1. Product Profile

EPCS series energy storage converter (PCS) is a bidirectional current controllable conversion device connecting the energy storage battery system and the power grid. Its main function is to realize the energy exchange between the battery and the power grid, and control and manage the charge and discharge of the battery. In the grid-connected mode, it can realize the peak cutting and valley filling, peak regulating and frequency regulating, virtual capacity adding and off-grid backup. At the same time, PCS also supports a variety of charge and discharge modes of constant voltage, constant current and floating charge.

Name	Model number	Remarks
Power Conversion system PCS	EPCS50-AM	
	EPCS63-AM	
	EPCS80-AM	
	EPCS105-AM	

2. Product Features

❖ Efficient conversion

1. Standby battery zero power consumption;
2. Charge and discharge conversion time ≤20ms;
3. The highest conversion efficiency 98.5%;

❖ Flexible application

Compatible with three-phase three-wire/four-wire system, customized communication bus can monitor all module data;

❖ Battery friendly

1. Different battery clusters can work completely independently, low battery parallel circulation, higher battery utilization and service life;
2. Support 20+ domestic mainstream BMS protocol;

❖ Comprehensive functions

1. Support pure grid-connected, pure off-grid, and off-grid operation;
2. Support high and low wear, island, black start;
3. Off-grid single-phase carrying capacity 100% (resistive load);
4. Support reactive power compensation, harmonic governance, three-phase unbalance compensation;

❖ Easy maintenance

1. The fault branch does not affect the operation of other branches;
2. Support module hot swap, quick maintenance;

❖ Safe and stable

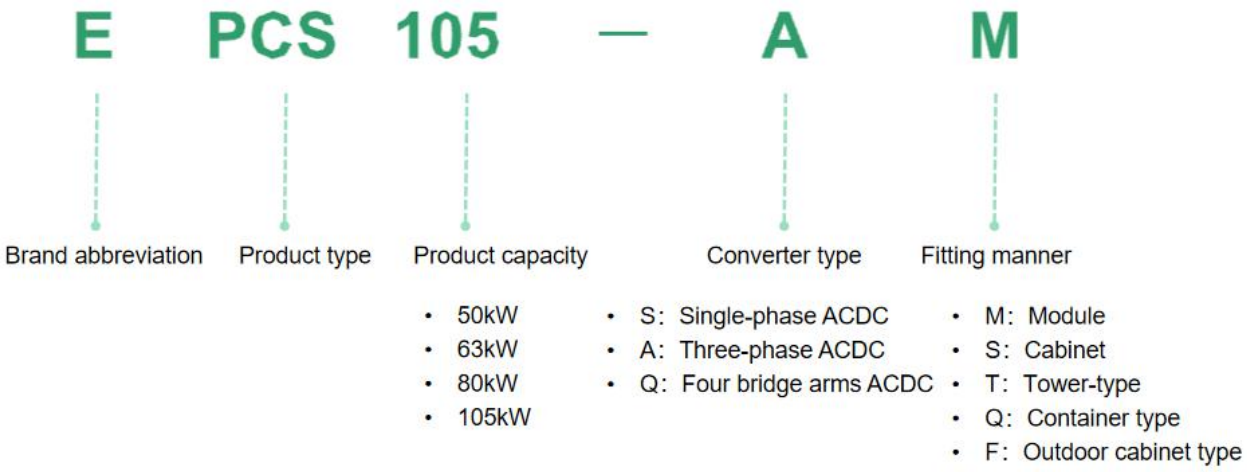
1. Perfect fault protection function;
2. Low battery circulation, multi-parallel automatic current sharing;
3. Support stable operation under THDu-20% power grid environment;

❖ Complete certification

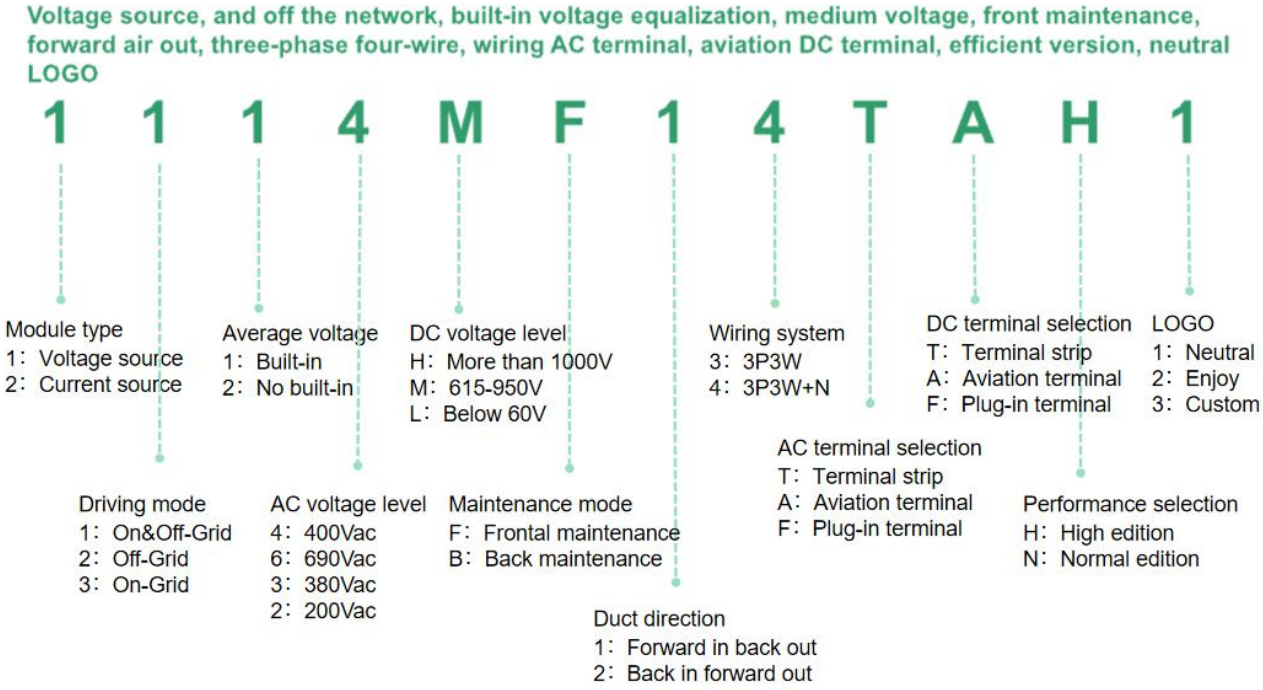
With CQC/CE/TUV certification, can meet the domestic and overseas mainstream market demand.

