

SAMSUNG

EHS

Technical

Data Book

EHS Mono R290 Pump for Europe
(R290, 50Hz, HP)



Model : AE***CXYB*K/EU

History

Version	Modification	Date	Remark
Ver.1.0	Released EHS Mono R290 Pump for Europe TDB	23. 09. 05	
Ver.1.1	Updated the final specification	23. 10. 10	

Nomenclature

Model Name

AE	160	C	X	Y	B	G	K	/	EU
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		Buyer

(1) Classification

AE	EHS
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(5) Feature 1

Y	MONO
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(2) Capacity

X 1/10 kW (3 digits)

(6) Feature 2

B	EHS Mono R290 Pump
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(3) Version

C	2023
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(7) Rating Voltage

E	220~240V, 50Hz, 1Φ
G	380~415V, 50Hz, 3Φ

(4) Product Type

N	Indoor Unit
X	Outdoor Unit

(8) Mode

K	Heat Pump (R290)
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Features & Benefits

EHS Mono R290 Pump



R290 Refrigerant

The natural R290 refrigerant has an Ozone Depletion Potential (ODP) of zero and a Global Warming Potential (GWP) of 3, which is lower than conventional R32 or R410A refrigerants*. It also has a reinforced design with 5 layers of safety features to reduce the risks of using the R290 refrigerant.

* GWP by refrigerant: R290 = 3, R32 = 675, R410A = 2088.



Creates extremely hot water – up to 75°C

Enjoy a supply of extremely hot leaving water of up to 75°C*, which enables effective convection heating and provides sanitary water. It improves energy efficiency**, as it can supply sanitary water of up to 70°C*** using only a Heatpump. And it is hot enough to kill Legionella bacteria****.

* Leaving water temperature from an outdoor unit is 75°C when the outdoor temperature is -10-35°C. Sanitary water leaving a DHW tank is 70°C when the outdoor temperature is -10-43°C. Results may vary depending on the actual usage conditions.

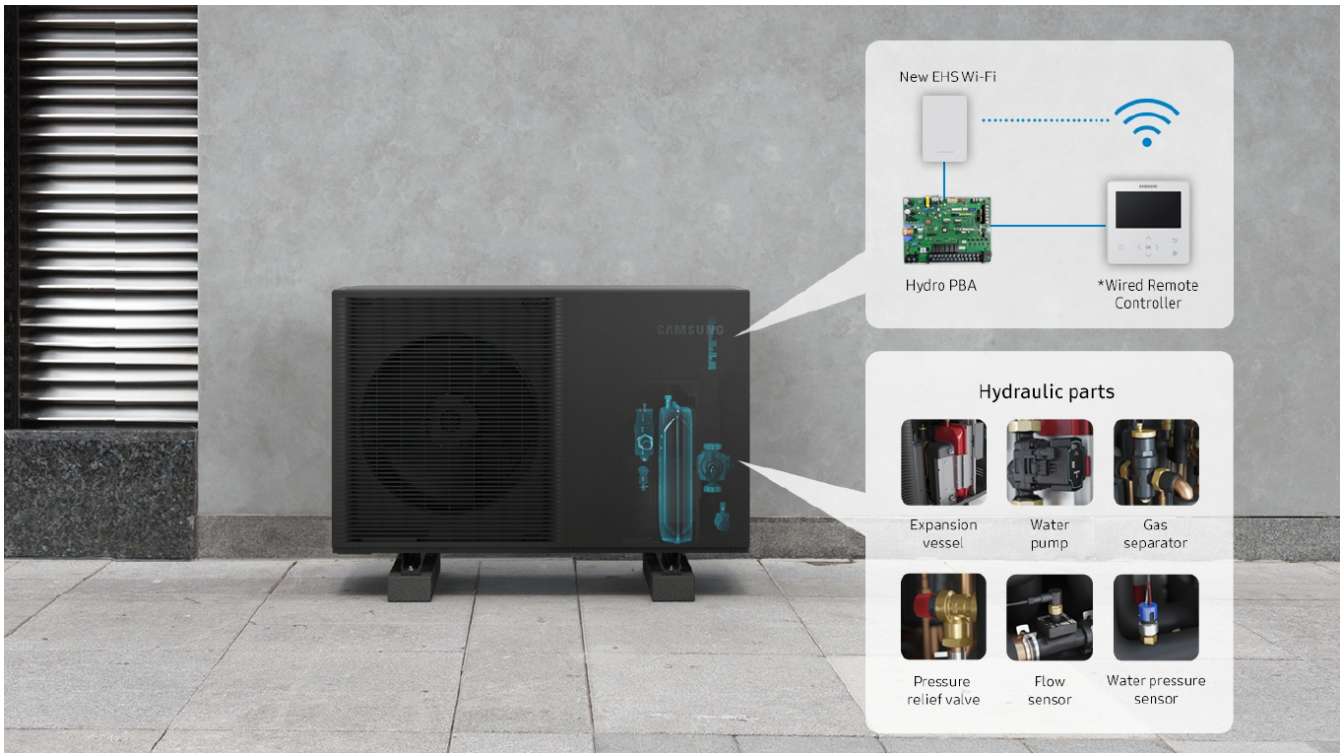
** Based on internal testing compared to a conventional model AE***RXYD*G/EU.

*** Leaving water temperature of sanitary hot water, when the outdoor temperature is between -10-43°C. If the outdoor temperature is lower than -10°C, a Booster Heater is required. Results may vary depending on the actual usage conditions.

**** Sanitary hot water should be stored at 60°C or higher in order to kill Legionella bacteria.

Features & Benefits

EHS Mono R290 Pump



Save time installing Convenience in Installation

Install the system and check the water pressure easily. All of the parts for the water piping, like the pump and expansion tank, are fitted inside, which reduces the installation time and space. And a water pressure sensor lets you conveniently monitor the water pressure on a remote controller.



Features & Benefits

EHS Mono R290 Pump



Adjustable, 4-step, low-noise operation Low Sound Level of 35dB(A)

Make less noise whenever you need. The 4-Step Quiet mode* enables adjustable low-noise operation to meet the noise level regulations in European countries. Simply select from four different steps and reduce the sound level by 3dB, 5dB, 7dB or keep it as low as 35dB(A)*** to reduce disturbance.

* The heating performance may be reduced when operating in Quiet mode.

** The Technical Instructions on Noise Abatement (German: TA-Lärm) contain regulations for protecting the general public or neighborhood from noise emissions.

*** Based on internal testing. The noise level is measured 3m away from the front of the outdoor unit. Results may vary depending on environmental factors and individual use.

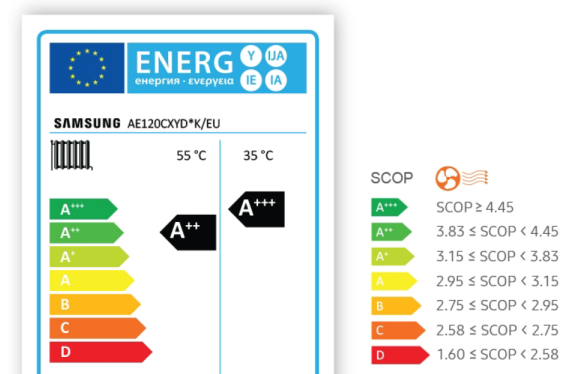
Enhanced efficiency High Efficiency (SCOP A+++)

Enjoy consistently high energy savings. It has an enhanced Seasonal Coefficient of Performance (SCOP) A+++ energy efficiency rating across the whole range of capacities*. It has been increased by up to 14%** compared to conventional models and is up to 15% more than the A+++ rating criteria***.

* Based on internal testing when generating 35°C water, in accordance with EN14825. Results may vary depending on the system configuration and actual usage conditions.

** Based on internal testing when generating 35°C water using an EHS R290 Mono 5kW model, AE050CXDEK/EU (SCOP: 5.10), compared to an EHS R32 Mono model of the same capacity, AE050RXYDEG/EU (SCOP: 4.46).

*** Based on internal testing when generating 35°C water using an EHS R290 Mono 5kW model, AE050CXDEK/EU (SCOP: 5.10), compared to the criteria of A+++, SCOP≥ 4.45.





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1.Line-up

1-1. Outdoor unit

Capacity		5.0 kW	8.0 kW	12.0 kW	16.0 kW
Image					
Model	1 phase	AE050CXYBEK/EU	AE080CXYBEK/EU	AE120CXYBEK/EU	AE160CXYBEK/EU
	3 phase	-	AE080CXYBGK/EU	AE120CXYBGK/EU	AE160CXYBGK/EU

2. Outdoor Units

2-1. Specifications

Model Name					-	AE050CXYBEK/EU	AE080CXYBEK/EU	AE080CXYBGK/EU
Power Supply					Φ, #, V, Hz	1, 2, 220~240, 50	1, 2, 220~240, 50	3, 4, 380~415, 50
System	Mode				-	Heat Pump (A2W)	Heat Pump (A2W)	Heat Pump (A2W)
	Performance	Capacity	Heating	A2W Condition #1. (A7/W35) ^{1)*}	W	5,000	8,000	8,000
			A2W condition #2		Btu/h	17,100	27,300	27,300
			A2W condition #3			5,000	8,000	8,000
			A2/W35 ^{4)*}		W	5,000	8,000	8,000
			A-7/W35 ^{4)*}			5,000	8,000	8,000
		Cooling	A2W Condition #1. (A35/W18) ^{1)*}		W	5,000	8,000	8,000
			A2W condition #2		Btu/h	17,100	27,300	27,300
			A2W condition #2		W	3,900	5,700	5,700
Power	Power Input	Heating	A2W Condition #1. (A7/W35) ^{1)*}	W	980	1,630	1,630	
			A2W condition #2		1,320	2,160	2,160	
			A2W condition #3		1,610	2,670	2,670	
			A2/W35 ^{4)*}		1,160	1,900	1,900	
		A-7/W35 ^{4)*}	1,670	2,670	2,670			
		Cooling	A2W Condition #1. (A35/W18) ^{1)*}	W	1,280	2,050	2,050	
			A2W condition #2		1,279	1,900	1,900	
		Current Input	Heating	A2W Condition #1.	A	4.63	7.70	2.56
	Cooling			6.05		9.69	3.22	
	Cooling		A2W condition #2	A	6.24	10.21	3.39	
			Cooling		7.61	12.62	4.19	
	Current	MCA		A	16.1	26.0	16.1	
		MFA		A	17.6	28.6	17.7	
	Efficiency	COP (Nominal Heating) A2W condition #1					5.10	4.91
EER (Nominal Cooling) A2W condition #1					3.91	3.90	3.90	
EER (Nominal Cooling) A2W condition #2					3.05	3.00	3.00	
COP				A2W condition #2	W/W	3.8	3.7	3.7
				A2W condition #3		3.1	3.0	3.0
				A2/W35 ^{4)*}		4.3	4.2	4.2
				A-7/W35 ^{4)*}		3.0	3.0	3.0
PdesignH (LWT 35°C)					5,500	8,000	8,000	
PdesignH (LWT 55°C)					5,500	8,000	8,000	
SCOP (35°C)					5.10	4.85	4.85	
SCOP (55°C)					3.60	3.55	3.55	
SCOP Class (35°C)					A+++	A+++	A+++	
SCOP Class (55°C)					A++	A++	A++	
SEER					4.2	4.3	4.3	
Water Connections	Water Flow Rate (Nominal)	Heating	LPM	14.4	23.1	23.1		
		Cooling	LPM	14.4	21.6	21.6		
	Water Flow Rate	Min	LPM	7	7	7		
		Max	LPM	48	48	48		
	Water Pressure (Max)		bar	3	3	3		
	Water Pipe Type	threaded	Inlet	Φ, mm	28	28	28	
		male	Outlet	Φ, mm	28	28	28	
	Leaving Water Temperature	Min.~Max	Heating	°C	15 ~ 75	15 ~ 75	15 ~ 75	
			Cooling	°C	5 ~ 25	5 ~ 25	5 ~ 25	
		Max.	DHW	°C	70	70	70	
Refrigerant	Type			-	R290	R290	R290	
	Factory Charging			kg	630	870	870	
	Control Method			tCO ₂ e	0.00189	0.00255	0.00255	
Outdoor Unit	Compressor	Type			-	Rotary	Rotary	Rotary
		Model Name			-	UF8HC5180FEU	UF5HC5260FEX	UF5HC5260FEX
		Oil	Type		-	Mineral	Mineral	Mineral
			Initial Charge	cc	590	850	850	
		Quantity	EA	1	1	1		
		Output	W	1551	2236	2236		
	Starting method			-	Inverter driven	Inverter driven	Inverter driven	
	Heat exchanger	Length		mm	986/957/928	986/957/928	986/957/928	
		Rows	Quantity	EA	2	3	3	
		Fin pitch		mm	1.5	1.5	1.5	
		Passes	Quantity	EA	6-6	9-9	9-9	
		Face area		m ²	0.79	0.79	0.79	
		Stages	Quantity	EA	38	38	38	
		Tube type		Φ	7	7	7	
		Fin	Type		-	Corrugate	Corrugate	Corrugate
			Treatment		-	Anti Salt	Anti Salt	Anti Salt
	Water Heat Exchanger	Type			-	Braszed Plate Exchanger	Braszed Plate Exchanger	Braszed Plate Exchanger
		Quantity		EA	1	1	1	
		Internal water volume		L	0.588	0.588	1.008	

2. Outdoor Units

2-1. Specifications

Model Name		-	AE050CXYBEK/EU	AE080CXYBEK/EU	AE080CXYBGK/EU		
Outdoor Unit	Fan	Type	-	Propeller Fan	Propeller Fan	Propeller Fan	
		Discharge direction		-	Horizontal	Horizontal	Horizontal
		Air Flow Rate	Heating	m ³ /min	52	65	65
			Cooling	m ³ /min	55	69	69
		Quantity	EA		1	1	1
	Fan motor	Quantity		EA	1	1	1
		Model		-	FMDC531SSJ	FMDC531SSJ	FMDC531SSJ
		Output		W	125	125	125
		Drive		-	Direct drive	Direct drive	Direct drive
		Speed	Heating	rpm	550	720	720
	Cooling		rpm	580	760	760	
	Base Heater		W	150	150	150	
	Water Pump	Model Name		-	UPM4K25-75/130	UPM4K25-75/130	UPM4K25-75/130
		Motor Input	Max	W	60	60	60
		Quantity		EA	1	1	1
	Backup Heater	Power		kW	2/4/6 (Option)	2/4/6 (Option)	2/4/6 (Option)
	Safety device	Pressure relief valve		bar	2.9	2.9	2.9
		Flow Sensor		LPM	O(5~60)	O(5~60)	O(5~60)
	Expansion vessel	Internal water volume		liter	10	10	10
		Working pressure		MPa	0.3	0.3	0.3
	Air vent		-	Gas seperator	Gas seperator	Gas seperator	
	Water Pressure Sensor		-	O	O	O	
	Strainer		-	O	O	O	
	Sound Level	Sound Pressure Level	Heating	dB(A)	41	45	45
			Cooling	dB(A)	41	45	45
			Night Mode(3m)	dB(A)	35	35	35
		Sound Power Level	Heating	dB(A)	55	59	59
			Cooling	dB(A)	55	59	59
	Connections	Water pipe	inlet	-	BSPP male 1"	BSPP male 1"	BSPP male 1"
			outlet	-	BSPP male 1"	BSPP male 1"	BSPP male 1"
Casing	Color	-	Shadow Gray	Shadow Gray	Shadow Gray		
	Material	-	GI-SGCC	GI-SGCC	GI-SGCC		
Packing	Material		-	EPS/BOX	EPS/BOX	EPS/BOX	
	Weight		kg	13	13	13	
External Dimension	Net Weight		kg	113	125	125	
	Shipping Weight		kg	131	143	143	
	Net Dimensions (WxHxD)		mm	1,270 × 850 × 500	1,270 × 850 × 500	1,270 × 850 × 500	
	Shipping Dimensions (WxHxD)		mm	1,330 × 1,018 × 630	1,330 × 1,018 × 630	1,330 × 1,018 × 630	
Operating Temp. Range	Heating		°C	-25 ~ 35	-25 ~ 35	-25 ~ 43	
	Cooling		°C	10 ~ 46	10 ~ 46	10 ~ 46	
	D.Hot Water		°C	-25 ~ 43	-25 ~ 43	-25 ~ 43	
Additional Accessories	Wi-Fi Kit		-	O	O	O	
	Shutoff Valve 25A		-	1EA (IN) inc. Filter	1EA (IN) inc. Filter	1EA (IN) inc. Filter	
	Temperature Sensor for DHW Tank		-	O	O	O	
	Connector Wire -PV Control/Peak power control		-	O	O	O	
	Water Pressure Sensor		-	-	-	-	
Gas seperator		-	-	-	-		
Function	SD Card Converter		-	O	O	O	
	PV / SG Ready		-	O	O	O	
	muti zone (2 zone)		-	O	O	O	
	Comm Kit (OEM Modbus)		-	-	-	-	
	Control Kt (Controller of water part)		-	O	O	O	
	Remote Controller		-	Optional Part	Optional Part	Optional Part	
	Wi-Fi Enable		-	O (Wi-Fi Module - Accessory)	O (Wi-Fi Module - Accessory)	O (Wi-Fi Module - Accessory)	

NOTE

- Specifications may be subject to change without prior notice.

1) A2W Condition #1 : (Heating) Water In/Out 30°C/35°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 23°C/18°C, Outdoor Air 35°C[DB].

2) A2W Condition #2 : (Heating) Water In/Out 40°C/45°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 12°C/7°C, Outdoor Air 35°C[DB].

3) A2W Condition #3 : (Heating) Water In/Out 47°C/55°C, Outdoor Air 7°C[DB]/6°C[WB].

4) A2W Condition : (A2W35) Water In/Out -/35°C, Outdoor Air 2°C[DB]/1°C[WB]; (A-7/W35) Water In/Out -/35°C, Outdoor Air -7°C[DB]/-(× Peak Capacity)

5) Select wire size based on the value of MCA

6) Soundpressure level is obtained in an anechoic room.

- Sound pressure level is a relative value, depending on the distance and acoustic environment.

- Sound pressure level may differ depending on operation condition.

- dBA = A-weighted sound pressure level

- Reference acoustic pressure 0 dB = 20uPa

7) Sound power level is an absolute value that a sound source generates.

- dBA = A-weighted Sound power level

- Reference power: 1pW

- Measured according to ISO 3741

8) These products contain R290 (GWP=3) which is fluorinated greenhouse gas.

9) The system is operated in (-25°C ≤ Outdoor temp. < -20°C) condition, but no guarantee of capacity.

10) The system is operated by only Booster Heater in special condition (35 °C < Outdoor temp. ≤ 43°C).

