

ACHIEVE YOUR VISION

CHILLER
FAN COIL
ICE THERMAL STORAGE SYSTEM
CHU & AHU
BOILER



AFRA
HVAC SYSTEM



Introduction



Compressor

The combination of COPELAND Semi-Hermetic Scroll type
With highly efficient performance
Anti Vibration Joint
Oil heater System (optional)
Dehumidifier filter dryer with replaceable cartridge for
two circuits units in capacities 40hp and higher
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch

Evaporator

Shell and tube type including steel pipe for shell and
copper tubes with 3/8 inch internal groove and
compressive strength of 300 PSI
Tested in accordance ASME section VIII standard
Special design for low pressure drop and optimized
heat transfer
Water Strainer
Anti Freeze System

Condenser

Our new U and L shaped style that bring more heat
exchange surface compared conventional flat heat
exchanger
Fin and Tube series
Thanks to this technology, the dimensions of the
device have been reduced
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Fan

Axial low noise model
Variable frequency drive for saving energy and
reducing sound level (optional)
Sound reduction diffuser (optional)
EUROVENT trademark with "IP54" grading for
difference models by the default

Electrical and safety equipment

- SIEMENS PLC
- Ability to synchronize with BMS
- Compatible with network connection protocols
- DANFOSS trademark high pressure and low pressure sensor
- Switch cabinet with IP54
- Switch cabinet with SIEMENS trademark;
- Main switching, phase control, Contactor, MSPS
- UPS buffered controller to prevent damage during operating (optional)
- Light and socket in the switch cabinet
- Alarm system for faults

PLC Programming

- Automatic troubleshooting
- Display the performance status of all control parameters
- Display operating hours
- Display number of start times of compressors separately
- Complete observance of the operation schedule of the compressors
- Recording of the latest errors that have occurred

Body

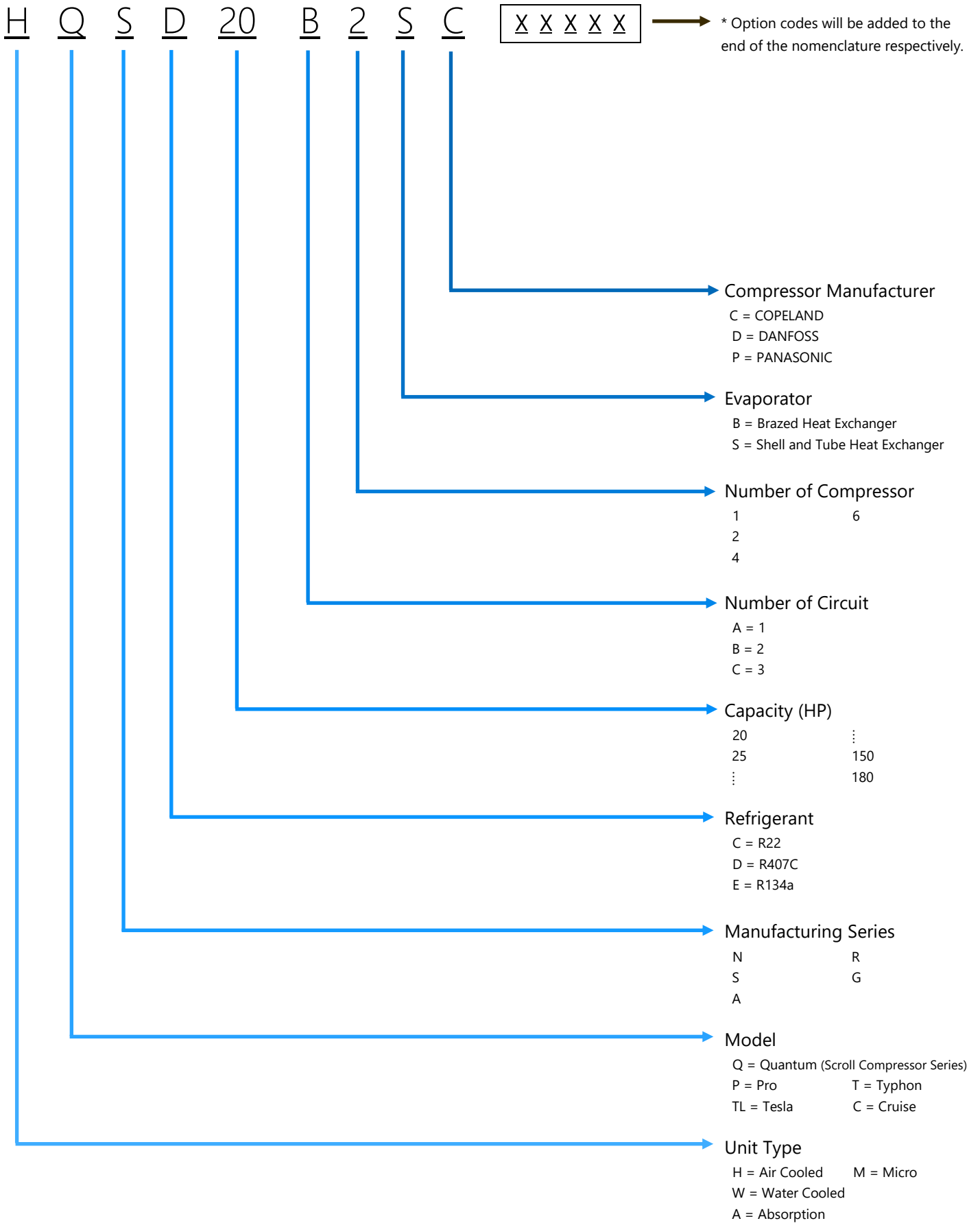
- Galvanized steel sheet with electrostatic paint coating
- Sound insulation for reducing sound level
- Manufactured with NC & CNC machines
- Air arteries on the columns of body to allow more air to pass through the U section of condenser

Liquid Line Equipment

- DANFOSS TEV by the default
- CASTEL trademark solenoid valve and sight glass
- Liquid Receiver with Rotalock valve
- CASTEL trademark filter dryer for dehumidification refrigerant



Nomenclature



Standard Features

- This table contains a complete explanation of each parts used in units.