3. Product naming rules

3.1. Naming Rules



3.2. Product Configuration coding



4. Module schematic

4.1. Rear maintenance terminal (wind direction: forward backward out)

4.1.1. Heat dissipation diagram

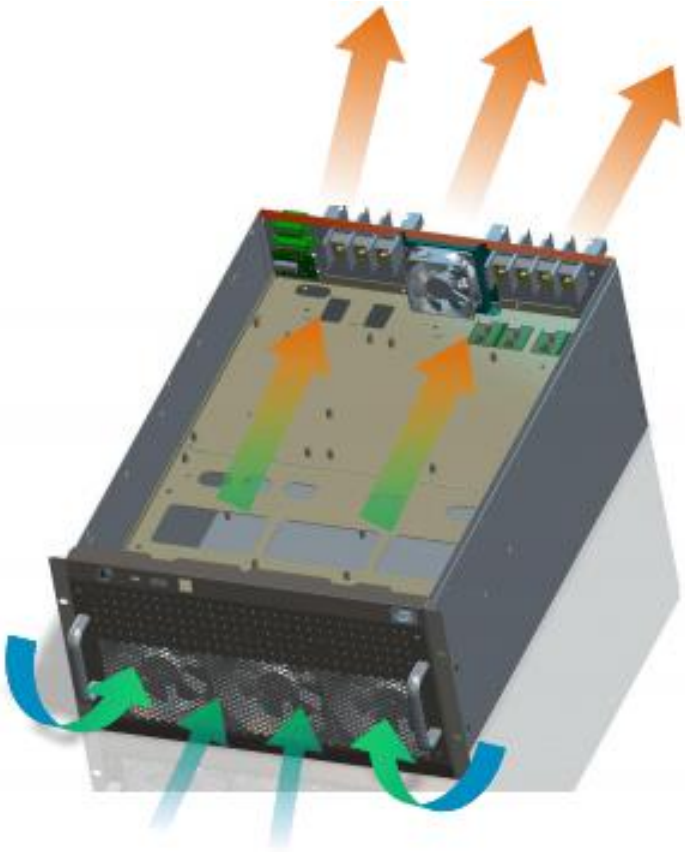


Figure 4-1 Heat dissipation of the rear terminal

4.1.2. Dimensional diagram

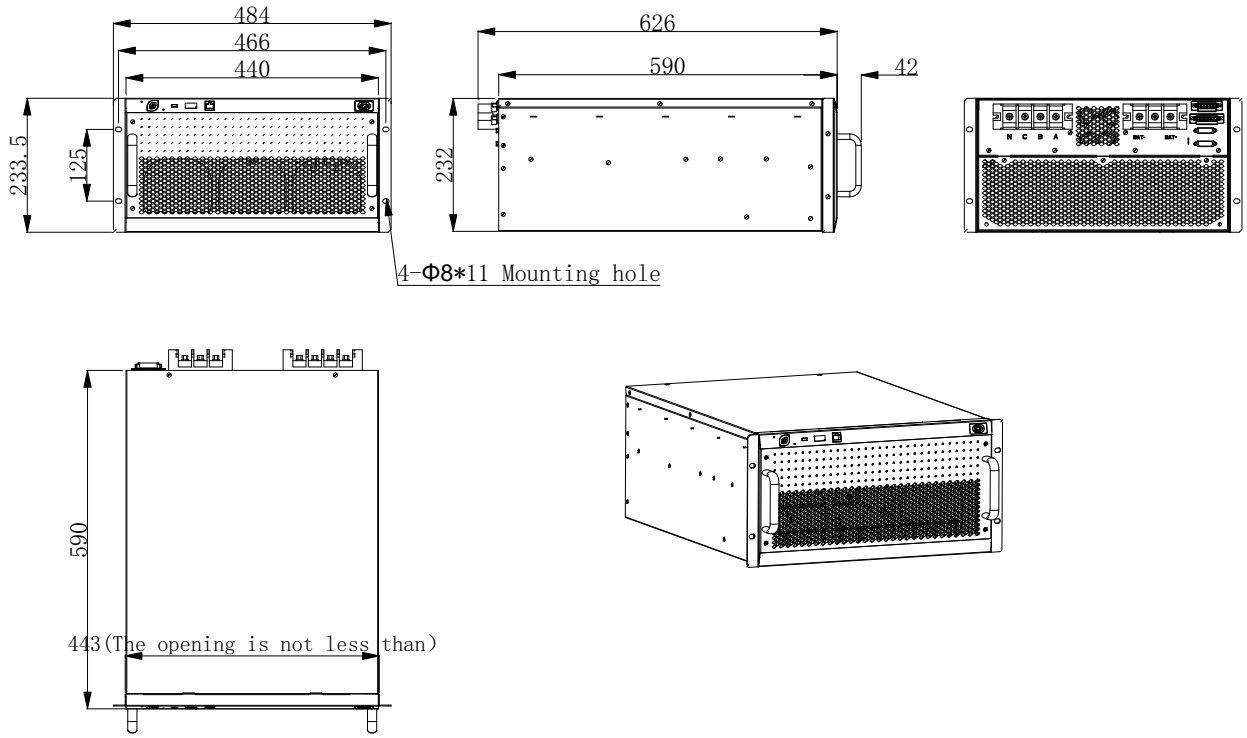


Figure 4-2 Size diagram of 50kW/62.5kW/80kW-PCS (after maintenance)

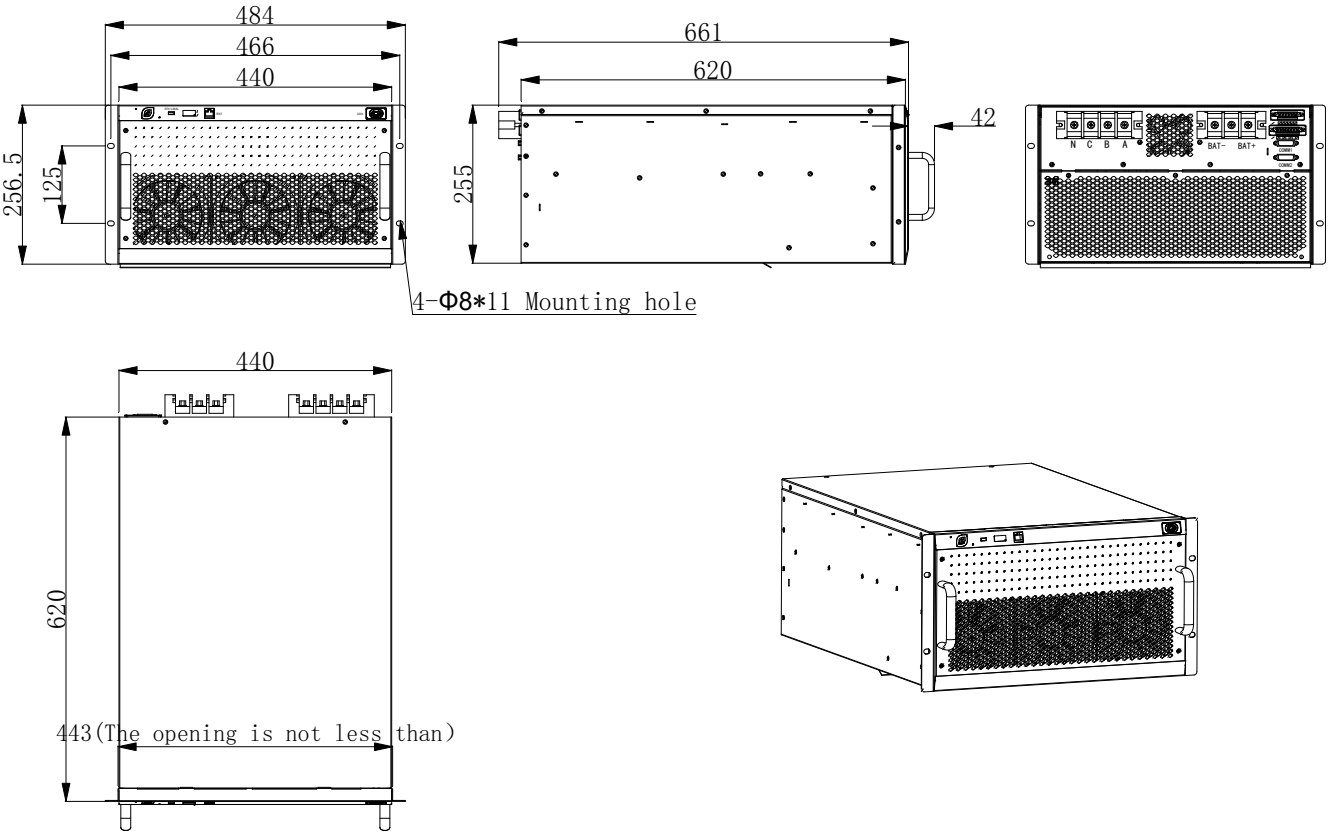


Figure 4-3 Dimensions of 105 KW-PCS (after maintenance)