2. Outdoor Units

2-1. Specifications

Model Name					-	AE120CXYBEK/EU	AE120CXYBGK/EU		
Power Supply					Φ, #, V, Hz	1, 2, 220~240, 50	3, 4, 380~415, 50		
System	Mode				-	Heat Pump (A2W)	Heat Pump (A2W)		
	Performance	Capacity	Heating	A2W Condition #1. (A7/W35) 1)*		W	12,000	12,000	
A2W condition #2				Btu/h	40,900	40,900			
			A2W condition #3		W	12,000	12,000		
			A2/W35 4)*			12,000	12,000		
			A-7/W35 4)*		W	12,000	12,000		
			A2W Condition #1. (A35/W18) 1)*			W	12,000	12,000	
		Cooling	A2W condition #2		Btu/h	40,900	40,900		
			A2W condition #2		W	9,000	9,000		
Power	Power Input	Heating	A2W Condition #1. (A7/W35) 1)*		W	2,500	2,500		
			A2W condition #2			3,240	3,240		
			A2W condition #3			4,000	4,000		
			A2/W35 4)*			2,790	2,790		
			A-7/W35 4)*			4,000	4,000		
			A2W Condition #1. (A35/W18) 1)*			W	3,000	3,000	
		Current Input	Cooling	A2W condition #2		W	3,103	3,103	
				A2W Condition #1.			A	11.81	3.92
				Cooling			A	14.18	4.71
				Heating			A	15.31	5.08
				Cooling			A	18.9	6.28
				Current			MCA	A	32.0
		MFA	A	35.2	17.7				
Efficiency	COP (Nominal Heating) A2W condition #1					4.80	4.80		
	EER (Nominal Cooling) A2W condition #1					4.00	4.00		
	EER (Nominal Cooling) A2W condition #2					2.90	2.90		
	COP	A2W condition #2		W/W	3.7	3.7			
		A2W condition #3			3.0	3.0			
		A2/W35 4)*			4.3	4.3			
		A-7/W35 4)*			3.0	3.0			
	PdesignH (LWT 35°C)					12,000	12,000		
	PdesignH (LWT 55°C)					12,000	12,000		
	SCOP (35°C)					4.90	4.90		
	SCOP (55°C)					3.65	3.65		
	SCOP Class (35°C)					A+++	A+++		
SCOP Class (55°C)					A++	A++			
SEER					4.8	4.8			
Water Connections	Water Flow Rate (Nominal)		Heating	LPM	34.6	34.6			
			Cooling	LPM	34.6	34.6			
	Water Flow Rate		Min	LPM	7	7			
			Max	LPM	58	58			
	Water Pressure (Max)			bar	3	3			
	Water Pipe Type	threaded male	Inlet	Φ, mm	28	28			
			Outlet	Φ, mm	28	28			
	Leaving Water Temperature	Min.~Max	Heating	°C	15 ~ 75	15 ~ 75			
		Min.~Max	Cooling	°C	5 ~ 25	5 ~ 25			
	Max.		DHW	°C	70	70			
Refrigerant	Type				-	R290	R290		
	Factory Charging				kg	1250	1250		
	Control Method				tCO2e	0.00375	0.00375		
Outdoor Unit	Compressor	Type				-	Scroll	Scroll	
		Model Name				-	DS4HC5066FNA	DS4HC5066FNA	
		Oil	Type			-	Kixx RF P85 (GSC)	Kixx RF P85 (GSC)	
			Initial Charge			cc	1100	1100	
		Quantity				EA	1	1	
		Output				W	3803	3803	
		Starting method				-	Inverter driven	Inverter driven	
	Heat exchanger	Length			mm	1239/1210/1182	1239/1210/1182		
		Rows	Quantity		EA	3	3		
		Fin pitch			mm	1.5	1.5		
		Passes	Quantity		EA	22-12	22-12		
		Face area			m ²	1.17	1.17		
		Stages	Quantity		EA	46	46		
		Tube type			Φ	7	7		
		Fin	Type			-	Corrugate	Corrugate	
	Treatment			-	Anti Salt	Anti Salt			
	Water Heat Exchanger	Type				-	Braszed Plate Exchanger	Braszed Plate Exchanger	
		Quantity				EA	1	1	
Internal water volume				L	1.008	1.008			

2. Outdoor Units

2-1. Specifications

Model Name		-	AE120CXYBEK/EU	AE120CXYBGK/EU			
Outdoor Unit	Fan	Type	-	Propeller Fan	Propeller Fan		
		Discharge direction		-	Horizontal	Horizontal	
		Air Flow Rate	Heating	m ³ /min	95	95	
			Cooling	m ³ /min	90	90	
		Quantity			EA	1	1
	Fan motor	Quantity			EA	1	1
		Model			-	SIC-88FWJ-F1122-1	SIC-88FWJ-F1122-1
		Output			W	122	122
		Drive			-	Direct drive	Direct drive
		Speed	Heating	rpm	590	590	
	Cooling		rpm	560	560		
	Base Heater			W	150	150	
	Water Pump	Model Name			-	UPM4XLK 25-90/130	UPM4XLK 25-90/130
		Motor Input	Max	W	60	60	
		Quantity			EA	1	1
	Backup Heater	Power			kW	2/4/6 (Option)	2/4/6 (Option)
	Safety device	Pressure relief valve			bar	2.9	2.9
		Flow Sensor			LPM	O(5~60)	O(5~60)
	Expansion vessel	Internal water volume			liter	10	10
		Working pressure			MPa	0.3	0.3
	Air vent			-	Gas seperator	Gas seperator	
	Water Pressure Sensor			-	O	O	
	Strainer			-	O	O	
	Sound Level	Sound Pressure Level	Heating	dB(A)	47	47	
			Cooling	dB(A)	47	47	
			Night Mode(3m)	dB(A)	35	35	
		Sound Power Level	Heating	dB(A)	60	60	
	Cooling		dB(A)	60	60		
	Connections	Water pipe	inlet	-	BSPP male 1"	BSPP male 1"	
			outlet	-	BSPP male 1"	BSPP male 1"	
	Casing	Color			-	Shadow Gray	Shadow Gray
		Material			-	GI-SGCC	GI-SGCC
	Packing	Material			-	EPS/BOX	EPS/BOX
Weight				kg	20	20	
External Dimension	Net Weight			kg	154	154	
	Shipping Weight			kg	174	174	
	Net Dimensions (WxHxD)			mm	1,270 × 1,018 × 530	1,270 × 1,018 × 530	
	Shipping Dimensions (WxHxD)			mm	1,330 × 1,226 × 630	1,330 × 1,226 × 630	
Operating Temp. Range	Heating			°C	-25 ~ 43	-25 ~ 43	
	Cooling			°C	10 ~ 46	10 ~ 46	
	D.Hot Water			°C	-25 ~ 43	-25 ~ 43	
Additional Accessories	Wi-Fi Kit			-	O	O	
	Shutoff Valve 25A			-	1EA (IN) inc. Filter	1EA (IN) inc. Filter	
	Temperature Sensor for DHW Tank			-	O	O	
	Connector Wire -PV Control/Peak power control			-	O	O	
	Water Pressure Sensor			-	O	O	
Gas seperator			-	O	O		
Function	SD Card Converter			-	O	O	
	PV / SG Ready			-	O	O	
	muti zone (2 zone)			-	O	O	
	Comm Kit (OEM Modbus)			-	-	-	
	Control Kt (Controller of water part)			-	O	O	
	Remote Controller			-	Optional Part	Optional Part	
	Wi-Fi Enable			-	O	O	
				(Wi-Fi Module - Accessory)	(Wi-Fi Module - Accessory)		

NOTE

- Specifications may be subject to change without prior notice.
- A2W Condition #1 : (Heating) Water In/Out 30°C/35°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 23°C/18°C, Outdoor Air 35°C[DB].
 - A2W Condition #2 : (Heating) Water In/Out 40°C/45°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 12°C/7°C, Outdoor Air 35°C[DB].
 - A2W Condition #3 : (Heating) Water In/Out 47°C/55°C, Outdoor Air 7°C[DB]/6°C[WB].
 - A2W Condition : (A2W35) Water In/Out -/35°C, Outdoor Air 2°C[DB]/1°C[WB]; (A-7/W35) Water In/Out -/35°C, Outdoor Air -7°C[DB]/-(× Peak Capacity)
 - Select wire size based on the value of MCA
 - Soundpressure level is obtained in an anechoic room.
 - Sound pressure level is a relative value, depending on the distance and acoustic environment.
 - Sound pressure level may differ depending on operation condition.
 - dBA = A-weighted sound pressure level
 - Reference acoustic pressure 0 dB = 20uPa
 - Sound power level is an absolute value that a sound source generates.
 - dBA = A-weighted Sound power level
 - Reference power: 1pW
 - Measured according to ISO 3741
 - These products contain R290 (GWP=3) which is fluorinated greenhouse gas.
 - The system is operated in (-25°C ≤ Outdoor temp. < -20°C) condition, but no guarantee of capacity.
 - The system is operated by only Booster Heater in special condition (35 °C < Outdoor temp. ≤ 43°C).

2. Outdoor Units

2-1. Specifications

Model Name					-	AE160CXYBEK/EU	AE160CXYBGK/EU
Power Supply					Φ,#,V,Hz	1, 2, 220~240, 50	3, 4, 380~415, 50
System	Mode				-	Heat Pump (A2W)	Heat Pump (A2W)
	Performance	Capacity	Heating	A2W Condition #1.		W	16,000
(A7/W35) ^{1)*}				Btu/h	54,600	54,600	
A2W condition #2					16,000	16,000	
A2W condition #3					16,000	16,000	
A2/W35 ^{4)*}				W	16,000	16,000	
A-7/W35 ^{4)*}					16,000	16,000	
A2W Condition #1.				W	14,000	14,000	
(A35/W18) ^{1)*}				Btu/h	47,800	47,800	
A2W condition #2				W	10,400	10,400	
Cooling							
A2W Condition #1.				W	3,550	3,550	
(A35/W18) ^{1)*}							
A2W condition #2				W	4,570	4,570	
A2W condition #3				W	5,520	5,520	
A2/W35 ^{4)*}			4,100	4,100			
A-7/W35 ^{4)*}			5,710	5,710			
Cooling							
A2W Condition #1.		W	3,680	3,680			
(A35/W18) ^{1)*}							
A2W condition #2		W	3,586	3,714			
Current Input							
Heating		A	16.78	5.57			
Cooling			17.39	5.77			
Heating		A	21.6	7.17			
Cooling			26.09	8.66			
Current							
MCA		A	32.0	16.1			
MFA		A	35.2	17.7			
Efficiency	COP (Nominal Heating) A2W condition #1					4.51	4.51
	EER (Nominal Cooling) A2W condition #1					3.80	3.80
	EER (Nominal Cooling) A2W condition #2					2.90	2.90
	COP						
	A2W condition #2		W/W	3.5	3.5		
	A2W condition #3			2.9	2.9		
	A2/W35 ^{4)*}			3.9	3.9		
	A-7/W35 ^{4)*}			2.8	2.8		
	PdesignH (LWT 35°C)					15,500	15,500
	PdesignH (LWT 55°C)					14,500	15,500
	SCOP (35°C)					4.70	4.70
	SCOP (55°C)					3.55	3.55
	SCOP Class (35°C)					A+++	A+++
	SCOP Class (55°C)					A++	A++
SEER					5.0	5.0	
Water Connections	Water Flow Rate (Nominal)		Heating	LPM	46.2	46.2	
			Cooling	LPM	40.4	40.4	
	Water Flow Rate		Min	LPM	7	7	
			Max	LPM	58	58	
	Water Pressure (Max)			bar	3	3	
	Water Pipe	threaded	Inlet	Φ, mm	28	28	
	Type	male	Outlet	Φ, mm	28	28	
	Leaving	Min.~Max	Heating	°C	15 ~ 75	15 ~ 75	
	Water	Min.~Max	Cooling	°C	5 ~ 25	5 ~ 25	
	Temperature	Max.	DHW	°C	70	70	
Refrigerant	Type				-	R290	R290
	Factory Charging				kg	1250	1250
					tCO ₂ e	0.00375	0.00375
Control Method				-	EEV	EEV	
Outdoor Unit	Compressor				-	Scroll	Scroll
	Type				-	DS4HC5066FNA	DS4HC5066FNA
	Model Name				-	Kixx RF P85 (GSC)	Kixx RF P85 (GSC)
	Oil		Type	-	1100	1100	
			Initial Charge	cc			
	Quantity				EA	1	1
	Output				W	3803	3803
	Starting method				-	Inverter driven	Inverter driven
	Heat exchanger						
	Length				mm	1239/1210/1182	1239/1210/1182
	Rows	Quantity			EA	3	3
	Fin pitch				mm	1.5	1.5
	Passes	Quantity			EA	22-12	22-12
	Face area				m ²	1.17	1.17
Stages	Quantity			EA	46	46	
Tube type				Φ	7	7	
Fin	Type			-	Corrugate	Corrugate	
				-	Anti Salt	Anti Salt	
Water Heat Exchanger							
Type				-	Braszed Plate Exchager	Braszed Plate Exchager	
Quantity				EA	1	1	
Internal water volume				L	1.008	1.008	

2. Outdoor Units

2-1. Specifications

Model Name		-	AE160CXYBEK/EU	AE160CXYBGK/EU		
Outdoor Unit	Fan	Type	-	Propeller Fan	Propeller Fan	
		Discharge direction		Horizontal	Horizontal	
		Air Flow Rate	Heating	m ³ /min	95	95
			Cooling	m ³ /min	94	94
		Quantity	EA		1	1
	Fan motor	Quantity		EA	1	1
		Model		-	SIC-88FWJ-F1122-1	SIC-88FWJ-F1122-1
		Output		W	122	122
		Drive		-	Direct drive	Direct drive
		Speed	Heating	rpm	590	590
	Cooling		rpm	580	580	
	Base Heater		W	150	150	
	Water Pump	Model Name		-	UPM4XLK 25-90/130	UPM4XLK 25-90/130
		Motor Input	Max	W	60	60
		Quantity		EA	1	1
	Backup Heater	Power		kW	2/4/6 (Option)	2/4/6 (Option)
	Safety device	Pressure relief valve		bar	2.9	2.9
		Flow Sensor		LPM	O(5~60)	O(5~60)
	Expansion vessel	Internal water volume		liter	10	10
		Working pressure		MPa	0.3	0.3
	Air vent		-	Gas seperator	Gas seperator	
	Water Pressure Sensor		-	O	O	
	Strainer		-	O	O	
	Sound Level	Sound Pressure Level	Heating	dB(A)	51	51
			Cooling	dB(A)	51	51
			Night Mode(3m)	dB(A)	35	35
		Sound Power Level	Heating	dB(A)	65	65
			Cooling	dB(A)	65	65
	Connections	Water pipe	inlet	-	BSP male 1"	BSP male 1"
			outlet	-	BSP male 1"	BSP male 1"
	Casing	Color	-	Shadow Gray	Shadow Gray	
		Material	-	GI-SGCC	GI-SGCC	
Packing	Material	-	EPS/BOX	EPS/BOX		
	Weight	kg	20	20		
External Dimension	Net Weight		kg	154	154	
	Shipping Weight		kg	174	174	
	Net Dimensions (WxHxD)		mm	1,270 × 1,018 × 530	1,270 × 1,018 × 530	
	Shipping Dimensions (WxHxD)		mm	1,330 × 1,226 × 630	1,330 × 1,226 × 630	
Operating Temp. Range	Heating	°C	-25 ~ 43	-25 ~ 43		
	Cooling	°C	10 ~ 46	10 ~ 46		
	D.Hot Water	°C	-25 ~ 43	-25 ~ 43		
Additional Accessories	Wi-Fi Kit		-	O	O	
	Shutoff Valve 25A		-	1EA (IN) inc. Filter	1EA (IN) inc. Filter	
	Temperature Sensor for DHW Tank		-	O	O	
	Connector Wire -PV Control/Peak power control		-	O	O	
	Water Pressure Sensor		-	O	O	
	Gas seperator		-	O	O	
Function	SD Card Converter		-	O	O	
	PV / SG Ready		-	O	O	
	muti zone (2 zone)		-	O	O	
	Comm Kit (OEM Modbus)		-	-	-	
	Control Kt (Controller of water part)		-	O	O	
	Remote Controller		-	Optional Part	Optional Part	
	Wi-Fi Enable		-	O (Wi-Fi Module - Accessory)	O (Wi-Fi Module - Accessory)	

NOTE

- Specifications may be subject to change without prior notice.

1) A2W Condition #1 : (Heating) Water In/Out 30°C/35°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 23°C/18°C, Outdoor Air 35°C[DB].

2) A2W Condition #2 : (Heating) Water In/Out 40°C/45°C, Outdoor Air 7°C[DB]/6°C[WB]; (Cooling) Water In/Out 12°C/7°C, Outdoor Air 35°C[DB].

3) A2W Condition #3 : (Heating) Water In/Out 47°C/55°C, Outdoor Air 7°C[DB]/6°C[WB].

4) A2W Condition : (A2W35) Water In/Out -/35°C, Outdoor Air 2°C[DB]/1°C[WB]; (A-7/W35) Water In/Out -/35°C, Outdoor Air -7°C[DB]/-(× Peak Capacity)

5) Select wire size based on the value of MCA

6) Soundpressure level is obtained in an anechoic room.

- Sound pressure level is a relative value, depending on the distance and acoustic environment.

- Sound pressure level may differ depending on operation condition.

- dBA = A-weighted sound pressure level

- Reference acoustic pressure 0 dB = 20uPa

7) Sound power level is an absolute value that a sound source generates.

- dBA = A-weighted Sound power level

- Reference power: 1pW

- Measured according to ISO 3741

8) These products contain R290 (GWP=3) which is fluorinated greenhouse gas.

9) The system is operated in (-25°C ≤ Outdoor temp. < -20°C) condition, but no guarantee of capacity.

10) The system is operated by only Booster Heater in special condition (35 °C < Outdoor temp. ≤ 43°C).

