Technical Catalogue

ACHIEVE YOUR VISION

CHILLER
FAN COIL
BOILER

AFRA
HVAC SYSTEM

Air Cooled Chiller

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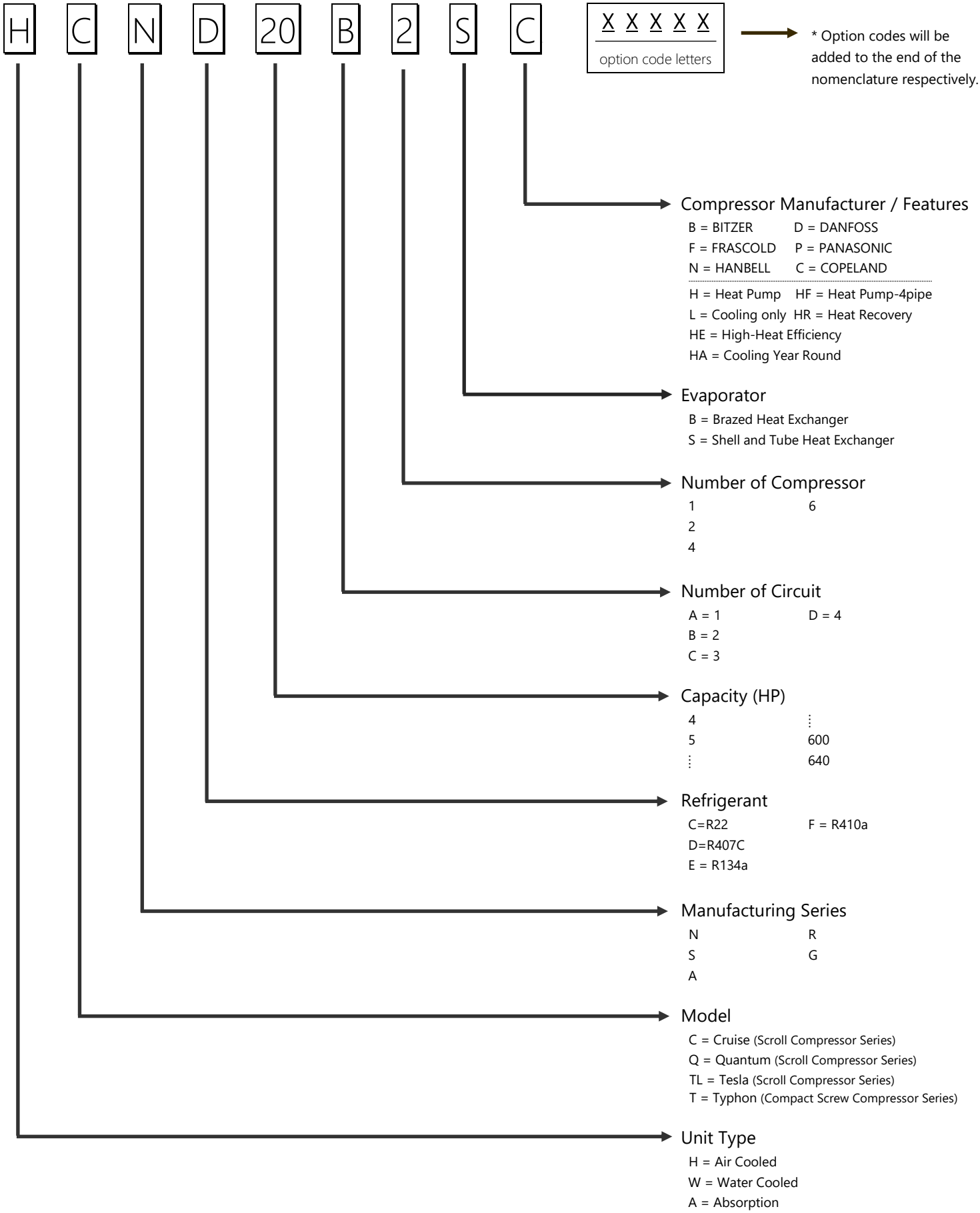
ACHIEVE
by AFRA
YOUR VISION

Air Cooled Chiller

Nomenclature



HTLS SERIES

10 - 28 KW

Introduction

Compressor

With highly efficient performance
Anti Vibration Joint
Dehumidifier filter dryer
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch and Pressure Transmitter

Liquid Line Equipment

Thermal Expansion Valve
Solenoid valve and sight glass
Liquid receiver with Rotalock valve
filter dryer for dehumidification refrigerant

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
Anti Freeze System

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

Condenser

Fin and Tube U shaped style that bring more heat exchange surface compared conventional flat heat-exchanger
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Electrical and Safety Equipment

Ability to synchronize with BMS
Compatible with network connection protocols
High pressure and low pressure sensor
Switch cabinet with IP54
Multi-device module capability
Light and socket in the switch cabinet
Alarm system for faults

Standard Features

AFRA

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

Item	Description	Product's Brand
Control Panel	▪ 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	Phase sequence and phase loss sensors are designed for the following measures: ▪ 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	▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance).	KLEMSAN
Contactor	▪ Connecting and disconnecting the electric current of the circuit.	SIEMENS
MSPS	Motor Start Protection System to performs an electric motor: ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor.	SIEMENS
Liquid Line	Includes: ▪ Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve.	CASTEL
Sensors	Includes: ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor.	DANFOSS
TEV	Thermal Expansion Valve: ▪ 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.

Item	Description	Product's Brand
Main Switch	▪ Power Switch (On/Off). ▪ Controlling the input current to the device.	SIEMENS
Condenser [1]	▪ 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]	▪ 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	▪ 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

AFRA

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

Item	Description	Product's Brand
1. Soft Starter	▪ 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	▪ 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. Oil Heater	▪ Preventing the mix of the refrigerant and the compressor oil.	-
4. Oil Separator	▪ 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
5. Accumulator	▪ 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
6. Economizer	▪ Increasing the efficiency by creating a sub-circuit. ▪ Improving the system performance. ▪ Energy saving. ▪ Utilizing brazed plate heat exchanger.	KELVION (Heat Exchanger)

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

Item	Description	Product's Brand
7. Equipment of Water Circuit	A. Linear pump [1] with water flow switch B. Close expansion tank	-
8. Switch Cabinet	A. UPS buffered controller to prevent damage during operating. B. Cooling system specially for switch cabinet.	-
9. Fan	A. ZILABEG trademark B. ROSENBERG trademark C. Sound reduction diffuser. (Executable only for EUROVENT fans)	-

1. Head of pump must be mentioned in the registration process.

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

Technical Data

AFRA

Model No.				HTLSD04A1SC	HTLSD05A1SC	HTLSD06A1SC
1	Cooling capacity		KW	9.5	11.5	13.8
			RT	2.7	3.3	3.9
	Total input power		KW	3.8	4.56	5.2
	Total rated current		A	8.4	10	10.5
	EER		-	2.5	2.52	2.66
2	Cooling capacity		KW	8.8	10.7	12.8
			RT	2.5	3	3.7
	Total input power		KW	4.22	5.03	5.77
	Total rated current		A	8.9	10.5	11.4
	EER		-	2.09	2.13	2.22
ESEER			-	3.59	3.69	3.88
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	6.5	8	9.5
			m^3/h	1.5	1.8	2.2
		Water pressure drop	kPa	4	5	4.3
		Max design pressure	Mpa	0.8		
Condenser		Type	-	U shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	2		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	2		
		Speed	rpm	1350		
		Diameter	mm	450		
		Air flow rate	m^3/h	4700		
		Discharge	Side/Top	Side		
Compressor		Type	-	Semi-Hermetic Scroll		
		Brand	-	COPELAND		
		Model	-	ZR48K3E-TFD	ZR61KCE-TFD	ZR72KCE-TFD
		Combination	Pieces	1		
		Oil type	-	POE RL32-3MAF		
		Oil charge amount	L	1.36	1.66	1.77
		Oil heater	-	● (Optional)		
Refrigerant		Type	-	R407C		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	Siemens PLC		
Sound pressure level			dB(A)	~ 72	~ 73	
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	603x1800x703		
Net weight			kg	~ 150		

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 m^2 . °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.				HTLSD08B2SC	HTLSD10B2SC	HTLSD12B2SC
1	Cooling capacity		KW	19	23	27.6
			RT	5.4	6.5	7.8
	Total input power		KW	7.7	9.2	10.5
	Total rated current		A	15.5	18.5	19.6
	EER		-	2.46	2.49	2.62
2	Cooling capacity		KW	17.6	21.4	25.6
			RT	5	6	7.3
	Total input power		KW	8.6	10.2	11.7
	Total rated current		A	16.5	19.6	21.4
	EER		-	2.06	2.10	2.20
ESEER			-	3.52	3.63	3.84
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	13	15.5	19
			m^3/h	2.9	3.5	4.3
		Water pressure drop	kPa	6	10	13
		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	1430		
		Diameter	mm	500		
		Air flow rate	m^3/h	9200		
		Discharge	Side/Top	Side		
Compressor		Type	-	Semi-Hermetic Scroll		
		Brand	-	COPELAND		
		Model	-	ZR48K3E-TFD	ZR61KCE-TFD	ZR72KCE-TFD
		Combination	Pieces	2		
		Oil type	-	POE RL32-3MAF		
		Oil charge amount	L	1.36	1.66	1.77
		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			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	600x1800x1158		
Net weight			kg	~ 300		

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 m^2 . °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".

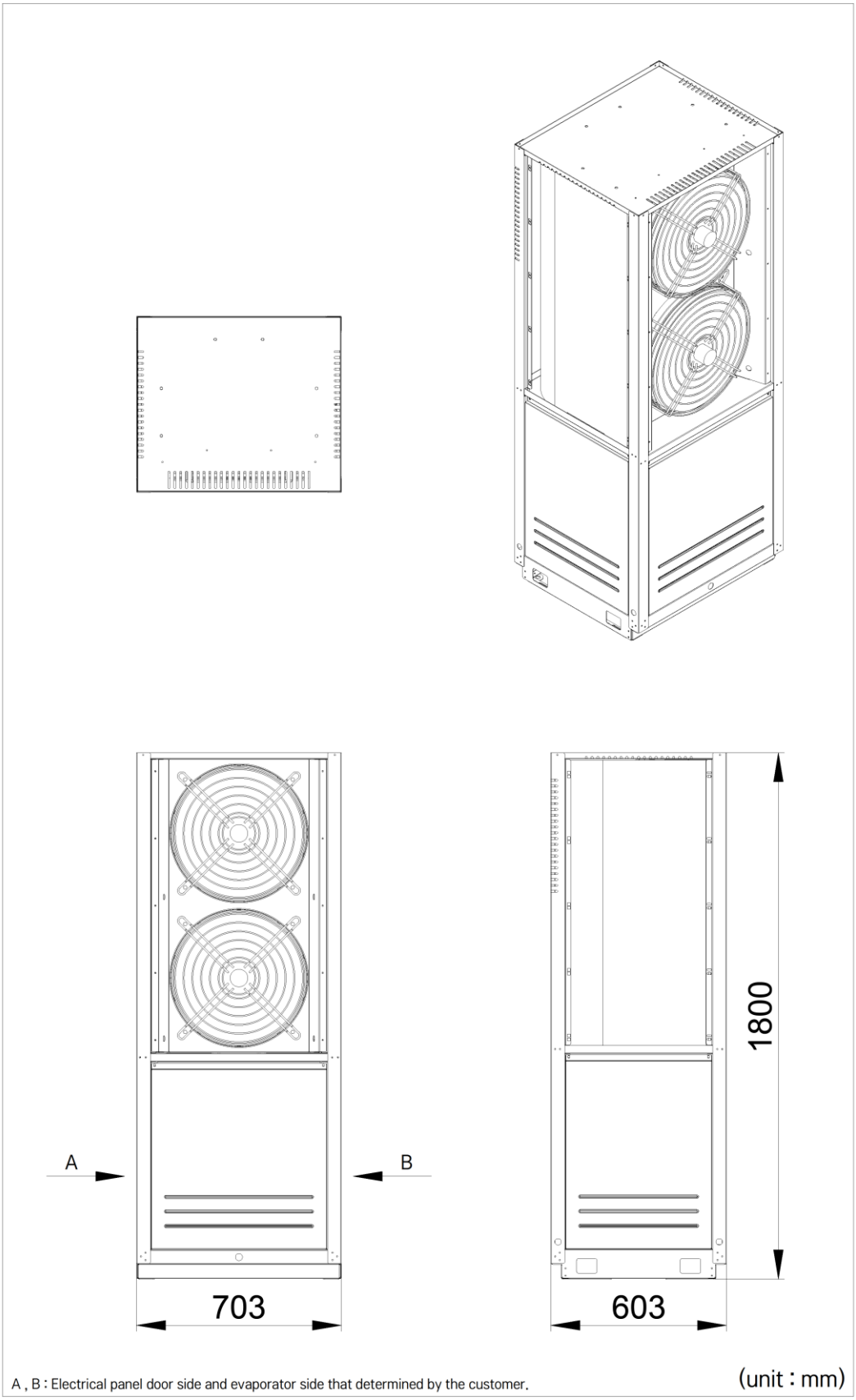
Performance Data

AFRA

Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HTLSD04A1SC	30	10.0	3.43	8.0	2.92
	35	9.5	3.80	8.4	2.50
	37	9.2	3.96	8.6	2.33
	40	8.8	4.22	8.9	2.09
	42	8.5	4.40	9.2	1.93
	46	8.0	4.81	9.6	1.66
HTLSD05A1SC	30	12.3	4.13	9.5	2.98
	35	11.5	4.56	10.0	2.52
	37	11.2	4.74	10.2	2.37
	40	10.7	5.03	10.5	2.13
	42	10.3	5.24	10.8	1.97
	46	9.6	5.67	11.3	1.69
HTLSD06A1SC	30	14.7	4.68	9.8	3.14
	35	13.8	5.20	10.5	2.66
	37	13.4	5.42	10.9	2.47
	40	12.8	5.77	11.4	2.22
	42	12.4	6.01	11.8	2.06
	46	11.7	6.53	12.6	1.79
HTLSD08B2SC	30	20.0	7.0	14.6	2.87
	35	19.0	7.7	15.5	2.46
	37	18.4	8.0	15.8	2.29
	40	17.6	8.6	16.5	2.06
	42	17.0	8.9	16.9	1.91
	46	16.0	9.7	17.9	1.64
HTLSD10B2SC	30	24.6	8.4	17.6	2.94
	35	23.0	9.2	18.5	2.49
	37	22.4	9.6	19.0	2.33
	40	21.4	10.2	19.6	2.10
	42	20.6	10.6	20.1	1.94
	46	19.2	11.5	21.1	1.68
HTLSD12B2SC	30	29.4	9.5	18.2	3.10
	35	27.6	10.5	19.6	2.62
	37	26.8	11.0	20.3	2.45
	40	25.6	11.7	21.4	2.20
	42	24.8	12.1	22.1	2.04
	46	23.4	13.2	23.8	1.78

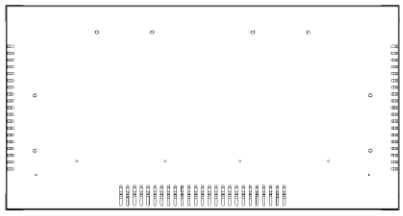
- Chilled water inlet / outlet : 12 °C / 7 °C

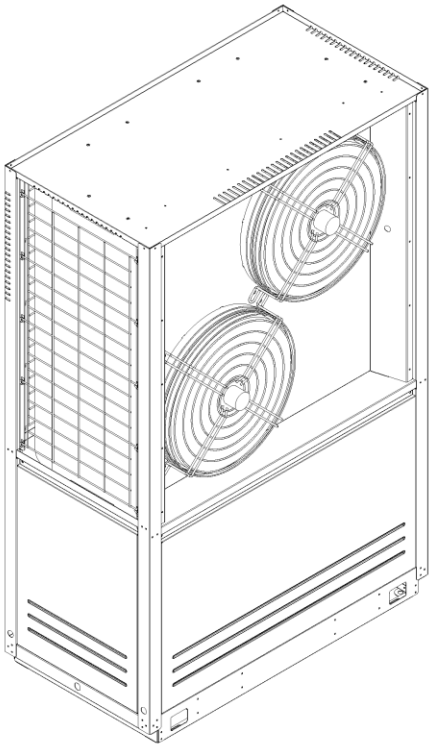
Dimensions (HTLSD04A1SC – HTLSD05A1SC - HTLSD06A1SC)

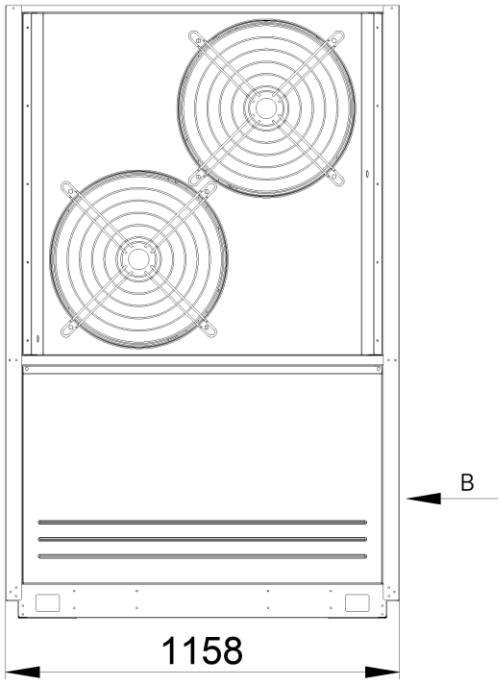


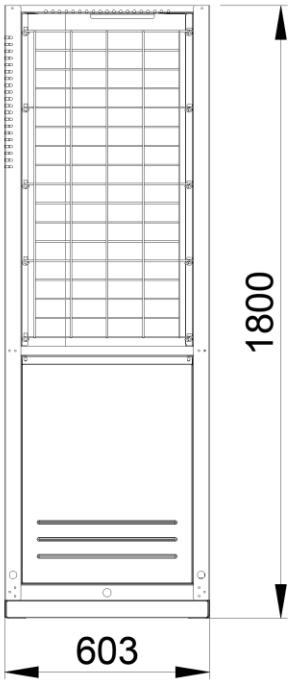
A , B : Electrical panel door side and evaporator side that determined by the customer.

(unit : mm)









A , B : Electrical panel door side and evaporator side that determined by the customer.

(unit : mm)

HCN SERIES

Adiabatic Cooling System 50 - 149 KW

Compressor

With highly efficient performance
Anti Vibration Joint
Dehumidifier filter dryer
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch and Pressure Transmitter

Liquid Line Equipment

Thermal Expansion Valve
Solenoid valve and sight glass
Liquid receiver with Rotalock valve
filter dryer for dehumidification refrigerant

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
Anti Freeze System

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

Condenser

Fin and Tube flat type series
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Electrical and Safety Equipment

Ability to synchronize with BMS
Compatible with network connection protocols
High pressure and low pressure sensor
Switch cabinet with IP54
Multi-device module capability
Light and socket in the switch cabinet
Alarm system for faults

Adiabatic Cooling System

For Reducing of power consumption, that is based on the natural thermodynamic properties of water.

With smart pre-cooling outdoor air system during high ambient temperature periods and only when the dry mode is not sufficient to maintain the outlet water temperature within a pre-set maximum set point, the adiabatic mode is automatically activated.

The high temperature ambient air, before entering the finned exchanger, passes through the "adiabatic chamber" where humidity is added and consequently it is pre-cooled.

In this case, the control system continuously regulates the quantity of water evaporation, only when necessary, to maintain the desired set point.

The result of this is that adiabatic systems are highly effective in hot, dry environments, while using less water than traditional evaporative units.

Adiabatic units also deliver the required cooling capacity in a smaller footprint and/or lower fan motor horsepower than a completely dry cooler condenser.

Combining aluminum fins, innovative waterfall system, 100% recycled pre-cooling pads and the V type configuration adiabatic coolers can provide condensers significant cooling capacity.

Significantly greater energy savings compared to other conventional cooling devices.

Water consumption associated with evaporative cooling is significantly less than conventional water-powered cooling units specially water cooled chillers.

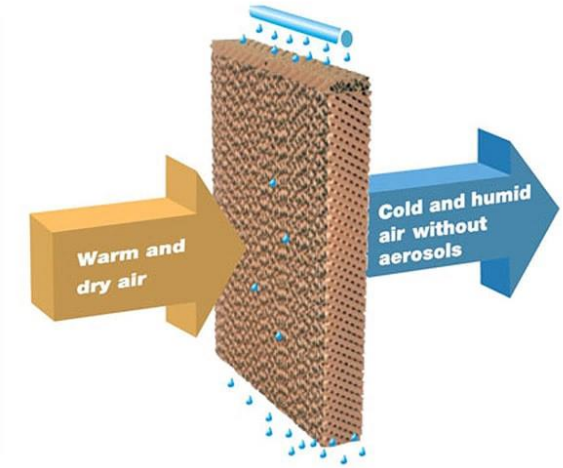
Strict temperature regulation ensures an overall higher efficiency of cooling as the system is only activated intermittently.

The evaporative system is a process by which water, coming from a water pipe positioned externally at the top of the condenser coils, wets the pads: the hot and dry air withdrawn from the environment passes through these wet panels and, this way, cools down. The cooling effect allows to reduce the condensing temperature obtaining a considerable reduction of the pressure ratio of the compressor, with the resulting energy benefits.

The water passing through the pads is collected by a "drain pipe" system, with gutters positioned under each pad and draining the water out.

The evaporative system is particularly effective and efficient when the ambient temperature is high and the relative humidity is lower than 60%.

The evaporation effect reduces the air temperature by as much as 10 °C increasing the efficiency of the condensers.



Standard Features

AFRA

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

Item	Description	Product's Brand
Control Panel	▪ 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.	INVOTECH
Phase Control	Phase sequence and phase loss sensors are designed for the following measures: ▪ 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	▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance).	KLEMSAN
Contactor	▪ Connecting and disconnecting the electric current of the circuit.	SIEMENS
MSPS	Motor Start Protection System to performs an electric motor: ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor.	SIEMENS
Liquid Line	Includes: ▪ Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve.	CASTEL
Sensors	Includes: ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor.	DANFOSS
TEV	Thermal Expansion Valve: ▪ Ensuring accurate control of refrigerant injection into the evaporator.	CAREL

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

Item	Description	Product's Brand
Main Switch	▪ Power Switch (On/Off). ▪ Controlling the input current to the device.	SIEMENS
Adiabatic Cooling system [1]	▪ 13cm Thickness cellulose pads waterfall system with semi-closed circuit and controlling ambient air temperature system to prevent water loss. ▪ The air temperature reduction can reach as much as 10 ºC depending on the ambient air enthalpy conditions. ▪ Electrical water level controller ▪ Electrical floater ▪ Circulator pump	AFRA
Condenser [2]	▪ Fin and tube "Flat" shaped series with 12FPI number of Fin per Inch including 3/8" copper tube and compressive strength of 450 PSI.	AFRA
Evaporator [2]	▪ 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	▪ Eliminating gas refrigerant. ▪ Ensuring that pure liquid refrigerant enters the expansion valve. ▪ Equipped with Rotalock Valve for easier operation and maintenance.	AFRA

1. For proper operation, must be supply soft water or moderately hard water.

2. Powered by UNILAB

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

Options

AFRA

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

Item	Description	Product's Brand
1. Soft Starter	▪ 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	▪ 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]	▪ 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.	CAREL
4. EEV [1]	Electronic Expansion Valve: ▪ Ensuring accurate control of refrigerant injection into the evaporator.	CAREL
5. Oil Heater	▪ Preventing the mix of the refrigerant and the compressor oil.	-
6. Oil Separator	▪ 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 INVOTECH 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.

Item	Description	Product's Brand
7. Accumulator	▪ 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	▪ 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	C. UPS buffered controller to prevent damage during operating. D. Cooling system specially for switch cabinet.	-
10. Fan [1]	A. ROSENBERG trademark. B. ZILABEG trademark. C. EBMPAPST trademark. D. Sound reduction diffuser. (Executable only for EUROVENT fans)	-

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

AFRA

Model No.				HCND20B2SC	HCND25B2SC	HCND30B2SC
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	13	12
		Max design pressure	mPa	0.8		
Condenser		Type	-	Flat 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	-	INVOTECH PLC		
Sound pressure level			dB(A)	~ 77		
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	972x1265x2171		
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 m^2 . °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".
- Tables calculated on Adiabatic Cooling System mode off.

Model No.				HCND40B2SC	HCND50B2SC	HCND60B2SC
1	Cooling capacity		KW	97.8	121.2	149.2
			RT	27.8	34.5	42.4
	Total input power		KW	38.1	45.9	54.5
	Total rated current		A	66.9	81.7	96.5
	EER		-	2.57	2.64	2.74
2	Cooling capacity		KW	90.8	111.9	137.8
			RT	25.8	31.8	39.2
	Total input power		KW	42.1	50.9	60.3
	Total rated current		A	72.3	88.2	104.9
	EER		-	2.16	2.20	2.29
ESEER			-	3.34	3.70	3.82
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	68	84	103
			m^3/h	15.4	19.1	23.4
		Water pressure drop	kPa	8	14.5	16
		Max design pressure	mPa	0.8		
Condenser		Type	-	Flat 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	-	3		
		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	-	ZR250KCE-TWD	ZR310KCE-TWD	ZR380KCE-TWD
		Combination	Pieces	2		
		Oil type	-	POE RL32-3MAF		
		Oil charge amount	L	4.67	6.80	6.30
		Oil heater	-	● (Optional)		
Refrigerant		Type	-	R407C		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	INVOTECH PLC		
Sound pressure level			dB(A)	~ 80	~ 81	
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	972x1265x3251		
Net weight			kg	~ 950		

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 m^2 . °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".
- Tables calculated on Adiabatic Cooling System mode off.

Attention

- Adiabatic Cooling System of the unit/s can reduce the ambient air temperature up to 10 °C at temperature of 35 - 40 °C and up to 5 °C at temperature of 40 - 47 °C depending on the ambient air enthalpy conditions.
- This application is not recommended for hot and humid climate zones.
- The lack of soft water or moderately hard water may reduce the efficiency of the system and damage the adiabatic system components.

Performance Data

AFRA

Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HCND20B2SC	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
HCND25B2SC	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
HCND30B2SC	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
HCND40B2SC	30	104.4	34.5	62.3	3.03
	35	97.8	38.1	66.9	2.57
	37	95.0	39.5	68.9	2.41
	40	90.8	42.1	72.3	2.16
	42	88.0	43.7	74.9	2.01
	46	82.0	47.5	80.3	1.73
HCND50B2SC	30	130.1	41.7	76.5	3.12
	35	121.2	45.9	81.7	2.64
	37	117.6	47.9	84.2	2.46
	40	111.9	50.9	88.2	2.20
	42	108.1	53.1	91.1	2.04
	46	100.6	57.9	97.6	1.74
HCND60B2SC	30	159.7	49.3	89.3	3.24
	35	149.2	54.5	96.5	2.74
	37	143.4	56.7	99.7	2.53
	40	137.8	60.3	104.9	2.29
	42	132.8	62.9	108.5	2.11
	46	122.4	68.5	116.7	1.79

- Chilled water inlet / outlet : 12 °C / 7 °C
- Tables calculated on Adiabatic Cooling System mode off.

HQN SERIES

66 - 460 KW

R410A CLASSICAL MODULAR UNIT (Heat Pump - Cooling only)

The new generation environment-friendly modular air cooled unit, which is greatly improved in aspects of the structure, system and microcomputer control technology, providing wider operation range of refrigeration and heating, and higher adaptability to applications with requirements on comfort and technology. There are basic modules of any combination available for different models, including 66 kW, 100 kW, 130 kW and at most 16 modules can be connected in parallel, providing combination products of 66 kW - 2080 kW.

Excellent Capacity

Units of the same model or different models can be combined freely. Each group can combine up to 16 modules.

Free master Module Design

Any single unit can operate as the master once connected with the wired controller. It overcomes the problem that the whole system would fail to work properly when the fixed master unit malfunctions.

Intelligent Defrosting Technology, Non Stop When Defrosting

The unit control system can determine whether defrosting is necessary according to the ambient temperature in heating mode, evaporating temperature and running time; when defrosting conditions are met, the unit will automatically activate the defrosting program to complete defrosting within a short time and provide heating operation efficiency up to over 90%, ensuring the optimum heating capacity and high EER.

Compact Design and Less Occupied Area

Unique and compact structure results in small size and occupied area, significant reductions in installation space and cost; the unit is compact and easy to install. A 130 KW unit covers floor space of only 2.42 m^2, a 50% reduction compared to its equivalents.

Famous Hermetic Scroll Compressor

Unit adopt famous brand hermetic scroll compressor, which is high-efficient, energy saving and operates stably, with low noise, vibration and long service life.

Efficient Shell and Tube Heat Exchanger

The waterside efficient shell and internal thread heat exchanger is of helical baffle type, with better heat transfer performance and higher resistance to freezing than plate heat exchanger, lower water resistance and lower requirements for water quality.

V-Shaped Condenser

The V-shaped condenser has used an integral reinforcing metal frame, internal thread and triple anti-frosting features (patented design of open-window hydrophilic aluminum foil + bottom elevated + one way valve), providing higher structural stability and corrosion resistance; with heat exchange efficiency improved through full use of heat exchange area, low tendency to dust accumulation and frosting in winter, low loss of pressure, smoother drainage and higher reliability.

Intelligent Air Volume Regulation

The shared duct system is adopted to greatly expand the operating range. The single-module unit can automatically increase or reduce fans based on the ambient temperature to achieve optimal matching between air volume and load and deliver outstanding performance.

High Precision Electronic Expansion Valve

The electronic expansion valve achieves 480 regulating range, precision throttle control technology to realize dynamic matching in refrigerating system, fully improve the optimum efficiency of each component and ensure the optimum condition of system operation pressure and temperature.

Saw-shaped Fan Impeller

Compared to plastic impellers, the saw-shaped impellers provide large air volume, high durability and high air supply efficiency with low noise.

Widely Operation Range

Low temperature cooling
5 °C to + 48 °C

High temperature heating
-15 °C to - 48 °C

Intelligent Energy Regulation Technology

Unique intelligent energy regulation technology in multi-module combination ensures that each module loads or unloads a refrigerant circuit before loading or unloading other refrigerant circuits in the single module, thereby providing higher efficiency, stability and IPLV.

Self-developed Microcomputer Control Panel

Control panel is fully upgraded based on original control panels with years of experience in R&D and design, which com bines more functions including phase sequence detection, current detection, RS- 485 communication interface, delivering stronger performance, utility, standardization, convenience and universality.
The USB interface is also provided to facilitate later-stage maintenance and upgrade of control function and developed control program which offers full operation control and multiple safety protection functions.

Multiple Protection Functions, Providing Safety and Stability

The unit has multiple safety protection functions which ensure safety and stable operation of the unit and systems. The water flow switch and multiple anti-freezing program designs protect the unit and systems in an all-round way.

Technical Data

AFRA

Model No.				HQNF20B2SH	HQNF30B2SH	HQNF40B2SH
1	Cooling capacity		KW	66	100	130
			RT	18.8	28.4	37
	Total input power		KW	23.6	35.9	46.3
	Total rated current		A	46.2	69	92.9
	EER		-	2.80	2.78	2.80
2	Heating capacity		KW	70	110	140
			RT	19.9	31.3	39.8
	Total input power		KW	24.1	38	48.1
	Total rated current		A	46.6	71	93.8
	EER		-	2.90	2.89	2.91
Evaporator		Type	-	Shell and tube		
		Water flow rate	gpm	50.2	75.7	98.6
			m^3/h	11.4	17.2	22.4
		Water pressure drop	kPa	45	30	45
		Water pipe connection	-	DN65 (Flange)		
Condenser		Type	-	V shaped		
		Heat exchanger	-	Hydrophilic Aluminium fin		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Number	-	2		
		Air flow rate	m^3/h	28000	43000	48000
		Discharge	Side/Top	Top		
Compressor		Type	-	Hermetic Scroll		
		Brand	-	EMERSON		
		Combination	Pieces	2		
Refrigerant		Type	-	R410A		
Input power		Maximum	KW	30.2	43.6	57.6
Current		Maximum	A	50	80	100
		Starting	A	140	125	266.1
Power supply			Ø , V , Hz	3 , 380 , 50		
Sound pressure level			dB(A)	~65	~68	~69
Dimension		WxHxD	mm	2200x2000x860	2200x2205x1100	2200x2205x1100
Weight		Net	kg	580	900	1000
		Operating		640	980	1100

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

Model No.				HQNF20B2SL	HQNF40B2SL
1	Cooling capacity		KW	66	130
			RT	18.8	37
	Total input power		KW	23.6	46.3
	Total rated current		A	42.6	87.6
	EER		-	2.80	2.80
Heating capacity			KW	-	-
			RT	-	-
Total input power			KW	-	-
Total rated current			A	-	-
EER			-	-	-
Evaporator		Type	-	Shell and tube	
		Water flow rate	gpm	50.2	98.6
			m^3/h	11.4	22.4
		Water pressure drop	kPa	45	48
		Water pipe connection	-	DN65 (Flange)	
Condenser		Type	-	V shaped	
		Heat exchanger	-	Hydrophilic Aluminium fin	
		Fins per inch	FPI	12	
Fan		Type	-	Axial fan	
		Number	-	2	
		Air flow rate	m^3/h	28000	48000
		Discharge	Side/Top	Top	
Compressor		Type	-	Hermetic Scroll	
		Brand	-	DAIKIN	EMERSON
		Combination	Pieces	2	
Refrigerant		Type	-	R410A	
Input power		Maximum	KW	30.2	57.6
Current		Maximum	A	50	100
		Starting	A	172	266.1
Power supply			Ø , V , Hz	3 , 380 , 50	
Sound pressure level			dB(A)	~70	~74
Dimension		WxHxD	mm	2200x2000x860	2200x2205x1100
Weight		Net	kg	570	850
		Operating		690	1040

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

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

TOTAL HEAT RECOVERY MODULAR UNIT

Total heat recovery modular air-cooled chiller (heat pump) unit uses the environment-friendly refrigerant R410A and combines the features of air-cooled chiller (heat pump) unit and air-source heat pump water heater unit. It has five modes: A/C cooling, A/C heating, heat recovery, heat pump water heating, A/C heating + heat pump water heating, widely applied in places requiring central air conditioning and water heating, such as hotels, schools, restaurants, hospitals, villas, bath centers.

Free Domestic Hot Water (DHW)

In the A/C cooling mode, the unit can recover waste heat and provide free domestic hot water up to 55°C. The unit replaces the boiler to meet the user needs for hot water, saves initial investment, eliminates the need for machine room, and saves the building area and energy for environmental protection.

Less Occupied Area

A single module covers a floor area of only 1.89 md which is the smallest in the industry, leaving larger valuable space for customers. The unit can substitute the boiler, eliminates the need for machine room, and saves initial investment and building area.

Efficient Components Providing Higher Efficiency

The unit employs efficient shell and tube heat exchanger, fan, and heat recovery unit, with optimized pipeline design, providing comprehensive energy efficiency up to 8.24 under conditions of cooling + heat recovery.

Compact Design and Complete Functions

The compact structural design does not impair strong functions and five modes are more widely applied, including refrigeration, heating, heat recovery, heat pump water heating, A/C heating + heat pump water heating.

Cooling Mode

In summer or transition season needing cooling but not hot water, this mode can be used. In such case, the unit operates for cooling only, just like a standard air-cooled heat pump unit.

Heat Recovery Mode

In circumstances where both cooling and production of domestic hot water are needed, this mode can be used. In such case, the unit automatically selects the optimal operation mode based on the needs for air conditioning and water heating to produce chilled water for air conditioning and domestic hot water for everyday use.

Heat Pump Water Heating Mode

In circumstances where only domestic hot water is needed instead of cooling or heating, this mode can be used. In such case, the unit only provides domestic hot water, just like a standard air source heat pump water heater unit.

Heating Mode

In circumstances where only domestic hot water is needed instead of cooling or heating, this mode can be used. In such case, the unit only provides domestic hot water, just like a standard air source heat pump water heater unit.

Heating + Heat Pump Water Heating Mode

In winter or other circumstances where both heating and domestic hot water are needed, this mode can be used. In such case, the water heating mode is preferred by default to ensure use of domestic hot water; then at the “idle time" when the demand for hot water is satisfied, the unit automatically switches to the heating mode to meet the needs for heating. Users may set the heating mode as the priority as required to ensure heating effect.

Technical Data

AFRA

Model No.				HQNF20B2SHR
1	Cooling capacity		KW	66
			RT	18.8
	Total input power		KW	22.3
	Total rated current		A	45
	EER		-	2.96
2	Heating capacity		KW	70
			RT	19.9
	Total input power		KW	23.3
	Total rated current		A	46.1
	EER		-	3.00
3	Domestic hot water mode	Rated water flow	gpm	57.7
			m^3/h	13.1
		Nominal heating capacity	KW	76
		Heating power input	KW	18.4
		Current	KW	40.6
		Nominal water output	gpm	7.2
			m^3/h	1.63
4	Cooling + heat recovery mode	Nominal cooling capacity	KW	60
		Nominal heat recovery capacity	KW	76
		Nominal input power	KW	16.5
		Current	KW	35.6
		Nominal water output	gpm	7.2
			m^3/h	1.63
		Water flow (air conditioner side)	gpm	45.4
			m^3/h	10.3
		Water flow (hot water side)	gpm	57.7
			m^3/h	13.1

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

3 : Heating water outlet : 45 °C
Inlet water temp. : 15 °C
Outdoor ambient temp. : 20 °C DB
Sea level : 4000 ft

4 : Chilled water inlet / outlet : 12 °C / 7 °C
Hot water outlet : 45 °C
Outdoor ambient temp. : 35 °C DB
Sea level : 4000 ft

Model No.			HQNF20B2SHR
Evaporator	Type	-	Shell and tube
	Water flow rate	gpm	50.2
		m^3/h	11.4
	Water pressure drop	kPa	20
	Water pipe connection	-	DN65 (Flange)
Condenser	Type	-	V shaped
	Heat exchanger	-	Hydrophilic Aluminium fin
	Fins per inch	FPI	12
Fan	Type	-	Axial fan
	Number	-	2
	Air flow rate	m^3/h	26000
	Discharge	Side/Top	Top
Compressor	Type	-	Hermetic Scroll
	Brand	-	EMERSON
	Combination	Pieces	2
Refrigerant	Type	-	R410A
Input power	Maximum	KW	30.2
Current	Maximum	A	50
	Starting	A	140
Power supply		Ø , V , Hz	3 , 380 , 50
Sound pressure level		dB(A)	~70
Dimension	WxHxD	mm	2200x2000x860
Weight	Net	kg	650
	Operating		710

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

3 : Heating water outlet : 45 °C
Inlet water temp. : 15 °C
Outdoor ambient temp. : 20 °C DB
Sea level : 4000 ft

4 : Chilled water inlet / outlet : 12 °C / 7 °C
Hot water outlet : 45 °C
Outdoor ambient temp. : 35 °C DB
Sea level : 4000 ft

4-PIPE MODULAR CHILLER

The 4-pipe modular air cooled chiller (heat pump) adopts R410A eco-friendly refrigerant, and supports cooling, heating, and cooling heat recovery operations. It is widely applied in places with higher requirements for temperature and humidity, such as hospitals, art galleries, and equipment rooms. When cold water is used for dehumidification, re-heating is obtained free of charge. The unit can also be applied in building complexes which require both cooling and heating, to greatly save operating cost and initial investment in equipment. Without the need for a dedicated equipment room and cooling tower, the 4-pipe modular air cooled chiller unit is the best choice in prosperous areas and the water shortage areas.

Maximized Energy Utilization

In places where both coo ling and heating are required and specific temperature and humidity limits are set, separate configuration for cooling and heating is not required. The waste heat emitted during cooling can be recovered for producing hot water, which will be used by air side products. The ICOP can reach up to 7.78, substantially reducing initial investment and later-phase operating costs.

Auto Balance of Cooling and Heating

With a modular design and self-adapting cooling and heat balancing technologies, the unit can automatically adjust the output of cooling and heating capacity based on actual conditions, and fast switch the operating status and control the water outlet temperature to achieve continuous balancing that enables "output on demand". Both temperature and humidity are controlled more accurately to provide enhanced comfort.

Wide Operation Range

The unit adopts well-known multi-speed fans to further reduce operation noise and implement smart air flow adjustment, so as to support stable cooling and heating within a wide range of -15°C to +48°C.

Technical Data

AFRA

Model No.				HQNF20B2SHF
1	Cooling	Capacity	KW	66
			RT	18.8
		Total input power	KW	22.3
		Total rated current	A	45
		EER	-	2.96
		Water flow rate	gpm	50.2
			m^3/h	11.4
		Water pressure drop	kPa	40
		Water pipe connection	-	DN65 (Flange)
2	Heating	Capacity	KW	70
			RT	19.9
		Total input power	KW	23.3
		Total rated current	A	46.1
		EER	-	3.00
		Water flow rate	gpm	50.2
			m^3/h	13.9
		Water pressure drop	kPa	60
		Water pipe connection	-	DN65
1 , 2	Cooling and heating	Cooling Capacity	KW	63
			RT	17.9
		Heating Capacity	KW	81
			RT	23
		Total input power	KW	22
		Total rated current	A	46
		Cooling Water flow rate	gpm	11.4
			m^3/h	40
		Heating Water flow rate	gpm	50.2
			m^3/h	13.9

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

Model No.			HQNF20B2SHF
Condenser	Type	-	V shaped
	Heat exchanger	-	Hydrophilic Aluminium fin
	Fins per inch	FPI	12
Fan	Type	-	Axial fan
	Number	-	2
	Air flow rate	m^3/h	26000
	Discharge	Side/Top	Top
Compressor	Type	-	Hermetic Scroll
	Brand	-	EMERSON
	Combination	Pieces	2
Refrigerant	Type	-	R410A
Dimension	WxHxD	mm	2200x1980x860
Weight	Net	kg	650
	Operating		710

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

High-Heat Efficiency Modular Unit

Featuring the most advanced EVI compressor from EMERSON and applicable for a wider range of heating.

Precision Throttle Control Technology of Electronic EXV

The electronic expansion valve achieves 480 regulating range, precision throttle control technology to realize dynamic matching in refrigerating system, fully improve the optimum efficiency of each component and ensure the optimum condition of system operation pressure and temperature.

EVI Compressor

The high-heat efficiency modular unit employs the efficient EVI technology, with a secondary suction port fitted on the scroll plate. The refrigerant volume is increased through the secondary suction loop and the enthalpy difference of refrigerant in the major cycle is increased to improve the efficiency of cooling and heating.

Wide Operation Range of Heating

The unit adopts well-known multi-speed fans to further reduce operation noise and implement smart air flow adjustment, so as to support stable cooling and heating within a wide range of -15°C to +48°C.

Low Carbon and Environmental Protection

The unit uses the environment-friendly refrigerant R410A, and combines air source heat pump and EVI technologies. It can be used in the northern area for cooling in summer and heat pump heating in winter, providing lower-carbon and more environment-friendly applications.

Technical Data

AFRA

Model No.				HQNF20B2SHE	HQNF40B2SHE
1	Cooling capacity		KW	70	150
			RT	19.9	42.6
	Total input power		KW	23.7	47.4
	Total rated current		A	46.6	88
	EER		-	2.95	3.16
2	Heating capacity		KW	78	160
			RT	22.2	45.5
	Total input power		KW	24.1	47.6
	Total rated current		A	46.5	88.7
	EER		-	3.24	3.36
Evaporator		Type	-	Shell and tube	
		Water flow rate	gpm	53	114
			m^3/h	12	25.8
		Water pressure drop	kPa	50	54
		Water pipe connection	-	DN65 (Flange)	DN80 (Flange)
Condenser		Type	-	V shaped	
		Heat exchanger	-	Hydrophilic Aluminium fin	
		Fins per inch	FPI	12	
Fan		Type	-	Axial fan	
		Number	-	2	4
		Air flow rate	m^3/h	30000	60000
		Discharge	Side/Top	Top	
Compressor		Type	-	Hermetic EVI Scroll	
		Brand	-	EMERSON	
		Combination	Pieces	2	
Refrigerant		Type	-	R410A	
Input power		Maximum	KW	31	58
Current		Maximum	A	60	105
		Starting	A	127	260.2
Power supply			Ø , V , Hz	3 , 380 , 50	
Sound pressure level			dB(A)	~70	~78
Dimension		WxHxD	mm	2200x2135x860	2200x2135x1720
Weight		Net	kg	665	1150
		Operating		710	1250

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

According to our innovation policy, some specifications may be change without prior notification.

YEAR-ROUND COOLING MODULAR UNIT

Year-round cooling modular unit is applicable for industrial applications, and requirements on energy saving and environment protection. It can operate for refrigeration at the ambient temperature of -10°C to +48°C all the year round, with environment-friendly refrigerant R410A, advanced electronic expansion valve control technology, efficient shell and tube heat exchanger, DC fan with stepless speed regulation, fully meeting the requirements of various industry applications for chilled water throughout the year.

High Precision Electronic Expansion Valve

The electronic expansion valve achieves 480 regulating range, precision throttle control technology to realize dynamic matching in refrigerating system, fully improve the optimum efficiency of each component and ensure the optimum condition of system operation pressure and temperature.

Dry-type Shell and Tube Heat Exchanger

The unit employs efficient dry-type heat exchanger as the waterside heat exchanger which has excellent anti-freezing performance and higher tolerance to impurities in water system, ensuring more reliable and stable operation of the unit.

Wide Operation Range of Banging

The modular water chiller unit is specially designed and can run in all weathers at the ambient temperature of -10°C to +48°C.

DC Fan with Stepless Speed Regulation

The condensate fan employs the DC brushless motor of which the speed is variable between 20%-100% to ensure that condensing pressure is within the range of safe operation under all conditions for longer service life.

Technical Data

AFRA

Model No.				HQNF20B2SHA
1	Cooling capacity		KW	66
			RT	18.8
	Total input power		KW	23.1
	Total rated current		A	45.5
	EER		-	2.86
2	Heating capacity		KW	70
			RT	19.9
	Total input power		KW	23.7
	Total rated current		A	46.6
	EER		-	2.95
Evaporator		Type	-	Shell and tube
		Water flow rate	gpm	50
			m^3/h	11.4
		Water pressure drop	kPa	45
		Water pipe connection	-	DN65 (Flange)
Condenser		Type	-	V shaped
		Heat exchanger	-	Hydrophilic Aluminium fin
		Fins per inch	FPI	12
Fan		Type	-	Axial fan
		Number	-	2
		Air flow rate	m^3/h	26000
		Discharge	Side/Top	Top
Compressor		Type	-	Hermetic Scroll
		Brand	-	EMERSON
		Combination	Pieces	2
Refrigerant		Type	-	R410A
Input power		Maximum	KW	30.2
Current		Maximum	A	50
		Starting	A	140
Power supply			Ø , V , Hz	3 , 380 , 50
Sound pressure level			dB(A)	~70
Dimension		WxHxD	mm	2200x1980x860
Weight		Net	kg	620
		Operating		680

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 12 modules.

Large Air-cooled Scroll Chiller

Our air cooled scroll chiller (heat pump) uses eco-friendly refrigerant R410A. Such chlorine-free refrigerant does not harm the ozone layer (zero-ODP), and is stable and nontoxic. Therefore, it is environmental friendly and is unlikely to be replaced. In addition, it is good in heat exchanging, which could help boost the unit performance and lower energy consumption.