4.2. Front maintenance terminal (Wind direction: rear in front out)

4.2.1. Heat dissipation diagram

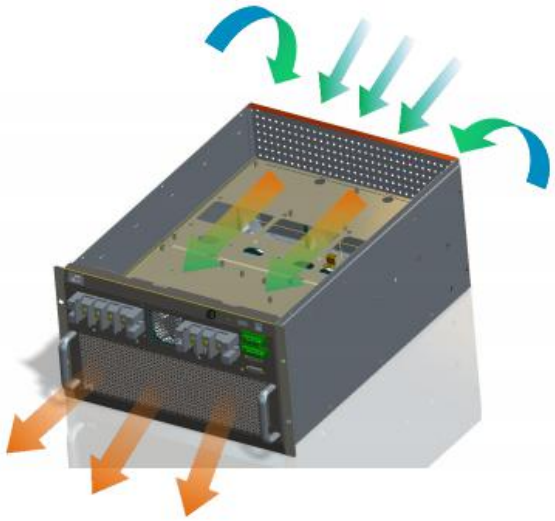


Figure 4-4 Heat dissipation of front terminals

4.2.2. Dimensions diagram

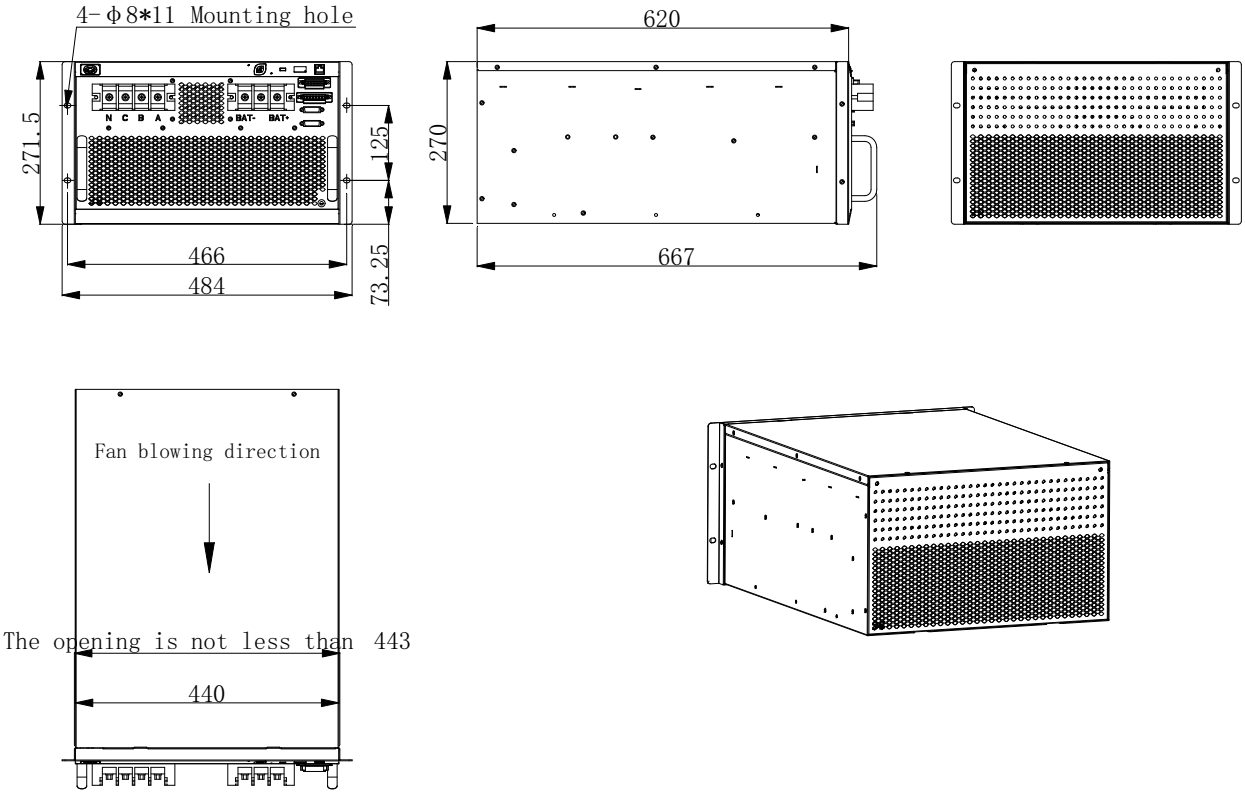


Figure 4-5 Size diagram of 105kW-PCS (front maintenance - terminal)