2. Outdoor Units

2-2. Electrical characteristics

Capacity [kW]	Model	Power Supply				Voltage Range [V]		Nominal Running Current [A]		Current [A]	
		Φ	#	Hz	Voltage	Min. (-10%)	Max. (+10%)	Cooling	Heating	MCA	MFA
5.0	AE050CXYBEK/EU	1	2	50	220-240	198	264	6.05	4.63	16.1	17.6
8.0	AE080CXYBEK/EU	1	2	50	220-240	198	264	9.69	7.70	26.0	28.6
12.0	AE120CXYBEK/EU	1	2	50	220-240	198	264	14.18	11.81	32.0	35.2
16.0	AE160CXYBEK/EU	1	2	50	220-240	198	264	17.39	16.78	32.0	35.2
8.0	AE080CXYBGK/EU	3	4	50	380-415	342	457	3.22	2.56	16.1	17.7
12.0	AE120CXYBGK/EU	3	4	50	380-415	342	457	4.71	3.92	16.1	17.7
16.0	AE160CXYBGK/EU	3	4	50	380-415	342	457	5.77	5.57	16.1	17.7

NOTE

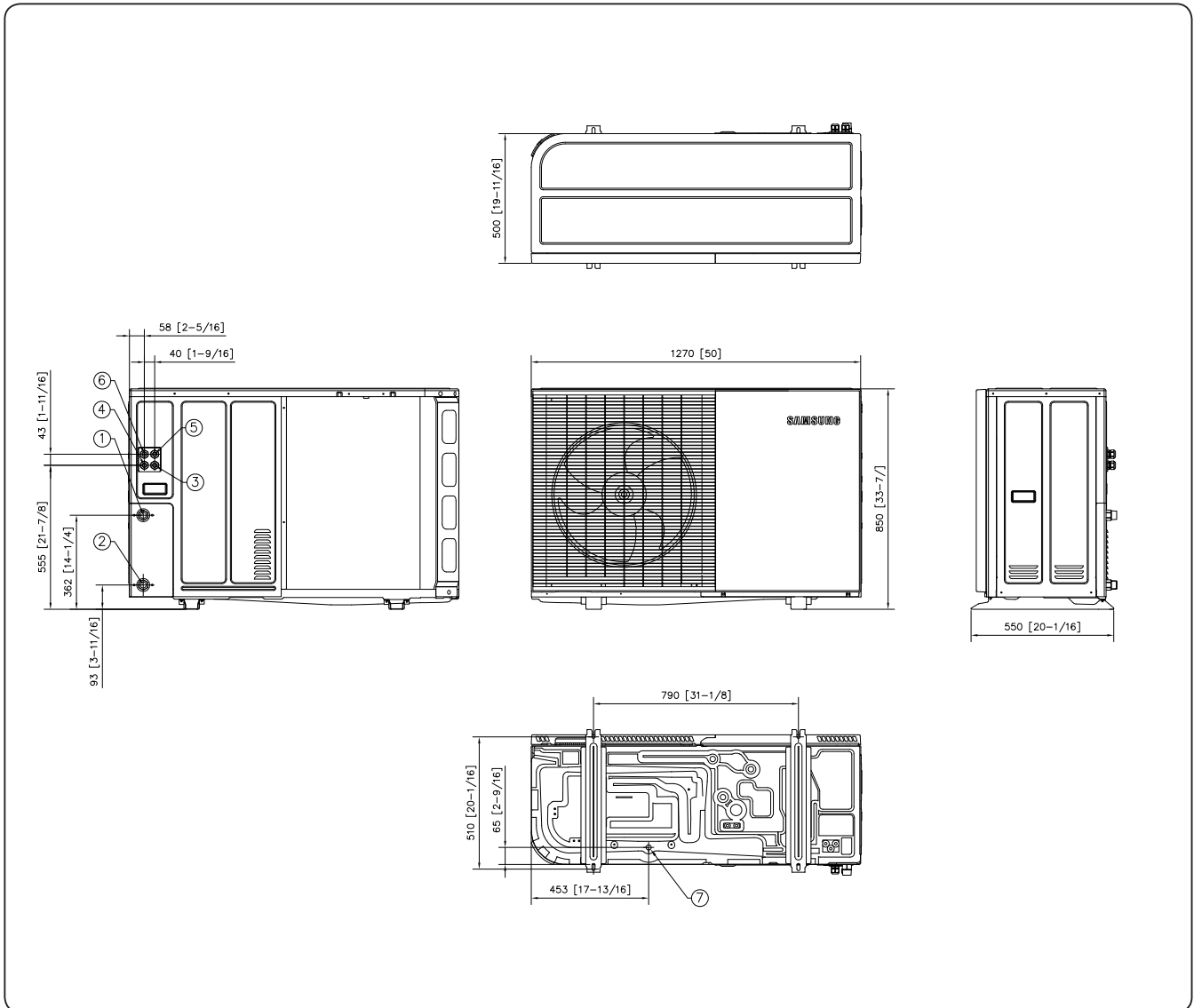
- MCA : Minimum circuit amperes
- MFA : Maximum fuse amperes
- Select wire size based on the value of MCA

2. Outdoor Units

2-3. Dimensional drawing

AE050CXYBEK/EU, 080CXYB*K/EU

Units : mm [inches]



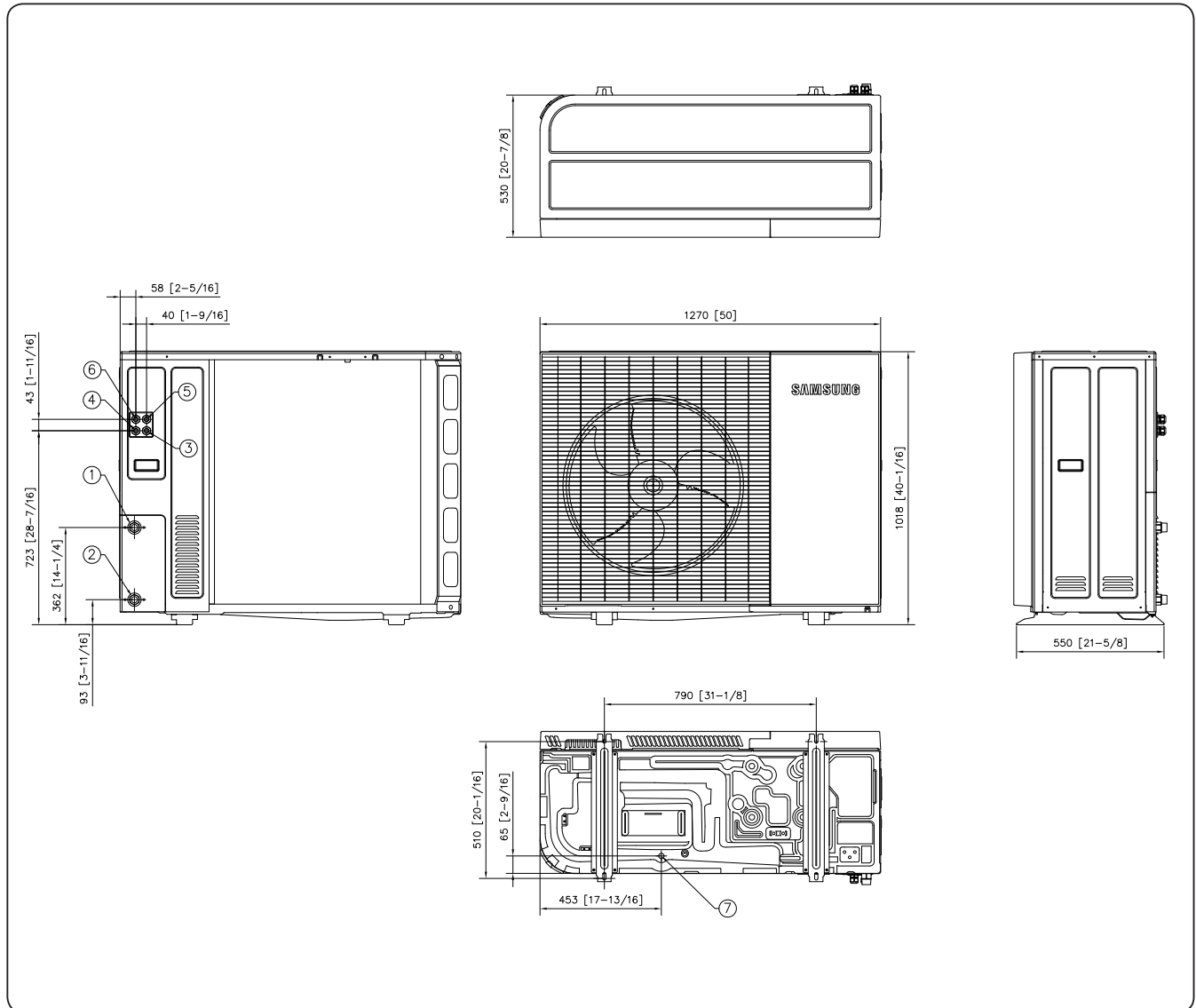
NO	Name	Description
1	Water Pipe (Out)	BSPP 1"Male
2	Water Pipe (In)	BSPP 1"Male
3	Power wiring conduit	Φ25
4	Communication wiring conduit	Φ25
5	Conduit	Φ25
6	Conduit	Φ25
7	Drain holes	Connect with the provided drain plug

2. Outdoor Units

2-3. Dimensional drawing

AE120/160CXIB*K/EU

Units : mm [inches]



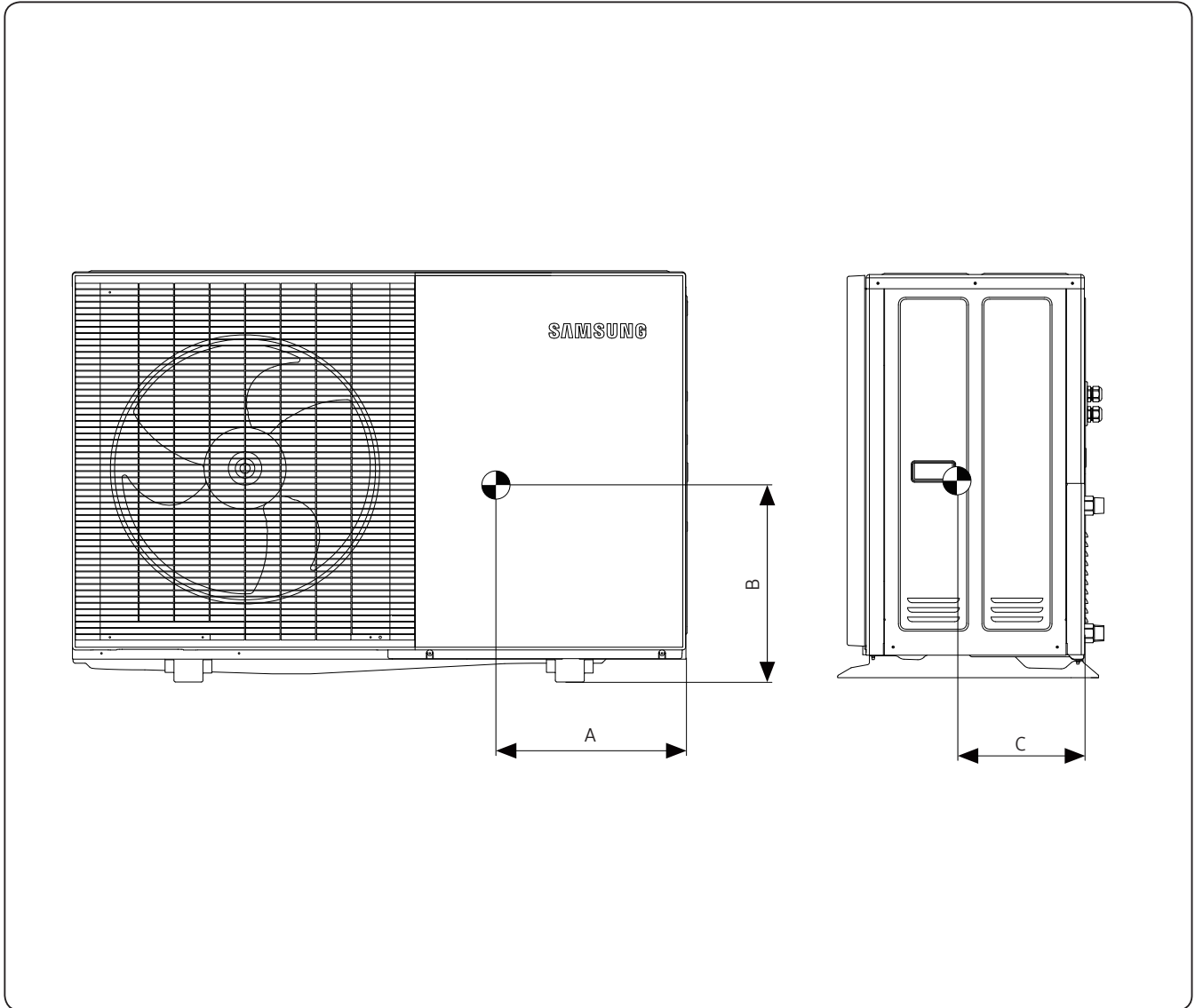
NO	Name	Description
1	Water Pipe (Out)	BSPP 1"Male
2	Water Pipe (In)	BSPP 1"Male
3	Power wiring conduit	Φ25
4	Communication wiring conduit	Φ25
5	Conduit	Φ25
6	Conduit	Φ25
7	Drain holes	Connect with the provided drain plug

2. Outdoor Units

2-4. Center of Gravity

AE050CXYBEK/EU, 080CXYB*K/EU

Units : mm [inches]



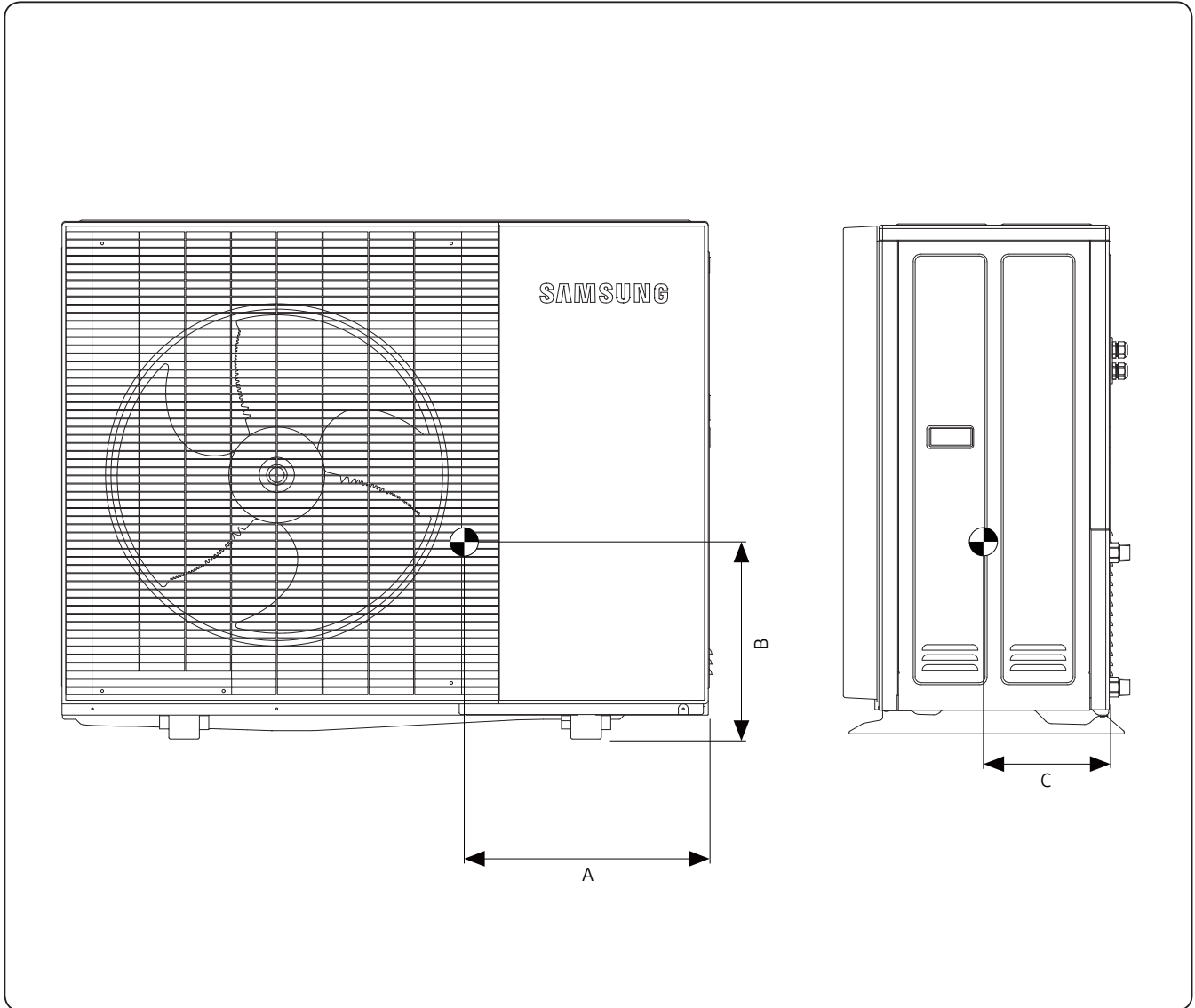
Model	A	B	C
AE050CXYBEK/EU AE080CXYBEK/EU AE080CXYBGK/EU	490 [19 5/16]	360 [14 3/16]	280 [11]

2. Outdoor Units

2-4. Center of Gravity

AE120/160CXYP*K/EU

Units : mm [inches]

