0)	5.07 (150)	83.37 (7.75)
	82 (25)	3/8 (9.52)	5/8 (15.88)	4.12 (1.87)	5.22 (2.37)	3.38 (100)	6.76 (200)	92.33 (8.58)
	98.4 (30)	3/8 (9.52)	5/8 (15.88)	4.63 (2.1)	5.73 (2.60)	5.07 (150)	8.45 (250)	101.29 (9.41)
	114.8 (35)	3/8 (9.52)	5/8 (15.88)	5.14 (2.33)	6.24 (2.83)	6.76 (200)	10.14 (300)	110.25 (10.24)
	131.2 (40)	1/2 (12.7)	5/8 (15.88)	8.51 (3.86)	9.61 (4.36)	18.60 (550)	21.98 (650)	169.85 (15.78)
	147.6 (45)	1/2 (12.7)	5/8 (15.88)	9.41 (4.27)	10.52 (4.77)	21.98 (650)	25.36 (750)	185.83 (17.26)
	164 (50)	1/2 (12.7)	5/8 (15.88)	10.34 (4.69)	11.44 (5.19)	25.36 (750)	28.74 (850)	202.19 (18.78)
	180.4 (55)	1/2 (12.7)	5/8 (15.88)	11.24 (5.1)	12.35 (5.60)	28.74 (850)	32.12 (950)	218.16 (20.27)
	196.8 (60)	1/2 (12.7)	5/8 (15.88)	12.17 (5.52)	13.27 (6.02)	32.12 (950)	35.50 (1050)	234.52 (21.79)

Table 5.3 Refrigerant and Lubricating Oil Charge (continued)

Model / Capacity	Length ft (m)	Liquid Line Diameter ANSI (DIN)	Suction Line Diameter ANSI (DIN)	Total Ref Charge: unit with Standard Ambient Condensing Unit lb (kg)	Total Ref Charge: Unit with Low Ambient Condensing Unit lb (kg)	Extra Lubricant Oil: Unit with Standard Ambient Condensing Unit fl oz (mL)	Extra Lubricant Oil: Unit with Low Ambient Condensing Unit fl oz (mL)	Minimum Room Floor Area ft ² (m ²)
WLM110A be paired with CUD111-E000A, CUL111-E000A, CUD115-E000A, CUL115-E000A, CUD115-E000B, CUL115-E000B,	16.4 (5)	3/8 (9.52)	5/8 (15.88)	2.65 (1.2)	4.30 (1.95)	0.00 (0)	0.00 (0)	75.97 (7.06)
	32.8 (10)	3/8 (9.52)	5/8 (15.88)	3.15 (1.43)	4.81 (2.18)	0.00 (0)	0.00 (0)	84.93 (7.89)
	49.2 (15)	3/8 (9.52)	5/8 (15.88)	3.66 (1.66)	5.31 (2.41)	0.00 (0)	3.38 (100)	93.89 (8.72)
	65.6 (20)	3/8 (9.52)	5/8 (15.88)	4.17 (1.89)	5.82 (2.64)	0.00 (0)	5.07 (150)	102.85 (9.55)
	82 (25)	1/2 (12.7)	3/4 (19.05)	6.31 (2.86)	7.96 (3.61)	6.76 (200)	13.53 (400)	140.64 (13.07)
	98.4 (30)	1/2 (12.7)	3/4 (19.05)	7.23 (3.28)	8.88 (4.03)	10.14 (300)	16.91 (500)	157.00 (14.59)
	114.8 (35)	1/2 (12.7)	3/4 (19.05)	8.14 (3.69)	9.79 (4.44)	13.53 (400)	20.29 (600)	172.97 (16.07)
	131.2 (40)	1/2 (12.7)	3/4 (19.05)	9.06 (4.11)	10.71 (4.86)	16.91 (500)	23.67 (700)	189.33 (17.59)
	147.6 (45)	1/2 (12.7)	3/4 (19.05)	9.96 (4.52)	11.62 (5.27)	20.29 (600)	27.05 (800)	205.31 (19.07)
	164 (50)	1/2 (12.7)	7/8 (22.23)	10.89 (4.94)	12.54 (5.69)	23.67 (700)	30.43 (900)	221.67 (20.59)
	180.4 (55)	1/2 (12.7)	7/8 (22.23)	11.79 (5.35)	13.45 (6.10)	27.05 (800)	33.81 (1000)	237.64 (22.08)
	196.8 (60)	1/2 (12.7)	7/8 (22.23)	12.72 (5.77)	14.37 (6.52)	30.43 (900)	37.20 (1100)	254.00 (23.60)

When the refrigerant charge falls between the values provided in **Table 5.3** on the previous page, apply the lower of the two. For instance, for a pipe length of 18 m, use the refrigerant and lubricating oil amounts specified for 15 m.

If the unit is installed in a room with a smaller floor area, supplementary ventilation is required. For more information on how to provide adequate ventilation, see ASHRAE 15, ASHRAE 15.2, EN IEC Safety standard 60335-2-40 or UL/CSA Safety Standard 60335-2-40.

6 Electrical Connection Requirements

Electrical Field Connection

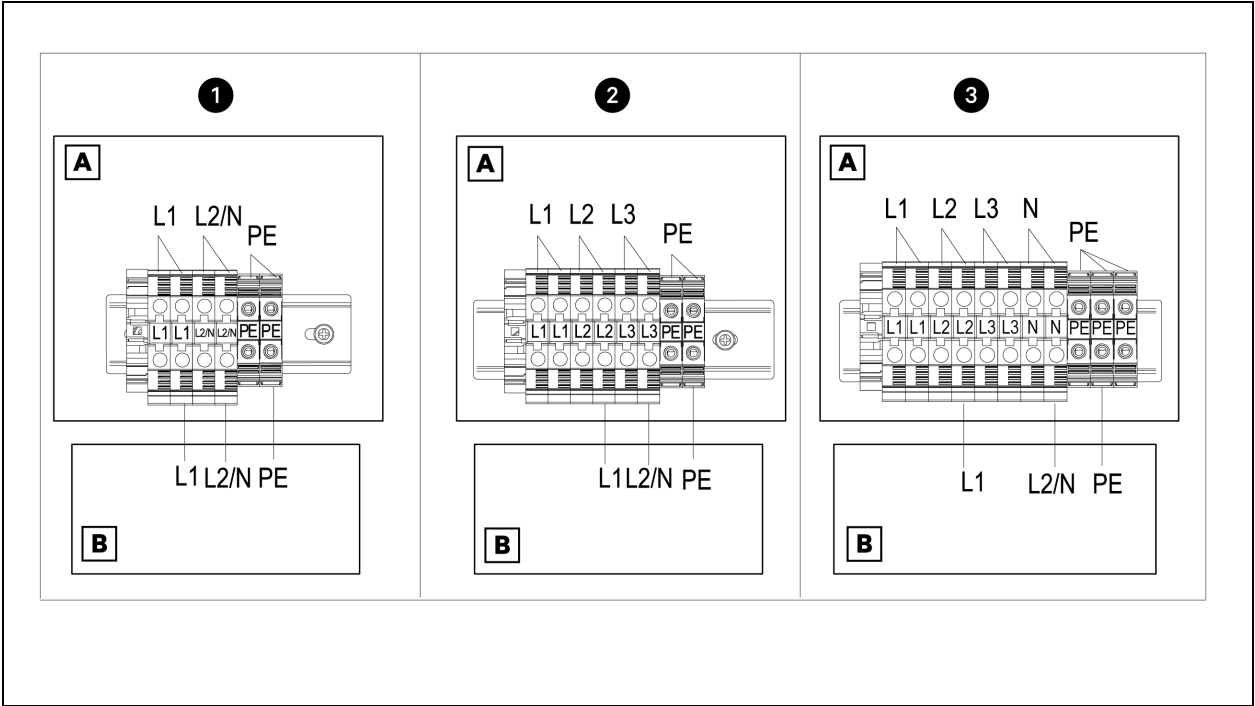
The Vertiv CoolPhase Wall unit can be powered either by the Vertiv CoolPhase Condensing Unit or powered by an independent power source.

- When powered by the Vertiv CoolPhase Condensing Unit: The power connection method is shown in **Figure 6.1** on the next page. To avoid wiring errors and potential equipment damage, all connections must be made in the exact order shown. Each wire must be connected individually and carefully.
- When powered by an independent power source: Connect L1, L2/N, and PE directly from the distribution box.

Table 6.1 Electrical Field Connection Submittals

Document Number	Submittal Name
Vertiv CoolPhase Wall unit	
20000114	Electrical field connection
Vertiv CoolPhase Condensing Unit	
20000161	Electrical field connection

Figure 6.1 Vertiv™ CoolPhase Wall Unit Connecting to Vertiv CoolPhase Condensing Unit



Item	Description	Item	Description
A	Vertiv CoolPhase Condensing Unit	2	Combination: WLM110A+CUD111-E000A, CUL111-E000A
B	Vertiv CoolPhase Wall Unit	3	Combination: WLM110A+CUD115-E000A, CUL115-E000A CUD115-E000B, CUL115-E000B
1	Combination: WLM030A+CUD030-E000A, CUL030-E000A, CUD032-E000B, CUL032-E000B WLM070A+CUD070-E000A, CUL070-E000A, CUD072-E000B, CUL072-E000B		

NOTE: The CU*111 model is intended for use in NAM, where the power supply may not include a neutral wire and the line-to-line voltage is 208V or 230V.

NOTE: The CU*115 model is intended for use in EMEA, where the power supply may include a neutral wire and the line-to-line voltage is 400V.

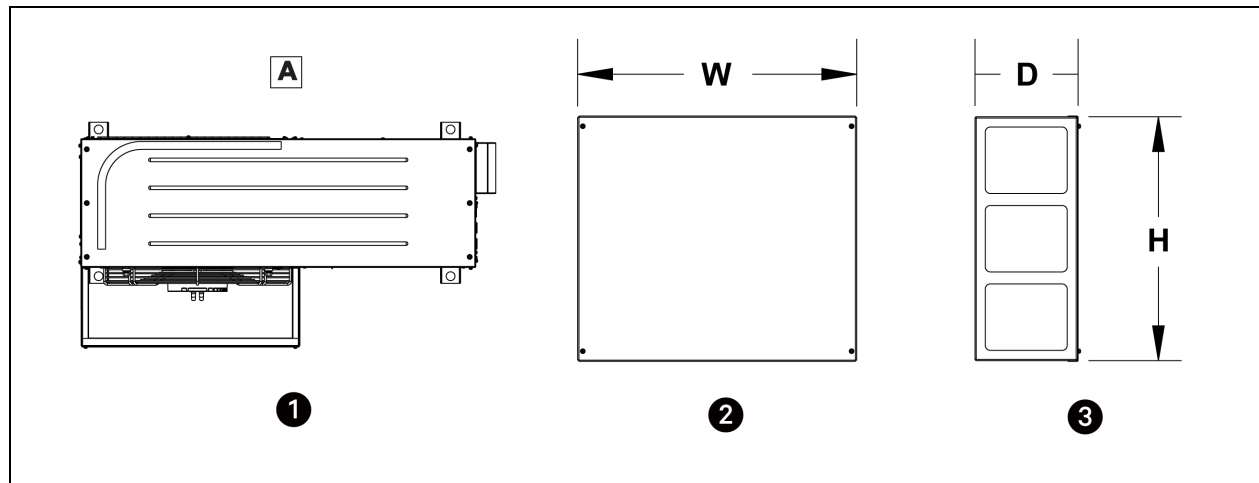
NOTE: Before installation, always verify that you have the correct model and ensure the wiring sequence for both the Vertiv CoolPhase Wall unit and the Vertiv CoolPhase Condensing Unit is accurate. Improper wiring may result in serious equipment damage or pose a significant fire hazard.

7 Optional Accessories

7.1 Wind Baffle

7.1.1 Wind Baffle Dimensional Data

Figure 7.1 Wind Baffle Dimensional Data



Item	Description	Item	Description
A	Unit top view	2	Wind baffle front view
1	Wind baffle location	3	Wind baffle side view

Table 7.1 Specifications and Compatibility

SKU	Wind Baffle Dimensions (Width x Depth x Height) in. (mm)	Compatible Condensing Unit Model
CUWINDKIT-03	21.4 x 7.9 x 18.78 (544.8 x 201.2 x 480)	CUD030-E000A, CUD032-E000B
CUWINDKIT-07	24.9 x 7.9 x 18.8 (633.8 x 201.2 x 480)	CUD070-E000A, CUD072-E000B
CUWINDKIT-11	32.1 x 7.9 x 21.5 (815.8 x 201.2 x 548.6)	CUD111-E000A, CUD114-E000A CUD115-E000A, CUD115-E000B

7.1.2 Wind Baffle Connection Locations

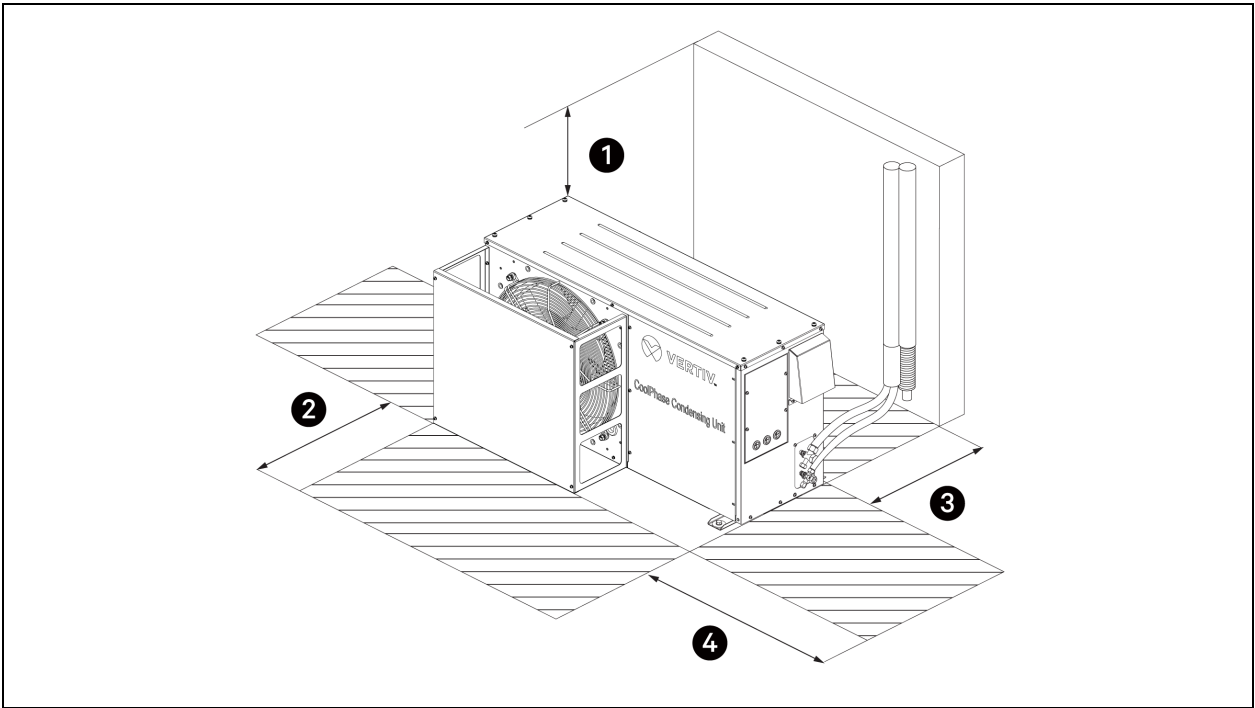
NOTE: With the wind baffle installed, the maximum ambient air temperature is 118.4 °F (48 °C), but cooling capacity will be reduced by approximately 1.5% in high ambient temperature. If both the hail guard and wind baffle are installed, the maximum ambient air temperature is 118.4 °F (48 °C), but the cooling capacity will decrease by approximately 3.5% in high ambient temperature.

Clearance Requirements

The following guidelines are needed to ensure optimal airflow, performance and maintenance to the unit while having the wind baffle installed:

NOTE: When the Vertiv CoolPhase Condensing Unit is equipped with a wind baffle, the distance between the rear of the unit and the wall should not exceed 11.8 in. (300 mm).