4.3. Front maintenance DC aviation terminal (Wind direction: Forward and out)

4.3.1. Heat dissipation diagram

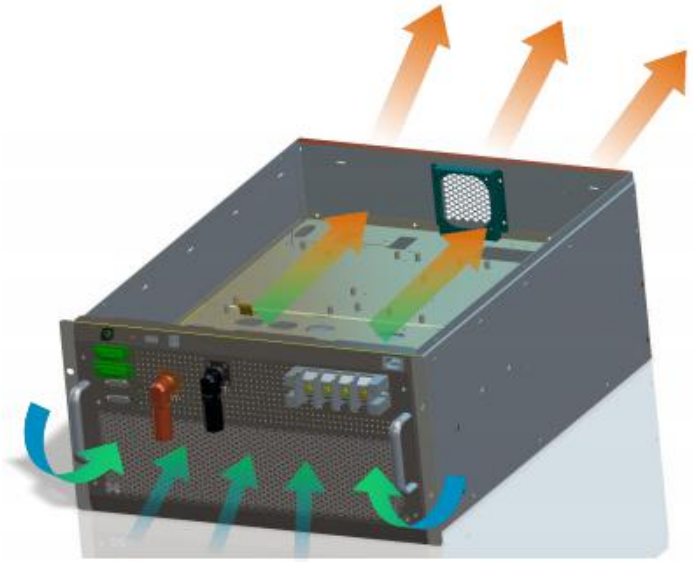


Figure 4-6 Heat dissipation of the front aviation terminal

4.3.2. Dimensions diagram

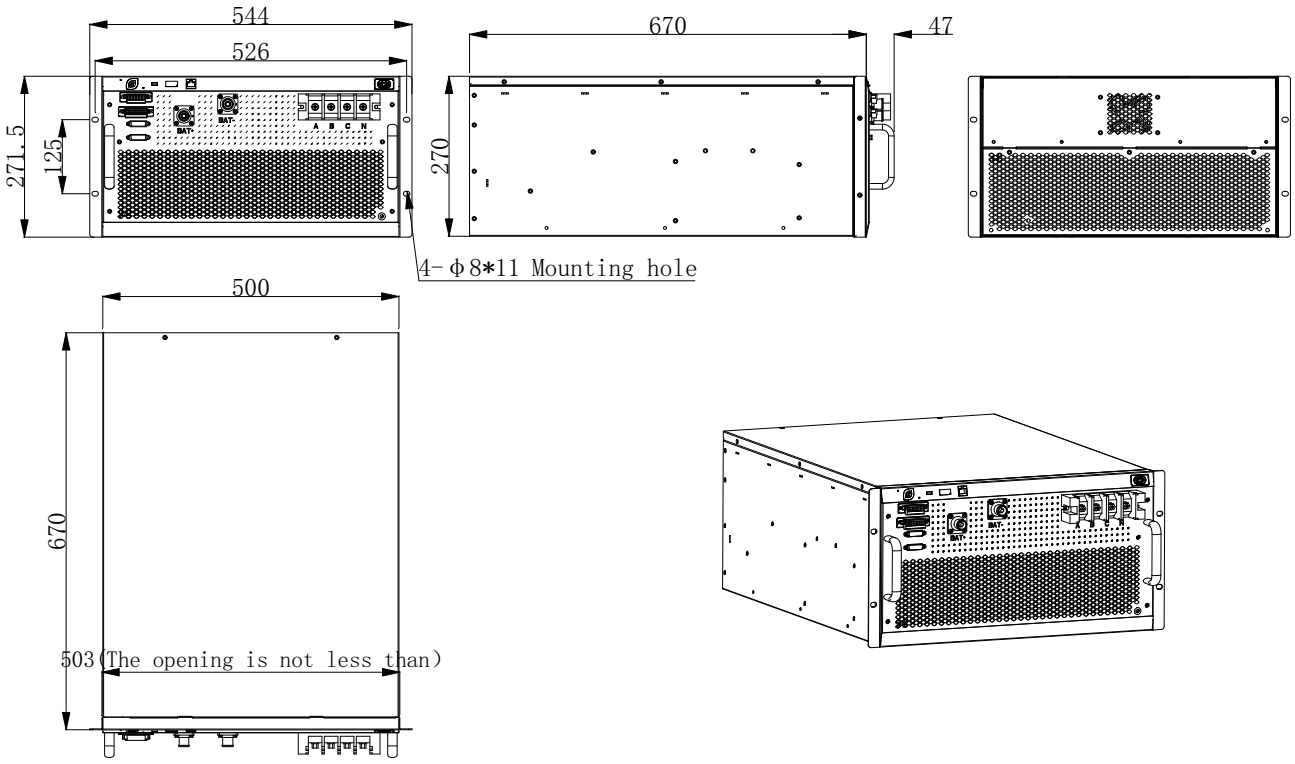


Figure 4-7 Dimensions of 105kW-PCS (front maintenance - DC side aviation terminal)

5. Electrical Specifications

5.1. Parameter sheet (with protection features)

Specifications	50kW	63kW	80kW	105kW
DC side				
Full load voltage range (V)	615 to 950 (3W+PE) /680 to 950 (3W+N+PE)			
Number of input routes	1			
Maximum current (A)	90	112	130	170
AC side (On-grid)				
Rated voltage (V)	230/400			
Voltage deviation	- 10% ~ + 15%			
AC output types	(3W+PE) three-phase three-wire/(3W+N+PE) three-phase four-wire			

Rated output power (kW)	50	63	80	105
Maximum power output (kW)	55	69	88	116
Maximum current (A)	80	100	130	167
Rated grid frequency (Hz)	50/60			
Power factor	0.99			
Power factor range	1(lead) ~1(lag)			
Current distortion rate	< 3% (rated power)			
Dc component	0.5%			
Overload capacity	110% long term			
Maximum discharge efficiency	98.5%			
AC side (Off-grid)				
Rated output voltage	230/400			
Ac voltage harmonics	< 3% (linear load)			
Rated frequency (Hz)	50/60			
Rated output power (kW)	50	63	80	105
Maximum apparent power (kVA)	55	69.3	88	116
Maximum output current (A)	80	101	128	167
Protective Features				
Features	Ac overcurrent protection, AC overvoltage protection, AC surge protection, AC short circuit protection, anti-island protection, DC reverse connection protection, straight surge protection			
System Parameters				
Dimensions (mm) Rear wiring	484 * 667 * 233.5			484*703*256.5
Dimensions (mm) Front wiring	/			484*667*271.5
Dimensions (mm) front wiring - DC aviation terminal	/			544*717*271.5
Weight (kg)	38			48
Altitude (m)	4000 (used for derating above 2000)			

Operating temperature	-30℃ ~ 55℃ (derated use above 45℃)
Storage temperature	-45℃ to 70℃
Humidity	0%RH to 95% RH, non-condensing
Cooling method	Intelligent forced air cooling
Level of protection	IP20
Communication interface	CAN/RS485
Compliant with standards	GB/T 34120-2017 , GB/T 34133-2017 , EN 62477 , EN IEC 61000
Grid support	L/HVRT, active and reactive power control
Certified	CE\CQC