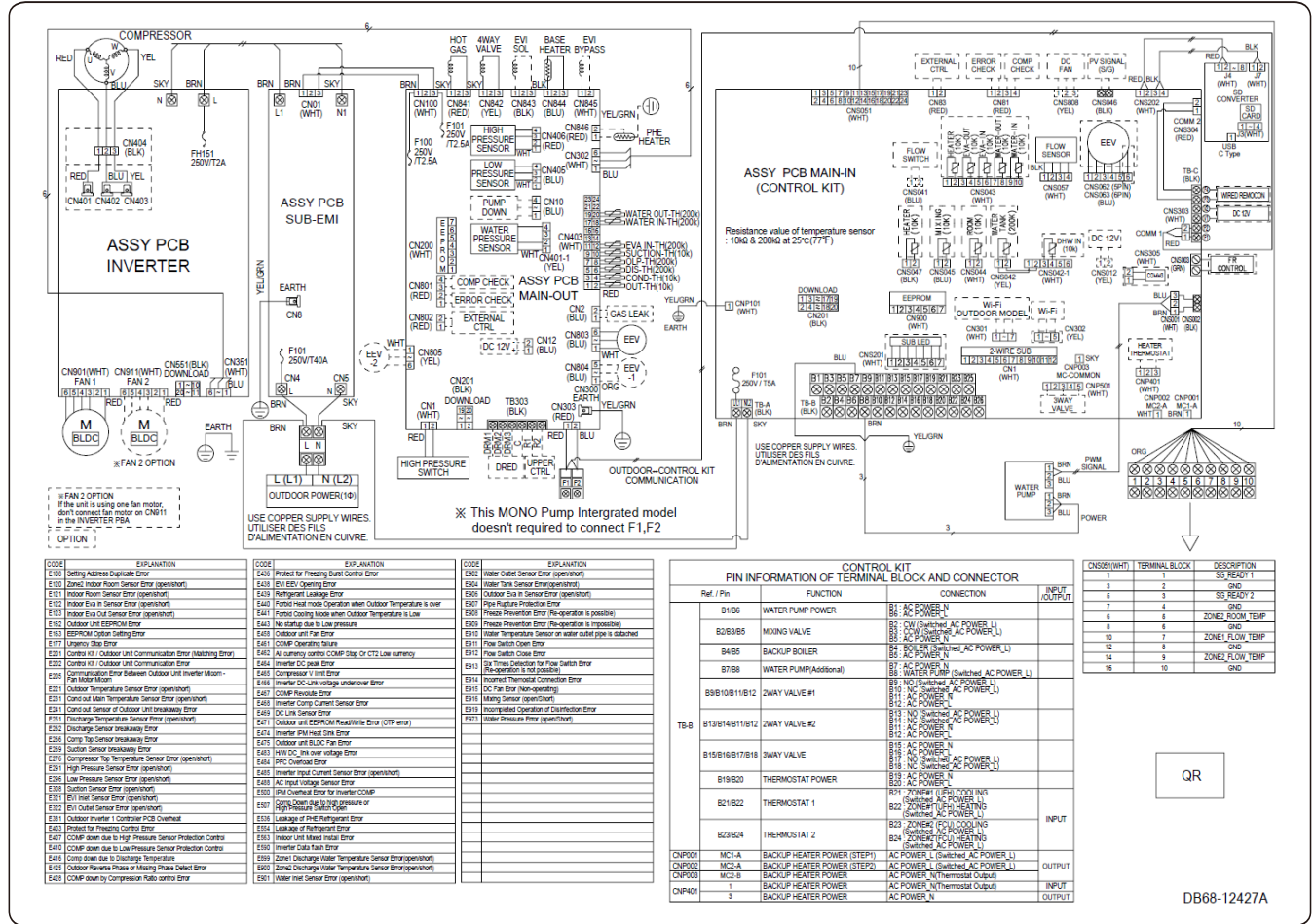


Model	A	B	C
AE120CXYP*K/EU AE160CXYP*K/EU	470 [18 1/2]	410 [16 1/8]	240 [9 7/16]

2. Outdoor Units

2-5. Electrical wiring diagram

AE050CXBYBEK/EU, AE080CXBYBEK/EU, AE120CXBYBEK/EU, AE160CXBYBEK/EU



ASSY PCB MAIN-OUT	Printed circuit board(MAIN)	EVA OUT(10k)	Thermistor (EVA OUT_10Kohm)
ASSY PCB INVER	Printed circuit board(INVERTER)	EVA-IN(10k)	Thermistor (EVA-IN_10Kohm)
ASSY PCB SUB-EMI	Printed circuit board(EMI)	WATER OUT(10k)	Thermistor (WATER OUT_10Kohm)
ASSY PCB MAIN-IN (CONTROL KIT)	Printed circuit board (CONTROL KIT)	WATER-IN(10k)	Thermistor (WATER-IN_10Kohm)
OUT-TH(10k)	Thermistor (OUT_10Kohm)	WATER OUT-TH(200k)	Thermistor (WATER OUT_200Kohm)
COND-TH(10k)	Thermistor (COND_10Kohm)	HOT GAS	Solenoid Valve - Hot Gas bypass
DIS-TH(200k)	Thermistor (DISCHARGE_200Kohm)	4WAY VALVE	Solenoid Valve - 4Way
OLP-TH(200k)	Thermistor (OLP_200Kohm)	EVI SOL	Solenoid Valve - EVI
SUCTION-TH(10k)	Thermistor (SUCTION_10kKohm)	EVI BYPASS	Solenoid Valve - EVI Bypass
EVA IN-TH(200k)	Thermistor (EVA IN_200Kohm)	M-BLDC	Motor for Outdoor Fan
WATER IN-TH(200k)	Thermistor (WATER IN_200Kohm)	EEV	Electronic Expansion Valve
HEATER(10k)	Thermistor (HEATER_10Kohm)	EXTERNAL CTRL	External Control
MIXING(10k)	Thermistor (MIXING_10Kohm)	UPPER CTRL	Upper Control
ROOM(10k)	Thermistor (ROOM_10Kohm)	PV SIGNAL	Photo Voltaic SIGNAL
WATER TANK(200k)	Thermistor (WATER TANK_200Kohm)	SD CONVERTER	Secure Digital Converter
DHW IN(10k)	Thermistor (Domestic Hot Water_10Kohm)	SD CARD	Secure Digital Card

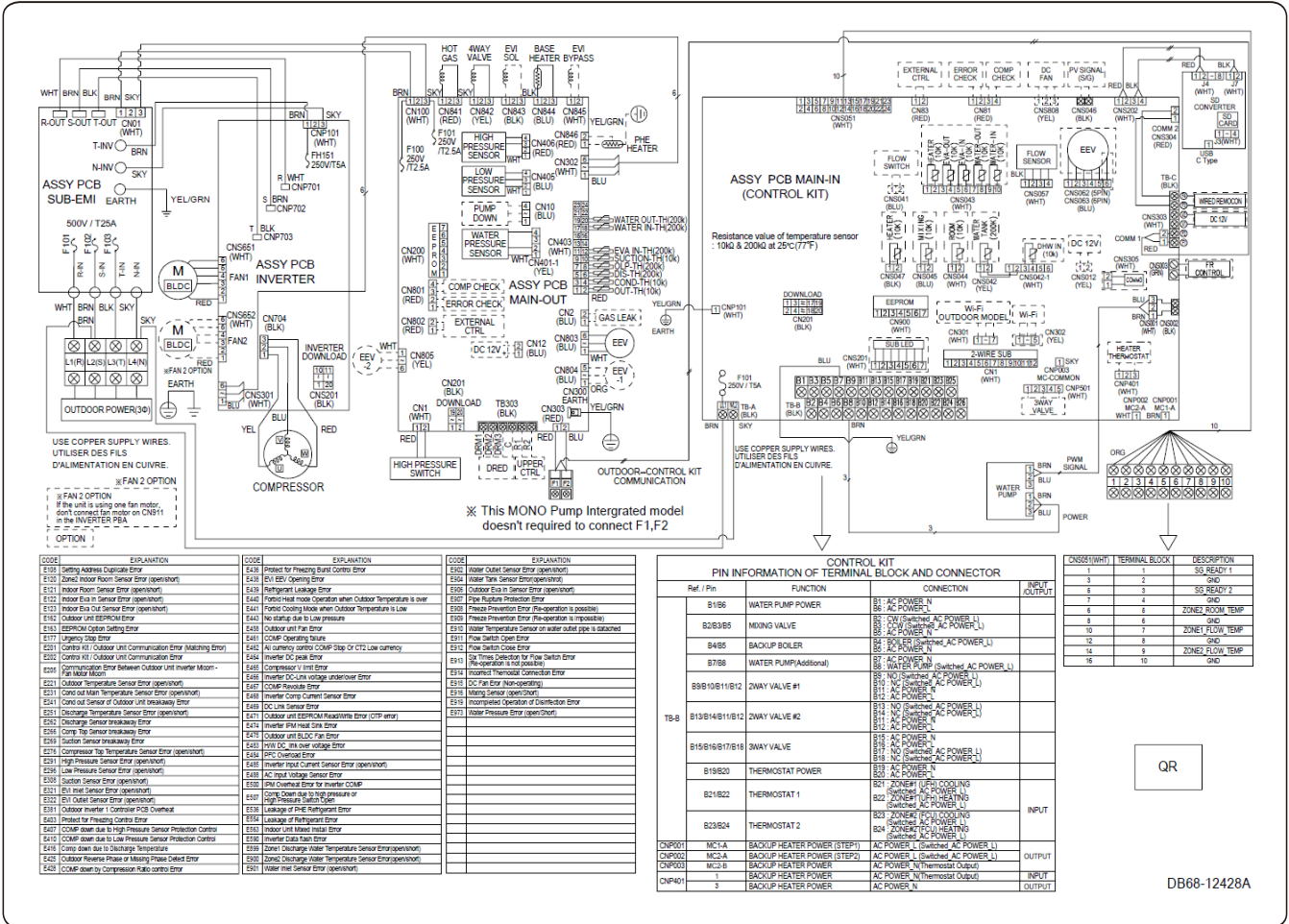
NOTES

1. This wiring diagram applies only to the Outdoor unit.
2. Symbols show as follow :
BLK: black, RED: red, BLU: blue, WHT: white, YEL: yellow, BRN: brown, SKY: skyblue, GRN: green
3. For connection wiring indoor-outdoor transmission F1-F2.
4. Protective earth(SCREW)

2. Outdoor Units

2-5. Electrical wiring diagram

AE080CXYBGK/EU, AE120CXYBGK/EU, AE160CXYBGK/EU



ASSY PCB MAIN-OUT	Printed circuit board(MAIN)	EVA OUT(10k)	Thermistor (EVA_OUT_10Kohm)
ASSY PCB INVER	Printed circuit board(INVERTER)	EVA-IN(10k)	Thermistor (EVA-IN_10Kohm)
ASSY PCB SUB-EMI	Printed circuit board(EMI)	WATER OUT(10k)	Thermistor (WATER_OUT_10Kohm)
ASSY PCB MAIN-IN (CONTROL KIT)	Printed circuit board (CONTROL KIT)	WATER-IN(10k)	Thermistor (WATER-IN_10Kohm)
OUT-TH(10k)	Thermistor (OUT_10Kohm)	WATER OUT-TH(200k)	Thermistor (WATER_OUT_200Kohm)
COND-TH(10k)	Thermistor (COND_10Kohm)	HOT GAS	Solenoid Valve - Hot Gas bypass
DIS-TH(200k)	Thermistor (DISCHARGE_200Kohm)	4WAY VALVE	Solenoid Valve - 4Way
OLP-TH(200k)	Thermistor (OLP_200Kohm)	EVI SOL	Solenoid Valve - EVI
SUCTION-TH(10k)	Thermistor (SUCTION_10kKohm)	EVI BYPASS	Solenoid Valve - EVI Bypass
EVA IN-TH(200k)	Thermistor (EVA_IN_200Kohm)	M-BLDC	Motor for Outdoor Fan
WATER IN-TH(200k)	Thermistor (WATER_IN_200Kohm)	EEV	Electronic Expansion Valve
HEATER(10k)	Thermistor (HEATER_10Kohm)	EXTERNAL CTRL	External Control
MIXING(10k)	Thermistor (MIXING_10Kohm)	UPPER CTRL	Upper Control
ROOM(10k)	Thermistor (ROOM_10Kohm)	PV SIGNAL	Photo Voltaic SIGNAL
WATER TANK(200k)	Thermistor (WATER_TANK_200Kohm)	SD CONVERTER	Secure Digital Converter
DHW IN(10k)	Thermistor (Domestic Hot Water_10Kohm)	SD CARD	Secure Digital Card

NOTES

- This wiring diagram applies only to the Outdoor unit.
- Symbols show as follow :
BLK: black, RED: red, BLU: blue, WHT: white, YEL: yellow, BRN: brown, SKY: skyblue, GRN: green
- For connection wiring indoor-outdoor transmission F1-F2.
- ⊕ Protective earth(SCREW)

2. Outdoor Units

2-6. Sound data

Summary

Capacity (kW)	Model	Sound Pressure dB(A)		Sound Power dB(A)	
		Heating	Cooling	Heating	Cooling
5.0	AE050CXYBEK/EU	41	41	55	55
8.0	AE080CXYBEK/EU	45	45	59	59
12.0	AE120CXYBEK/EU	47	47	60	60
16.0	AE160CXYBEK/EU	51	51	65	65
8.0	AE080CXYBGK/EU	45	45	59	59
12.0	AE120CXYBGK/EU	47	47	60	60
16.0	AE160CXYBGK/EU	51	51	65	65

NOTE

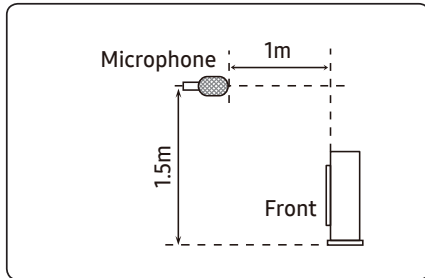
- Specifications may be subject to change without prior notice.
- Sound Pressure Level
 - Sound pressure level is obtained in an anechoic room.
 - Sound pressure level is a relative value, depending on the distance and acoustic environment.
 - Sound pressure level may differ depending on operation condition.
 - dBA = A-weighted sound pressure level
 - Reference acoustic pressure 0 dB = 20μPa
- Sound Power Level
 - Sound power level is an absolute value that a sound source generates.
 - dBA = A-weighted sound power level.
 - Reference power : 1pW.
 - Measured according to ISO 3741.

2. Outdoor Units

2-6. Sound data

Sound Pressure level

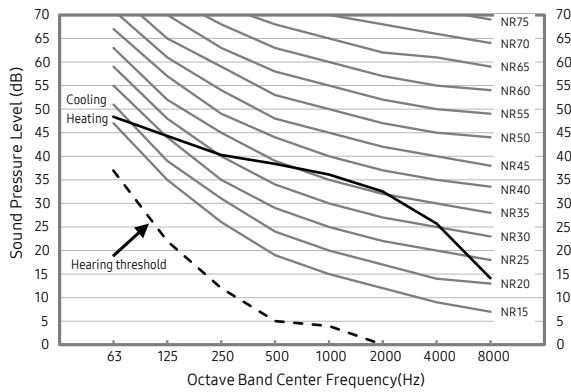
Unit: dB(A)



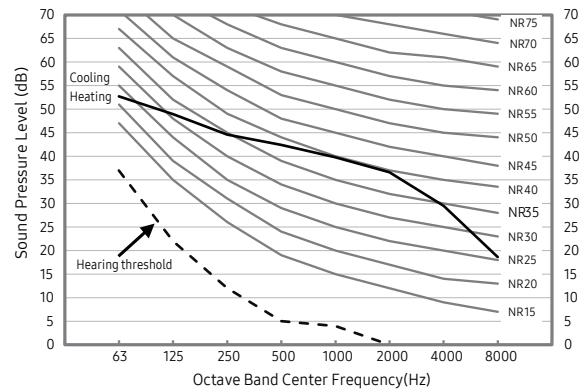
Model	Heating	Cooling
AE050CXYBEK/EU	41	41
AE080CXYBEK/EU	45	45
AE120CXYBEK/EU	47	47
AE160CXYBEK/EU	51	51

- NR Curve

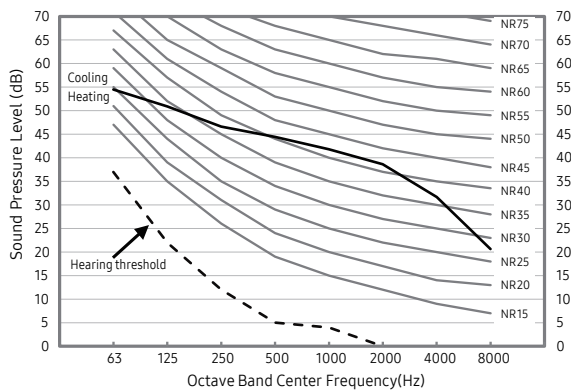
1) AE050CXYBEK/EU



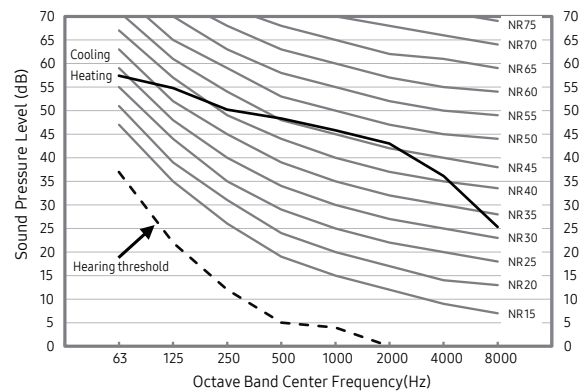
2) AE080CXYBEK/EU



3) AE120CXYBEK/EU



4) AE160CXYBEK/EU

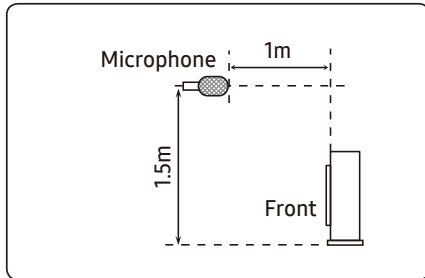


2. Outdoor Units

2-6. Sound data

Sound Pressure level

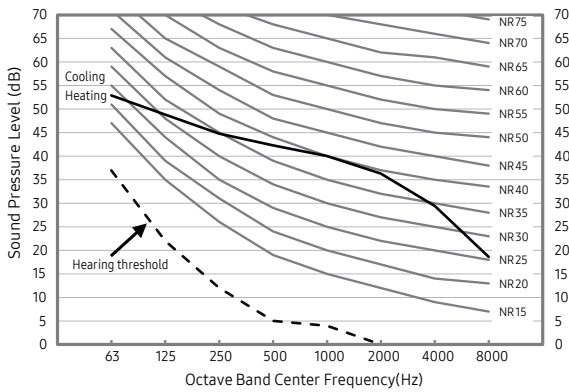
Unit: dB(A)



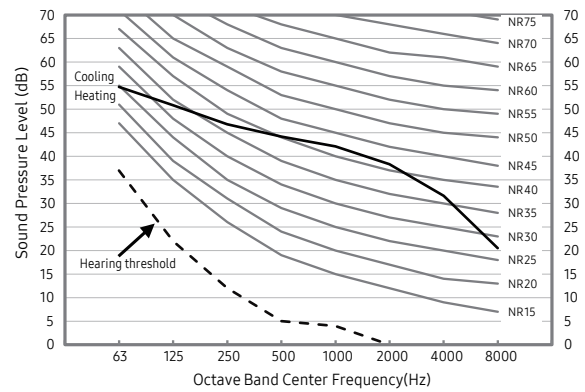
Model	Heating	Cooling
AE080CXYBGK/EU	45	45
AE120CXYBGK/EU	47	47
AE160CXYBGK/EU	51	51

- NR Curve

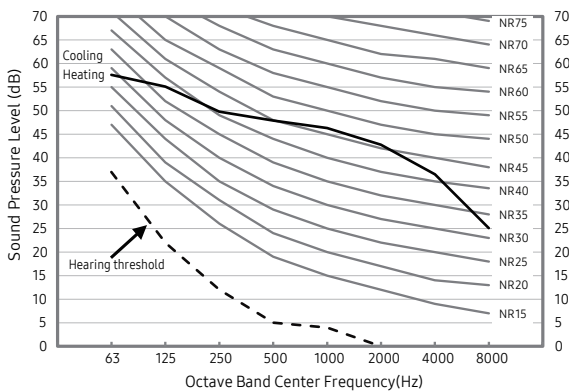
5) AE080CXYBGK/EU



6) AE120CXYBGK/EU



7) AE160CXYBGK/EU



2. Outdoor Units

2-6. Sound data

Sound Power level

Unit: dB(A)

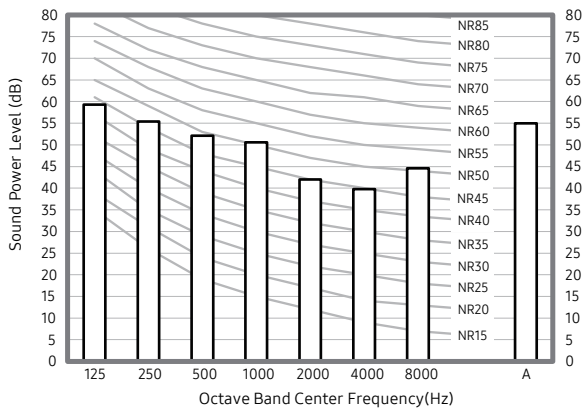
NOTE

- Specifications may be subject to change without prior notice
 - Sound power level is an absolute value that a sound source generates.
 - dBA = A-weighted sound power level.
 - Reference power : 1pW.
 - Measured according to ISO 3741.