Figure 7.2 Clearance Requirements

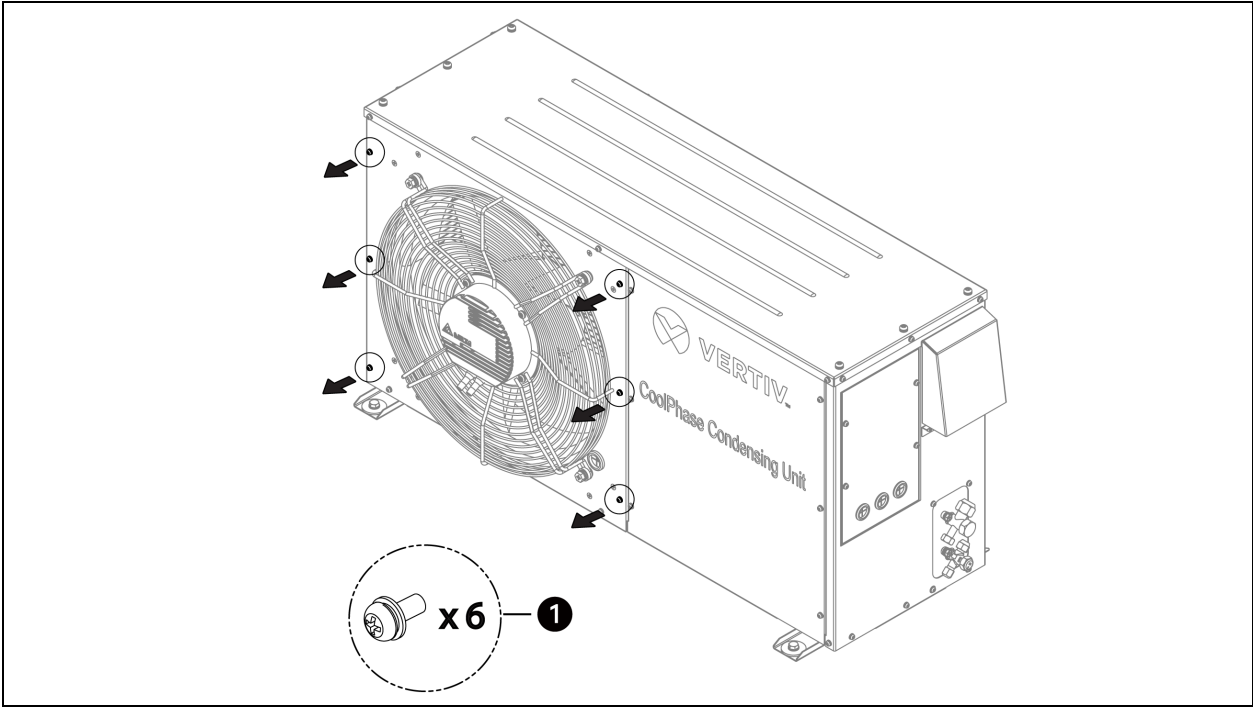


Item	Description	Item	Description
1	Top: 11.8 in. (300 mm) minimum distance	3	Back: 11.8 in. (300 mm) maximum distance
2	Front: 23.6 in. (600 mm) minimum distance	4	Sides: 23.6 in. (600 mm) minimum distance

Installation Procedures

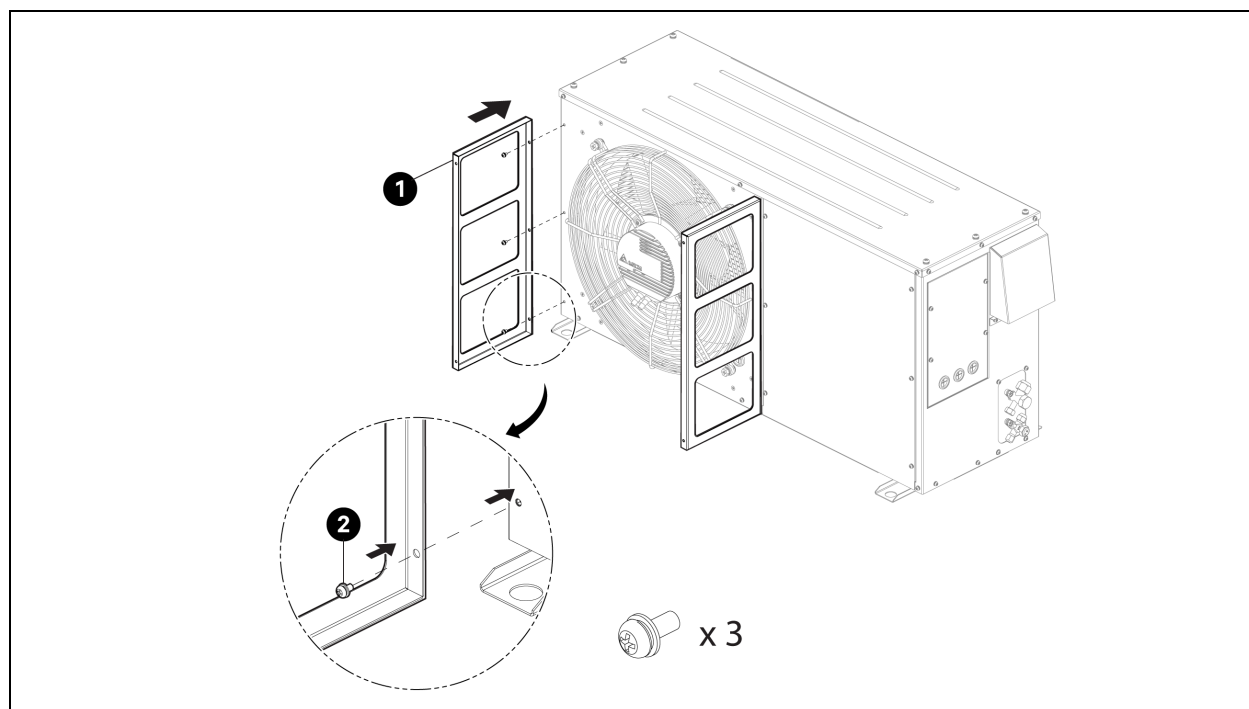
- 1. Remove the six M4 screws attached to the condensing unit.

Figure 7.3 Wind Baffle Connection Locations 1



Item	Description
1	M4 screws (six pieces)

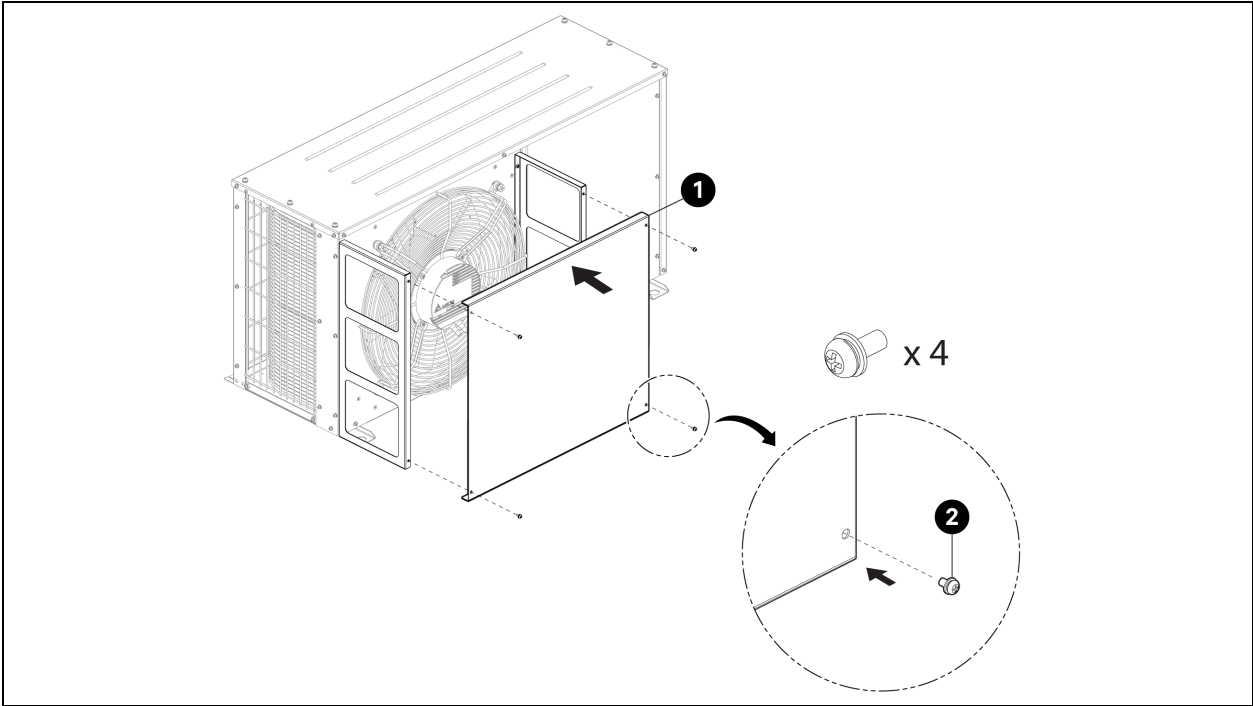
2. Locate the corresponding screw location that matches with the holes of the panel, and then attach both side panels using the three M4 screws on each one.

Figure 7.4 Wind Baffle Connection Locations 2

Item	Description
1	Side panel (two pieces)
2	M4 screws (six pieces in total, three pieces for each side panel)

- 3. Once the side pieces are assembled, take the front panel and attach it using the four M4 screws contained in the kit and secure them with a screwdriver.

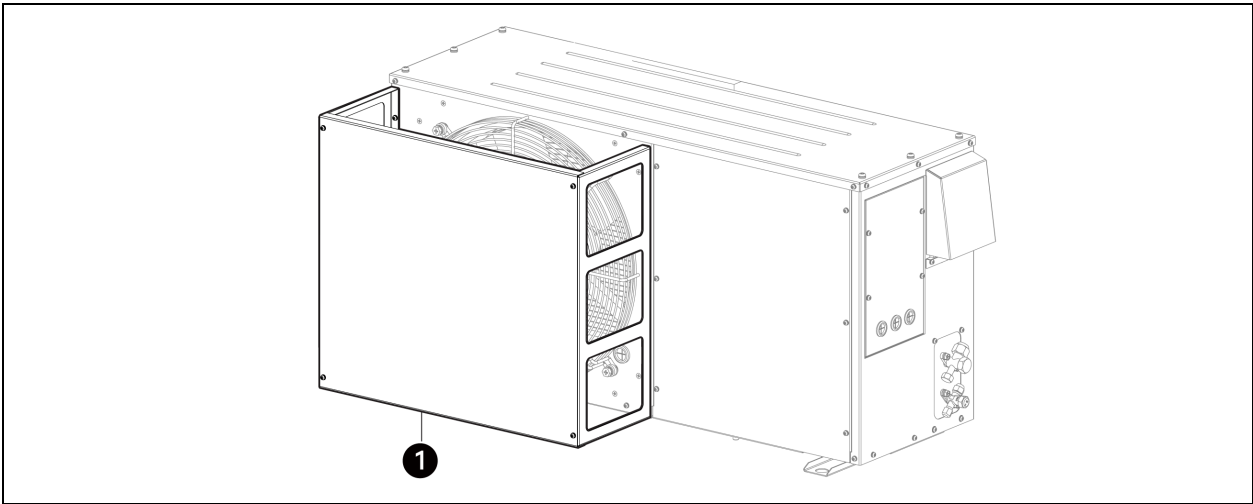
Figure 7.5 Wind Baffle Connection Locations 3



Item	Description
1	Front panel
2	M4 screws (four pieces)

Figure 7.6 below shows the wind baffle after attached and secured.

Figure 7.6 Wind Baffle Connection Locations 4

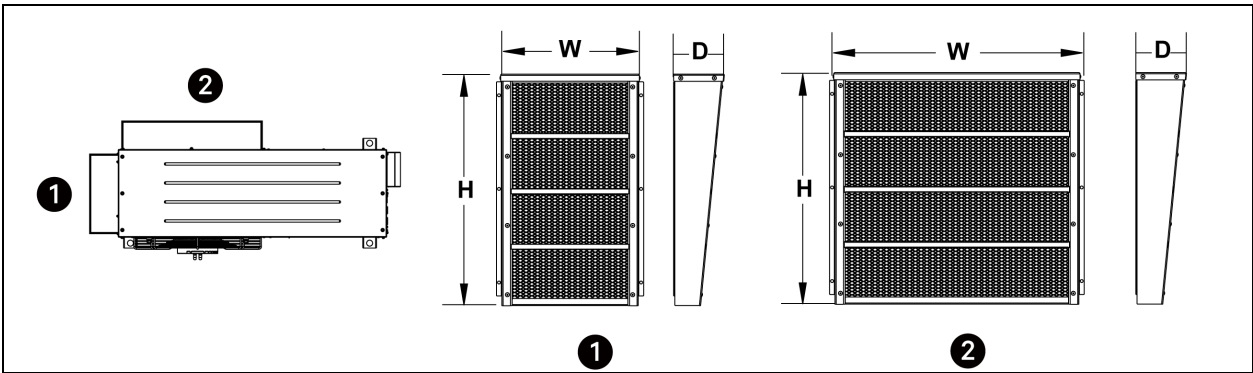


Item	Description
1	Wind baffle

7.2 Hail Guard

7.2.1 Hail Guard Dimensional Data

Figure 7.7 Hail Guard Dimensional Data



Item	Description
1	Side hail guard
2	Back hail guard

Table 7.2 Specifications and Compatibility

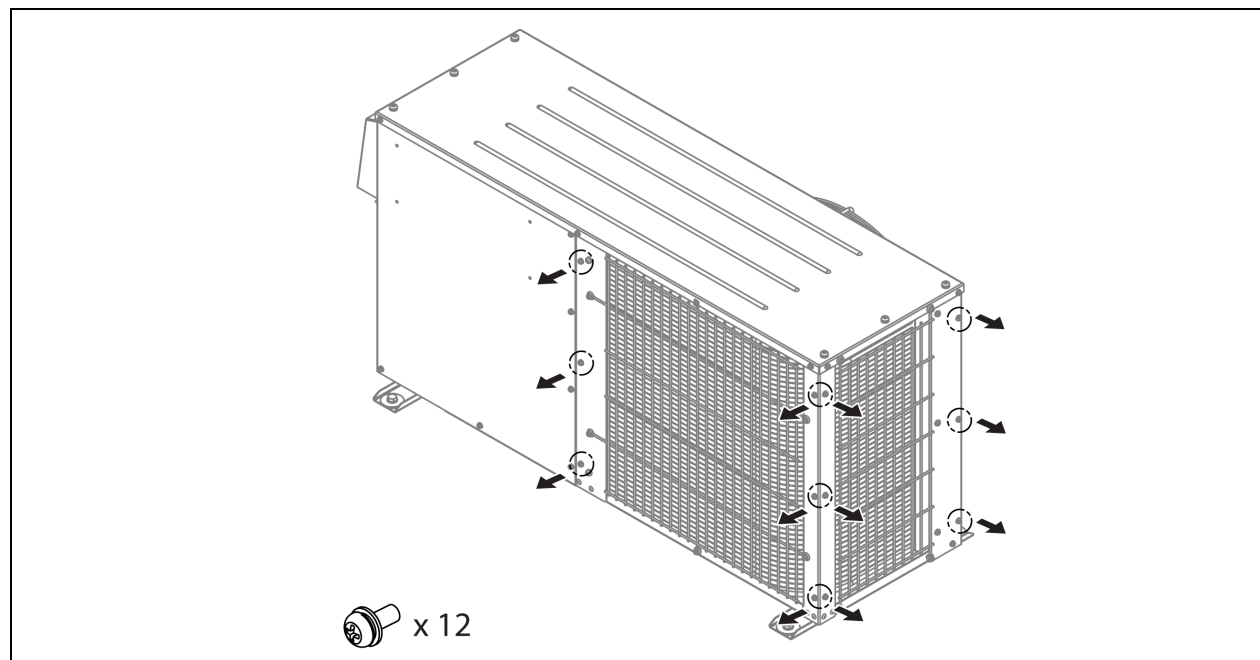
SKU	Hail Guard Dimensions (Width x Depth x Height) in. (mm)		Compatible Condensing Unit Model
	Side Hail Guard	Back Hail Guard	
CUHAILGRD-03	11.3 x 4.1 x 18.9 (288.8 x 105.3 x 482.2)	20.1 x 4.1 x 18.9 (512.8 x 105.3 x 482.2)	CUD030-E000A, CUD032-E000B, CUL030-E000A, CUL032-E000B
CUHAILGRD-07	15.2 x 4.1 x 18.9 (386.6 x 105.3 x 482.2)	27.3 x 4.1 x 18.9 (695.8 x 105.3 x 482.2)	CUD070-E000A, CUD072-E000B, CUL070-E000A, CUL072-E000B
CUHAILGRD-11	19 x 4.1 x 21.6 (484.6 x 105.3 x 549.4)	36 x 4.1 x 21.6 (914.8 x 105.3 x 549.4)	CUD111-E000A, CUD114-E000A, CUL111-E000A, CUL114-E000A, CUD115-E000A, CUD115-E000B, CUL115-E000A, CUL115-E000B

7.2.2 Hail Guard Connection Locations

NOTE: With the hail guard installed, the maximum ambient air temperature is 118.4 °F (48 °C), but cooling capacity will be reduced by approximately 2% in high ambient temperature. If both the hail guard and wind baffle are installed, the maximum ambient air temperature is 118.4 °F (48 °C), but the cooling capacity decreases by approximately 3.5% in high ambient temperature.

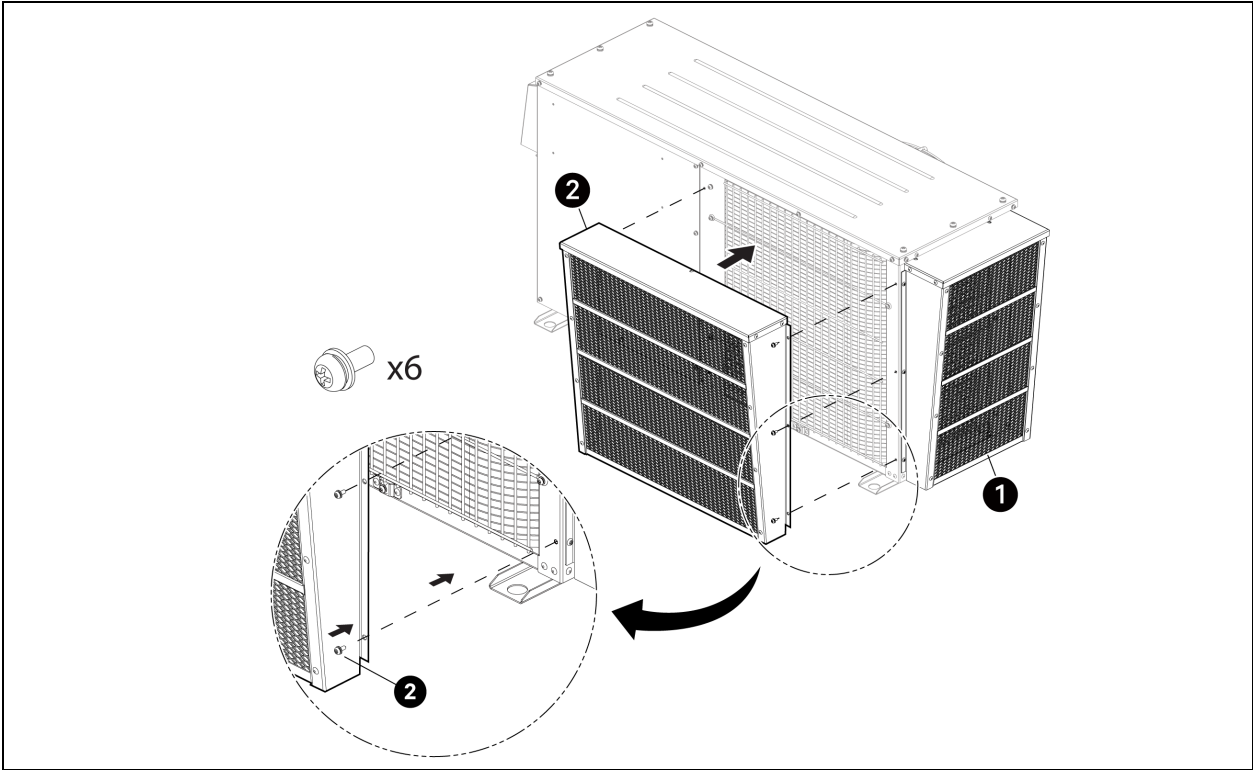
1. The twelve M4 screws needed are already attached on the condensing unit. Remove them before the hail guard kit installation.

Figure 7.8 Hail Guard Connection Locations 1



- 2. Place the side hail guard on the left side of the unit, locate the corresponding screw location that matches with the holes of the guard, then tighten the six M4 screws using a screwdriver. Repeat the same procedure with the back hail guard using the six M4 screws placed on the back of the unit.