Item	Description	Product's Brand
Control Panel	<ul style="list-style-type: none"> ▪ Controlling the unit circuit for the required closed loop. ▪ Providing the preview and the configuration of controlling system parameters to the user. ▪ Equipped with the advanced communication interfaces. ▪ Compatible with grid connection protocols. ▪ Displaying errors. 	SIEMENS
Phase Control	<p>Phase sequence and phase loss sensors are designed for the following measures:</p> <ul style="list-style-type: none"> ▪ Protecting three-phase electric motors. ▪ Controlling the phase sequence, zero control in zero-based series, controlling each single phase with adjacent phase, and controlling each phase and zero to provide standard electricity input. ▪ Detecting the defections leading motor damages such as voltage failure in one or more phases or voltage imbalance between them. ▪ Preventing rotation of the motor the wrong way. 	SIEMENS
Terminals	<ul style="list-style-type: none"> ▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance). 	KLEMSAN
Contactora	<ul style="list-style-type: none"> ▪ Connecting and disconnecting the electric current of the circuit. 	SIEMENS
MSPS	<p>Motor Start Protection System to performs an electric motor:</p> <ul style="list-style-type: none"> ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor. 	SIEMENS
Liquid Line	<p>Includes:</p> <ul style="list-style-type: none"> ▪ Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve. 	CASTEL
Sensors	<p>Includes:</p> <ul style="list-style-type: none"> ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor. 	DANFOSS
TEV	<p>Thermal Expansion Valve:</p> <ul style="list-style-type: none"> ▪ Ensuring accurate control of refrigerant injection into the evaporator. 	DANFOSS

- All models are supplied with COPELAND scroll compressor trademark. Contact us for more data about other brands.

Standard Features

Item	Description	Product's Brand
Main Switch	<ul style="list-style-type: none"> ▪ Power Switch (On/Off). ▪ Controlling the input current to the device. 	SIEMENS
Condenser ¹	<ul style="list-style-type: none"> ▪ Fin and tube "U" shaped series with 12FPI number of Fin per Inch including 3/8" copper tube and compressive strength of 450 PSI. 	AFRA
Evaporator ¹	<ul style="list-style-type: none"> ▪ Shell and tube type including steel pipe for shell and copper tubes with 3/8-inch internal groove and compressive strength of 300 PSI. ▪ Equipped with water flow switch, water strainer, Anti Freeze System. ▪ Tested in Accordance "ASME Section VIII" Standard. ▪ IT Trademark Insulator. 	REFKAR
Liquid Receiver	<ul style="list-style-type: none"> ▪ Eliminating gas refrigerant. ▪ Ensuring that pure liquid refrigerant enters the expansion valve. ▪ Equipped with Rotalock Valve for easier operation and maintenance. 	AFRA

1. Powered by UNILAB

- All models are supplied with COPELAND scroll compressor trademark. Contact us for more data about other brands.

Options

- This table includes information of equipment that their installation enhances the unit's efficiency.

Item	Description	Product's Brand
1. Soft Starter	<ul style="list-style-type: none"> ▪ Reducing the mechanical stress and shocks caused by starts and stops to the compressor ▪ Controlling the consuming current of compressors and protecting them from the electrical overload ▪ Having the minimum amount of reactive power ▪ To perform a safe boot, three asynchronous phases are used ▪ Consistently controlling of the compressor voltage source in the operating stage ▪ The compressor is aligned with load behavior to accelerate the mechanical equipment's operation ▪ Increasing the life span 	SIEMENS
2. VFD Controller	<ul style="list-style-type: none"> ▪ Controlling the fan speed. ▪ Reducing the fan sound level. ▪ Balancing the refrigerant pressure in the condenser. ▪ Increasing the compressor's life span. ▪ Preventing the frequent start / stops that damage the equipment. 	SIEMENS
3. Control Panel ¹	<ul style="list-style-type: none"> ▪ Controlling the unit circuit for the required closed loop. ▪ Providing the preview and the configuration of controlling system parameters to the user. ▪ Equipped with the advanced communication interfaces. ▪ Compatible with grid connection protocols. ▪ Displaying errors. 	DANFOSS
4. EEV ¹	<p>Electronic Expansion Valve:</p> <ul style="list-style-type: none"> ▪ Ensuring accurate control of refrigerant injection into the evaporator. 	DANFOSS
5. Oil Heater	<ul style="list-style-type: none"> ▪ Preventing the mix of the refrigerant and the compressor oil. 	-
6. Oil Separator	<ul style="list-style-type: none"> ▪ Preventing the compressor oil discharge. ▪ Returning the oil to the compressor leading an automatic lubrication for the compressor's parts. ▪ Preventing the mix of the oil and the refrigerant which makes acid in the system. ▪ Protecting from corrosion. ▪ Protecting the compressor from damage. 	CASTEL

1. for choosing equipment number 3 or 4, makes it necessary to select these together.

- All models are supplied with SIEMENS control panel trademark and Thermal Expansion Valve type.

- Option codes must be added to the end of the nomenclature and it is mandatory in the registration process.

Options

Item	Description	Product's Brand
7. Accumulator	<ul style="list-style-type: none"> ▪ Preventing the liquid refrigerant to enter the compressor. ▪ Reevaporating of collected refrigerant in Accumulator to enhance the compressor's efficiency. ▪ Protecting the compressor from damage. 	CASTEL
8. Economizer	<ul style="list-style-type: none"> ▪ Increasing the efficiency by creating a sub-circuit. ▪ Improving the system performance. ▪ Energy saving. ▪ Utilizing brazed plate heat exchanger. 	KELVION (Heat Exchanger)
9. Switch Cabinet	<p>A. UPS buffered controller to prevent damage during operating.</p> <p>B. Cooling system specially for switch cabinet.</p>	-
10. Fan ¹	<p>A. ROSENBERG trademark.</p> <p>B. ZIEHL-ABEGG trademark.</p> <p>C. EBMPAPST trademark.</p> <p>D. Sound reduction diffuser. (Executable only for EUROVENT fans)</p>	-

1. All models are supplied with EUROVENT fan trademark.

- Option codes must be added to the end of the nomenclature and it is mandatory in the registration process.