Efficient flexible scroll compressor

The unit uses the well-known hermetic efficient scroll compressor and the optimized scroll and sealing ring so that the refrigerant compressor features axial and radial flexibility. This not only effectively reduces refrigerant leakage, but also raises the volumetric efficiency of the compressor. Moreover, each compressor is equipped with a unidirectional discharge valve to avoid backflow of the refrigerant and ensure that the compressor can run stably in the full operating condition.

High precision electronic expansion valve

The unit adopts the 480-step electronic expansion valve of premium brand (for total heat recovery: 500 steps) for precise adjustment of refrigerant flow, and refrigerant in the system is dynamically adjusted to suit the load demands in a fast and accurate way, to greatly improve the unit energy efficiency.

High efficiency & energy saving

EER of air cooled scroll chiller (heat pump) at full load is greater than 3.3, reaching and exceeding national grade 2 energy efficiency standard. Air cooled scroll chiller (heat pump) has achieved the Energy Conservation Certification issued by the authoritative detection institute certified by China National Accreditation Service for Conformity Assessment (CNAS). The whole unit adopts air-cooled mode without the need of large external equipment such as boiler and cooling tower, thereby reducing initial investment.

Efficient Shell and Tube Heat Exchanger

The water-side heat exchanger employs the efficient shell and tube heat exchanger. Compared with the plate heat exchanger, the shell-and-tube heat exchanger provides wider water-side channels and produces less water resistance and scale, with less possibility of being blocked by impurity. Therefore, the shell-and-tube heat exchanger raises lower requirements for water quality and is equipped with more powerful anti-freezing capability.

Microcomputer control system

Air cooled scroll chiller (heat pump) employs the third-generation microcomputer control system and wired controllers that are upgraded. The third-generation microcomputer control panel integrates phase sequence detection and current detection features and provides more USB ports to facilitate subsequent maintenance and upgrade self-developed control program. Moreover, the unit supports modular control, and up to 8 modules can be combined in parallel mode. When the unit is deployed in a modular system, the master and slave units can be set on demand. A faulty master unit can be easily replaced without affecting monitoring and running of the entire system.

Unique energy regulation

When air cooled scroll chiller (heat pump) is deployed in a modular system, with smart energy regulation technology, the first system of each modular unit is loaded before loading the corresponding second system. In this way, the inlet and outlet water temperature difference of the modular unit at part load can be effectively balanced with less water temperature fluctuation, to raise the energy efficiency ratio of the modular unit at part load and enhance the anti-freezing capability of the water-side heat exchanger in winter, making the multi-modular unit a compact and easy-to-use system that features high efficiency and automatic energy regulation.

High-performance fan

The air cooled scroll chiller (heat pump) is installed with IP54-rated (or higher) fan motor, to ensure safe and reliable running in the most severe weather conditions.

Smart air flow regulation

With the common air system, the new-generation air cooled scroll chiller (heat pump) implements hierarchical control of fans. The unit with a single module can automatically adjust the number of active fans based on the ambient temperature so that the air flow change of the unit best matches the load change without frequently powering on or off fans. Therefore, the pressure of the system is stable with small water temperature fluctuation and the modular unit can run more reliably. Moreover, the common air system and hierarchical fan control design greatly increases the temperature ranges of the unit in cooling and heating modes.

User-friendly control

The unit is equipped with a perfect control program, providing the following functions: balanced running of the compressor, standby operation, smart anti-freezing running, manual defrosting, automatic fault judgment, automatic fault handling, and automatic alarm display. Additionally, the control part can use a multi-functional centralized controller (with keys , 7" touch screen). The centralized controller can be customized to provide multiple functions, such as scheduled power-on/power-off, running on weekends/in holidays, memory upon power-off, and multi-level passwords.

Improved protection functions

The unit programs have multiple protection functions to guarantee stable and reliable running. This unit is equipped with a water flow switch, which does not need to be installed and debugged during installation. This makes the unit running safer, simplifies the installation process, and reduces the costs, thus providing a cost-effective and convenient solution to customers.

Technical Data

AFRA

Model No.				HQNF50B4SH	HQNF80B4SH
1	Cooling capacity		KW	165	260
			RT	46.9	73.9
	Total input power		KW	50	78
	Total rated current		A	101	159
	EER		-	3.30	3.33
2	Heating capacity		KW	180	280
			RT	51.2	79.6
	Total input power		KW	54	84
	Total rated current		A	103	166
	EER		-	3.33	3.33
Evaporator		Type	-	Shell and tube	
		Water flow rate	gpm	125	198
			m^3/h	28.4	45
		Water pressure drop	kPa	45	45
		Water pipe connection	-	DN80 (Victaulic)	DN100 (Victaulic)
Condenser		Type	-	V shaped	
		Heat exchanger	-	Hydrophilic Aluminium fin	
		Fins per inch	FPI	12	
Fan		Type	-	Axial fan	
		Number	-	4	
		Air flow rate	m^3/h	66000	112000
		Discharge	Side/Top	Top	
Compressor		Type	-	Scroll	
		Brand	-	DANFOSS	
		Combination	Pieces	4	
Refrigerant		Type	-	R410A	
Input power		Maximum	KW	73.2	123.4
Current		Maximum	A	135	220
		Starting	A	203	274
Power supply			Ø , V , Hz	3 , 380 , 50	
Sound pressure level			dB(A)	~72	~75
Dimension		WxHxD	mm	1720x2000x2200	2400x2235x2200
Weight		Net	kg	1460	2050
		Operating		1590	2250

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 8 modules.

Model No.				HQNF100C3SH	HQNF140B4SH
1	Cooling capacity		KW	340	460
			RT	96.7	130.8
	Total input power		KW	105	142
	Total rated current		A	191	257
	EER		-	3.24	3.24
2	Heating capacity		KW	370	485
			RT	105.2	137.9
	Total input power		KW	111	147
	Total rated current		A	202	272
	EER		-	3.33	3.30
Evaporator		Type	-	Shell and tube	
		Water flow rate	gpm	257	333
			m^3/h	58.5	75.7
		Water pressure drop	kPa	52	56
		Water pipe connection	-	DN125 (Victaulic)	
Condenser		Type	-	V shaped	
		Heat exchanger	-	Hydrophilic Aluminium fin	
		Fins per inch	FPI	12	
Fan		Type	-	Axial fan	
		Number	-	6	8
		Air flow rate	m^3/h	123000	164000
		Discharge	Side/Top	Top	
Compressor		Type	-	Scroll	
		Brand	-	COPELAND	
		Combination	Pieces	3	4
Refrigerant		Type	-	R410A	
Input power		Maximum	KW	146	198
Current		Maximum	A	255	340
		Starting	A	319	417
Power supply			Ø , V , Hz	3 , 380 , 50	
Sound pressure level			dB(A)	~75	
Dimension		WxHxD	mm	2250x2450x3500	2250x2520x4700
Weight		Net	kg	3100	3700
		Operating		3550	4200

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 : Hot water outlet : 45 °C
Outdoor ambient temp. : 7 °C DB
Sea level : 4000 ft
Fan input power included
Pump input power not included

- Water side fouling factor : 0.000018 m^2 . °C / KW
- Measuring sound pressure level at 2m away and ±2dB tolerance
- The characteristics of water flow rate and water pressure drop are given based on case "1".
- Each system can combine up to 8 modules.

Cooling Capacity Correction factor for units; HQNFXXXXXH / HQNFXXXXXL / HQNFXXXXXHR / HQNFXXXXXHF / HQNFXXXXXHE

LWT (°C)	Ambient Temp. (°C)																	
	5		10		15		20		25		30		35		40		48	
	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input
5	1.06	0.72	1.08	0.73	1.09	0.71	1.09	0.78	1.04	0.84	0.99	0.90	0.93	0.97	0.87	1.01	0.80	1.08
7	1.14	0.75	1.16	0.76	1.17	0.74	1.16	0.81	1.11	0.87	1.06	0.93	1.00	1.00	0.94	1.04	0.87	1.11
9	1.21	0.78	1.23	0.79	1.24	0.77	1.23	0.84	1.18	0.90	1.13	0.96	1.07	1.03	1.01	1.07	0.94	1.14
12	1.28	0.81	1.30	0.82	1.31	0.80	1.30	0.87	1.25	0.93	1.20	0.99	1.14	1.06	1.08	1.10	1.01	1.17
15	1.35	0.84	1.37	0.85	1.38	0.83	1.37	0.90	1.32	0.96	1.27	1.02	1.21	1.09	1.15	1.13	1.08	1.20
20	1.40	0.88	1.43	0.89	1.44	0.87	1.42	0.94	1.38	1.00	1.32	1.06	1.26	1.13	1.20	1.17	1.13	1.24

Heating Capacity Correction factor for units; HQNFXXXXH / HQNFXXXXHR / HQNFXXXXHF / HQNFXXXXHE

LWT (°C)	Ambient Temp. (°C)																	
	-15		-10		-5		0		7		10		15		20		25	
	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input	Heating	Power Input
30	0.50	0.71	0.65	0.72	0.76	0.73	0.89	0.79	1.05	0.83	1.12	0.85	1.20	0.87	1.30	0.89	1.37	0.91
35	0.48	0.77	0.63	0.78	0.74	0.79	0.87	0.85	1.06	0.89	1.10	0.91	1.18	0.93	1.28	0.95	1.35	0.97
40	0.46	0.83	0.61	0.84	0.72	0.85	0.85	0.91	1.01	0.95	1.06	0.97	1.14	0.99	1.24	1.01	1.31	1.03
45	-	-	0.60	0.89	0.71	0.90	0.84	0.96	1.00	1.00	1.03	1.03	1.11	1.05	1.21	1.07	1.28	1.09
50	-	-	-	-	0.68	0.96	0.81	1.02	0.97	1.06	1.00	1.09	1.08	1.11	1.18	1.13	1.25	1.15

- Excluding the data under the ambient temperature of -15 (°C).

AFRA

Cooling Capacity Correction factor for unit; HQNFXXXXHA

LWT (°C)	Ambient Temp. (°C)																	
	5		10		15		20		25		30		35		40		48	
	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input
5	1.06	0.72	1.08	0.73	1.09	0.71	1.09	0.78	1.04	0.84	0.99	0.90	0.93	0.97	0.87	1.01	0.80	1.08
7	1.14	0.75	1.16	0.76	1.17	0.74	1.16	0.81	1.11	0.87	1.06	0.93	1.00	1.00	0.94	1.04	0.87	1.11
9	1.21	0.78	1.23	0.79	1.24	0.77	1.23	0.84	1.18	0.90	1.13	0.96	1.07	1.03	1.01	1.07	0.94	1.14
12	1.28	0.81	1.30	0.82	1.31	0.80	1.30	0.87	1.25	0.93	1.20	0.99	1.14	1.06	1.08	1.10	1.01	1.17
15	1.35	0.84	1.37	0.85	1.38	0.83	1.37	0.90	1.32	0.96	1.27	1.02	1.21	1.09	1.15	1.13	1.08	1.20
20	1.38	0.86	1.41	0.88	1.43	0.85	1.42	0.92	1.37	0.99	1.34	1.04	1.27	1.12	1.21	1.15	1.14	1.23

Cooling Capacity Correction factor for unit; HQNFXXXXHA

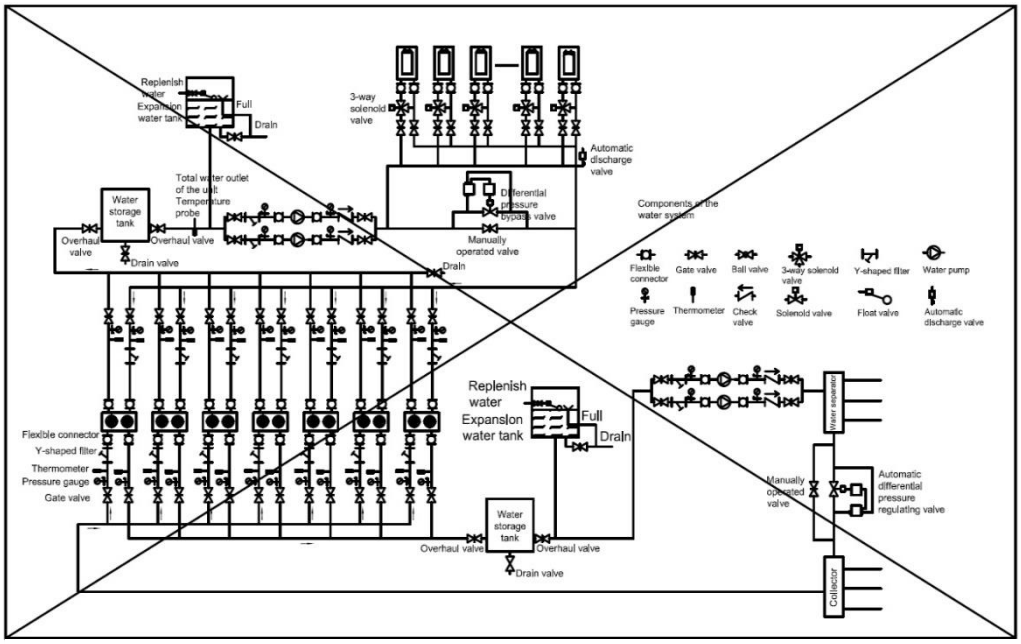
LWT (°C)	Ambient Temp. (°C)									
	-20		-15		-10		-5		0	
	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input	Cooling	Power Input
5	1.15	0.43	1.12	0.49	1.09	0.57	1.06	0.63	1.09	0.66
7	1.20	0.44	1.18	0.50	1.16	0.58	1.14	0.66	1.17	0.69
9	1.24	0.45	1.23	0.51	1.22	0.59	1.21	0.69	1.24	0.72
12	1.27	0.46	1.27	0.52	1.27	0.60	1.28	0.72	1.31	0.75
15	1.32	0.47	1.33	0.53	1.33	0.60	1.35	0.75	1.38	0.78
20	1.34	0.49	1.35	0.55	1.35	0.62	1.39	0.78	1.43	0.81

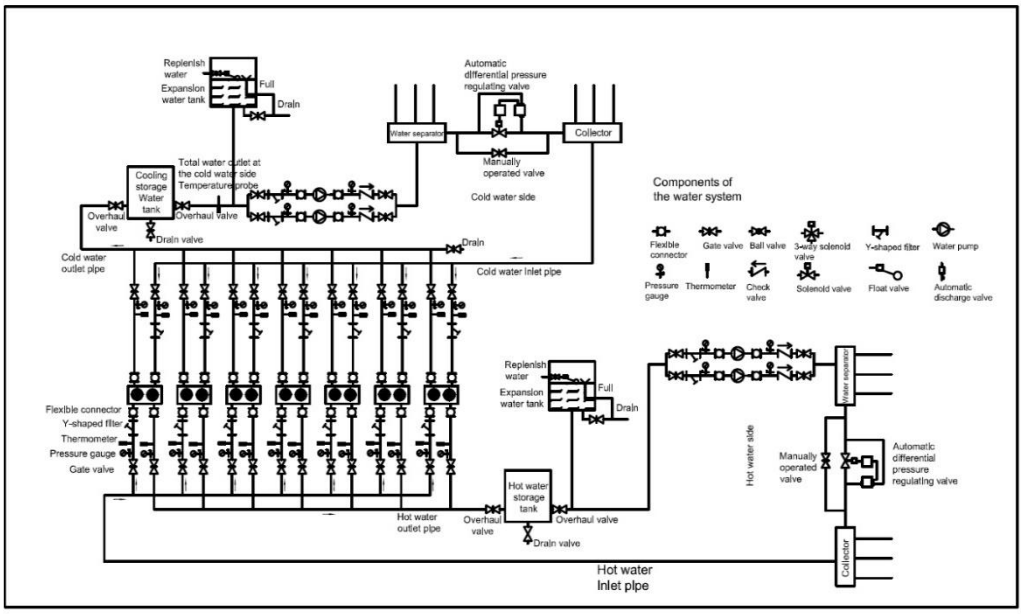
Attention

AFRA

- The water system shall be provided with safety valves and automatic water-refilling valves.
- The automatic air bleeding valve shall be provided at the highest point of water system.
- A proper water drain valve shall be set at the lowest point of the water system.
- The water system pipes shall be provided with expansion water tanks which can adapt to volume changes caused by water temperature changes.
- The water system pipes shall be provided with bypass pipes which can be connected with water lines of the main machine only after the water system is confirmed to be clean.
- The water system shall be clean frequently to prevent impurities from entering the evaporator and damage the unit.
- The unit should be equipped with the special power supply. The supply voltage fluctuates +10%. The automatic air switch should be used. setting current is 1.5 times of the running current of the unit. Inverse phase protection devices are installed. Never apply the knife switch unit.
- at the time of the first application every season, the unit must be electrified and preheated for 24 hours and start later. If the single cooling unit will stay for a long period of time, the water in the unit and the pipeline must be drained completely. After the heat pump type units stop, the master controller should correspond with the host and the power supply can never be disconnected to avoid the water pipelines or the unit frozen (the controller in accordance with the environment temperature and the temperature of the incoming water and the outgoing water automatically implement the anti-freezing functions).
- The host switch can not be operated quite often. It can be operate 6 times per hour at most. electric control cabinet should avoid humidity.
- Keep the unit in good ventilation environment constantly. Air side heat exchanger should be cleaned regularly.
- The water system should be equipped with the expansion tank. Recycling water should be clean and tidy. at the time of operation, a sufficient water flow (as for details, see the nameplate) should be maintained, or the water side heat exchanger would be frozen. and the filter should be cleaned regularly.
- Appoint the specific person to maintain and record.

In the above figure, the four units on the left are 4-pipe units, which are controlled independently; while the three units on the right are common units, which are controlled independently.





The figure shows the installation of the water system. The installation is subject to the construction drawings of the design institute.

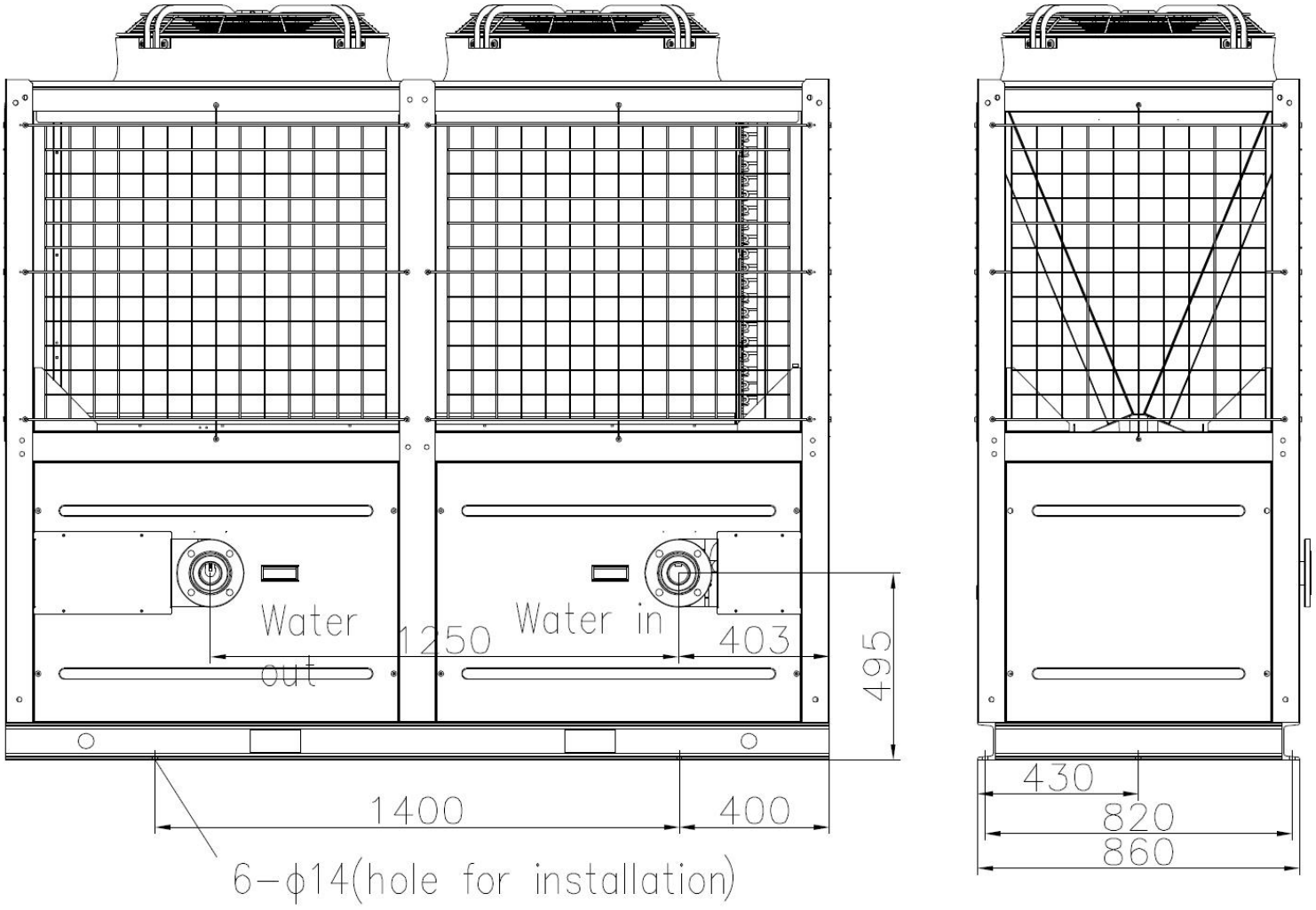
Water flow switches have be installed inside the unit and they do not need to be installed on site.

The water system of the unit should ensure that water flow each unit is allocated reasonably.

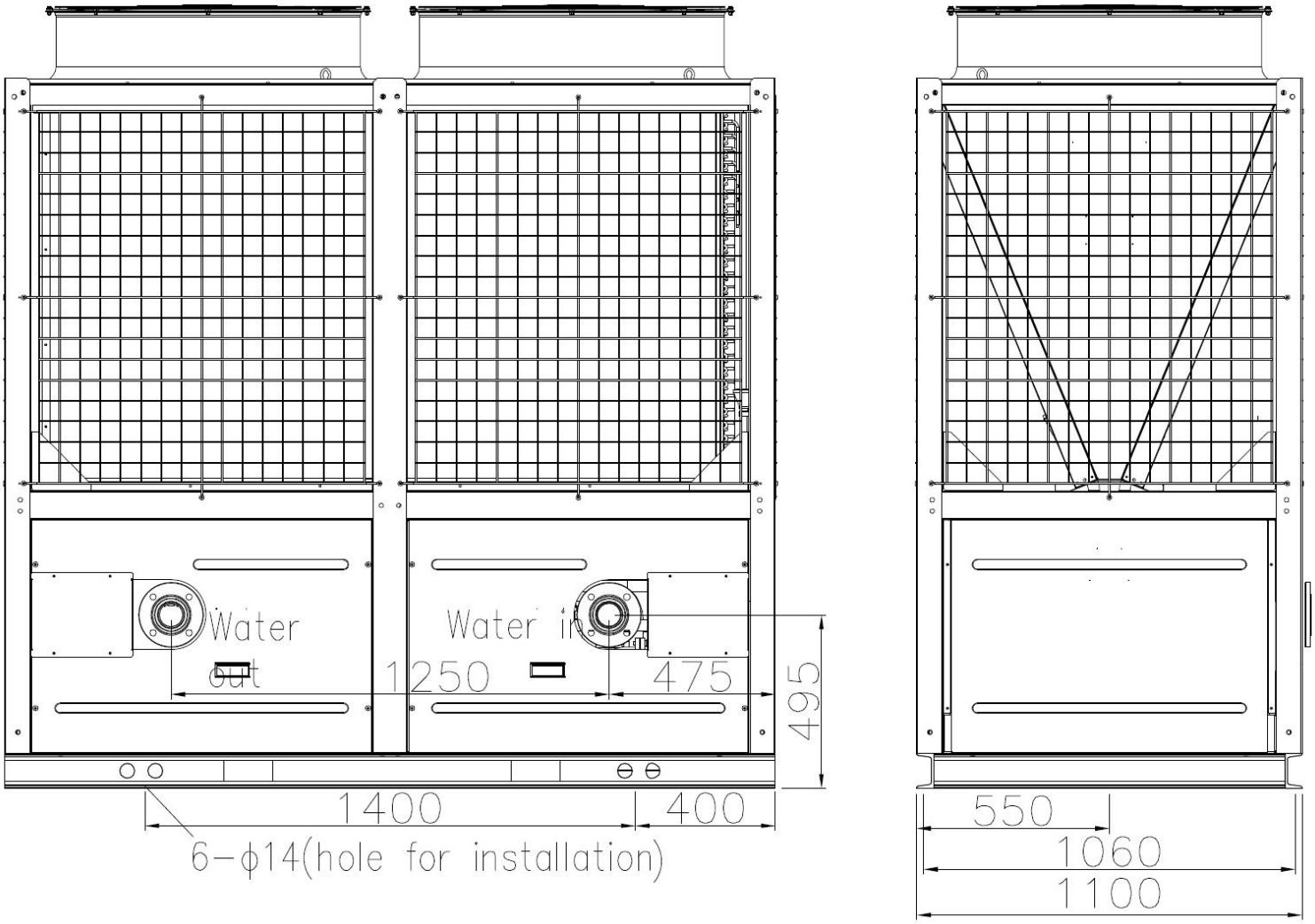
At any time as long as the unit is running, the water flow of the unit cannot be less than the value marked on the nameplate. Pay special attention to the water flow in transition seasons to avoid frequent start and stop of the unit due to over-low water outlet temperature as a result of the low condensation temperature.

Reserve sufficient space between modular chillers to guarantee ventilation.

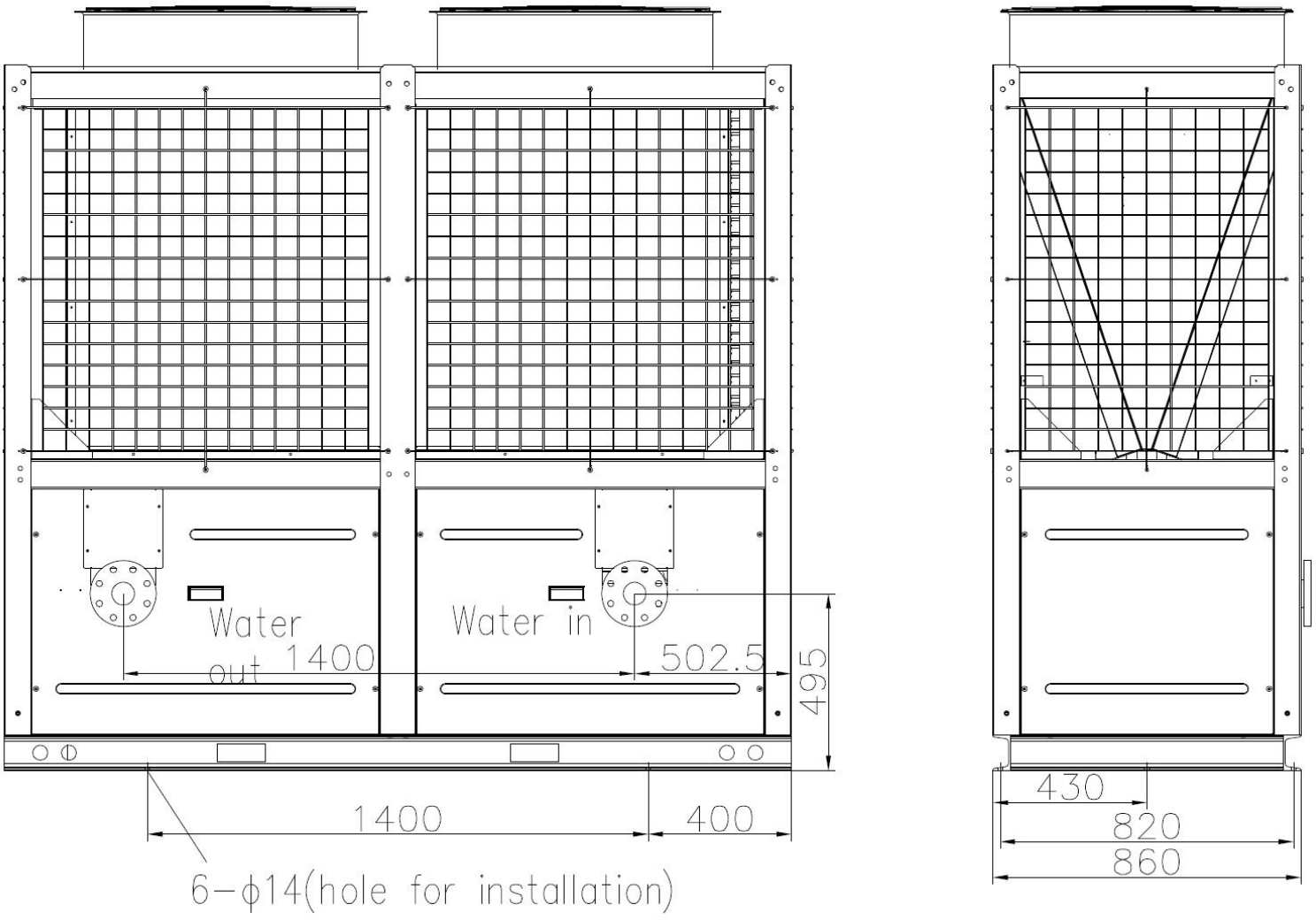
Dimensions **(HQNF20B2SH - HQNF20B2SL)**



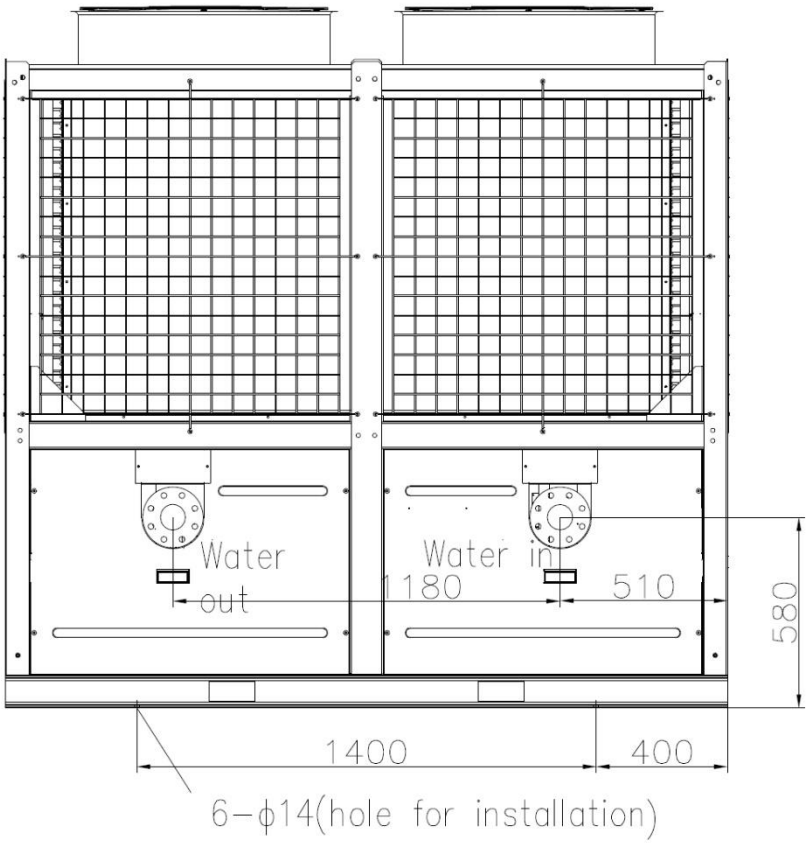
(unit : mm)

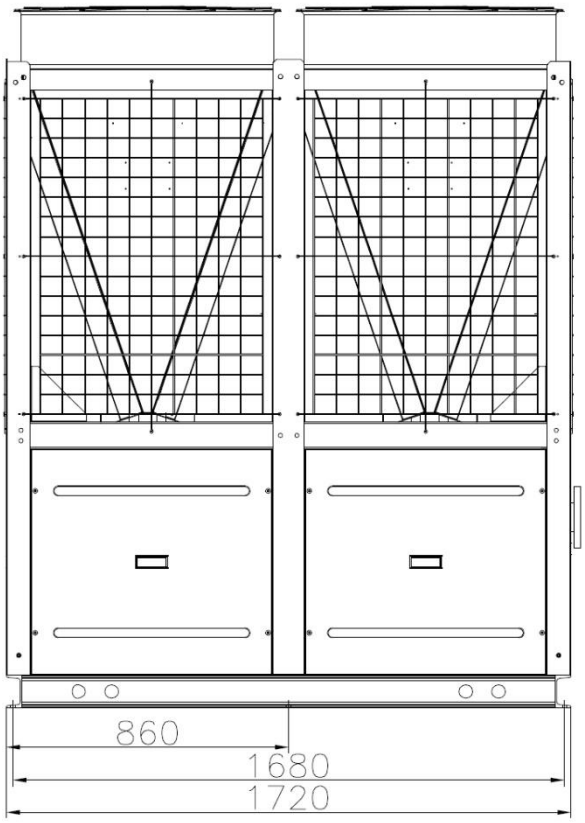

Water out
Water in
1250
475
495
1400
400
6-ϕ14(hole for installation)
550
1060
1100

(unit : mm)

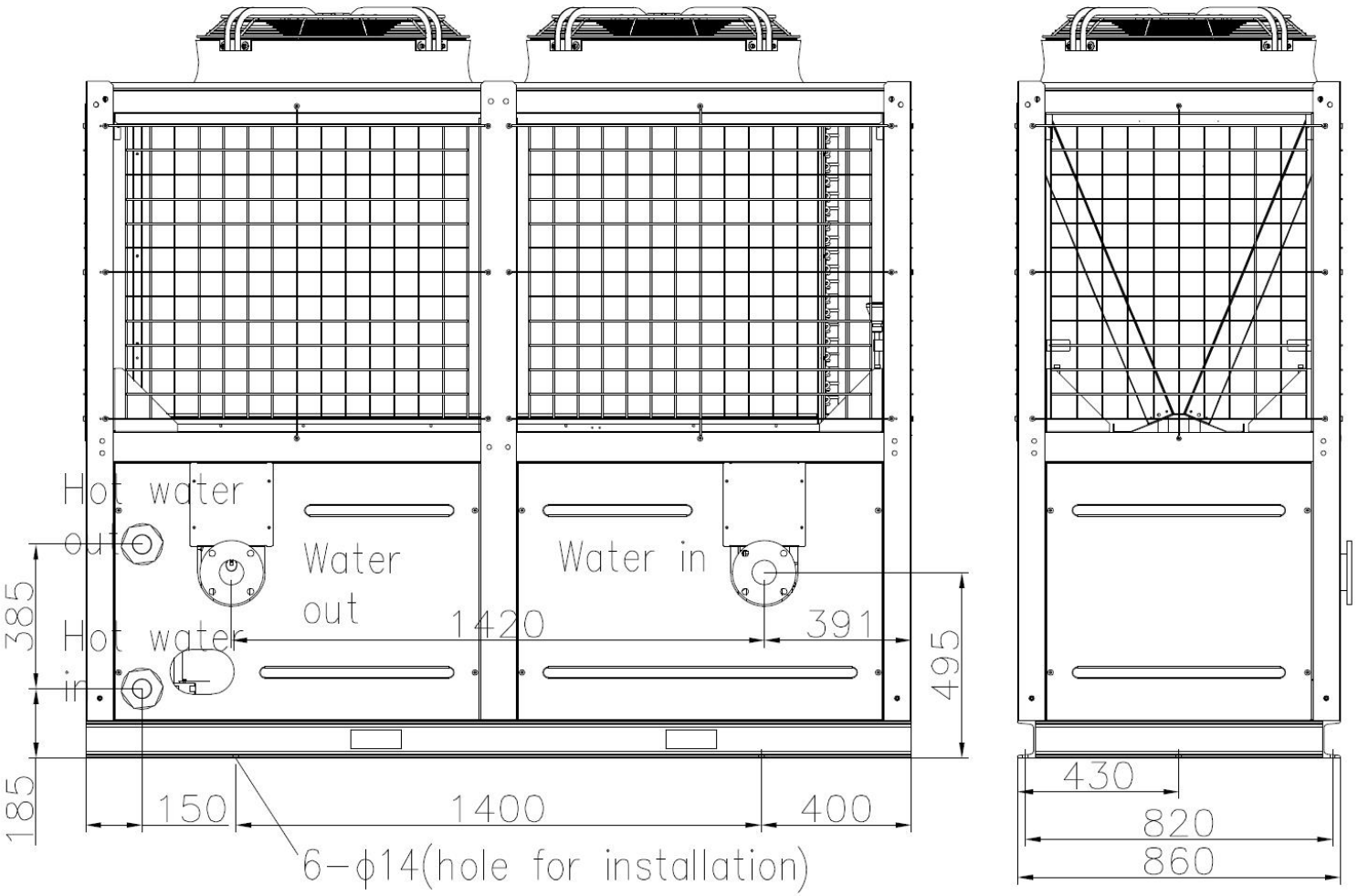

Water out
Water in
1400
502.5
495
1400
400
6−ϕ14(hole for installation)
430
820
860

(unit : mm)

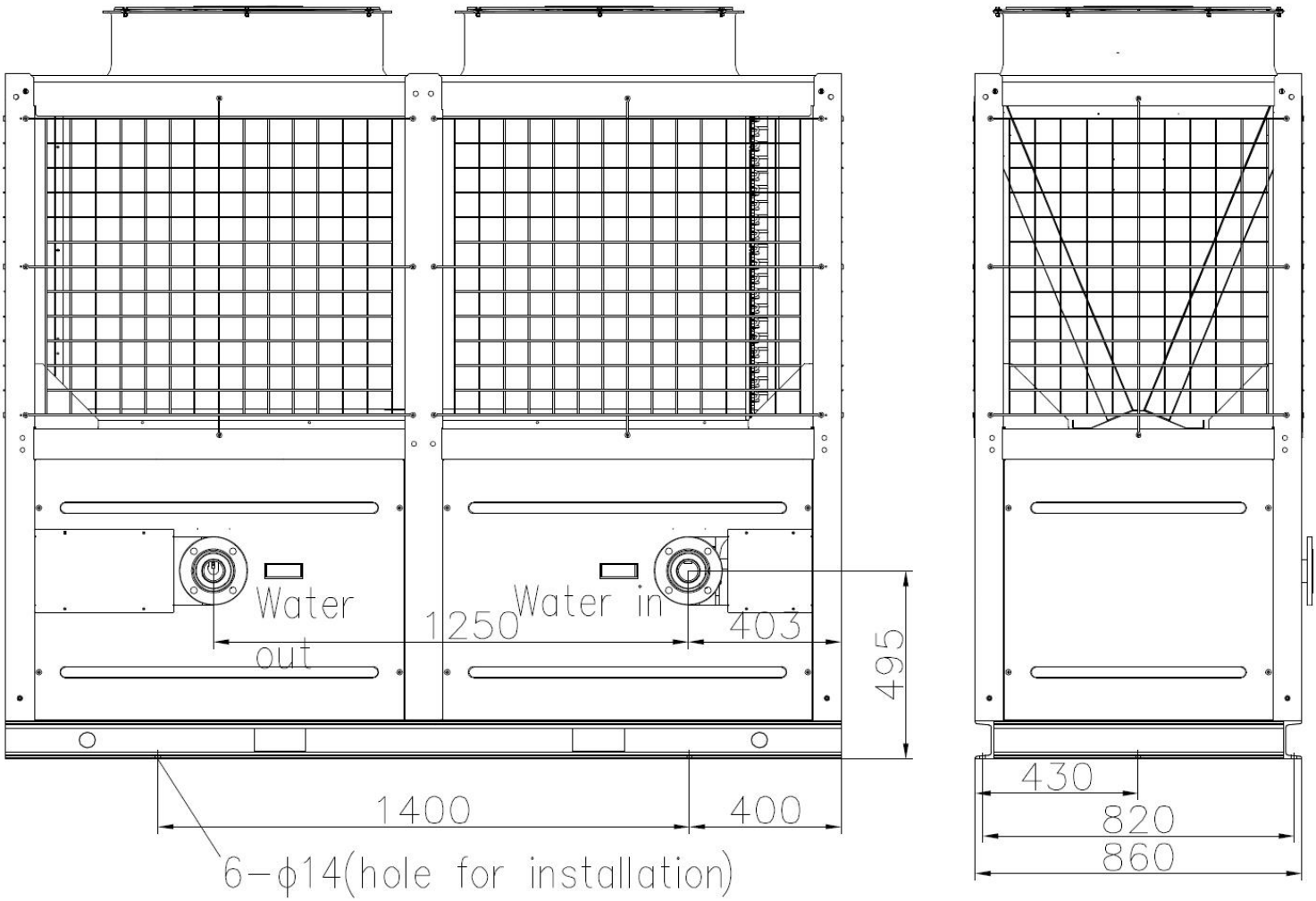

Water out
Water in
1180
510
580
1400
400
6−ϕ14(hole for installation)


860
1680
1720

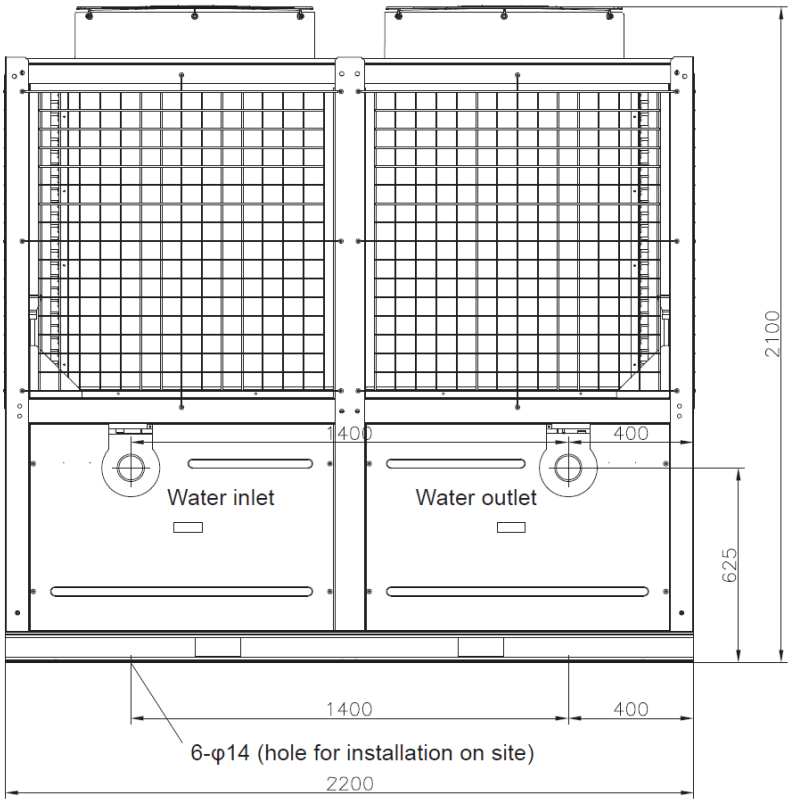
(unit : mm)

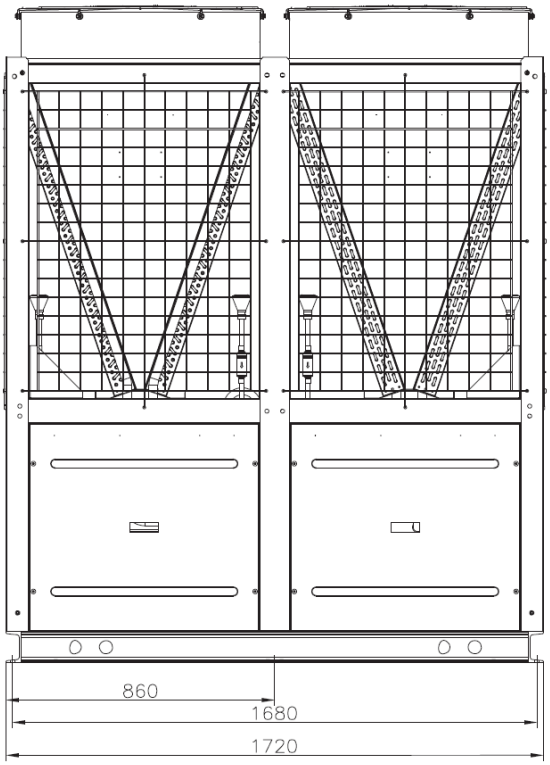

Hot water out
Water out
Water in
Hot water in
385
185
1420
391
495
150
1400
400
6−ϕ14(hole for installation)
430
820
860

(unit : mm)

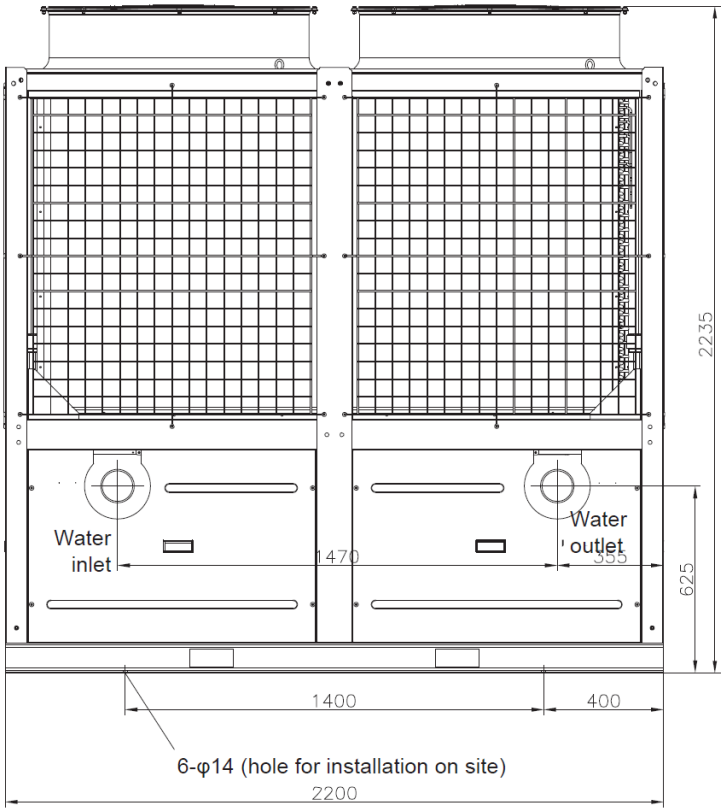

Water out
Water in
1250
403
495
1400
400
6-ϕ14(hole for installation)
430
820
860

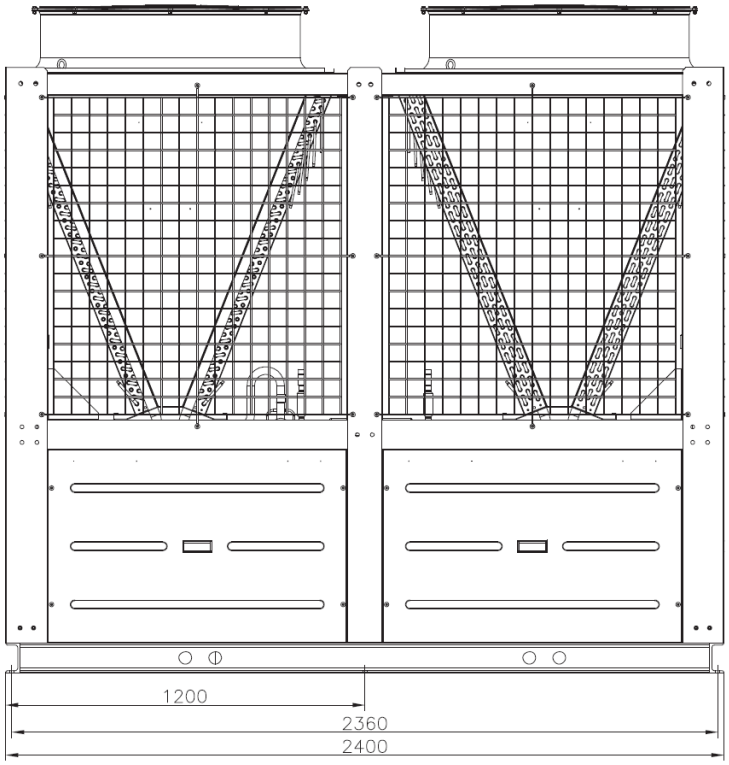
(unit : mm)