5.2. Power curve

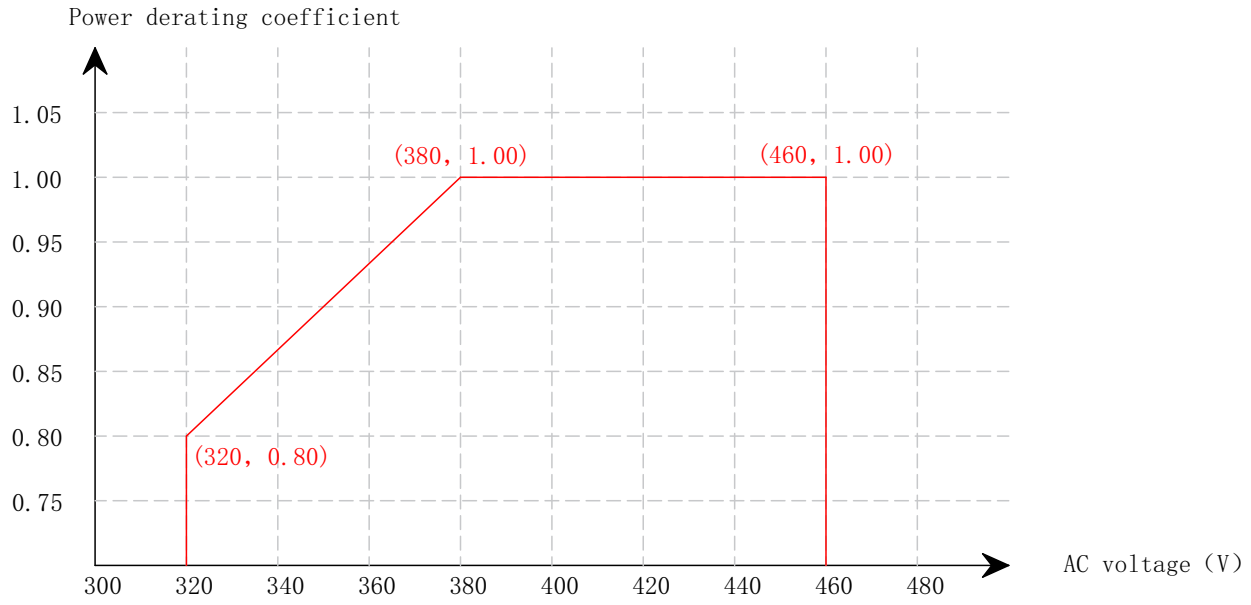


Figure 5-1 AC voltage-derating curve

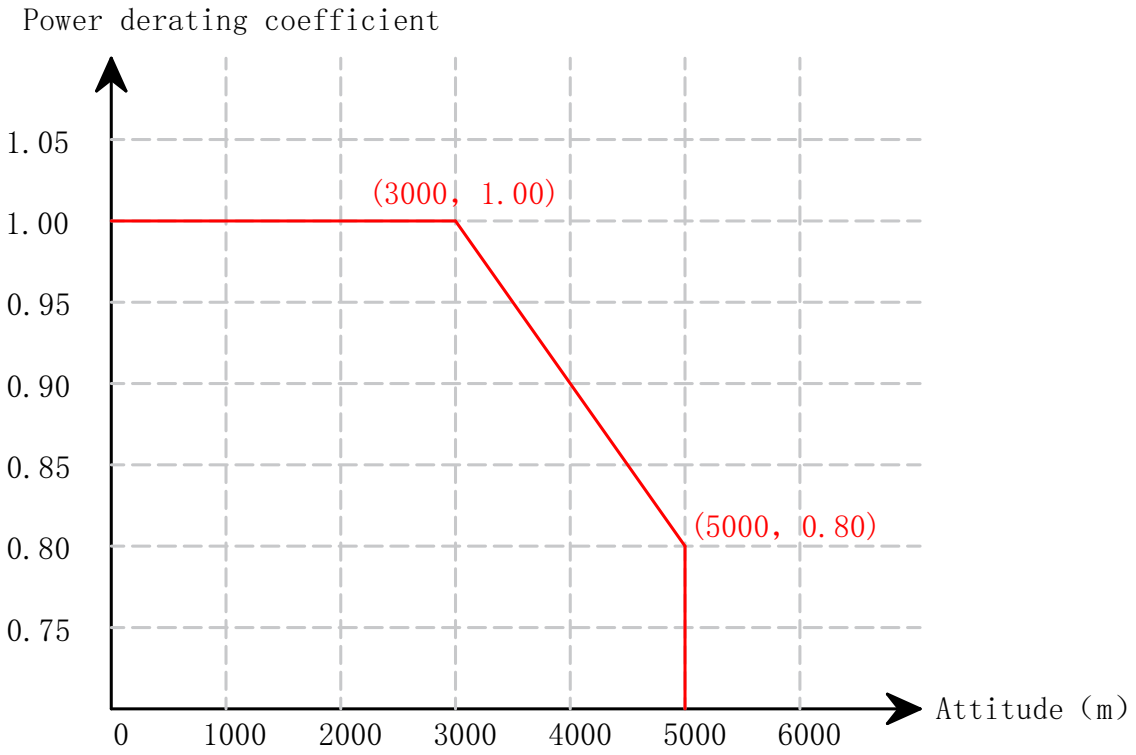


Figure 5-2 altitude-derating curve

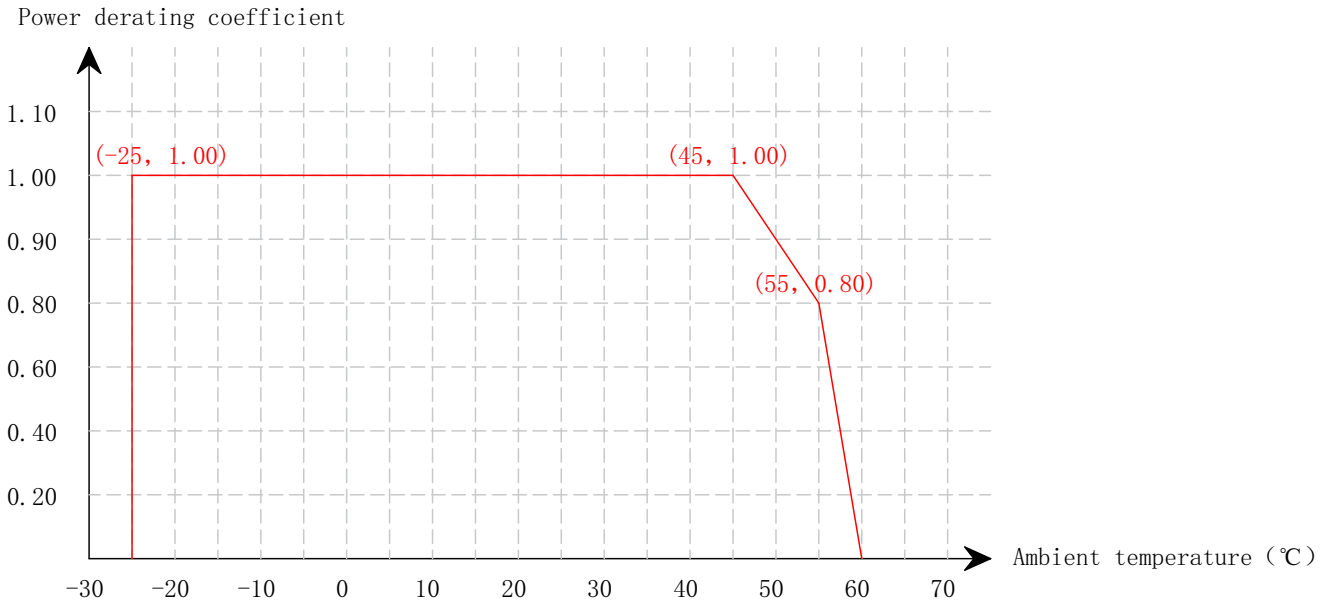


Figure 5-3 Temperature derating curve

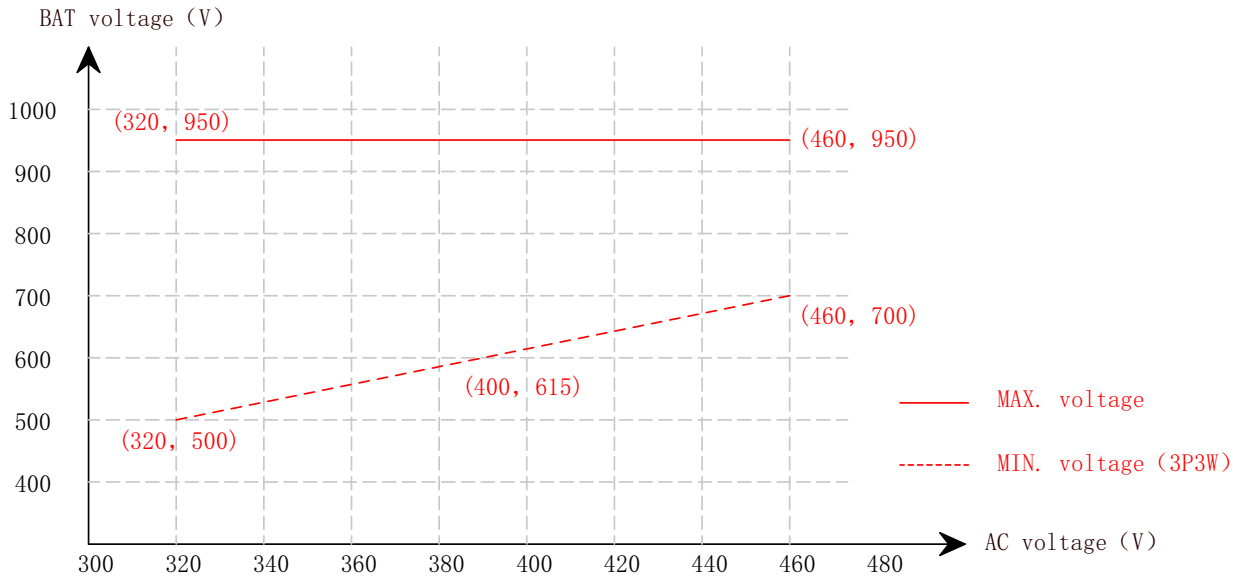