Figure 7.9 Hail Guard Connection Locations 2

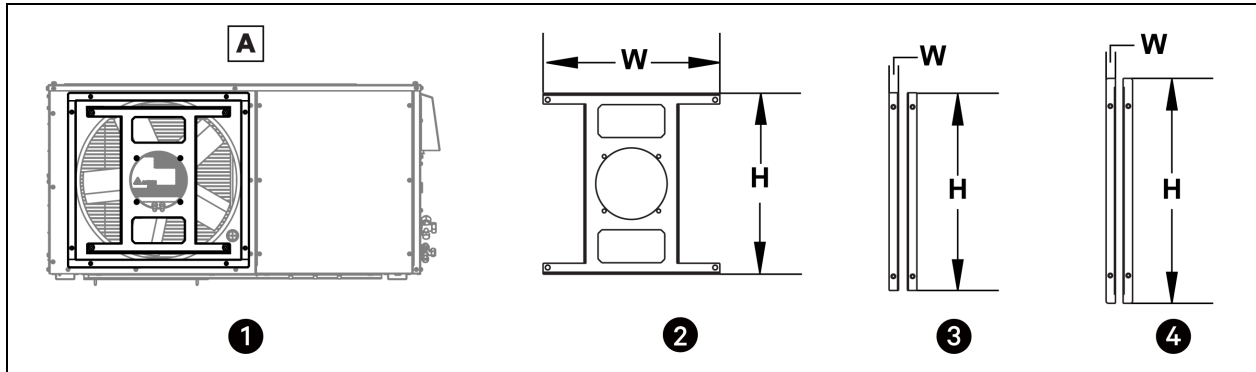


Item	Description
1	Side hail guard
2	Back hail guard

7.3 Duct Kit

7.3.1 Duct Kit Dimensional Data

Figure 7.10 Duct Kit Dimensional Data



Item	Description	Item	Description
A	Unit front view	3	Duct mounting plate, short plate
1	Duct kit location	4	Duct mounting plate, long plate
2	Fan bracket		

Table 7.3 Specifications and Compatibility

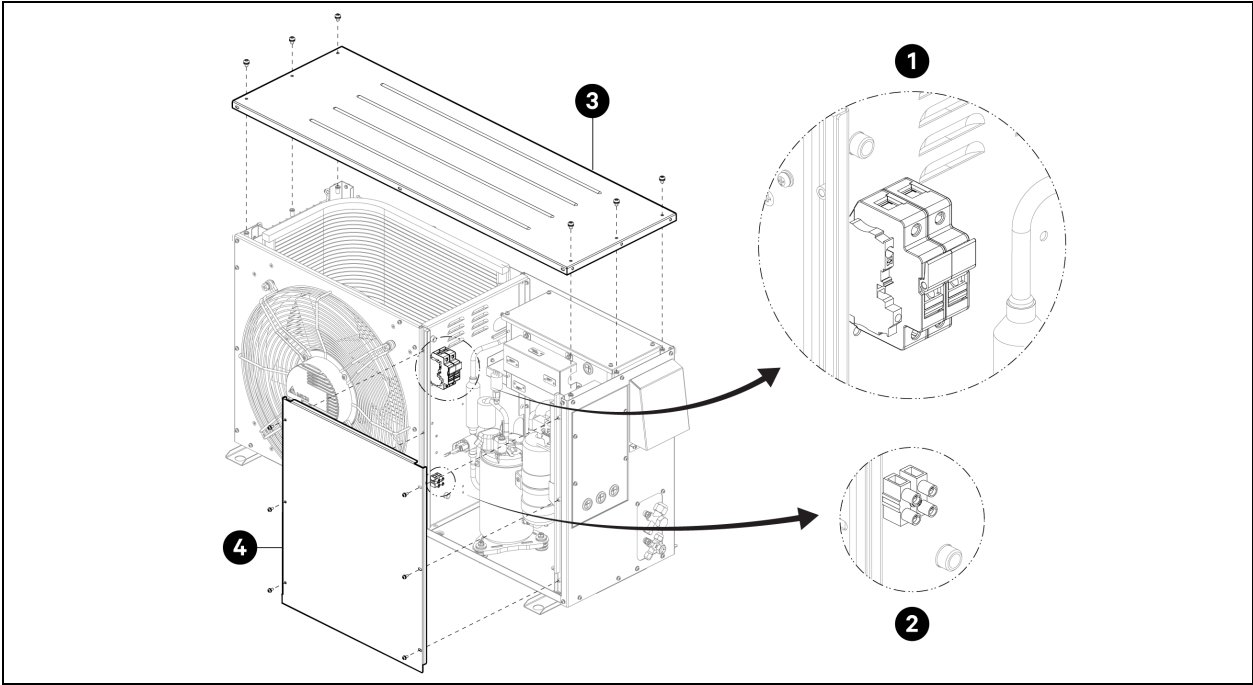
SKU	Duct Kit Dimensions (Width x Depth x Height) in. (mm)			Compatible Vertiv CoolPhase Condensing Unit Model
	Fan bracket	Duct Mounting Plate		
		Long plate	Short plate	
CUDUCTKIT-07	14.8 x 15.1 (376.4 x 384.4)	0.78 x 18.81 (20 x 478)	0.78 x 16.53 (20 x 420)	CUD030-E000A, CUD032-E000B, CUD070-E000A, CUD072-E000B
CUDUCTKIT-11	16.6 x 16.9 (423 x 431)	0.78 x 22.67 (20 x 576)	0.78 x 19.4 (20 x 493)	CUD111-E000A, CUD114-E000A, CUD115-E000A, CUD115-E000B

NOTE: When installing the Vertiv CoolPhase Condensing Unit within a plenum, the refrigerant charge shall not exceed 4.0 lb (1.8 kg). If the system requires a higher charge, the condensing unit must be installed outdoors.

7.3.2 Duct Kit Connection Locations

- 1. To install the duct kit, the fan must be removed. Before removing it, disconnect the fan power and communication cables by unplugging them from the terminals. The top panel and service panel must also be removed to access the terminals.

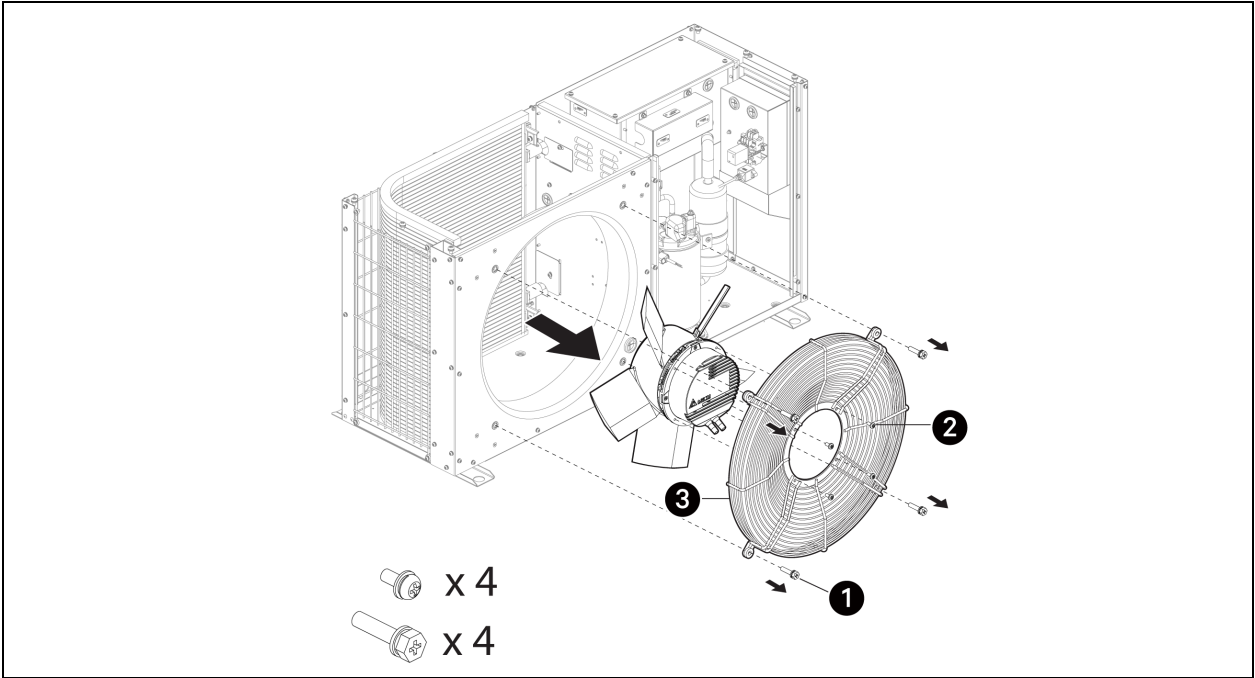
Figure 7.11 Duct Kit Connection Locations 1



Item	Description	Item	Description
1	Fan power cable terminals	3	Top panel
2	Communication cable terminals	4	Service panel

- 2. Loosen and remove the four M8 screws that are securing the fan or fan guard to the Vertiv CoolPhase Condensing Unit. Remove the fan guard by removing the four M4 screws that attach the fan guard to the motor located in the center of the fan guard. Keep all hardware for use later during the reassembly process.

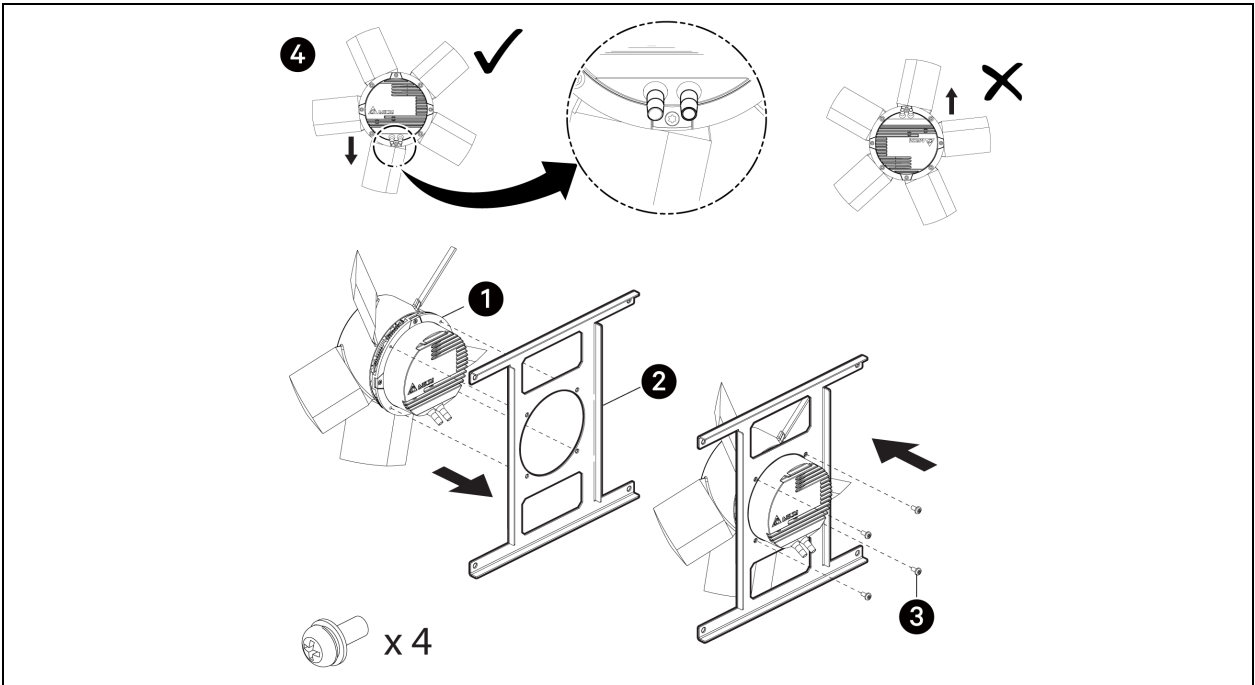
Figure 7.12 Duct Kit Connection Locations 2



Item	Description	Item	Description
1	M8 screw (four pieces)	3	Fan guard
2	M4 screw (four pieces)		

3. Using the M4 screws, attach the fan bracket to the fan motor.

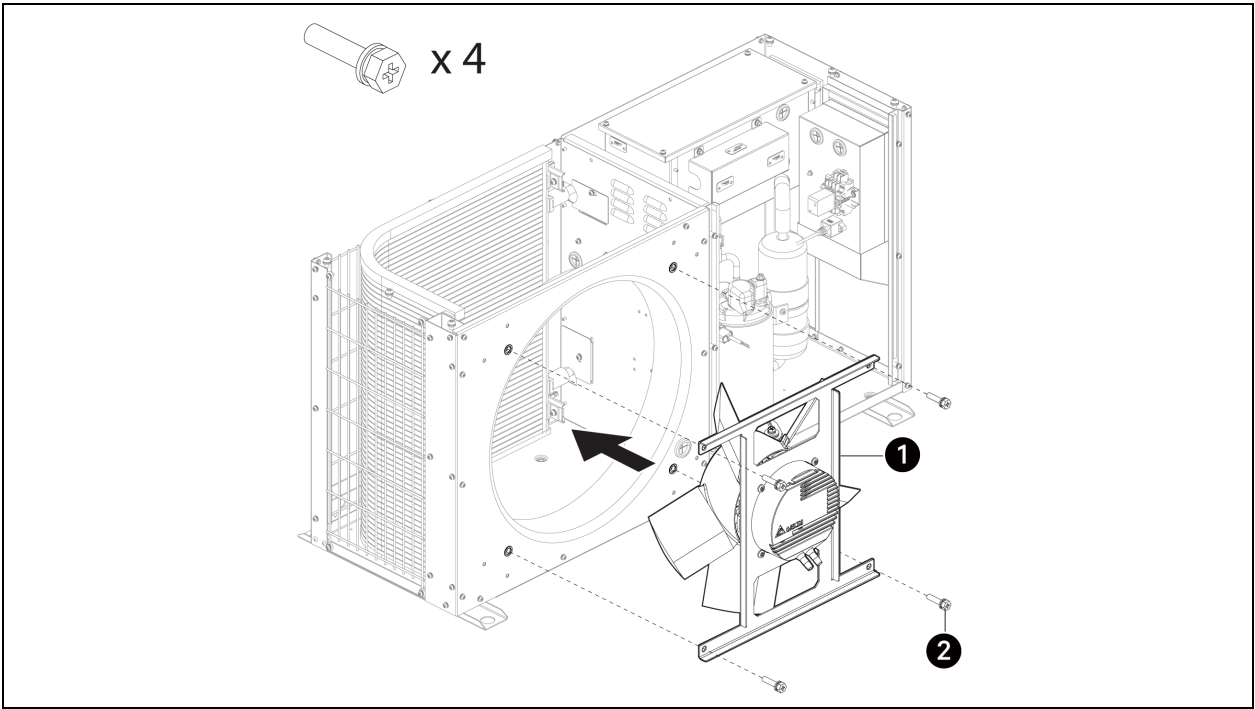
Figure 7.13 Duct Kit Connection Locations 3



Item	Description	Item	Description
1	Fan motor	3	M4 screw
2	Fan bracket	4	The fan motor should be installed in the correct orientation, with the fan power cables facing downward

4. Attach the assembly to the unit using the M8 screws. Use the fan guard holes that remain after removing the fan.

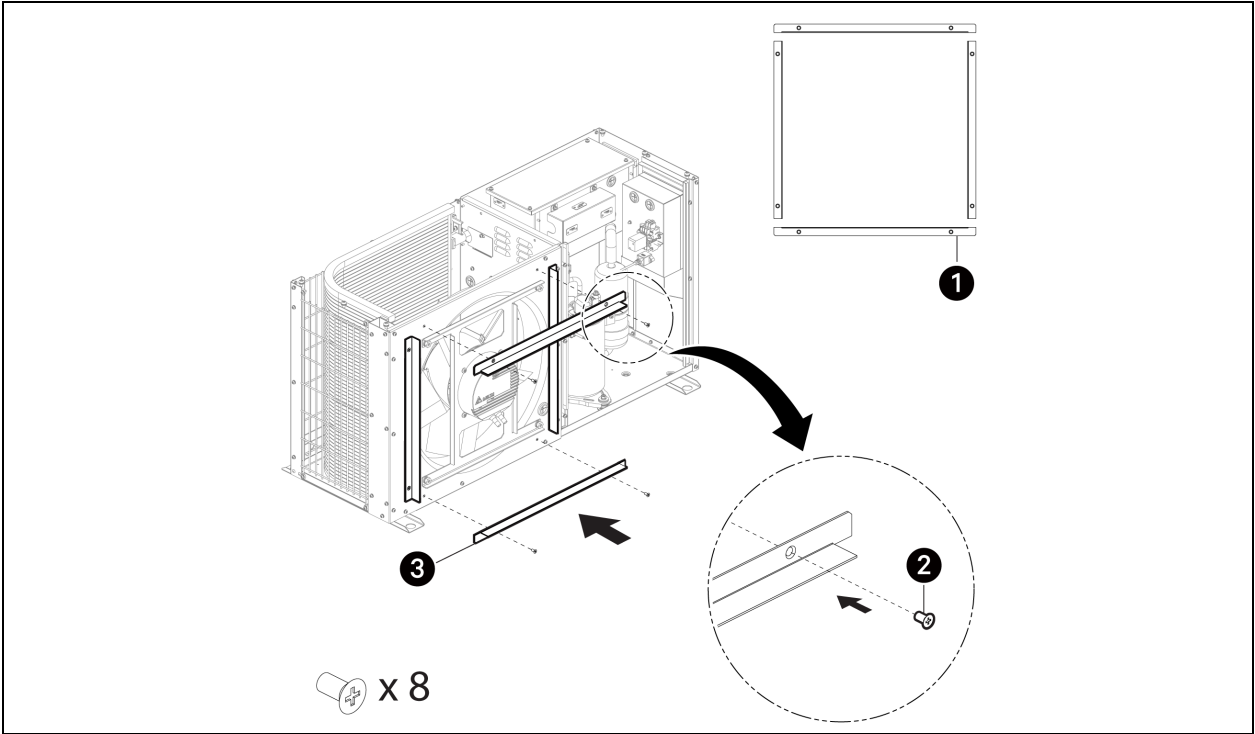
Figure 7.14 Duct Kit Connection Locations 4



Item	Description
1	Assembly
2	M8 screw

5. Once the fan is secured, install the components of the mounting plate. Use the eight M4 screws and screw the four plate pieces to their corresponding position.