Technical Data

Model No.		HQSD20B2SC	HQSD25B2SC	HQSD30B2SC	
1	Cooling capacity	KW	50.2	61.9	73.2
		RT	14.3	17.6	20.8
	Total input power	KW	19.9	24.4	28.4
	Total rated current	A	37.4	45.8	57.5
	EER	-	2.52	2.54	2.58
2	Cooling capacity	KW	46.7	57.0	67.6
		RT	13.3	16.2	19.2
	Total input power	KW	21.9	27	31.4
	Total rated current	A	40.1	49.1	61.1
	EER	-	2.13	2.11	2.15
ESEER		-	3.10	3.29	3.34
Evaporator	Type	-	Shell and tube		
	Brand	-	REFKAR		
	Water flow rate	gpm	35	43	51
		m ³ /h	8	9.7	11.6
	Water pressure drop	kPa	6.2	12.2	12.3
Max design pressure	Mpa	0.8			
Condenser	Type	-	U shape		
	Brand	-	AFRA GOSTAR		
	Heat exchanger	-	Aluminium fin		
	Number of rows	-	2		3
		Fins per inch	FPI	12	
Fan	Type	-	Axial fan		
	Brand	-	EUROVENT		
	Number	-	2		
	Speed	rpm	900		
	Diameter	mm	800		
	Air flow rate	m ³ /h	22000		
	Discharge	Side/Top	Top		
Compressor	Type	-	Semi-Hermetic Scroll		
	Brand	-	COPELAND		
	Model	-	ZR125KCE-TFD	ZR160KCE-TFD	ZR190KCE-TFD
	Combination	Pieces	2		
	Oil type	-	POE RL32-3MAF		
	Oil charge amount	L	3.25	3.37	3.38
	Oil heater	-	• (Optional)		
Refrigerant	Type	-	R407C		
Ambient temp. range	°C	21 ~ 46			
Command control system	Type	-	Siemens PLC		
Sound pressure level	dB(A)	~ 77			
Power supply	∅, V, Hz	3, 400, 50			
Dimension	WxHxD	1960x2580x1046			
Net weight	kg	~ 800			

1 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 35 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

2 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 40 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

- Evaporating SST : 2 °C
 - Water side fouling factor : 0.000043 m² . °C / KW
 - ESEER calculations is based on European standard.
 - Measuring sound pressure level at 3m away and ±3dB tolerance.
 - The characteristics of water flow rate and water pressure drop are given based on case "1".

Model No.			HQSD40B4SC	HQSD50B4SC	HQSD60B4SC
1	Cooling capacity	KW	100.4	123.9	146.3
		RT	28.5	35.2	41.6
	Total input power	KW	39.8	48.8	56.8
	Total rated current	A	74.8	91.7	115.1
	EER	-	2.52	2.54	2.58
2	Cooling capacity	KW	93.4	114.0	135.3
		RT	26.6	32.4	38.5
	Total input power	KW	43.8	54	62.8
	Total rated current	A	80.2	98.3	122.2
	EER	-	2.13	2.11	2.15
ESEER		-	3.10	3.29	3.34
Evaporator	Type	-	Shell and tube		
	Brand	-	REFKAR		
	Water flow rate	gpm	70	86	101
		m ³ /h	15.9	19.5	22.9
	Water pressure drop	kPa	7.5	11.6	15.8
Max design pressure	Mpa	0.8			
Condenser	Type	-	U shape		
	Brand	-	AFRA GOSTAR		
	Heat exchanger	-	Aluminium fin		
	Number of rows	-	2		3
	Fins per inch	FPI	12		
Fan	Type	-	Axial fan		
	Brand	-	EUROVENT		
	Number	-	4		
	Speed	rpm	900		
	Diameter	mm	800		
	Air flow rate	m ³ /h	22000		
	Discharge	Side/Top	Top		
Compressor	Type	-	Semi-Hermetic Scroll		
	Brand	-	COPELAND		
	Model	-	ZR125KCE-TFD	ZR160KCE-TFD	ZR190KCE-TFD
	Combination	Pieces	4		
	Oil type	-	POE RL32-3MAF		
	Oil charge amount	L	3.25	3.37	3.38
	Oil heater	-	● (Optional)		
Refrigerant	Type	-	R407C		
Ambient temp. range	°C	21 ~ 46			
Command control system	Type	-	Siemens PLC		
Sound pressure level	dB(A)	~ 78			
Power supply	∅ , V , Hz	3 , 400 , 50			
Dimension	WxHxD	2062x2580x2090			
Net weight	kg	~ 1500			

1 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 35 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

2 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 40 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

- Evaporating SST : 2 °C
 - Water side fouling factor : 0.000043 m² . °C / KW
 - ESEER calculations is based on European standard.
 - Measuring sound pressure level at 3m away and ±3dB tolerance.
 - The characteristics of water flow rate and water pressure drop are given based on case "1".

Model No.		HQSD80C6SC	HQSD95C6SC	HQSD100B4SC	
1	Cooling capacity	KW	185.8	219.5	242.4
		RT	52.8	62.4	68.9
	Total input power	KW	73.2	85.2	95.6
	Total rated current	A	137.5	172.6	171.2
	EER	-	2.54	2.58	2.54
2	Cooling capacity	KW	170.9	202.9	223.9
		RT	48.6	57.7	63.7
	Total input power	KW	81	94.2	105.6
	Total rated current	A	147.4	183.2	184.1
	EER	-	2.11	2.15	2.12
	ESEER	-	3.29	3.34	3.65
Evaporator	Type	-	Shell and tube		
	Brand	-	REFKAR		
	Water flow rate	gpm	129	152	167
		m ³ /h	29.3	34.5	37.9
	Water pressure drop	kPa	34.7	55.61	38
Max design pressure	Mpa	0.8			
Condenser	Type	-	U shape		
	Brand	-	AFRA GOSTAR		
	Heat exchanger	-	Aluminium fin		
	Number of rows	-	2	3	2
	Fins per inch	FPI	12		
Fan	Type	-	Axial fan		
	Brand	-	EUROVENT		
	Number	-	6		8
	Speed	rpm	900		
	Diameter	mm	800		
	Air flow rate	m ³ /h	22000		
	Discharge	Side/Top	Top		
Compressor	Type	-	Semi-Hermetic Scroll		
	Brand	-	COPELAND		
	Model	-	ZR160KCE-TFD	ZR190KCE-TFD	ZR310KCE-TWD
	Combination	Pieces	6		4
	Oil type	-	POE RL32-3MAF		
	Oil charge amount	L	3.37	3.38	6.8
	Oil heater	-	● (Optional)		
Refrigerant	Type	-	R407C		
Ambient temp. range	°C	21 ~ 46			
Command control system	Type	-	Siemens PLC		
Sound pressure level	dB(A)	~ 81		~ 84	
Power supply	∅, V, Hz	3, 400, 50			
Dimension	WxHxD	2062x2580x3134		2062x2580x4176	
Net weight	kg	~ 3000			

1 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 35 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

2 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 40 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

- Evaporating SST : 2 °C
 - Water side fouling factor : 0.000043 m² . °C / KW
 - ESEER calculations is based on European standard.
 - Measuring sound pressure level at 3m away and ±3dB tolerance.
 - The characteristics of water flow rate and water pressure drop are given based on case "1".

