



**EMPEROR**  
**Precision Air Conditioner for Critical Application**  
**Cooling Capacity: 17.6~134.5 kW**

Sy-G® is a worldwide supplier of high efficiency refrigeration solutions and a member of Under a vision of vertically integrated manufacturing, which includes our own coils and condensers, quality control is closely monitored throughout the industrial process, resulting in high-end reliable products. Our permanent efforts in securing the highest levels of quality in our products and solutions, are backed up by ISO 9001, ISO 14001, OSHAS 18001, UL, TUV and CE certifications.

We continuously strive to design innovative solutions in order to satisfy and exceed the changing expectations of different industries. Our products are engineered to comply and surpass the specific needs and requirements of each geographical market.



EMPEROR precision air conditioners are designed for mission critical applications, providing temperature and humidity control, high reliability, high stability, better energy saving performance and all units are built for 24x7x365 continuous operation.

EMPEROR units can be designed in various air supply and cooling alternatives, as shown in the table below:

Air Supply			Air Return		Cooling Method
Downflow	Upflow	Lower Front	Front	Top	DXA
<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

**REMARKS:**

- a) **Air Supply:**  
 Downflow: Supply air from unit's bottom, is abbreviated as: \_\_\_\_\_ "D"  
 Upflow: Supply air from unit's top, is abbreviated as: \_\_\_\_\_ "U"  
 Lower Front: Supply air from unit's lower front, is abbreviated as \_\_\_\_\_ "L"
  
- b) **Air Return:**  
 Front: Return air from unit's front, is abbreviated as: \_\_\_\_\_ "F"  
 Top: Return air from unit's top is abbreviated as: \_\_\_\_\_ "T"
  
- c) **Cooling Method:**  
 DXA: Direct expansion with air cooled outdoor units, is abbreviated as: \_\_\_\_\_ "A"



## Downflow

Specially designed for medium to large applications, providing precise temperature and humidity control with high operating reliability and energy efficiency.

### FEATURES:

- Constructed with a steel frame and painted with epoxy powder to ensure proper adhesion to the surface
- Microprocessor control system with LCD display
- Equipped with AC directly-coupled centrifugal fan (no belts and pulleys)
- Aluminum water pan with drainpipe, liquid receiver complete with accessories, leak detection sensor, and coolant tank
- R407C environmentally-friendly refrigerant
- Electric resistance heaters with temperature control, built with low density heating components and non-corrosive metal sheath tubular finned
- Self-contained immersed electrode boiler type humidifier with water level control and auto-drain functions
- Independent electrical protections for: compressor, fan, motor, heater, and humidifier
- Hermetic scroll compressor equipped with: electrical protector, phase protector, exhaust muffler, and oil tank heater
- Thermodynamic expansion valve (TXV)
- Washable G4 fiber-pad folded filter, built with an exterior aluminum mount structure
- Hot gas bypass
- Liquid detection sensor
- Independent refrigerant charging system for high and low pressure lines
- Indoor service valves

### OPTIONAL FEATURES:

- Electronically Commuted (EC) fan
- Electronic expansion valve (EXV)
- Touch screen display for controller
- Multiple communication protocols for remote monitoring, such as: SNMP (web interface), Modbus and BACnet.

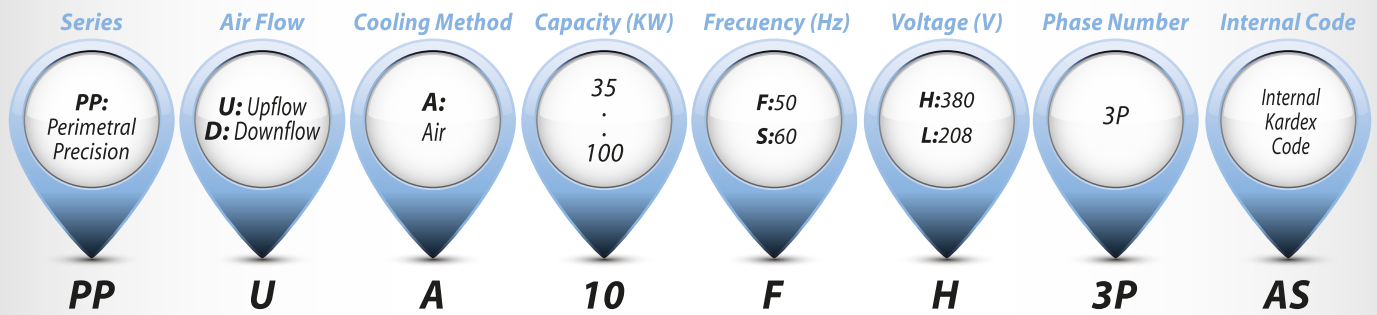
### BENEFITS:

- Capability for cooling, heating, de-humidifying, and humidifying, as well as filtering air in the room
- Provides high Sensible Heat Ratio (SHR) and world-class Energy Efficiency Ratio (EER)
- Designed and manufactured to operate at 3,000 meters above sea level without suffering any degradation
- Random multiple units insertion after a power failure, with a time delay from 2 to 60 seconds, avoiding simultaneous starting of the units
- The control system allows customized programming of temperature, relative humidity, and manual start-up of components. In addition, up to sixteen (16) units can be installed to function synchronously in parallel, alternating, and/or in redundant configurations
- Optional energy saving working mode
- AC directly-coupled centrifugal fans are 35% more efficient, have an average lifespan of 10 to 15 years, and for ease of maintenance, there are no belts to change or pulleys to adjust
- Compressor positive start to avoid short-cycling alarms and low-pressure lockout
- Highly accurate temperature and humidity control that extends the service interval and life-cycle, designed to operate with ordinary tap water and equipped with automatic water supply and flushing system to reduce mineral precipitation
- All units are 100% front serviceable with all major components located away from the airflow stream, providing important space savings
- Electric board, protection switches and control devices are installed in a separated compartment, making the unit serviceable without requiring shut down

### APPLICATIONS

- Data centers
- Rail transit
- Mine workings
- Metallurgy industry
- Petrochemical industry
- Industrial process control center

## NOMENCLATURE



## MAIN COMPONENTS INDOOR UNIT:

### Plug-in AC centrifugal fans:

- Backwards curved, directly coupled, Carbon-fiber fan.
- Lifespan of 10 to 15 years.
- 35% more efficient because of its inclination and direct coupling
- Maintenance-free ball bearings.
- No belts and pulleys.
- Does not require belt changes and pulley adjustments.
- High efficiency.
- Quiet operation.
- High-strength, corrosion-resistant aluminum alloy carrier with a jacket of special, fiber-reinforced plastic.
- Thermal overload motor protection.

### Heater:

- Electric resistance heaters with temperature control.
- Low density heating components, tubular finned construction.

### Immersed Electrode Humidifier:

- Self-contained electrode boiler type with water level control and auto-drain functions.
- Incorporates advanced control system, which supplies highly accurate humidity control. and also extends the service interval and life-cycle.
- Designed to operate with ordinary tap water and equipped with automatic water supply and flushing system to reduce mineral precipitation.

### Filters:

- Pleated type filters with 25-30 % efficiency, > 95% compliant with
- ASHRAE 52.1 (MERV 8).
- G4 fiber-pad folded filter.
- Washable, built with an exterior mount aluminum structure.

### Compressor:

- Hermetic scroll compressor equipped with electric protector, exhaust muffler and oil tank heater.
- Compressor rubber absorber.
- Phase loss monitor.
- Installed away from the air path to avoid disturbing the unit's operation during service visits.
- Compressor positive start to avoid short-cycling alarms and low-pressure lockout.





### **Microprocessor Control System:**

- All components are connected to the microprocessor and are continuously monitored and controlled, and to avoid malfunction, the unit is shut down and the failure is shown on the display.
- All units are built with Carel's most recent pCO microprocessor with automatic control and monitoring capabilities.
- All the pCO series controllers feature a 16-bit microprocessor, 2 MB flash memory, and a large LCD display.
- The control system has an adjustable tolerance temperature of +/- 0.5°C and a relative tolerance humidity control of +/-3% RH.
- The pCO series controllers can interface with various communication protocols like: ModBus®, BacNet™, Johnson Metasys®, DLL for Windows®, TCP/IP, SNMP, LonWorks®, Trend, among others.
- The pCO series control system allow for configuration and display in several languages, including: English, Spanish, Chinese, Japanese, among others.
- Multiple levels of password protection for parameter configuration.
- Up to sixteen (16) units can be installed to function synchronized in parallel or redundant configuration.
- Lead-lag control when two or more units are installed, in case of a unit failure, the standby unit will activate automatically.
- Allows setting daily starts and stops of the unit according to weekly program.
- Dry contacts inputs and outputs.



### **Temperature and humidity:**

- Return air temperature.
- Return air relative humidity.

### **Working status:**

- Indoor unit supply fans.
- Compressors.
- Dehumidification activation valves.
- Two - stage electric heaters.
- Automatic or manual restart status of components.
- High pressure of the refrigeration system.
- Control and monitoring of the unit.
- Outdoor unit fans.

### **Working hours of every main component:**

- Indoor unit supply fans.
- Individual compressor.
- Humidifier.
- Heaters.

### **Alarm display:**

- Date and time of most recent intervened alarm (yy/mm/dd/hh/mm).
- High and low temperature.
- High and low humidity.
- High and low pressure.
- High and low voltage.
- Filter dirty.
- Low airflow.
- Fire.
- Flood.
- Compressor short-cycle.
- Compressor overload.
- Phase loss.

### **Manual control:**

- Able to activate or deactivate each component according to the needs of commissioning and service of the unit.
- Optional energy saving working mode:
- There are two kinds of running modes that can be chosen:
- Standard running mode with temperature and humidity controlled in a narrower range.
- Energy savings mode with temperature and humidity controlled in a wider range.

### **MAINTENANCE:**

- All units are 100% front serviceable, which provides important space savings.
- All major components are located away from the airflow stream, including compressor, humidifier and control and safety devices, making ordinary service and preventive maintenance easy during operation.
- All units are equipped with directly coupled fans, for ease of maintenance there are no belts to change end pulleys to adjust.