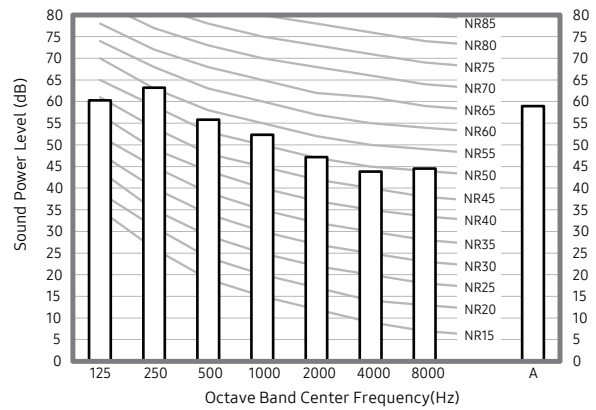
Model	Heating	Cooling
AE050CXYBEK/EU	55	55
AE080CXYBEK/EU	59	59
AE120CXYBEK/EU	60	60
AE160CXYBEK/EU	65	65

• NR Curve

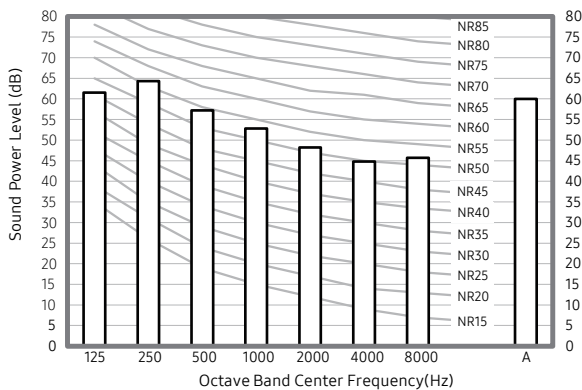
1) AE050CXYBEK/EU



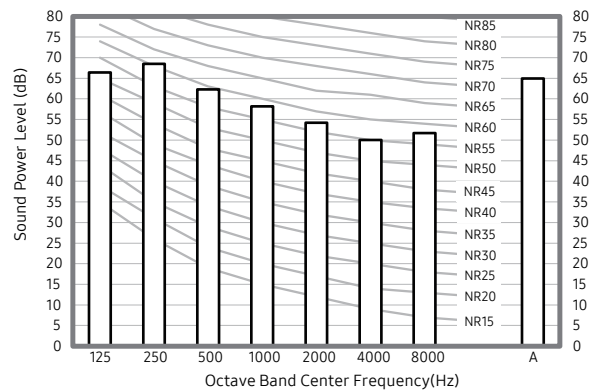
2) AE080CXYBEK/EU



3) AE120CXYBEK/EU



4) AE160CXYBEK/EU



2. Outdoor Units

2-6. Sound data

Sound Power level

Unit: dB(A)

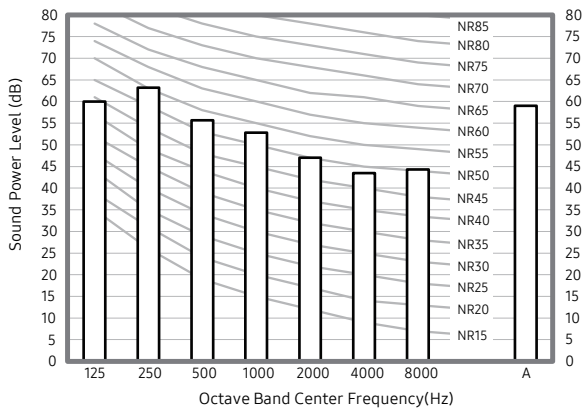
NOTE

- Specifications may be subject to change without prior notice
 - Sound power level is an absolute value that a sound source generates.
 - dBA = A-weighted sound power level.
 - Reference power : 1pW.
 - Measured according to ISO 3741.

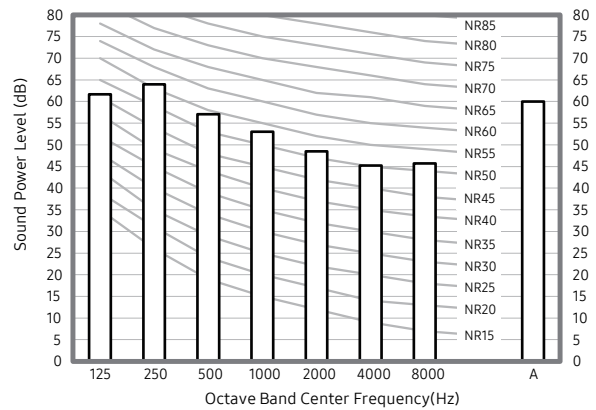
Model	Heating	Cooling
AE080CXYBGK/EU	59	59
AE120CXYBGK/EU	60	60
AE160CXYBGK/EU	65	65

• NR Curve

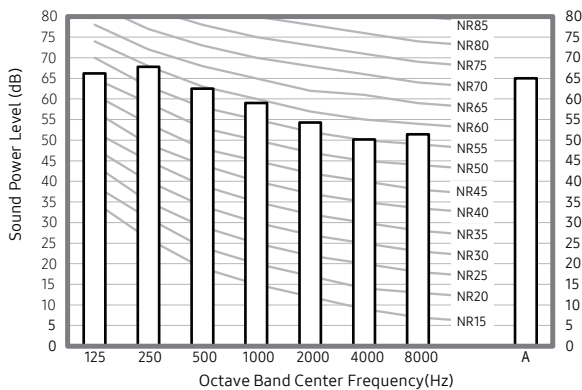
5) AE080CXYBGK/EU



6) AE120CXYBGK/EU



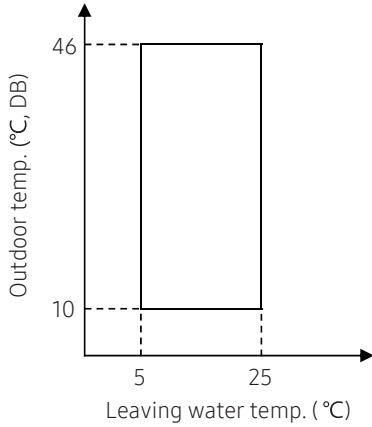
7) AE160CXYBGK/EU



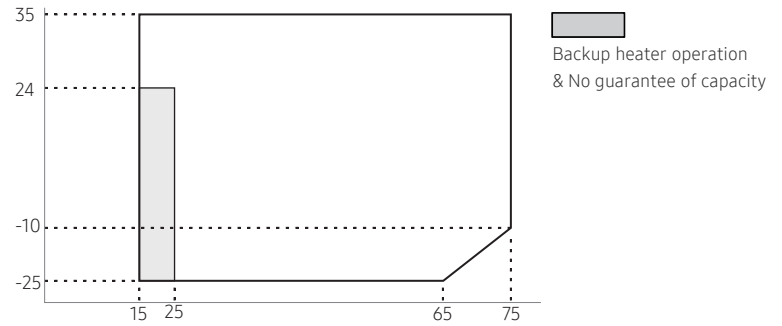
2. Outdoor Units

2-7. Operation range

1) Cooling



2) Heating



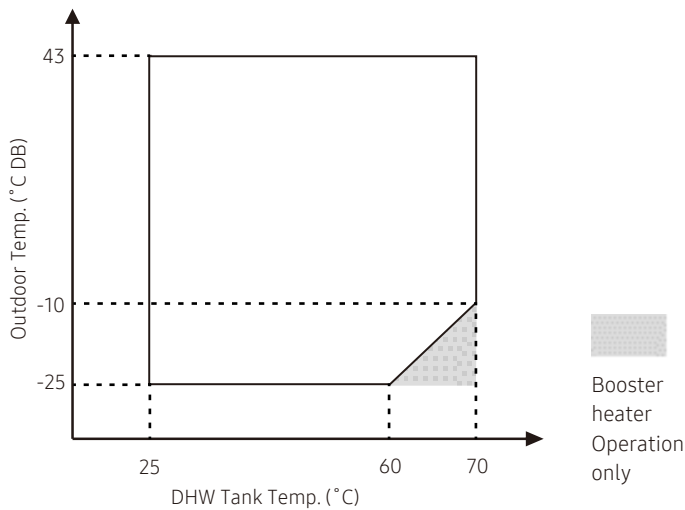
Outdoor Unit		Water Temp. (°C)			Water Flow Rates (LPM)			Air Temp. (°C, DB/WB)		
		Min	Std	Max	Min	Std	Max	Min	Std	Max
Controller	Cooling	5	-	25						
	Heating	15	-	75						
Cooling	Inlet	-	23 (12 ^{*2})	30	7	Δ 5°C	58 (48 ^{*1})	10/-	35/24	46/28
	Outlet	5	18 (7 ^{*2})	25						
Heating	Inlet	5	30 (40 ^{*2})	-				-25/-	7/6	35/24
	Outlet	25 (15 ^{*3})	35 (45 ^{*2})	75						

*1) Model : AE050CXYBEK/EU
AE080CXYB*K/EU

*2) Eurovent Test Condition #2

*3) Back up heater operation.

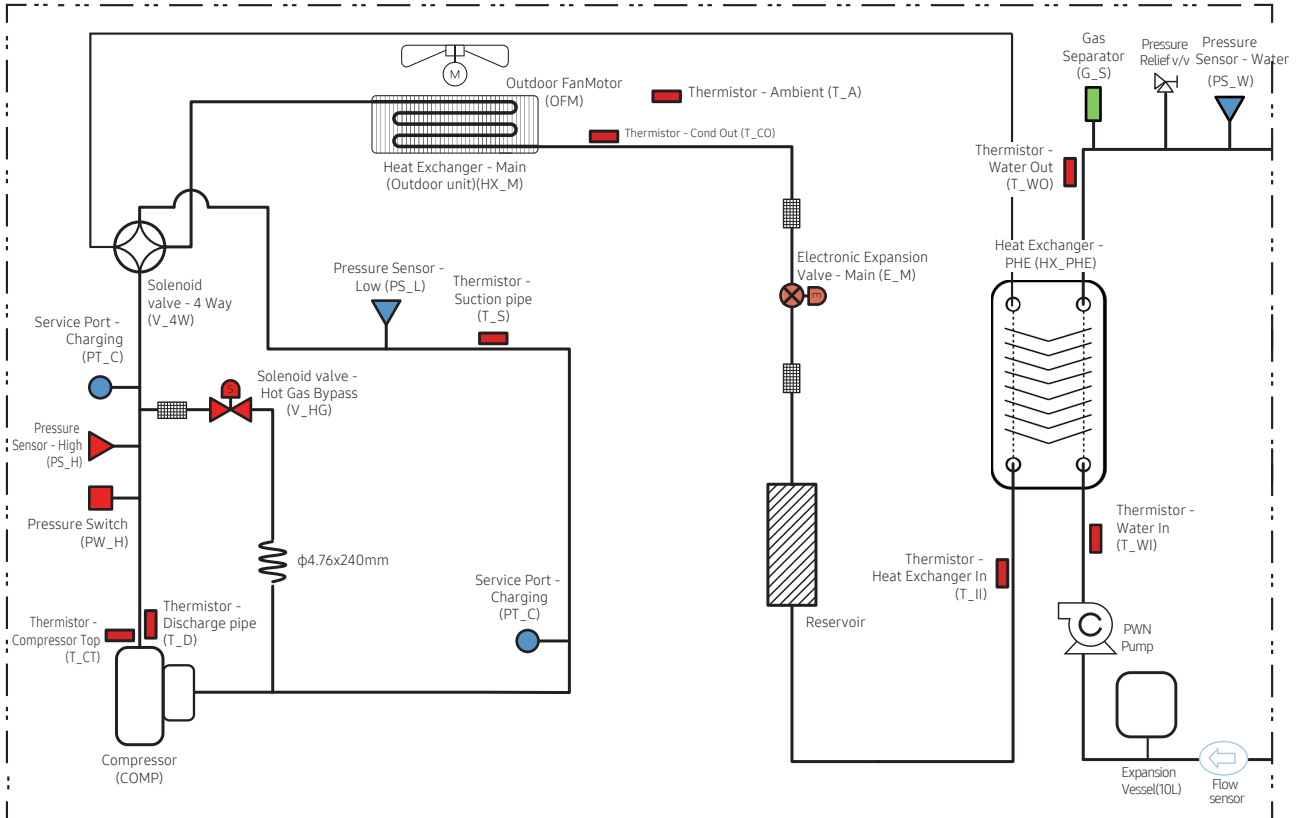
3) DHW (Domestic Hot Water Tank)



2. Outdoor Units

2-8 Piping diagram

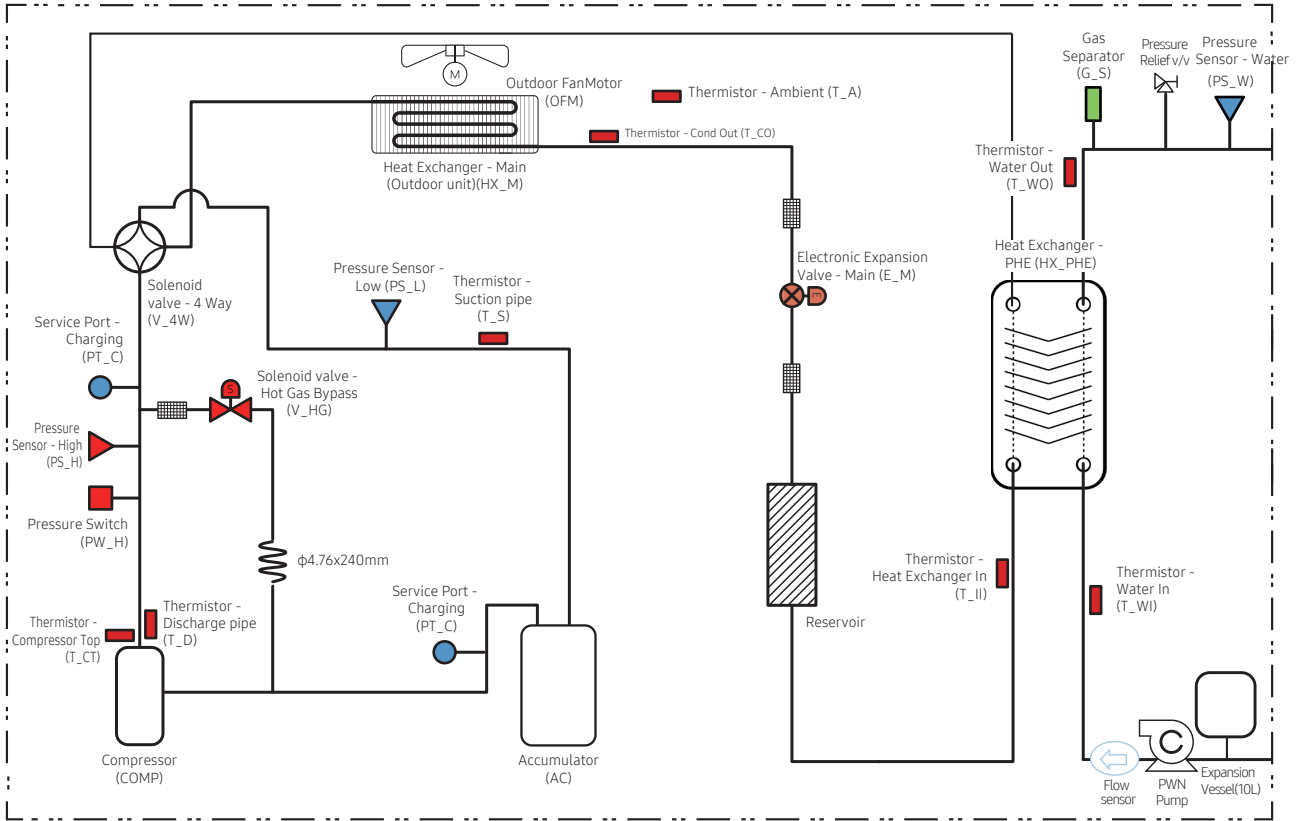
AE050CXYBEK/EU, 080CXYB*K/EU



2. Outdoor Units

2-8 Piping diagram

AE120/160CXIB*K/EU



2. Outdoor Units

2-9. Capacity table

3) Cooling Capacity

LWT (Leaving Water Temp.), Tamb (Ambient Temp.), CC (Cooling Capacity), PI (Power input), WF (Water Flow)