2100
1400
400
Water inlet
Water outlet
625
1400
400
6-φ14 (hole for installation on site)
2200

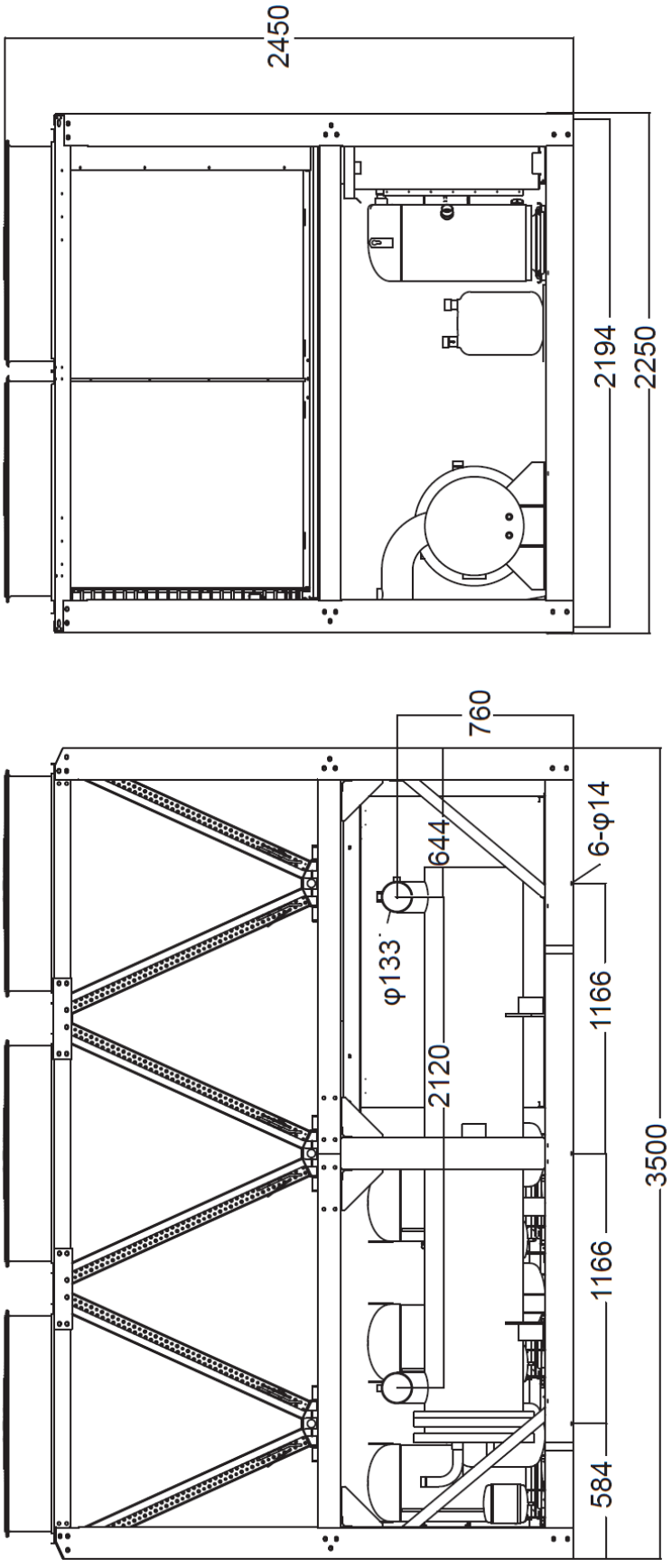

860
1680
1720

(unit : mm)

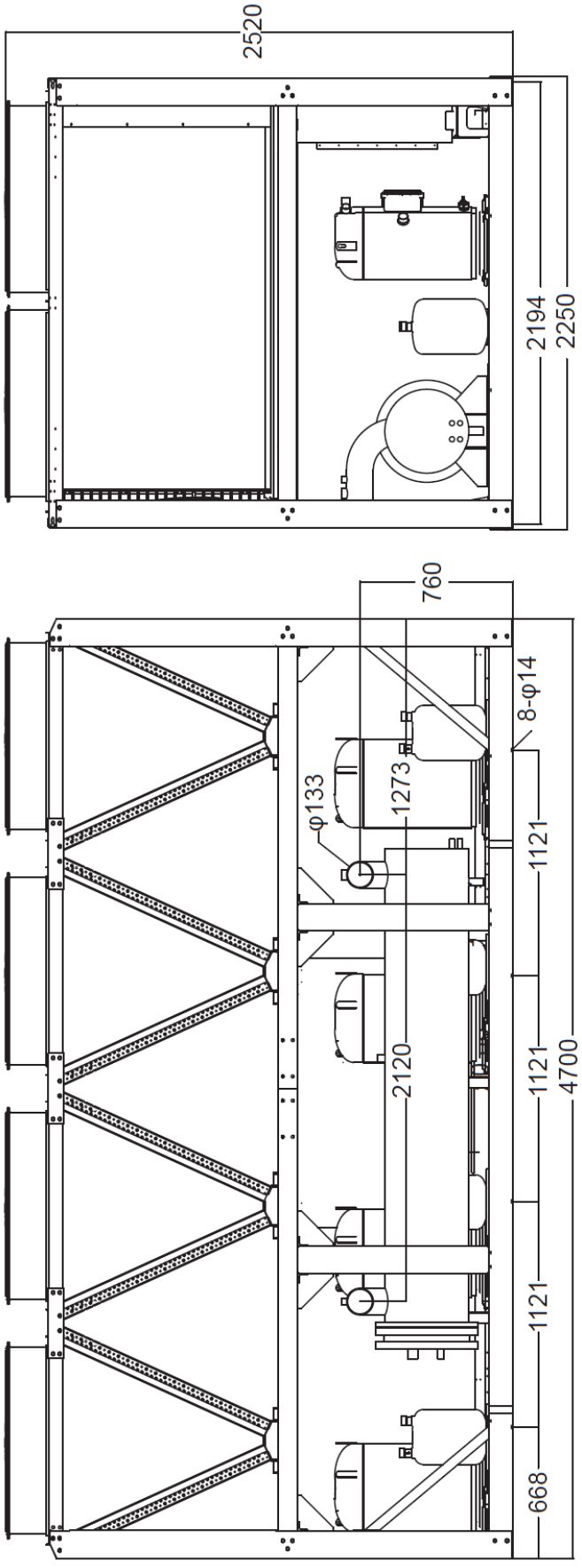

2235
Water
inlet
1470
Water
outlet
355
625
1400
400
6-φ14 (hole for installation on site)
2200


1200
2360
2400

(unit : mm)



(unit : mm)


2520
2194
2250
760
8-φ14
φ133
1273
1121
2120
1121
4700
1121
668

(unit : mm)

HQS SERIES

50 - 149 KW

Introduction

Compressor

With highly efficient performance
Anti Vibration Joint
Dehumidifier filter dryer with replaceable cartridge
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch and Pressure Transmitter

Liquid Line Equipment

Thermal Expansion Valve
Solenoid valve and sight glass
Liquid receiver with Rotalock valve
filter dryer for dehumidification refrigerant

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
Anti Freeze System

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

Condenser

Fin and Tube U shaped style that bring more heat exchange surface compared conventional flat heat-exchanger
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Electrical and Safety Equipment

Ability to synchronize with BMS
Compatible with network connection protocols
High pressure and low pressure sensor
Switch cabinet with IP54
Multi-device module capability
Light and socket in the switch cabinet
Alarm system for faults

Standard Features

AFRA

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

Item	Description	Product's Brand
Control Panel	▪ 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	Phase sequence and phase loss sensors are designed for the following measures: ▪ 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	▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance).	KLEMSAN
Contactor	▪ Connecting and disconnecting the electric current of the circuit.	SIEMENS
MSPS	Motor Start Protection System to performs an electric motor: ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor.	SIEMENS
Liquid Line	Includes: ▪ Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve.	CASTEL
Sensors	Includes: ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor.	DANFOSS
TEV	Thermal Expansion Valve: ▪ 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.

Item	Description	Product's Brand
Main Switch	▪ Power Switch (On/Off). ▪ Controlling the input current to the device.	SIEMENS
Condenser [1]	▪ 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]	▪ 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	▪ 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	▪ 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	▪ 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]	▪ 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]	Electronic Expansion Valve: ▪ Ensuring accurate control of refrigerant injection into the evaporator.	DANFOSS
5. Oil Heater	▪ Preventing the mix of the refrigerant and the compressor oil.	-
6. Oil Separator	▪ 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.

Item	Description	Product's Brand
7. Accumulator	▪ 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	▪ 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	A. UPS buffered controller to prevent damage during operating. B. Cooling system specially for switch cabinet.	-
10. Fan [1]	A. ROSENBERG trademark. B. ZILABEG trademark. C. EBMPAPST trademark. D. Sound reduction diffuser. (Executable only for EUROVENT fans)	-

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

AFRA

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			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	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 m^2 . °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			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	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 m^2 . °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			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	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 m^2 . °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			Ø , 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 m^2 . °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

AFRA

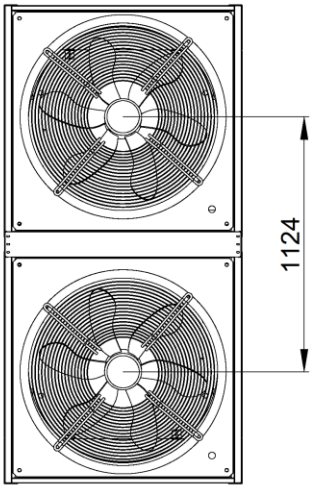
Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HQSD20B2SC	30	53.5	18.1	35.2	2.95
	35	50.2	19.9	37.4	2.52
	37	48.9	20.7	38.4	2.36
	40	46.7	21.9	40.1	2.13
	42	45.2	22.8	41.3	1.98
	46	42.1	24.7	43.9	1.70
HQSD25B2SC	30	66.9	22.2	43.1	3.01
	35	61.9	24.4	45.8	2.54
	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

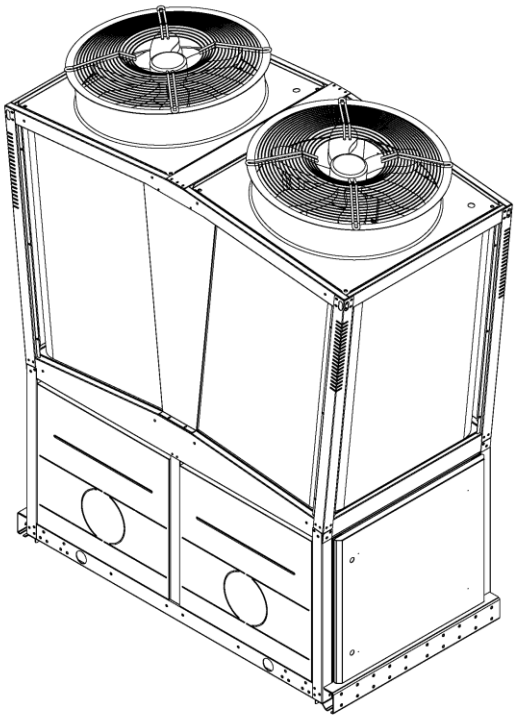
- Chilled water inlet / outlet : 12 °C / 7 °C

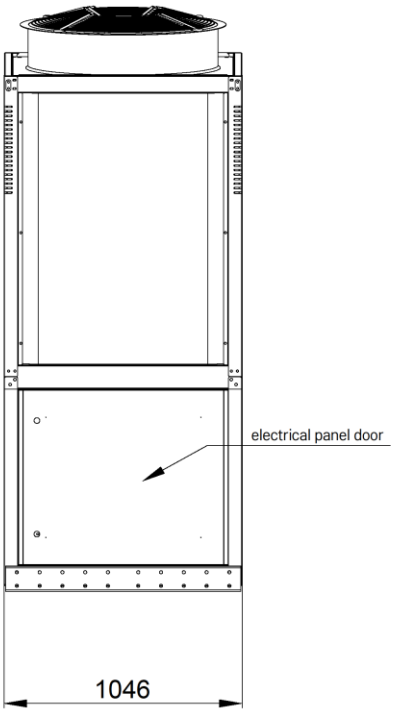
Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HQSD80C6SC	30	200.7	66.7	129.2	3.01
	35	185.8	73.2	137.5	2.54
	37	180.3	76.2	141.2	2.37
	40	170.9	81.0	147.4	2.11
	42	164.9	84.3	151.9	1.96
	46	152.2	91.5	161.8	1.66
HQSD95C6SC	30	234.9	77.4	163.8	3.03
	35	219.5	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

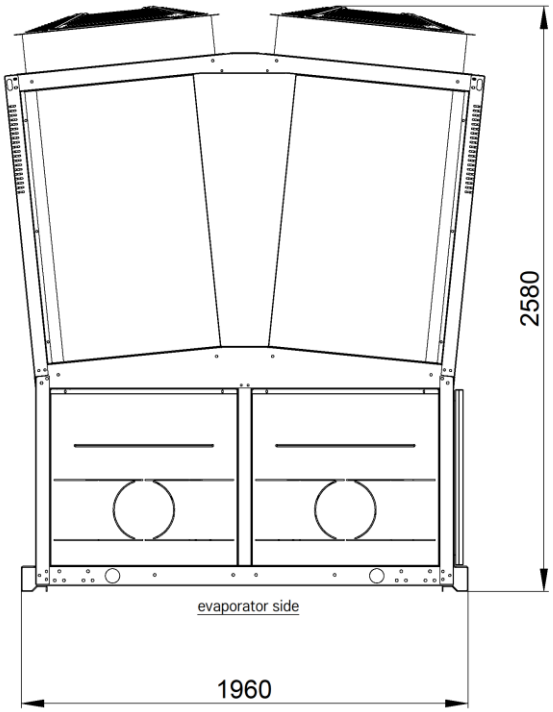
- Chilled water inlet / outlet : 12 °C / 7 °C

Dimensions (HQSD20B2SC - HQSD25B2SC - HQSD30B2SC)









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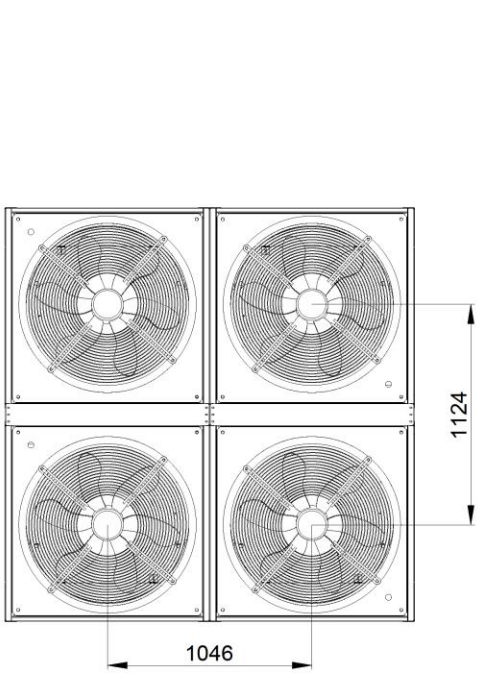
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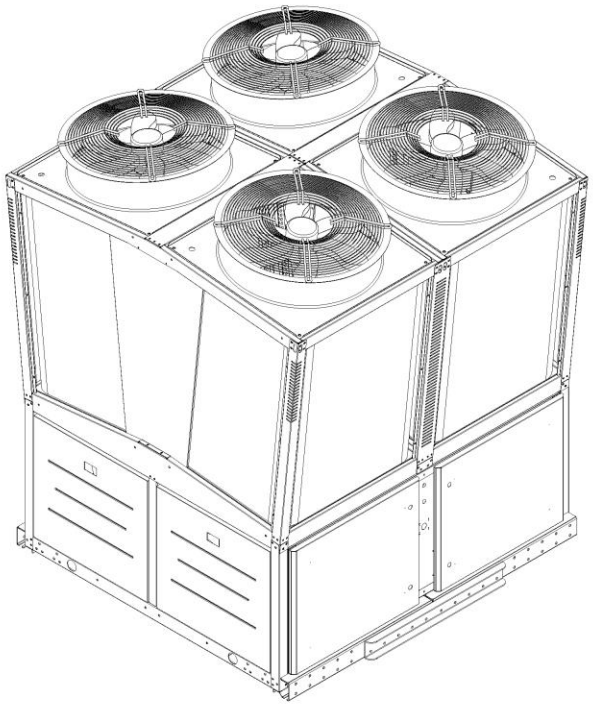

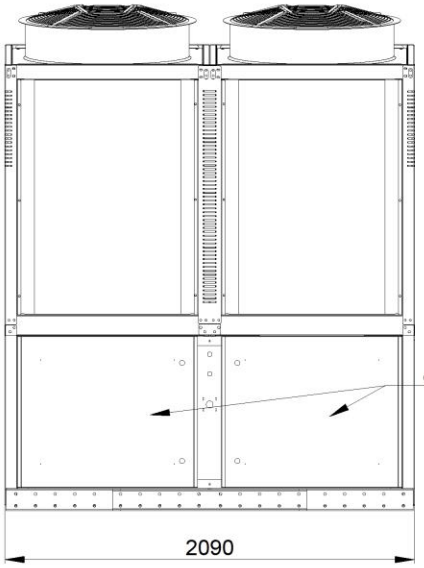
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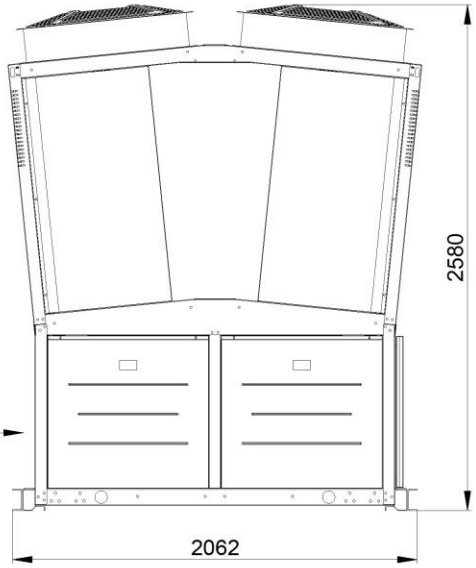
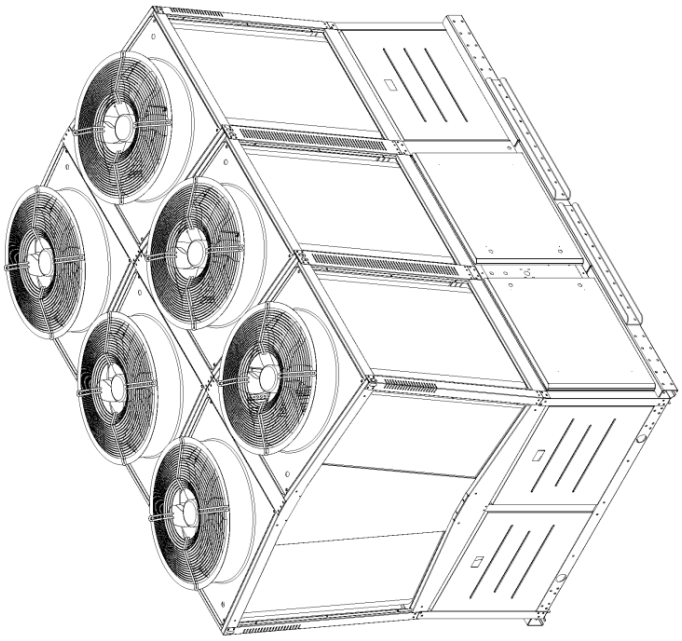
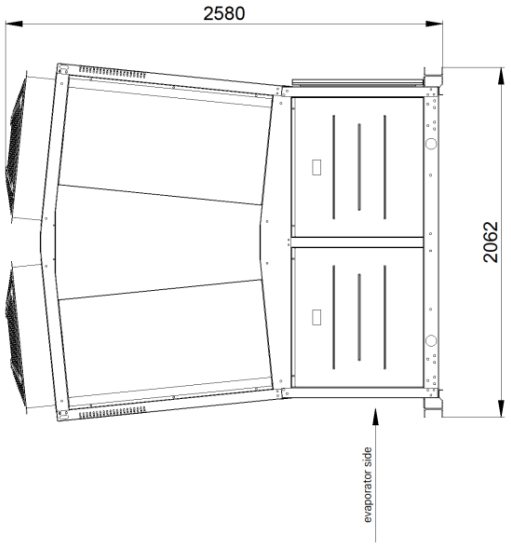
2090


evaporator side
2580
2062

(unit : mm)

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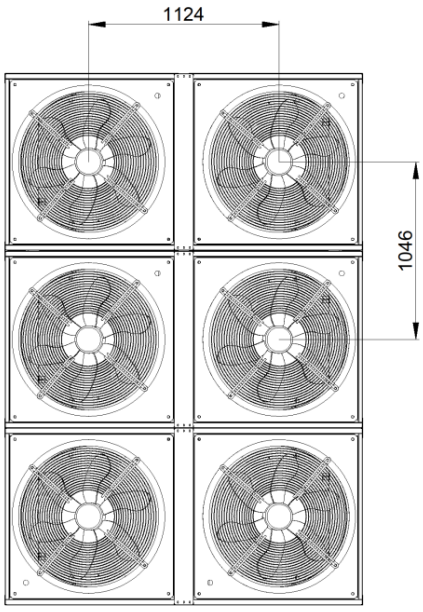
2062
evaporator side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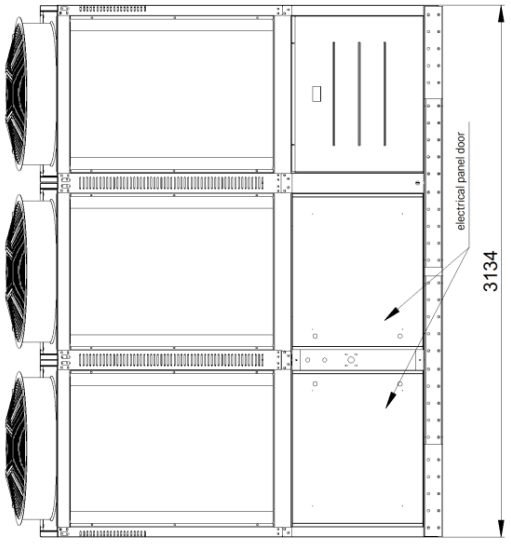
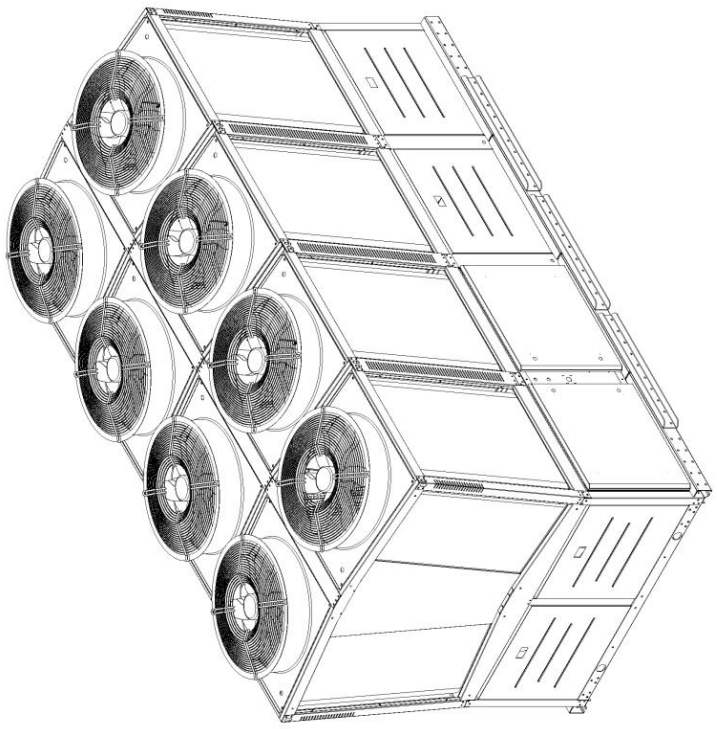
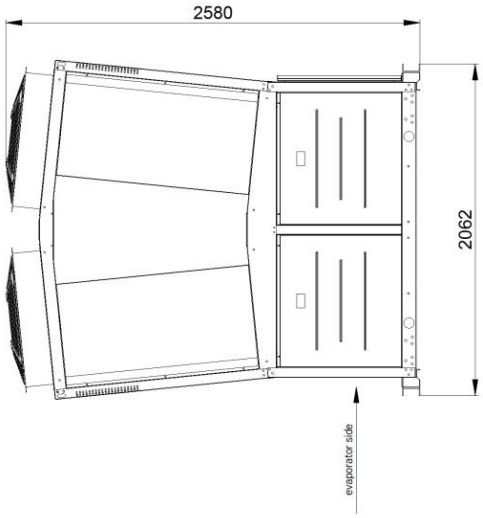
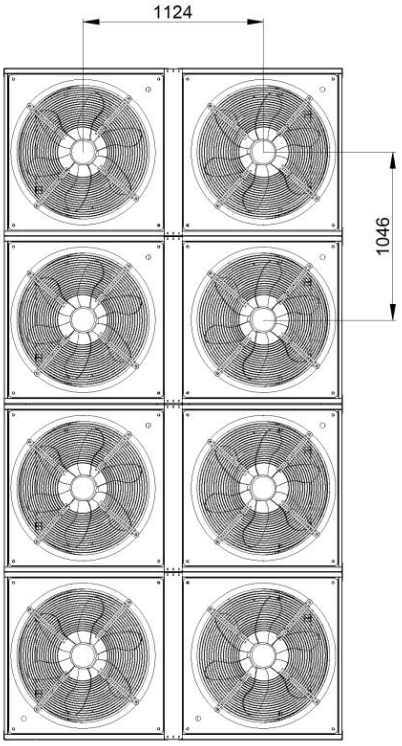

electrical panel door
3134

(unit : mm)




2580
2062
evaporator side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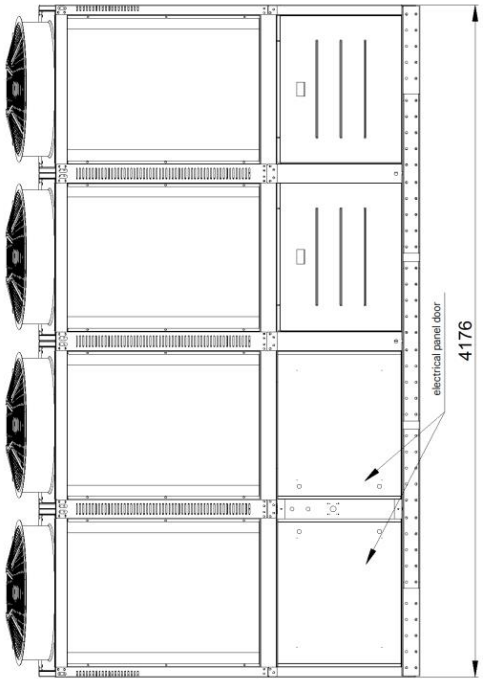
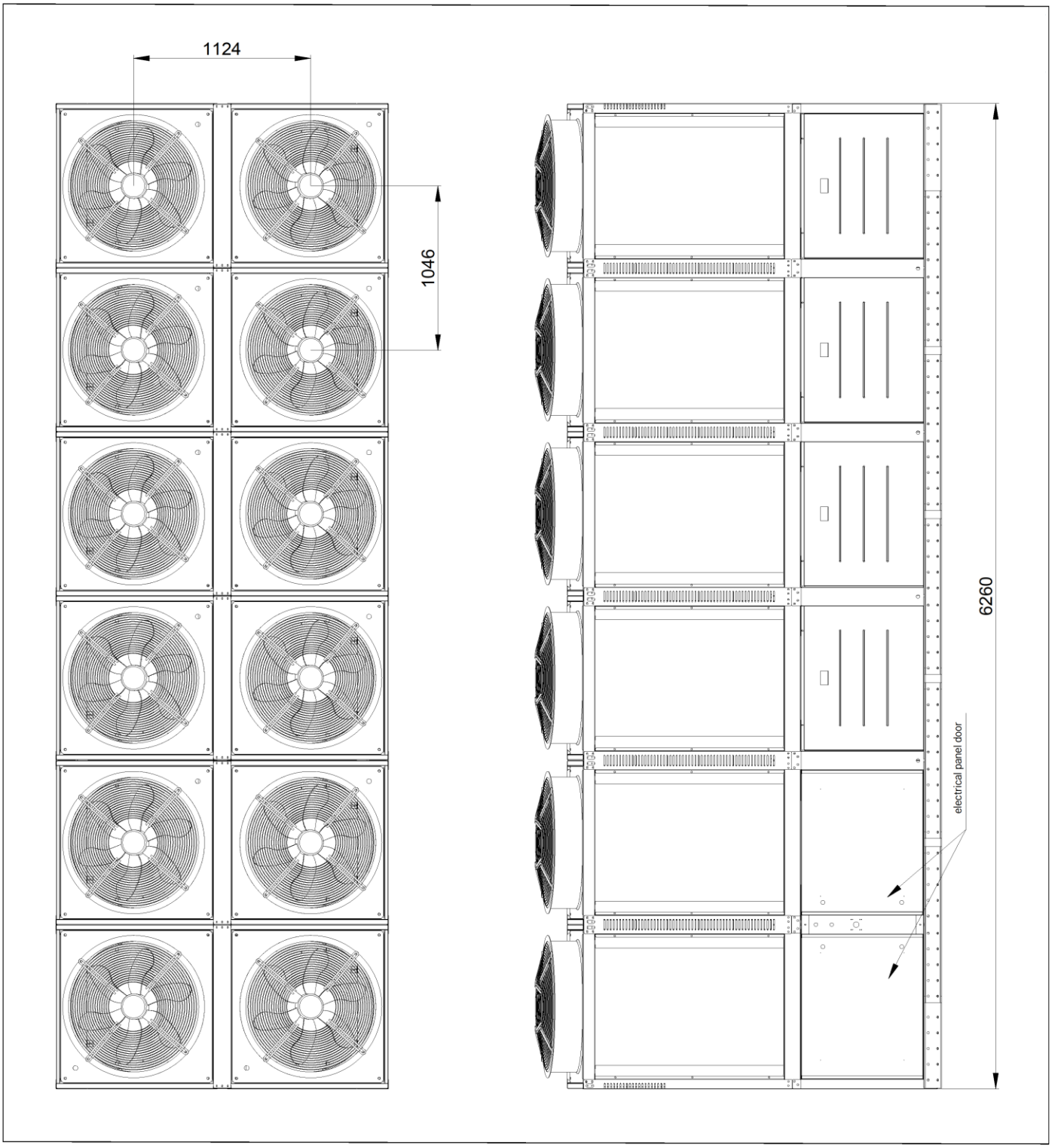
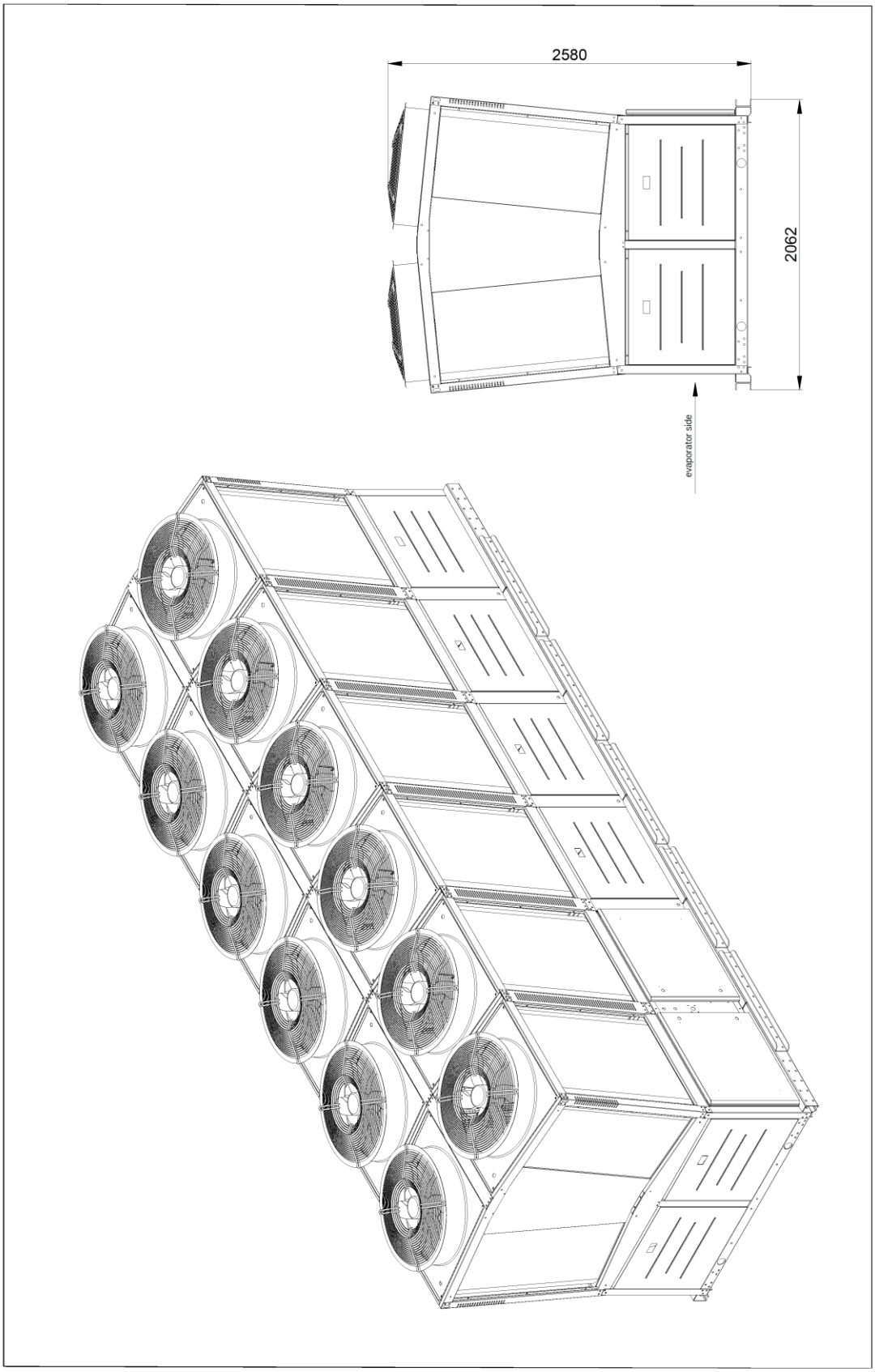

electrical panel door
4176

(unit : mm)



(unit : mm)



(unit : mm)

HTS SERIES

114 - 898 KW

Compressor

With highly efficient performance
Anti Vibration Joint
Oil heater System
Dehumidifier filter dryer with replaceable cartridge
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch and Pressure Transmitter

Liquid Line Equipment

Electronic Expansion Valve
Solenoid valve and sight glass
Liquid receiver with Rotalock valve
filter dryer for dehumidification refrigerant

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
Anti Freeze System

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

Condenser

Fin and Tube U shaped style that bring more heat exchange surface compared conventional flat heat-exchanger
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Electrical and Safety Equipment

Ability to synchronize with BMS
Compatible with network connection protocols
High pressure and low pressure sensor
Switch cabinet with IP54
Multi-device module capability
Light and socket in the switch cabinet
Alarm system for faults

Standard Features

AFRA

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

Item	Description	Product's Brand
VFD Controller	▪ 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
Control Panel	▪ 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
Phase Control	Phase sequence and phase loss sensors are designed for the following measures: ▪ 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	▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance).	KLEMSAN
Contactor	▪ Connecting and disconnecting the electric current of the circuit.	SIEMENS
MSPS	Motor Start Protection System to performs an electric motor: ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor.	SIEMENS
Liquid Line	Includes: Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve.	CASTEL

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

- Compressors are equipped with Oil Pressure Safety Control and Oil Heater by the default.

Item	Description	Product's Brand
Sensors	Includes: ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor.	DANFOSS
EEV	Electronic Expansion Valve: ▪ Ensuring accurate control of refrigerant injection into the evaporator.	DANFOSS
Main Switch	▪ Power Switch (On/Off). ▪ Controlling the input current to the device.	SIEMENS
Condenser [1]	▪ 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]	▪ 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	▪ 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 BITZER screw compressor trademark. Contact us for more data about other brands.

- Compressors are equipped with Oil Pressure Safety Control and Oil Heater by the default.

Options

AFRA

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

Item	Description	Product's Brand
1. Soft Starter	▪ 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. Oil Separator	▪ 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
3. Accumulator	▪ 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
4. Economizer	▪ Increasing the efficiency by creating a sub-circuit. ▪ Improving the system performance. ▪ Energy saving. ▪ Utilizing brazed plate heat exchanger.	KELVION (Heat Exchanger)
5. Switch Cabinet	E. UPS buffered controller to prevent damage during operating. F. Cooling system specially for switch cabinet.	-
6. Fan	A. ROSENBERG trademark. B. ZILABEG trademark. C. EBMPAPST trademark. D. Sound reduction diffuser. (Executable only for EUROVENT fans)	-

- 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

AFRA

Model No.				HTSE60A1SB	HTSE70A1SB	HTSE80A1SB
1	Cooling capacity		KW	114.3	134.0	165.0
			RT	32.5	38.1	46.9
	Total input power		KW	42.7	51.2	60.9
	Total rated current		A	78	91	100
	EER		-	2.68	2.62	2.71
2	Cooling capacity		KW	105.4	122.8	153.2
			RT	30	34.9	43.6
	Total input power		KW	46.2	55.8	66.5
	Total rated current		A	83	97	108
	EER		-	2.28	2.20	2.30
ESEER			-	3.75	3.75	3.76
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	79	93	114
			m^3/h	17.9	21.1	25.9
		Water pressure drop	kPa	14.4	23.6	13.6
		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	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH6593-60Y	CSH7573-70Y	CSH8553-80Y
		Combination	Pieces	1		
		Capacity	hp	60	70	80
		Oil type	-	BSE170		
		Oil charge amount	L	9.5	15	22
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 86	~ 85	~ 86
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	2060x2580x2090		
Net weight			kg	~ 2200		

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 m^2 . °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".

According to our innovation policy , some specifications may be change without prior notification.

Model No.				HTSE90A1SB	HTSE110A1SB	HTSE120B2SB
1	Cooling capacity		KW	190.1	222.4	228.5
			RT	54.1	63.2	65.0
	Total input power		KW	68.1	80.3	85.6
	Total rated current		A	114	140	156
	EER		-	2.79	2.77	2.67
2	Cooling capacity		KW	176.6	205.8	210.8
			RT	50.2	58.5	59.9
	Total input power		KW	75.0	87.8	92.6
	Total rated current		A	124	152	166
	EER		-	2.35	2.34	2.28
ESEER			-	3.95	3.95	3.75
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	132	154	157
			m^3/h	30	35	35.7
		Water pressure drop	kPa	25.3	22	16.5
		Max design pressure	mPa	0.8		
Condenser		Type	-	U Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		2
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	4	6	8
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH8563-90Y	CSH8573-110Y	CSH6593-60Y
		Combination	Pieces	1		2
		Capacity	hp	90	110	120
		Oil type	-	BSE170		
		Oil charge amount	L	22	22	2 x 9.5
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 85	~ 86	~ 87
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	2060x2580x3130		2060x2580x4170
Net weight			kg	~ 2200	~ 4000	

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 m^2 . °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.				HTSE140B2SB	HTSE160B2SB	HTSE180B2SB
1	Cooling capacity		KW	268.0	329.9	380.2
			RT	76.2	93.8	108.1
	Total input power		KW	102.2	121.6	136.0
	Total rated current		A	182	200	228
	EER		-	2.62	2.71	2.80
2	Cooling capacity		KW	245.7	306.4	353.2
			RT	69.9	87.1	100.4
	Total input power		KW	111.4	132.8	149.8
	Total rated current		A	194	216	248
	EER		-	2.21	2.31	2.36
ESEER			-	3.76	3.84	3.96
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	185	228	263
			m^3/h	42	51.7	59.7
		Water pressure drop	kPa	33	36.3	43.5
		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	-	8		
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH7573-70Y	CSH8553-80Y	CSH8563-90Y
		Combination	Pieces	2		
		Capacity	hp	140	160	180
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 15	2 x 22	2 x 15
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			℃	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 85	~ 86	~ 85
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	2060x2580x4170		
Net weight			kg	~ 4200		

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

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

- Evaporating SST : 2 ℃
- Water side fouling factor : 0.000043 m^2 . ℃ / 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.				HTSE220B2SB	HTSE250B2SB	HTSE280B2SB
1	Cooling capacity		KW	444.7	493.9	561.1
			RT	126.4	140.4	159.5
	Total input power		KW	160.4	177.7	206.6
	Total rated current		A	280	311	361
	EER		-	2.77	2.78	2.72
2	Cooling capacity		KW	411.7	458.0	519.4
			RT	117.1	130.2	147.7
	Total input power		KW	175.7	194.9	226.2
	Total rated current		A	304	336	390
	EER		-	2.34	2.35	2.30
ESEER			-	3.95	3.95	3.85
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	308	341	388
			m^3/h	69.9	77.4	88.1
		Water pressure drop	kPa	42	49	51
		Max design pressure	mPa	0.8		
Condenser		Type	-	U Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	12		16
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH8573-110Y	CSH8583-125Y	CSH8593-140Y
		Combination	Pieces	2		
		Capacity	hp	220	250	280
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 22	2 x 19	2 x 19
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			℃	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 86	~ 88	~ 86
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	2060x2580x6250		2060x2580x8344
Net weight			kg	~ 6000		~ 8000

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

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

- Evaporating SST : 2 ℃
- Water side fouling factor : 0.000043 m^2 . ℃ / 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.				HTSE320B2SB	HTSE360B2SB	HTSE420B2SB
1	Cooling capacity		KW	665.6	776.8	897.9
			RT	189.3	220.9	255.3
	Total input power		KW	236.9	263.5	305.5
	Total rated current		A	403	442	524
	EER		-	2.81	2.95	2.94
2	Cooling capacity		KW	613.7	717.9	835.9
			RT	174.5	204.1	237.7
	Total input power		KW	258.9	285.7	333.3
	Total rated current		A	435	476	566
	EER		-	2.37	2.51	2.51
ESEER			-	4.01	4.11	4.12
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	460	537	620
			m^3/h	104.5	122	141
		Water pressure drop	kPa	22.3	24	38
		Max design pressure	mPa	0.8		
Condenser		Type	-	U Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	16	18	20
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH9563-160Y	CSH9573-180Y	CSH9583-210Y
		Combination	Pieces	2		
		Capacity	hp	320	360	420
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 29	2 x 29	2 x 29
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 87	~ 87	~ 89
Power supply			Ø , V , Hz	3 , 400 , 50		
Dimension		WxHxD	mm	2060x2580x8344	2060x2580x9386	2060x2580x10428
Net weight			kg	~ 8000	~ 9000	~ 10000

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 m^2 . °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

AFRA

Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HTSE60A1SB	30	122.8	39.5	74	3.11
	35	114.3	42.7	78	2.68
	37	110.7	44.0	80	2.52
	40	105.4	46.2	83	2.28
	42	101.8	47.8	85	2.13
	46	94.5	51.2	90	1.85
HTSE70A1SB	30	144.9	47.1	85	3.08
	35	134.0	51.2	91	2.62
	37	129.6	52.9	93	2.45
	40	122.8	55.8	97	2.20
	42	118.4	57.8	100	2.05
	46	109.2	62.2	106	1.76
HTSE80A1SB	30	176.2	55.9	93	3.15
	35	165.0	60.9	100	2.71
	37	160.3	63.2	103	2.54
	40	153.2	66.5	108	2.30
	42	148.4	69.5	112	2.13
	46	138.7	75.2	120	1.84
HTSE90A1SB	30	203.0	62.5	106	3.25
	35	190.1	68.1	114	2.79
	37	184.8	70.8	118	2.61
	40	176.6	75.0	124	2.35
	42	171.1	77.9	129	2.20
	46	159.8	84.5	139	1.89
HTSE110A1SB	30	240.0	73.7	131	3.26
	35	222.4	80.3	140	2.77
	37	216.1	83.2	145	2.60
	40	205.8	87.8	152	2.34
	42	198.2	91.3	157	2.17
	46	184.9	98.7	168	1.87

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

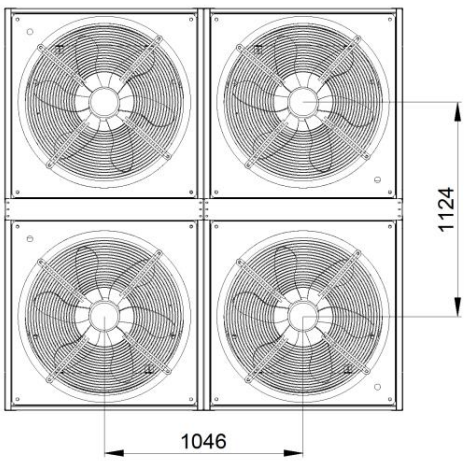
Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HTSE120B2SB	30	245.7	79.2	148	3.10
	35	228.5	85.6	156	2.67
	37	221.5	88.2	160	2.51
	40	210.8	92.6	166	2.28
	42	203.6	95.8	170	2.12
	46	189.1	102.6	180	1.84
HTSE140B2SB	30	289.7	94.0	170	3.08
	35	268.0	102.2	182	2.62
	37	259.2	105.6	186	2.45
	40	245.7	111.4	194	2.21
	42	236.7	115.4	200	2.05
	46	218.4	124.2	212	1.76
HTSE160B2SB	30	352.4	111.2	186	3.17
	35	329.9	121.6	200	2.71
	37	320.6	126.2	206	2.54
	40	306.4	132.8	216	2.31
	42	296.8	138.8	224	2.14
	46	277.3	150.2	240	1.85
HTSE180B2SB	30	406.0	124.8	212	3.25
	35	380.2	136.0	228	2.80
	37	369.6	141.4	236	2.61
	40	353.2	149.8	248	2.36
	42	342.1	155.6	258	2.20
	46	319.6	168.8	278	1.89
HTSE220B2SB	30	479.9	147.3	262	3.26
	35	444.7	160.4	280	2.77
	37	432.1	166.3	290	2.60
	40	411.7	175.7	304	2.34
	42	396.4	182.5	314	2.17
	46	369.8	197.3	336	1.87

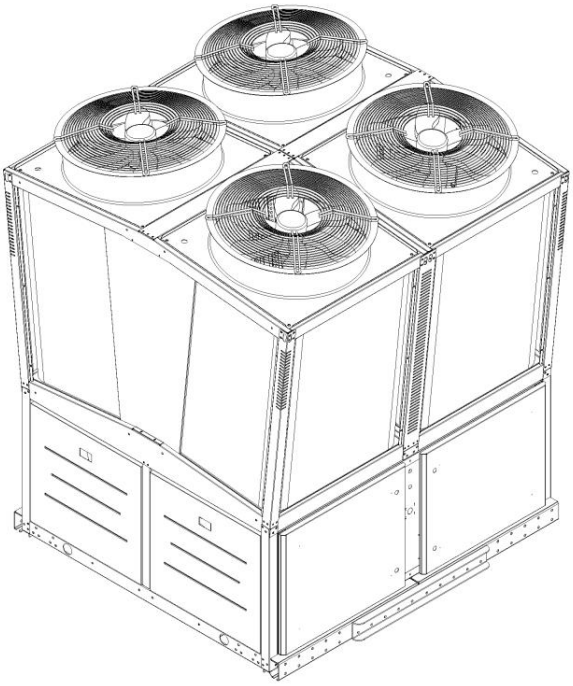
- Chilled water inlet / outlet : 12 °C / 7 °C