Figure 5-4 Three-phase three-wire battery voltage-AC voltage curve

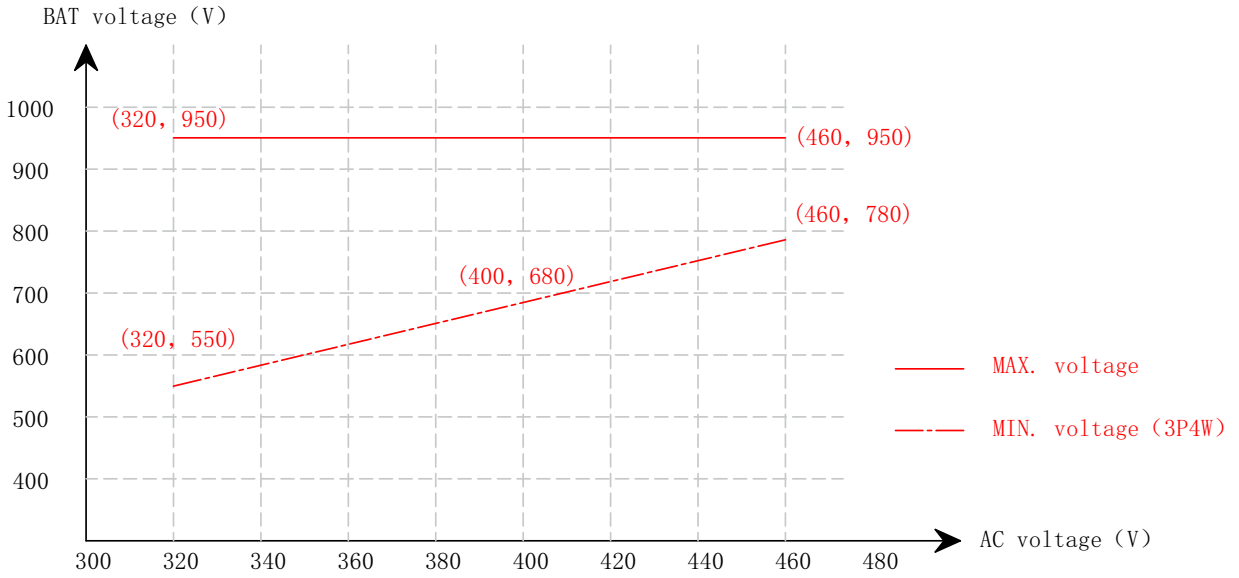
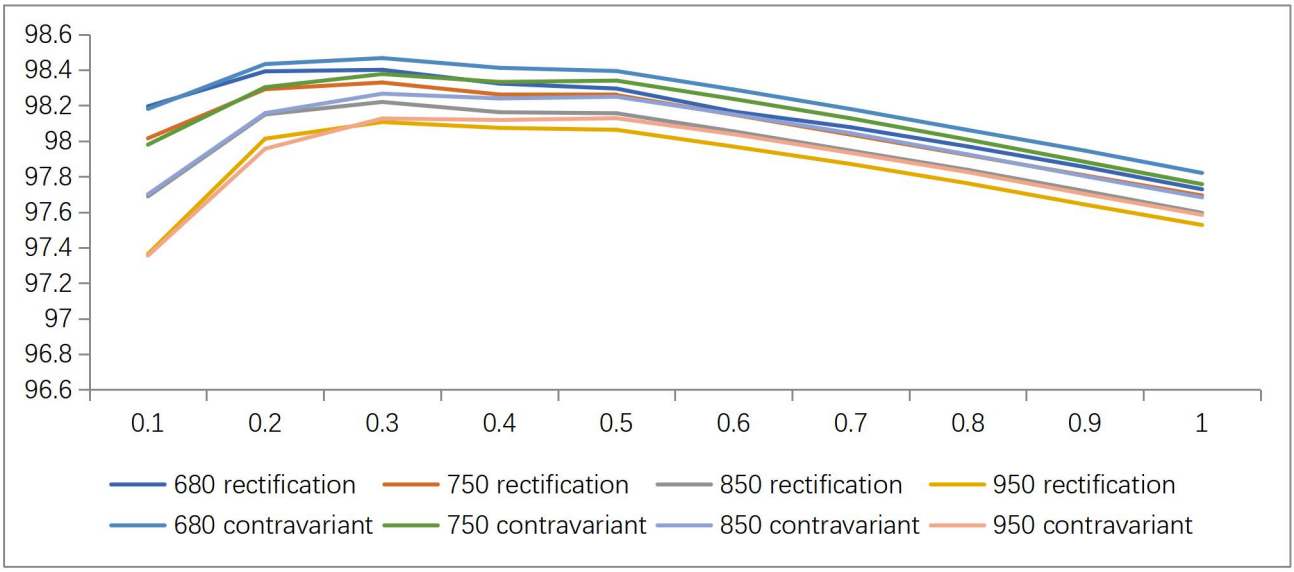


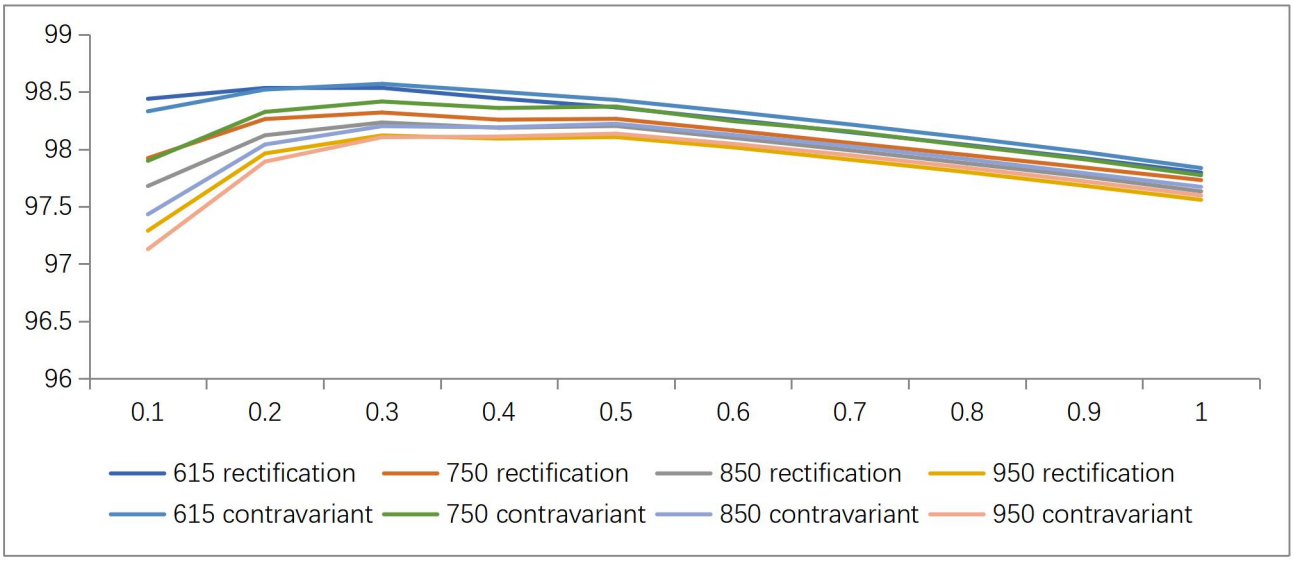
Figure 5-5 voltage-AC voltage curve of a three-phase four-wire battery