### **MAIN COMPONENTS OUTDOOR UNIT:**

#### **Features:**

- Remote direct expansion air-cooled outdoor unit with axial fans (DXA).
- Built entirely in heavy gauge corrosion resistant aluminum.
- Aluminum fins and copper tubes staggered in direction of the airflow
- Fan speed is step-less controlled by microprocessor according to compressor discharge pressure
- Outdoor service valves

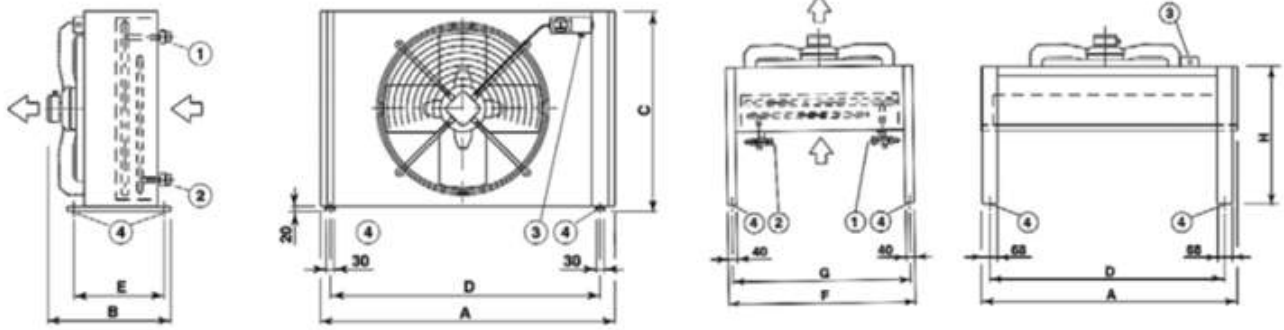
#### **Benefits:**

- Designed and manufactured to operate at 3,000 meters above sea level without suffering any degradation
- Can be installed in either vertical or horizontal air discharge, for footprint considerations
- Fan motor provides steady operation, lower noise level, energy savings and low temperature start-up