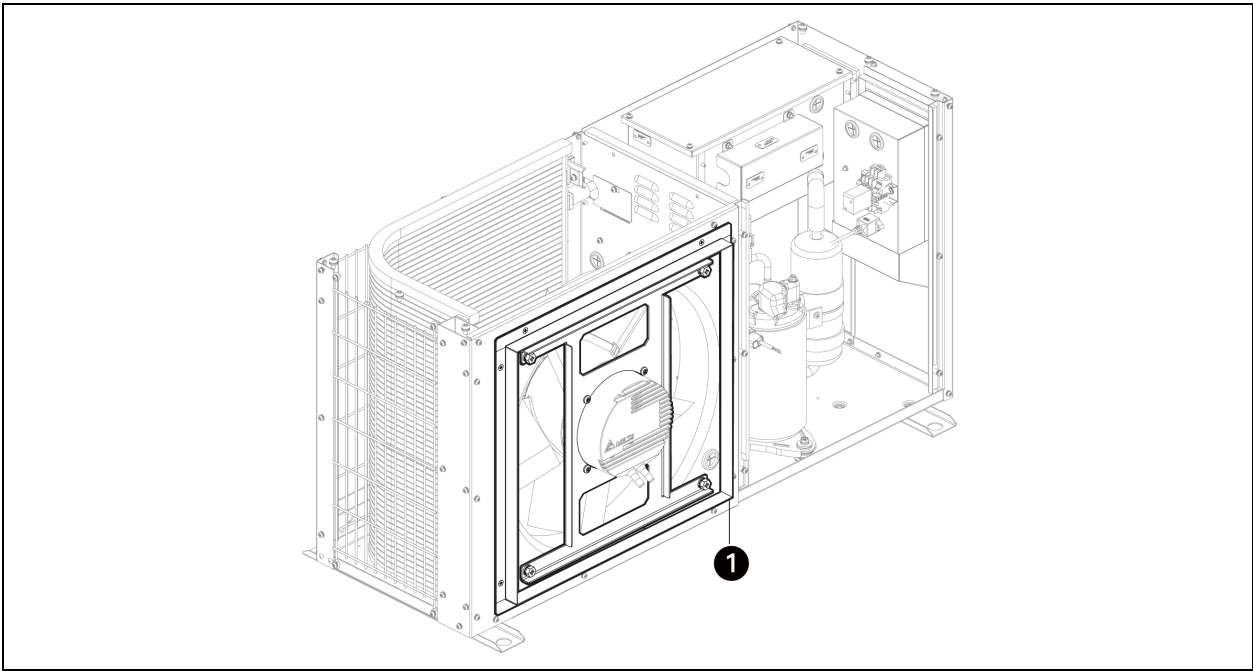
Figure 7.15 Duct Kit Connection Locations 5



Item	Description	Item	Description
1	Mounting plate	3	Plate piece (four pieces)
2	M4 screw (eight pieces)		

6. After attaching and securing both kit pieces, reconnect the fan power and communication cable.

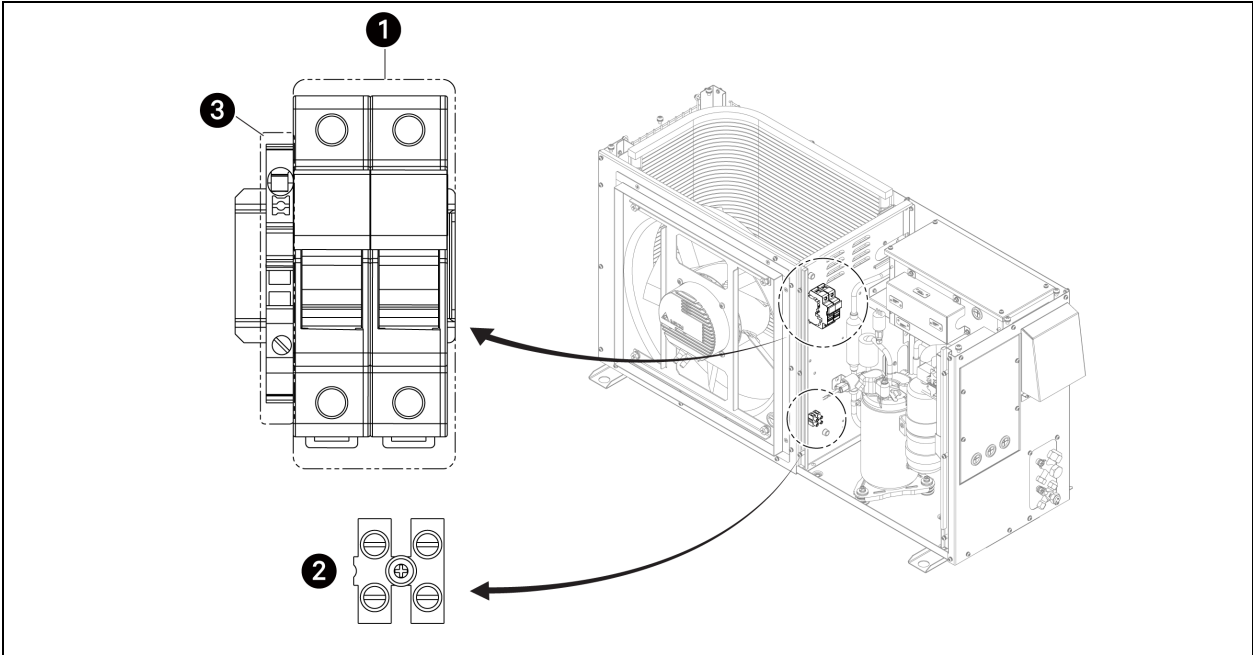
Figure 7.16 Duct Kit Connection Locations 6



Item	Description
1	Kit piece

7. For terminal block 1: the brown line connects to fuse 1, the blue line connects to fuse 2, the grey and yellow line connect to PE. For terminal block 2, the blue and white line connect to the left inlet of terminal block 2, and the black line connects to the right inlet of terminal block 2.

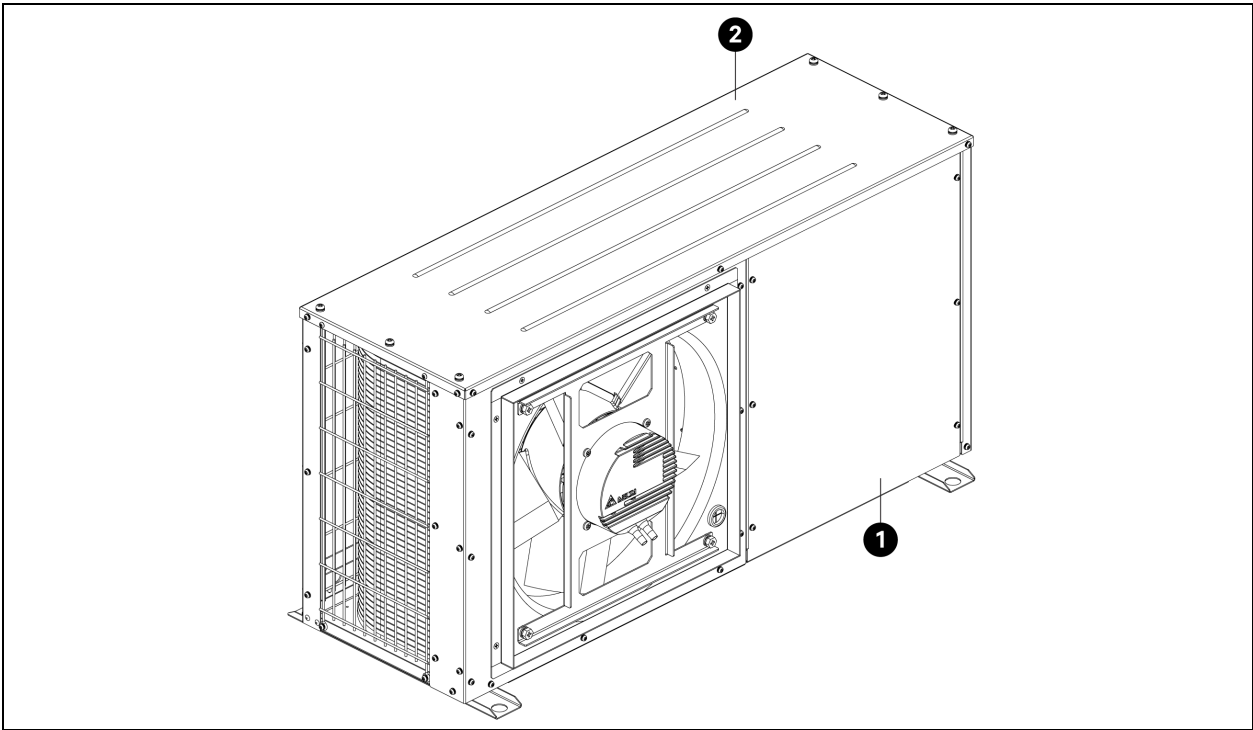
Figure 7.17 Duct Kit Connection Locations 7



Item	Description	Item	Description
1	Terminal block 1	3	PE
2	Terminal block 2		

8. Return the service panel and the top panel to their original positions.

Figure 7.18 Duct Kit Connection Locations 8



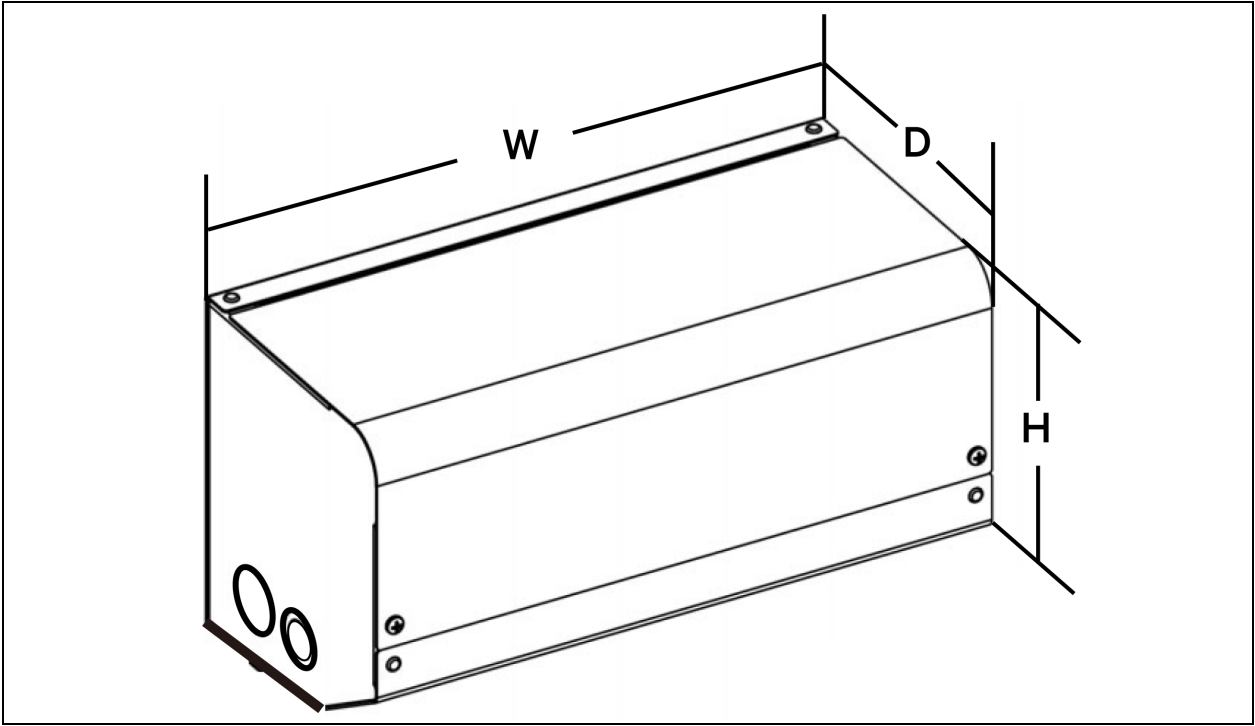
Item	Description
1	Service panel
2	Top panel

7.4 Condensate Pump

7.4.1 Condensate Pump Kit Dimensional Data

NOTE: The condensate pump can be used with the WLM030A, WLM070A, and WLM110A units.

Figure 7.19 Condensate Pump Kit Dimensional Data



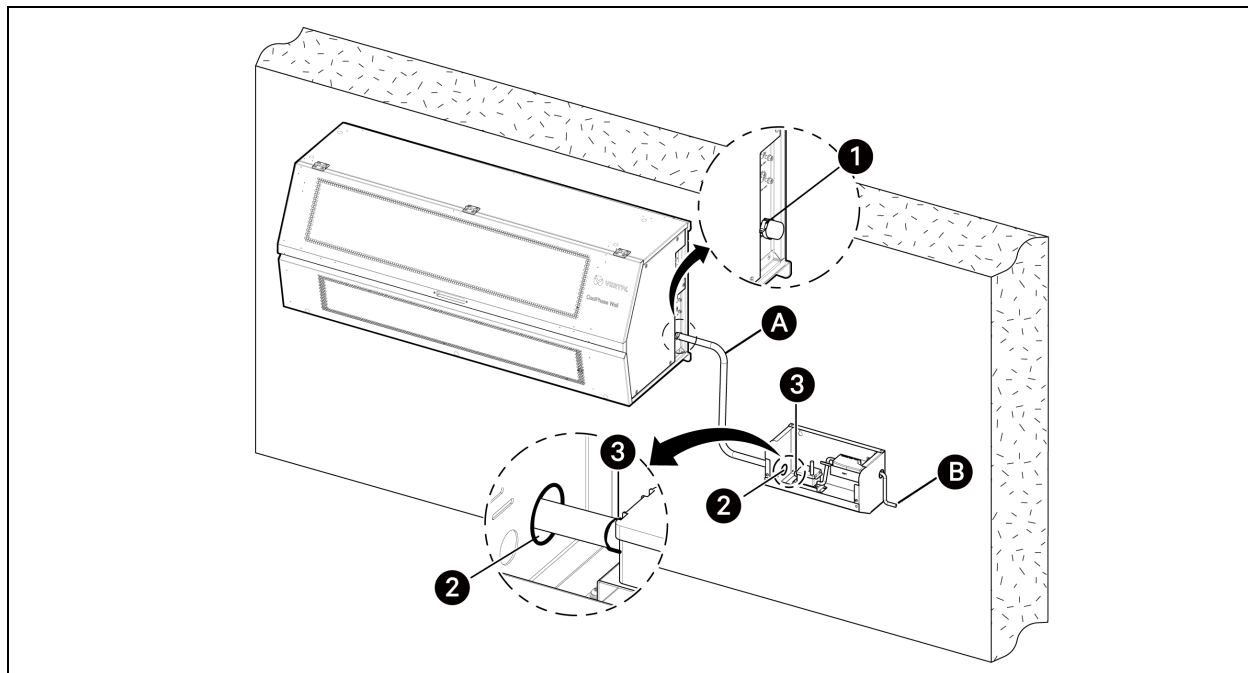
Weight lb (kg)	Dimensions (Width x Depth x Height) in. (mm)
5.4 (2.45)	11.8 x 5.7 x 6.3 (300 x 144.8 x 159.5)

NOTE: Although the condensate pump is a factory assembled kit, for better field installation these materials should be prepared: M4 x 50 mm expansion bolts (two pieces), drainpipe I.D. 16 mm, drainpipe I.D. 6 mm (if necessary), and a metal clamp.

7.4.2 Condensate Pump Pipe and Electrical Connection Locations

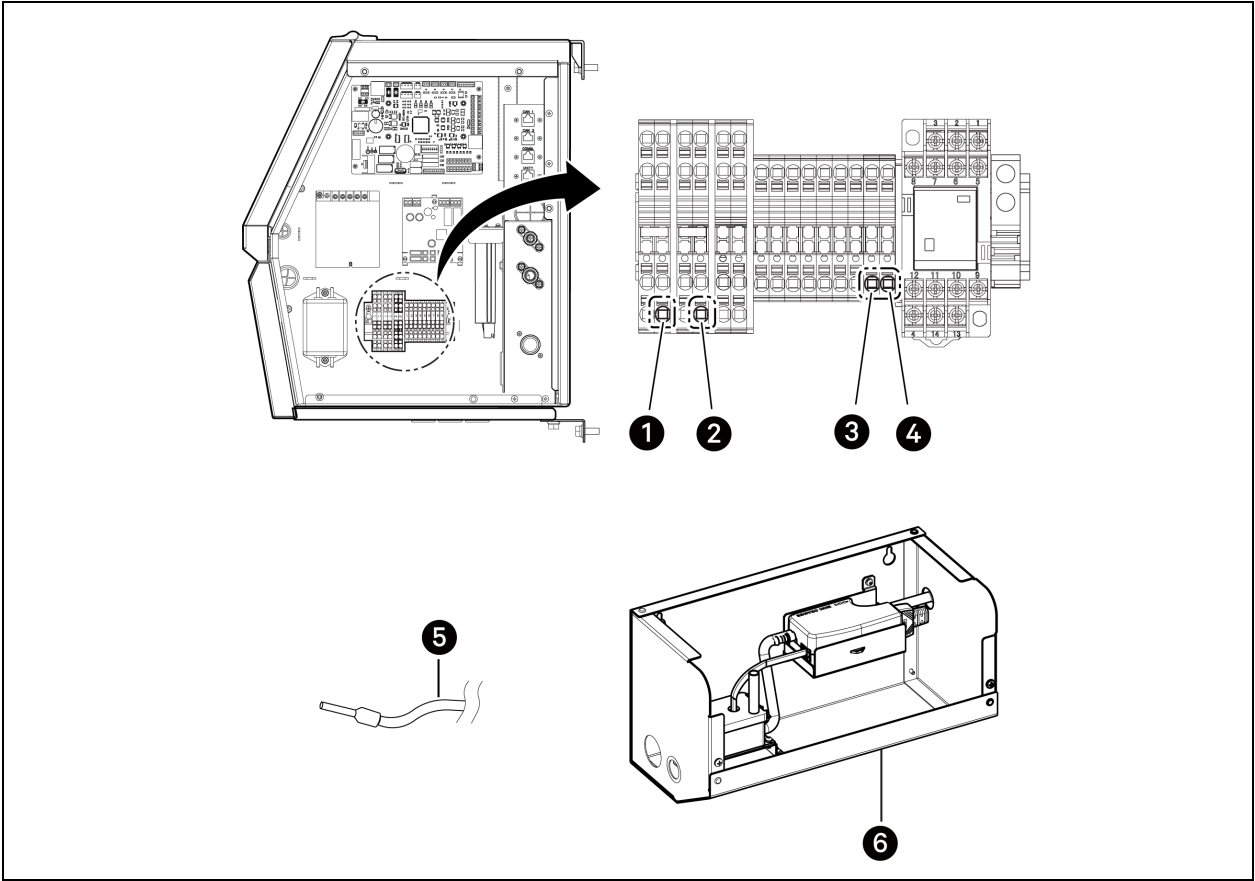
The standard outlet for the Vertiv CoolPhase Wall unit's drain pipe is located on the right side of the unit. Open the metal clamps reserved at the right side of Vertiv CoolPhase Wall unit outlet — do not discard it. Remove the black rubber cap. Connect one end of the condensate drain pipe A to the Vertiv CoolPhase Wall unit's outlet and the other end to the condensate pump. Use the metal clamp to secure the drain pipe A in place.