Model No.		HQSD120B4SC	HQSD150C6SC	HQSD180C6SC	
1	Cooling capacity	KW	298.4	363.6	447.6
		RT	84.8	103.4	127.3
	Total input power	KW	112.8	143.4	169.2
	Total rated current	A	201.2	256.8	301.8
	EER	-	2.65	2.54	2.65
2	Cooling capacity	KW	274.9	335.8	412.3
		RT	78.2	95.5	117.2
	Total input power	KW	124.4	158.4	186.6
	Total rated current	A	217.8	276.2	326.6
	EER	-	2.21	2.12	2.21
ESEER		-	3.79	3.65	3.79
Evaporator	Type	-	Shell and tube		
	Brand	-	REFKAR		
	Water flow rate	gpm	206	251	309
		m ³ /h	46.8	57	70.2
	Water pressure drop	kPa	68.3	52.1	66.6
	Max design pressure	Mpa	0.8		
Condenser	Type	-	U shape		
	Brand	-	AFRA GOSTAR		
	Heat exchanger	-	Aluminium fin		
	Number of rows	-	3	2	3
	Fins per inch	FPI	12		
Fan	Type	-	Axial fan		
	Brand	-	EUROVENT		
	Number	-	8	12	
	Speed	rpm	900		
	Diameter	mm	800		
	Air flow rate	m ³ /h	22000		
	Discharge	Side/Top	Top		
Compressor	Type	-	Semi-Hermetic Scroll		
	Brand	-	COPELAND		
	Model	-	ZR380KCE-TWD	ZR310KCE-TWD	ZR380KCE-TWD
	Combination	Pieces	4	6	
	Oil type	-	POE RL32-3MAF		
	Oil charge amount	L	6.3	6.8	6.3
	Oil heater	-	• (Optional)		
Refrigerant	Type	-	R407C		
Ambient temp. range	°C	21 ~ 46			
Command control system	Type	-	Siemens PLC		
Sound pressure level	dB(A)	~ 88			
Power supply	∅, V, Hz	3, 400, 50			
Dimension	WxHxD	mm	2062x2580x4176	2062x2580x6260	
Net weight	kg	~ 3000	~ 3500		

1 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 35 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

2 : Chilled water inlet / outlet : 12 °C / 7 °C
 Outdoor ambient temp. : 40 °C DB
 Sea level : 4000 ft
 Fan input power included
 Pump input power not included

- Evaporating SST : 2 °C
 - Water side fouling factor : 0.000043 m² . °C / KW
 - ESEER calculations is based on European standard.
 - Measuring sound pressure level at 3m away and ±3dB tolerance.
 - The characteristics of water flow rate and water pressure drop are given based on case "1".



Performance Data

Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HQSD20B2SC	30	53.5	18.1	35.2	2.95
	35	50.2	19.9	37.4	2.52
	37	48.9	20.7	38.4	2.36
	40	46.7	21.9	40.1	2.13
	42	45.2	22.8	41.3	1.98
	46	42.1	24.7	43.9	1.70
HQSD25B2SC	30	66.9	22.2	43.1	3.01
	35	61.9	24.4	45.8	2.54
	37	60.1	25.4	47.1	2.37
	40	57.0	27.0	49.1	2.11
	42	55.0	28.1	50.6	1.96
	46	50.7	30.5	53.9	1.66
HQSD30B2SC	30	78.3	25.8	54.6	3.03
	35	73.2	28.4	57.5	2.58
	37	71.1	29.6	58.9	2.40
	40	67.6	31.4	61.1	2.15
	42	65.4	32.7	62.6	2.00
	46	60.5	35.5	66.1	1.70
HQSD40B4SC	30	107.0	36.3	70.4	2.95
	35	100.4	39.8	74.8	2.52
	37	97.8	41.4	76.8	2.36
	40	93.4	43.8	80.2	2.13
	42	90.4	45.6	82.6	1.98
	46	84.2	49.4	87.8	1.70
HQSD50B4SC	30	133.8	44.5	86.2	3.01
	35	123.9	48.8	91.7	2.54
	37	120.2	50.8	94.2	2.37
	40	114.0	54.0	98.3	2.11
	42	109.9	56.2	101.2	1.96
	46	101.5	61.0	107.9	1.66
HQSD60B4SC	30	156.6	51.6	109.2	3.03
	35	146.3	56.8	115.1	2.58
	37	142.3	59.2	117.8	2.40
	40	135.3	62.8	122.2	2.15
	42	130.9	65.4	125.3	2.00
	46	120.9	71.0	132.2	1.70