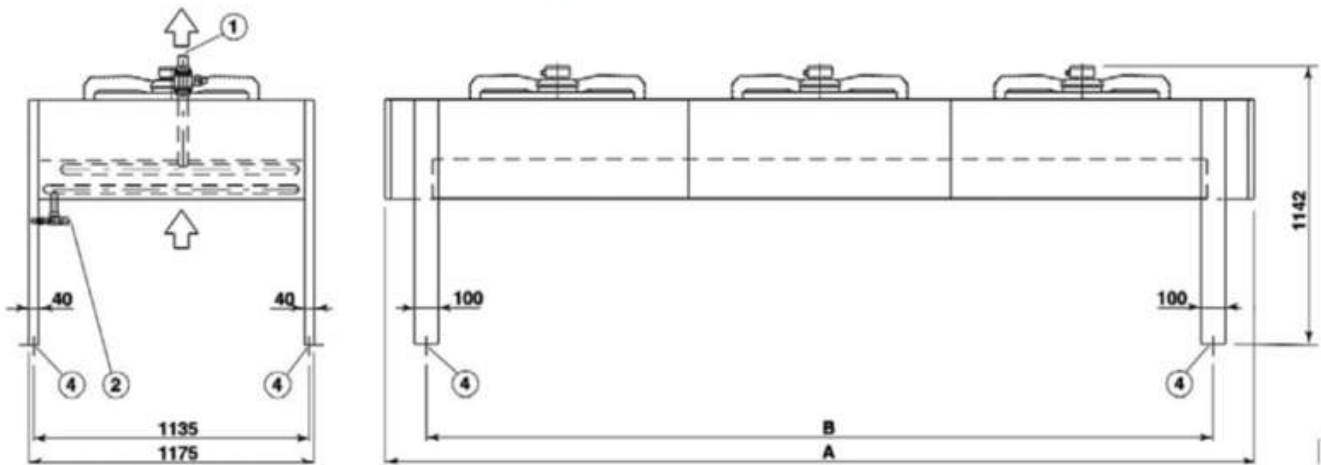
### Vertical unit

### Horizontal unit



Please leave 0.5m maintenance space around the unit

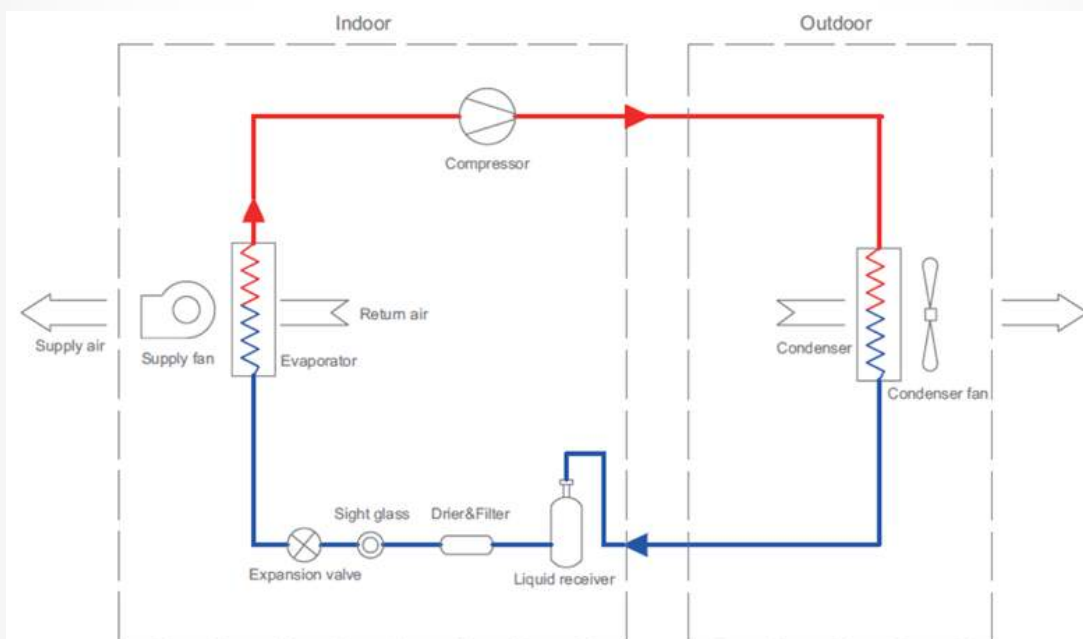
### Horizontal air cooler condenser



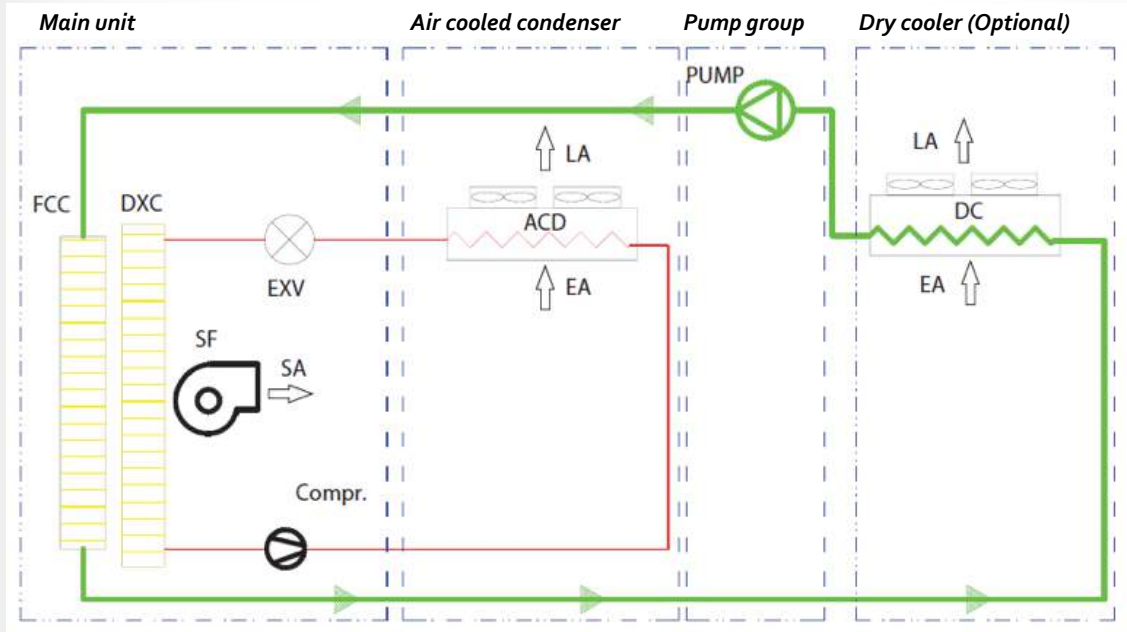
Please leave 0.5m maintenance space around the unit

### Working principle for mechanical compressing refrigeration system:

- DXA: Direct expansion air cooled machine (remote air cooled outdoor unit)



- FCC: Free cooling coil air cooled machine (Optional configuration for energy efficiency)



- SA: Supply air
- RA: Return air
- SF: Supply fan
- Pump: Glycol pump
- FCC: Free cooling coil
- DXC: Direct expansion cooling coil

- Compr.: Compressor
- EA: Entering air of condenser coil
- LA: leaving air of condenser coil
- DC: Dry cooler
- ACD: Air cooled condenser