Model	LWT(°C)	7			10			13			15			18			25		
	Tamb(°C)	CC (W)	PI (W)	WF(LPM)	CC (W)	PI (W)	WF(LPM)	CC (W)	PI (W)	WF(LPM)	CC (W)	PI (W)	WF(LPM)	CC (W)	PI (W)	WF(LPM)	CC (W)	PI (W)	WF(LPM)
AE050CXYBEK/EU	10	4,485	670	12.9	4,577	670	13.2	4,959	720	14.3	5,244	730	15.1	5,750	730	16.5	6,327	690	18.2
	20	4,290	790	12.3	4,415	800	12.7	4,785	750	13.8	5,060	780	14.6	5,550	830	16.0	6,105	860	17.6
	30	4,095	1,040	11.8	4,253	1,030	12.2	4,611	1,090	13.3	4,876	1,100	14.0	5,350	1,020	15.4	5,883	1,020	17.0
	35	3,900	1,280	11.2	4,050	1,300	11.6	4,350	1,200	12.5	4,600	1,220	13.2	5,000	1,280	14.4	5,550	1,080	16.0
	46	3,650	1,870	10.5	3,850	1,860	11.1	4,120	1,830	11.8	4,420	1,870	12.7	4,800	1,930	13.8	5,246	1,900	15.1
AE080CXYBEK/EU	10	6,560	990	18.8	7,010	1,030	20.1	7,870	1,140	22.6	8,440	1,170	24.3	9,200	1,160	26.5	10,260	1,120	29.6
	20	6,270	1,150	18.0	6,760	1,220	19.4	7,590	1,220	21.8	8,140	1,250	23.4	8,880	1,320	25.6	9,900	1,390	28.5
	30	5,990	1,520	17.2	6,510	1,580	18.7	7,310	1,730	21.0	7,840	1,780	22.5	8,560	1,640	24.6	9,540	1,650	27.5
	35	5,700	1,900	16.4	6,200	1,990	17.8	6,900	1,900	19.8	7,400	1,970	21.3	8,000	2,050	23.1	9,000	1,750	26.0
	46	5,250	2,690	15.1	5,820	2,810	16.7	6,390	2,840	18.4	6,900	2,920	19.8	7,750	3,110	22.3	8,320	3,020	24.0
AE080CXYBGK/EU	10	6,560	990	18.8	7,010	1,030	20.1	7,870	1,140	22.6	8,440	1,170	24.3	9,200	1,160	26.5	10,260	1,120	29.6
	20	6,270	1,150	18.0	6,760	1,220	19.4	7,590	1,220	21.8	8,140	1,250	23.4	8,880	1,320	25.6	9,900	1,390	28.5
	30	5,990	1,520	17.2	6,510	1,580	18.7	7,310	1,730	21.0	7,840	1,780	22.5	8,560	1,640	24.6	9,540	1,650	27.5
	35	5,700	1,900	16.4	6,200	1,990	17.8	6,900	1,900	19.8	7,400	1,970	21.3	8,000	2,050	23.1	9,000	1,750	26.0
	46	5,250	2,690	15.1	5,820	2,810	16.7	6,390	2,840	18.4	6,900	2,920	19.8	7,750	3,110	22.3	8,320	3,020	24.0
AE120CXYBEK/EU	10	10,350	1,590	29.7	10,740	1,600	30.9	11,630	1,650	33.4	12,430	1,690	35.7	13,800	1,700	39.7	15,050	1,470	43.4
	20	9,900	1,850	28.4	10,360	1,890	29.8	11,220	1,780	32.3	11,990	1,800	34.5	13,320	1,930	38.3	14,520	1,770	41.9
	30	9,450	2,440	27.1	9,980	2,450	28.7	10,810	2,490	31.1	11,550	2,550	33.2	12,840	2,400	37.0	13,990	2,030	40.3
	35	9,000	3,100	25.9	9,500	3,070	27.3	10,200	2,700	29.3	10,900	2,830	31.3	12,000	3,000	34.6	13,200	2,230	38.1
	46	7,500	3,920	21.5	8,150	3,970	23.4	9,050	3,920	26.0	9,650	3,970	27.8	10,050	3,940	28.9	12,200	3,970	35.2
AE120CXYBGK/EU	10	10,350	1,590	29.7	10,740	1,600	30.9	11,630	1,650	33.4	12,430	1,690	35.7	13,800	1,700	39.7	15,050	1,470	43.4
	20	9,900	1,850	28.4	10,360	1,890	29.8	11,220	1,780	32.3	11,990	1,800	34.5	13,320	1,930	38.3	14,520	1,770	41.9
	30	9,450	2,440	27.1	9,980	2,450	28.7	10,810	2,490	31.1	11,550	2,550	33.2	12,840	2,400	37.0	13,990	2,030	40.3
	35	9,000	3,100	25.9	9,500	3,070	27.3	10,200	2,700	29.3	10,900	2,830	31.3	12,000	3,000	34.6	13,200	2,230	38.1
	46	8,550	4,620	24.6	9,030	4,400	25.9	9,690	4,200	27.9	10,360	4,260	29.8	11,400	4,470	32.8	12,540	4,080	36.2
AE160CXYBEK/EU	10	11,960	1,910	34.4	12,430	1,930	35.7	13,510	2,060	38.8	14,480	1,990	41.6	16,100	2,090	46.3	17,670	1,820	50.9
	20	11,440	2,190	32.9	11,990	2,220	34.5	13,040	2,210	37.5	13,970	2,200	40.2	15,540	2,370	44.7	17,050	2,190	49.2
	30	10,920	2,880	31.4	11,550	3,000	33.2	12,560	3,110	36.1	13,460	2,960	38.7	14,980	2,940	43.1	16,430	2,510	47.4
	35	10,400	3,590	29.9	11,000	3,590	31.6	11,850	3,350	34.1	12,700	3,480	36.5	14,000	3,680	40.4	15,500	2,750	44.7
	46	7,520	3,940	21.6	8,170	3,990	23.5	9,080	3,940	26.1	9,680	3,970	27.8	10,100	3,960	29.1	12,270	3,980	35.4
AE160CXYBGK/EU	10	11,960	1,910	34.4	12,430	1,930	35.7	13,510	2,060	38.8	14,480	1,990	41.6	16,100	2,090	46.3	17,670	1,820	50.9
	20	11,440	2,190	32.9	11,990	2,220	34.5	13,040	2,210	37.5	13,970	2,200	40.2	15,540	2,370	44.7	17,050	2,190	49.2
	30	10,920	2,880	31.4	11,550	3,000	33.2	12,560	3,110	36.1	13,460	2,960	38.7	14,980	2,940	43.1	16,430	2,510	47.4
	35	10,400	3,590	29.9	11,000	3,590	31.6	11,850	3,350	34.1	12,700	3,480	36.5	14,000	3,680	40.4	15,500	2,750	44.7
	46	9,880	5,340	28.4	10,450	5,150	30.0	11,260	5,000	32.4	12,070	5,070	34.7	13,300	5,340	38.3	14,730	4,990	42.5

- Heating capacity
 - Capacity is according to EN14511.
 - Valid for heated water range ($\Delta T = \text{Leaving water temperature} - \text{Entering water temperature}$)
 - : If $LWT \leq 50^\circ C, \Delta T = 5^\circ C$ or $50^\circ C < LWT \leq 60^\circ C, \Delta T = 8^\circ C$ or $LWT > 60^\circ C, \Delta T = 10^\circ C$, within the minimum ~ maximum water flow rate.
 - Cooling capacity
 - Capacity is according to EN14511
 - Valid for cooling water range ($\Delta T = \text{Entering water temperature} - \text{Leaving water temperature}$)
 - : $\Delta T = 5^\circ C$, within the minimum ~ maximum water flow rate.
 - Power input : Power input is according to EN1451
 - Peak value : Tested without defrost operation in accordance with EN14511.
- * The real capacity would be changed according to the install environment.

2. Outdoor Units

2-10. Silent mode corrections

Heating

Silent Function	Outdoor Air Temperature(°C DB)			
	-15	2	7	15
Level 1	0.92	0.90	0.95	0.95
Level 2	0.82	0.80	0.86	0.86
Level 3	0.68	0.67	0.72	0.72
Low-noise	0.54	0.60	0.65	0.65

Cooling

Silent Function	Outdoor Air Temperature(°C DB)			
	10	20	35	45
Level 1	1.00	1.00	0.95	0.95
Level 2	0.98	0.98	0.86	0.86
Level 3	0.78	0.78	0.65	0.65
Low-noise	0.70	0.70	0.65	0.65

Correction factor by % glycol

Anti-freeze	Propylene glycol	
	Correction factor	
%wt	Capacity	Power Input
0%	1.000	1.000
10%	0.988	0.994
20%	0.973	0.988
30%	0.955	0.982
40%	0.933	0.976
50%	0.910	0.970

3. Installation

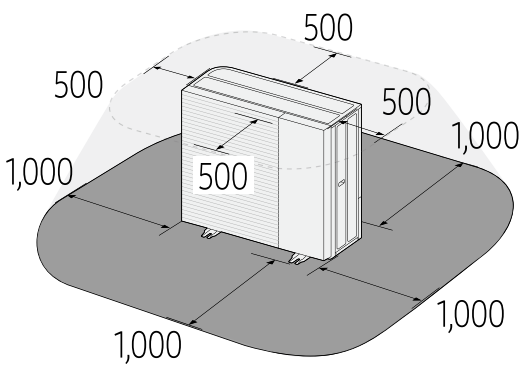
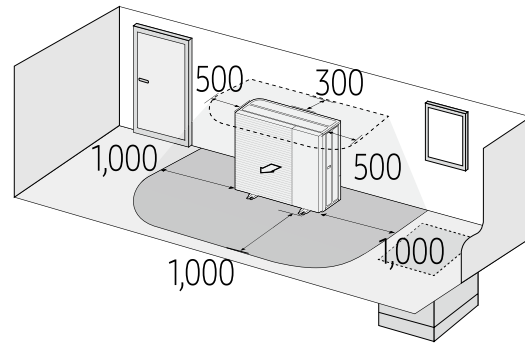
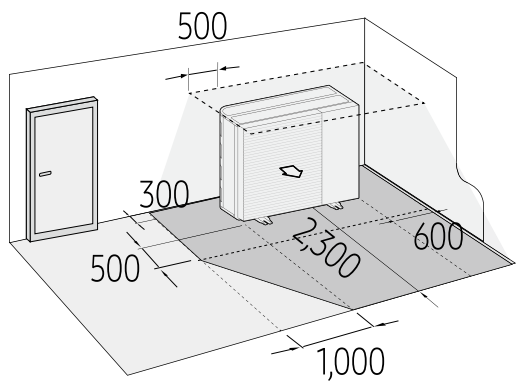
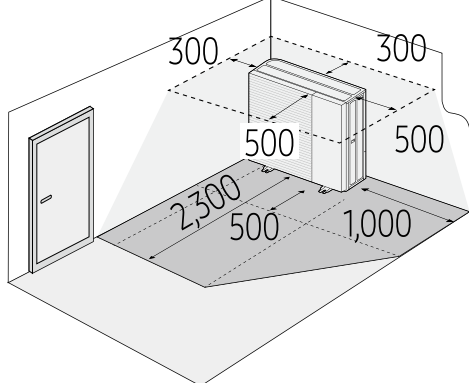
Outdoor unit

Safety Zone

⚠ WARNING

- In case of a leakage the refrigerant must not be able to enter the indoor under any circumstances. The Safety Zone shall not have any building openings such as: Windows, Doors, Light wells, Flat roof windows, Air Inlet / Outlet of ventilation systems, etc.
- R-290 refrigerant is heavier than air and can be collected on the ground. There should be no sinking or deepening of the ground in the safety zone.
- The safety zone should not extend to intact buildings or public spaces.
- The safety zone cannot be modified later to violate the protection rules.

(Unit : mm)

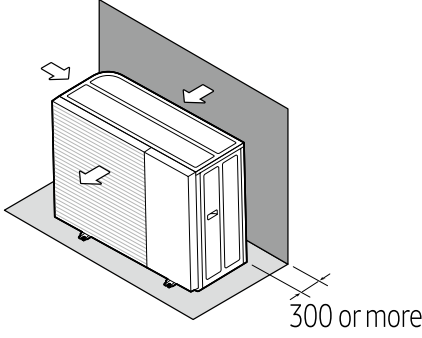
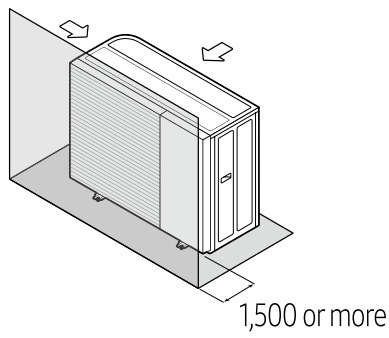
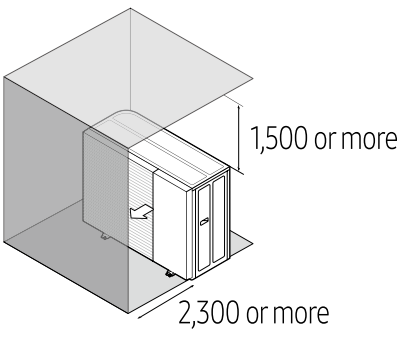
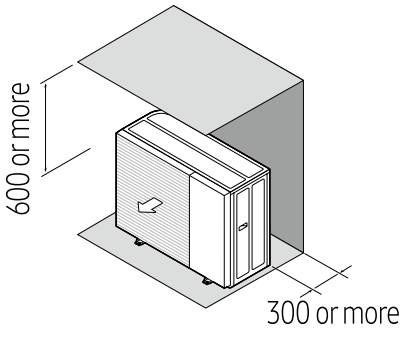
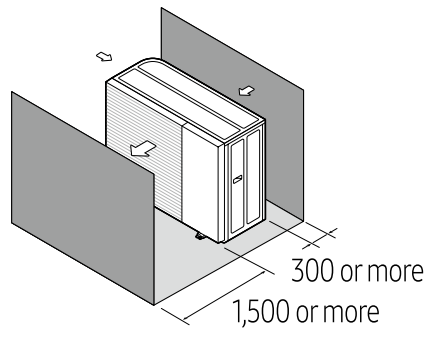
 <ul style="list-style-type: none">• When installed on the ground• When installed in a place with a flat roof	 <ul style="list-style-type: none">• When installed on the ground in front of a building wall
 <ul style="list-style-type: none">• When installed at the right corner of a building	 <ul style="list-style-type: none">• When installed at the Left corner of a building

3. Installation

Outdoor unit

When installing 1 outdoor unit

(Unit : mm)

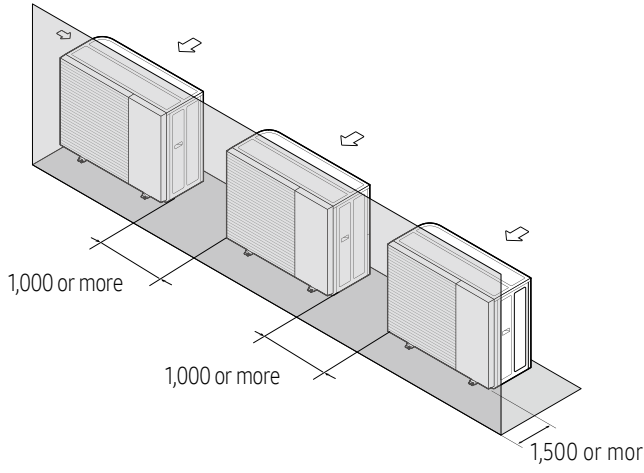
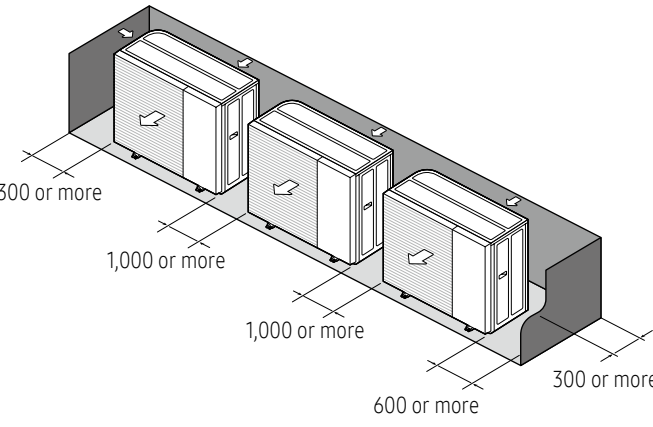
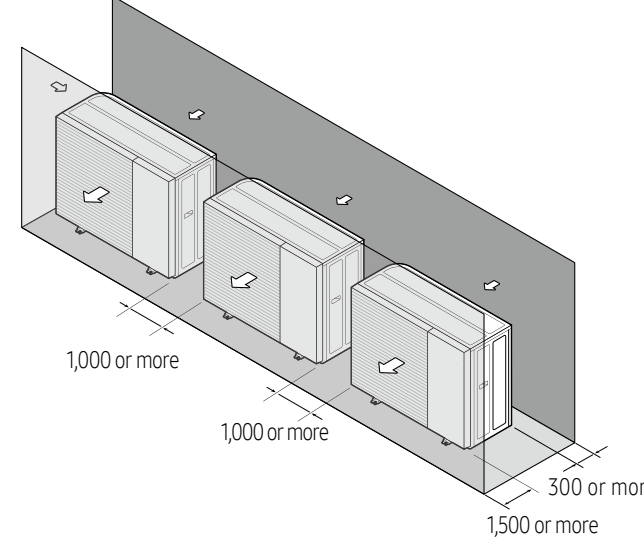
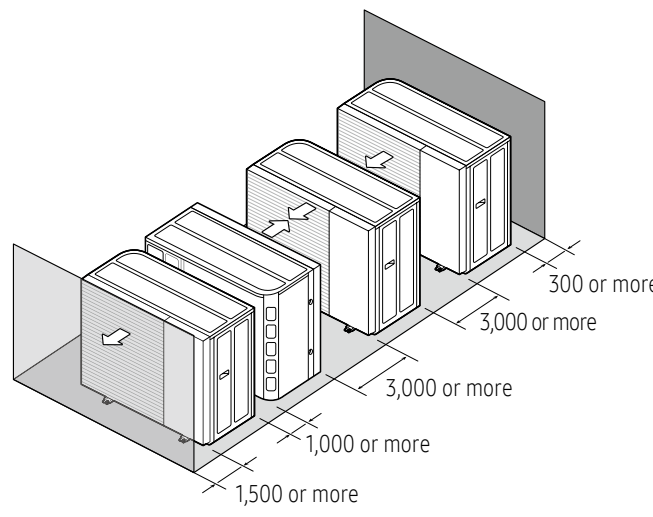
 <ul style="list-style-type: none">• Wall on suction-side	 <ul style="list-style-type: none">• When the air outlet is towards the wall
 <ul style="list-style-type: none">• Top-side obstacle• Discharge-side obstacle• Wall on discharge-side	 <ul style="list-style-type: none">• Top-side obstacle• Wall on suction-side
 <ul style="list-style-type: none">• Suction-side obstacle• Wall on discharge-side	

3. Installation

Outdoor unit

When installing more than 1 outdoor unit

(Unit : mm)

 <ul style="list-style-type: none"> • Wall on discharge-side 	 <ul style="list-style-type: none"> • Suction-side obstacle (3 sides) • No top-side obstacle
 <ul style="list-style-type: none"> • Wall on suction-side • Wall on discharge-side 	 <ul style="list-style-type: none"> • Wall on suction-side • Wall on discharge-side

CAUTION

- The units must be installed according to distances declared, in order to permit accessibility from each side, to guarantee correct operation of maintenance or repairing of the products. The unit's parts must be accessible and serviceable under safe working conditions (for people or things).