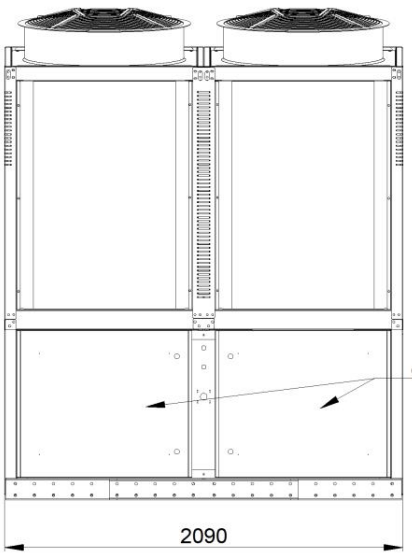
Model No.	Ambient Temp. (°C)	Cooling Capacity (KW)	Power Input (KW)	Rated Current (A)	COP
HTSE250B2SB	30	529.4	162.9	290	3.25
	35	493.9	177.7	311	2.78
	37	479.1	184.3	320	2.60
	40	458.0	194.9	336	2.35
	42	443.3	202.5	347	2.19
	46	412.2	219.1	372	1.88
HTSE280B2SB	30	600.4	189.8	337	3.16
	35	561.1	206.6	361	2.72
	37	544.2	214.0	372	2.54
	40	519.4	226.2	390	2.30
	42	503.2	234.8	403	2.14
	46	467.9	253.8	431	1.84
HTSE320B2SB	30	714.3	217.3	374	3.29
	35	665.6	236.9	403	2.81
	37	645.6	245.9	415	2.63
	40	613.7	258.9	435	2.37
	42	592.7	267.9	450	2.21
	46	549.8	287.9	481	1.91
HTSE360B2SB	30	831.7	244.2	412	3.41
	35	776.8	263.5	442	2.95
	37	753.0	272.6	455	2.76
	40	717.9	285.7	476	2.51
	42	693.9	295.4	492	2.35
	46	646.0	316.5	524	2.04
HTSE420B2SB	30	957.6	280.7	488	3.41
	35	897.9	305.5	524	2.94
	37	875.8	316.4	541	2.77
	40	835.9	333.3	566	2.51
	42	810.9	345.2	583	2.35
	46	760.4	370.0	621	2.06

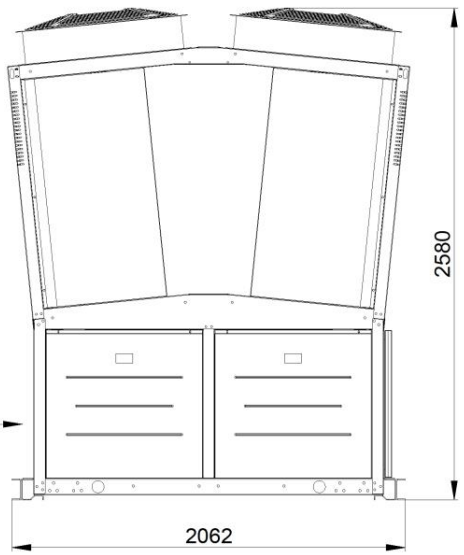
- Chilled water inlet / outlet : 12 °C / 7 °C

Dimensions (HTSE60A1SB - HTSE70A1SB - HTSE80A1SB - HTSE90A1SB)





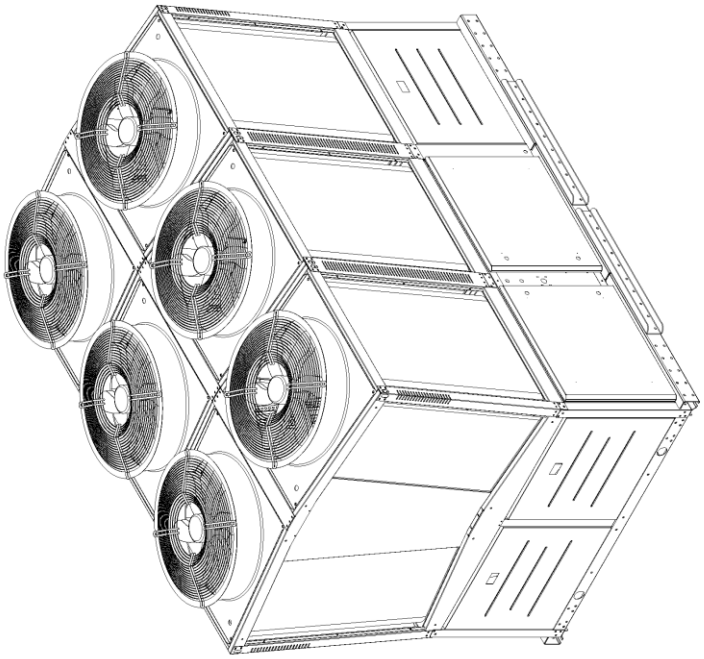


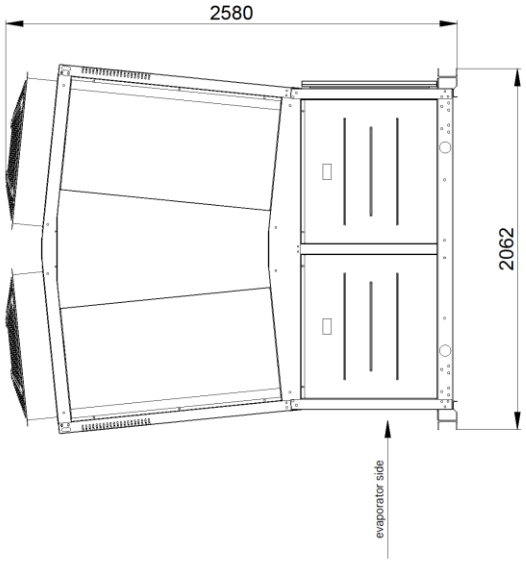


electrical panel door

evaporator side

(unit : mm)

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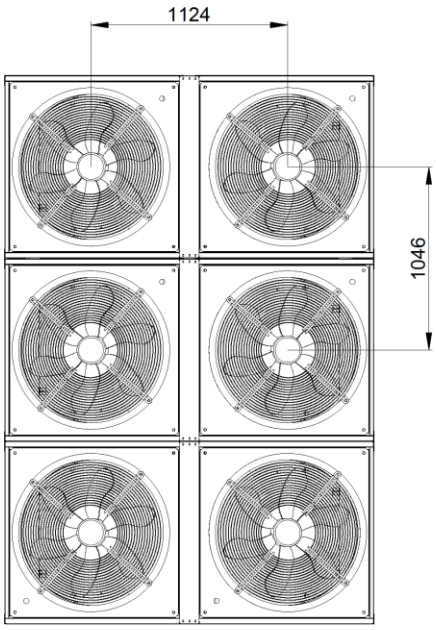
2062
evaporator side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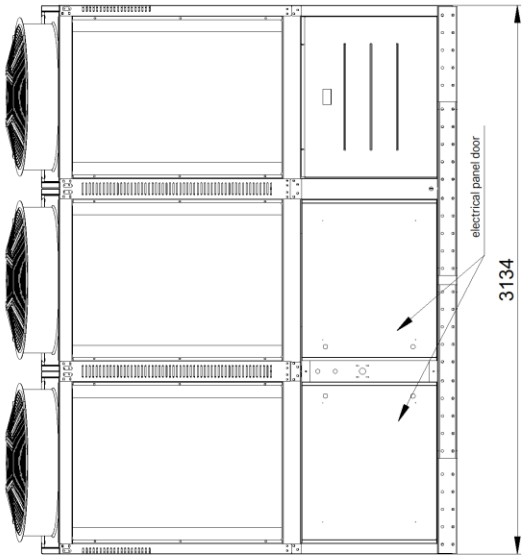
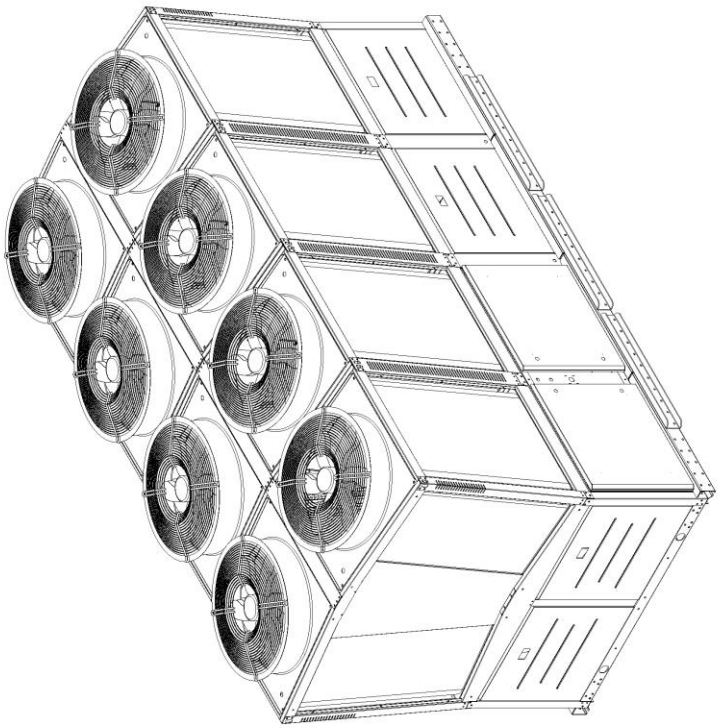
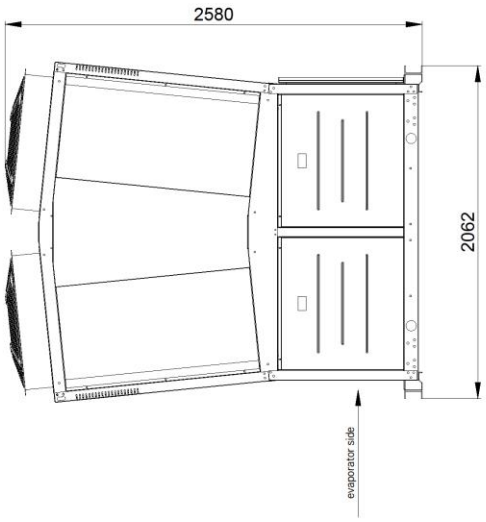

electrical panel door
3134

(unit : mm)

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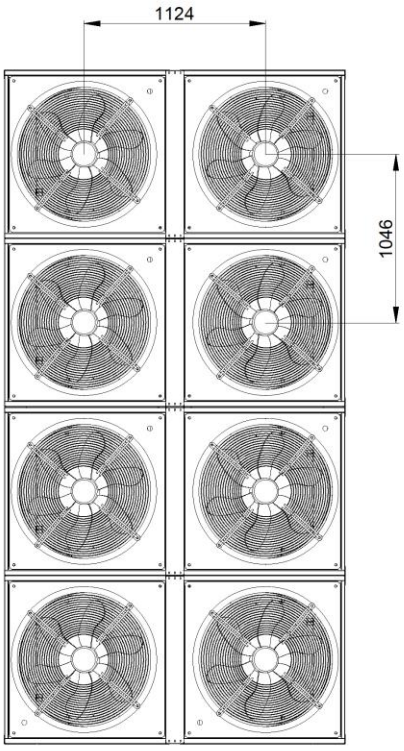
evaporator side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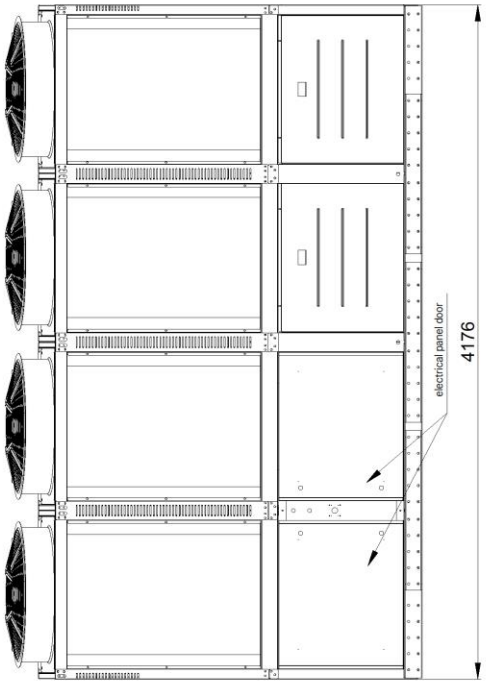
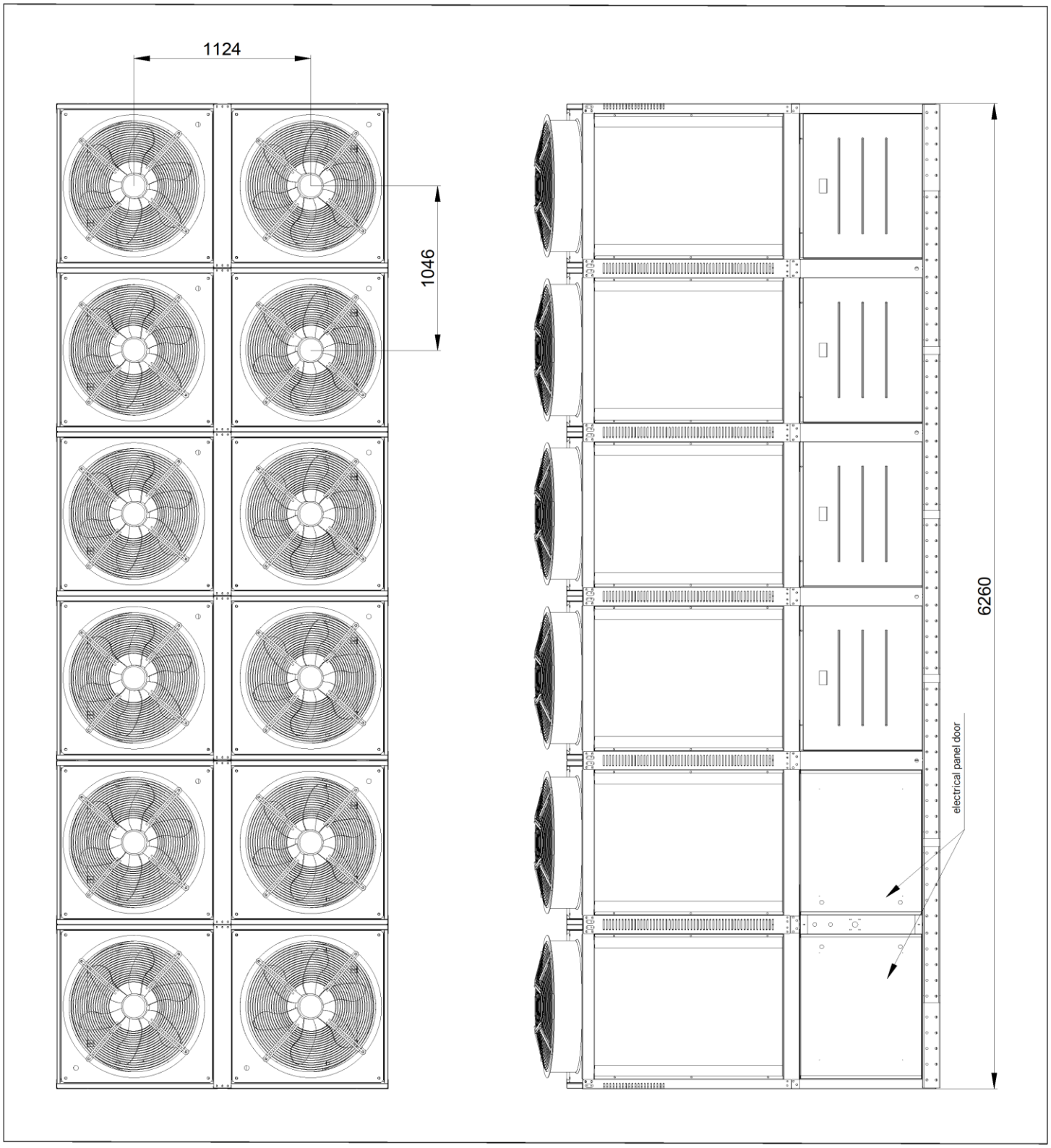

4176
electrical panel door

(unit : mm)



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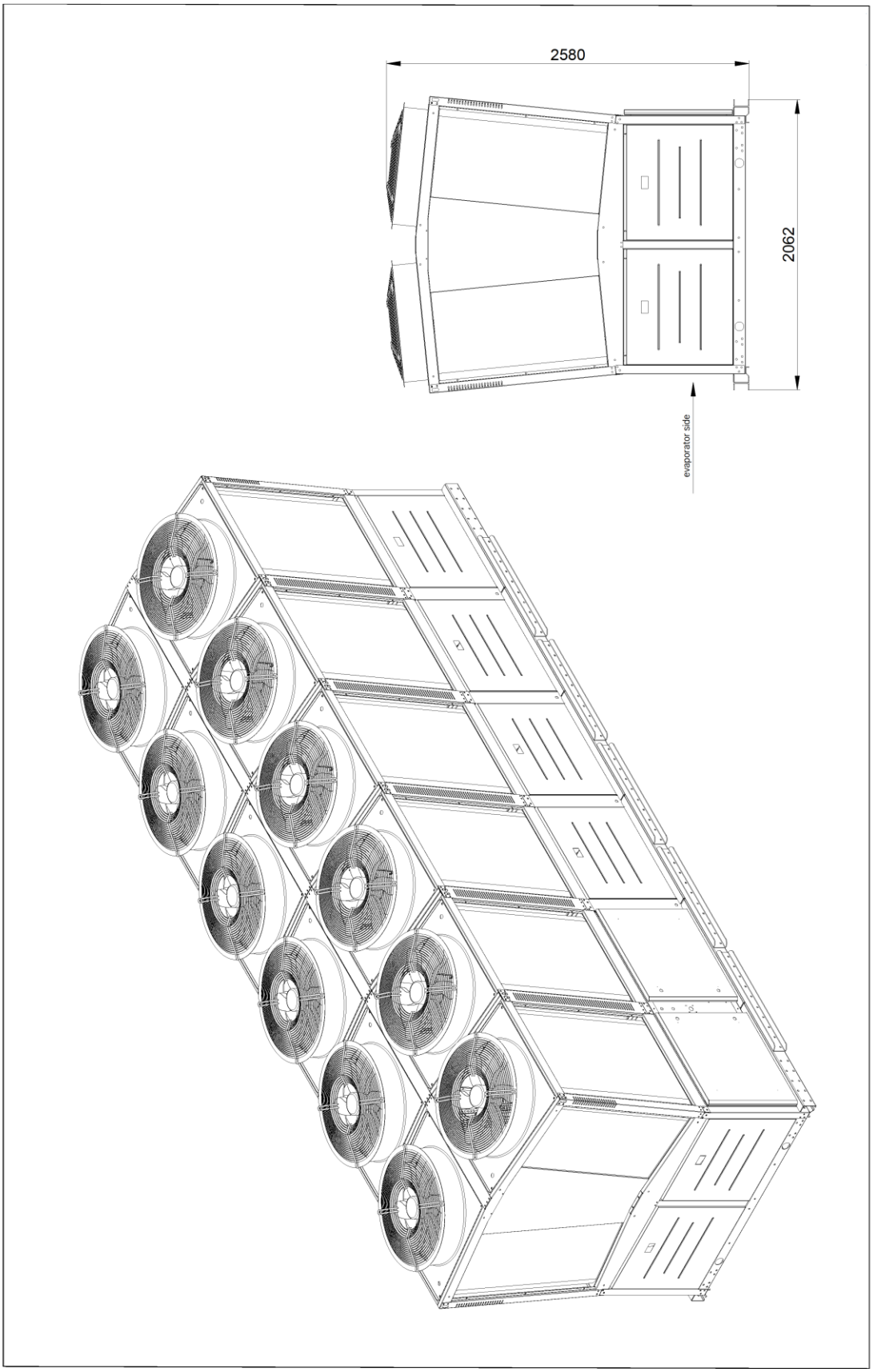

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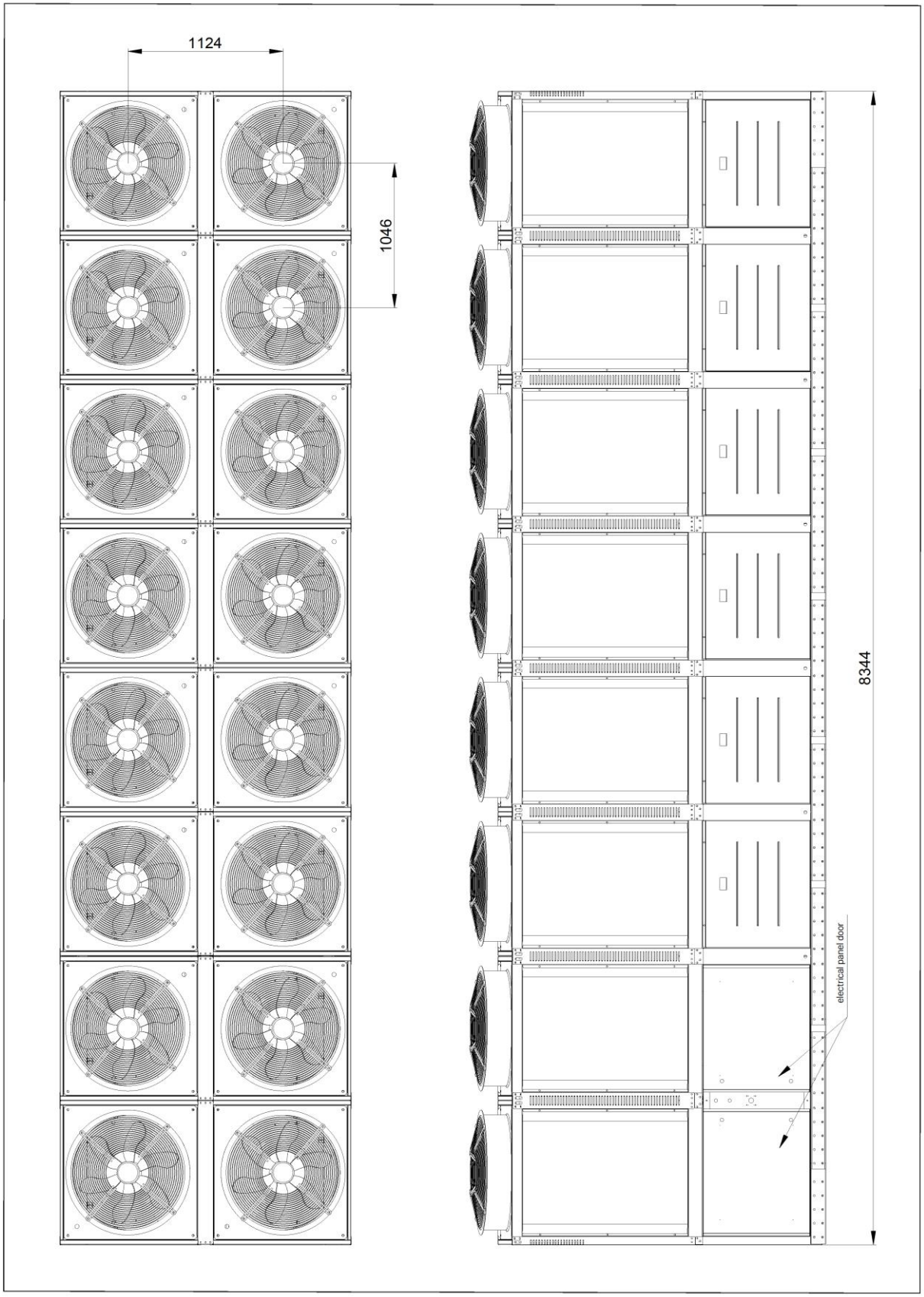

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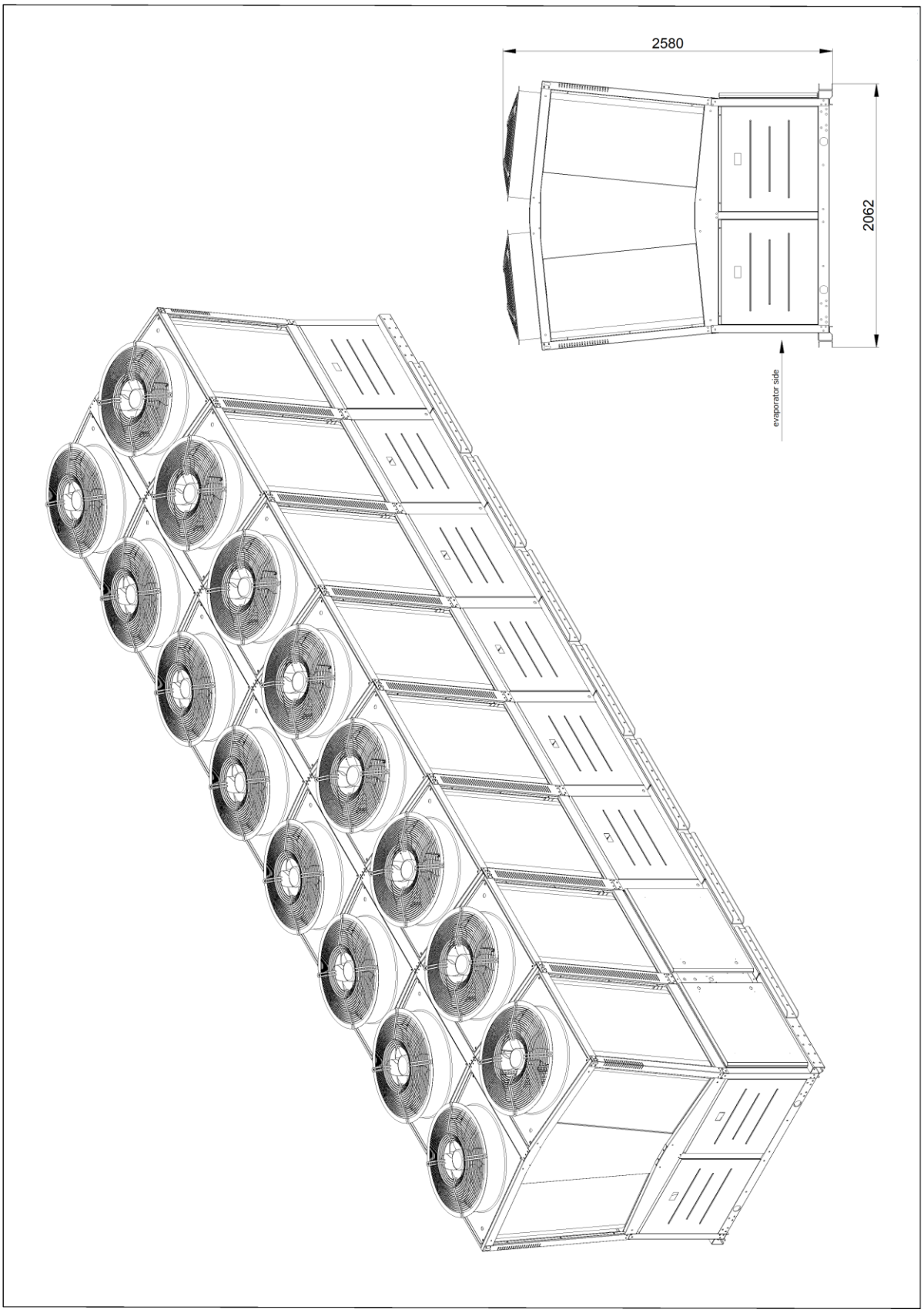

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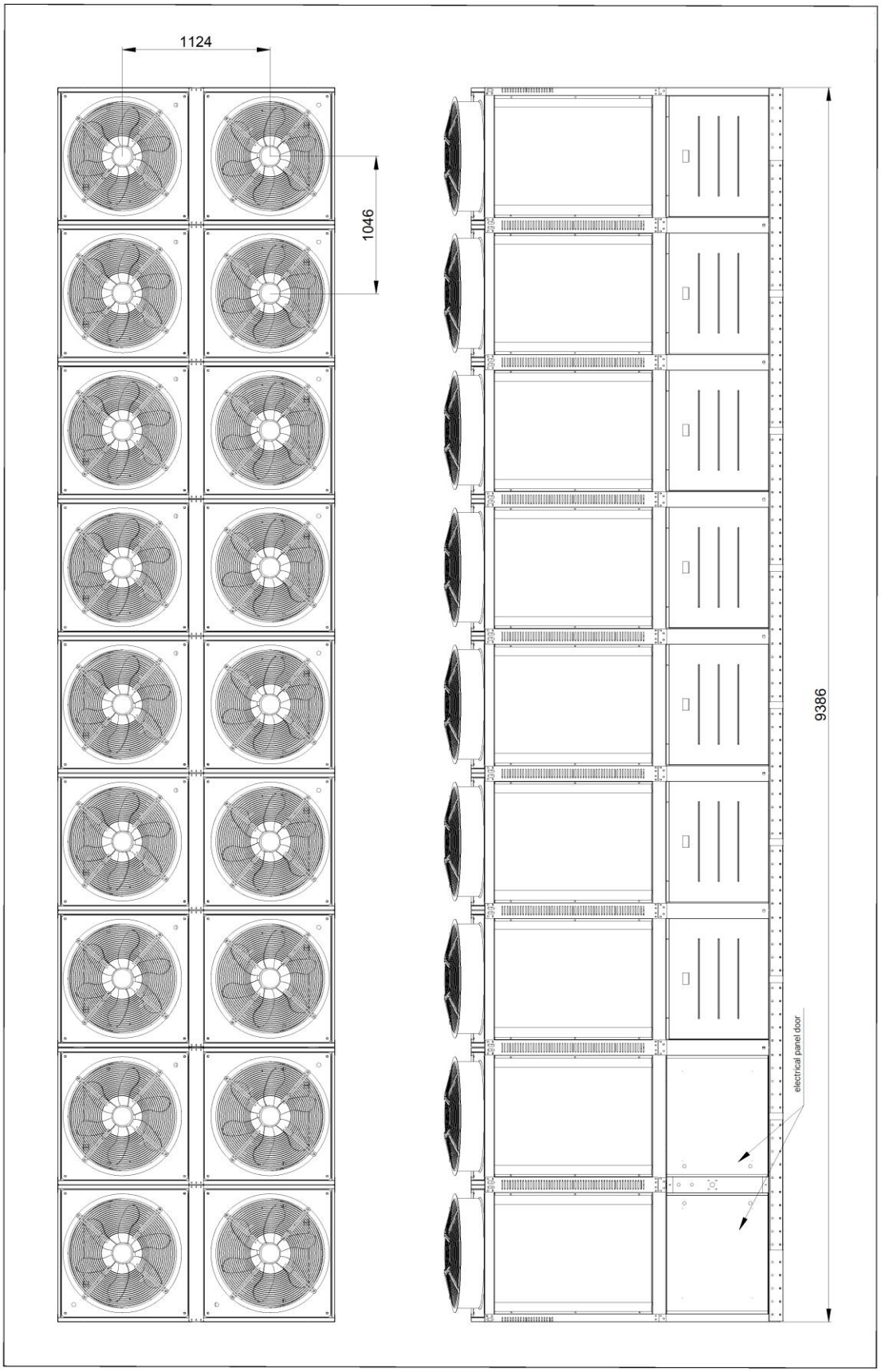

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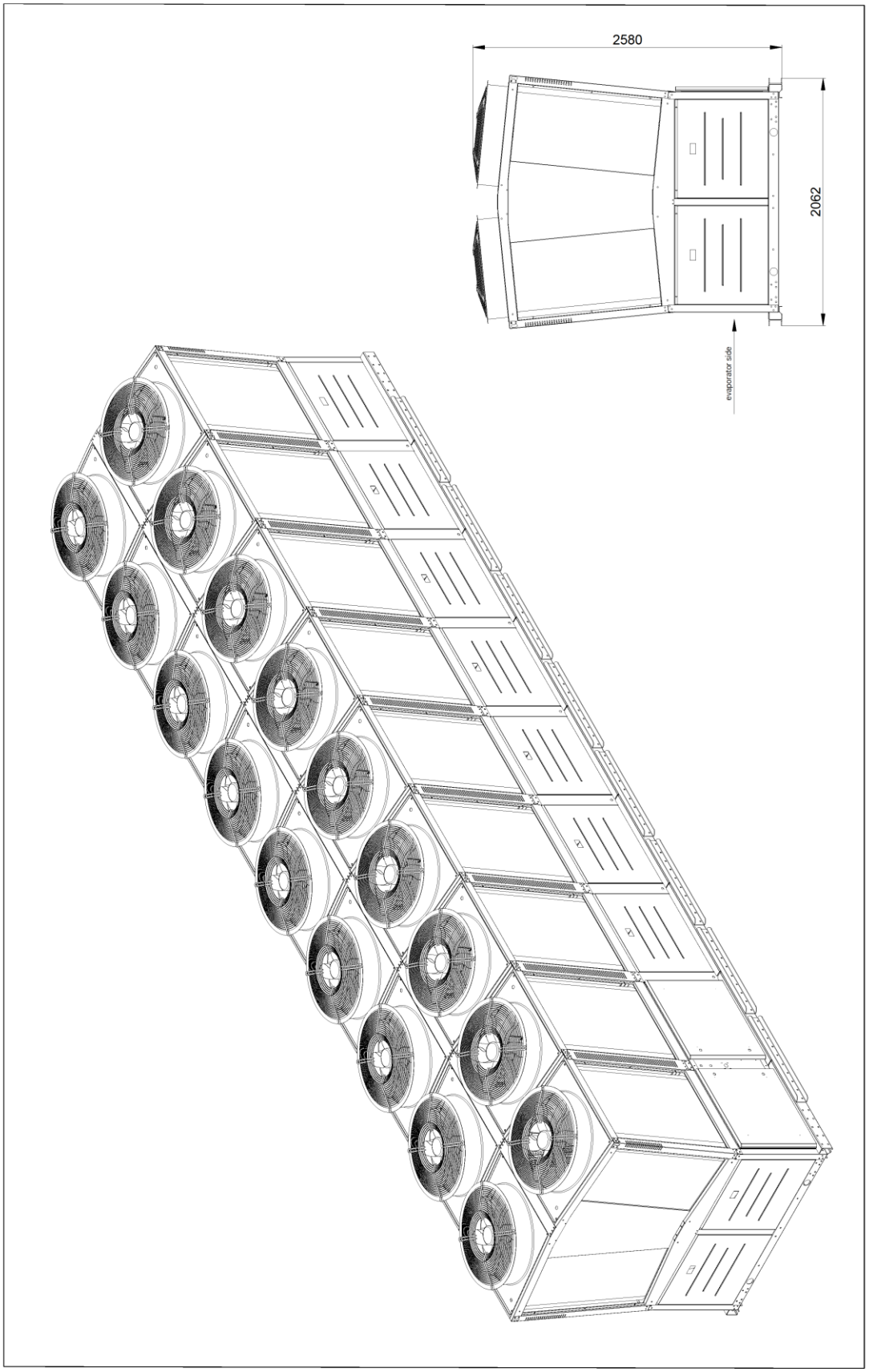

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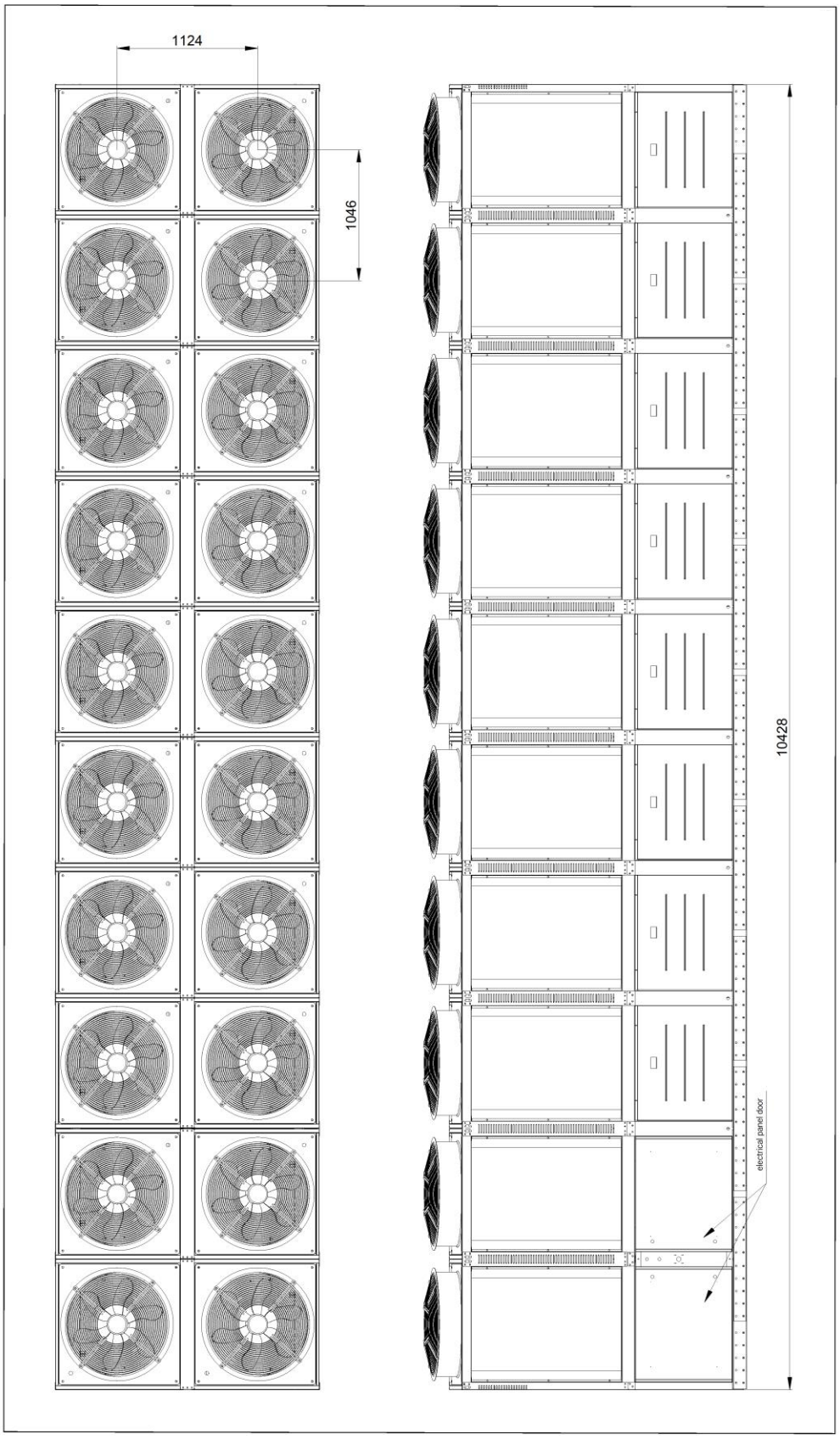

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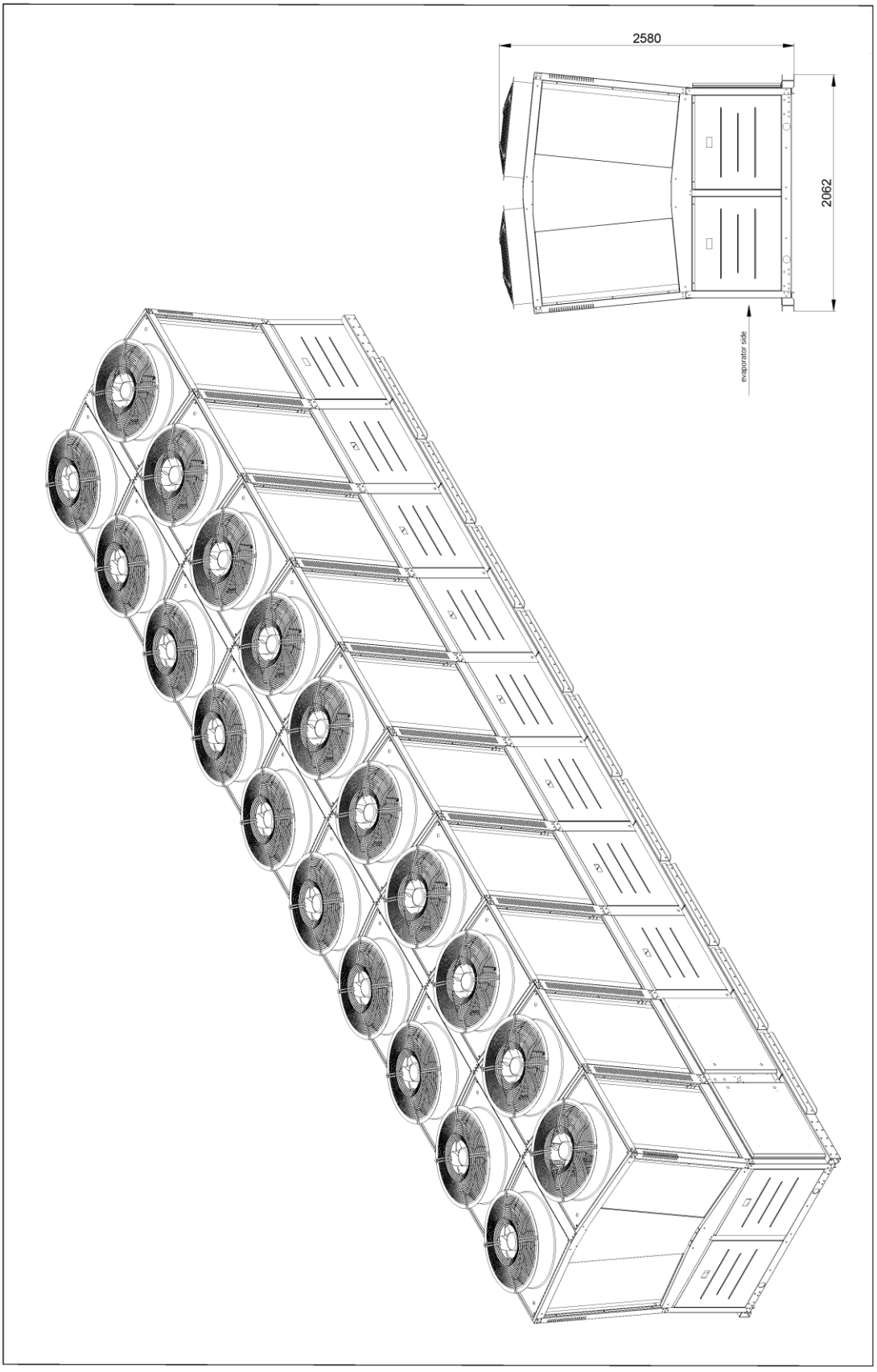


(unit : mm)

HTN SERIES

268 - 1202 KW

Compressor

With highly efficient performance
Anti Vibration Joint
Oil heater System
Dehumidifier filter dryer with replaceable cartridge
Safety valve for protect compressor at high Pressure
Liquid Line Solenoid Valve
Liquid Line Pressure Switch and Pressure Transmitter

Liquid Line Equipment

Electronic Expansion Valve
Solenoid valve and sight glass
Liquid receiver with Rotalock valve
filter dryer for dehumidification refrigerant

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
Anti Freeze System

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

Condenser

Fin and Tube V type series
With high efficiency and low pressure drop
3/8" copper tube with up to 450 PSI compressive strength
12FPI number of Fin per Inch

Electrical and Safety Equipment

Ability to synchronize with BMS
Compatible with network connection protocols
High pressure and low pressure sensor
Switch cabinet with IP54
Multi-device module capability
Light and socket in the switch cabinet
Alarm system for faults

Standard Features

AFRA

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

Item	Description	Product's Brand
VFD Controller	▪ 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
Control Panel	▪ 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
Phase Control	Phase sequence and phase loss sensors are designed for the following measures: ▪ 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	▪ Acting as a connector or separator between electrical panel tray and other components of the device (in terms of electrical performance).	KLEMSAN
Contactor	▪ Connecting and disconnecting the electric current of the circuit.	SIEMENS
MSPS	Motor Start Protection System to performs an electric motor: ▪ Isolation. ▪ Motor protection against overload and short circuit. ▪ Control of the motor.	SIEMENS
Liquid Line	Includes: Sight Glass, Filter Dryer, Safety Valve, Solenoid Valve, Bulb Valve.	CASTEL

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

- Compressors are equipped with Oil Pressure Safety Control and Oil Heater by the default.

Item	Description	Product's Brand
Sensors	Includes: ▪ Pressure Switch, Pressure Transmitter, Temperature Sensor.	DANFOSS
EEV	Electronic Expansion Valve: ▪ Ensuring accurate control of refrigerant injection into the evaporator.	DANFOSS
Main Switch	▪ Power Switch (On/Off). ▪ Controlling the input current to the device.	SIEMENS
Condenser [1]	▪ Fin and tube "V" shaped series with 12FPI number of Fin per Inch including 3/8" copper tube and compressive strength of 450 PSI.	AFRA
Evaporator [1]	▪ 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	▪ 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 BITZER screw compressor trademark. Contact us for more data about other brands.

- Compressors are equipped with Oil Pressure Safety Control and Oil Heater by the default.