**Technical Specifications for:**  
**Emperor DXA<sup>(1)</sup> 35 KW to 100KW - 208~230V/3Ph/60Hz**

UNIT MODEL	PPUA35SL3PAO	PPUA40SL3PAO	PPUA50SL3PAO	PPUA60SL3PAO	PPUA70SL3PAO	PPUA80SL3PAO	PPUA90SL3PAO	PPUA100SL3PAO	
	PPDA35SL3PAO	PPDA40SL3PAO	PPDA50SL3PAO	PPDA60SL3PAO	PPDA70SL3PAO	PPDA80SL3PAO	PPDA90SL3PAO	PPDA100SL3PAO	
Supply air scheme <sup>(2)</sup>	U: Upflow D: Downflow								
<b>POWER SUPPLY</b>									
Power source	208V, 3Ph, 60Hz								
<b>COOLING CAPACITY<sup>(3)</sup></b>									
Total	KW [Btu/h]	35.3 [120,448]	41.8 [142,627]	50.5 [172,313]	60.2 [205,410]	70.6 [240,897]	80.2 [273,653]	85.3 [291,055]	97.6 [333,025]
Sensible	KW [Btu/h]	33.5 [114,320]	38.9 [132,643]	47.0 [160,456]	57.8 [197,294]	66.2 [225,820]	74.0 [252,356]	79.6 [271,606]	90.3 [308,048]
<b>SUPPLY FAN</b>									
Type	Plug-in AC centrifugal fan								
Qty of fan	n	1	2		3				
Air Volume	m3/h [CFM]	9,600 [5,650]	12,600 [7,416]	13,600 [8,004]	17,800 [10,476]	19,200 [11,300]	21,000 [12,360]	24,600 [14,479]	27,900 [16,421]
<b>COMPRESSOR</b>									
Type	Hermetic scroll compressor								
Qty of Compressor	n	1	2						
<b>REFRIGERANT</b>									
Type	R407c								
Control	Thermal expansion valve								
Charge weight	Kg	12	15	2x10	2x11	2x12	2x15	2x17	2x18
<b>FILTERS</b>									
Type	G4								
Qty of filters - U: Upflow	n	2			3			4	
Qty of filters - U: Downflow	n	4	6				8		
<b>ELECTRIC HEATHER</b>									
Type	Stainless steel								
Working class	n	2							
Heating capacity <sup>(4)</sup>	KW	9	13,5			18			
<b>HUMIDIFIER</b>									
Type	Electrode								
Humidifying capacity <sup>(4)</sup>	Kg/h	5	8						
<b>DIMENSIONS AND WEIGHT</b>									
Length	mm	1.480	1.750		2.490			3.095	
Depth	mm	890	890		890			890	
Height	mm	1.960	1.960		1.960			2.050	
Weight	Kg	420	630	680	940	980	1.040	1.230	1.270
<b>OUTDOOR UNIT</b>									
Model <sup>(5)</sup>		OPCME15SLA	OPCME8SLA	OPCME10SLA		OPCME15SLA		OPCME20SLA	
Qty condenser	n	1	2						
<b>CERTIFICATIONS &amp; STANDARDS</b>									
Quality	ISO 9001:2008 ; ISO 14001:2004 ; ISO 13485:2003 ; OHSAS 18001:2007								
Compliance <sup>(6)</sup>	CE CQC31-439125-2010								

(1) - DXA: Direct expansion cooler with air.

(2) - All specifications apply for U: Upflow, D: Downflow and L: Lower front discharge.

(3) - Return air dry bulb temperature 24 °C, RH 50%, Outdoor dry bulb temperature 35 °C.

(4) - The above capacities of heater and humidifier are standard. Other customized option are available.

(5) - For technical specifications of outdoor unit, please refer to the next table: Outdoor Unit Technical Specifications for: PP Series DXA 10 KW to 30 KW at 50/60 Hz.

(6) - CQC31-439125-2010 Energy saving standard apply only to 40, 60, 70, 80 models.

Sy-G reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Sy-G products previously or subsequently sold.

**Outdoor Unit Technical Specifications for:**  
**Emperor DXA & DXA FC<sup>(1)</sup> 35 KW to 100KW - 208V/3Ph/60Hz**

MODEL	OPCME8SLA	OPCME10SLA	OPCME15SLA	OPCME20SLA
Qty of fan	n	1	1	2
Power Input	KW	0,63		1,26
Input current	A	3,0		6
<b>CONNECTION TUBE SIZE</b>				
Gas pipe	ODF	22		28,0
Liquid pipe	ODF	16,0		19,0
<b>DIMENSIONS</b>				
Length	mm	1.340		2.400
Width	mm	620		630
Height	mm	1.070		1.135
Weight	Kg	95	110	130

(1) - DXA: Direct expansion cooler with air.

(2) - The capacity is rated at entering air temperature 35 °C and condensing temperature 50 °C condition.

(3) - The noise is measured at 1 meter distance from unit at open field on condenser coil side according to ISO 3744.

**Technical Specifications for:**  
**Emperor DXA<sup>(1)</sup> 35 KW to 100KW - 380V/3P/50Hz**

UNIT MODEL	PPUA35FH3PAO	PPUA40FH3PAO	PPUA50FH3PAO	PPUA60FH3PAO	PPUA70FH3PAO	PPUA80FH3PAO	PPUA90FH3PAO	PPUA100FH3PAO	
	PPDA35FH3PAO	PPDA40FH3PAO	PPDA50FH3PAO	PPDA60FH3PAO	PPDA70FH3PAO	PPDA80FH3PAO	PPDA90FH3PAO	PPDA100FH3PAO	
Supply air scheme <sup>(2)</sup>	U: Upflow D: Downflow								
<b>POWER SUPPLY</b>									
Power source	380V, 3Ph, 50Hz								
<b>COOLING CAPACITY<sup>(3)</sup></b>									
Total	KW [Btu/h]	37.6 [128,296]	46.6 [159,005]	55.1 [188,009]	65.3 [222,812]	74.5 [254,204]	84.6 [288,667]	90.7 [309,481]	103.4 [352,815]
Sensible	KW [Btu/h]	35.3 [120,448]	44.3 [151,157]	51.1 [174,360]	59.9 [204,387]	71.4 [243,626]	79.4 [270,924]	86.1 [293,785]	97.7 [333,366]
<b>SUPPLY FAN</b>									
Type	Plug-in AC centrifugal fan								
Qty of fan	n	1	2		3				
Air Volume	m3/h [CFM]	9,600 [5,650]	12,600 [7,416]	13,600 [8,004]	17,800 [10,476]	19,200 [11,300]	21,000 [12,360]	24,600 [14,479]	27,900 [16,421]
<b>COMPRESSOR</b>									
Type	Hermetic scroll compressor								
Qty of Compressor	n	1	2						
<b>REFRIGERANT</b>									
Type	R407C								
Control	Thermal expansion valve								
Charge weight	Kg	12	15	2x10	2x11	2x12	2x15	2x17	2x18
<b>FILTERS</b>									
Type	G4								
Qty of filters - U: Upflow	n	2			3			4	
Qty of filters - U: Downflow	n	4	6				8		
<b>ELECTRIC HEATHER</b>									
Type	Stainless steel								
Working class	n	2							
Heating capacity <sup>(4)</sup>	KW	9	13,5			18			
<b>HUMIDIFIER</b>									
Type	Electrode								
Humidifying capacity <sup>(4)</sup>	Kg/h	5	8						
<b>DIMENSIONS AND WEIGHT</b>									
Length	mm	1.480	1.750		2.490			3.095	
Depth	mm	890	890		890			890	
Height	mm	1.960	1.960		1.960			2.050	
Weight	Kg	420	630	680	940	980	1.040	1.230	1.270
<b>OUTDOOR UNIT</b>									
Model <sup>(5)</sup>		OPCME15FHA	OPCME8FHA	OPCME10FHA		OPCME15FHA		OPCME20FHA	
Qty condenser	n	1	2						
<b>CERTIFICATIONS &amp; STANDARDS</b>									
Quality	ISO 9001:2008 ; ISO 14001:2004 ; ISO 13485:2003 ; OHSAS 18001:2007								
Compliance <sup>(6)</sup>	CE CQC31-439125-2010								