5.3. Efficiency curve

5.3.1. Current source (3P4W)



5.3.2. Current source (3P3W)



Note: The above data are laboratory test results and are for reference only.

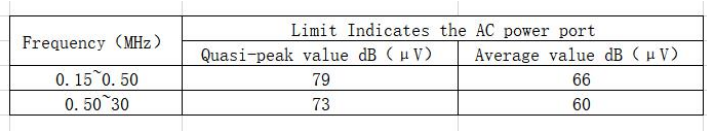
5.4. Safety Requirements

Serial number	Items		Standards	Remarks
1	Withstand pressure	Power loop - Earth	2120Vdc/1min	Refer to IEC 62477-1 standard for 2120Vdc; The actual withstand voltage test is 2820Vdc.
2	Insulation resistance	Input - Earth Output - Earth	1000Vdc, >10MΩ	
3	Contact current	Input - Earth	/	System pastes large leakage current warning label
4	Ground resistance		< 0.1 Ω	
5	Safety certification standards		IEC62477-1	
6	Certification requirements		CE/CQC	

5.5. Requirements for lightning protection

Items	Indicator requirements	Requirements
Ac side	Line line 1kV, line ground 2kV	8/20us
Note: PCS adds a corresponding level of surge arrester to the distribution section of the front end of the application.		

5.6. EMC Requirements

Items	Index requirement	Remarks
Conducted Interference (CE)		

Frequency (MHz)	Limit Indicates the AC power port	
	Quasi-peak value dB (μV)	Average value dB (μV)
0.15~0.50	79	66
0.50~30	73	60

Radiation interference (RE)	<table><tr><td>Frequency (MHz)</td><td>Quasi-peak value dB (μV/m) Measuring distance 10m</td></tr><tr><td>30~230</td><td>40</td></tr><tr><td>230~1000</td><td>47</td></tr></table>	
Radiation immunity	10V/m	Criterion A
Conducted immunity	10V	Criterion A
Fast Transient Pulse Group (EFT)	±2kV	Criterion A
A) SURGE	Difference mode: ±1kV Common mode: ±2kV	Criterion B
Static electricity (ESD)	±6kV CD ±8kV AD	Criterion B

6. Reliability environmental requirements

Serial number	Items	Parameters	Units	Environmental conditions for use	Transport environmental conditions	Storage environmental conditions	Remarks
1	Temperature	hypothermy	℃	- 30	- 40	- 40	Use derated above 45 ° C
		High temperature	℃	+ 55	+ 70	+ 70	
2	Humidity	Low relative humidity	%	5	/	5	/
		High relative humidity	%	95	/	95	
		Gel	With/ without	There is no	/	There is no	

3	Altitude Height	Low altitude	m	0	/	0	Drop capacity above 2000 meters above sea level
		High altitude	m	4000	/	4000	

7. Packaging shipping test requirements

Serial number	Trial items	Test conditions/parameters	Adoption of standards
1	Shipping requirements	2M1	GB/T4798.2

8. Schematic diagram

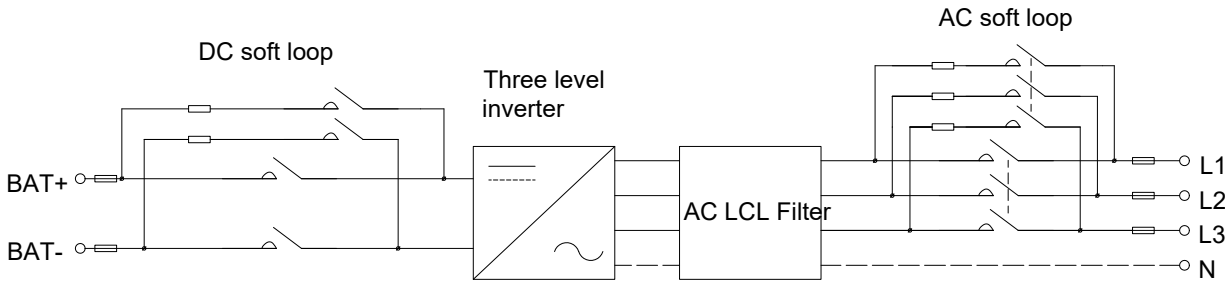
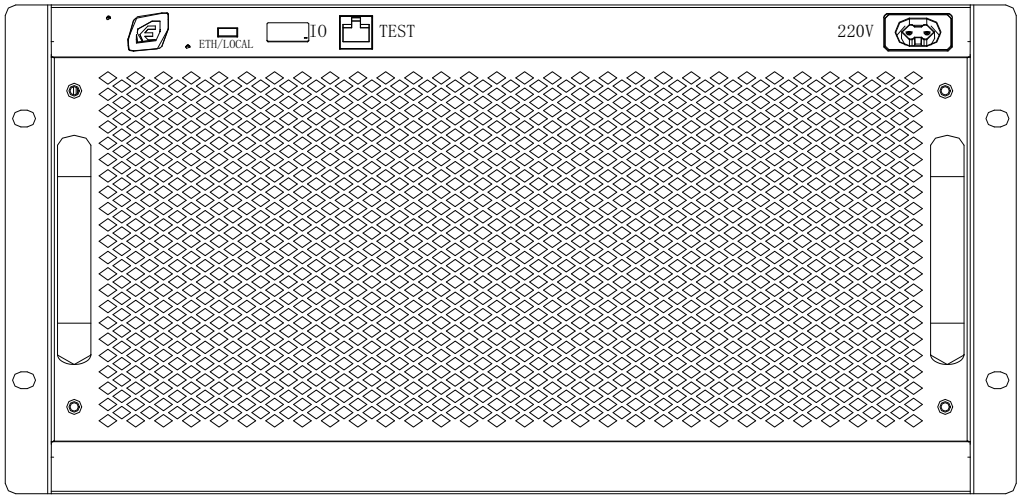