Options

AFRA

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

Item	Description	Product's Brand
1. Soft Starter	▪ 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. Oil Separator	▪ 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
3. Accumulator	▪ 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
4. Economizer	▪ Increasing the efficiency by creating a sub-circuit. ▪ Improving the system performance. ▪ Energy saving. ▪ Utilizing brazed plate heat exchanger.	KELVION (Heat Exchanger)
5. Switch Cabinet	G. UPS buffered controller to prevent damage during operating. H. Cooling system specially for switch cabinet.	-
6. Fan	E. ROSENBERG trademark. F. ZILABEG trademark. G. EBMPAPST trademark. H. Sound reduction diffuser. (Executable only for EUROVENT fans)	-

- 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

AFRA

Model No.				HTNE140B2SB	HTNE160B2SB	HTNE180B2SB
1	Cooling capacity		KW	268.0	329.9	380.2
			RT	76.2	93.8	108.1
	Total input power		KW	102.2	121.6	136.0
	Total rated current		A	182	200	228
	EER		-	2.62	2.71	2.80
2	Cooling capacity		KW	245.7	306.4	353.2
			RT	69.9	87.1	100.4
	Total input power		KW	111.4	132.8	149.8
	Total rated current		A	194	216	248
	EER		-	2.21	2.31	2.36
ESEER			-	3.76	3.84	3.96
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	185	228	263
			m^3/h	42	51.7	59.7
		Water pressure drop	kPa	33	36.3	43.5
		Max design pressure	mPa	0.8		
Condenser		Type	-	V 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	-	8		
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH7573-70Y	CSH8553-80Y	CSH8563-90Y
		Combination	Pieces	2		
		Capacity	hp	140	160	180
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 15	2 x 22	2 x 15
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			℃	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 85	~ 86	~ 85
Power supply			Ø , V , Hz	3 , 400 , 50		
Net weight			kg	~ 4500		

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

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

- Evaporating SST : 2 ℃
- Water side fouling factor : 0.000043 m^2 . ℃ / 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.				HTNE220B2SB	HTNE250B2SB	HTNE280B2SB
1	Cooling capacity		KW	444.7	493.9	561.1
			RT	126.4	140.4	159.5
	Total input power		KW	160.4	177.7	206.6
	Total rated current		A	280	311	361
	EER		-	2.77	2.78	2.72
2	Cooling capacity		KW	411.7	458.0	519.4
			RT	117.1	130.2	147.7
	Total input power		KW	175.7	194.9	226.2
	Total rated current		A	304	336	390
	EER		-	2.34	2.35	2.30
ESEER			-	3.95	3.95	3.85
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	308	341	388
			m^3/h	69.9	77.4	88.1
		Water pressure drop	kPa	42	49	51
		Max design pressure	mPa	0.8		
Condenser		Type	-	V Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	12		16
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH8573-110Y	CSH8583-125Y	CSH8593-140Y
		Combination	Pieces	2		
		Capacity	hp	220	250	280
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 22	2 x 19	2 x 19
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			℃	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 86	~ 88	~ 86
Power supply			Ø , V , Hz	3 , 400 , 50		
Net weight			kg	~ 6500		~ 8000

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

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

- Evaporating SST : 2 ℃
- Water side fouling factor : 0.000043 m^2 . ℃ / 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.				HTNE320B2SB	HTNE360B2SB	HTNE420B2SB
1	Cooling capacity		KW	665.6	776.8	897.9
			RT	189.3	220.9	255.3
	Total input power		KW	236.9	263.5	305.5
	Total rated current		A	403	442	524
	EER		-	2.81	2.95	2.94
2	Cooling capacity		KW	613.7	717.9	835.9
			RT	174.5	204.1	237.7
	Total input power		KW	258.9	285.7	333.3
	Total rated current		A	435	476	566
	EER		-	2.37	2.51	2.51
ESEER			-	4.01	4.11	4.12
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	460	537	620
			m^3/h	104.5	122	141
		Water pressure drop	kPa	22.3	24	38
		Max design pressure	mPa	0.8		
Condenser		Type	-	V Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	16	18	20
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH9563-160Y	CSH9573-180Y	CSH9583-210Y
		Combination	Pieces	2		
		Capacity	hp	320	360	420
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 29	2 x 29	2 x 29
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 87	~ 87	~ 89
Power supply			Ø , V , Hz	3 , 400 , 50		
Net weight			kg	~ 8000	~ 10000	

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 m^2 . °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.				HTNE480B2SB	HTNE560B2SB	HTNE640B2SB
1	Cooling capacity		KW	1020	1098	1202
			RT	290	312	342
	Total input power		KW	344.2	388.8	418.2
	Total rated current		A	585.8	661.6	720
	EER		-	2.96	2.82	2.87
2	Cooling capacity		KW	950	1018	1120
			RT	270	289	318
	Total input power		KW	375.2	421.6	453.4
	Total rated current		A	633.5	711.6	772
	EER		-	2.53	2.41	2.47
ESEER			-	4.12	4.11	4.11
Evaporator		Type	-	Shell and tube		
		Brand	-	REFKAR		
		Water flow rate	gpm	705	760	830
			m^3/h	160	172	189
		Water pressure drop	kPa	45	52	62
		Max design pressure	mPa	0.8		
Condenser		Type	-	V Shape		
		Brand	-	AFRA GOSTAR		
		Heat exchanger	-	Aluminium fin		
		Number of rows	-	3		
		Fins per inch	FPI	12		
Fan		Type	-	Axial fan		
		Brand	-	EUROVENT		
		Number	-	22	24	26
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Compact Screw		
		Brand	-	BITZER		
		Model	-	CSH9593-240Y	CSH95103-280Y	CSH95113-320Y
		Combination	Pieces	2		
		Capacity	hp	480	560	640
		Oil type	-	BSE170		
		Oil charge amount	L	2 x 29	2 x 31	2 x 31
		Oil heater	-	●		
Refrigerant		Type	-	R134a		
Ambient temp. range			°C	21 ~ 46		
Command control system		Type	-	DANFOSS PLC		
Sound pressure level			dB(A)	~ 92	~ 93	~ 95
Power supply			Ø , V , Hz	3 , 400 , 50		
Net weight			kg	~ 11000	~ 12000	~ 14000

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 m^2 . °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".

Condensing Package Boiler

RESIDENTIAL SERIES

21 - 35 KW

Introduction

- 21 - 35 kW capacity options in condensing combi-boilers
- Capacity to heat 780 liters of hot water per hour
- Comfortable use with the specially designed and ergonomic
- Low NOx and emission values
- Economy and comfort feature in domestic water; thus obtaining domestic water in a much shorter time
- High security standards with 14 different advanced security systems
- Electronic ignition and intelligent fault diagnosis system
- Long service life with copper main heat exchanger that plate heat exchanger that prepares the usage circuit water
- With its high heating capacity, plate heat exchanger and high water flow rate, it has the ability to produce uninterrupted and maximum hot water comfort.
- Thanks to its full premix condensing feature, it is the most high level of environmental awareness
- European Union ERP Regulation and CE quality conforming to the standards
- Class A heating efficiency
- High energy thanks to wide modulation range savings
- Stainless steel heat exchanger
- New generation user-friendly interface
- Quiet operation (44 dB)
- Both heating and hot water at the same time
- Large and user-friendly LCD displaying the temperature screen
- Capacity options for every need
- Fast and hot water at any time
- Suitable for any place thanks to its compact design stylish appearance
- Space-saving compact dimensions

Technical Data

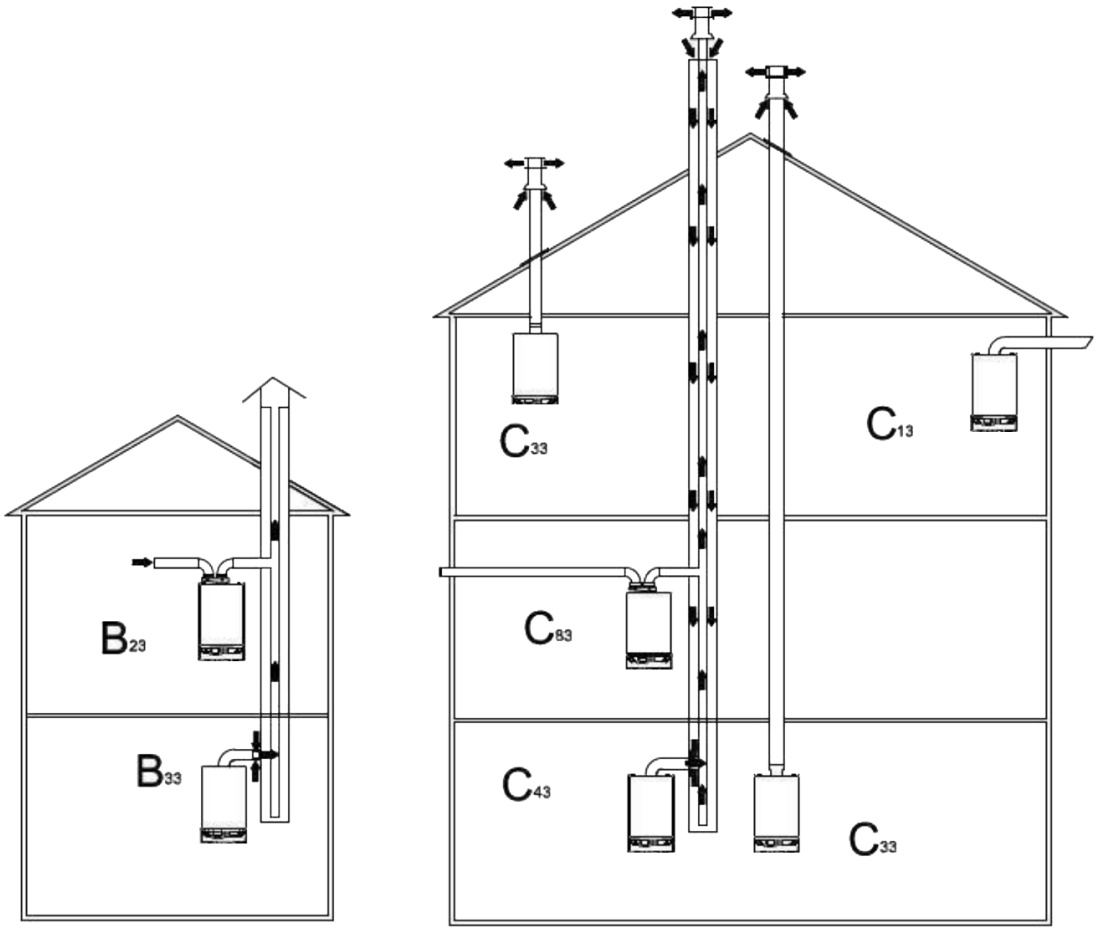
AFRA

Model No.				21	25	35
1	Nominal heat output	min/max	KW	7.9/20.2	7.9/24.1	7.9/31.3
			Kcal/hr	6790/17370	6790/20720	6790/26900
	Heating efficiency	min/max	%	102/98	102.2/98.1	102.3/98.2
2	Nominal heat output	min/max	KW	8.5/21.4	8.5/25.6	8.5/33.2
			Kcal/hr	7300/18400	7300/22000	7300/28550
	Heating efficiency	min/max	%	107.5/106	107.6/106.1	107.6/106.2
Fuel		Gas type	-	G20		
		Consumption rate (min/max)	m^3/h	0.82/2.11	0.82/2.52	0.82/3.27
		Gas pressure (G20/G31)	mbar	20 - 37		
Flue		NOx class	-	6		
Energy efficiency class			-	A		
Sound pressure level			dB(A)	~ 44		
Input power			W	75		
Power supply			Ø , V , Hz	1 , 230 , 50		
Dimension		WxDxH	mm	412x226x708	412x226x708	412x296x708
Net weight			kg	30	30	35

1 : Heating water inlet / outlet : 60 °C / 80 °C
2 : Heating water inlet / outlet : 30 °C / 50 °C

- Total hardness : 1 °d
- Water side PH range : 7 - 8.5 ppm
- Measuring sound pressure level at 1m away and ±2dB tolerance.

Attention (Flue Application Detail)



B23 = The connection that takes the combustion air from the environment, the flue gas outlet pipe removed from the roof form. In this type of installation, vented device installation rules apply.

B33 = Horizontally; It is the connection form of the flue gas and combustion air lines to the specially made flue duct, which takes the combustion air from the environment by using nested flue pipes or 2 parallel pipes. In this type of installation, vented device installation rules apply.

B13 = Horizontally; It is the way of connecting the flue gas and combustion air lines directly to the atmosphere through the glass or the wall, using nested flue pipes or 2 parallel pipes.

C33 = Vertically; It is a way of connecting the flue gas and combustion air lines directly to the atmosphere from the roof using nested flue pipes or 2 parallel pipes.

C43 = Horizontally; It is a way of connecting flue gas and combustion air lines to a custom made flue duct using nested flue pipes or 2 parallel pipes.

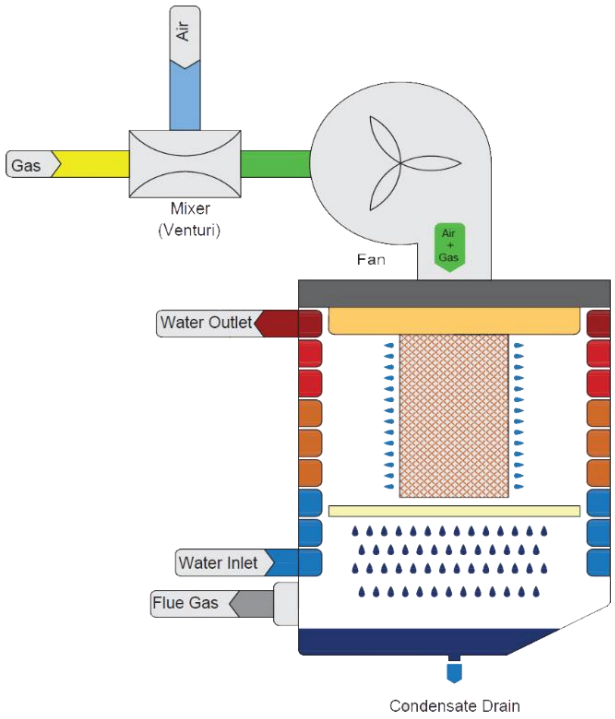
C53 = Combustion air inlet and flue gas outlet connection type separately. The combustion air pipe must be removed from the glass or wall, and the flue gas pipe from the roof.

LIGHT COMMRECIAL SERIES

50 - 150 KW Single
Up to 2400 KW Modular

Boiler Performance Diagram

Condensation technology is an effective method for converting natural gas into beneficial energy by combustion. Hidden energy of hot flue gas in water vapor gain into the system and provides energy efficiency. Condensing boilers are operate with low flue gas temperatures. Mixing of the air and gas used in the energy production to obtain an efficient combustion before get inside the combustion chamber is named as premix. Premix systems provide lower emissions values (NOx-CO) after combustion.



- 50-150 KW capacity range,
- Aluminum heat exchanger
- Low NOx values
- Low flue gas temperatures
- Turndown ratio up to 14:100
- Cascade operation option up to 16 boilers
- Low noise level
- Energy class A
- Efficiency up to %108,2 according to EN 15502-1+A1
- Suitable B23, C13, C33, C43, C53, C63, C83 flue types
- Frost protection
- Overheat protection
- Low and highwater pressure safety
- Flue gas temperature and pressure safety
- Pump/valve protection
- Legionella protection for DHW tank
- Condensate blockage safety with siphon sensor
- Fan speed safety
- 6 Bar operation pressure
- External circulation pump

Options

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

Item	Description
Outside Sensor	▪ Operates between -50 °C and 70 °C. ▪ Max. distance 120 m with 1.5 mm² cable. ▪ Tolerance ±1 K
Clamp Type Temperature Sensor	▪ Operates between -30 °C and 125 ° C. ▪ Max. distance 120 m with 1.5 mm² cable. ▪ Tolerance ±0,5 K
Immersion Type Temperature Sensor	▪ Operates between 0 °C and 95 °C. ▪ Tolerance ±0,5 K.
External Zone Module	▪ Provides 3-way valve control function on ▪ temperature based zones. Requires ▪ additional relay and sensor connections
Modbus Module	▪ Provides Building Management Systems (BMS) connection.
Webserver	▪ Controlling and displaying possibility of the boiler system from ▪ anywhere via internet, ▪ Time program adjustments (heating circuit, DHW, external zone time ▪ program) ▪ Temperature adjustments of the heating circuits: ▪ Such as DHW, swimming pool, solar energy, accumulation tank, ▪ Monitoring errors and error times in the system, ▪ Sending error messages up to 4 users, ▪ Checking cascade parameters, ▪ Setting holiday mode for heating circuits, ▪ Displaying maintenance periods and define the maintenance interval, ▪ Operating modes adjustment (economy, comfort, holiday and ▪ automatic operation)

Technical Data

AFRA

Model No.				50	70	90
1	Nominal heat output	min/max	KW	7.3/47.8	9.9/63.4	14.3/86.3
			Kcal/hr	6280/41100	8510/54510	12290/74200
	Heating efficiency	min/max	%	96.9/97.7	96.7/97.2	96.8/98.4
2	Nominal heat output	min/max	KW	8.4/51.4	11.6/68.5	15.1/91.0
			Kcal/hr	7220/44200	9970/58900	12300/74200
	Heating efficiency	min/max	%	108.1/105.9	108.0/103.9	108.2/105.0
Turndown ratio			-	16:100	16:100	17:100
Hydraulic separator		Operation water pressure (min/max)	bar	0.8/6.0		
		Exchanger water volume	L	3.2	3.2	4.6
		Water flow rate (min/max)	m^3/h	0.4/2.2	0.5/3.0	0.7/3.8
		Pump head	mWC	3	3	5
		Max. operation temp.	˚C	85		
		Limit shut off temp.	˚C	95		
Fuel		Gas type	-	G20		
		Consumption rate (min/max)	m^3/h	0.8/5.1	1.1/6.8	1.6/9.2
		Gas pressure (G20/G31)	mbar	20		
Flue		Gas pressure	Pa	100	130	170
		CO2 emission (min/max)	%	9.32/9.36	9.05/9.61	9.44/9.33
		Gas temp. [1] (min/max)	˚C	54.7/65.6	55.4/72.1	56.8/61.4
		Gas temp. [2] (min/max)	˚C	29.5/45.1	30.1/52.3	30.2/44.8
		NOx class	-	6		
		NOx value	mg/kWh	37	28	39
Pipe connection		Water inlet/outlet (DN)	mm	25		
		Air intake	mm	80	80	110
		Flue gas	mm	100		
		Gas supply (DN)	mm	20	20	25
Energy efficiency class			-	A		
Sound pressure level			dB(A)	~ 57	~ 66	~ 59
Input power			W	52	97	116
Power supply			Ø , V , Hz	1 , 230 , 50		
Dimension	WxDxH		mm	510x540x770		
Net weight			kg	69	69	79

1 : Heating water inlet / outlet : 60 °C / 80 °C
2 : Heating water inlet / outlet : 30 °C / 50 °C

- Total hardness : 1 °d
- Water side PH range : 7 - 8.5 ppm
- Measuring sound pressure level at 1m away and ±2dB tolerance.

According to our innovation policy, some specifications may be change without prior notification.

Model No.				115	125	150
1	Nominal heat output	min/max	KW	14.3/109.5	19.2/120.8	19.2/139.8
			Kcal/hr	12290/94150	16510/103870	16510/120200
	Heating efficiency	min/max	%	96.8/98.2	97.0/98.3	97.0/98.2
2	Nominal heat output	min/max	KW	15.1/118.1	22.3/128.0	22.3/149.1
			Kcal/hr	12980/101550	19170/110060	128200
	Heating efficiency	min/max	%	108.2/104.8	108.1/104.4	108.1/103.2
Turndown ratio			-	14:100	17:100	14:100
Hydraulic separator		Operation water pressure (min/max)	bar	0.8/6.0		
		Exchanger water volume	L	4.6	6	6
		Water flow rate (min/max)	m^3/h	0.7/4.8	1.0/5.4	1.0/6.2
		Pump head	mWC	5	5.5	5.5
		Max. operation temp.	˚C	85		
		Limit shut off temp.	˚C	95		
Fuel		Gas type	-	G20		
		Consumption rate (min/max)	m^3/h	1.6/11.7	2.1/12.8	2.1/14.9
		Gas pressure (G20/G31)	mbar	20		
Flue		Gas pressure	Pa	200	220	330
		CO2 emission (min/max)	%	9.44/9.36	9.54/9.49	9.54/9.56
		Gas temp. [1] (min/max)	˚C	56.8/64.9	56.9/61.8	56.9/70.3
		Gas temp. [2] (min/max)	˚C	30.2/53.5	30.5/44.9	30.5/47.1
		NOx class	-	6		
		NOx value	mg/kWh	43	46	44
Pipe connection		Water inlet/outlet (DN)	mm	25		
		Air intake	mm	110		
		Flue gas	mm	100		
		Gas supply (DN)	mm	25		
Energy efficiency class			-	A		
Sound pressure level			dB(A)	~ 61	~ 66	~ 69
Input power			W	203	212	313
Power supply			Ø , V , Hz	1 , 230 , 50		
Dimension	WxDxH		mm	510x540x770	600x540x770	600x540x770
Net weight			kg	79	91	91

1 : Heating water inlet / outlet : 60 °C / 80 °C
2 : Heating water inlet / outlet : 30 °C / 50 °C

- Total hardness : 1 °d
- Water side PH range : 7 - 8.5 ppm
- Measuring sound pressure level at 1m away and ±2dB tolerance.

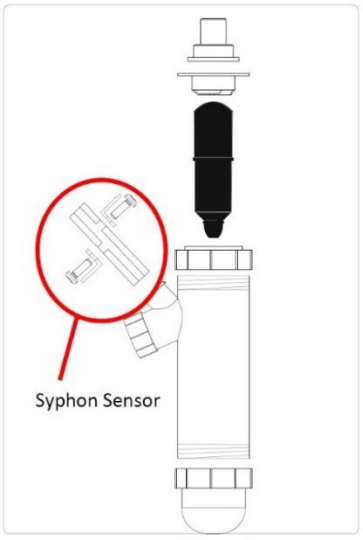
Attention

AFRA

- Nitrite protection should not be used in boilers with aluminum heat exchangers.
- It's Recommend flushing in the system to prolong the life of system and boilers. No acid-based products should be used during flushing.
- The boiler have to be serviced annually. All this maintenance should be made by authorized service, water values and the water softening unit (resin, salt etc.) values should be measured and maintained by service
- Depending on the water conditions specified in the table, the problems that may occur in the boiler heat exchanger could make out of warranty.
- The water used in the installation have to be city-water and observe the hardness range of the water side. Never use well-water.
- Assembly and installation should made according to sample schemes.
- Boiler (primary) pump have to be selected to in accordance with the required pressure and flow rate.
- The boiler (primary) pump have to be in the direction of the installation return line to the boiler.
- The system operating pressure should match with the working pressure of boiler.
- In system with a total power of 200 KW and above, a neutralization tank must be used.
- Boiler output and input diameters have to be strictly followed, other equipment should be selected according to this diameters. In order to install other equipment, the diameter of the boiler out should not be reduced.
- It is mandatory to use a suitable diameter filter and check valve to the boiler return line pipe at each boiler turn.
- In case the plate heat exchanger is used instead of the hydraulic separator as the system separator, expansion tank have to be placed in the primary circuit. If an automatic filling valve is used in the system, a water meter have to be used for following how much water is added to the system.
- In cascade systems, the sensor housing must be placed on the hydraulic separator or on the secondary flow line. If the system is separated by a plate heat exchanger, place the sensor housing on the secondary circuit flow line.

- 6A fuses have to be used for the power supply of the boilers. The electrical system must be grounded.
- Chimney connections have to be made in accordance with the chimney types and regulations.
- The flue gas analysis measuring probe (probe hole) have to be opened by the flue company for each boiler.
- Boiler chimneys should be extended by a minimum 1 meter from the boiler flue outlet direction and then connected to the chimney collector without elbows or with elbows.
- If the chimney connections passes over the boiler, the connections should be checked properly and water tightening should be provided. Water in the chimney due to leaks may cause the system out of warranty. Adequate ventilation should be provided for the boiler room.
- This product is manufactured for heating and domestic water. Not suitable for commercial or industrial purposes.
- The operating pressure of the boilers in the natural gas installation is 21 Mbar. Therefore, it is necessary to use a regulator in the gas line. There should be a minimum distance of 1-2 meters between the regulator and the boiler gas flange. There should be discharge line after regulator for discharge of the excess air.
- In order to control the gas pressures, the manometer must be fitted before and after the regulator.
- The pipes and elbows to be used for the waste gas must be made of plastic material due to the corrosive effects of condensation water.
- Boilers do not have an expansion tank. So the capacity of the expansion tank should be selected according to the capacity of the heating system and the static pressure. It is recommended to place the expansion tank on the turn of the central heating system.
- Boilers are equipped with a safety valve. The hose of this safety valve must be connected to a drain. Manufacturer cannot be held liable for damages caused by water flow into the boiler or on the ground when excessive pressure is generated in the heating installation.

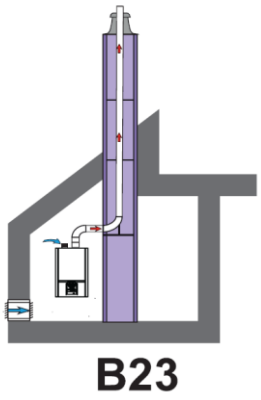
- Condensation water which is generated during to the combustion, transfers to the water drain connection by the syphon and drain hose. Condensation water is acidic and corrosive (approx. 2 PH). So all of the connections which are made for condensation water must be made with PP type pipes. Condensation water must be transferred to the drain well system with the shortest way possible. For health and environmental reasons it must not transfer such places near people, animals and plants.

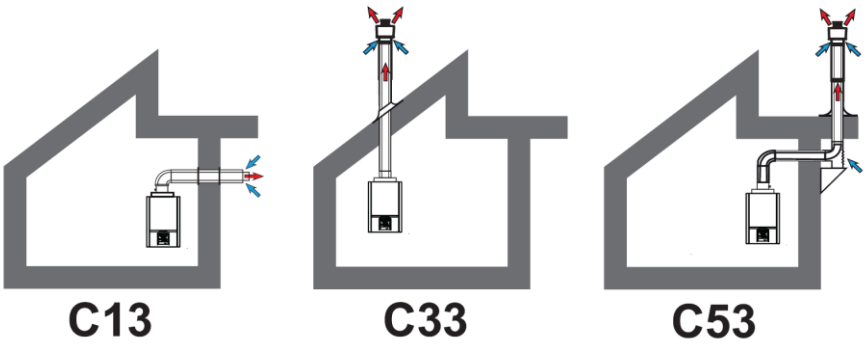


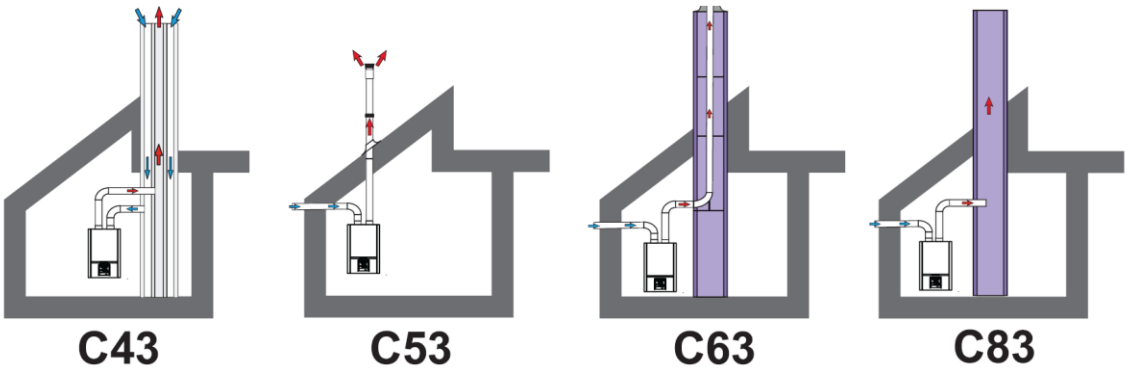
- Condensation water must not be connected to rain drain systems.
- The condensate drain line must have a slope of at least 3%.
- A neutralization tank should be used for condensate water occurring in systems with a total power of 200 KW and above.
- It is mandatory to comply with the relevant local regulations for the discharge of condensate water.
- Boilers have an automatic relief valve for the evacuation of the air accumulated in the heat exchanger. However, for the evacuation of the air that may occur in the installation, it is necessary to place one or more automatic air relief valves in the appropriate places of the installation. Local regulations must be followed in this regard.
- DYNAMIC AND CHEMICAL WASHING/FLUSHING: In the newly established systems, to avoid the possible substances in the installations (metal shavings, some oils, residues of construction wastes, etc.) flushing treatment is a mandatory. Likewise, it is a mandatory to apply the flushing treatment without water given to the boiler in conversion of older systems. Neutral-based, non-acidic, non-alkaline registered products can be used to clean the installation or keep the water conditions at desired levels.
- If Boilers will be used in to a dirty air environment, they must be supported with the air inlet filters. This optional filter must be checked regularly.

- Flue and chimney connections must be carried out in accordance with applicable regulations and relevant standards. Materials which are used for the flue and chimney must be resistant to the temperature, corrosive effect of condensation water and mechanical stresses and must be gas-tight. So all of the connections which are made for flue and chimney must be made with PPS type pipes or stainless steel pipes.
- Chimney system and the condensation drainage systems connected to it should be checked once a year and cleaned if necessary.
- FROST PROTECTION: It will be activated when the temperature of the water in the boiler falls below 4 °C and activates the primary circulation pump. In order for the frost protection mode to be active, boiler's electrical switch must be switched on and the system water must be full.
- Frost Protection function is valid only for boiler, cannot protect the installations circuit.
- Boilers are equipped with a fault diagnosis system. When a malfunction code is displayed on both the Master and Slave boilers, the red light on the bottom of the control panel flashes with the no flame sign.
- Boilers are designed to work only with natural gas. never be used with LPG.

Installation Type		Unit Model					
		50	70	90	115	125	150
B23	m	25	25	25	25	22	22
C13 - C33	m	20	20	20	20	17	17
C43 - C53 - C63 - C83	m	20	20	20	20	17	17







B23 = It is a flue system that takes the combustion air from the environment and throws flue gas to the outside.

C13 = It is a flue system that takes the combustion air from the outside and throws flue gas to the outside with the horizontal concentric flue pipe system.

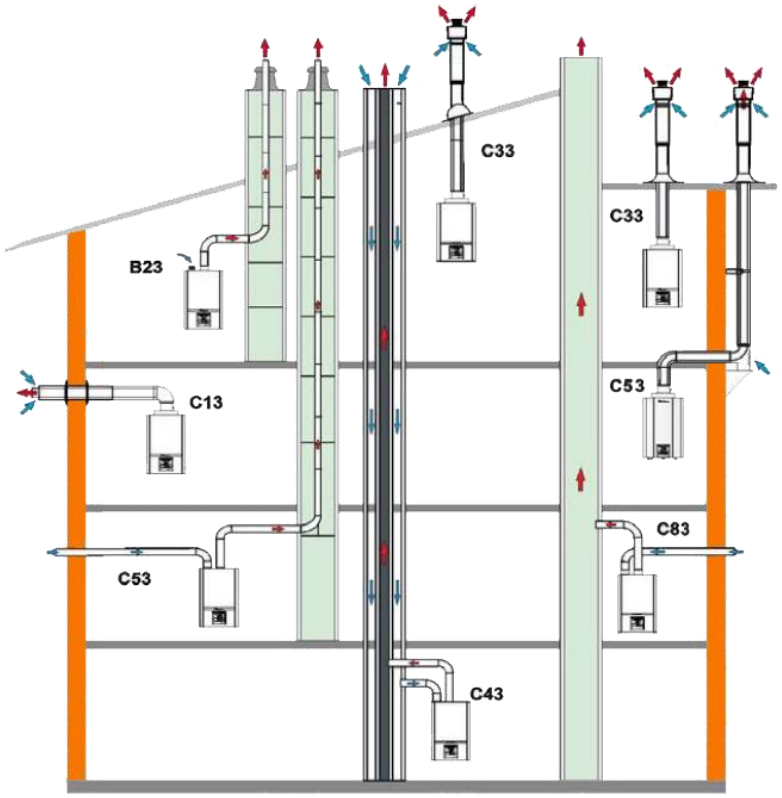
C33 = It is a flue system that takes the combustion air from the outside and throws flue gas to the outside with the vertical concentric flue pipe system.

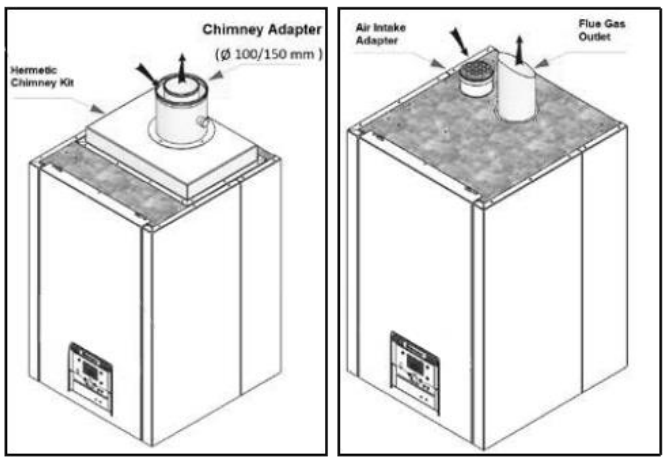
C43 = It is a flue system that takes the combustion air from the outside and throws flue gas to the outside with separate flue pipes.

C53 = It is a flue system that takes the combustion air from the outside and throws flue gas to the outside with the vertical and horizontal concentric flue pipe system.

C63 = It is a flue system that flue pipes are not supplied by the manufacturer. It has to be applied according to one of the applicable flue systems which are mentioned in technical table in flue types section with CE certified flue pipes.

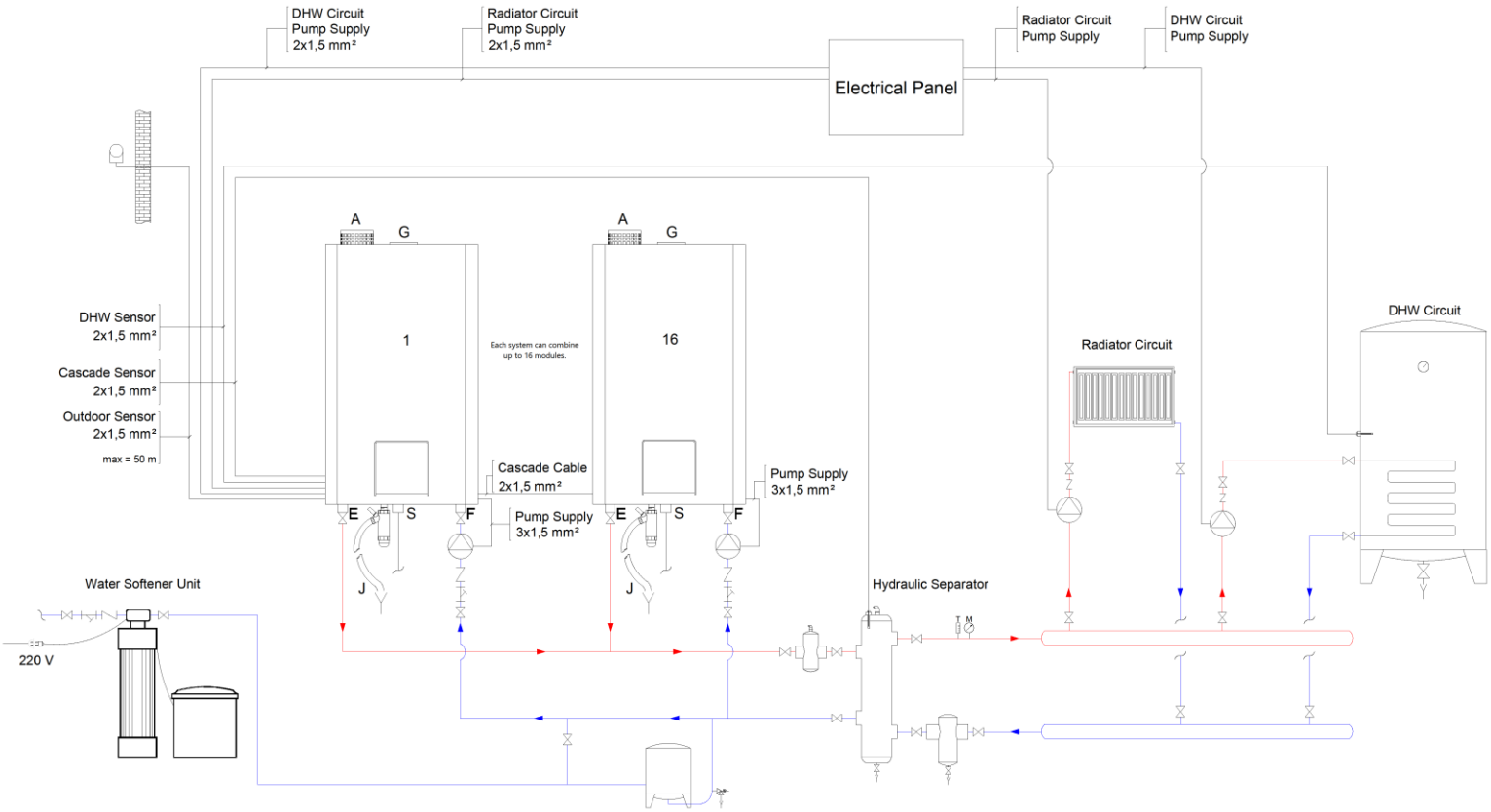
C83 = It is a flue system which takes the combustion air from the outside with horizontal flue pipes and throws flue gas to the self contained (negative pressure) chimney.





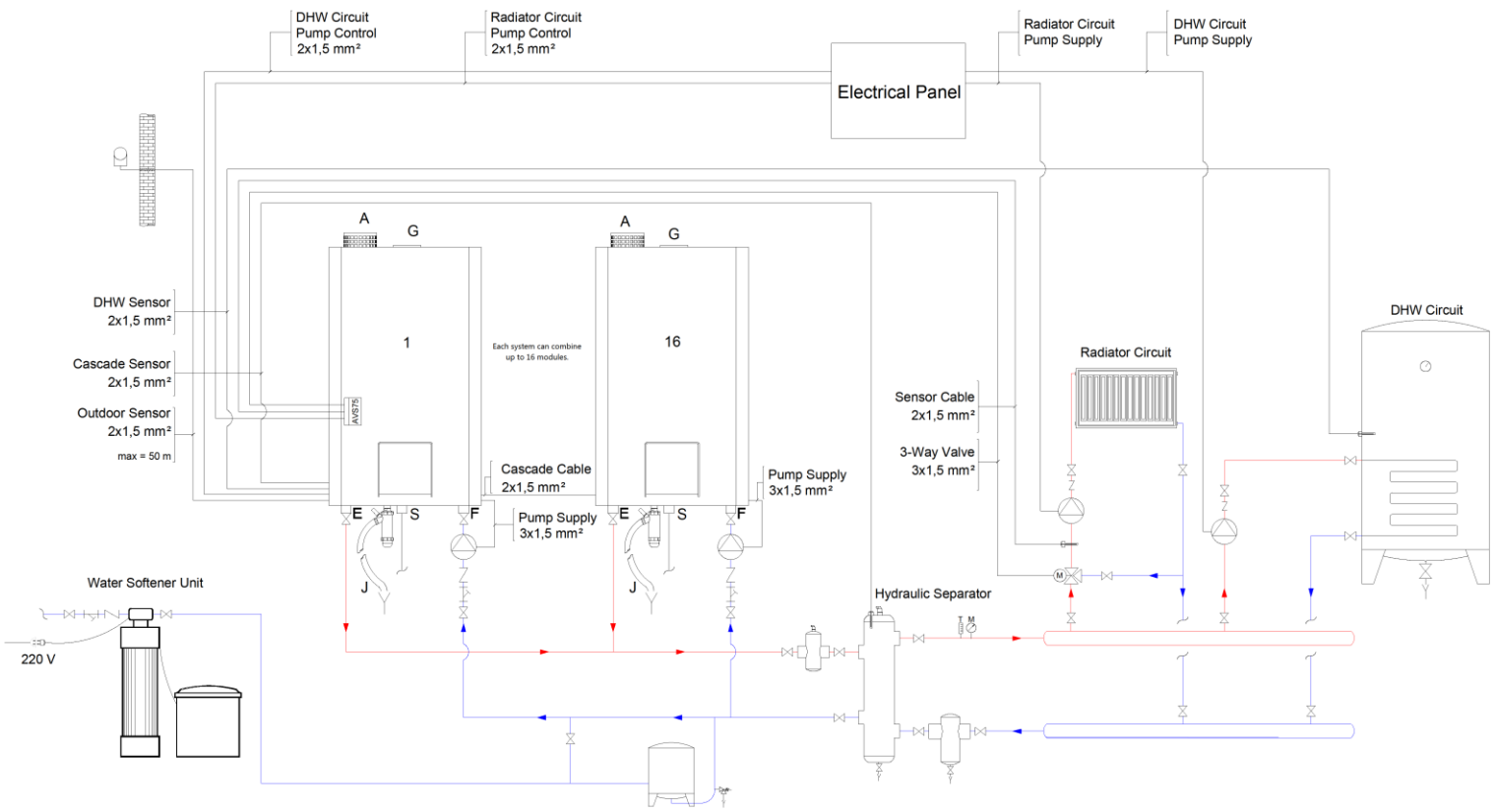
- If the C13 and C33 (Hermetic) type chimney connection is to be If the C13 and C33 (Hermetic) type chimney connection is to be Chimney Adapter.
- For horizontal flue connections, an upward slope of 3% should be provided and the condensate formed in the chimney should be provided and the condensate formed in the chimney should be directed towards the boiler.
- If B23 type flue connection is to be applied, air suction adapter should be used for clean air and waste gas should be discharged to external environment with Ø100 mm pipe.
- The maximum permissible chimney lengths must be observed in all flue applications.

DHW - Radiator with Hydraulic Separator



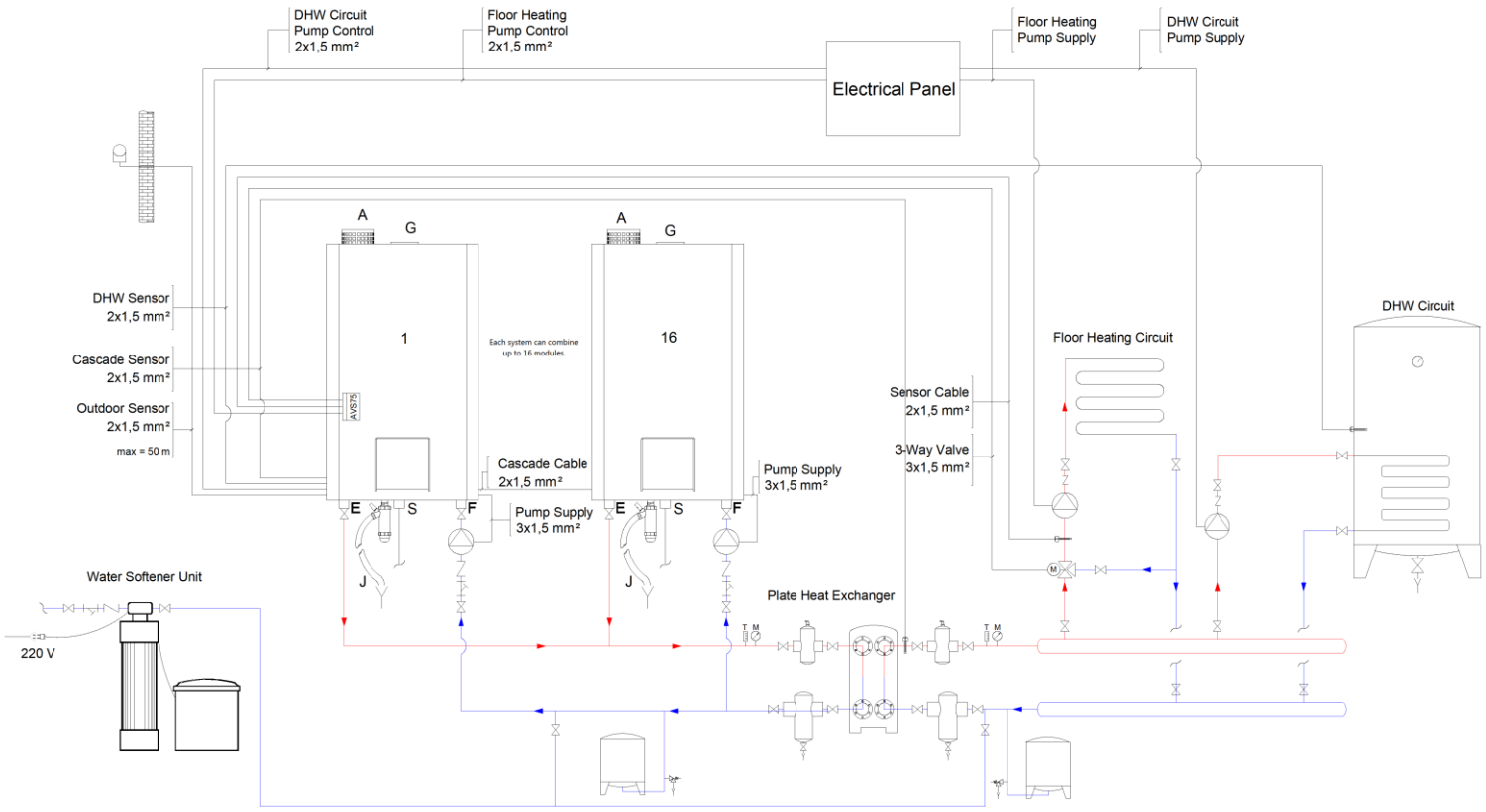
pump	valve	non-return valve	strainer	temperature sensor	outdoor sensor	air relief valve	thermometer	manometer	safety valve	drain	air separator	dirt separator	expansion vessel

DHW - Radiator with Hydraulic Separator and 3-Way Valve



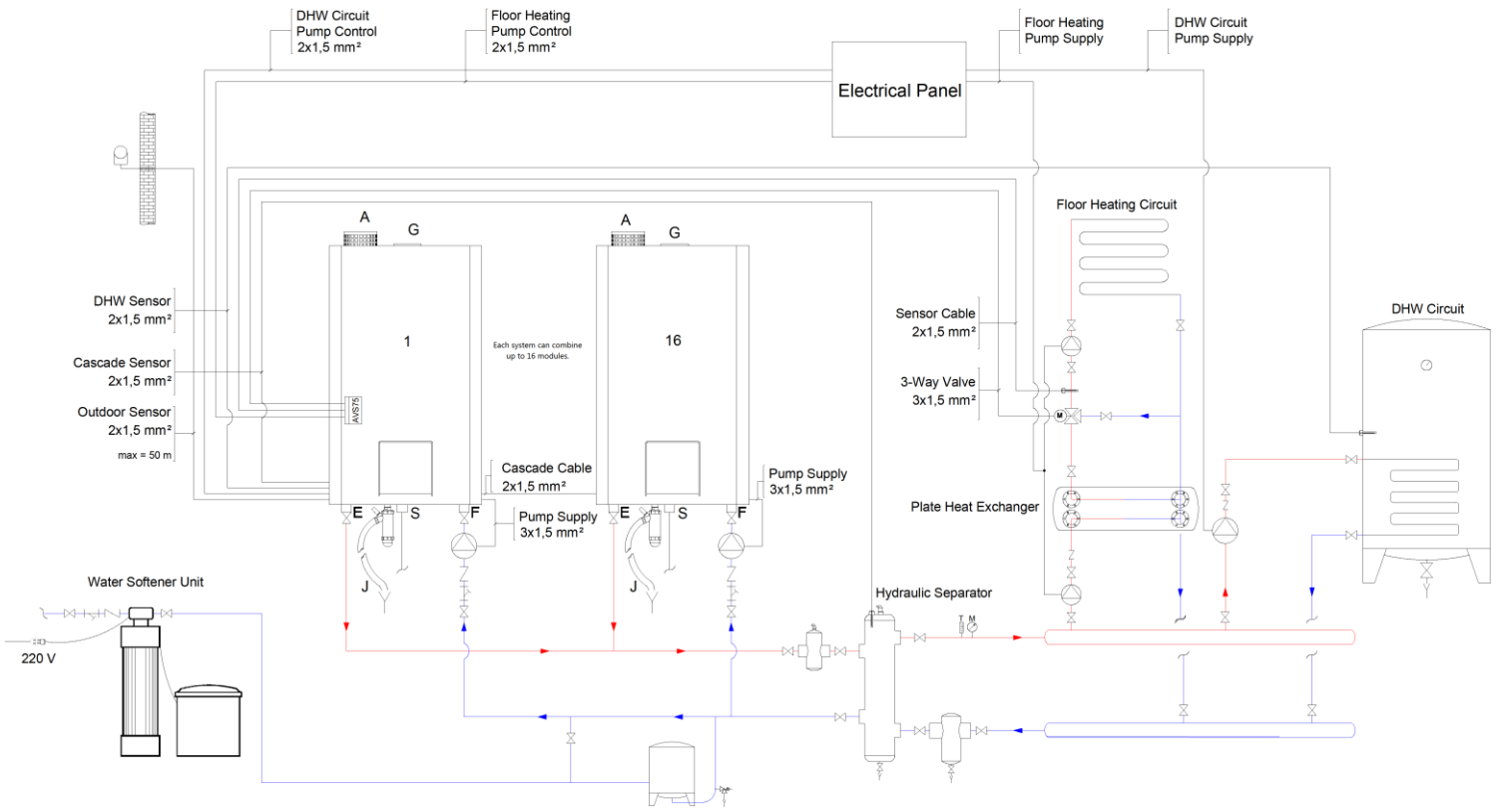
pump	valve	non-return valve	strainer	temperature sensor	outdoor sensor	air relief valve	thermometer	manometer	safety valve	drain	air separator	dirt separator	expansion vessel

DHW - Floor Heating with Plate Heat Exchanger and 3-Way Valve



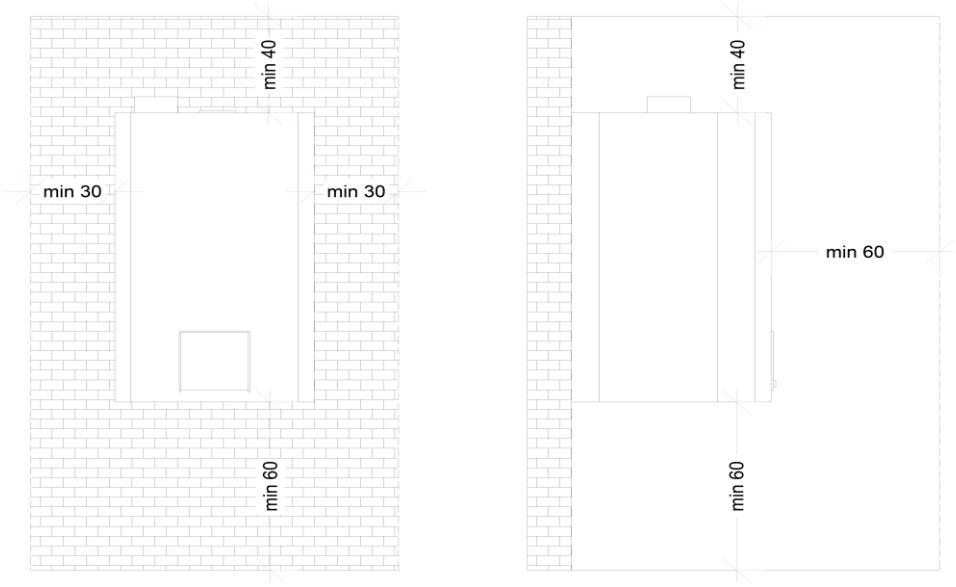
pump	valve	non-return valve	strainer	temperature sensor	outdoor sensor	air relief valve	thermometer	manometer	safety valve	drain	air separator	dirt separator	expansion vessel

DHW - Floor Heating with Hydraulic Separator, Plate Heat Exchanger and 3-Way Valve



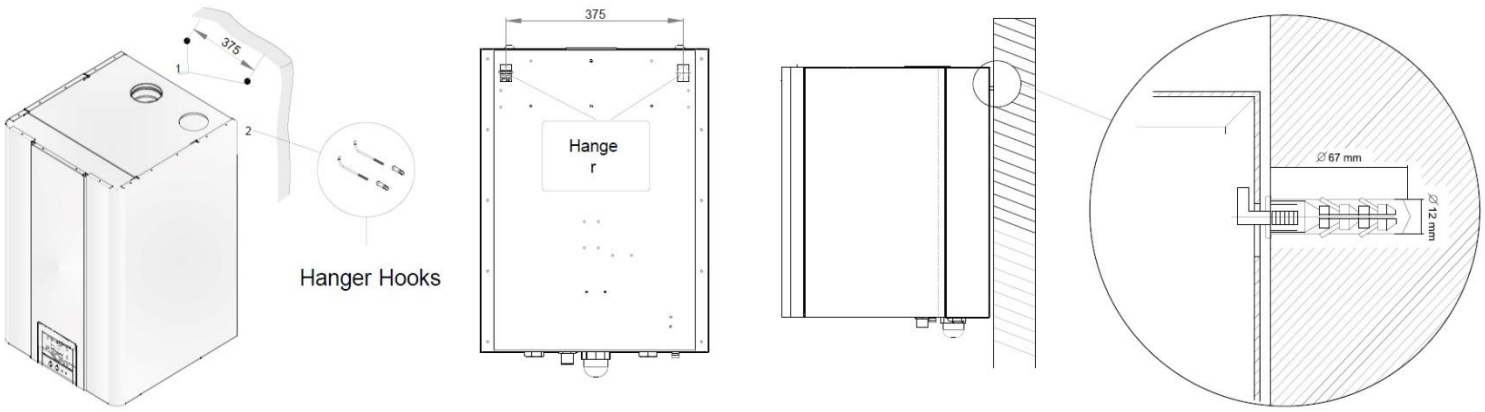
pump	valve	non-return valve	strainer	temperature sensor	outdoor sensor	air relief valve	thermometer	manometer	safety valve	drain	air separator	dirt separator	expansion vessel

The wall must be strong enough to hold a water filled boiler. If the carrying capacity of the wall is not sufficient, an external suspension device must be provided. For example; a footed device may be used. For ease of service operation to the boiler, the necessary distances must be left around the boiler.