- Chilled water inlet / outlet : 12 °C / 7 °C

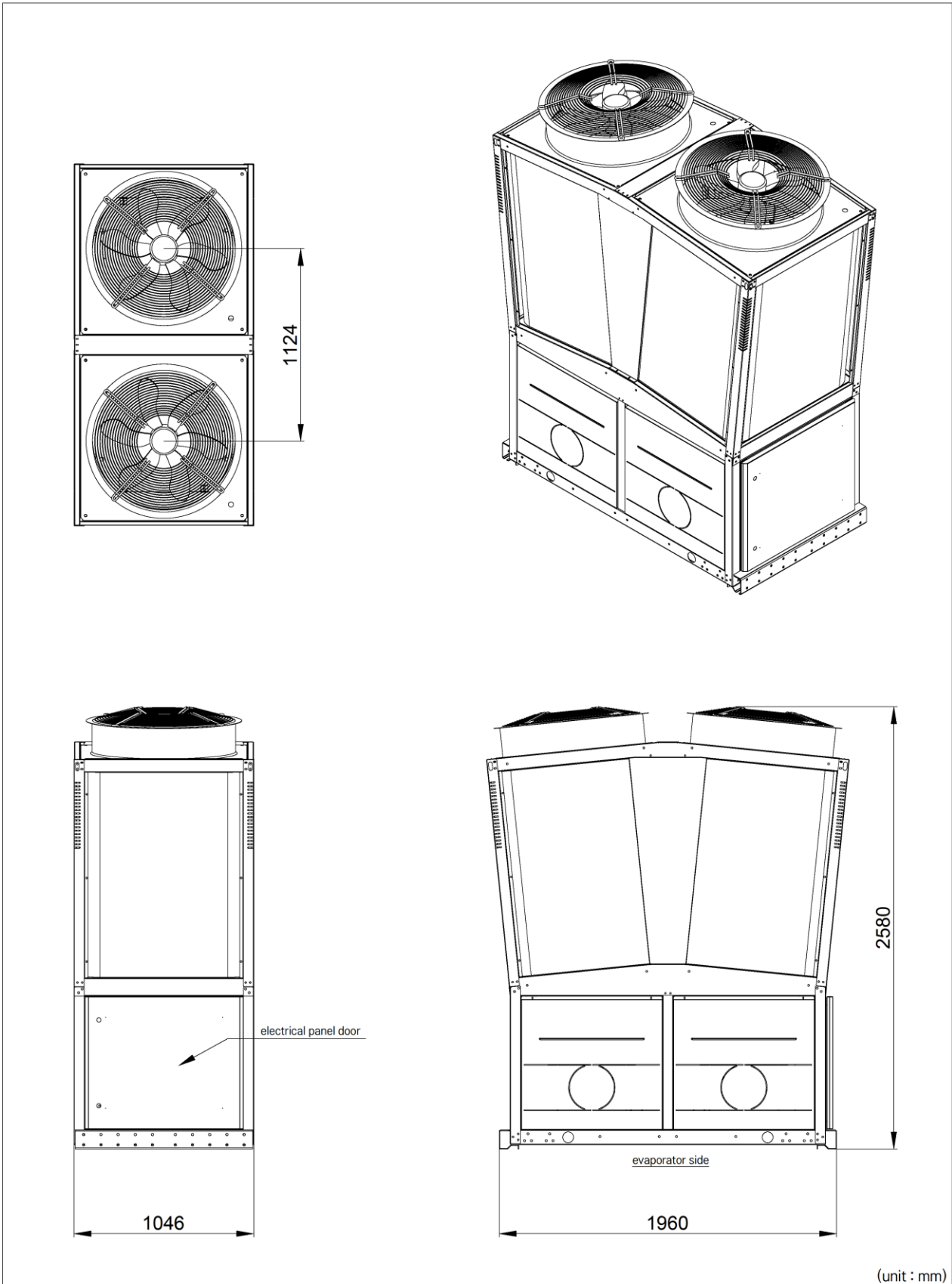
Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HQSD80C6SC	30	200.7	66.7	129.2	3.01
	35	185.8	73.2	137.5	2.54
	37	180.3	76.2	141.2	2.37
	40	170.9	81.0	147.4	2.11
	42	164.9	84.3	151.9	1.96
	46	152.2	91.5	161.8	1.66
HQSD95C6SC	30	234.9	77.4	163.8	3.03
	35	219.5	85.2	172.6	2.58
	37	213.4	88.8	176.7	2.40
	40	202.9	94.2	183.2	2.15
	42	196.3	98.1	187.9	2.00
	46	181.4	106.5	198.2	1.70
HQSD100B4SC	30	260.2	87.2	160.7	2.98
	35	242.4	95.6	171.2	2.54
	37	235.2	99.6	176.1	2.36
	40	223.9	105.6	184.1	2.12
	42	216.3	110.0	189.9	1.97
	46	201.2	119.6	202.9	1.68
HQSD120B4SC	30	319.0	102.4	186.9	3.12
	35	298.4	112.8	201.2	2.65
	37	286.5	117.2	207.6	2.44
	40	274.9	124.4	217.8	2.21
	42	265.4	129.6	225.2	2.05
	46	244.6	140.8	241.6	1.74
HQSD150C6SC	30	390.3	130.8	241.1	2.98
	35	363.6	143.4	256.8	2.54
	37	352.8	149.4	264.2	2.36
	40	335.8	158.4	276.2	2.12
	42	324.4	165.0	284.9	1.97
	46	301.8	179.4	304.4	1.68
HQSD180C6SC	30	478.6	153.6	280.4	3.12
	35	447.6	169.2	301.8	2.65
	37	429.7	175.8	311.4	2.44
	40	412.3	186.6	326.6	2.21
	42	398.0	194.4	337.8	2.05
	46	366.9	211.2	362.4	1.74