Figure 7.20 Condensate Pump Pipe and Electrical Connection Locations 1



Item	Description	Item	Description
1	Standard outlet for the Vertiv CoolPhase Wall unit's drain pipe	A	Drain pipe A
2	Pipe inlet	B	Drain pipe B
3	Water pump inlet		

Figure 7.21 Condensate Pump Pipe and Electrical Connection Locations 2



Item	Description	Item	Description
1	Power cable 1 (Black)	4	Alarm cable 2 (Grey)
2	Power cable 2 / Neutral (Red)	5	Wiring cable overview
3	Alarm cable (Purple)	6	Condensate pump kit

Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

505 N. Cleveland Ave.

Westerville, OH 43082, USA

Europe

Victor-von-Bruns Strasse 21,

8212 Neuhausen am Rheinfall, Switzerland

Asia

Singapore

151 Lorong Chuan, Lobby D #05-04

New Tech Park, Singapore 556741

India

Vertiv Energy Private Limited

Plot No. C 20, Road No. 19

Wagle Industrial Estate, MIDC

Thane (West), Maharashtra 400604, India

China

Vertiv Technology Co., Limited

Floors 1–4 and 6–10,

Building B2, Nanshan I Park

No. 1001 Xueyuan Road, Nanshan District

Shenzhen, Guangdong 518055, China

Appendix B: Guide Specifications

Vertiv CoolPhase Wall Unit Guide Specifications

1.0 General

1.1 Summary

These specifications describe requirements for a wall-mounted, split system, and Thermal Management system. The system shall be designed to control the temperature in rooms containing electronic equipment, with good insulation and vapor barrier. The manufacturer shall design and furnish all equipment in the quantities and configurations shown on the project drawings.

The thermal management system shall be a Vertiv CoolPhase Wall, split-system, factory assembled unit with cooling capacity of 3.7 kW, or 7 kW, or 11 kW and energy efficiency rating SCOP greater than or equal to 3.4.

Systems shall meet ETL and CE certifications, which pass the UL 60335 and EN 60335 tests, and are marked with the ETL and CE logo.

The evaporator unit shall be designed for wall-mount installation. The heat rejection condensing unit shall be installed outdoors or is approved to be installed within an indoor ceiling plenum.

The system shall have a net total cooling capacity of _____ BTU/hr (kW) and net sensible cooling capacity of _____ BTU/hr (kW), based on entering air conditions of _____°F (____°C) dry bulb temperature and ____°F (____°C) wet bulb temperature.

The evaporator electrical supply shall be ____ Volts, _____ phase, ____ Hz.

The heat rejection of the Vertiv CoolPhase Condensing Unit electrical supply shall be _____ Volts, _____ phase, _____ Hz.

1.2 Submittals

Submittals shall be provided with the proposal and shall include: Single-Line Diagrams; Dimensional, Refrigeration Schematic Diagram, Electrical, and Capacity Data; Piping and Electrical Connection Drawings.

2.0 CoolPhase Wall Unit

2.1 CoolPhase Wall Unit Cabinet Construction

All cabinet panels shall be painted, hot-dip galvanized sheet metal, with the side panels covered with insulation cotton.

The unit shall be equipped with two wall-mounted brackets to facilitate on-site service personnel with mounting the indoor unit to the wall.

On the left and right sides of the indoor unit, there are drainage quick connectors, gas pipe quick connectors and liquid pipe quick connectors, which are convenient for the flexible pipe wiring on the customer's site and connecting the indoor unit and the outdoor unit.

2.2 Cabinet Serviceability and Accessibility

The evaporator cabinet shall be designed so all components are easily accessible for service and maintenance through either the front or side of the unit.

The upper front cover of the unit opens, allowing easy access to the filter and temperature and humidity detection board.

The left side panel is removable with maintenance access to refrigerant leak sensors, EEV, temperature sensor and pressure transducer, filter driers, water level detection boards and other electrical components, so that field service personnel can quickly replace these components.

2.3 Fan Section

Each unit is equipped with a direct-driven centrifugal fan featuring backward-curved blades and an electronically commutated (EC) AC motor. The fan speed shall be variable and automatically regulated by the ICOM™ Edge through all modes of operation. Each fan shall be equipped with its own motor, integrated fault monitoring circuitry, and an individual speed controller, providing a level of redundancy in models with multiple fans. The entire fan assembly shall be removed from the front of the cabinet.

Return air to the evaporator shall be through the front, towards the top of the cabinet. The supply air shall be horizontal, near the bottom of the cabinet.

The evaporator fan output adjustment range is 40%-100%.

Each system shall deliver ___ CFM (___CMH) at full air flow.

2.4 Refrigeration System

A single refrigeration circuit shall include factory installed evaporator coil, electronic expansion valve, low pressure transducer, and fan(s). The indoor evaporator refrigerant piping shall be spun and shut off with a nitrogen holding charge. Field relief of the service valve shall indicate a leak-free system. The evaporator unit shall be powered by the condensing unit or a separate source, with ___ V, ___ Ph, ___ Hz power.

2.5 Evaporator Coil

The evaporator shall be constructed of copper tubes and hydrophilic-coated aluminum fins. The hydrophilic coating improves condensate drainage from the fins to reduce the risk of water carryover.

2.6 Electronic Expansion Valve

The Electronic Expansion Valve (EEV) shall be designed for precise modulation of refrigerant mass flow in response to varying system loads. The EEV shall incorporate sensors for simultaneous collection of temperature and pressure signals to accurately regulate refrigerant flow. The valve shall operate within a wide envelope, enabling it to reduce condensing pressure when conditions allow, thereby optimizing energy consumption.

2.7 Refrigerant Filter Drier

A factory installed filter drier shall be designed to remove moisture and contaminants from the refrigeration system that may otherwise clog or damage the refrigeration system.

2.8 R32 Refrigerant

The system shall use R32 refrigerant, with a GWP100 of 675. Refrigerant shall be field supplied, and field charged.

2.9 Short Circuit Current Rating (SCCR)

The customer electrical panel shall provide at least 5000A SCCR.

2.10 Air Filtration

The filter channel shall be located inside the evaporator cabinet and can be quickly accessed by opening the front cover. The filters are all washable mesh structures, including regular maintenance warnings.

3.0 iCOM Edge Controller

3.1 Display

The display is 128 × 64 dot screen with white backlight, offering symbolic representation of unit functions and diagnostics feature. A buzzer provides audible indication in case of the Warning or Alarm event.

A password shall be required to make system changes. Service menus shall include setpoints, standby settings (lead/lag), timers, alarm setup, maintenance/wellness settings, options setup, and system setup.

The display is equipped with a 3m 22AWG cable when it leaves the factory, which is convenient for customers to wire and install the display on site.

- Password Protection - The iCOM™ Edge shall contain three unique passwords to protect against unauthorized changes. An auto hide/show feature shall allow the user to see applicable information based on the login used.
- Setup Wizards - The iCOM™ Edge shall contain step-by-step tutorials or wizards to provide easy setup of the control.
- Display Setup - The user shall be able to configure the display information based on the specific user's preference. Language, units of measure, screen contrast, back-light timer and the hide/show of certain readouts shall be configurable through the display.
- Status of LED - The iCOM™ Edge shall show the unit's operating status using an integral LED. The LED shall indicate if the unit has an active alarm; if the unit has an active alarm that has been acknowledged; or if the unit is On, Off or in standby status.
- Event Log - The iCOM™ Edge shall automatically store the last 500 unit-only events (messages, warnings, and alarms).
- Service Contact Information - The iCOM™ Edge shall be able to store the local service or sales contact information.
- Upgradeable - iCOM™ Edge upgrades shall be performed through a USB connection.
- Menu Layout - The menus shall be divided into two main menus: User and Service. The User screen shall contain the menus to access parameters required for basic unit control and setup. The Service screen shall be designed for service personnel and shall provide access to advanced control setup features and diagnostic information.
- Maintenance/Wellness Settings - The menus shall allow reporting of potential component problems before they occur.
- Options Setup - The menus shall provide operation settings for the installed components. (Service menu only.)

3.2 Alarms

All unit alarms shall be annunciated through both audio and visual cues, clearly displayed on the screen, automatically recorded in the event log, and communicated to the customers Building Management System/Building Automation System.

The iCOM™ Edge shall activate an audible and visual alarm in event of any of the following conditions:

- High Temperature
- Low Temperature
- High Humidity
- Low Humidity
- EC Fan Fault
- Change Filters
- Loss of Power
- High Pressure
- High Discharge Temperature
- Low Suction Pressure
- Refrigerant Leakage
- Sensor Failure
- Communication Failure

Most alarm attributes can be set to Enable (EN), Suspended (MSG), or Disable (DIS), but some alarms can only be set to Enable (EN) or Suspended (MSG).

3.3 Control Methods and Options

The iCOM™ Edge shall be factory-set to allow precise monitoring and control of the condition of the air entering and leaving the unit. This control shall include predictive methods to control cooling capacity-based control sensors installed.

Proportional and Tunable PID shall also be user selectable options.

3.4 Controlling Sensor Options

ICOM™ Edge shall be flexible in the sense that it shall allow for controlling the capacity and fan from multiple different sensor selections. The sensor selections shall be:

Cooling Capacity

- Supply
- Return

Temperature Compensation

The iCOM™ Edge shall be able to adjust the capacity output based on supply and return temperature conditions to operate at the highest efficiency.

3.5 Multi-Unit Co-ordination

ICOM™ Edge teamwork shall save energy by preventing multiple units in an area from operating in opposing modes.

Teamwork allows the control to optimize a group of connected cooling units equipped with ICOM™ Edge using the U2U (Unit-to-Unit) network. There shall be three modes of teamwork operation:

- Teamwork Mode 1: Is best in small rooms with balanced heat loads. The controlling temperature and humidity sensor readings of all units in operation (fan on) are collected to be used for an average or worst-case sensor reading (user selectable). The master unit shall send the operating requirements to all operating units in the group. The control band (temperature, fan, and humidity) is divided and shared among the units in the group.
- Teamwork Mode 2: The ICOM™ Edge calculates the worse-case demand for cooling and humidification. Based on the greatest demand within the group, each unit operates independently, meaning that the unit may respond to the thermal load and humidity conditions based on the unit's controlling sensors.
- Teamwork Mode 3: Optimized Aisle: May be employed in large and small rooms with varying heat loads. Optimized Aisle is the most efficient teamwork mode that allows the unit to match cooling capacity with heat load. In the Optimized Aisle mode, the fans operate in parallel. Fans can be controlled exclusively by remote temperature or using static pressure with a secondary remote temperature sensor(s) as an override to ensure that the inlet rack temperature is being met. Cooling (Compressors) is controlled through unit supply-air conditions. Vertiv™ ICOM™ Edge calculates the average or worst-case sensor reading (user-selectable) for cooling and humidification. Based on the demand within the group, units will be allowed to operate within that mode until room conditions are satisfied.

3.6 Standby Lead

The ICOM™ Edge shall allow scheduled rotation to keep equal run time on units and provide automated emergency rotation of operating and standby units.

3.7 Standby Unit Cascading

The ICOM™ Edge cascade option shall allow the units to turn On and Off based on heat load when utilizing Optimized Aisle, Teamwork Mode 3 and remote temperature sensors. Cascade mode dynamically coordinates the fan speed to save energy and to meet the cooling demands. For instance, with an ICOM™ Edge group of six units and only 50% of the heat load, the ICOM™ Edge shall operate only four units at 80% fan speed and leave the other two units in standby. As the heat load increases, the ICOM™ Edge shall automatically respond to the additional load and bring on another unit, increasing the units in operation to five. As the heat load shifts up or down, the control shall meet the needs by cascading units On or putting them into standby.

3.8 Wired Supply Sensor

Each ICOM™ Edge shall have one factory-supplied and connected supply-air sensor that may be used as a controlling sensor or reference.

3.9 Virtual Master

As part of the robust architecture of the ICOM™ Edge control, it shall allow for a virtual master that coordinates operation. The Virtual Master function shall provide smooth control operation if the group's communication is compromised. When the lead unit, which is in charge of component staging in teamwork, unit staging and standby rotation, becomes disconnected from the network, the ICOM™ Edge shall automatically assign a virtual master. The virtual master shall assume the same responsibilities as the master until communication is restored.

3.10 Low Noise Operation

Units may be matched to a premium efficiency condensing unit control with enhanced monitoring, alarming, and diagnostics. The condensing unit control shall have an automated, low-noise night mode.

3.11 System Auto Restart

The auto restart feature shall automatically restart the system after a power failure.

3.12 Sequential Load Activation

On initial startup or restart after power failure, each operational load shall be sequenced with a minimum delay of one second to minimize total inrush current.

3.13 Low/High Pressure Monitoring

Units shall ship standard with low-pressure and high-pressure transducers for monitoring compressor suction and discharge pressure. If the pressure falls or increases due to mechanical cause, the corresponding circuit shall shut down to prevent equipment damage. The user shall be notified of the low-pressure and high-pressure condition through the local display and remote monitoring.

3.14 Advanced Low/High Pressure Protection

When the compressor is initially activated, the system shall be monitored for high pressure and low pressure. When high or low pressure is detected, the control shall alter the compressor operating speed to decrease high pressure or increase low pressure, preventing circuit shut down. If the issue cannot be resolved through this adjustment and the alarm duration or trigger count reaches the preset threshold, an alarm shall occur, and the affected compressor shall be immediately locked off. When the pressure returns to a safe level, the unit must be restarted to resume operation.

3.15 Low/High Pressure Transducer Failure

The control shall monitor the low-side and high-side refrigerant pressure transducers. If the control senses the transducer has failed, has been disconnected, has shorted or the reading has gone out of range, the user shall be notified through an event on the local display and remote monitoring. The corresponding circuit that the failure has occurred on shall be disabled to prevent unit damage.

3.16 Oil Return Protection

The control shall monitor compressor operation and staging to ensure that liquid and hot gas velocity are maintained for proper oil return to the compressor.

3.17 High Temperature Protection

The control shall monitor the discharge temperature of compressor during unit operation. A compressor temperature limit shall be imposed to help prevent damage to the compressor. If the temperature reaches the maximum temperature limit, the compressor shall be shutdown/locked out and an alarm shall be announced on the local display and through monitoring. After the initial lockout, the control shall continue to monitor compressor temperature during the off-cycle. Once the temperature returns to a safe operating range, the unit shall require a manual restart.

3.18 Compressor High and Low Temperature Protection Adjustment

The Vertiv™ ICOM™ Edge shall automatically adjust the compressor speed according to high/low pressure, and discharge/suction temperature at the high or low outdoor ambient temperature to ensure the stability and reliability of the unit in each ambient temperature.

3.19 Compressor Run Time Monitoring

The control shall log these compressor statistics:

- Run hours
- Number of high-pressure alarms

The user shall have the ability to monitor compressor operating temperature and pressure from the local display to be used as a diagnostic tool.

3.20 Communication Interfaces

3.20.1 Remote Shutdown Terminal

The remote shutdown terminal shall provide a location to remotely shut down the unit, complying with the national fire code.

3.20.2 Common Alarm Contact

The common alarm contact shall provide a set of normally open contacts for remote indication of unit alarms.

3.20.3 Vertiv™ IntelliSlot™ Unity-DP Card

The IntelliSlot™ Unity Card (IS-UNITY-DP) shall provide ground fault isolated RS-485 Modbus, BACnet IP and Modbus IP network connectivity to Building Management Systems for unit monitoring and management. Also, it shall provide ground fault isolated 10/100BASE-T Ethernet connectivity for unit monitoring and management. The supported management interfaces include SNMP for Network Management Systems, HTTP for Web page viewing, SMTP for e-mail and SMS for mobile messaging. The card shall support IP and 485 protocols simultaneously.

3.21 R32 Refrigerant Leakage Sensor

The unit shall be equipped with refrigerant leak detection sensor(s) for real-time monitoring of refrigerant leaks.

When the unit detects that the refrigerant concentration in the air exceeds the set threshold, it will shut down the compressor and operate the internal fan to help adjust the ambient refrigerant concentration. An alarm will be displayed locally and transmitted through the monitoring system.

4.0 CoolPhase Condensing Unit

4.1 CoolPhase Condensing Unit

4.1.1 Standard Features

The condensing unit shall include a TCP-coated microchannel condenser coil, an axial EC fan, electrical control components, and a protective enclosure. Microchannel coils shall provide superior heat transfer, reduce air side pressure drop, increase energy efficiency, and reduce the system refrigerant volume required. EC fan motors and fan operating techniques shall provide reduced sound levels when running at reduced speeds.

The standard ambient condenser is capable of operating in temperatures ranging from 23 °F to 118 °F (-5 °C to 48 °C). With the addition of the wind baffle assembly (Optional), the unit can operate within a temperature range of -4 °F to 118 °F (-20 °C to 48 °C).

The low ambient Condensing Unit shall operate from -31 °F to 118 °F (-35 °C to 48 °C).

4.1.2 Cabinet

The condensing unit cabinet is made of galvanized steel sheet and is divided into separate fan chambers and compressor chambers by partitions. The internal structural supports, including the coil supports, are made of galvanized steel and powder-coated on the outer surface for strong strength and corrosion resistance. A service panel is provided on the compressor chamber side for easy cleaning and maintenance. Inside the compressor chamber is a drive mounting box with independent fresh air. On the side of the unit, there is an IPX4 waterproof electric control box for external cables.

4.1.3 Aluminum Microchannel Coil

Aluminum Microchannel Coil

Microchannel coils shall be constructed of aluminum microchannel tubes, fins, and manifolds. Tubes shall be flat and contain multiple parallel flow microchannels and span between aluminum headers. Full-depth louvered aluminum fins shall fill spaces between the tubes.

TCP-Coating

TCP-coating shall be included on the condensing unit coil to resist corrosion caused by atmospheric conditions; regular coil cleaning is required to reduce the effects of corrosion.

4.1.4 Condenser Fan

The condensing unit EC fan shall have an EC motor, fan blades and fan/finger guard. Fan guards shall be heavy gauge, coated with a black, corrosion-resistant finish. Fan terminal blocks shall be located in an IP54 enclosure located on the top of the fan motor. Fan shall be tested before shipment and mounted securely to the condensing unit structure.

The EC fan output modulation range is 10%-100%.

4.1.5 Rotary Compressor

The compressor shall be rotary type, suitable for operation with an inverter drive to adjust capacity in response to changing room loads.

The compressor output modulation range is 20%-100%.

4.1.6 Electrical Controls

Electrical controls and service connection terminals shall be provided and factory-wired inside the attached control panel section. Only high-voltage supply wiring and low-voltage indoor unit communication wiring shall be required at condensing unit installation.

Premium Control

The Premium Control System shall include an inverter (Variable Frequency Driver), EC fan motor, discharge temperature sensor, and refrigerant pressure transducers. The inverter board shall receive a signal from the indoor unit via field-supplied low-voltage interlock wiring connected to the compressor-side control terminal. The inverter board shall use refrigerant pressure transducer and communication inputs to maintain system pressure by controlling EC fan.

Variable Frequency Driver

The condensing unit uses a variable frequency driver to control the frequency of the compressor, thereby controlling and regulating the entire refrigeration system.

Refrigerant Leak Protection

In the event of a refrigerant leak, the system will enter a protection mode: the compressor will be shut down, the indoor fans will be forced to run, and the outdoor fans will stop operating.

4.2 Installation

1. Hoisting bracket

Each condensing unit is equipped with two hoisting brackets, one side can be connected to the top of the unit, and the other side can be connected to the sling or eye, so that the unit can be hoisted into place.

2. Multi-scenario installation

Securely attach the condensing unit to the roof, a condensing unit pad, base rails, or another mounting platform securely anchored to the ground or building structure with M10 anchor bolts.