3. Installation

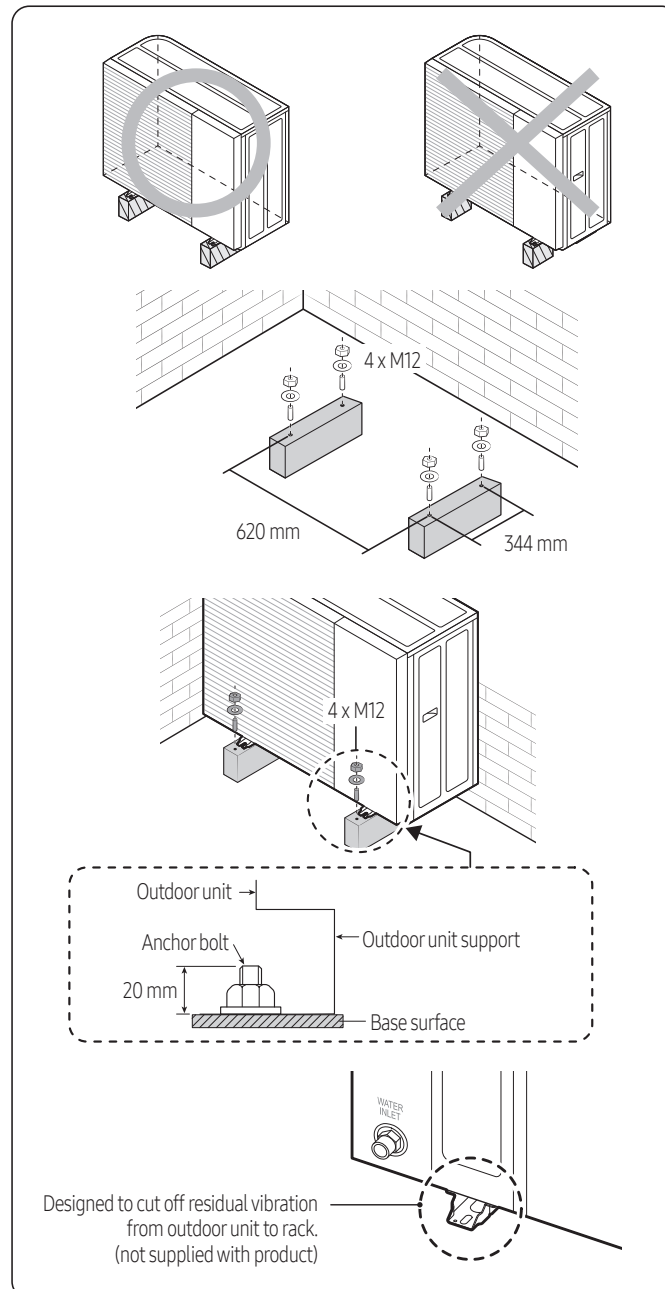
Outdoor unit

Mounting the outdoor unit

The outdoor unit must be installed on a rigid and stable base to avoid any increase in the noise level and vibration, particularly if the outdoor unit is to be installed in a location exposed to strong winds or at a height, the unit must be fixed to an appropriate support (wall or ground).

CAUTION

- When tightening the anchor bolt, tighten the rubber washer to prevent the outdoor unit bolt connection part from corroding.
- Make a drain outlet around the base for outdoor unit drainage.
- If the outdoor unit is installed on the roof, you have to check the ceiling strength and waterproof the unit.
- The anchor bolt must be 20 mm or higher from the base surface.
- ※ In order to prevent freezing of water drains, additional protection such as application of a heating cable may be required.



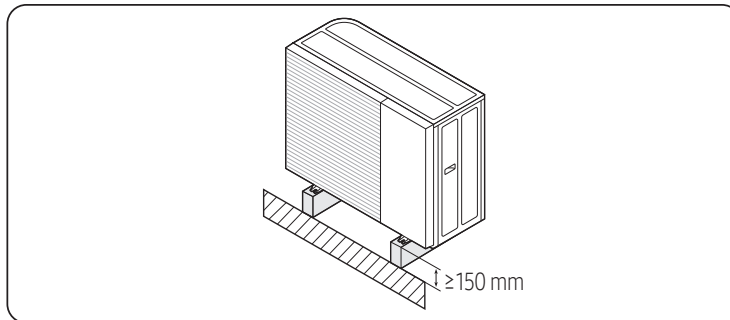
3. Installation

Outdoor unit

General area

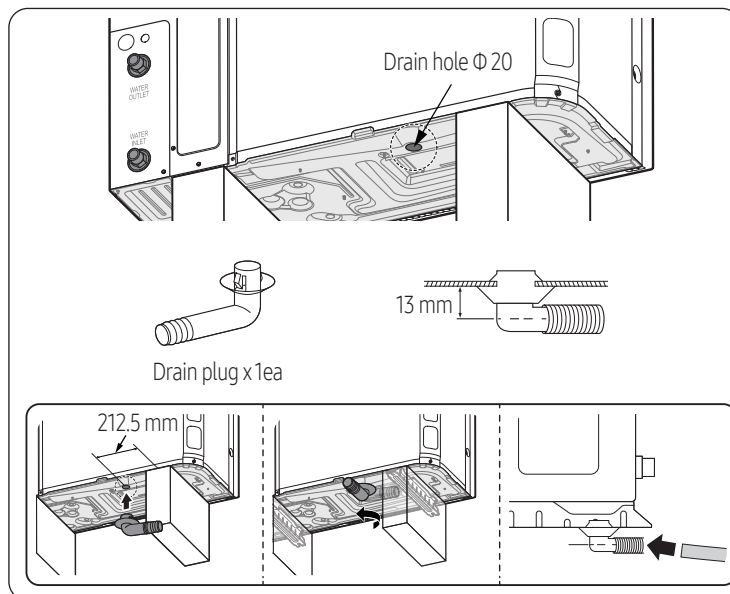
While the air to water heat pump is operating in heating mode, ice can accumulate on the surface of the condenser. To prevent ice from growing, the system occasionally enters a defrost mode and the ice on the surface thaws off. Water dripping from the condenser is guided through the drain holes to prevent ice formation inside the base plate at subzero temperatures.

- In case there is not enough space for natural drainage from the outdoor unit, additional drain work is required. Follow the description as per below:
 - Provide a minimum of 150 mm of free space to the floor.
 - Insert the drain plug into the hole at the bottom of the outdoor unit.
 - Connect the drain hose to the drain plug.
 - Make sure dirt and debris cannot block the drain (hose). Clean the base plate whenever needed.
 - For the remaining holes (that do not have the drain plug), insert the drain cap
 - Make sure that the water dripping from the drain hose runs away correctly and safely.



WARNING

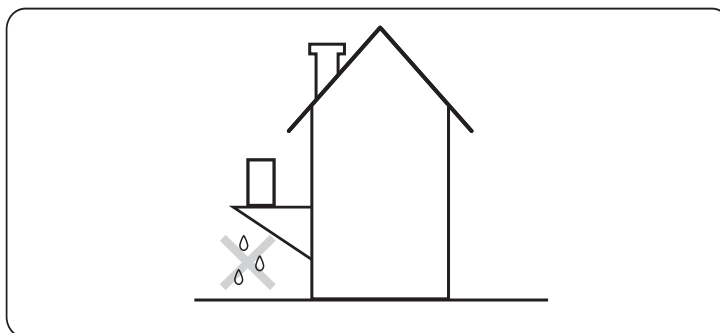
- If the drainage is not adequate, it can lead to stagnant water and ice build-up, causing system performance issues and possible damages.



- 1 Prepare a water drainage channel around the foundation, to drain waste water from around the unit.
- 2 If the water drainage from the unit is inadequate, please raise the unit on construction concrete blocks, etc. (the height of the construction should be at least 150 mm).

3. Installation

Outdoor unit



- 3 If you install the unit on a frame, please install a slanted waterproof plate within 150 mm of the underside of the unit to prevent water from splashing against the bottom plate from below.
 - 4 When installing the unit in a place frequently exposed to snow, pay special attention to elevating the foundation as high as the average snow height plus the additional required 150 mm.
 - 5 If you install the unit on a wall support bracket, please install drainage pipework. In order to avoid the drain water from dripping on the floor potentially creating a slippery surface or an ice layer under freezing conditions.
- ※ Please securely mount the outdoor unit before connecting the water piping.

3. Installation

Outdoor unit

About the piping work

Water connections must be made in accordance with the Water Piping and Wiring diagram delivered with the unit, respecting the water inlet and outlet. If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall so that no dust and dirt enter.
- Use a good thread sealant for the sealing of the connections.
- The sealing must be able to withstand the pressures and temperatures of the system. When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
- Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.

CAUTION

- Be careful not to deform the unit piping by using excessive force when connecting the piping. Deformation of the piping can cause the unit to malfunction.
- Always use two wrenches (spanners) for tightening or loosening the water connections, and tighten connections with a torque wrench as specified in the below table. If not, connections and parts can be damaged and leak.
- The unit is only to be used in a closed water system. If applications are in open water circuit, it will generate heat exchangers fouling, corrosion, and leak.

Name	Tightening torque	
BSPP1	350~380 kgf•cm	34~37 N•m

Connecting the water pipes

Connecting the water piping typically follows the below procedure:

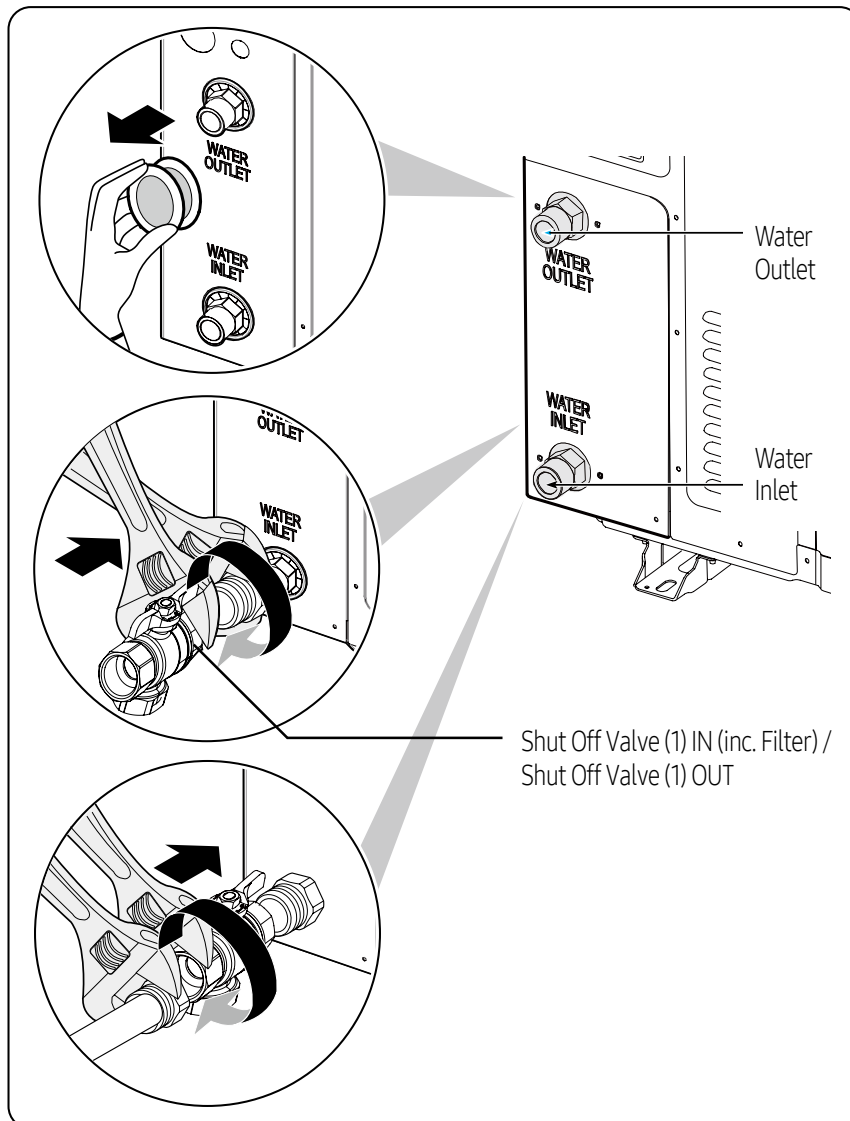
- 1 Connect the water piping to the outdoor unit.
- 2 Connect the water piping to the indoor unit.
- 3 Connect the recirculation piping.
- 4 Connect the drain hose to the drain.
- 5 Fill the water circuit.
- 6 Fill the DHW tank.
- 7 Insulate the water piping.

NOTE

- Do not use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
 - Connect the shut-off valve (with integrated filter) to the outdoor unit water inlet, using the thread sealant. At this time, the filter should be directed downward so that impurities can be collected.
 - Connect the field piping to the shut-off valve.
 - Connect the shut-off valve to the outdoor unit water outlet, using the thread sealant.
-

3. Installation

Outdoor unit

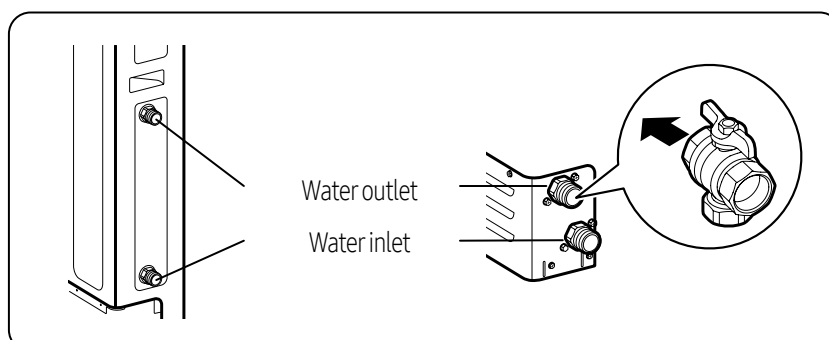


NOTE

- About the shut-off valve with integrated filter:
 - The installation of the shut-off valve at the water inlet is mandatory.
 - Mind the flow direction of the valve.

Water Charging

Fill water into the outdoor unit by opening the shut-off and drain valves.



3. Installation

Outdoor unit

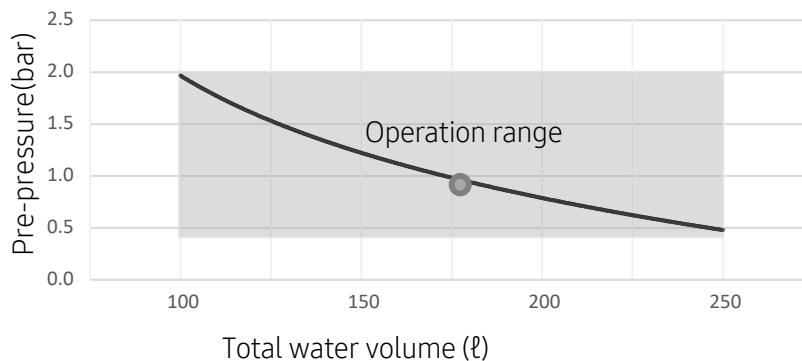
⚠ CAUTION

- The operating range of leaving water temperature is 15~75°C at heating conditions and 5~25°C at cooling conditions.
- The minimum required water flow for operation is 7 liters/min. At all times the required water flow-rates should remain. Otherwise, the unit can stop due to a lack of water.
- Water quality must be according to EN directive 98/83 EC. (Please refer to the reference guide for details.)
- Charge the water higher than pressure of 1.0 bar by using make-up water assembly(Field supply).
(The water pressure indicated on the manometer will vary depending on the water temperature) The nominal water pressure in the system should remain about 1.0 bar at all times to avoid air entering the water system.

Setting capacity and pre-pressure of the expansion vessel

When it is required to change the default pre-pressure of the expansion vessel(1 bar), keep in mind the following guidelines:

- ▶ Use only dry nitrogen to set the expansion vessel prepressure.
- ▶ Inappropriate setting of the expansion vessel prepressure will lead to malfunction of the system. Therefore, the pre-pressure should only be adjusted by a licensed installer.



Installation height difference ^(a)	Water volume	
	<185 Litres	>185 Litres
<7m	No pre-pressure adjustment required.	Actions required: <ul style="list-style-type: none"> • Pre-pressure must be decreased, calculate according to “Calculating the pre-pressure of the expansion vessel”. • Check if the water volume is lower than maximum allowed water volume.
>7m	Actions required: <ul style="list-style-type: none"> • Pre-pressure must be increased, calculate the appropriate value following by “Calculating the pre-pressure of the expansion vessel”. • Check if the water volume is lower than maximum allowed water volume. 	Expansion vessel of the unit too small for the installation.

(a) Installation height difference: height difference(m) between the highest point of the water circuit and the indoor unit. If the unit is located at the highest point of the installation, the installation height is considered 0m.

- When Expansion vessel has a capacity 8 liters and 1bar pre-charged. Water volume of total system for reliable performance is minimum 30 Liter (AE050/080CXYB**), 50 Liter (AE120/160CXYB**).

3. Installation

Outdoor unit

Calculating the pre-pressure of the expansion vessel

- The pre-pressure(P_g) to be set depends on the maximum installation height difference(H) and is calculated as below :
- $$P_g = (H/10 + 0.3) \text{ bar}$$

Protection of the water circuit freezing

To prevent the hydraulic components from freezing, it has a freezing protection function that includes activation of the pump at low temperatures.

However, in case of a power failure, these functions cannot guarantee protection.

To protect the water circuit from freezing, any one of the following acts shall be performed.

- Add glycol to water. Glycol lowers the freezing point of water.
- Install the anti-freeze valve. The anti-freeze valve discharges water from the system before it freezes.

Freeze protection by glycol

Freeze protection solutions must use propylene glycol with a toxicity rating of Class 1 as listed in Clinical Toxicology of Commercial Products, 5th Edition.

WARNING

- Ethylene glycol is toxic and must not be used in the primary water circuit in case of any cross-contamination of the portable circuit.
- If you add glycol to the water, do NOT install anti-freeze valve, to avoid Glycol leaking out of the anti-freeze valves into the environment.
- If an anti-freeze protection is used, it will result in increased pressure drop and it may also cause a slight capacity reduction.