- Chilled water inlet / outlet : 12 °C / 7 °C

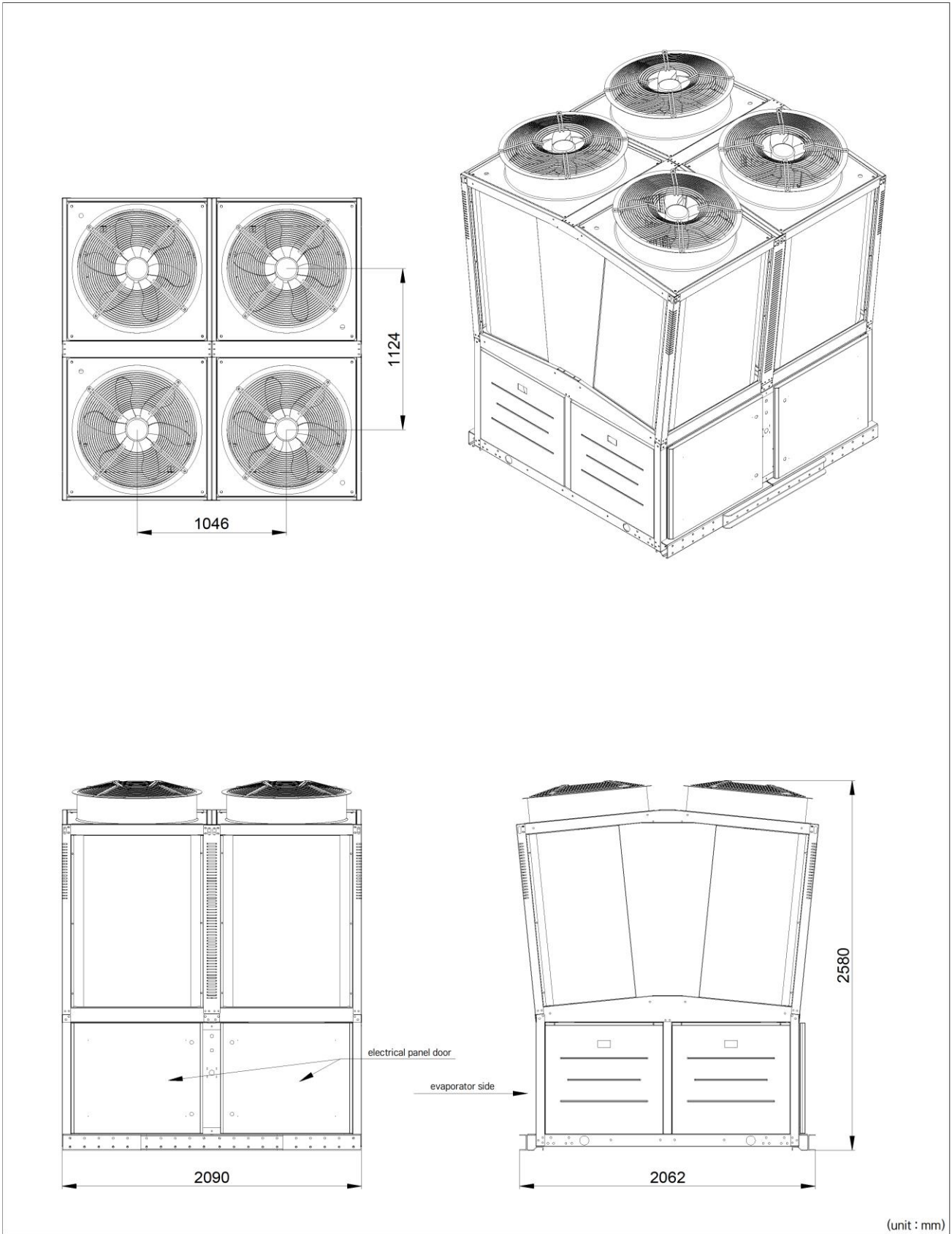


Dimensions

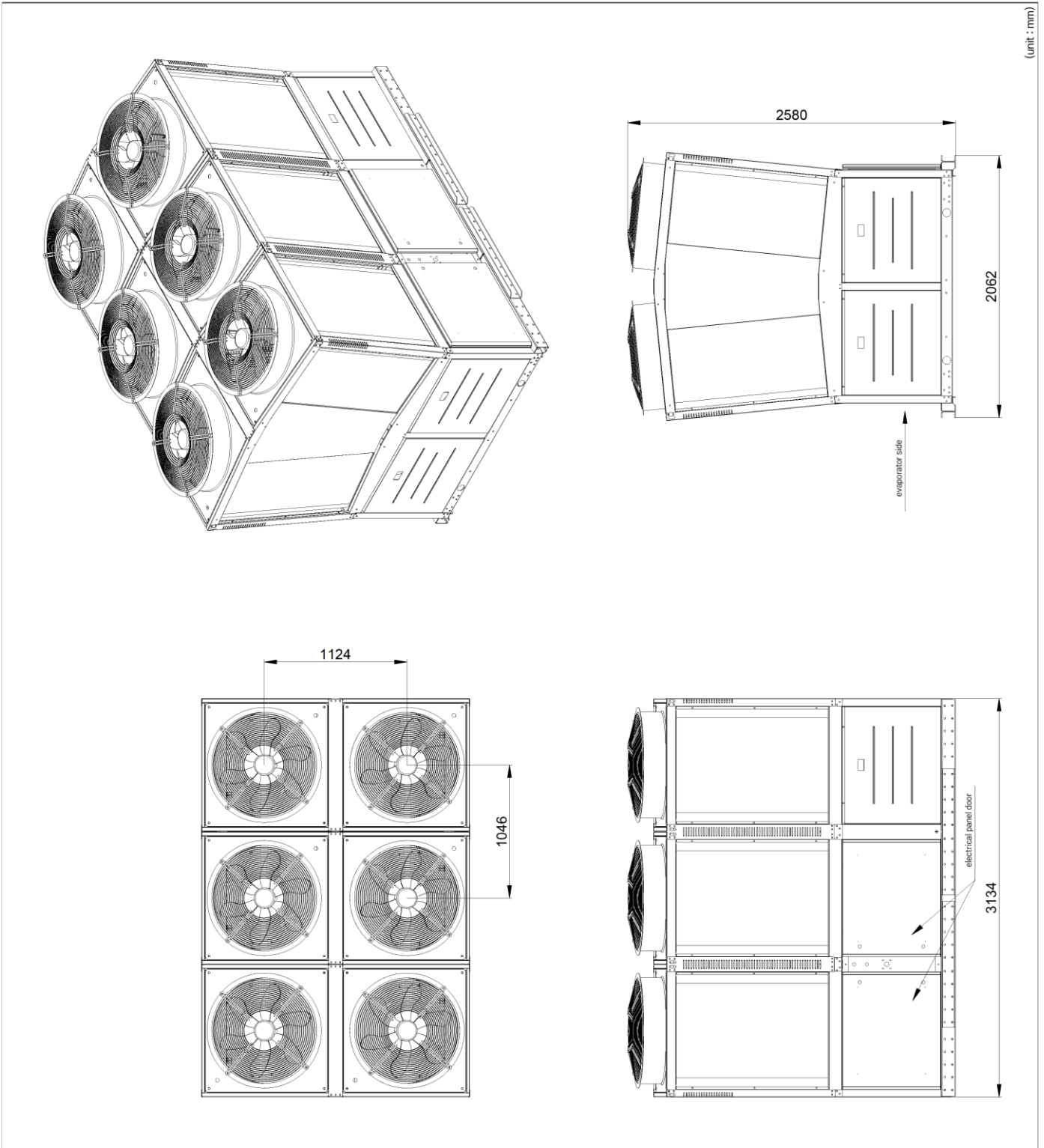
HQSD20B2SC - HQSD25B2SC - HQSD30B2SC



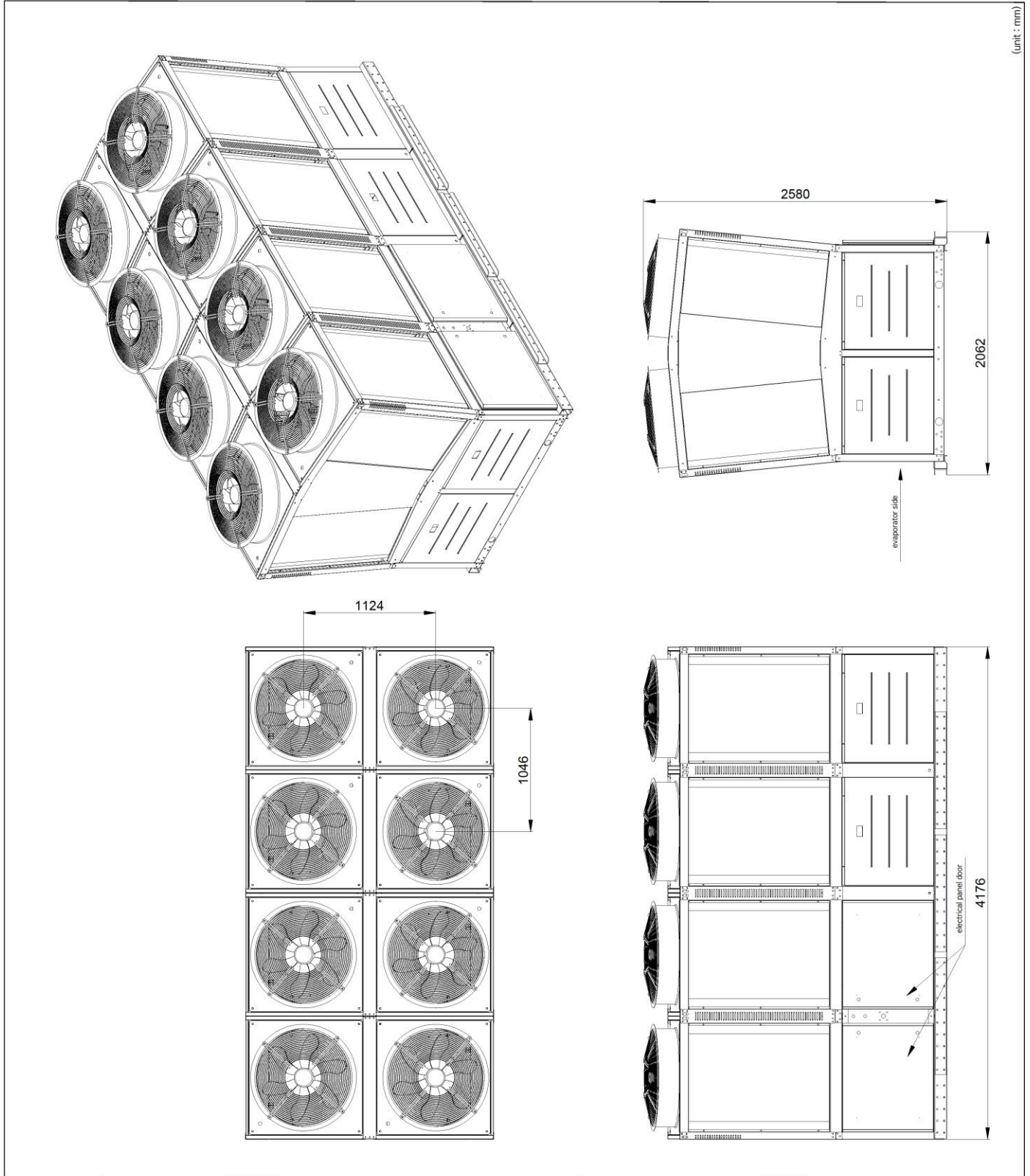
HQSD40B4SC - HQSD50B4SC - HQSD60B4SC

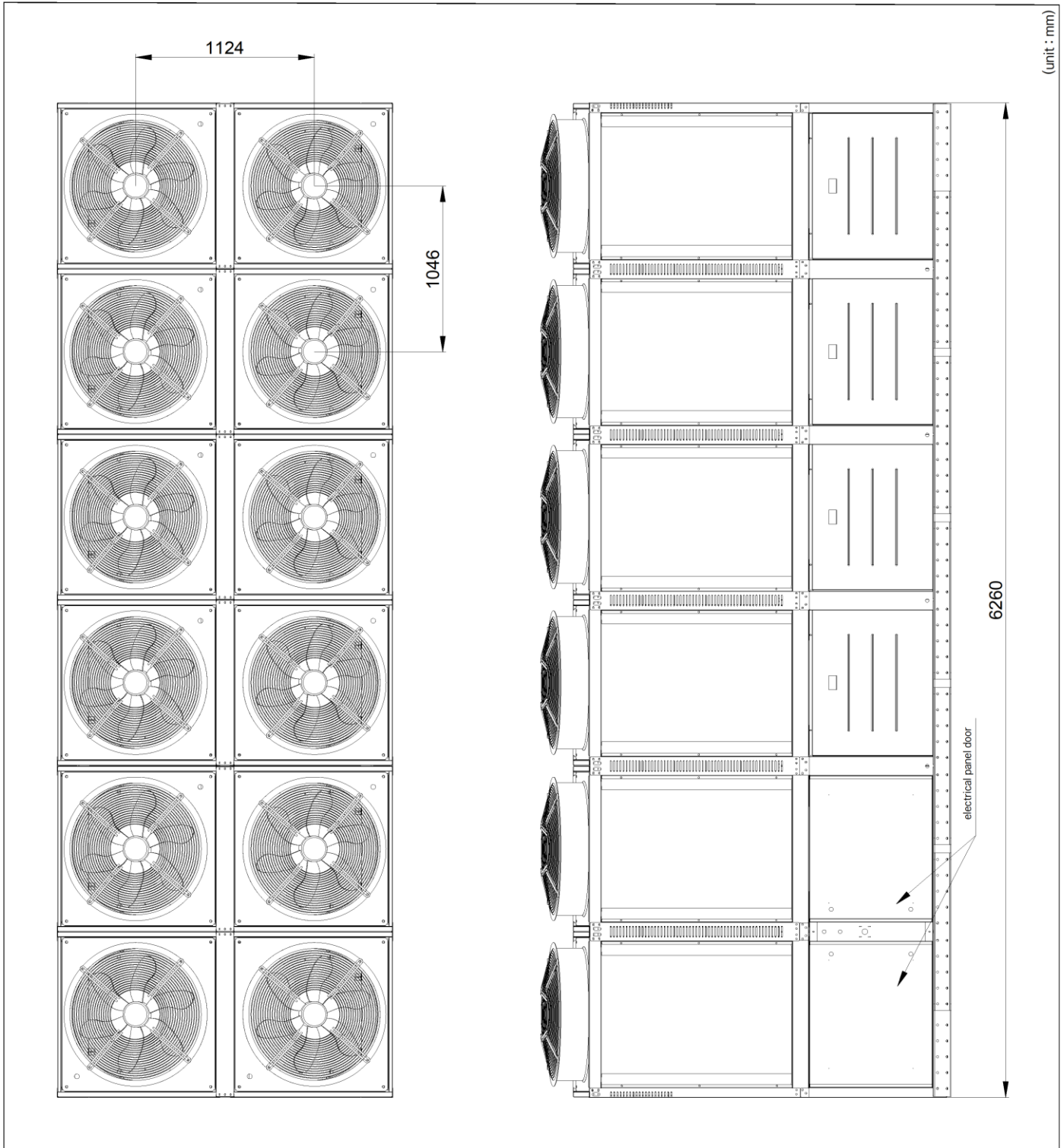


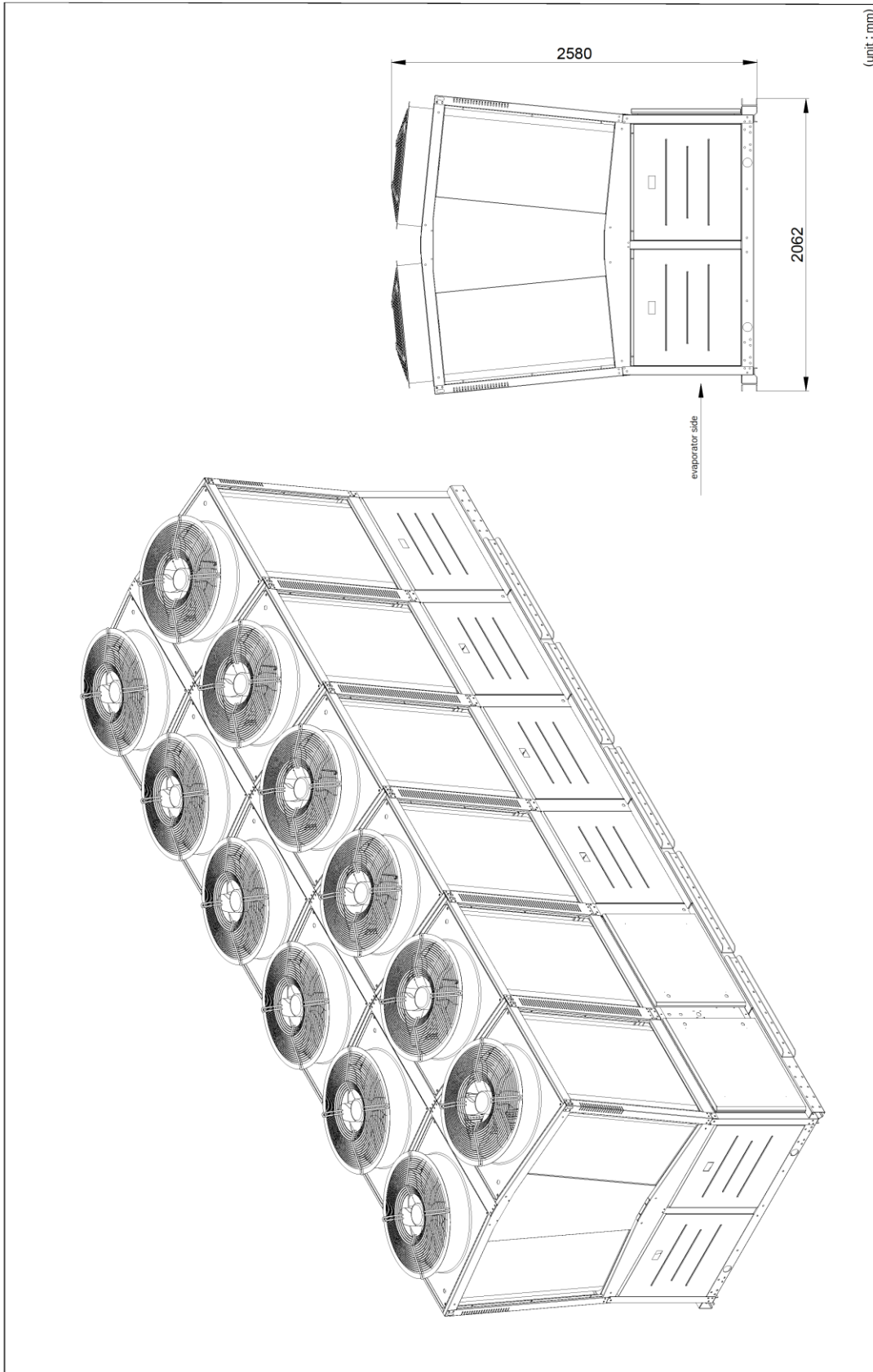
HQSD80C6SC - HQSD95C6SC



HQSD100B4SC - HQSD120B4SC









**No. 118, West 9 St., Farvardin Blvd., Safadasht Industrial Town
Malard, Tehran, IRAN**

(+98) 21 65438141-6

www.afragostar.co

© Copyright 2024 AFRA HVAC Products – All rights reserved.
Any part of this publication may be reproduced, copied, filed or transmitted in any shape or form without the permission of AFRA HVAC. Within the policy of continuous improvement of its products, AFRA HVAC reserves the right to make changes at any time without prior notification and without being compelled to introducing them into products subsequently sold. This document may therefore have been subject to amendments during the life of the product.



SCAN ME