Wall Mount: The dimensions of the hanger spaces behind the boiler are shown below.

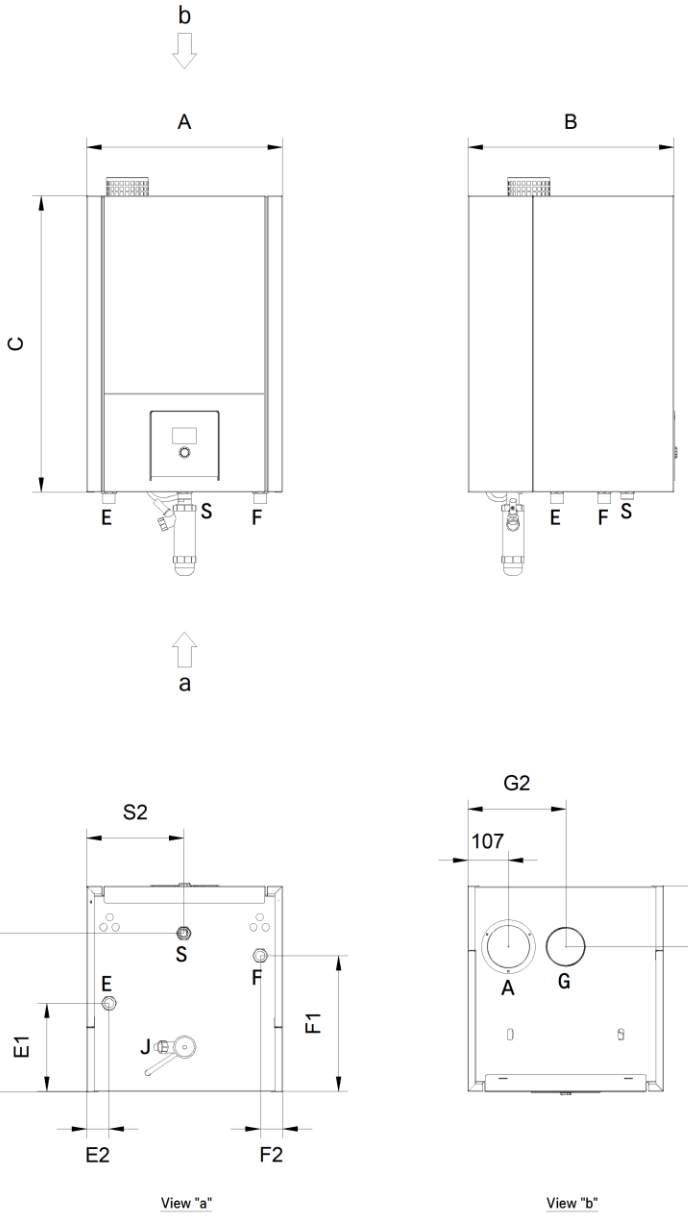
- Drill the holes you marked with a 12-point drill.
- Screw the hooks and hanger hooks into place.
- Hang the boiler from the sling slots on the wall.

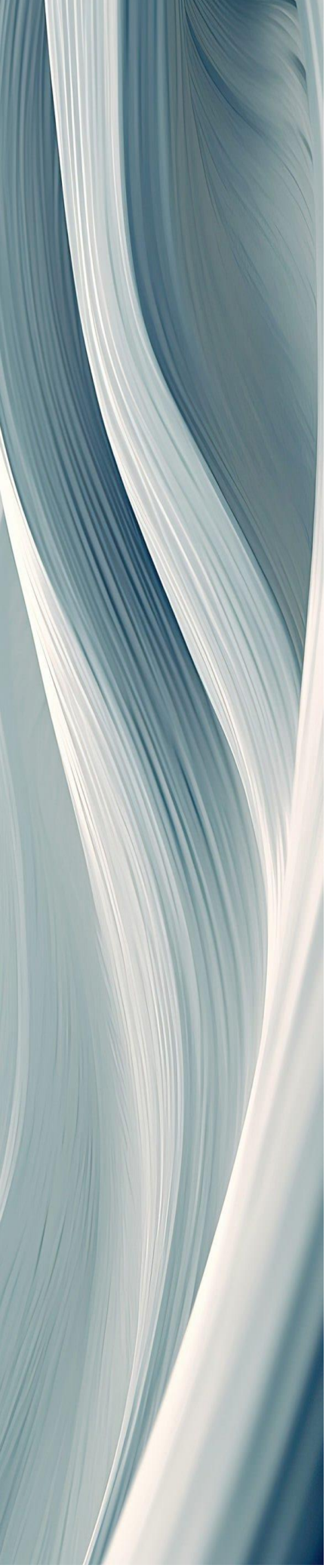


Dimensions

No.	Model						unit
	50	70	90	115	125	150	
A	510	510	510	510	600	600	mm
B	540	540	540	540	540	540	
C	770	770	770	770	770	770	
S1	417	417	417	417	417	417	
S2	455	455	455	455	455	455	
E1	232	232	232	232	232	232	
E2	105	105	58	58	58	58	
F1	357	357	357	357	357	357	
F2	105	105	58	58	58	58	
G1	159	159	159	159	159	159	
G2	257	257	257	257	303	303	
G (Ø)	100	100	100	100	100	100	
A (Ø)	80	80	110	110	110	110	
J (Ø)	25	25	25	25	25	25	
S	3/4	3/4	1	1	1	1	in
E	1	1	1	1	1	1	
F	1	1	1	1	1	1	

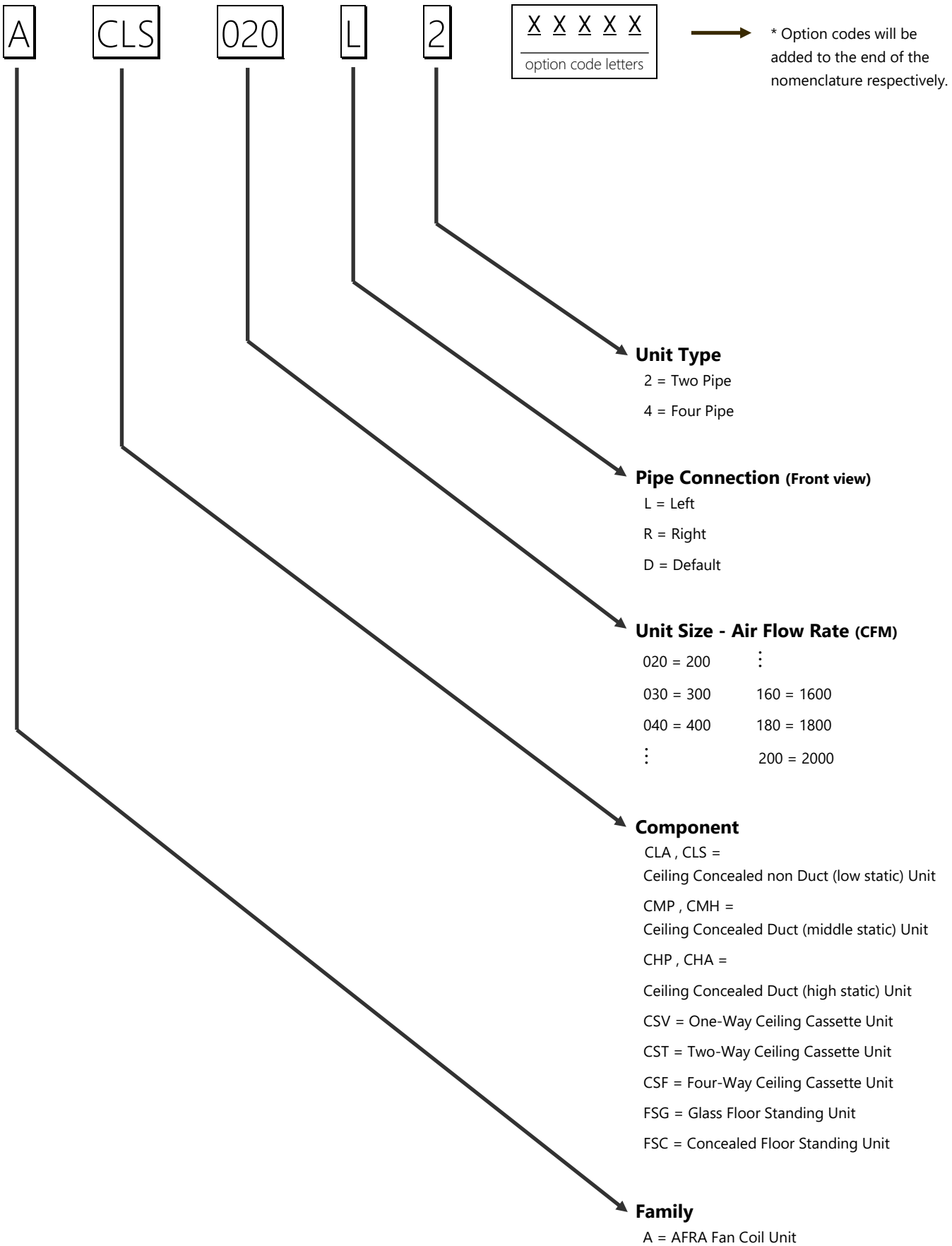
No.	Part Name
A	Fresh air hole
G	Flue gas hole
S	Gas supply pipe
E	Water outlet
F	Water inlet
J	Drain pipe connection



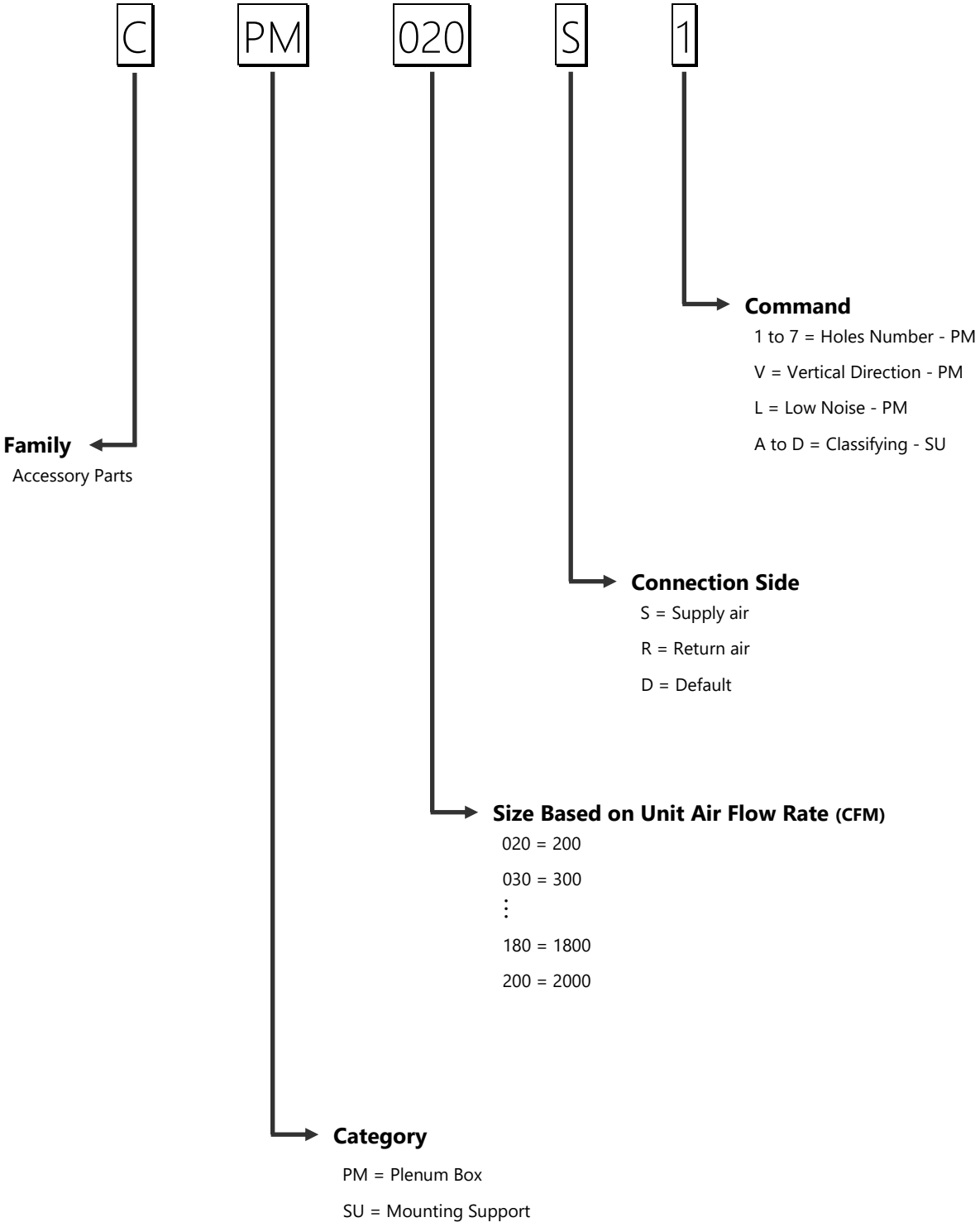


Fan Coil Unit

Nomenclature (Fan Coil Unit)



Nomenclature (Accessories)



Options

Item	Description	Product's Brand
1. Remote Control	▪ Works with two pipe or four pipe fan coil units. ▪ Efficient LCD display which provides easy setting and operation. ▪ Built-in clock and timing ON/OFF function. ▪ Set your desired temperature easily with a thermostat mounted on the return air. ▪ Signal Receiving Range: 8 meter ▪ Fahrenheit or Celsius temperature display option.	ordered by AFRA
2. Three Way Valve [1]	▪ To provide more temperature comfort. ▪ Can be used in cooling and heating control system. ▪ Application: hot water, cold water, water glycol mixture. ▪ Threaded connections ▪ Compressive strength up to 16 bar. ▪ Temperature range: 1 - 110 °C ▪ Low pressure drop	SIEMENS
3. BLDC Motor Fan [2]	▪ Brushless Direct Current motor fan. ▪ Current passes to its windings to control the speed and torque of the control unit. ▪ High efficiency, with low maintenance requirements. ▪ Quieter and produce less heat than traditional motor fans. ▪ More energy efficiency because of using less power to produce the same amount of airflow.	ordered by AFRA
4. Drain Pump [3]	▪ Head: 3-5 meter	ordered by AFRA

1. for choosing equipment number 2, makes it necessary to select equipment number 1 for this item.

2. This option cannot be selected for ACSF series.

3. The drain pump is external in all series except ACSF series.

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

ACLA SERIES

Low Static

Technical Data

AFRA

Model No.				ACLA020L2	ACLA030L2	ACLA040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	External static pressure		Pa	25		
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x220x520	745x220x520	845x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACLA060L2	ACLA080L2	ACLA100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	External static pressure		Pa	25		
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat	Galvanized steel with electrostatic powder coated	
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40	42	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x220x520	1195x220x520	1445x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACLS SERIES

Low Static

Model No.				ACLS020L2	ACLS030L2	ACLS040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	External static pressure		Pa	25		
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x180x520	745x180x520	845x180x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACLS060L2	ACLS080L2	ACLS100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	External static pressure		Pa	25		
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat	Galvanized steel with electrostatic powder coated	
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40	42	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x180x520	1195x180x520	1445x180x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACMP SERIES

Middle Static

Model No.				ACMP020L2	ACMP030L2	ACMP040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	External static pressure		Pa	40		
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x220x350	745x220x350	845x220x350

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACMP060L2	ACMP080L2	ACMP100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward Centrifugal		
	Material		-	Galvanized Steel		
	Number		-	2	3	
	External static pressure		Pa	40		
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat	Galvanized steel with electrostatic powder coated	
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40	42	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x220x350	1195x220x350	1445x220x350

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACMH SERIES

Middle Static
2 pipe

Model No.				ACMH020L2	ACMH030L2	ACMH040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	External static pressure		Pa	40		
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x220x520	745x220x520	845x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACMH060L2	ACMH080L2	ACMH100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	External static pressure		Pa	40		
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat	Galvanized steel with electrostatic powder coated	
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40	42	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x220x520	1195x220x520	1445x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACMH SERIES

Middle Static
4 pipe

Model No.				ACMH020L4	ACMH030L4	ACMH040L4
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	1.15	1.62	2.08
			BTU/hr	3,900	5,500	7,100
Water flow rate			gpm	1.5	2	2.5
Water pressure drop	Cooling		kPa	4.6	8.7	14.5
	Heating		kPa	1.8	2	4
Cooling	Coil	Tube size	inch	3/8		
		Number of row	-	3		
		Number of tubes for row	-	8		
		Fin Per Inch	FPI	12		
Heating	Coil	Tube size	inch	3/8		
		Number of row	-	1		
		Number of tubes for row	-	8		
		Fin Per Inch	FPI	12		
Fan		Type	-	Forward centrifugal		
		Material	-	Galvanized steel		
		Number	-	1		2
		External static pressure	Pa	35		
		Number of motor	-	1		
Pipe connection		Inlet	inch - mm	¾ - 25		
		Outlet	inch - mm	¾ - 25		
		Drain	inch - mm	½ - 16		
Drain pan		Type	-	Internal		
		Material	-	ABS high heat		
		Insulator	-	Elastomeric		
Filter		Type	-	Washable		
		Material	-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	40		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x220x520	745x220x520	845x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACMH060L4	ACMH080L4	ACMH100L4
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	2.87	3.9	4.89
			BTU/hr	9,800	13,300	16,700
Water flow rate			gpm	3.5	5	6
Water pressure drop	Cooling		kPa	29.3	64	105
	Heating		kPa	8	19	31.3
Cooling	Coil	Tube size	inch	3/8		
		Number of row	-	3		
		Number of tubes for row	-	8		
		Fin Per Inch	FPI	12		
Heating	Coil	Tube size	inch	3/8		
		Number of row	-	1		
		Number of tubes for row	-	8		
		Fin Per Inch	FPI	12		
Fan		Type	-	Forward centrifugal		
		Material	-	Galvanized steel		
		Number	-	2	3	
		External static pressure	Pa	35		
		Number of motor	-	1	2	
Pipe connection		Inlet	inch - mm	¾ - 25		
		Outlet	inch - mm	¾ - 25		
		Drain	inch - mm	½ - 16		
Drain pan		Type	-	Internal		
		Material	-	ABS high heat	Galvanized steel with electrostatic powder coated	
		Insulator	-	Elastomeric		
Filter		Type	-	Washable		
		Material	-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41	43	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x220x520	1195x220x520	1445x220x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACHP SERIES

Middle Static

Model No.				ACHP060L2	ACHP080L2	ACHP100L2	ACHP120L2
Air flow rate		H/M/L	CFM	600/450/300	800/600/400	1000/600/450	1200/800/650
Capacity	Cooling	Max	KW	5.12	6.57	8.33	9.65
			BTU/hr	17,500	22,400	28,400	33,000
	Heating	Max	KW	7.77	9.83	12.18	14.07
			BTU/hr	26,500	33,500	41,600	48,000
Water flow rate			gpm	3	4	5	6
Water pressure drop			kPa	6.7	11.2	18.4	25.4
Coil	Tube size		inch	3/8			
	Number of row		-	4			
	Number of tubes for row		-	12			
	Fin Per Inch		FPI	12			
Fan	Type		-	Forward centrifugal			
	Material		-	Galvanized steel			
	Number		-	2			
	External static pressure		Pa	70			
	Number of motor		-	1			
Pipe connection	Inlet		inch - mm	1 - 32			
	Outlet		inch - mm	1 - 32			
	Drain		inch - mm	½ - 22			
Drain pan	Type		-	Internal			
	Material		-	Galvanized steel with electrostatic powder coated			
	Insulator		-	Elastomeric			
Filter	Type		-	Washable			
	Material		-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	47	50	51	
Input power			W	1x 250 - 450			
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	845x320x430		945x320x430	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACHP140L2	ACHP160L2	ACHP180L2	ACHP200L2
Air flow rate		H/M/L	CFM	1400/1000/800	1600/1200/1000	1800/1400/1200	2000/1600/1400
Capacity	Cooling	Max	KW	12.06	13.99	15.82	17.77
			BTU/hr	41,200	47,700	54,000	60,600
	Heating	Max	KW	17.05	19.26	21.95	24.15
			BTU/hr	58,200	65,800	74,900	82,500
Water flow rate			gpm	7	9	9	11
Water pressure drop			kPa	41.43	64.65	77.14	110
Coil	Tube size		inch	3/8			
	Number of row		-	4			
	Number of tubes for row		-	12			
	Fin Per Inch		FPI	12			
Fan	Type		-	Forward centrifugal			
	Material		-	Galvanized steel			
	Number		-	2		3	
	External static pressure		Pa	70			
	Number of motor		-	1		2	
Pipe connection	Inlet		inch - mm	1 - 32			
	Outlet		inch - mm	1 - 32			
	Drain		inch - mm	½ - 22			
Drain pan	Type		-	Internal			
	Material		-	Galvanized steel with electrostatic powder coated			
	Insulator		-	Elastomeric			
Filter	Type		-	Washable			
	Material		-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	53		55	57
Input power			W	1x 250 - 450		2x 250 - 450	
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	1195x320x430		1445x320x430	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACHA SERIES

High Static
2 pipe

Model No.				ACHA060L2	ACHA080L2	ACHA100L2	ACHA120L2
Air flow rate		H/M/L	CFM	600/450/300	800/600/400	1000/600/450	1200/800/650
Capacity	Cooling	Max	KW	5.12	6.57	8.33	9.65
			BTU/hr	17,500	22,400	28,400	33,000
	Heating	Max	KW	7.77	9.83	12.18	14.07
			BTU/hr	26,500	33,500	41,600	48,000
Water flow rate			gpm	3	4	5	6
Water pressure drop			kPa	6.7	11.2	18.4	25.4
Coil	Tube size		inch	3/8			
	Number of row		-	4			
	Number of tubes for row		-	12			
	Fin Per Inch		FPI	12			
Fan	Type		-	Forward centrifugal			
	Material		-	Galvanized steel			
	Number		-	2			
	External static pressure		Pa	120			
	Number of motor		-	1			
Pipe connection	Inlet		inch - mm	1 - 32			
	Outlet		inch - mm	1 - 32			
	Drain		inch - mm	½ - 22			
Drain pan	Type		-	Internal			
	Material		-	Galvanized steel with electrostatic powder coated			
	Insulator		-	Elastomeric			
Filter	Type		-	Washable			
	Material		-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	47	50	51	
Input power			W	1x 250 - 450			
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	845x320x750		945x320x750	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACHA140L2	ACHA160L2	ACHA180L2	ACHA200L2
Air flow rate		H/M/L	CFM	1400/1000/800	1600/1200/1000	1800/1400/1200	2000/1600/1400
Capacity	Cooling	Max	KW	12.06	13.99	15.82	17.77
			BTU/hr	41,200	47,700	54,000	60,600
	Heating	Max	KW	17.05	19.26	21.95	24.15
			BTU/hr	58,200	65,800	74,900	82,500
Water flow rate			gpm	7	9	9	11
Water pressure drop			kPa	41.43	64.65	77.14	110
Coil	Tube size		inch	3/8			
	Number of row		-	4			
	Number of tubes for row		-	12			
	Fin Per Inch		FPI	12			
Fan	Type		-	Forward centrifugal			
	Material		-	Galvanized steel			
	Number		-	2		3	
	External static pressure		Pa	120			
	Number of motor		-	1		2	
Pipe connection	Inlet		inch - mm	1 - 32			
	Outlet		inch - mm	1 - 32			
	Drain		inch - mm	½ - 22			
Drain pan	Type		-	Internal			
	Material		-	Galvanized steel with electrostatic powder coated			
	Insulator		-	Elastomeric			
Filter	Type		-	Washable			
	Material		-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	53		55	57
Input power			W	1x 250 - 450		2x 250 - 450	
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	1195x320x750		1445x320x750	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACHA SERIES

High Static
4 pipe

Model No.				ACHA060L4	ACHA080L4	ACHA100L4	ACHA120L4
Air flow rate		H/M/L	CFM	600/450/300	800/600/400	1000/600/450	1200/800/650
Capacity	Cooling	Max	KW	5.12	6.57	8.33	9.65
			BTU/hr	17,500	22,400	28,400	33,000
	Heating	Max	KW	5.28	6.54	8.07	9.2
			BTU/hr	18,000	22,300	27,500	31,400
Water flow rate			gpm	3	4	5	6
Water pressure drop	Cooling		kPa	6.7	11.2	18.4	25.4
	Heating		kPa	2.4	4.1	6.7	9.2
Cooling	Coil	Tube size	inch	3/8			
		Number of row	-	4			
		Number of tubes for row	-	12			
		Fin Per Inch	FPI	12			
Heating	Coil	Tube size	inch	3/8			
		Number of row	-	2			
		Number of tubes for row	-	12			
		Fin Per Inch	FPI	12			
Fan		Type	-	Forward centrifugal			
		Material	-	Galvanized steel			
		Number	-	2			
		External static pressure	Pa	100			
		Number of motor	-	1			
Pipe connection		Inlet	inch - mm	1 - 32			
		Outlet	inch - mm	1 - 32			
		Drain	inch - mm	½ - 22			
Drain pan		Type	-	Internal			
		Material	-	Galvanized steel with electrostatic powder coated			
		Insulator	-	Elastomeric			
Filter		Type	-	Washable			
		Material	-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	47	51	53	
Input power			W	1x 250 - 450			
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	845x320x750		945x320x750	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACHA140L4	ACHA160L4	ACHA180L4	ACHA200L4
Air flow rate		H/M/L	CFM	1400/1000/800	1600/1200/1000	1800/1400/1200	2000/1600/1400
Capacity	Cooling	Max	KW	12.06	13.99	15.82	17.77
			BTU/hr	41,200	47,700	54,000	60,600
	Heating	Max	KW	11.31	12.62	14.55	15.86
			BTU/hr	38,600	43,100	49,600	54,100
Water flow rate			gpm	7	9	9	11
Water pressure drop	Cooling		kPa	41.43	64.65	77.14	110
	Heating		kPa	15.2	23.6	28.4	40.4
Cooling	Coil	Tube size	inch	3/8			
		Number of row	-	4			
		Number of tubes for row	-	12			
		Fin Per Inch	FPI	12			
Heating	Coil	Tube size	inch	3/8			
		Number of row	-	2			
		Number of tubes for row	-	12			
		Fin Per Inch	FPI	12			
Fan		Type	-	Forward centrifugal			
		Material	-	Galvanized steel			
		Number	-	2		3	
		External static pressure	Pa	100			
		Number of motor	-	1		2	
Pipe connection		Inlet	inch - mm	1 - 32			
		Outlet	inch - mm	1 - 32			
		Drain	inch - mm	½ - 22			
Drain pan		Type	-	Internal			
		Material	-	Galvanized steel with electrostatic powder coated			
		Insulator	-	Elastomeric			
Filter		Type	-	Washable			
		Material	-	Polypropylene			
Fresh air intake hole			inch - mm	4 - 110			
Sound pressure level		Max	dB(A)	54		57	60
Input power			W	1x 250 - 450		2x 250 - 450	
Power supply			PH , V , Hz	1 , 220 , 50			
Dimension		WxHxD	mm	1195x320x750		1445x320x750	

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

ACSV SERIES

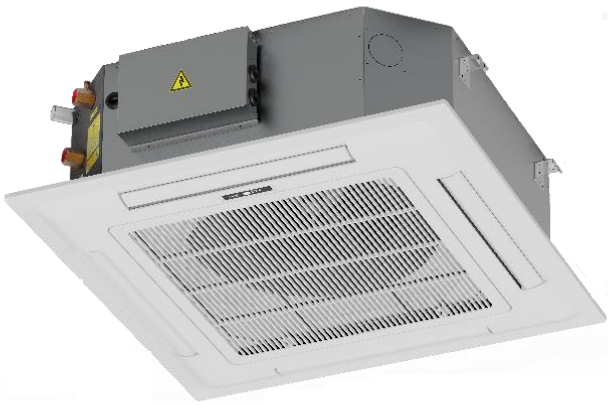
One Way

Model No.				ACSV020L2	ACSV030L2	ACSV040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension	Body	WxHxD	mm	650x270x400	750x270x400	850x270x400
	Decoration panel	WxHxD	mm	1000x20x520	1100x20x520	1200x20x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				ACSV060L2	ACSV080L2	ACSV100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37,900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	ABS high heat	Galvanized steel with electrostatic powder coated	
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41	42	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension	Body	WxHxD	mm	950x270x400	1200x270x400	1450x270x400
	Decoration panel	WxHxD	mm	1300x20x520	1550x20x520	1800x20x520

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.



ACSF SERIES

Four Way
2 pipe

Model No.					ACSF020D2	ACSF030D2	ACSF040D2
Air flow rate			H/M/L	CFM	220/175/135	320/250/195	400/315/240
Capacity	Cooling		Max	KW	2	3	3.8
				BTU/hr	6,800	10,200	13,000
	Heating		Max	KW	3.1	4.7	5.9
				BTU/hr	10,600	16,000	20,100
Water flow rate				gpm	1.5	2.3	2.9
Water pressure drop				kPa	23	27	26
Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	37	39	44
Input power				W	30	37	50
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	592x242x592		
		Decoration panel	WxHxD	mm	650x40x650		
	B	Body	WxHxD	mm	592x340x592		
		Decoration panel	WxHxD	mm	650x40x650		

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF045D2	ACSF050D2	ACSF060D2
Air flow rate			H/M/L	CFM	460/360/270	510/410/310	610/490/370
Capacity	Cooling		Max	KW	4.2	4.9	5.8
				BTU/hr	14,300	16,700	19,800
	Heating		Max	KW	6.5	7.6	9
				BTU/hr	22,200	25,900	30,700
Water flow rate				gpm	3.2	3.7	4.4
Water pressure drop				kPa	29	28	27
Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	46	42	45
Input power				W	60	63	80
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	592x242x592	750x242x750	
		Decoration panel	WxHxD	mm	650x40x650	850x40x850	
	B	Body	WxHxD	mm	592x340x592	750x340x750	
		Decoration panel	WxHxD	mm	650x40x650	850x40x850	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF070D2	ACSF080D2	ACSF090D2
Air flow rate			H/M/L	CFM	700/560/410	810/640/480	910/730/540
Capacity	Cooling		Max	KW	6.4	7.5	8.1
				BTU/hr	21,800	25,600	27,600
	Heating		Max	KW	9.7	11.6	12.2
				BTU/hr	33,100	39,600	41,600
Water flow rate				gpm	4.8	5.6	6.1
Water pressure drop				kPa	30	26	28
Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	46	46	47
Input power				W	110	125	145
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	750x242x750	840x242x840	
		Decoration panel	WxHxD	mm	850x40x850	950x40x950	
	B	Body	WxHxD	mm	750x340x750	840x340x840	
		Decoration panel	WxHxD	mm	850x40x850	950x40x950	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF100D2	ACSF120D2	ACSF130D2
Air flow rate			H/M/L	CFM	1020/820/610	1200/960/720	1290/1030/770
Capacity	Cooling		Max	KW	9.8	11	12
				BTU/hr	33,400	37,500	40,900
	Heating		Max	KW	15.2	17.1	18.6
				BTU/hr	51,800	58,300	63,400
Water flow rate				gpm	7.4	8.2	9
Water pressure drop				kPa	35	36	42
Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	48	50	52
Input power				W	150	190	210
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	840x292x840		
		Decoration panel	WxHxD	mm	950x40x950		
	B	Body	WxHxD	mm	840x390x840		
		Decoration panel	WxHxD	mm	950x40x950		

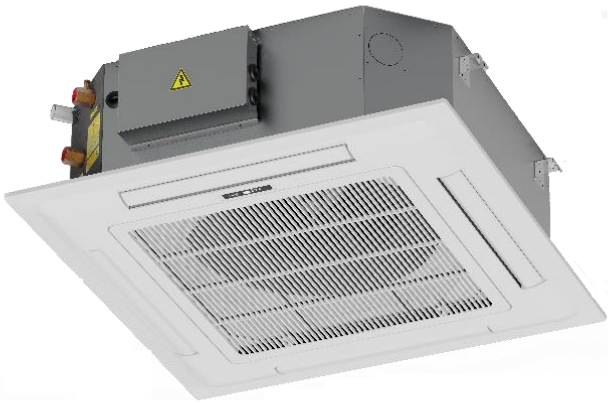
A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF150D2	ACSF160D2
Air flow rate			H/M/L	CFM	1470/1170/880	1600/1200/800
Capacity	Cooling		Max	KW	13.4	15
				BTU/hr	45,700	51,200
	Heating		Max	KW	21.4	24
				BTU/hr	73,000	81,900
Water flow rate				gpm	10	11.2
Water pressure drop				kPa	43	45
Coil	Tube size			inch	3/8	
	Number of row			-	2	
	Number of tubes for row			-	8	
	Fin Per Inch			FPI	12	
Fan	Material			-	ABS high heat	
	Number			-	1	
	Number of motor			-	1	
Pipe connection	Inlet			inch - mm	¾ - 25	
	Outlet			inch - mm	¾ - 25	
	Drain			mm	26	
Drain pan	Material				ABS high heat	
	Insulator				Elastomeric	
Filter	Type			-	Washable	
	Material			-	Polypropylene	
Sound pressure level			Max	dB(A)	52	53
Input power				W	220	240
Power supply				PH , V , Hz	1 , 220 , 50	
Dimension	A	Body	WxHxD	mm	946x292x946	
		Decoration panel	WxHxD	mm	1050x40x1050	
	B	Body	WxHxD	mm	946x390x946	
		Decoration panel	WxHxD	mm	1050x40x1050	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.



ACSF SERIES

Four Way
4 pipe

Model No.					ACSF020D4	ACSF030D4	ACSF040D4
Air flow rate			H/M/L	CFM	210/170/130	300/240/190	385/30/230
Capacity	Cooling		Max	KW	2	3	3.7
				BTU/hr	6,800	10,200	12,700
	Heating		Max	KW	1.9	3	3.7
				BTU/hr	6,400	10,200	12,700
Water flow rate	Cooling			gpm	1.5	2.3	2.9
	Heating			gpm	1	1.5	1.8
Water pressure drop	Cooling			kPa	23	27	26
	Heating			kPa	7	8	13
Cooling	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Heating	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Fan		Material		-	ABS high heat		
		Number		-	1		
		Number of motor		-	1		
Pipe connection		Inlet		inch - mm	¾ - 25		
		Outlet		inch - mm	¾ - 25		
		Drain		mm	26		
Drain pan		Material			ABS high heat		
		Insulator			Elastomeric		
Filter		Type		-	Washable		
		Material		-	Polypropylene		
Sound pressure level			Max	dB(A)	37	39	44
Input power				W	30	37	50
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	592x242x592		
		Decoration panel	WxHxD	mm	650x40x650		
	B	Body	WxHxD	mm	592x340x592		
		Decoration panel	WxHxD	mm	650x40x650		

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF045D4	ACSF050D4	ACSF060D4
Air flow rate			H/M/L	CFM	440/350/260	490/400/305	580/470/350
Capacity	Cooling		Max	KW	4.1	4.8	5.7
				BTU/hr	14,000	16,400	19,400
	Heating		Max	KW	4.1	4.8	5.7
				BTU/hr	14,000	16,400	19,400
Water flow rate	Cooling			gpm	3.2	3.7	4.4
	Heating			gpm	2	2.4	2.8
Water pressure drop	Cooling			kPa	29	28	27
	Heating			kPa	14	11	15
Cooling	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Heating	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Fan		Material		-	ABS high heat		
		Number		-	1		
		Number of motor		-	1		
Pipe connection		Inlet		inch - mm	¾ - 25		
		Outlet		inch - mm	¾ - 25		
		Drain		mm	26		
Drain pan		Material			ABS high heat		
		Insulator			Elastomeric		
Filter		Type		-	Washable		
		Material		-	Polypropylene		
Sound pressure level			Max	dB(A)	46	42	45
Input power				W	60	63	80
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	592x242x592	750x242x750	
		Decoration panel	WxHxD	mm	650x40x650	850x40x850	
	B	Body	WxHxD	mm	592x340x592	750x340x750	
		Decoration panel	WxHxD	mm	650x40x650	850x40x850	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF070D4	ACSF080D4	ACSF090D4
Air flow rate			H/M/L	CFM	700/560/410	770/620/450	850/700/500
Capacity	Cooling		Max	KW	6.3	7.3	7.9
				BTU/hr	21,500	25,100	27,000
	Heating		Max	KW	6.4	7.4	7.8
				BTU/hr	21,000	25,200	26,600
Water flow rate	Cooling			gpm	4.8	5.6	6.1
	Heating			gpm	3.1	3.6	3.8
Water pressure drop	Cooling			kPa	30	26	28
	Heating			kPa	18	15	15
Cooling Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Heating Coil	Tube size			inch	3/8		
	Number of row			-	2		
	Number of tubes for row			-	8		
	Fin Per Inch			FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	46	46	47
Input power				W	110	125	145
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	750x242x750	840x242x840	
		Decoration panel	WxHxD	mm	850x40x850	950x40x950	
	B	Body	WxHxD	mm	750x340x750	840x340x840	
		Decoration panel	WxHxD	mm	850x40x850	950x40x950	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.					ACSF100D4	ACSF120D4	ACSF130D4
Air flow rate			H/M/L	CFM	970/780/570	1150/910/680	1250/1000/720
Capacity	Cooling		Max	KW	9.6	10.8	11.7
				BTU/hr	32,700	36,800	40,100
	Heating		Max	KW	9.7	10.9	11.8
				BTU/hr	33,100	37,200	40,200
Water flow rate	Cooling			gpm	7.4	8.2	9
	Heating			gpm	4.8	5.3	5.8
Water pressure drop	Cooling			kPa	35	36	42
	Heating			kPa	19	23	26
Cooling	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Heating	Coil	Tube size		inch	3/8		
		Number of row		-	2		
		Number of tubes for row		-	8		
		Fin Per Inch		FPI	12		
Fan	Material			-	ABS high heat		
	Number			-	1		
	Number of motor			-	1		
Pipe connection	Inlet			inch - mm	¾ - 25		
	Outlet			inch - mm	¾ - 25		
	Drain			mm	26		
Drain pan	Material				ABS high heat		
	Insulator				Elastomeric		
Filter	Type			-	Washable		
	Material			-	Polypropylene		
Sound pressure level			Max	dB(A)	48	50	52
Input power				W	150	190	210
Power supply				PH , V , Hz	1 , 220 , 50		
Dimension	A	Body	WxHxD	mm	840x292x840		
		Decoration panel	WxHxD	mm	950x40x950		
	B	Body	WxHxD	mm	840x390x840		
		Decoration panel	WxHxD	mm	950x40x950		

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.						ACSF150D4	ACSF160D4
Air flow rate				H/M/L	CFM	1410/1110/830	1540/1160/760
Capacity	Cooling		Max		KW	12.8	13.2
					BTU/hr	43,700	45,000
	Heating		Max		KW	13	13.5
					BTU/hr	44,300	46,000
Water flow rate	Cooling				gpm	10	11.2
	Heating				gpm	6.3	6.6
Water pressure drop	Cooling				kPa	43	45
	Heating				kPa	28	30
Cooling	Coil	Tube size			inch	3/8	
		Number of row			-	2	
		Number of tubes for row			-	8	
		Fin Per Inch			FPI	12	
Heating	Coil	Tube size			inch	3/8	
		Number of row			-	2	
		Number of tubes for row			-	8	
		Fin Per Inch			FPI	12	
Fan		Material			-	ABS high heat	
		Number			-	1	
		Number of motor			-	1	
Pipe connection		Inlet			inch - mm	¾ - 25	
		Outlet			inch - mm	¾ - 25	
		Drain			mm	26	
Drain pan		Material				ABS high heat	
		Insulator				Elastomeric	
Filter		Type			-	Washable	
		Material			-	Polypropylene	
Sound pressure level				Max	dB(A)	52	53
Input power					W	220	240
Power supply					PH , V , Hz	1 , 220 , 50	
Dimension	A	Body		WxHxD	mm	946x292x946	
		Decoration panel		WxHxD	mm	1050x40x1050	
	B	Body		WxHxD	mm	946x390x946	
		Decoration panel		WxHxD	mm	1050x40x1050	

A: With drain pump , B: Without drain pump

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 20 °C (67 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

AFSG SERIES

Glass Floor Standing

Model No.				AFSG020L2	AFSG030L2	AFSG040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	Galvanized steel with electrostatic powder coated		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	865x640x233	965x640x233	1065x640x233

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				AFSG060L2	AFSG080L2	AFSG100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	Galvanized steel with electrostatic powder coated		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41	44	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	1165x640x233	1415x640x233	1665x640x233

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

AFSC SERIES

Concealed Floor Standing

Model No.				AFSC020L2	AFSC030L2	AFSC040L2
Air flow rate		H/M/L	CFM	200/150/100	300/250/150	400/350/200
Capacity	Cooling	Max	KW	1.8	2.61	3.6
			BTU/hr	6,100	8,900	12,300
	Heating	Max	KW	2.55	3.64	4.74
			BTU/hr	8,700	12,400	16,200
Water flow rate			gpm	1.5	2	2.5
Water pressure drop			kPa	4.6	8.7	14.5
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	1		2
	Number of motor		-	1		
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	Galvanized steel with electrostatic powder coated		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41		
Rated current			A	1x 0.55		
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	645x520x242	745x520x242	845x520x242

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Model No.				AFSC060L2	AFSC080L2	AFSC100L2
Air flow rate		H/M/L	CFM	600/500/200	800/600/400	1000/600/400
Capacity	Cooling	Max	KW	5.13	7.03	8.89
			BTU/hr	17,500	24,000	30,300
	Heating	Max	KW	6.68	8.87	11.1
			BTU/hr	22,800	30,300	37900
Water flow rate			gpm	3.5	5	6
Water pressure drop			kPa	29.3	64	105
Coil	Tube size		inch	3/8		
	Number of row		-	3		
	Number of tubes for row		-	8		
	Fin Per Inch		FPI	12		
Fan	Type		-	Forward centrifugal		
	Material		-	Galvanized steel		
	Number		-	2	3	
	Number of motor		-	1	2	
Pipe connection	Inlet		inch - mm	¾ - 25		
	Outlet		inch - mm	¾ - 25		
	Drain		inch - mm	½ - 16		
Drain pan	Type		-	Internal		
	Material		-	Galvanized steel with electrostatic powder coated		
	Insulator		-	Elastomeric		
Filter	Type		-	Washable		
	Material		-	Polypropylene		
Fresh air intake hole			inch - mm	4 - 110		
Sound pressure level		Max	dB(A)	41	44	
Rated current			A	1x 0.55	2x 0.55	
Power supply			PH , V , Hz	1 , 220 , 50		
Dimension		WxHxD	mm	945x520x242	1195x520x242	1445x520x242

- Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp; DB=27 °C (80 °F) , WB=20 °C (67 °F) , sea level: 4000 ft
- Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level: 4000 ft
- Measuring sound pressure level at high speed mode at 2m away and ±2dB tolerance.
- Fan coil pipes connection side can be selected by the customer.