5.0 Ship-Loose Accessories (Optional)

5.1 Evaporator Accessories

5.1.1 Condensate Pump Kit

The standard indoor unit is configured for natural gravity drainage. For applications requiring upward drainage, an optional condensate pump is available, with a maximum head of 16.4 ft (5 m).

5.2 Condensing Unit Accessories

Hail Guard Kit

Hail Guards protect the coil against hail produced during storms. It is recommended to add this accessory when the unit is in a place with extreme weather conditions.

Wind Baffle Kit

The wind baffle allows cooling-mode operation at lower ambient outdoor temperatures.

Duct Kit

The duct kit is needed when the unit is required to be adapted to a duct system; this kit must be attached before mounting the unit to the ceiling for proper component access and installation.

6.0 Execution

6.1 Installation of Thermal Management Units

6.1.1 General Arrangement

Install cooling units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated and maintain manufacturer's recommended clearances.

6.1.2 Electrical Wiring

Install and connect electrical devices furnished by manufacturers but not specified to be factory mounted. Furnish copy of manufacturer's electrical connection diagram submittal to electrical contractor.

6.1.3 Piping Connections

Install and connect devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's piping connection diagram submittal to piping contractor.

6.1.4 Refrigerant Charging

Charge completed cooling system in accordance with manufacturer's refrigerant charging instructions.

6.1.5 Field Quality Control

Start-up cooling units in accordance with manufacturer's startup instructions. Test controls and demonstrate compliance with requirements. These specifications describe requirements for a computer room environmental control system. The system shall be designed to maintain temperature conditions in the rooms containing electronic equipment.

6.1.6 Plenum Installation Option

The outdoor unit comes with air duct installation accessories. The air duct may be installed in accordance with the supplier's instructions and requirements, allowing flexible selection of the outdoor unit's installation location.

Appendix C: Submittals

C.1 Document Number and Submittal Name

Table A Document Number and Submittal Name

Document Number	Submittal Name
Standard and optional features	
20000110	Standard features and options
20000162	Standard features and options
Vertiv CoolPhase Wall unit planning dimensions	
20000111	Cabinet dimensional data
Vertiv CoolPhase Condensing Unit planning dimensions	
20000159	Dimensional data
20000159	Clearance space
Vertiv CoolPhase Wall unit to Vertiv CoolPhase Condensing Unit arrangement diagram	
20000112	General arrangement diagram
Vertiv CoolPhase Wall unit field connections	
20000114	Electrical field connection
Vertiv CoolPhase Condensing Unit field connections	
20000161	Electrical field connection
Vertiv CoolPhase Wall unit connection locations	
20000113	Primary connection locations
Vertiv CoolPhase Condensing Unit connection locations	
20000160	Primary connection locations
System controls	
20000115	iCOM edge general features and alarms



Vertiv CoolPhase Wall

STANDARD FEATURES AND OPTIONS

STANDARD FEATURES

CABINET AND CHASSIS. All cabinet panels shall be painted, hot-dip galvanized sheet metal, with the side panels covered with insulation. Refrigerant piping connections are located on the left and right side (choose one location to pipe to).

EVAPORATOR COIL are constructed of copper tubes in a staggered tube pattern. Tubes are expanded into continuous corrugated aluminum plate type fins. Coil is set in a condensate drain pan. There is a drain trapper inside of indoor unit.

REFRIGERATION SYSTEM. Single refrigerant circuit includes evaporator coil, electronic expansion valve, filter drier, and low-pressure transducer. R32 refrigerant is charged on site.

AIR FILTER is a washable, mesh type filter installed within the cabinet.

REFRIGERANT LEAK SENSOR monitors for potential refrigerant leakage. Upon detection, the system will automatically shut down the compressor and send an alarm signal to the controller. Simultaneously, indoor fan will adjust its speed, and a low-voltage dry contact will be provided for external alarm or system integration.

FAN ASSEMBLY includes direct-drive centrifugal fans with backward-curved blades and electronically commutated (EC) motors.

FILTER DRIER is installed in the liquid line to remove moisture and contaminants from the refrigeration system.

The **iCOM™ EDGE CONTROL SYSTEM** is installed and wired in the evaporator cabinet. It controls and monitors the unit operating.

THE DISPLAY is packaged together with the indoor unit and shipped as part of the complete system. A 3-meter communication cable is also included, allowing customers to install the display as needed. The display is a 128x64 dot screen, with an audible alarm that sounds upon alarm detection.

SHIP-LOOSE FEATURE (OPTIONAL & FIELD INSTALLED)

CONDENSATE PUMP KIT can be field installed and wired to the indoor unit and has a maximum head of 16.4 ft (5m).



Vertiv CoolPhase Condensing Unit

STANDARD FEATURES AND OPTIONS

STANDARD FEATURES

CABINET is IPX4 rated, made of galvanized sheet metal with powder-coated exterior panels and is equipped with an IPX4-rated waterproof electrical control box.

ROTARY COMPRESSOR is inverter-duty, driven by an inverter, with capacity adjustment range from 20 to 100%.

CONDENSER COIL is an aluminum microchannel heat exchanger, with TCP coating to protect the coil from corrosion.

FAN ASSEMBLY includes an axial EC fan, driven by an Electronically Commutated (EC) motor with speed control from 10% to 100%.

REFRIGERATION SYSTEM is a single-circuit design that includes a compressor, microchannel condenser coil, discharge temperature sensor, high-pressure switch, and check valve. It is designed for field-supplied and charged R32 refrigerant. The standard ambient condenser is capable of operating in temperatures ranging from 23°F to 118°F (-5°C to 48°C). With the addition of the wind baffle assembly (Optional), the unit can operate within a temperature range of -4°F to 118°F (-20°C to 48°C).

HIGH PRESSURE SWITCH is mounted on the compressor discharge line and is set at 595 psi (41 bar) with tolerance of ± 14.5 psi (1 bar). The switch will open when the high pressure exceeds 595 psi (41 bar) and close when the pressure drops below 479 psi (33 bar). If the switch is open, the compressor will be shut down.

DISCHARGE TEMPERATURE SENSOR is installed on the compressor discharge line. If the temperature reaches the limit of 239°F (115°C), the iCOM Edge controller will shut down the compressor.

THE HIGH-PRESSURE TRANSDUCER is installed on the compressor discharge line. If the discharge pressure reaches 565 psi (39 bar), the iCOM Edge controller will shut down the compressor.

CHECK VALVE is mounted on the compressor discharge line to prevent refrigerant migration from the condenser or receiver when the unit is stopped for a long time.

LOW-AMBIENT CONDENSER model includes head pressure valve, liquid receiver, heating belts, relief valve, and low-pressure switch based on the standard units. The condensing unit can operate between -31 to 118°F (-35 to 48°C). The relief valve is installed on the liquid receiver of the low ambient condenser. It features threaded connections for routing refrigerant discharge to the outside. The valve is factory-set to open at 595 psi (45 bar). The check valve is installed on the inlet line of the liquid receiver.

SHIP-LOOSE FEATURE (Optional- FIELD INSTALLED)

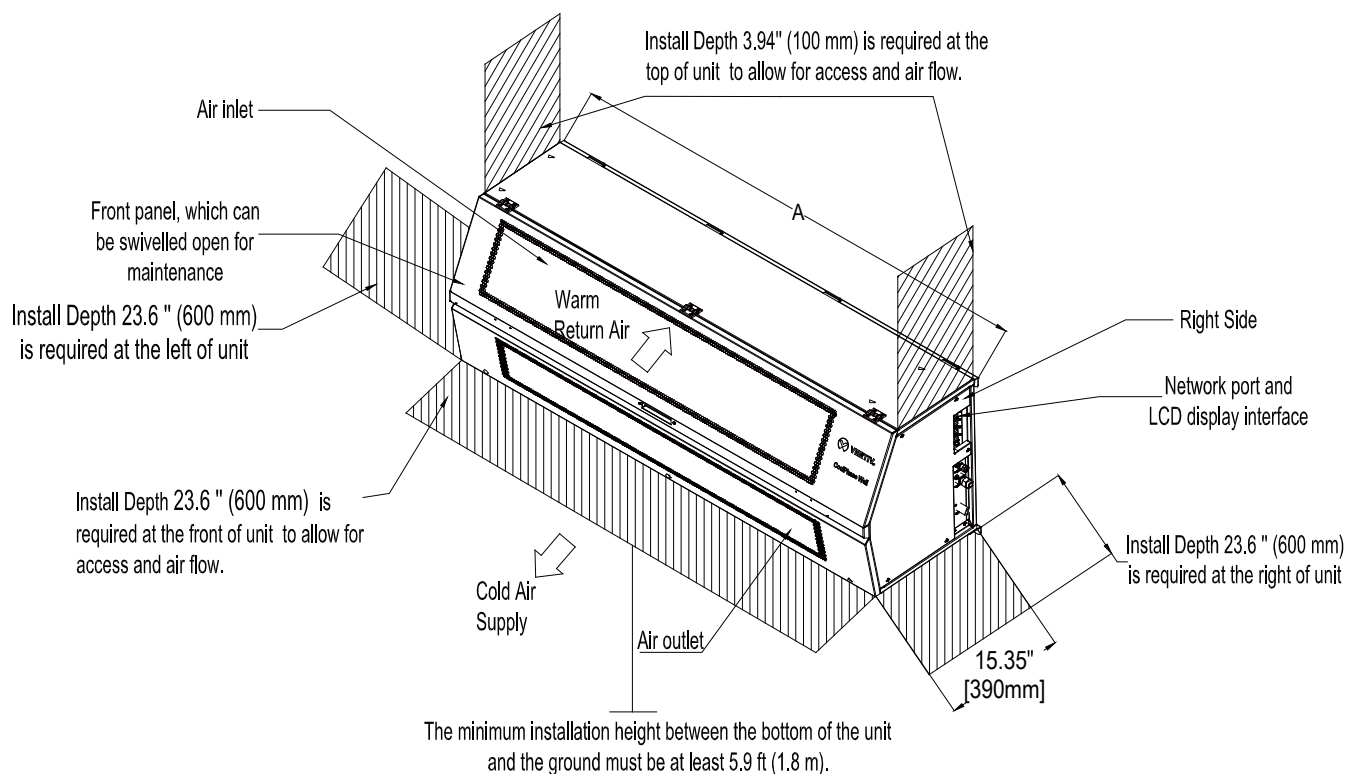
DUCT KIT is field attached to the condensing unit to enable ductwork to be connected to the condensing unit. When using the duct kit, please pay attention to the allowable static pressure conditions.

	CUD030-E000A CUL030-E000A	CUD070-E000A CUL070-E000A	CUD111-E000A CUL111-E000A	CUD114-E000A CUL114-E000A	CUD115-E000A CUL115-E000A
Unit Static Pressure (in H ₂ O/Pa)	0.12in H ₂ O(30Pa)	0.12in H ₂ O(30Pa)	0.12in H ₂ O(30Pa)	0.12in H ₂ O(30Pa)	0.12in H ₂ O(30Pa)

HAILGUARD KIT protects the condensing coil from hail strikes.

WIND BAFFLE helps shield the condenser from cold wind, enabling the system to operate down to -4°F (-20°C) with standard version unit.

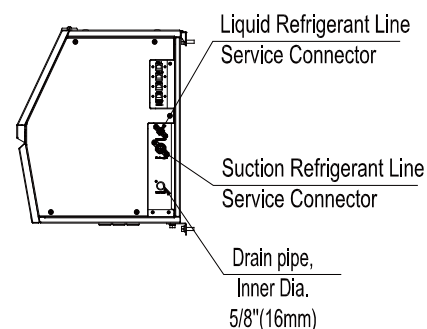
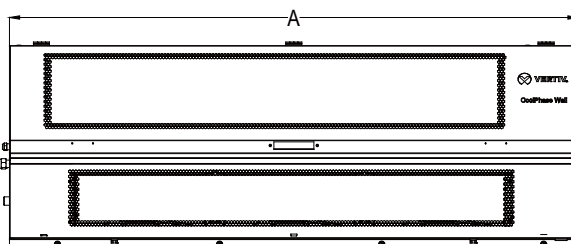
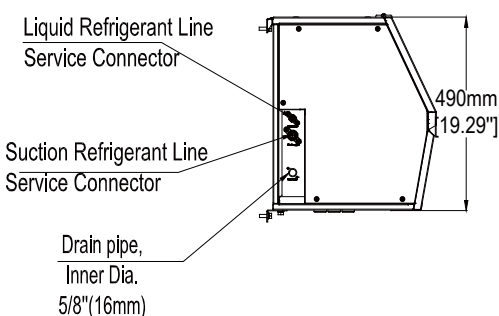
CABINET DIMENSIONAL DATA



Left Side View

Front View

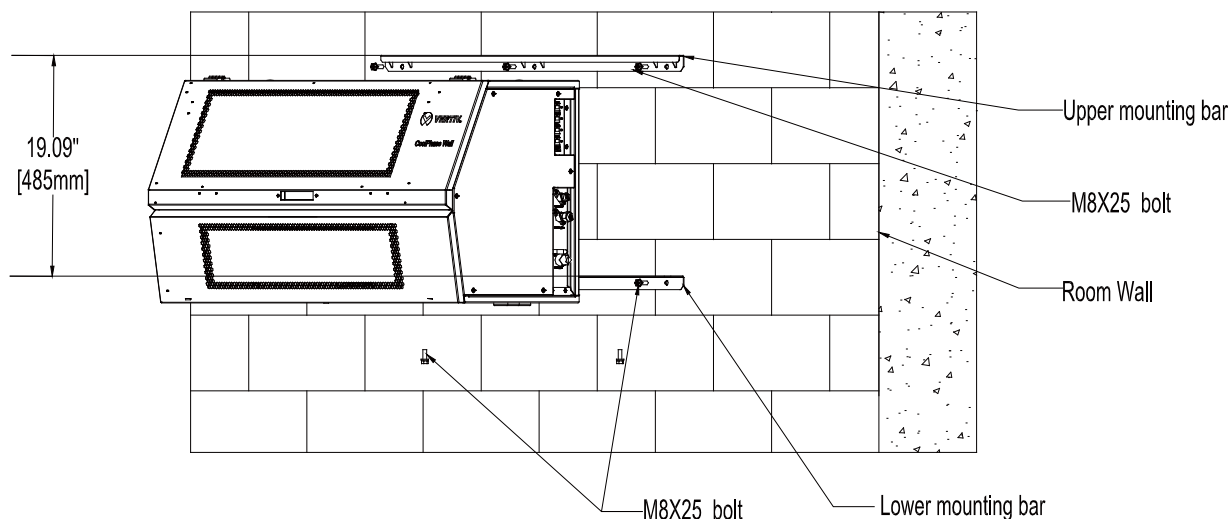
Right Side View



NOTE: Drain Connectors, liquid pipe Connectors, and suction Connectors are reserved on both sides of the unit. Customers can connect them according to the on-site conditions.

MODEL #	DIMENSIONAL DATA A in. (mm).	NET WEIGHT lb (kg)	SHIPPING WEIGHT lb (kg) GW	Shipping Dimensions(W×H×D) in.(mm).
WLM030A	36 (915)	91.5 (41.5)	112.4 (51)	42 x 21 x 26 (1070 x 530 x 660)
WLM070A	49.8 (1265)	120 (54.5)	147.7 (67)	56 x 21 x 26 (1419 x 530 x 660)
WLM110A	56 (1425)	144.4 (65.5)	178.6 (81)	62.4 x 21 x 26 (1585 x 530 x 660)

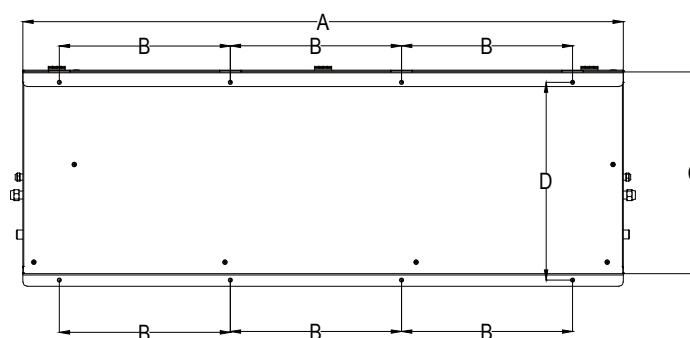
CABINET DIMENSIONAL DATA



NOTE:

1. Drill holes with a hole spacing of 16" (406.4mm). Be sure the holes are horizontally aligned and the distance between the top surfaces of the upper and lower mounting bars is 19.09" (485 mm).
2. Then install and fix the upper and lower mounting bars to the wall using M8 bolts.
3. Once the upper and lower mounting bars are installed, seat the indoor unit on the upper bar by placing the unit brackets into the bar slots.
4. Adjust the angle of the indoor unit and secure it to the lower mounting bar using two M8 bolts.