CAUTION

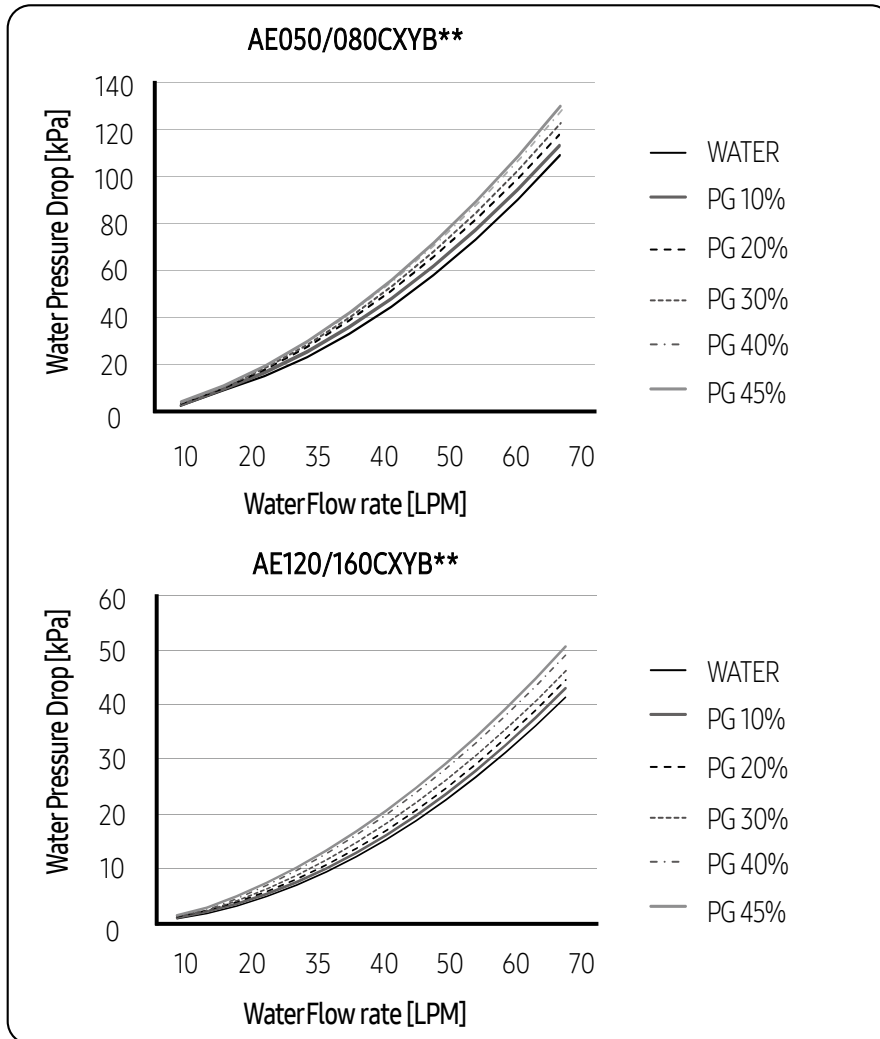
- Due to the presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system.
- A glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols.
- No automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system.
- Galvanized pipes are NOT used in glycol systems since the presence may lead to the precipitation of certain components in the glycol's corrosion inhibitor.

Unit resistance and PHE resistance by glycol concentrate

The unit is composed of water pipes and PHE basically. To ensure correct operation and predict the expected performance, Flow and Resistance table can be used and Flow and resistance characteristic is dependent on Glycol concentration.

3. Installation

Outdoor unit



Changing Glycol concentration can cause the pressure drop of the system and it can lead to make flow rate slow. Just in case of performance degradation, installer shall be careful of flow rate changes.

The required concentration of glycol depends on the lowest expected outdoor temperature, and on whether you want to protect the system from bursting or from freezing. To prevent the system from freezing, more glycol is required. Add glycol according to the table below.

Freezing Points of Propylene Glycol - Water Mixtures		
Percent Propylene Glycol [wt.%]	Freezing Point [°F]	Freezing Point [°C]
0	32	0
10	26	-3
20	20	-7
30	10	-12
36	0	-18
40	-5	-20
43	-10	-23
48	-20	-29

3. Installation

Outdoor unit

Outdoor water piping insulation

The complete water circuit, inclusive all the piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter time. The thickness of the sealing materials must be at least 9 mm with $\lambda=0.035$ W/mK in order to prevent freezing on the outside water piping. If the temperature is higher than 30°C and the humidity is higher than RH 80%, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the sealing.

For piping in free air, it is recommended to use the insulation thickness as shown in the below table as a minimum (with $\lambda=0.035$ W/mK).

Piping length (m)	Minimum insulation thickness (mm)
< 20	19
20 ~ 30	32
30 ~ 40	40
40 ~ 50	50

NOTE

- This recommendation ensures good operation of the unit, however, local regulations may differ and shall be followed.

Minimum active water volume

The minimum active water volume of the system is the amount of water which is always pumped around, even when all valves in the system are closed. The use of a buffer tank can increase the active volume and therefore the operation time between compressor start and stop.

Ideally, systems should be designed for around 12 to 15 minutes of operation, in order to meet with our declared efficiencies. This time frame is based on a maximum of 4 On/Off cycles per hour. The required minimum active water volume can be calculated via the below stated formula:

$$V_{min} = \frac{t_{min} \times \Phi_{min}}{C_{water} \times \Delta T}$$

V_{min} : Minimum active volume

[dm³]

t_{min} : Minimum allowed operation time is 12 min or 720 sec per cycle

[s, sec]

Φ_{min} : Minimum compressor output

[kW = kJ/s]

C_{water} : Specific heat of water (4,2)

[kJ/kg*K]

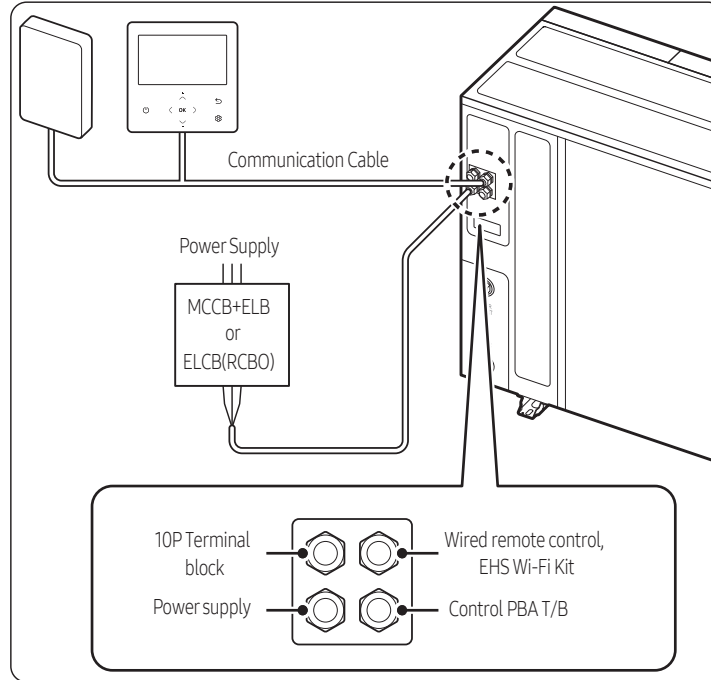
ΔT : Temperature increase (5-10 K)

[K]

3. Installation

Outdoor unit

Electrical wiring diagram



Specification of power cable

- 1 Phase
 - The power cables are not supplied with the air to water heat pump.
 - Power supply cords of parts of appliances for outdoor use shall not be thinner than polychloroprene sheathed flexible cord (Code designation IEC:60245 IEC 57 / CENELEC:H05RN-F)
 - This equipment complies with IEC 61000-3-12.

Outdoor unit	Rated		Voltage Range		MCA	MFA
	Hz	Volts	Min	Max	Min Circuit Amps.	Max Fuse Amps.
AE050CXYBEK	50	220-240	198	264	16.1	17.6
AE080CXYBEK	50	220-240	198	264	26	28.6
AE120CXYBEK	50	220-240	198	264	32	35.2
AE160CXYBEK	50	220-240	198	264	32	35.2

- 3 Phase
 - The power cables are not supplied with the air to water heat pump.
 - Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord (Code designation IEC:60245 IEC 66 / CENELEC:H07RN-F)
 - This equipment complies with IEC 61000-3-12 provided that the short-circuit power (SSC) is greater than or equal to 3.3[MVA] at the interface point between the user's supply and the public system. It is the responsibility of the installer to ensure, by consultation with the energy company if necessary, that the equipment is connected only to a supply with a short-circuit power (SSC) greater than or equal to 3.3[MVA].

Outdoor unit	Rated		Voltage Range		MCA	MFA
	Hz	Volts	Min	Max	Min Circuit Amps.	Max Fuse Amps.
AE080CXYBGK	50	380-415	342	457	16.1	17.7
AE120CXYBGK	50	380-415	342	457	16.1	17.7
AE160CXYBGK	50	380-415	342	457	16.1	17.7

3. Installation

Outdoor unit

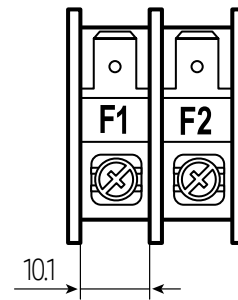
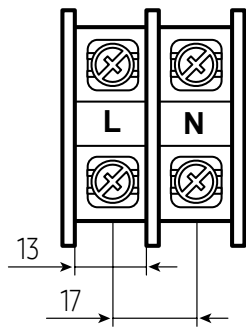
Terminal block specification

- 1 Phase

(Unit: mm)

AC power: M5 screw

Communication: M4 screw

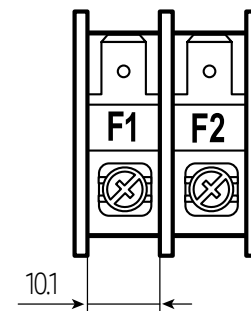
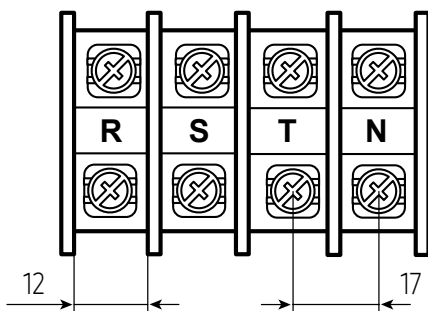


- 3 Phase

(Unit: mm)

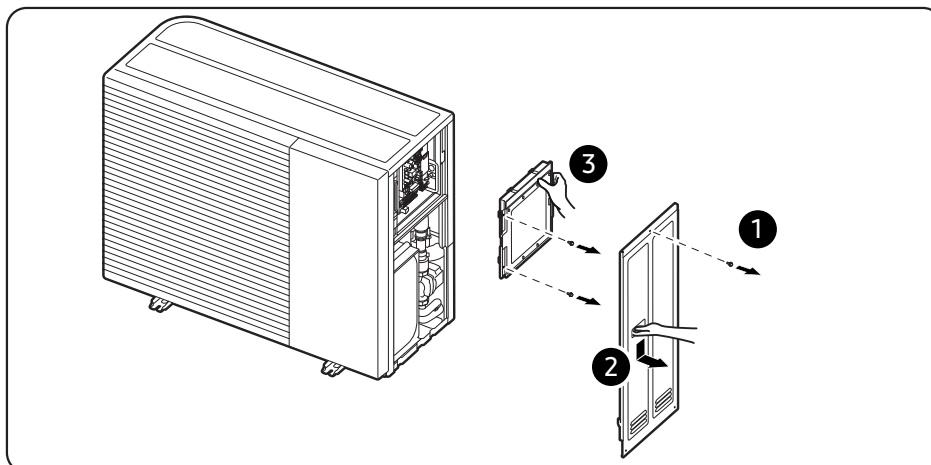
AC power: M5 screw

Communication: M4 screw



Outdoor wiring

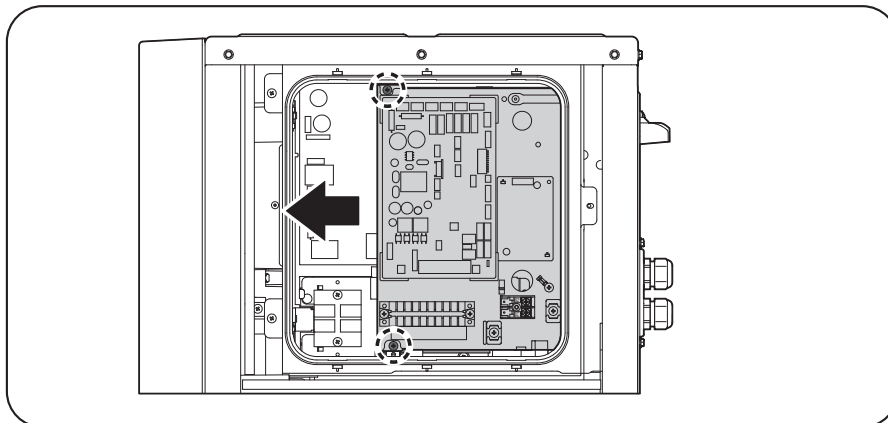
- 1 Open the switch side cover.



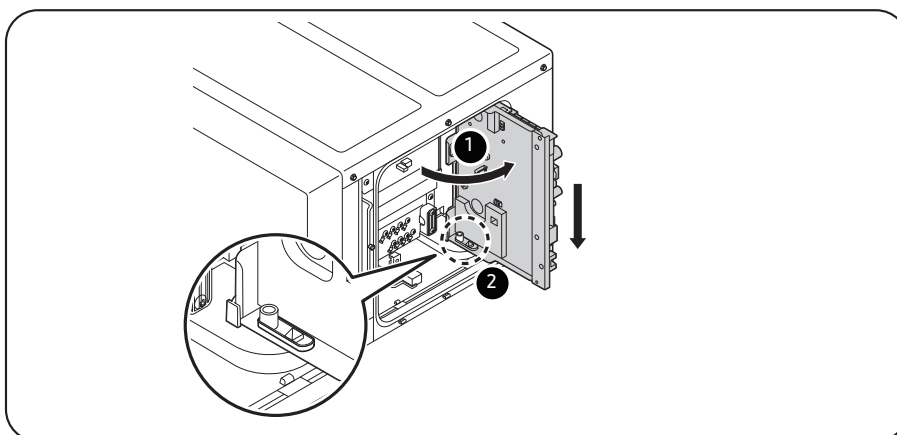
3. Installation

Outdoor unit

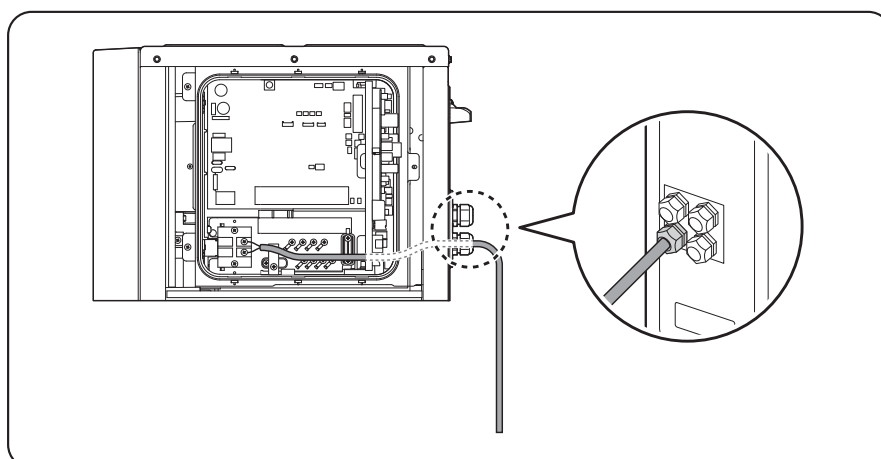
- 2 Remove 2 screws and pull the plate to the left.



- 3 If the plate is rotated to where the hook is, it will be fixed to the hook.



- 4 Insert the cables at the rear of the unit, and route them through the factory mounted cable sleeves into the switch box.

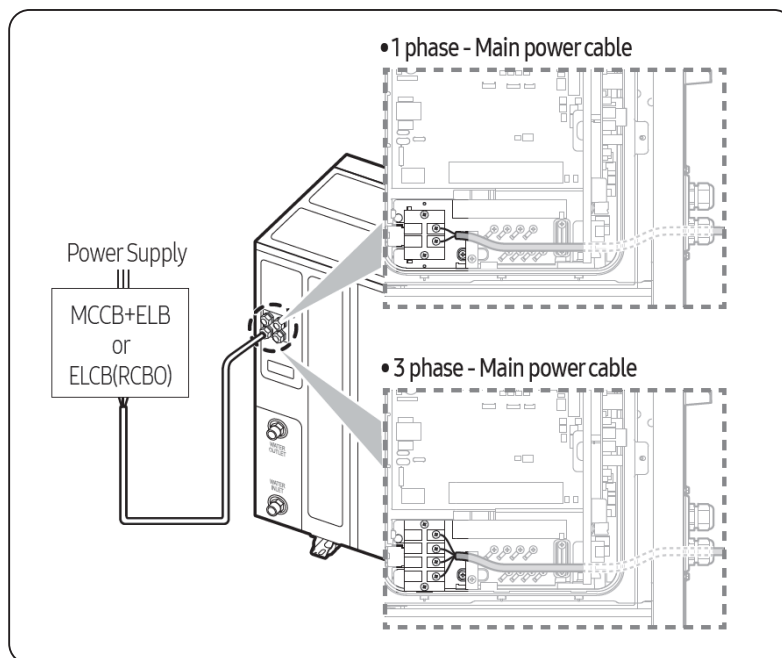


3. Installation

Outdoor unit

Route the cable through the frame

- Connect the wires to the terminal block and fix the cable with the cable tie.



- When installing electrical wiring: tension on the cable(s) must be avoided.
- Earth wire for the outdoor unit cables must be clamped to a suitable ring terminal clamp (not supplied)
- For the power cable, use the grade H07RN-F or H05RN-F materials.
- Power supply cords of parts of appliances for outdoor unit use shall not be thinner than polychloroprene sheathed flexible cord. (Code designation IEC:60245 IEC 57 / CENELEC: H05RN-F or IEC:60245 IEC 66 / CENELEC: H07RN-F)

- Specification of communication cable

Communication cable	Specifications
0.75 mm ² , 2 wires shielded	LiYCY

3. Installation

Outdoor unit

Important information: regulation regarding the refrigerant used

Please fill in the following with indelible ink on the refrigerant charge label supplied with this product and on this manual.

- ① the factory refrigerant charge of the product.
- ② the additional refrigerant amount charged in the field.

Unit	kg	tCO ₂ e
①, a		
②, b	DO NOT CHARGE	

Refrigerant type	GWP value
R-290	3

- GWP: Global Warming Potential
- Calculating tCO₂e: kg x GWP/1000

NOTE

- a Factory refrigerant charge of the product: see unit name plate.
- b Additional refrigerant amount charged in the field.
(Refer to the above information for the quantity of refrigerant replenishment.)

CAUTION

- The filled-out label must be adhered in the proximity of the product charging port.
(ex. onto the inside of the stop valve cover.)



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Samsung Electronics Co., LTD.

Head Office (Suwon Korea) 129, Samsung-Ro, Yeongtong-Gu, Suwon City, Gyeonggi-Do, Korea 16677
Website : www.samsung.com, <https://partnerhub.samsung.com> Email : airconditioner@samsung.com
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