Performance Data (ACLAXXXX2 / ACLSXXXX2 / ACMPXXXX2 / ACMHXXXX2 / ACSVXXXX2 / AFSGXXXX2 / AFSCXXXX2)

AFRA

Cooling Mode

Water Flow Rate (GPM)	Unit Size-020 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	200	150	100	
	TC			
2.5	2.13	1.79	1.36	11.48
2	2	1.71	1.32	7.7
1.5	1.8	1.57	1.24	4.6

Heating Mode

Water Flow Rate (GPM)	Unit Size-020 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	200	150	100	
	Capacity (KW)			
2.5	2.68	2.15	1.56	8.8
2	2.63	2.12	1.54	5.9
1.5	2.55	2.07	1.52	3.61

Water Flow Rate (GPM)	Unit Size-030 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	300	250	150	
	TC			
2.5	2.82	2.56	1.89	13
2	2.61	2.39	1.8	8.7
1.5	2.29	2.13	1.67	5.2

Water Flow Rate (GPM)	Unit Size-030 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	300	250	150	
	Capacity (KW)			
2.5	3.73	3.28	2.23	10
2	3.64	3.21	2.2	6.7
1.5	3.48	3.09	2.15	4.1

Water Flow Rate (GPM)	Unit Size-040 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	400	300	200	
	TC			
3	3.82	3.3	2.59	20
2.5	3.6	3.14	2.5	14.5
2	3.32	2.94	2.38	10

Water Flow Rate (GPM)	Unit Size-040 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	400	300	200	
	Capacity (KW)			
3	4.85	3.96	2.91	15.8
2.5	4.74	3.89	2.88	11.5
2	4.59	3.8	2.84	7.8

Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	TC			
4	5.36	4.64	3.68	37
3.5	5.13	4.48	3.58	29.3
3	4.85	4.28	3.47	22.2

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	TC			
5.5	7.22	6.23	4.91	76
5	7.03	6.1	4.83	64
4.5	6.8	5.94	4.74	53

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	TC			
6.5	9.09	6.9	5.3	122
6	8.89	6.8	5.7	105
5.5	8.65	6.68	5.6	90

Heating Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	Capacity (KW)			
4	6.79	5.58	4.15	28.8
3.5	6.68	5.51	4.12	23
3	6.54	5.42	4.07	17.4

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	Capacity (KW)			
5.5	8.96	7.36	5.47	59
5	8.87	7.3	5.54	50
4.5	8.75	7.23	5.41	41

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	Capacity (KW)			
6.5	11.2	7.84	6.31	95.1
6	11.1	7.8	6.29	83
5.5	10.99	7.75	6.26	71

Cooling design condition; inlet / outlet water temp: 7 °C (45 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-020 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	200	150	100	
	TC			
2.5	2.13	1.79	1.36	11.48
2	2	1.71	1.32	7.7
1.5	1.8	1.57	1.24	4.6

Water Flow Rate (GPM)	Unit Size-030 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	300	250	150	
	TC			
2.5	2.82	2.56	1.89	13
2	2.61	2.39	1.8	8.7
1.5	2.29	2.13	1.67	5.2

Water Flow Rate (GPM)	Unit Size-040 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	400	300	200	
	TC			
3	3.82	3.3	2.59	20
2.5	3.6	3.14	2.5	14.5
2	3.32	2.94	2.38	10

Heating Mode

Water Flow Rate (GPM)	Unit Size-020 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	200	150	100	
	Capacity (KW)			
2.5	1.21	1.01	0.78	3
2	1.18	1	0.77	2.2
1.5	1.15	0.97	0.74	1.8

Water Flow Rate (GPM)	Unit Size-030 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	300	250	150	
	Capacity (KW)			
2.5	1.65	1.48	1.08	3.5
2	1.62	1.44	1.06	2
1.5	1.56	1.41	1.04	1.5

Water Flow Rate (GPM)	Unit Size-040 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	400	300	200	
	Capacity (KW)			
3	2.12	1.79	1.39	5.4
2.5	2.08	1.76	1.37	4
2	2.03	1.72	1.35	2.8

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	TC			
4	5.36	4.64	3.68	37
3.5	5.13	4.48	3.58	29.3
3	4.85	4.28	3.47	22.2

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	TC			
5.5	7.22	6.23	4.91	76
5	7.03	6.1	4.83	64
4.5	6.8	5.94	4.74	53

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	TC			
6.5	9.09	6.9	5.3	122
6	8.89	6.8	5.7	105
5.5	8.65	6.68	5.6	90

Heating Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	Capacity (KW)			
4	2.9	2.45	1.91	10.1
3.5	2.87	2.43	1.9	8
3	2.82	2.39	1.88	6.1

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	Capacity (KW)			
5.5	3.92	3.31	2.58	22.2
5	3.9	3.29	2.56	19
4.5	3.86	3.26	2.55	16.9

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	Capacity (KW)			
6.5	4.92	3.62	3.02	36.1
6	4.89	3.6	3.01	31.3
5.5	4.86	3.58	2.99	27

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	TC			
4	5.82	5.41	4.24	11.23
3.5	5.51	5.18	4.11	8.86
3	5.12	4.88	3.94	6.74

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	TC			
4.5	6.92	6.52	5.22	13.81
4	6.57	6.25	5.06	11.2
3.5	6.15	5.92	4.87	8.84

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	TC			
6	8.95	7.39	6.19	25.42
5	8.33	7.04	5.97	18.4
4	7.5	6.55	5.64	12.38

Water Flow Rate (GPM)	Unit Size-120 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1200	800	650	
	TC			
7	10.23	9.01	8.02	33.37
6	9.65	8.63	7.73	25.4
5	8.91	8.12	7.35	18.36

Heating Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	Capacity (KW)			
4	8.1	6.57	4.77	8.81
3.5	7.96	6.49	4.74	7
3	7.77	6.37	4.69	5.4

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	Capacity (KW)			
4.5	10.01	8.21	6.06	10.9
4	9.83	8.1	6	8.84
3.5	9.61	7.96	5.94	7

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	Capacity (KW)			
6	12.49	8.67	6.93	19.95
5	12.18	8.54	6.85	14.51
4	11.71	8.34	6.74	9.84

Water Flow Rate (GPM)	Unit Size-120 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1200	800	650	
	Capacity (KW)			
7	14.38	10.87	9.32	26.16
6	14.07	10.71	9.21	20
5	13.65	10.48	9.06	14.55

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-140 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1400	1000	800	
	TC			
8	12.67	10.93	9.62	52.52
7	12.06	10.53	9.34	41.43
6	11.31	10.02	8.96	31.51

Water Flow Rate (GPM)	Unit Size-160 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1600	1200	1000	
	TC			
10	14.47	12.75	11.51	77.94
9	13.99	12.41	11.25	64.65
8	13.41	12	10.93	52.45

Water Flow Rate (GPM)	Unit Size-180 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1800	1400	1200	
	TC			
10	16.42	14.78	13.6	93
9	15.82	14.34	13.25	77.14
8	15.11	13.81	12.81	62.58

Water Flow Rate (GPM)	Unit Size-200 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	2000	1600	1400	
	TC			
12	18.26	16.62	15.42	128
11	17.77	16.24	15.15	110
10	17.19	15.8	14.78	92.91

Heating Mode

Water Flow Rate (GPM)	Unit Size-140 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1400	1000	800	
	Capacity (KW)			
8	17.36	13.73	11.63	41.22
7	17.05	13.56	11.51	32.65
6	17.36	13.73	11.63	41.22

Water Flow Rate (GPM)	Unit Size-160 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1600	1200	1000	
	Capacity (KW)			
10	19.5	15.98	13.98	61
9	19.26	15.82	13.87	50.7
8	18.95	15.64	13.73	41.3

Water Flow Rate (GPM)	Unit Size-180 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1800	1400	1200	
	Capacity (KW)			
10	22.25	18.71	16.73	73.07
9	21.95	18.51	16.58	60.8
8	21.57	18.26	16.39	49.52

Water Flow Rate (GPM)	Unit Size-200 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	2000	1600	1400	
	Capacity (KW)			
12	24.4	20.93	19.01	100.56
11	24.15	20.76	18.88	86.4
10	23.85	20.55	18.71	73.16

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	TC			
4	5.82	5.41	4.24	11.23
3.5	5.51	5.18	4.11	8.86
3	5.12	4.88	3.94	6.74

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	TC			
4.5	6.92	6.52	5.22	13.81
4	6.57	6.25	5.06	11.2
3.5	6.15	5.92	4.87	8.84

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	TC			
6	8.95	7.39	6.19	25.42
5	8.33	7.04	5.97	18.4
4	7.5	6.55	5.64	12.38

Water Flow Rate (GPM)	Unit Size-120 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1200	800	650	
	TC			
7	10.23	9.01	8.02	33.37
6	9.65	8.63	7.73	25.4
5	8.91	8.12	7.35	18.36

Heating Mode

Water Flow Rate (GPM)	Unit Size-060 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	600	450	300	
	Capacity (KW)			
4	5.5	4.58	3.47	4.1
3.5	5.41	4.52	3.44	3.21
3	5.28	4.43	3.39	2.45

Water Flow Rate (GPM)	Unit Size-080 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	800	600	400	
	Capacity (KW)			
4.5	6.65	5.58	4.28	5
4	6.54	5.5	4.24	4.1
3.5	6.4	5.41	4.18	3.22

Water Flow Rate (GPM)	Unit Size-100 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1000	600	450	
	Capacity (KW)			
6	8.27	6	4.93	9.21
5	8.07	5.9	4.86	6.7
4	7.78	5.75	4.77	4.54

Water Flow Rate (GPM)	Unit Size-120 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1200	800	650	
	Capacity (KW)			
7	9.39	7.32	6.39	12.1
6	9.2	7.21	6.31	9.23
5	8.95	7.06	6.2	6.71

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Water Flow Rate (GPM)	Unit Size-140 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1400	1000	800	
	TC			
8	12.67	10.93	9.62	52.52
7	12.06	10.53	9.34	41.43
6	11.31	10.02	8.96	31.51

Water Flow Rate (GPM)	Unit Size-160 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1600	1200	1000	
	TC			
10	14.47	12.75	11.51	77.94
9	13.99	12.41	11.25	64.65
8	13.41	12	10.93	52.45

Water Flow Rate (GPM)	Unit Size-180 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1800	1400	1200	
	TC			
10	16.42	14.78	13.6	93
9	15.82	14.34	13.25	77.14
8	15.11	13.81	12.81	62.58

Water Flow Rate (GPM)	Unit Size-200 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	2000	1600	1400	
	TC			
12	18.26	16.62	15.42	128
11	17.77	16.24	15.15	110
10	17.19	15.8	14.78	92.91

Heating Mode

Water Flow Rate (GPM)	Unit Size-140 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1400	1000	800	
	Capacity (KW)			
8	11.49	9.32	8.05	19.19
7	11.31	9.2	7.97	15.15
6	11.06	9.05	7.85	11.6

Water Flow Rate (GPM)	Unit Size-160 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1600	1200	1000	
	Capacity (KW)			
10	12.77	10.68	9.49	28.35
9	12.62	10.58	9.42	23.6
8	12.44	10.46	9.32	19.2

Water Flow Rate (GPM)	Unit Size-180 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	1800	1400	1200	
	Capacity (KW)			
10	14.73	12.61	11.42	34.16
9	14.55	12.48	11.32	28.42
8	14.33	12.32	11.19	23.14

Water Flow Rate (GPM)	Unit Size-200 Air Flow Rate (CFM)			Water Pressure Drop (kPa)
	2000	1600	1400	
	Capacity (KW)			
12	16	13.95	12.81	47.1
11	15.86	13.84	12.72	40.4
10	15.69	13.71	12.61	34.2

Cooling design condition; inlet / outlet water temp: 7 °C (44.6 °F) / 12 °C (54 °F) and inlet air temp: 27 °C (80 °F) WB= 20 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet water temp: 60 °C (140 °F) and inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity (KW)

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	1.85	1.41	1.57	1.28	1.12	1.08
	2	1.75	1.35	1.48	1.22	1.06	1.06
	1.5	1.58	1.25	1.34	1.13	1	1
030	2.5	2.47	1.93	2.09	1.75	1.5	1.5
	2	2.3	1.83	1.95	1.66	1.45	1.45
	1.5	2.04	1.66	1.73	1.51	1.37	1.37
040	3	3.2	2.52	2.71	2.28	1.94	1.94
	2.5	3.02	2.41	2.56	2.18	1.89	1.89
	2	2.78	2.25	2.35	2.04	1.82	1.82
060	4	4.46	3.56	3.77	3.23	2.74	2.74
	3.5	4.28	3.45	3.62	3.13	2.69	2.69
	3	4.07	3.31	3.43	3	2.62	2.62
080	5.5	6.17	4.89	5.22	4.43	3.72	3.72
	5	6.02	4.8	5.09	4.35	3.67	3.67
	4.5	5.85	4.68	4.93	4.25	3.62	3.62
100	6.5	7.76	6.14	6.55	5.56	4.66	4.66
	6	7.6	6.04	6.41	5.47	4.61	4.61
	5.5	7.42	5.92	6.26	5.37	4.56	4.56

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	3.19	3.59	3.99
	2	3.13	3.53	3.92
	1.5	3.04	3.42	3.81
030	2.5	4.46	5.02	5.59
	2	4.35	4.9	5.45
	1.5	4.17	4.7	5.23
040	3	5.77	6.49	7.22
	2.5	5.65	6.36	7.08
	2	5.47	6.17	6.86
060	4	8.09	9.11	10.13
	3.5	7.96	8.97	9.98
	3	7.8	8.79	9.77
080	5.5	10.91	12.29	13.66
	5	10.8	12.16	13.52
	4.5	10.67	12.02	13.36
100	6.5	13.64	15.35	17.06
	6	13.52	15.22	16.92
	5.5	13.39	15.07	16.75

Cooling design condition; inlet air temp: 24 °C (75 °F) WB= 17 °C (62 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 20 °C (68 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	2.4	1.56	2.13	1.43	1.66	1.23
	2	2.26	1.48	2	1.36	1.57	1.17
	1.5	2.05	1.36	1.8	1.26	1.42	1.08
030	2.5	3.2	2.12	2.82	1.95	2.21	1.68
	2	2.98	1.99	2.61	1.83	2.05	1.58
	1.5	2.64	1.8	2.29	1.66	1.81	1.43
040	3	4.14	2.75	3.82	2.49	2.85	2.18
	2.5	3.91	2.62	3.6	2.37	2.68	2.07
	2	3.59	2.44	3.32	2.2	2.45	1.93
060	4	5.76	3.88	5.36	3.49	3.95	3.07
	3.5	5.54	3.75	5.13	3.37	3.79	2.96
	3	5.25	3.58	4.85	3.22	3.58	2.83
080	5.5	7.99	5.34	7.22	4.86	5.48	4.22
	5	7.79	5.23	7.03	4.75	5.33	4.13
	4.5	7.55	5.1	6.8	4.63	5.16	4.02
100	6.5	10.03	6.7	9.09	6.08	6.87	5.29
	6	9.82	6.59	8.89	5.95	6.72	5.19
	5.5	9.59	6.45	8.65	5.84	6.54	5.08

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	2.86	3.26	3.66
	2	2.81	3.2	3.6
	1.5	2.73	3.11	3.49
030	2.5	4	4.56	5.12
	2	3.91	4.45	5
	1.5	3.75	4.28	4.8
040	3	5.18	5.9	6.63
	2.5	5.07	5.78	6.49
	2	4.92	5.61	6.3
060	4	7.27	8.29	9.3
	3.5	7.16	8.16	9.16
	3	7.01	7.99	8.97
080	5.5	9.8	11.17	12.54
	5	9.71	11.06	12.41
	4.5	9.59	10.93	12.27
100	6.5	12.25	13.96	15.66
	6	12.15	13.84	15.53
	5.5	12.03	13.7	15.38

Cooling design condition; inlet air temp: 27 °C (80 °F) WB= 19 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 24 °C (75 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	3	1.7	2.72	1.57	2.26	1.38
	2	2.83	1.61	2.56	1.49	2.13	1.31
	1.5	2.56	1.47	2.31	1.37	1.92	1.2
030	2.5	4	2.29	3.61	2.12	2.99	1.86
	2	3.72	2.15	3.35	1.99	2.77	1.74
	1.5	3.29	1.93	2.96	1.79	2.44	1.57
040	3	5.17	2.97	4.66	2.75	3.86	2.41
	2.5	4.88	2.83	4.39	2.61	3.63	2.29
	2	4.48	2.62	4.02	2.42	3.31	2.12
060	4	7.2	4.18	6.48	3.86	5.35	3.38
	3.5	6.91	4.03	6.21	3.72	5.12	3.26
	3	6.54	3.84	5.88	3.55	4.83	3.1
080	5.5	9.98	5.76	8.98	5.33	7.41	4.66
	5	9.72	5.63	8.75	5.2	7.21	4.56
	4.5	9.42	5.48	8.47	5.06	6.97	4.43
100	6.5	12.53	7.23	11.27	6.68	9.3	5.85
	6	12.26	7.1	11.02	6.55	9.08	5.73
	5.5	11.95	6.94	10.74	6.41	8.84	5.6

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	2.68	3.02	3.42
	2	2.63	2.97	3.36
	1.5	2.55	2.89	3.27
030	2.5	3.73	4.24	4.8
	2	3.64	4.14	4.68
	1.5	3.48	3.97	4.5
040	3	4.85	5.48	6.2
	2.5	4.74	5.37	6.08
	2	4.59	5.21	5.9
060	4	6.79	7.7	8.71
	3.5	6.68	7.58	8.58
	3	6.54	7.43	8.41
080	5.5	8.96	10.38	11.74
	5	8.87	10.28	11.63
	4.5	8.75	10.16	11.5
100	6.5	11.2	12.97	14.67
	6	11.1	12.86	14.55
	5.5	10.99	12.74	14.41

Cooling design condition; inlet air temp: 29 °C (85 °F) WB= 22 °C (72 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	1.85	1.41	1.57	1.28	1.12	1.08
	2	1.75	1.35	1.48	1.22	1.06	1.06
	1.5	1.58	1.25	1.34	1.13	1	1
030	2.5	2.47	1.93	2.09	1.75	1.5	1.5
	2	2.3	1.83	1.95	1.66	1.45	1.45
	1.5	2.04	1.66	1.73	1.51	1.37	1.37
040	3	3.2	2.52	2.71	2.28	1.94	1.94
	2.5	3.02	2.41	2.56	2.18	1.89	1.89
	2	2.78	2.25	2.35	2.04	1.82	1.82
060	4	4.46	3.56	3.77	3.23	2.74	2.74
	3.5	4.28	3.45	3.62	3.13	2.69	2.69
	3	4.07	3.31	3.43	3	2.62	2.62
080	5.5	6.17	4.89	5.22	4.43	3.72	3.72
	5	6.02	4.8	5.09	4.35	3.67	3.67
	4.5	5.85	4.68	4.93	4.25	3.62	3.62
100	6.5	7.76	6.14	6.55	5.56	4.66	4.66
	6	7.6	6.04	6.41	5.47	4.61	4.61
	5.5	7.42	5.92	6.26	5.37	4.56	4.56

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	1.45	1.64	1.82
	2	1.43	1.61	1.79
	1.5	1.38	1.56	1.74
030	2.5	1.99	2.25	2.5
	2	1.95	2.2	2.45
	1.5	1.88	2.12	2.36
040	3	2.55	2.88	3.2
	2.5	2.51	2.83	3.15
	2	2.44	2.75	3.07
060	4	3.49	3.94	4.38
	3.5	3.45	3.89	4.33
	3	3.39	3.83	4.26
080	5.5	4.72	5.32	5.92
	5	4.69	5.28	5.88
	4.5	4.65	5.23	5.82
100	6.5	5.93	6.67	7.42
	6	5.89	6.63	7.38
	5.5	5.85	6.59	7.33

Cooling design condition; inlet air temp: 24 °C (75 °F) WB= 17 °C (62 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 20 °C (68 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	2.4	1.56	2.13	1.43	1.66	1.23
	2	2.26	1.48	2	1.36	1.57	1.17
	1.5	2.05	1.36	1.8	1.26	1.42	1.08
030	2.5	3.2	2.12	2.82	1.95	2.21	1.68
	2	2.98	1.99	2.61	1.83	2.05	1.58
	1.5	2.64	1.8	2.29	1.66	1.81	1.43
040	3	4.14	2.75	3.82	2.49	2.85	2.18
	2.5	3.91	2.62	3.6	2.37	2.68	2.07
	2	3.59	2.44	3.32	2.2	2.45	1.93
060	4	5.76	3.88	5.36	3.49	3.95	3.07
	3.5	5.54	3.75	5.13	3.37	3.79	2.96
	3	5.25	3.58	4.85	3.22	3.58	2.83
080	5.5	7.99	5.34	7.22	4.86	5.48	4.22
	5	7.79	5.23	7.03	4.75	5.33	4.13
	4.5	7.55	5.1	6.8	4.63	5.16	4.02
100	6.5	10.03	6.7	9.09	6.08	6.87	5.29
	6	9.82	6.59	8.89	5.95	6.72	5.19
	5.5	9.59	6.45	8.65	5.84	6.54	5.08

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	1.31	1.49	1.68
	2	1.28	1.46	1.65
	1.5	1.25	1.42	1.6
030	2.5	1.79	2.05	2.3
	2	1.75	2	2.25
	1.5	1.69	1.93	2.17
040	3	2.3	2.62	2.95
	2.5	2.26	2.58	2.9
	2	2.2	2.51	2.82
060	4	3.15	3.59	4.03
	3.5	3.11	3.55	3.98
	3	3.06	3.49	3.92
080	5.5	4.26	4.85	5.45
	5	4.23	4.82	5.41
	4.5	4.19	4.77	5.36
100	6.5	5.34	6.09	6.83
	6	5.31	6.05	6.79
	5.5	5.27	6.01	6.74

Cooling design condition; inlet air temp: 27 °C (80 °F) WB= 19 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 24 °C (75 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
020	2.5	3	1.7	2.72	1.57	2.26	1.38
	2	2.83	1.61	2.56	1.49	2.13	1.31
	1.5	2.56	1.47	2.31	1.37	1.92	1.2
030	2.5	4	2.29	3.61	2.12	2.99	1.86
	2	3.72	2.15	3.35	1.99	2.77	1.74
	1.5	3.29	1.93	2.96	1.79	2.44	1.57
040	3	5.17	2.97	4.66	2.75	3.86	2.41
	2.5	4.88	2.83	4.39	2.61	3.63	2.29
	2	4.48	2.62	4.02	2.42	3.31	2.12
060	4	7.2	4.18	6.48	3.86	5.35	3.38
	3.5	6.91	4.03	6.21	3.72	5.12	3.26
	3	6.54	3.84	5.88	3.55	4.83	3.1
080	5.5	9.98	5.76	8.98	5.33	7.41	4.66
	5	9.72	5.63	8.75	5.2	7.21	4.56
	4.5	9.42	5.48	8.47	5.06	6.97	4.43
100	6.5	12.53	7.23	11.27	6.68	9.3	5.85
	6	12.26	7.1	11.02	6.55	9.08	5.73
	5.5	11.95	6.94	10.74	6.41	8.84	5.6

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
020	2.5	1.21	1.39	1.57
	2	1.18	1.36	1.54
	1.5	1.15	1.32	1.5
030	2.5	1.65	1.91	2.16
	2	1.62	1.86	2.11
	1.5	1.56	1.8	2.04
040	3	2.12	2.44	2.76
	2.5	2.08	2.4	2.72
	2	2.03	2.34	2.65
060	4	2.9	3.34	3.78
	3.5	2.87	3.3	3.74
	3	2.82	3.25	3.68
080	5.5	3.92	4.52	5.11
	5	3.9	4.49	5.08
	4.5	3.86	4.45	5.03
100	6.5	4.92	5.67	6.41
	6	4.89	5.63	6.37
	5.5	4.86	5.59	6.33

Cooling design condition; inlet air temp: 29 °C (85 °F) WB= 22 °C (72 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	5.22	4.03	4.41	3.65	3.27	3.27
	3.5	4.95	3.87	4.18	3.5	3.19	3.19
	3	4.62	3.66	3.9	3.32	3.09	3.09
080	4.5	6.22	4.92	5.25	4.46	4.02	4.02
	4	5.93	4.73	5	4.29	3.93	3.93
	3.5	5.57	4.5	4.69	4.08	3.81	3.81
100	6	8.03	6.31	6.77	5.71	5.06	5.06
	5	7.5	5.98	6.32	5.41	4.91	4.91
	4	6.79	5.52	5.72	5	4.68	4.68
120	7	9.19	7.29	7.75	6.6	5.83	5.83
	6	8.7	6.98	7.33	6.32	5.68	5.68
	5	8.06	6.57	6.78	5.95	5.48	5.48
140	8	11.35	8.9	9.57	8.05	7.09	7.09
	7	10.84	8.58	9.13	7.76	6.94	6.94
	6	10.21	8.18	8.58	7.4	6.75	6.75
160	10	12.94	10.15	10.92	9.18	7.98	7.98
	9	12.54	9.9	10.57	8.96	7.87	7.87
	8	12.05	9.59	10.15	8.68	7.72	7.72
180	10	14.7	11.51	12.39	10.4	9.13	9.13
	9	14.2	11.2	11.95	10.12	8.99	8.99
	8	13.61	10.82	11.44	9.78	8.81	8.81
200	12	16.32	12.78	13.76	11.55	10.02	10.02
	11	15.91	12.52	13.4	11.32	9.91	9.91
	10	15.43	12.22	12.99	11.05	9.77	9.77

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	9.76	11	12.23
	3.5	9.59	10.8	12.02
	3	9.36	10.55	11.7
080	4.5	12.05	13.58	15.11
	4	11.83	13.34	14.84
	3.5	11.56	13.03	14.5
100	6	15.04	16.94	18.85
	5	14.66	16.51	18.37
	4	14.1	15.9	17.67
120	7	17.31	19.5	21.7
	6	16.94	19.08	21.23
	5	16.42	18.51	20.59
140	8	20.91	23.55	26.19
	7	20.53	23.13	25.72
	6	20.04	22.57	25.1
160	10	23.5	26.45	29.41
	9	23.19	26.11	29.04
	8	22.82	25.7	28.58
180	10	26.8	30.17	33.55
	9	26.43	29.75	33.08
	8	25.97	29.24	32.51
200	12	29.39	33.08	36.78
	11	29.08	32.74	36.4
	10	28.72	32.33	35.95

Cooling design condition; inlet air temp: 24 °C (75 °F) WB= 17 °C (62 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 20 °C (68 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	6.63	4.36	5.82	3.99	4.55	3.43
	3.5	6.28	4.17	5.51	3.82	4.3	3.28
	3	5.84	3.92	5.12	3.59	3.99	3.09
080	4.5	7.89	5.29	6.92	4.84	5.39	4.16
	4	7.5	5.06	6.57	4.64	5.11	3.99
	3.5	7.03	4.79	6.15	4.39	4.78	3.78
100	6	10.21	6.8	8.95	6.22	6.97	5.35
	5	9.51	6.41	8.33	5.87	6.47	5.04
	4	8.57	5.87	7.5	5.38	5.81	4.62
120	7	11.67	7.84	10.23	7.18	7.96	6.17
	6	11.02	7.47	9.65	6.84	7.5	5.88
	5	10.18	6.99	8.91	6.4	6.91	5.5
140	8	14.46	9.62	12.67	8.79	9.85	7.55
	7	13.78	9.24	12.06	8.45	9.36	7.25
	6	12.94	8.76	11.31	8.01	8.76	6.87
160	10	16.51	10.98	14.47	10.05	11.27	8.63
	9	15.97	10.68	13.99	9.77	10.88	8.39
	8	15.32	10.31	13.41	9.43	10.41	8.1
180	10	18.75	12.46	16.42	11.39	12.77	9.76
	9	18.09	12.08	15.82	11.04	12.28	9.47
	8	17.29	11.64	15.11	10.63	11.71	9.11
200	12	20.84	13.84	18.26	12.66	14.21	10.86
	11	20.29	13.53	17.77	12.37	13.81	10.62
	10	19.65	13.17	17.19	12.04	13.34	10.33

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	8.8	10.03	11.27
	3.5	8.65	9.86	11.07
	3	8.44	9.63	10.82
080	4.5	10.87	12.4	13.92
	4	10.68	12.18	13.68
	3.5	10.43	11.9	13.37
100	6	13.57	15.47	17.37
	5	13.22	15.07	16.93
	4	12.71	14.5	16.29
120	7	15.62	17.8	19.99
	6	15.28	17.42	19.56
	5	14.81	16.89	18.98
140	8	18.86	21.49	24.13
	7	18.52	21.11	23.7
	6	18.07	20.6	23.13
160	10	21.19	24.14	27.09
	9	20.92	23.83	26.76
	8	20.58	23.46	26.34
180	10	24.17	27.54	30.91
	9	23.83	27.16	30.48
	8	23.42	26.69	29.96
200	12	26.5	30.19	33.89
	11	26.23	29.88	33.54
	10	25.9	29.51	33.12

Cooling design condition; inlet air temp: 27 °C (80 °F) WB= 19 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 24 °C (75 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	8.28	4.72	7.45	4.36	6.15	3.81
	3.5	7.83	4.5	7.04	4.15	5.8	3.63
	3	7.27	4.22	6.54	3.89	5.38	3.4
080	4.5	9.83	5.69	8.83	5.25	7.27	4.59
	4	9.33	5.43	8.38	5.02	6.89	4.38
	3.5	8.74	5.13	7.84	4.74	6.44	4.14
100	6	12.72	7.33	11.43	6.76	9.41	5.91
	5	11.83	6.88	10.62	6.35	8.72	5.54
	4	10.65	6.26	9.54	5.78	7.81	5.04
120	7	14.55	8.43	13.07	7.78	10.75	6.8
	6	13.71	8	12.31	7.39	10.1	6.45
	5	12.65	7.45	11.34	6.88	9.29	6
140	8	18.01	10.36	16.18	9.56	13.3	8.33
	7	17.15	9.93	15.39	9.15	12.62	7.97
	6	16.07	9.38	14.4	8.64	11.78	7.52
160	10	20.58	11.84	18.5	10.93	15.23	9.54
	9	19.89	11.49	17.86	10.6	14.68	9.25
	8	19.07	11.07	17.1	10.21	14.03	8.9
180	10	23.37	13.43	20.97	12.37	17.23	10.78
	9	22.51	13	20.18	11.97	16.55	10.42
	8	21.49	12.48	19.25	11.49	15.75	10
200	12	25.98	14.93	23.34	13.77	19.2	12.01
	11	25.28	14.58	22.68	13.43	18.64	11.71
	10	24.45	14.16	21.93	13.05	17.99	11.37

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	8.1	9.33	10.56
	3.5	7.96	9.17	10.38
	3	7.77	8.95	10.14
080	4.5	10.01	11.53	13.05
	4	9.83	11.32	12.82
	3.5	9.6	11.07	12.53
100	6	12.49	14.38	16.28
	5	12.17	14.02	15.87
	4	11.71	13.49	15.27
120	7	14.38	16.56	18.74
	6	14.07	16.2	18.34
	5	13.65	15.72	17.79
140	8	17.36	19.99	22.61
	7	17.05	19.63	22.21
	6	16.64	19.16	21.69
160	10	19.5	22.45	25.4
	9	19.26	22.17	25.08
	8	18.95	21.82	24.69
180	10	22.25	25.61	28.97
	9	21.95	25.26	28.57
	8	21.57	24.82	28.08
200	12	24.4	28.08	31.76
	11	24.15	27.79	31.44
	10	23.85	27.45	31.05

Cooling design condition; inlet air temp: 29 °C (85 °F) WB= 22 °C (72 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	5.22	4.03	4.41	3.65	3.27	3.27
	3.5	4.95	3.87	4.18	3.5	3.19	3.19
	3	4.62	3.66	3.9	3.32	3.09	3.09
080	4.5	6.22	4.92	5.25	4.46	4.02	4.02
	4	5.93	4.73	5	4.29	3.93	3.93
	3.5	5.57	4.5	4.69	4.08	3.81	3.81
100	6	8.03	6.31	6.77	5.71	5.06	5.06
	5	7.5	5.98	6.32	5.41	4.91	4.91
	4	6.79	5.52	5.72	5	4.68	4.68
120	7	9.19	7.29	7.75	6.6	5.83	5.83
	6	8.7	6.98	7.33	6.32	5.68	5.68
	5	8.06	6.57	6.78	5.95	5.48	5.48
140	8	11.35	8.9	9.57	8.05	7.09	7.09
	7	10.84	8.58	9.13	7.76	6.94	6.94
	6	10.21	8.18	8.58	7.4	6.75	6.75
160	10	12.94	10.15	10.92	9.18	7.98	7.98
	9	12.54	9.9	10.57	8.96	7.87	7.87
	8	12.05	9.59	10.15	8.68	7.72	7.72
180	10	14.7	11.51	12.39	10.4	9.13	9.13
	9	14.2	11.2	11.95	10.12	8.99	8.99
	8	13.61	10.82	11.44	9.78	8.81	8.81
200	12	16.32	12.78	13.76	11.55	10.02	10.02
	11	15.91	12.52	13.4	11.32	9.91	9.91
	10	15.43	12.22	12.99	11.05	9.77	9.77

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	6.65	7.49	8.34
	3.5	6.53	7.36	8.2
	3	6.37	7.19	8
080	4.5	8.03	9.05	10.08
	4	7.89	8.9	9.91
	3.5	7.71	8.7	9.7
100	6	9.98	11.24	12.51
	5	9.73	10.97	12.22
	4	9.38	10.59	11.8
120	7	11.33	12.76	14.2
	6	11.1	12.51	13.93
	5	10.97	12.17	13.55
140	8	13.87	15.62	17.38
	7	13.64	15.37	17.1
	6	13.34	15.03	16.73
160	10	15.4	17.35	19.3
	9	15.22	17.15	19.08
	8	15	16.91	18.81
180	10	17.77	20.02	22.27
	9	17.55	19.77	21.99
	8	17.28	19.47	21.66
200	12	19.31	21.75	24.19
	11	19.13	21.55	23.97
	10	18.92	21.31	23.71

Cooling design condition; inlet air temp: 24 °C (75 °F) WB= 17 °C (62 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 20 °C (68 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	6.63	4.36	5.82	3.99	4.55	3.43
	3.5	6.28	4.17	5.51	3.82	4.3	3.28
	3	5.84	3.92	5.12	3.59	3.99	3.09
080	4.5	7.89	5.29	6.92	4.84	5.39	4.16
	4	7.5	5.06	6.57	4.64	5.11	3.99
	3.5	7.03	4.79	6.15	4.39	4.78	3.78
100	6	10.21	6.8	8.95	6.22	6.97	5.35
	5	9.51	6.41	8.33	5.87	6.47	5.04
	4	8.57	5.87	7.5	5.38	5.81	4.62
120	7	11.67	7.84	10.23	7.18	7.96	6.17
	6	11.02	7.47	9.65	6.84	7.5	5.88
	5	10.18	6.99	8.91	6.4	6.91	5.5
140	8	14.46	9.62	12.67	8.79	9.85	7.55
	7	13.78	9.24	12.06	8.45	9.36	7.25
	6	12.94	8.76	11.31	8.01	8.76	6.87
160	10	16.51	10.98	14.47	10.05	11.27	8.63
	9	15.97	10.68	13.99	9.77	10.88	8.39
	8	15.32	10.31	13.41	9.43	10.41	8.1
180	10	18.75	12.46	16.42	11.39	12.77	9.76
	9	18.09	12.08	15.82	11.04	12.28	9.47
	8	17.29	11.64	15.11	10.63	11.71	9.11
200	12	20.84	13.84	18.26	12.66	14.21	10.86
	11	20.29	13.53	17.77	12.37	13.81	10.62
	10	19.65	13.17	17.19	12.04	13.34	10.33

Heating Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	5.98	6.82	7.66
	3.5	5.87	6.7	7.53
	3	5.73	6.54	7.36
080	4.5	7.23	8.24	9.27
	4	7.1	8.1	9.11
	3.5	6.94	7.93	8.92
100	6	8.98	10.24	11.5
	5	8.76	9.99	11.23
	4	8.45	9.64	10.84
120	7	10.19	11.63	13.06
	6	9.99	11.4	12.81
	5	9.72	11.09	12.46
140	8	12.48	14.23	15.98
	7	12.27	14	15.72
	6	12	13.7	15.39
160	10	13.86	15.8	17.74
	9	13.7	15.62	17.54
	8	13.51	15.4	17.3
180	10	16	18.23	20.47
	9	15.8	18	20.22
	8	15.56	17.73	19.92
200	12	17.38	19.81	22.24
	11	17.22	19.63	22.04
	10	17.03	19.41	21.8

Cooling design condition; inlet air temp: 27 °C (80 °F) WB= 19 °C (67 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 24 °C (75 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Cooling Mode

Unit Size (at High Speed)	Water Flow Rate (GPM)	Saturated Temperature Leaving Evaporator °F (°C)					
		41 (5)		45 (7)		50 (10)	
		Capacity (KW)					
		TC	SHC	TC	SHC	TC	SHC
060	4	8.28	4.72	7.45	4.36	6.15	3.81
	3.5	7.83	4.5	7.04	4.15	5.8	3.63
	3	7.27	4.22	6.54	3.89	5.38	3.4
080	4.5	9.83	5.69	8.83	5.25	7.27	4.59
	4	9.33	5.43	8.38	5.02	6.89	4.38
	3.5	8.74	5.13	7.84	4.74	6.44	4.14
100	6	12.72	7.33	11.43	6.76	9.41	5.91
	5	11.83	6.88	10.62	6.35	8.72	5.54
	4	10.65	6.26	9.54	5.78	7.81	5.04
120	7	14.55	8.43	13.07	7.78	10.75	6.8
	6	13.71	8	12.31	7.39	10.1	6.45
	5	12.65	7.45	11.34	6.88	9.29	6
140	8	18.01	10.36	16.18	9.56	13.3	8.33
	7	17.15	9.93	15.39	9.15	12.62	7.97
	6	16.07	9.38	14.4	8.64	11.78	7.52
160	10	20.58	11.84	18.5	10.93	15.23	9.54
	9	19.89	11.49	17.86	10.6	14.68	9.25
	8	19.07	11.07	17.1	10.21	14.03	8.9
180	10	23.37	13.43	20.97	12.37	17.23	10.78
	9	22.51	13	20.18	11.97	16.55	10.42
	8	21.49	12.48	19.25	11.49	15.75	10
200	12	25.98	14.93	23.34	13.77	19.2	12.01
	11	25.28	14.58	22.68	13.43	18.64	11.71
	10	24.45	14.16	21.93	13.05	17.99	11.37

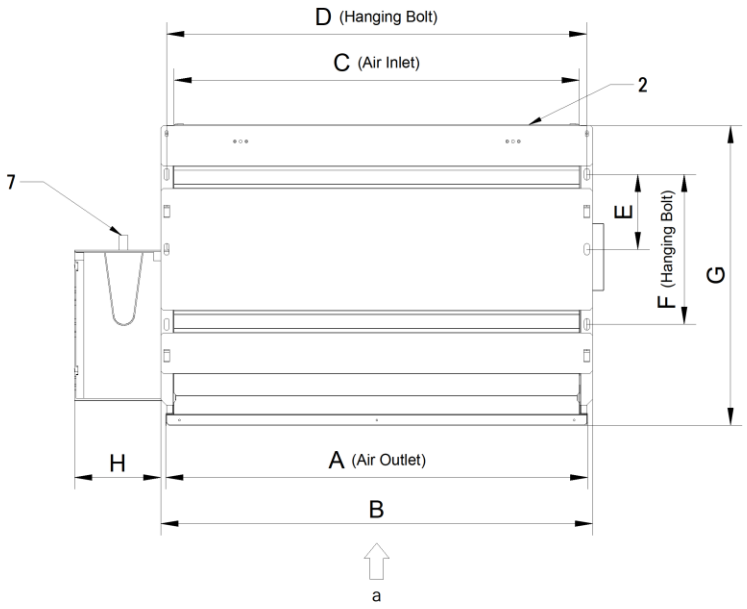
Heating Mode

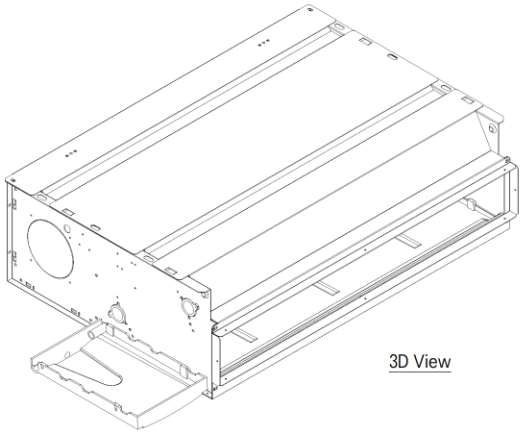
Unit Size (at High Speed)	Water Flow Rate (GPM)	Intering Water °F (°C)		
		140 (60)	149 (65)	158 (70)
		Capacity (KW)		
060	4	5.5	6.34	7.18
	3.5	5.41	6.23	7.06
	3	5.28	6.09	6.9
080	4.5	6.65	7.67	8.69
	4	6.54	7.54	8.54
	3.5	6.4	7.38	8.36
100	6	8.27	9.53	10.8
	5	8.07	9.3	10.53
	4	7.78	8.97	10.17
120	7	9.39	10.82	12.25
	6	9.2	10.61	12
	5	8.95	10.32	11.69
140	8	11.49	13.24	14.98
	7	11.31	13.02	14.74
	6	11.06	12.74	14.43
160	10	12.77	14.7	16.64
	9	12.62	14.53	16.45
	8	12.44	14.33	16.22
180	10	14.73	16.96	19.19
	9	14.55	16.75	18.96
	8	14.33	16.5	18.68
200	12	16	18.43	20.85
	11	15.86	18.26	20.66
	10	15.69	18.06	20.44

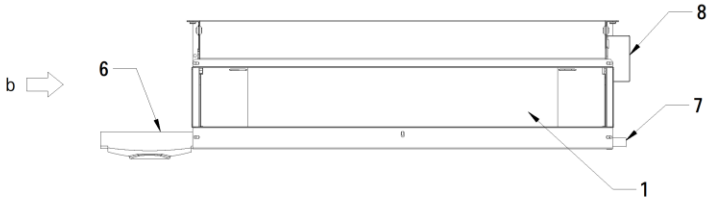
Cooling design condition; inlet air temp: 29 °C (85 °F) WB= 22 °C (72 °F) , sea level : 4000 ft
Heating design condition; inlet air temp: 27 °C (80 °F) , sea level : 4000 ft
TC : Total Cooling Capacity SHC : Sensible Capacity

Dimensions (ACLAXXXL2)

[unit : mm]







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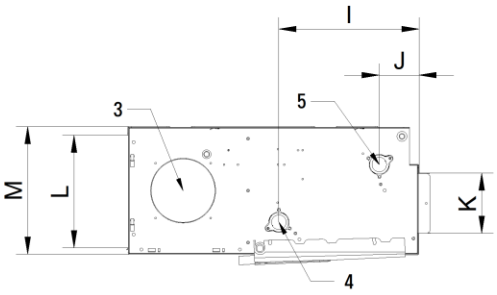

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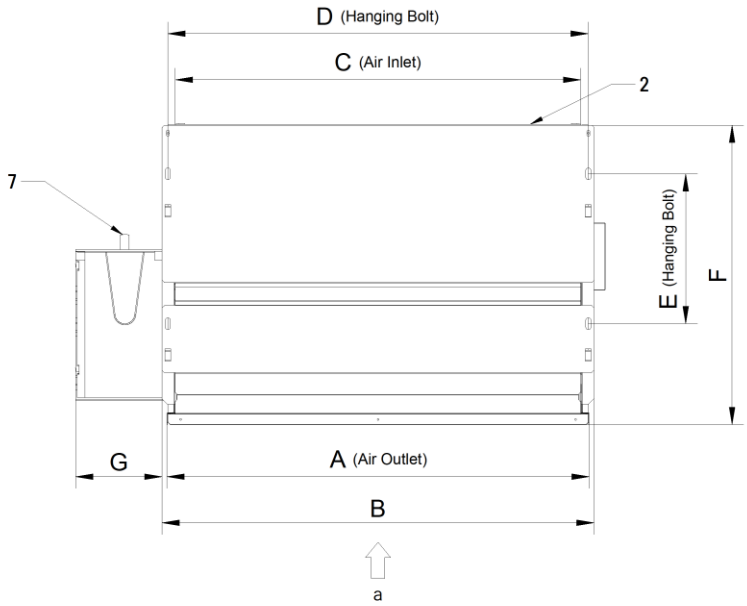
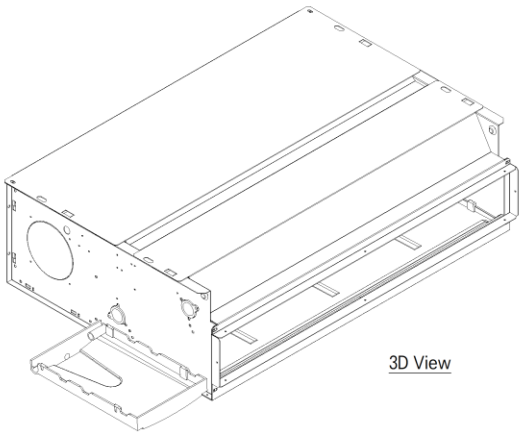
Unit Model	A	B	C	D	E	F	G	H	I	J	K	L	M
ACLA020L2	628	645	600	625	130	260	520	150	180	85	105	195	220
ACLA030L2	728	745	700	725	130	260	520	150	180	85	105	195	220
ACLA040L2	828	845	800	825	130	260	520	150	180	85	105	195	220
ACLA060L2	928	945	900	925	130	260	520	150	180	85	105	195	220
ACLA080L2	1178	1195	1150	1175	130	260	520	150	180	85	105	195	220
ACLA100L2	1428	1445	1400	1425	130	260	520	150	180	85	105	195	220

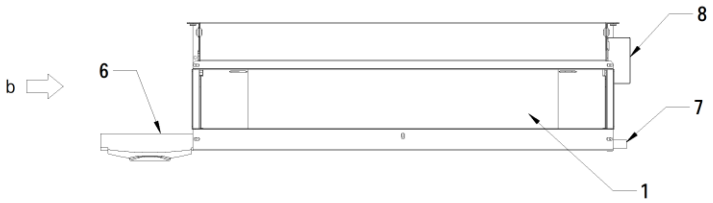
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

No.	Part Name
1	Air outlet
2	Air intake
3	Fresh air intake hole
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	External drain pan (optional accessory)
7	Drain pipe connection
8	Electrical box

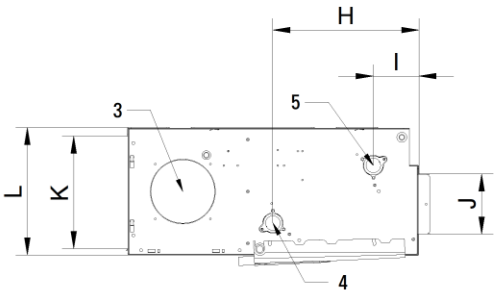
[unit : mm]







View "a"