(1) - DXA: Direct expansion cooler with air.

(2) - All specifications apply for U: Upflow, D: Downflow and L: Lower front discharge.

(3) - Return air dry bulb temperature 24 °C, RH 50%, Outdoor dry bulb temperature 35 °C.

(4) - The above capacities of heater and humidifier are standard. Other customized option are available.

(5) - For technical specifications of outdoor unit, please refer to the next table: Outdoor Unit Technical Specifications for: PP Series DXA 10 KW to 30 KW at 50/60 Hz.

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**Outdoor Unit Technical Specifications for:**  
**Emperor DXA & DXA FC<sup>(1)</sup> 35 KW to 100KW - 380V/3P/50Hz**

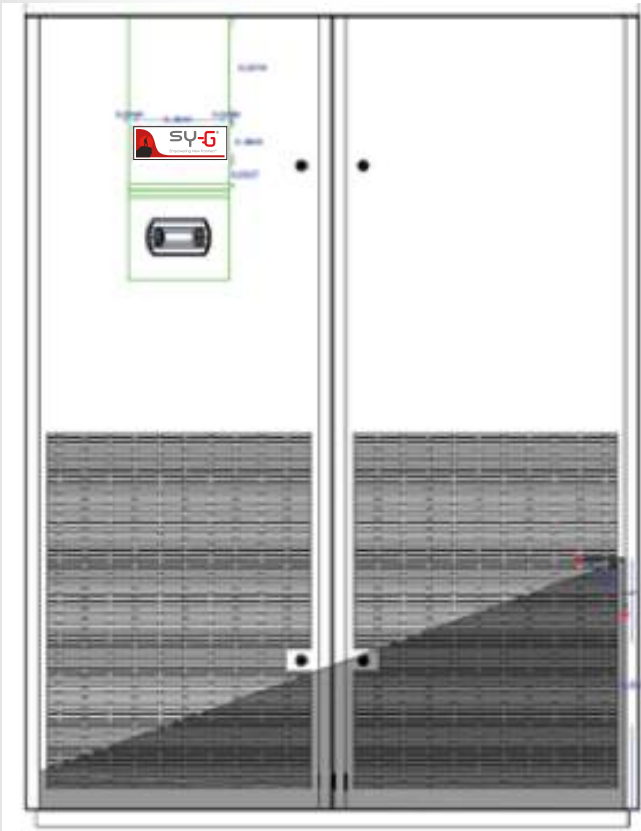
MODEL	OPCME8FHA	OPCME10FHA	OPCME15FHA	OPCME20FHA
Qty of fan	n	1	1	2
Power Input	KW	0,63		1,26
Input current	A	3,0		6
<b>CONNECTION TUBE SIZE</b>				
Gas pipe	ODF	22		28,0
Liquid pipe	ODF	16,0	19,0	
<b>DIMENSIONS</b>				
Length	mm	1.340		2.400
Width	mm	620		630
Height	mm	1.070		1.135
Weight	Kg	95	110	130