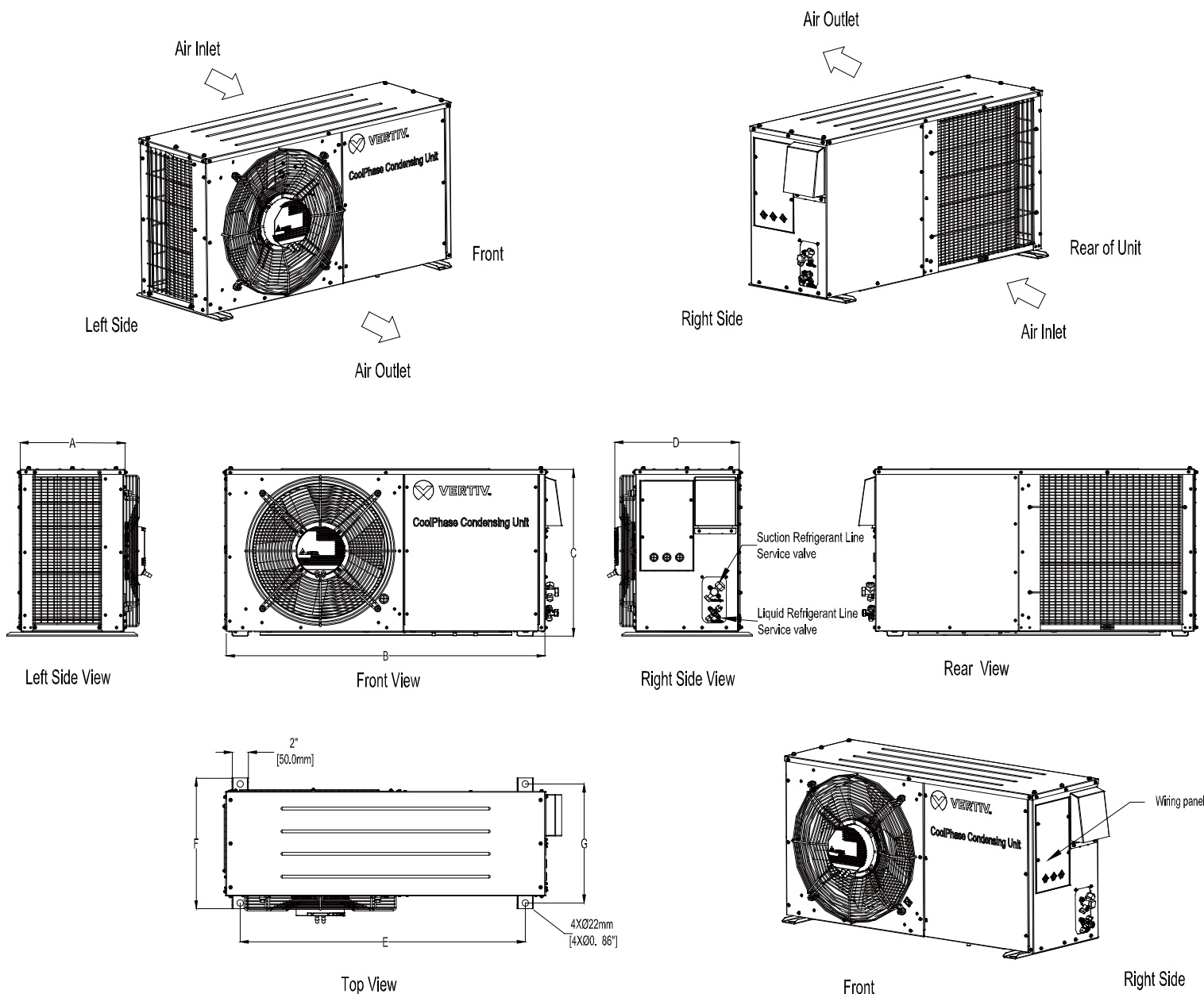
Back View



MODEL #	A DIMENSIONAL DATA in. (mm).	B DIMENSIONAL DATA in. (mm).	C DIMENSIONAL DATA in. (mm).	D DIMENSIONAL DATA in. (mm).	Bolt Qty.
WLM030A	36 (915)	16 (406.4)	19.1 (485)	18.7 (475)	8
WLM070A	49.8 (1265)	16 (406.4)	19.1 (485)	18.7 (475)	8
WLM110A	56 (1425)	16 (406.4)	19.1 (485)	18.7 (475)	10

Vertiv CoolPhase Condensing Unit

DIMENSIONAL DATA

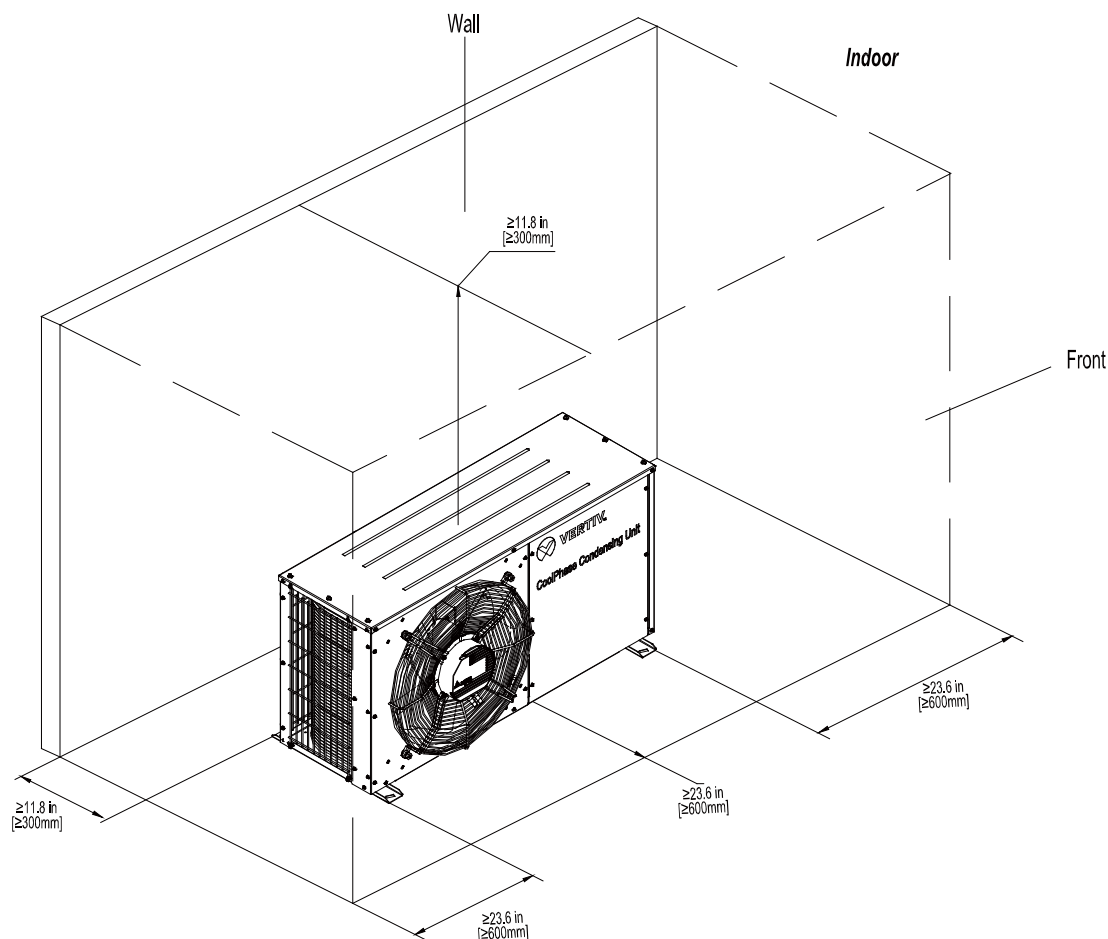


MODEL #	DIMENSIONAL DATA in. (mm).							NET WEIGHT lb (kg)		Shipping Dimensions(W×D×H) in.(mm).		SHIPPING WEIGHT lb (kg)	
	A	B	C	D	E	F	G	CUD	CUL	/		CUD	CUL
CUD030-E000A CUL030-E000A	12.6 (319)	38.8 (985)	20.3 (516)	15.2 (385)	34.7 (881)	15.9 (404)	14.5 (368)	110.2 (50)	116.8 (53)	45.2 x 22 x 28.8 (1149 x 559 x 732)		169.8 (77)	176.4 (80)
CUD070-E000A CUL070-E000A	16.5 (419)	44.4 (1128)		19.1 (485)	40.1 (1018)	19.8 (504)	18.4 (468)	118 (53.5)	130 (59)	50.7 x 26 x 28.8 (1289 x 659 x 732)		188.5 (85.5)	200.6 (91)
CUD111-E000A CUL111-E000A	20.5 (520)	51.3 (1303)	22.8 (580)	23.4 (595)	46.4 (1179)	23.8 (604)	22.4 (568)	175.3 (79.5)	184.1 (83.5)	57.6 x 30.1 x 31.3 (1464 x 764 x 795)		259 (117.5)	272.3 (123.5)
CUD114-E000A CUL114-E000A								165.35 (75)	176.37 (80)			254.63 (115.5)	263.45 (119.5)
CUD115-E000A CUL115-E000A								174.17 (79)	183 (83)			257.9 (117)	271.2 (123)

Vertiv CoolPhase Condensing Unit

CLEARANCE SPACE

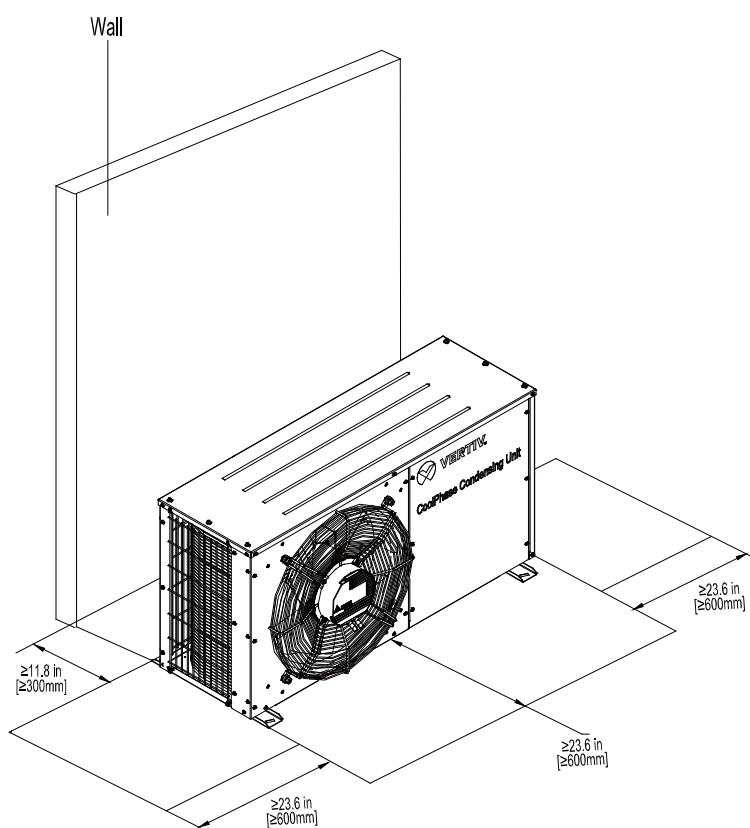
Standard Condensing Unit Install indoor



NOTES: When Standard Condensing Unit is installed in indoor environment, it is not necessary to install the wind baffle.

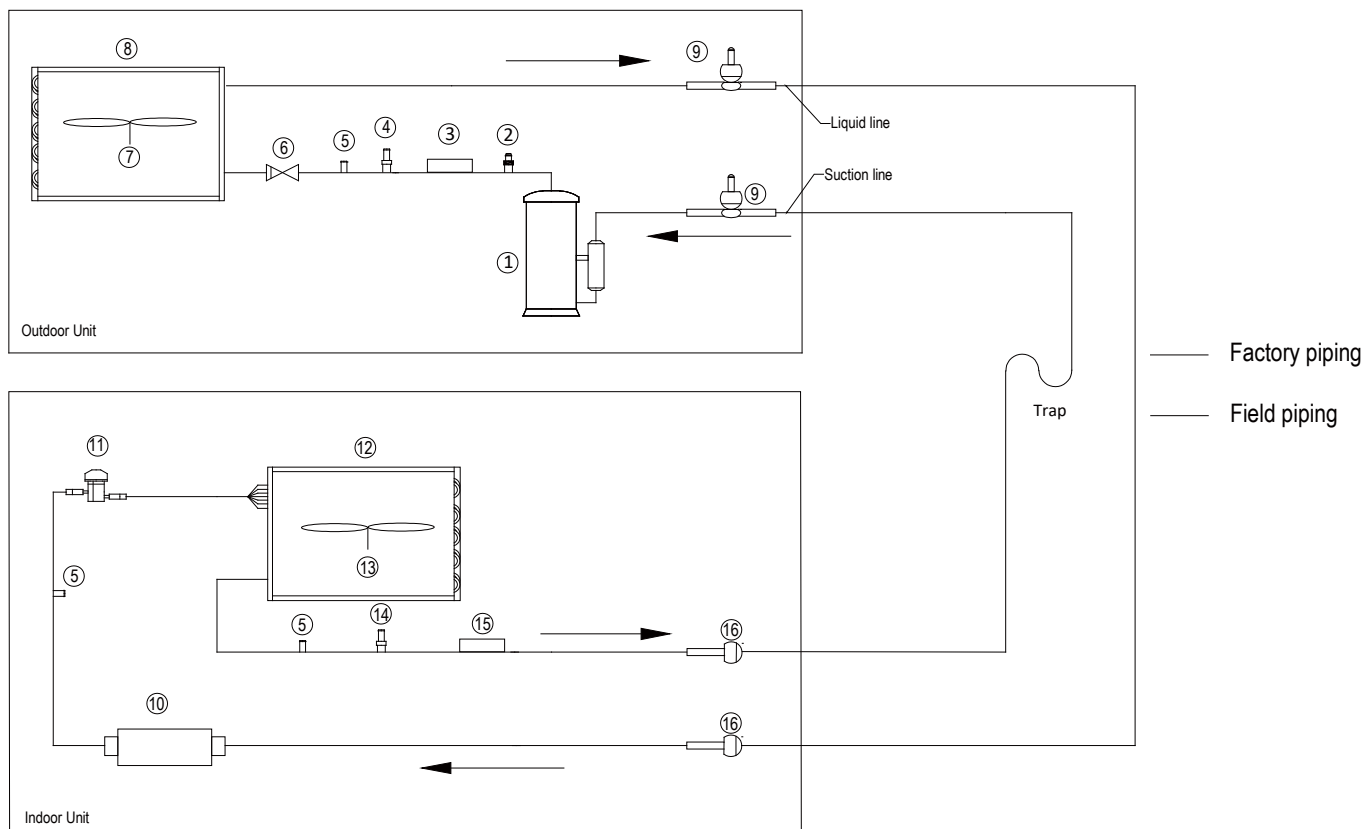
CLEARANCE SPACE

Standard Condensing Unit Install outdoor



GENERAL ARRANGEMENT DIAGRAM

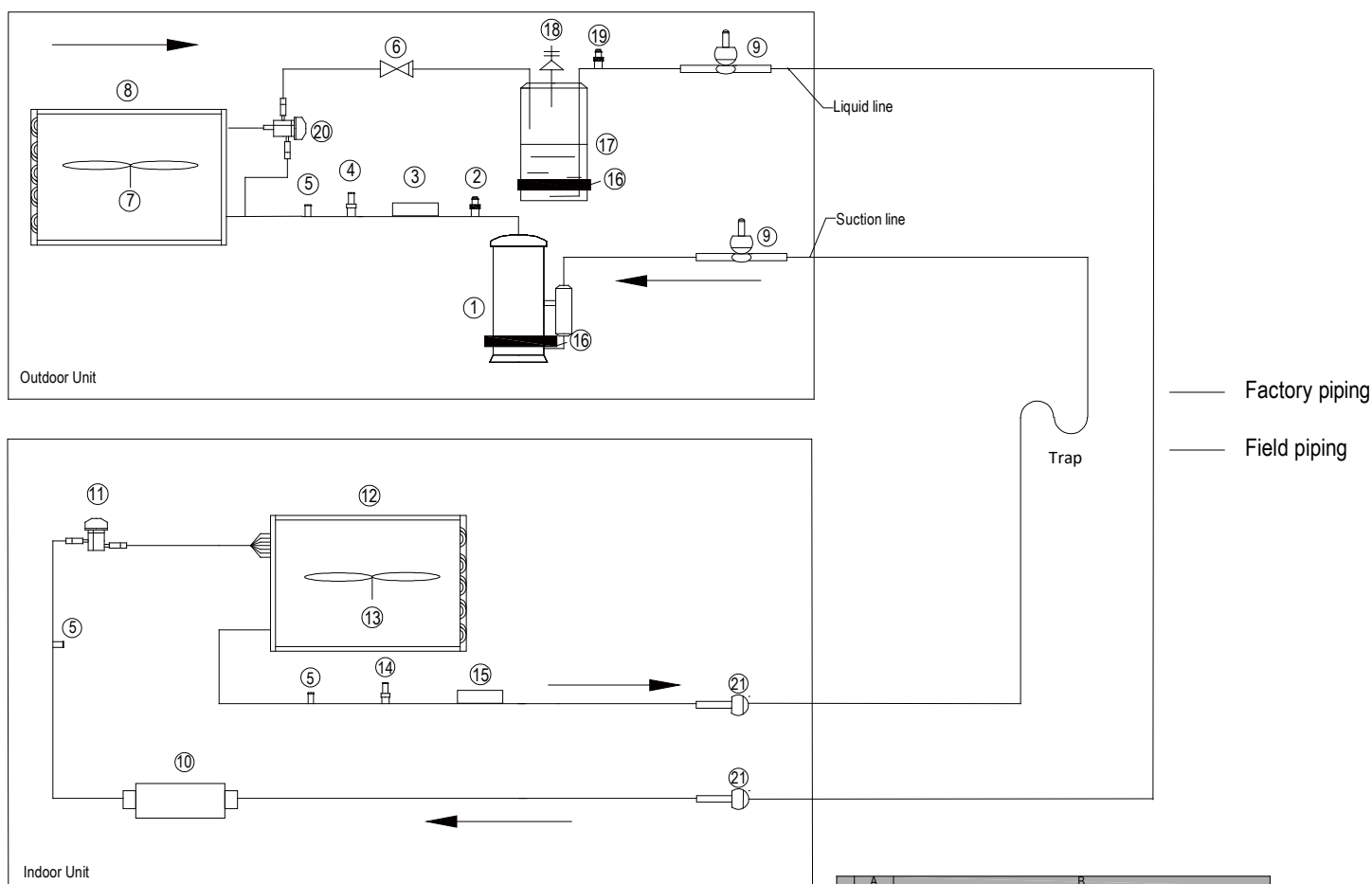
STANDARD TEMPERATURE UNIT:



1	A	B
1	NO.	Description
2	1	Compressor
3	2	High pressure switch
4	3	Discharge temperature sensor
5	4	High pressure transducer
6	5	Schrader valve
7	6	Check valve
8	7	Condenser fan
9	8	Condenser coil
10	9	Manual shut-off valve
11	10	Filter drier
12	11	Electronic expansion valve
13	12	Evaporator coil
14	13	Evaporator fan
15	14	Low pressure transducer
16	15	Suction temperature sensor
17	16	Refrigerant Pipe Connector

GENERAL ARRANGEMENT DIAGRAM

LOW AMBIENT TEMPERATURE UNIT:

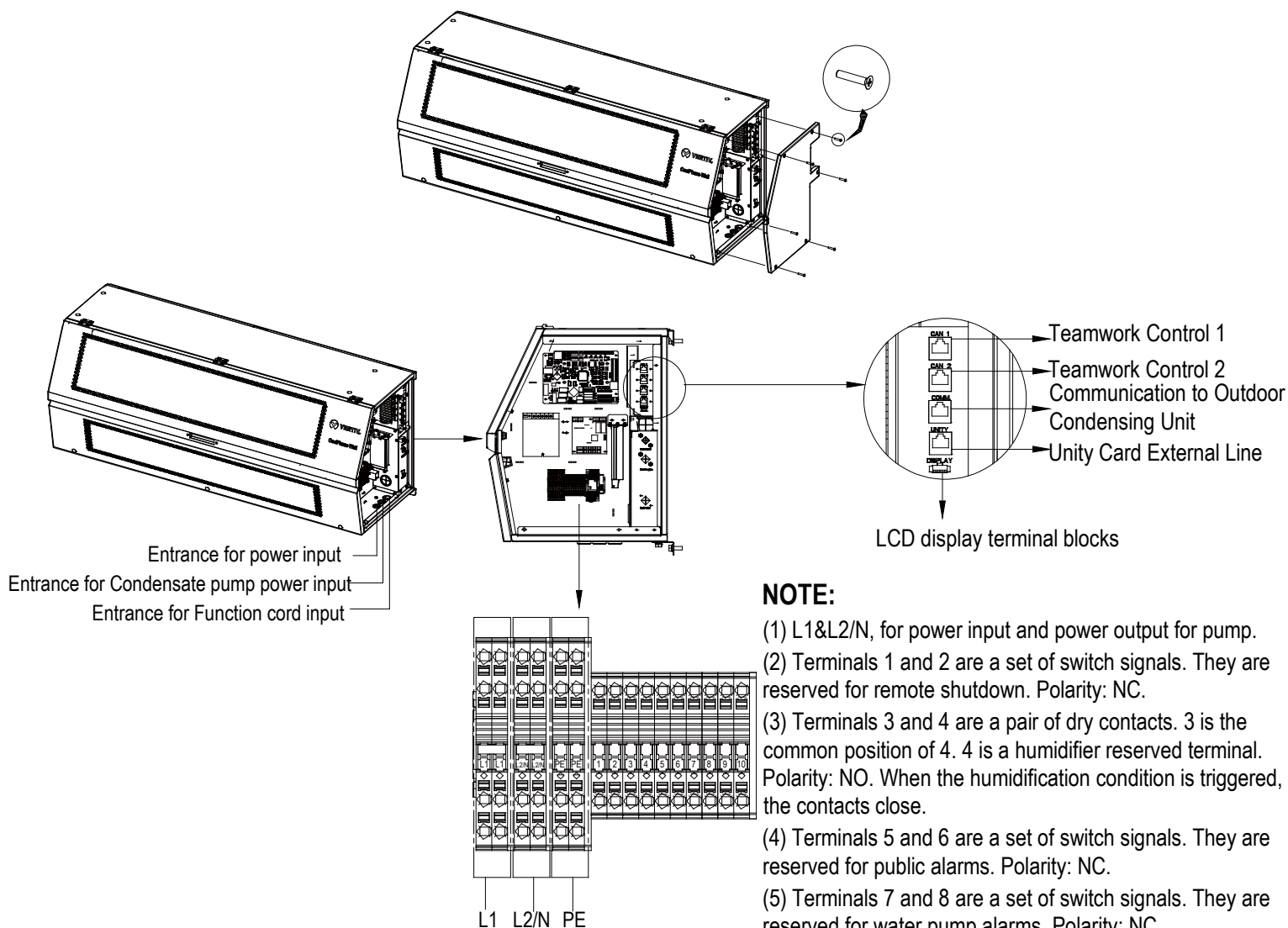


A	B
NO.	Description
1	Compressor
2	High pressure switch
3	Discharge temperature sensor
4	High pressure transducer
5	Schrader valve
6	Check valve
7	Condenser fan
8	Condenser coil
9	Manual shut-off valve
10	Filter drier
11	Electronic expansion valve
12	Evaporator coil
13	Evaporator fan
14	Low pressure transducer
15	Suction temperature sensor
16	Electrical heat belt
17	Receiver
18	Relief valve
19	Low pressure switch
20	Head pressure valve
21	Refrigerant Pipe Connector

ELECTRICAL FIELD CONNECTIONS

E-Box Disassembly Instructions:

1. Remove the cover from the electrical box by removing six (6) M5-0.8x25mm flat head screws.
2. Route the power supply cables into the unit through the grommet holes located at the bottom of the unit and connect the cables to the L1, L2/N, and PE power supply terminals blocks.

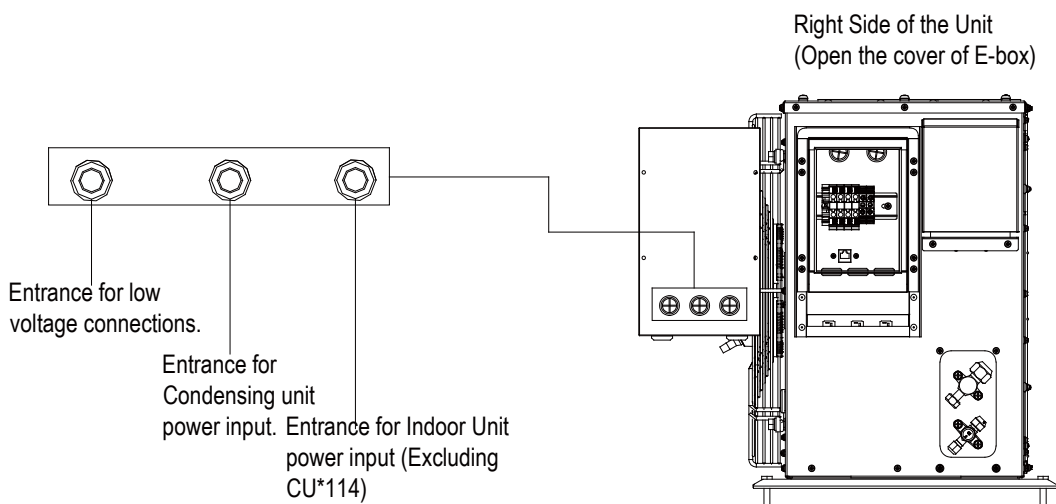


MODEL	POWER SUPPLY TYPE
WLM030A	208/230V/1Ph/50/60Hz
WLM070A	208/230V/1Ph/50/60Hz
WLM110A	208/230V/1Ph/50/60Hz

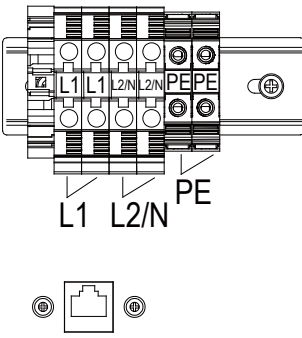
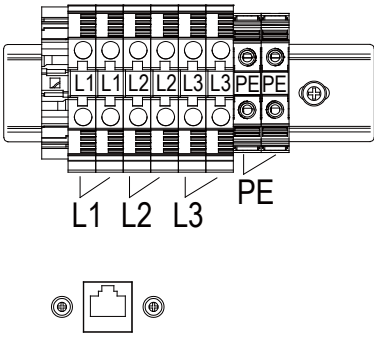
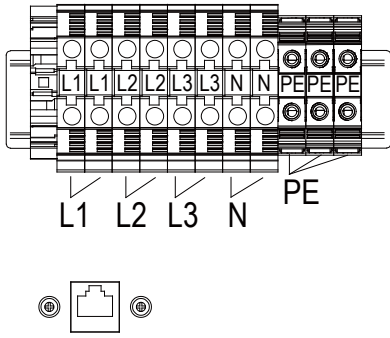
The maximum matching wire diameter of the terminal block shall not exceed 14AWG.

Vertiv CoolPhase Condensing Unit

ELECTRICAL FIELD CONNECTIONS



Electric control box layout and power supply system

CUD030-E000A, CUL030-E000A CUD070-E000A, CUL070-E000A 208/230V/1Ph/50/60Hz	CUD111-E000A, CUL111-E000A 208/230V/3Ph/50/60Hz CUD114-E000A, CUL114-E000A 460V/3Ph/60Hz	CUD115-E000A, CUL115-E000A 400V/3Ph+N/50/60Hz
 RJ45-low voltage connector	 RJ45-low voltage connector	 RJ45-low voltage connector

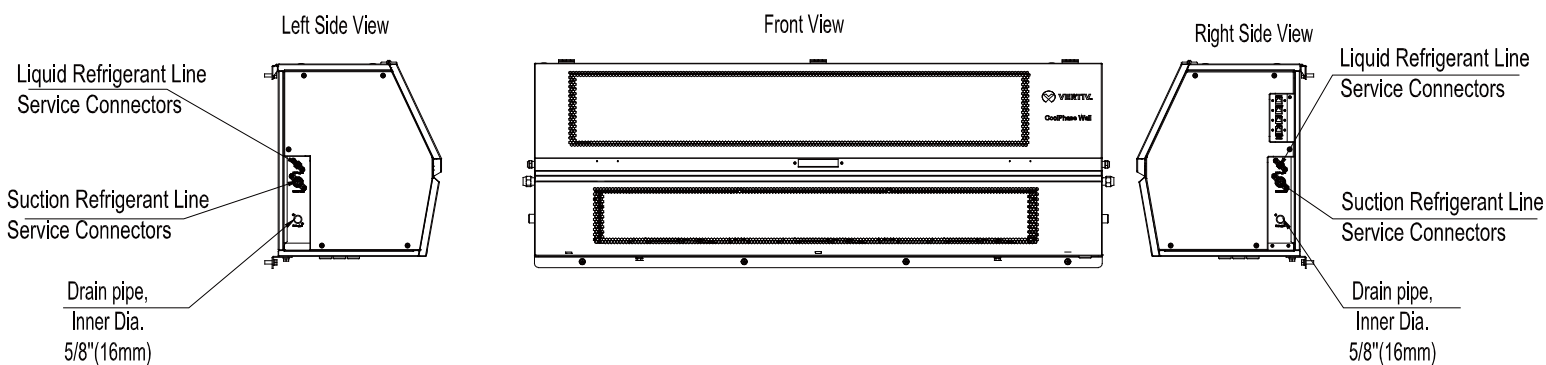
NOTE:

- 1.After wiring is completed, secure the excess cables with wire ties. The Wire Saddles are at the bottom of the electrical box.
- 2.The CUD/L114-E000A model does not support power supply to the indoor unit from the outdoor unit.



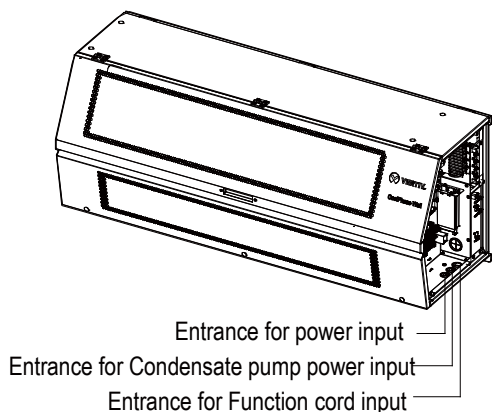
Vertiv CoolPhase Wall

Primary Connection Locations



NOTE: Drain Connectors, liquid pipe Connectors, and suction Connectors are reserved on both sides of the unit. Customers can connect them according to the on-site conditions.

	A	B	C
1	MODEL#	"LIQUID LINE SERVICE VALVE"	"SUCTION LINE SERVICE VALVE"
2	WLM030A	7/16" - 20UNF	3/4" - 16UNF
3	WLM070A	5/8" - 18UNF	3/4" - 16UNF
4	WLM110A	5/8" - 18UNF	7/8" - 14UNF



MODEL #	Entrance for Condensing unit power input.in. (mm).	Entrance for Condensate pump power input.in. (mm).	Entrance for Function cord input.in. (mm).
WLM030A	7/8"(22)	7/8"(22)	7/8"(22)
WLM070A	7/8"(22)	7/8"(22)	7/8"(22)
WLM110A	7/8"(22)	7/8"(22)	7/8"(22)



Vertiv CoolPhase Condensing Unit

PRIMARY CONNECTION LOCATIONS

Field-installed piping must comply with all applicable local codes.

The vertical riser pipe size must be reduced according to the following trade sizes: (1-1/8 to 7/8, 7/8 to 3/4, 3/4 to 5/8, 5/8 to 1/2.)

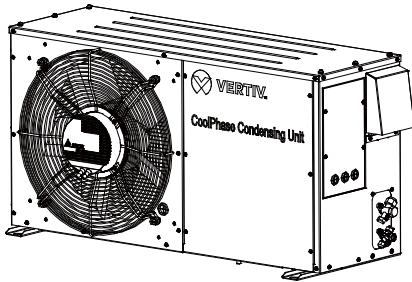


Table 1. Vertiv Coolphase Wall Unit recommended refrigerant line size

	A	B	C	D	E	F
1	Indoor Model	Refrigerant line length ft(m)	Liquid line diameter In(mm)	Suction line diameter In(mm)	"LIQUID LINE SERVICE VALVE"	"SUCTION LINE SERVICE VALVE"
2	WLM030A	$L \leq (33)10$	1/4"(6.35)	1/2"(12.7)	7/16"-20UNF	3/4"-16UNF
3		$33(10) < L \leq 197(60)$	3/8"(9.52)	1/2"(12.7)	7/16"-20UNF	3/4"-16UNF
4	WLM070A	$L \leq (33)10$	3/8"(9.52)	1/2"(12.7)	5/8"-18UNF	3/4"-16UNF
5		$33(10) < L \leq 115(35)$	3/8"(9.52)	5/8"(16)	5/8"-18UNF	3/4"-16UNF
6		$115(35) < L \leq 197(60)$	1/2"(12.7)	5/8"(16)	5/8"-18UNF	3/4"-16UNF
7	WLM110A	$L \leq 66(20)$	3/8"(9.52)	5/8"(16)	5/8"-18UNF	7/8"-14UNF
8		$66(20) < L \leq 148(45)$	1/2"(12.7)	3/4"(19.05)	5/8"-18UNF	7/8"-14UNF
9		$148(45) < L \leq 197(60)$	1/2"(12.7)	7/8"(22.23)	5/8"-18UNF	7/8"-14UNF

Table 2. Vertiv Coolphase Ceiling Unit recommended refrigerant line size

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Indoor Model	Equivalent Length	16.4ft(5m)	32.8ft(10m)	49.2ft(15m)	65.6ft(20m)	98.4ft(30m)	114.8ft(35m)	131.2ft(40m)	164.0ft(50m)	196.9ft(60m)	229.7ft(70m)	262.5ft(80m)	278.8ft(85m)	295.3ft(90m)
2	MMI2	Suction Line, In(mm)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	N/A	N/A	N/A	N/A
3		Liquid Line, In(mm)	1/4"(6.35)	1/4"(6.35)	5/16"(7.94)	5/16"(7.94)	5/16"(7.94)	5/16"(7.94)	5/16"(7.94)	5/16"(7.94)	5/16"(7.94)	N/A	N/A	N/A	N/A
4	MMI24	Suction Line, In(mm)	1/2"(12.7)	1/2"(12.7)	5/8"(16)	5/8"(16)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	N/A	N/A	N/A	N/A
5		Liquid Line, In(mm)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	N/A	N/A	N/A	N/A
6	MMI36	Suction Line, In(mm)	5/8"(16)	5/8"(16)	5/8"(16)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	N/A	N/A	N/A	N/A
7		Liquid Line, In(mm)	3/8"(9.52)	3/8"(9.52)	3/8"(9.52)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	N/A	N/A	N/A	N/A
8	MMI48	Suction Line, In(mm)	3/4"(19.05)	3/4"(19.05)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)
9		Liquid Line, In(mm)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)	1/2"(12.7)
10	MMI60	Suction Line, In(mm)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	7/8"(22.23)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)
11		Liquid Line, In(mm)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)	5/8"(16)
12	MMI96	Suction Line, In(mm)	7/8"(22.23)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-1/8"(28.58)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)	1-3/8"(34.93)
13		Liquid Line, In(mm)	1/2"(12.7)	1/2"(12.7)	5/8"(16)	5/8"(16)	5/8"(16)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	3/4"(19.05)	7/8"(22.23)	7/8"(22.23)



Vertiv CoolPhase Wall

iCOM™ EDGE Controller General Features & Alarms

General Features:

The control system of the unit consists of Vertiv™ Liebert® iCOM™ EDGE and an LCD display.

Vertiv™ Liebert® iCOM™ EDGE (Hereinafter referred to as iCOM EDGE.) is a controller with the size of 4.72Wx6.69Lx1.18H(in) or 120Wx170Lx30H (mm).

The controller has the functions of acquisition, control, communication, alarm, recording, etc.

The LCD display is a 128 × 64 dot screen with white backlight, offering symbolic representation of unit functions and diagnostics feature. A buzzer provides audible indication in case of a Warning or Alarm event. It is housed in an ergonomically designed and aesthetically pleasing enclosure.

Functions and Alarms:

Menu Layout- The menus will be divided into two main screens: the User Screen and the Service Screen. The User screen contains the menus to access parameters required for basic unit control and setup. The Service screen is designed for service personal and provides access to advanced control setup features and diagnostic information.

Password Protection- The display will support three password levels, each corresponding to a different level of authority, to prevent unauthorized changes. Unlocking with each password grants access to information appropriate to that authority level.

Display Setup- The user has the ability to configure the display information based on the specific user's preference. Language, units of measure, screen contrast and the on/off of certain functions will be configurable through the display.

Additional Readouts- The display allows users to configure custom widgets on the main screen. Available widget options include fan speed, cooling call status, and maintenance status.

Status LEDs- The display will use an integrated LED to indicate the unit's operating status. It will show whether the unit has an active alarm, an acknowledged alarm, or if the unit is on, off, or in standby mode.

Unit Alarms - All unit alarms are annunciated through both audio and visual cues, clearly displayed on the screen, automatically recorded in the event log, and communicated to optional Unity monitoring cards.

Event Log - The iCOM Edge will automatically store the last 500 unit-only events (messages, warnings, and alarms).

Upgradeable - The display is upgraded by connecting to the 6-pin ISP interface on the display board. The iCOM Edge is connected to a laptop via a double-ended USB cable and upgraded using professional software.

Temperature Control - Precision temperature control is maintained while maximizing efficiency based on a user entered setpoint and tolerance.



Vertiv CoolPhase Wall

iCOM™ EDGE Controller General Features & Alarms

Humidity Control - The dewpoint level of the room is monitored and controlled based on a user specified Relative Humidity setpoint and tolerance.

Operating Modes - The components can be set to operate based on the return air and supply air temperature sensors.

Various Control Types - Proportional, PI (proportional-integral), or Intelligent control types can be selected for supply or return temperature. These control types have been developed to maximize component life and maintain precise environmental control.

Wellness / Maintenance - System components are monitored to warn of potential issues in advance (helps avoid unplanned downtime) and prolong component life.

Auto Restart - The unit will return to its previous operating status after loss of power. Units can be stagger started to minimize system current draw.

Unity Card - Unity card allow for external unit communication and control.

Service Contact Information - Local service or sales contact information can be conveniently stored in the control.

Unit-to-Unit (U2U) Communication - Communication via private Ethernet network allows for advanced control functionality (Teamwork modes, sharing sensor data, Standby Rotation, Lead-Lag, and Cascade operation).

Cascade - Standby units on a U2U network are automatically activated if active unit(s) cannot maintain control of the environment.

Lead-Lag - A standby unit on a U2U network is automatically activated if an alarm occurs in an active unit.

Standby Rotation - Standby units are rotated through a U2U network to balance system run hours. Units can be set to automatically rotate daily, weekly, or monthly.

Teamwork modes:

Mode No - Units share data but operate independently using local sensor readings.

Mode 1 (Parallel) - All units perform the same operation with the same capacity based on sensor readings from the entire network, typically for rooms with balanced heat loads.

Mode 2 (Independent) - All units perform the same operation with varying capacity based on sensor readings from the entire network, typically for rooms with un-balanced heat loads.

Mode 3 (Optimized Aisle) - All units perform the same operation and vary capacity based on IT server load and airflow requirements.

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