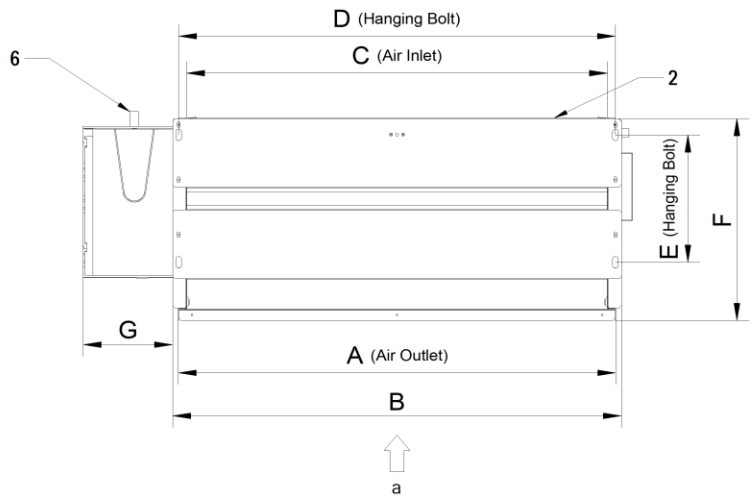
View "b"

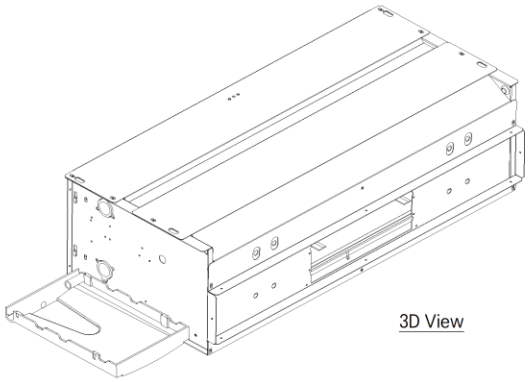
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

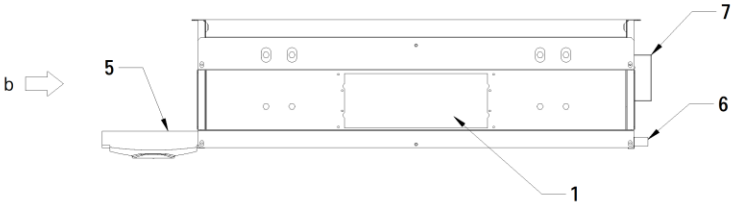
Unit Model	A	B	C	D	E	F	G	H	I	J	K	L
ACLS020L2	628	645	600	625	260	520	150	220	110	105	155	180
ACLS030L2	728	745	700	725	260	520	150	220	110	105	155	180
ACLS040L2	828	845	800	825	260	520	150	220	110	105	155	180
ACLS060L2	928	945	900	925	260	520	150	220	110	105	155	180
ACLS080L2	1178	1195	1150	1175	260	520	150	220	110	105	155	180
ACLS100L2	1428	1445	1400	1425	260	520	150	220	110	105	155	180

No.	Part Name
1	Air outlet
2	Air intake
3	Fresh air intake hole
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	External drain pan (optional accessory)
7	Drain pipe connection
8	Electrical box

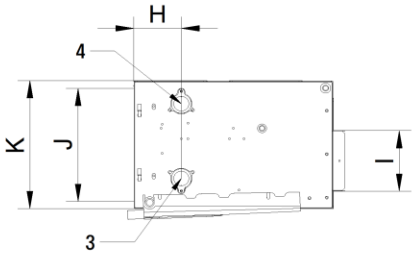
[unit : mm]







View "a"



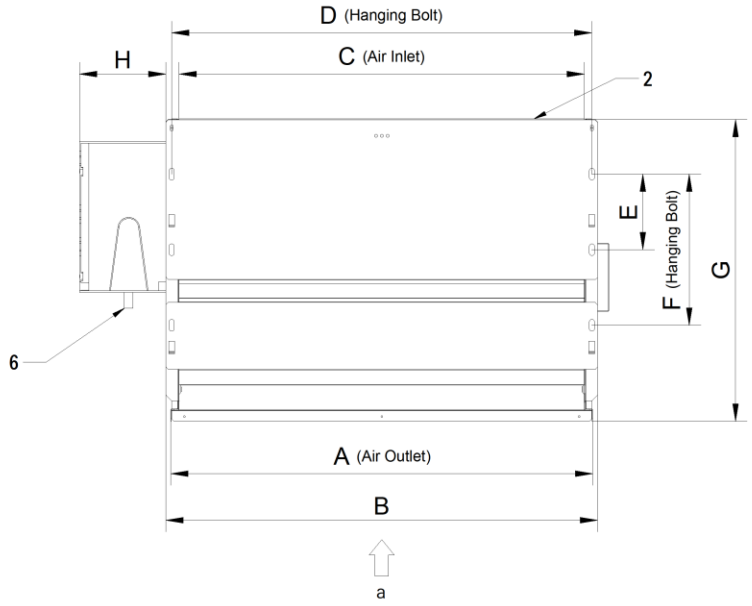
View "b"

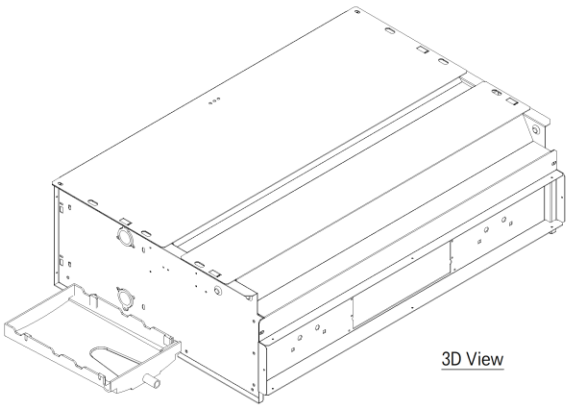
Unit Model	A	B	C	D	E	F	G	H	I	J	K
ACMP020L2	628	645	600	625	220	350	150	78	105	195	220
ACMP030L2	728	745	700	725	220	350	150	78	105	195	220
ACMP040L2	828	845	800	825	220	350	150	78	105	195	220
ACMP060L2	928	945	900	925	220	350	150	78	105	195	220
ACMP080L2	1178	1195	1150	1175	220	350	150	78	105	195	220
ACMP100L2	1428	1445	1400	1425	220	350	150	78	105	195	220

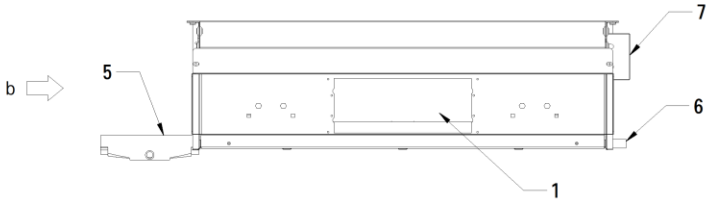
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	External drain pan (optional accessory)
6	Drain pipe connection
7	Electrical box

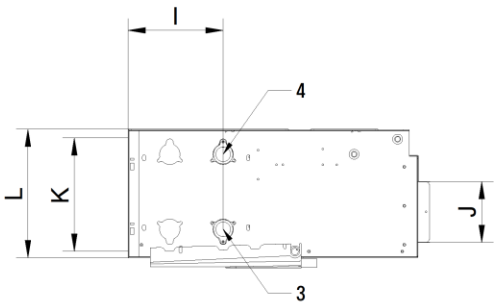
[unit : mm]







View "a"



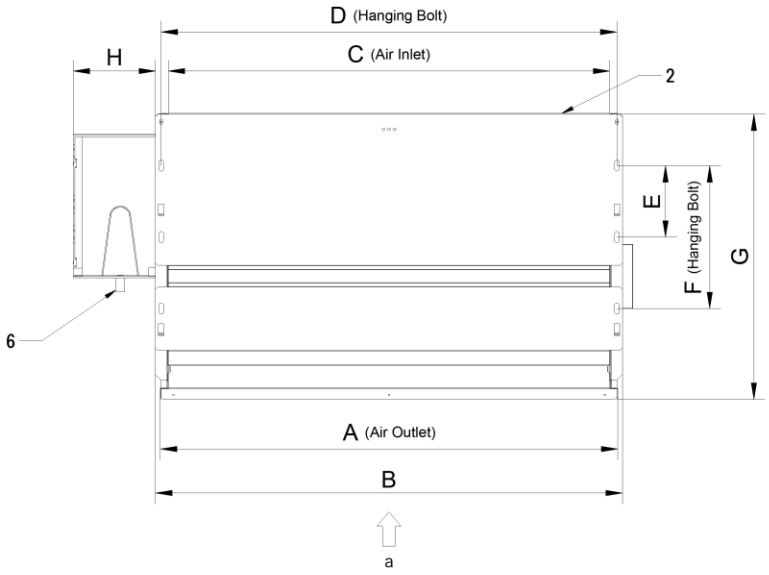
View "b"

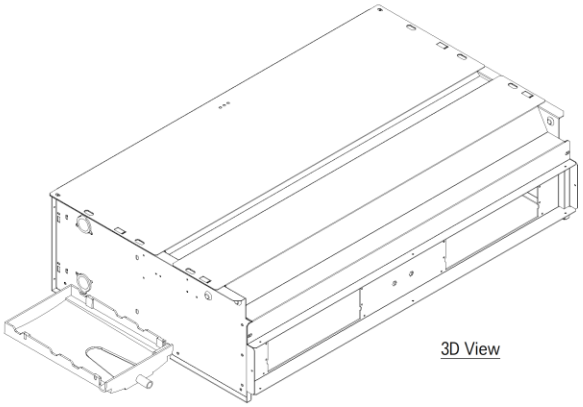
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

Unit Model	A	B	C	D	E	F	G	H	I	J	K	L
ACMH020L2	628	645	600	625	130	260	520	150	164	105	195	220
ACMH030L2	728	745	700	725	130	260	520	150	164	105	195	220

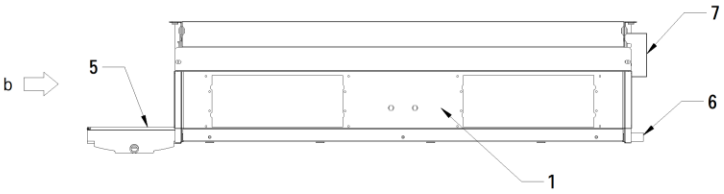
No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	External drain pan (optional accessory)
6	Drain pipe connection
7	Electrical box

[unit : mm]

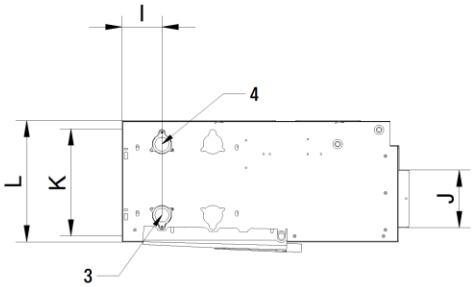




3D View



View "a"



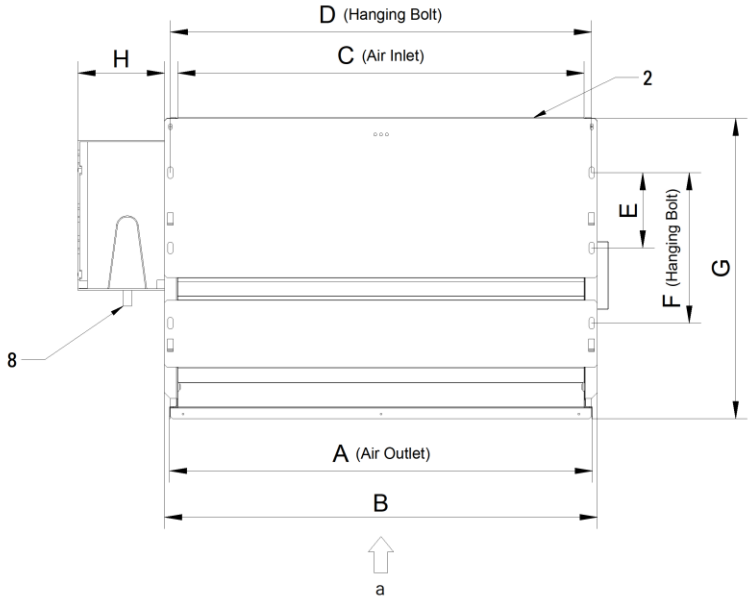
View "b"

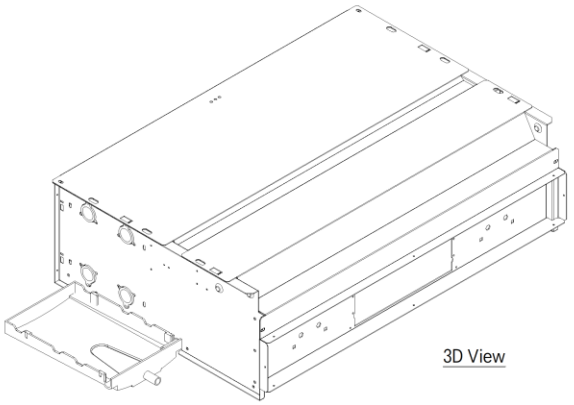
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

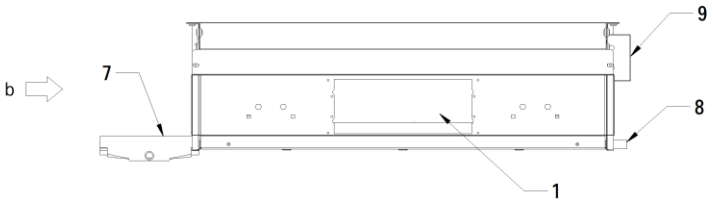
Unit Model	A	B	C	D	E	F	G	H	I	J	K	L
ACMH040L2	828	845	800	825	130	260	520	150	72	105	195	220
ACMH060L2	928	945	900	925	130	260	520	150	72	105	195	220
ACMH080L2	1178	1195	1150	1175	130	260	520	150	72	105	195	220
ACMH100L2	1428	1445	1400	1425	130	260	520	150	72	105	195	220

No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	External drain pan (optional accessory)
6	Drain pipe connection
7	Electrical box

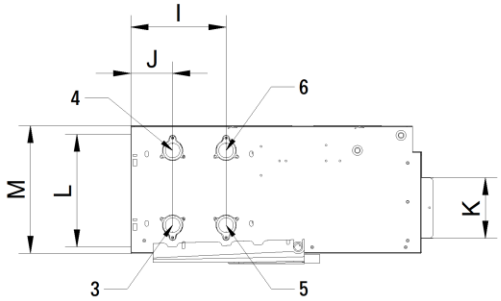
[unit : mm]







View "a"



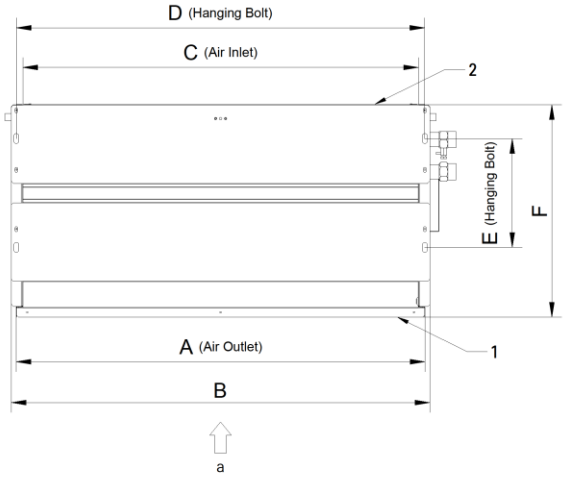
View "b"

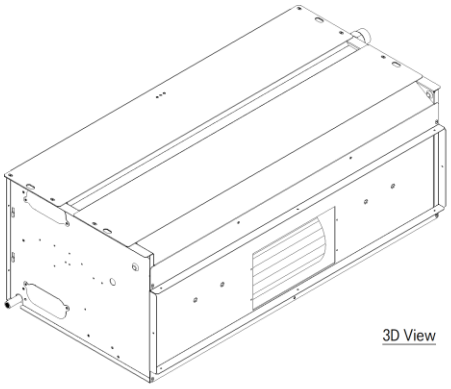
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

Unit Model	A	B	C	D	E	F	G	H	I	J	K	L	M
ACMH020L4	628	645	600	625	130	260	520	150	164	72	105	195	220
ACMH030L4	728	745	700	725	130	260	520	150	164	72	105	195	220
ACMH040L4	828	845	800	825	130	260	520	150	164	72	105	195	220
ACMH060L4	928	945	900	925	130	260	520	150	164	72	105	195	220
ACMH080L4	1178	1195	1150	1175	130	260	520	150	164	72	105	195	220
ACMH100L4	1428	1445	1400	1425	130	260	520	150	164	72	105	195	220

No.	Part Name
1	Air outlet
2	Air intake
3	Inlet hot water pipe connection
4	Outlet hot water pipe connection
5	Inlet chilled water pipe connection
6	Outlet chilled water pipe connection
7	External drain pan (optional accessory)
8	Drain pipe connection
9	Electrical box

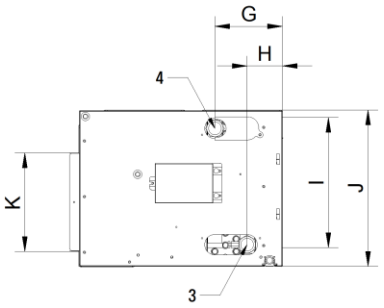
[unit : mm]





3D View

View "a"



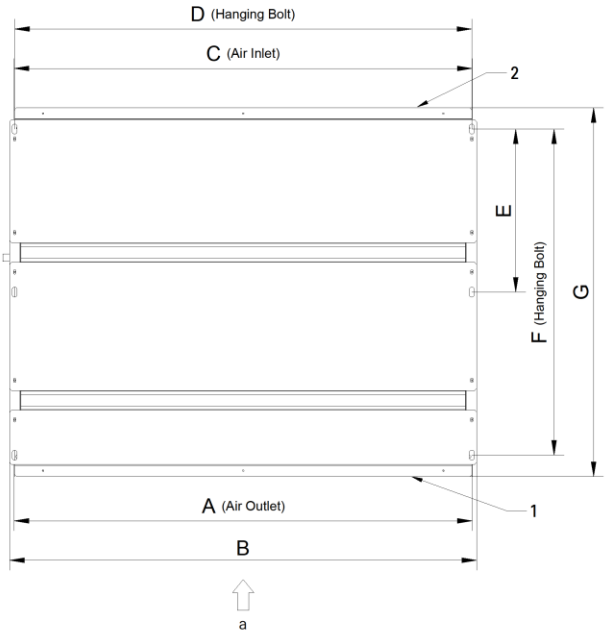
View "b"

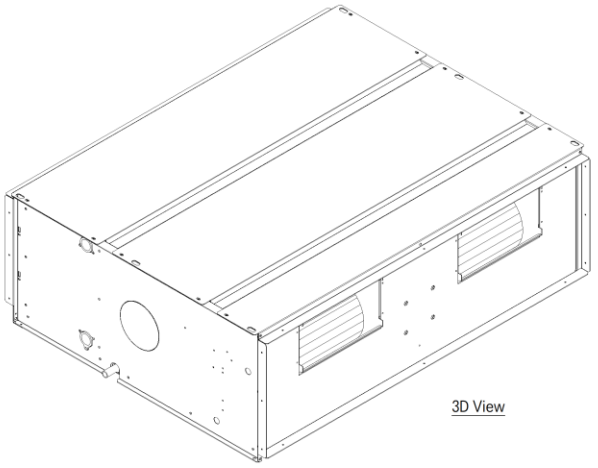
Unit Model	A	B	C	D	E	F	G	H	I	J	K
ACHP060L2	827	845	827	825	220	430	136	71	268	320	200
ACHP080L2	827	845	827	825	220	430	136	71	268	320	200
ACHP100L2	927	945	927	925	220	430	136	71	268	320	200
ACHP120L2	927	945	927	925	220	430	136	71	268	320	200
ACHP140L2	1177	1195	1177	1175	220	430	136	71	268	320	200
ACHP160L2	1177	1195	1177	1175	220	430	136	71	268	320	200
ACHP180L2	1427	1445	1427	1425	220	430	136	71	268	320	200
ACHP200L2	1427	1445	1427	1425	220	430	136	71	268	320	200

Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

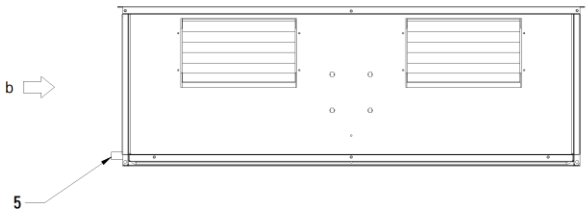
No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	Electrical box
6	Drain pipe connection

[unit : mm]

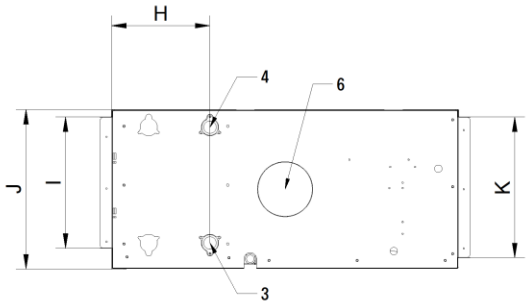




3D View



View "a"



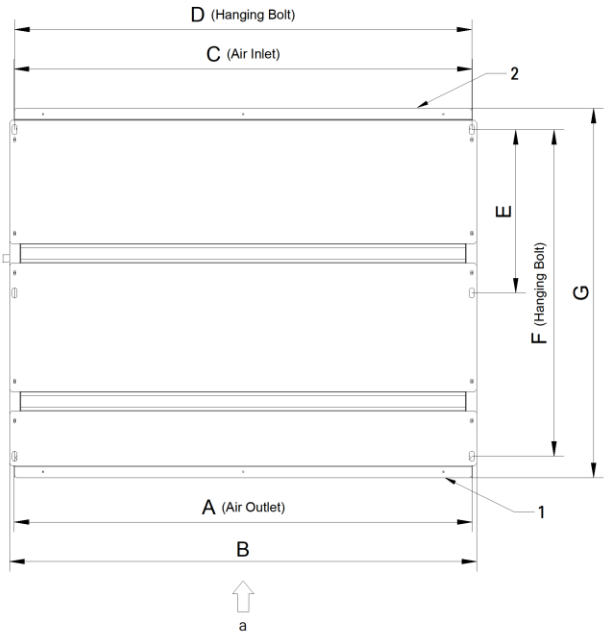
View "b"

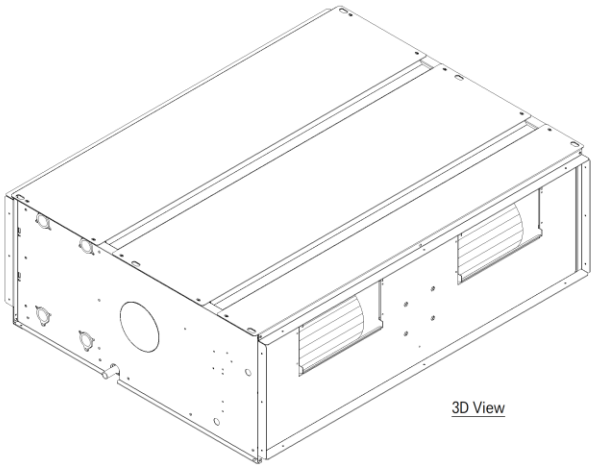
Unit Model	A	B	C	D	E	F	G	H	I	J	K
ACHA060L2	827	845	827	825	330	662	750	200	268	320	288
ACHA080L2	827	845	827	825	330	662	750	200	268	320	288
ACHA100L2	927	945	927	925	330	662	750	200	268	320	288
ACHA120L2	927	945	927	925	330	662	750	200	268	320	288
ACHA140L2	1177	1195	1177	1175	330	662	750	200	268	320	288
ACHA160L2	1177	1195	1177	1175	330	662	750	200	268	320	288
ACHA180L2	1427	1445	1427	1425	330	662	750	200	268	320	288
ACHA200L2	1427	1445	1427	1425	330	662	750	200	268	320	288

Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

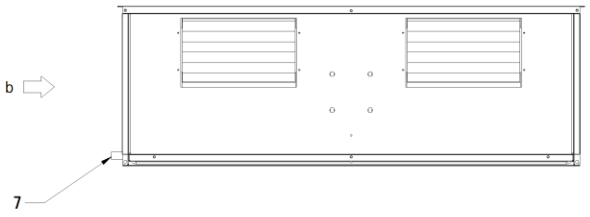
No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	Drain pipe connection
6	Fresh air intake hole

[unit : mm]

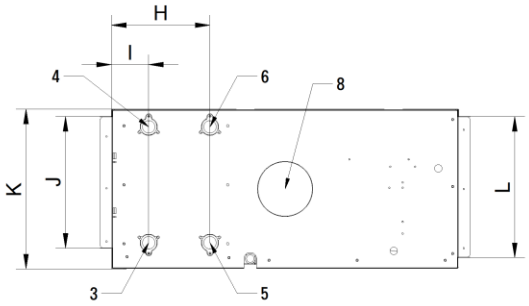




3D View



View "a"



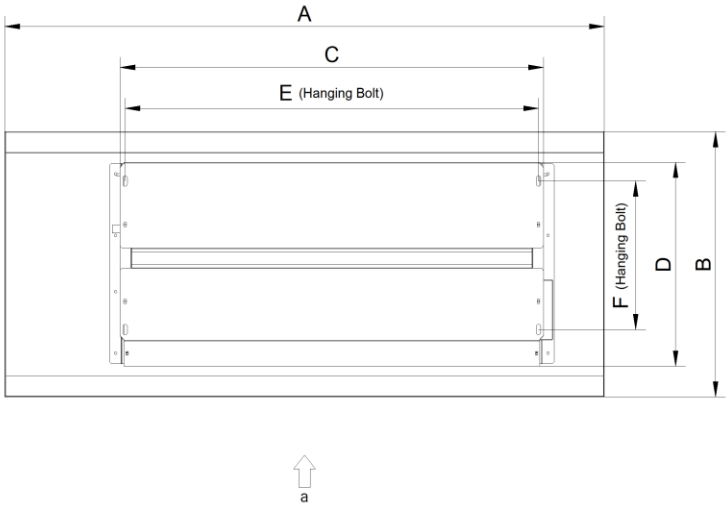
View "b"

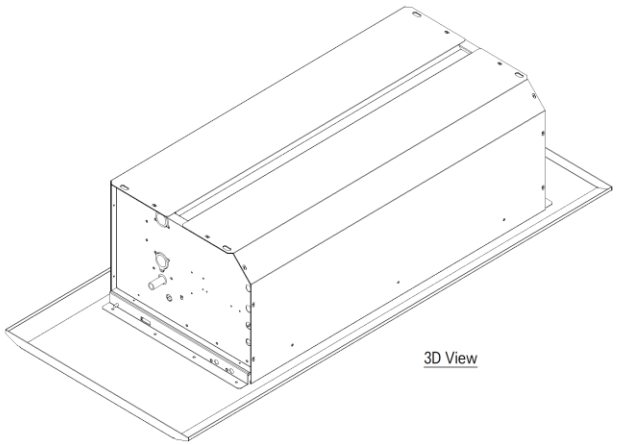
Unit Model	A	B	C	D	E	F	G	H	I	J	K	L
ACHA060L4	827	845	827	825	330	662	750	200	75	268	320	288
ACHA080L4	827	845	827	825	330	662	750	200	75	268	320	288
ACHA100L4	927	945	927	925	330	662	750	200	75	268	320	288
ACHA120L4	927	945	927	925	330	662	750	200	75	268	320	288
ACHA140L4	1177	1195	1177	1175	330	662	750	200	75	268	320	288
ACHA160L4	1177	1195	1177	1175	330	662	750	200	75	268	320	288
ACHA180L4	1427	1445	1427	1425	330	662	750	200	75	268	320	288
ACHA200L4	1427	1445	1427	1425	330	662	750	200	75	268	320	288

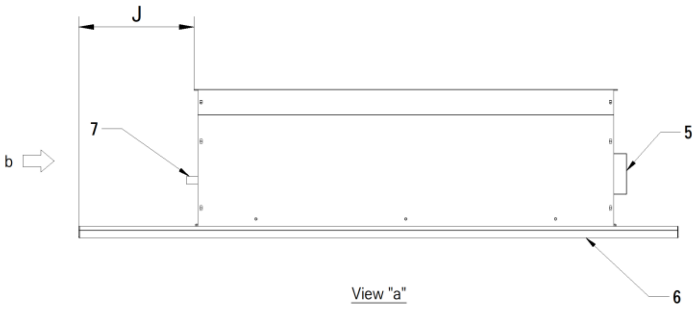
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

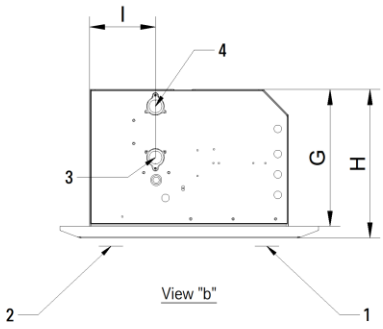
No.	Part Name
1	Air outlet
2	Air intake
3	Inlet hot water pipe connection
4	Outlet hot water pipe connection
5	Inlet chilled water pipe connection
6	Outlet chilled water pipe connection
7	Drain pipe connection
8	Fresh air intake hole

[unit : mm]







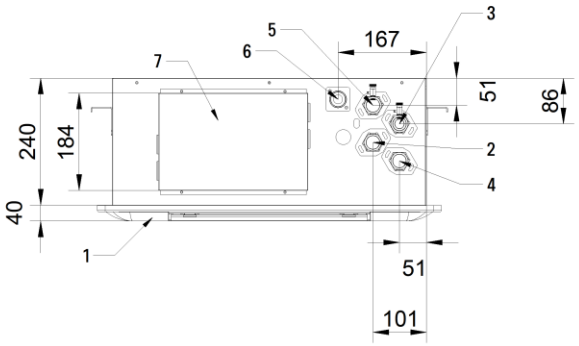


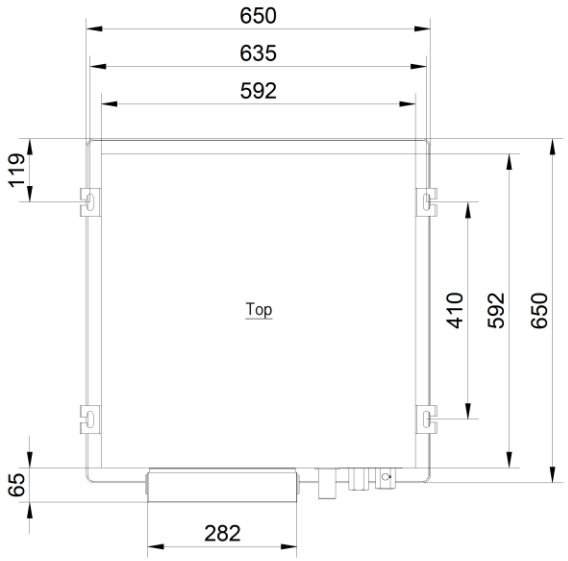
Unit Model	A	B	C	D	E	F	G	H	I	J
ACSV020L2	1000	520	650	400	630	290	270	290	130	230
ACSV030L2	1100	520	750	400	730	290	270	290	130	230
ACSV040L2	1200	520	850	400	830	290	270	290	130	230
ACSV060L2	1300	520	950	400	930	290	270	290	130	230
ACSV080L2	1550	520	1200	400	1180	290	270	290	130	230
ACSV100L2	1800	520	1450	400	1430	290	270	290	130	230

Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

No.	Part Name
1	Air outlet
2	Air intake
3	Inlet chilled water pipe connection
4	Outlet chilled water pipe connection
5	Electrical box
6	Decoration panel
7	Drain pipe connection

[unit : mm]

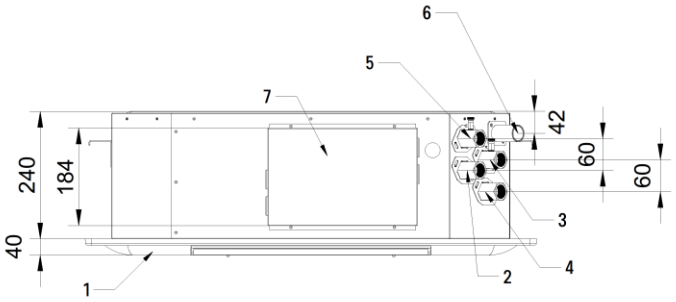


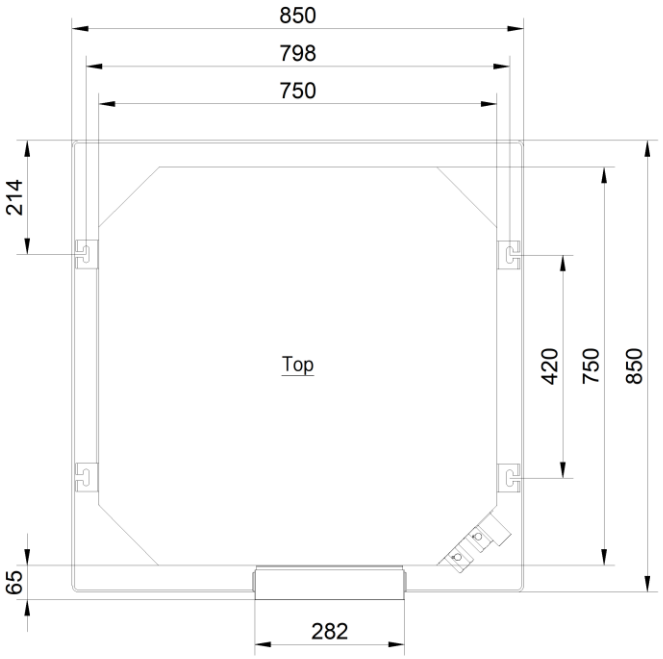


No.	Part Name
1	Decoration panel
2	Inlet hot water pipe connection (in 4-pipe series)
3	Outlet hot water pipe connection (in 4-pipe series)
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	Drain pipe connection
7	Electrical box

Note :
1. Unit should be installed in compliance with the instructions in the product box.

[unit : mm]

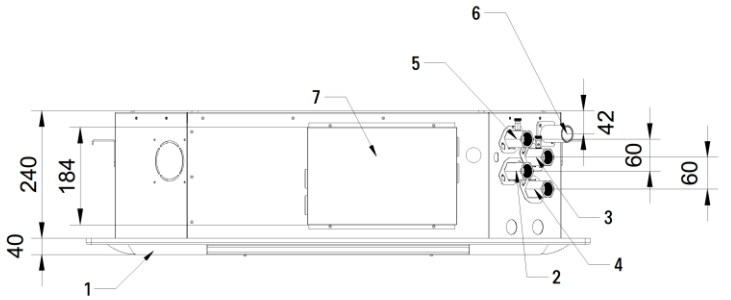


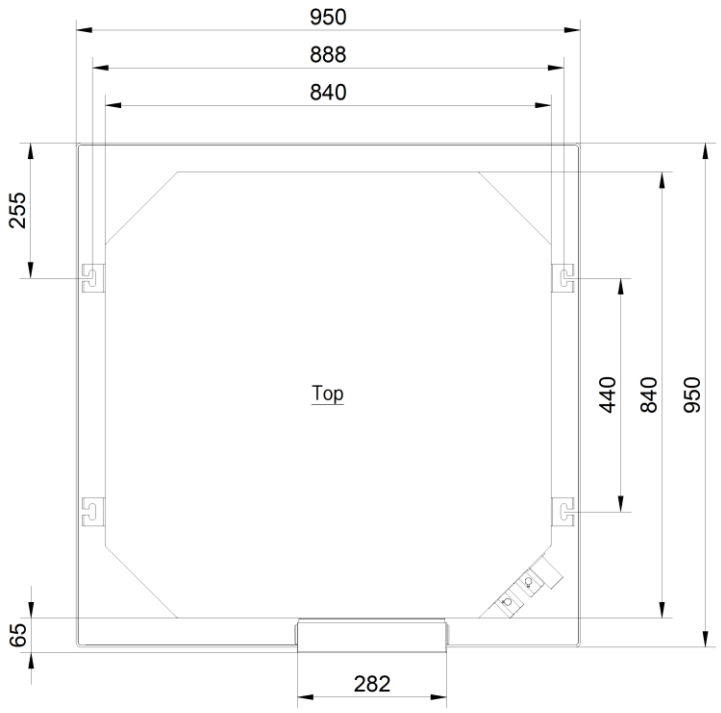


No.	Part Name
1	Decoration panel
2	Inlet hot water pipe connection (in 4-pipe series)
3	Outlet hot water pipe connection (in 4-pipe series)
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	Drain pipe connection
7	Electrical box

Note :
1. Unit should be installed in compliance with the instructions in the product box.

[unit : mm]

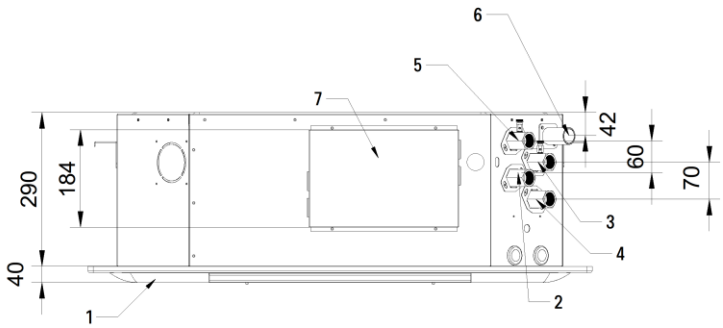


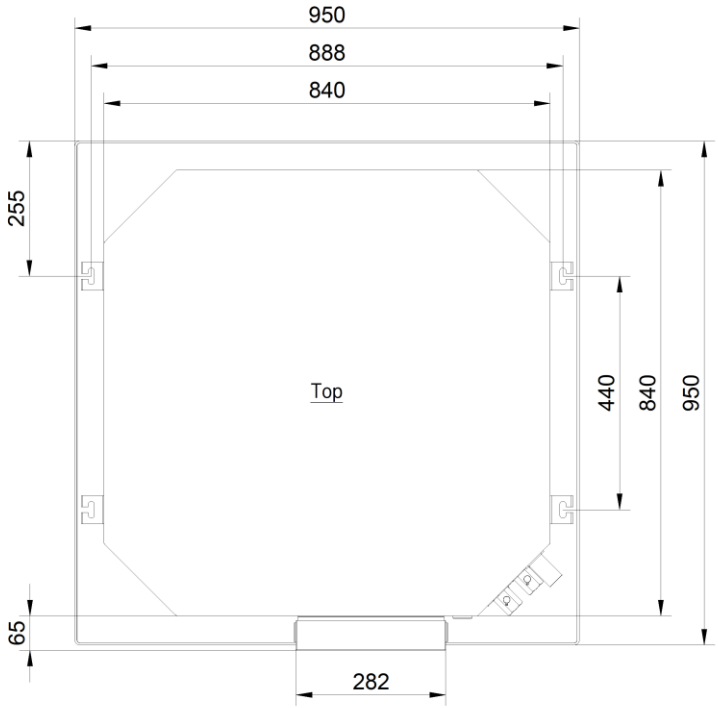


No.	Part Name
1	Decoration panel
2	Inlet hot water pipe connection (in 4-pipe series)
3	Outlet hot water pipe connection (in 4-pipe series)
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	Drain pipe connection
7	Electrical box

Note :
1. Unit should be installed in compliance with the instructions in the product box.

[unit : mm]

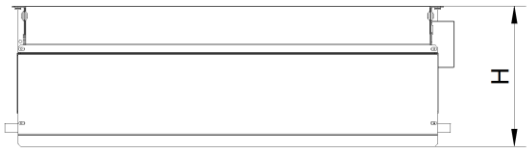




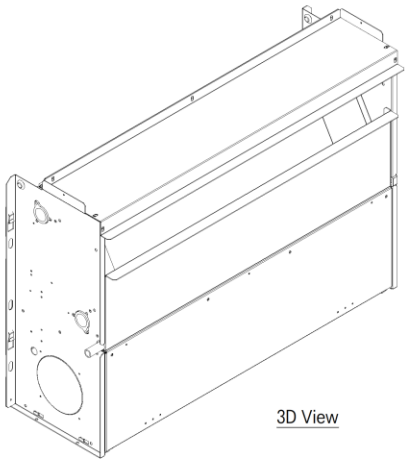
No.	Part Name
1	Decoration panel
2	Inlet hot water pipe connection (in 4-pipe series)
3	Outlet hot water pipe connection (in 4-pipe series)
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	Drain pipe connection
7	Electrical box

Note :
1. Unit should be installed in compliance with the instructions in the product box.

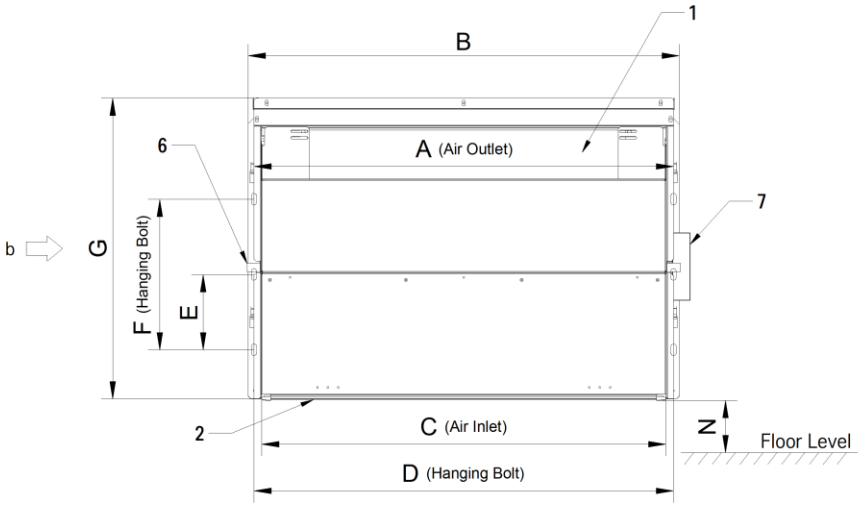
[unit : mm]



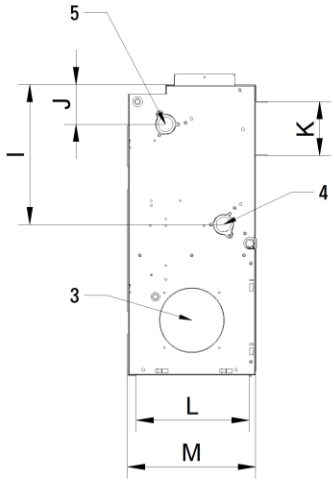
a



3D View



View "a"



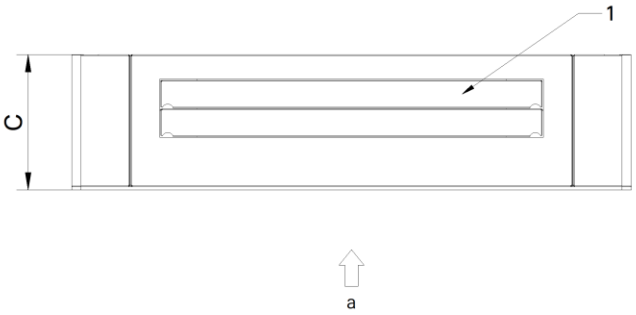
View "b"

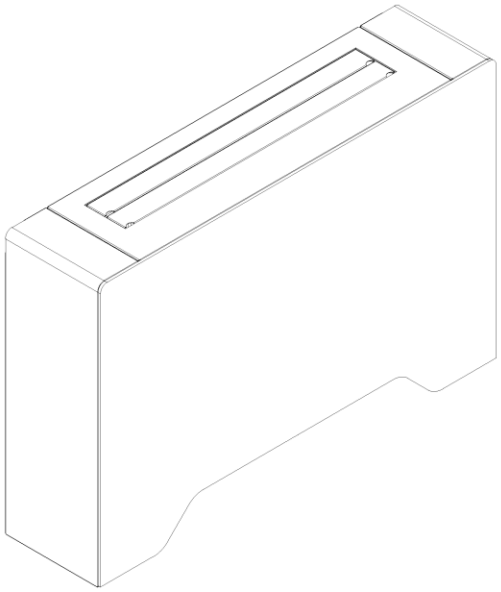
Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

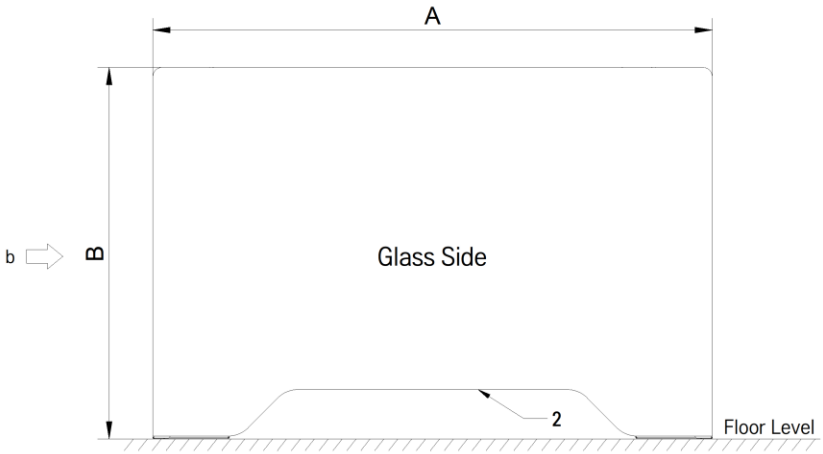
Unit Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N (min)
ACLA020L2	628	645	600	625	130	260	520	242	180	85	93	195	220	80
ACLA030L2	728	745	700	725	130	260	520	242	180	85	93	195	220	80
ACLA040L2	828	845	800	825	130	260	520	242	180	85	93	195	220	100
ACLA060L2	928	945	900	925	130	260	520	242	180	85	93	195	220	100
ACLA080L2	1178	1195	1150	1175	130	260	520	242	180	85	93	195	220	100
ACLA100L2	1428	1445	1400	1425	130	260	520	242	180	85	93	195	220	100

No.	Part Name
1	Air outlet
2	Air intake
3	Fresh air intake hole
4	Inlet chilled water pipe connection
5	Outlet chilled water pipe connection
6	Drain pipe connection
7	Electrical box

[unit : mm]







View "a"

View "b"

Unit Model	A	B	C
ACLA020L2	865	640	233
ACLA030L2	965	640	233
ACLA040L2	1065	640	233
ACLA060L2	1165	640	233
ACLA080L2	1415	640	233
ACLA100L2	1665	640	233

Note :
1. Unit should be installed in compliance with the instructions in the product box.
2. Inlet/outlet pipes connection side can be selected by the customer.

No.	Part Name
1	Air outlet vane
2	Air intake

Accessories

Transition Fitting

Rectangular to Round (CPM020S1 - CPM200S7)

- For supply air
- Suitable for ACLA, ACLS, ACMP, ACMH models

90 Deg. Elbow (CPM020SV - CPM200SV)

- For supply air
- Suitable for ACLA, ACLS, ACMP, ACMH models

Fish Gill (CPM020RL - CPM200RL)

- For reducing noise level caused by return air
- Suitable for ACLA, ACMP, ACMH models

Air Intake Hole Connection

- Suitable for ACLA, ACMP, ACMH models

Installation Equipment

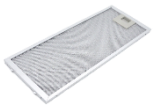
Mounting Support (CSU020DA - CSU200DD)

- Well-advised for easy and safe installation
- Suitable for all except CSF models

External Drain Pan

- Preventing unexpected leakage
- Suitable for ACLA, ACLS, ACMP, ACMH models

Aluminum Filter



- For return air instead of polypropylene filter
- Suitable for all except CS and CHA models

Note

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HVAC SYSTEM

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