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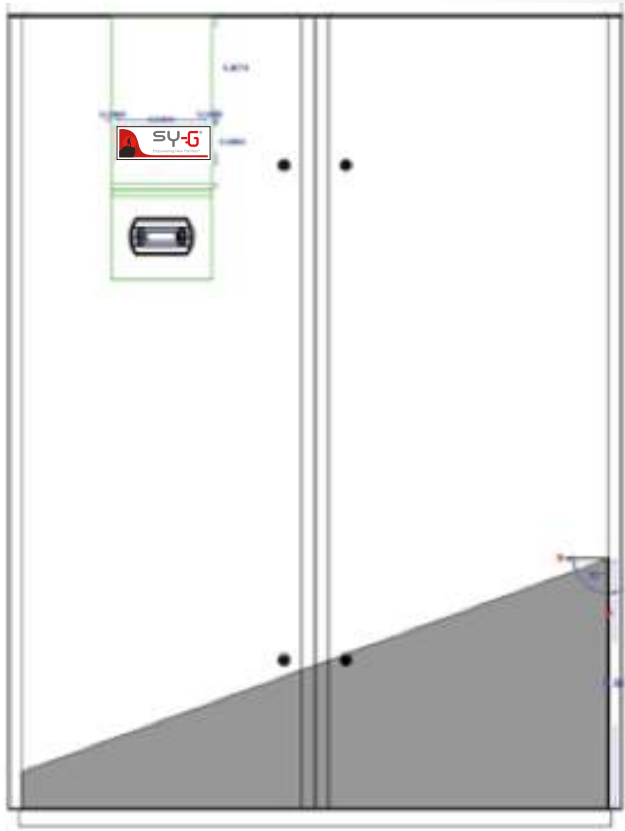
(2) - The capacity is rated at entering air temperature 35 °C and condensing temperature 50 °C condition.

(3) - The noise is measured at 1 meter distance from unit at open field on condenser coil side according to ISO 3744.

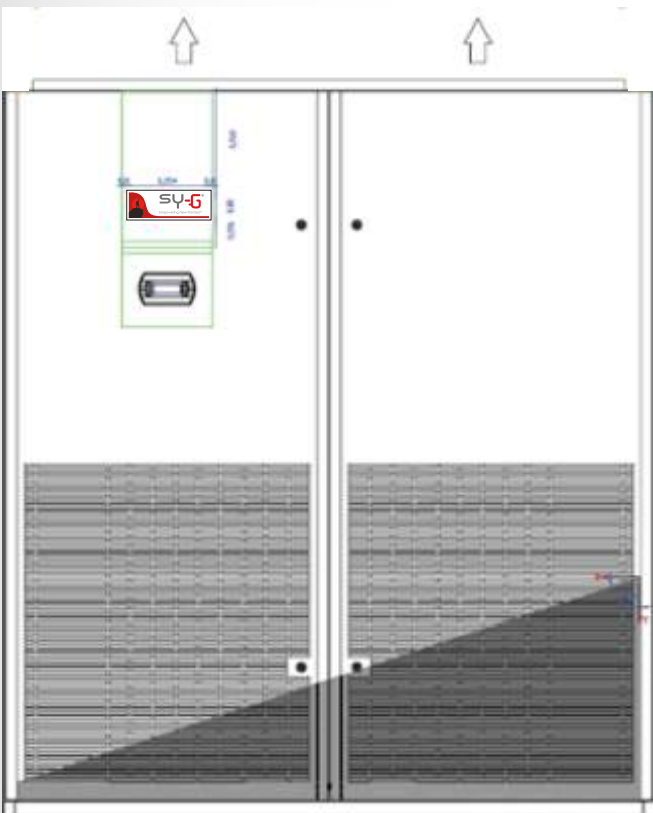
**Up Flow  
35KW**



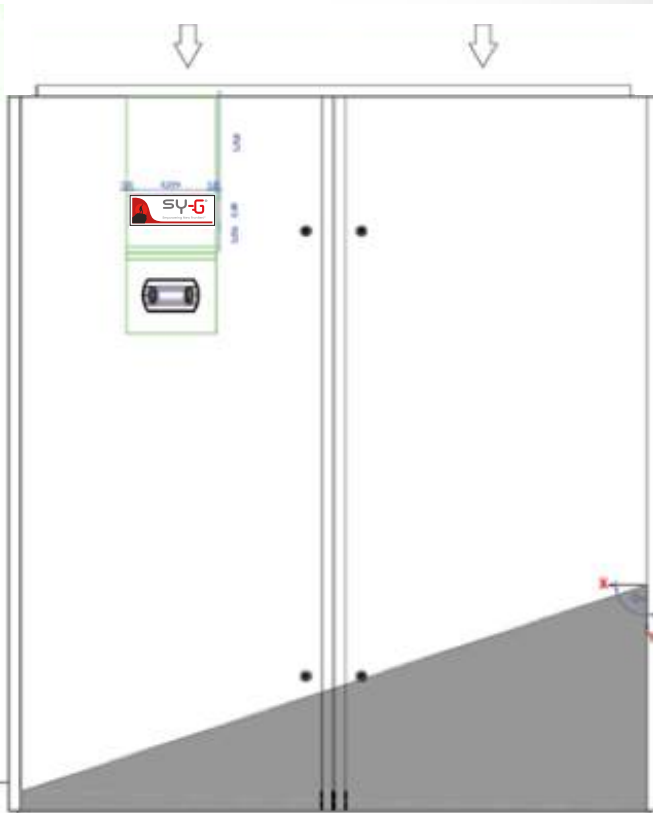
**Down Flow  
35KW**



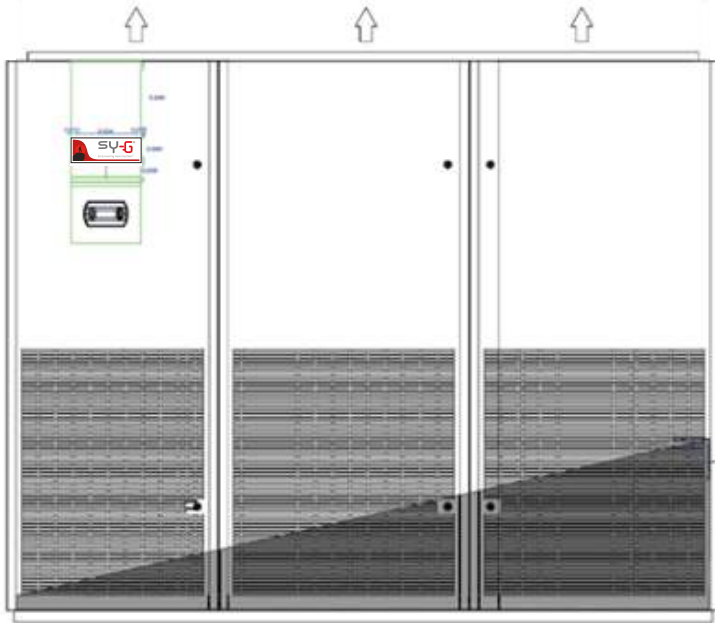
**Up Flow  
40KW/50KW**



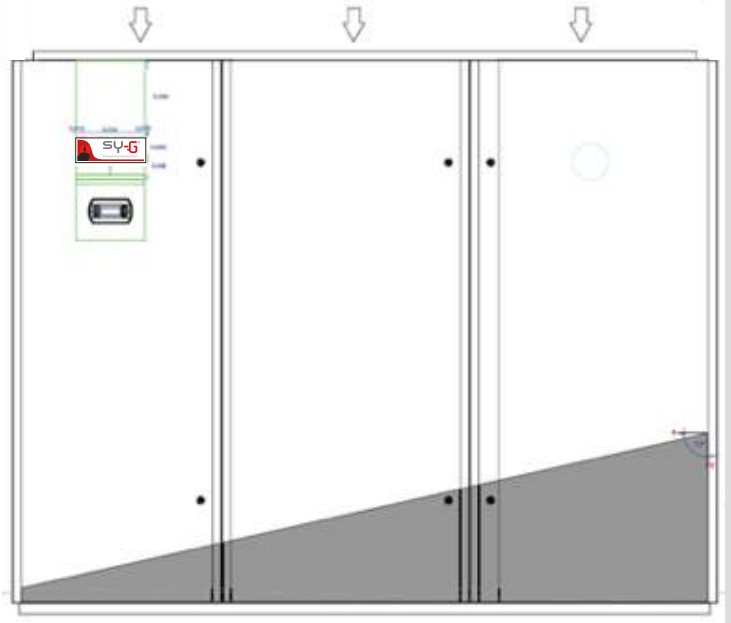
**Down Flow  
40KW/50KW**



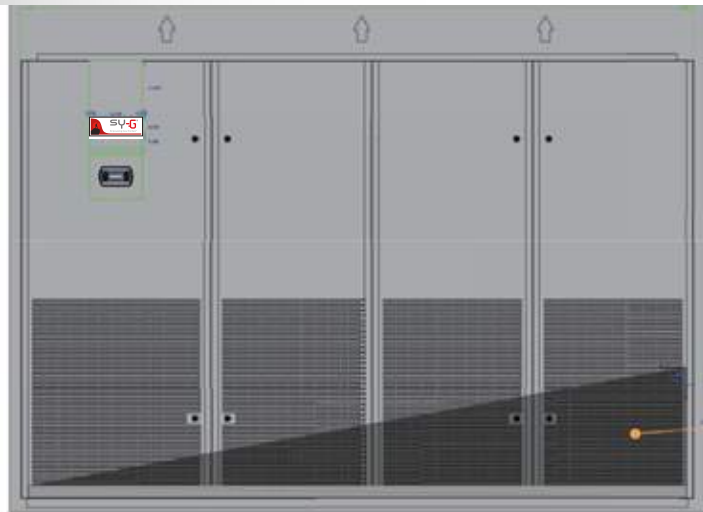
10 KW



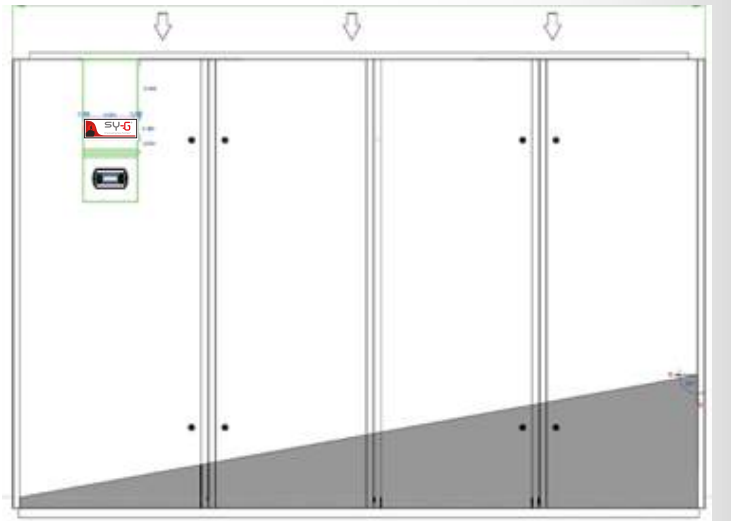
Down Flow  
15KW/18KW



Up Flow  
15KW/18KW



Up Flow  
22KW/25KW/30KW



**SY-G**<sup>®</sup>

Empowering New Frontiers™