Figure 8-1 Schematic of PCS

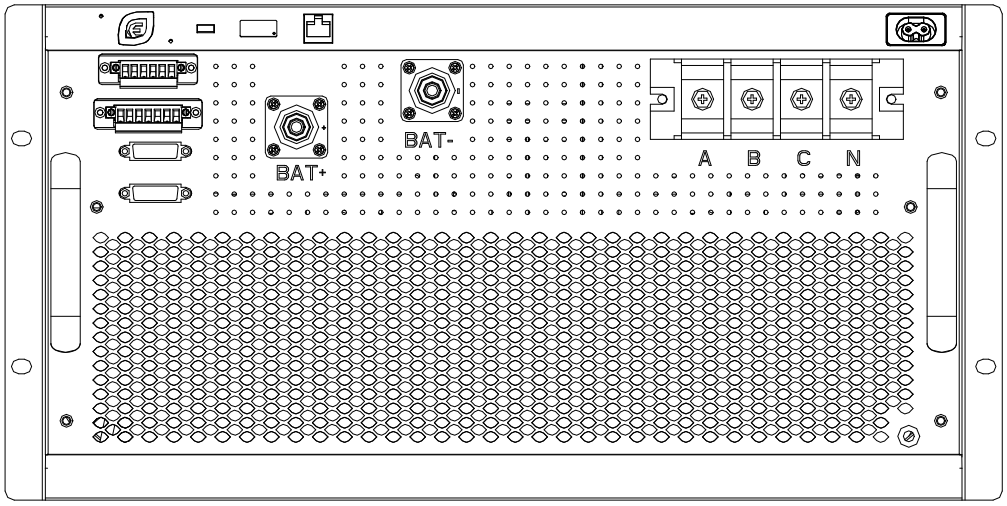
9. Module port type and connection definition

9.1. Signal port

The front signal port of PCS module is shown as follows:



Front view of PCS- Rear wiring - terminal scheme



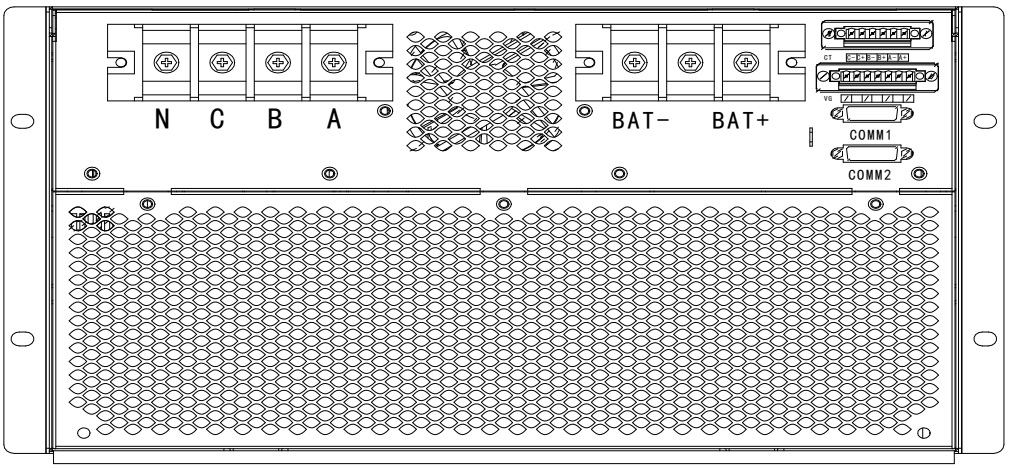
PCS- Front wiring - DC side aviation terminal scheme front view

See the following table for the signal description of each port

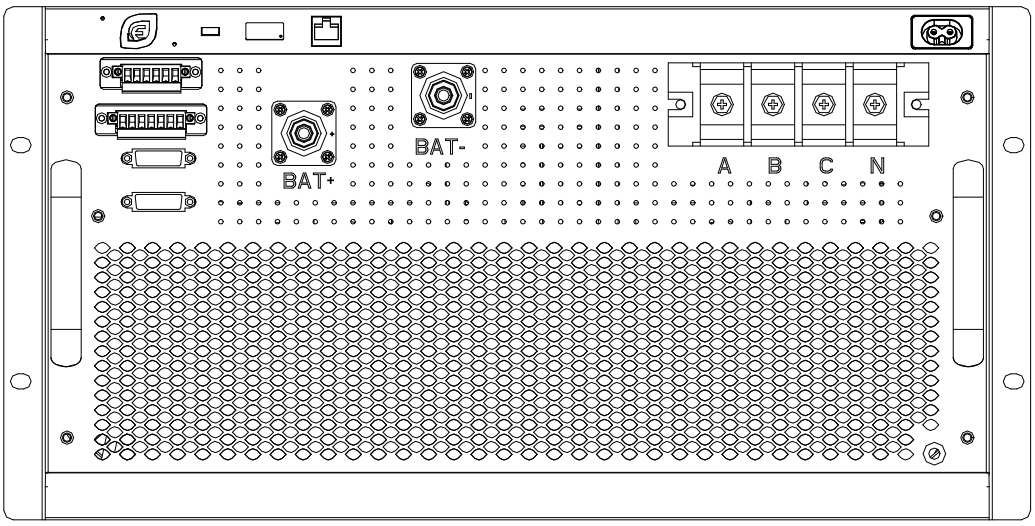
Serial Number	Symbols	Function description
1	ETH/LOCAL	Remote/local switch, right dial for background debugging (right dial by default)
2	(IO) 6-bit dip switch	1-2 bits match resistance access for CAN communication; 3-6 for module address Settings (binary)
3	TEST	Factory debugging communication port (for internal use)
4	220V	220V AC input (internal only)

9.2. Power port

PCS module power distribution ports are divided into power ports and control ports:



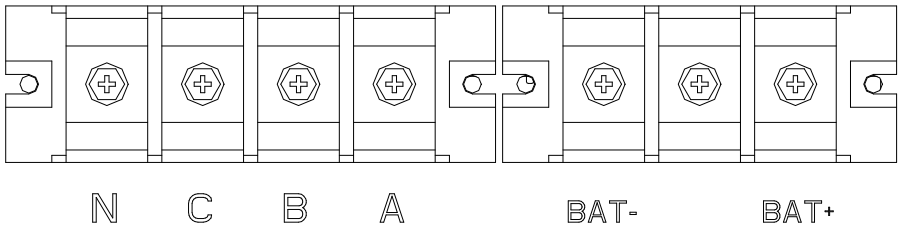
PCS- Rear wiring - Rear view of the terminal scheme



PCS- Front wiring - DC side aviation terminal scheme front view

PCS port diagram (Aviation terminal)

PCS port diagram (conventional terminals)

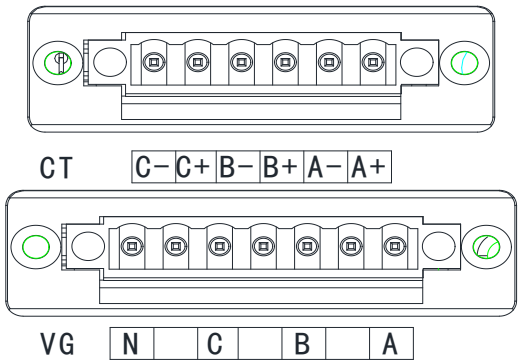


PCS Power port Diagram & Instruction sheet

Terminal Symbols	Terminal function Description
BAT +	Dc positive end
The BAT −	Dc negative end
A	A phase input end
B	B phase input end
C	C phase input end
N	Three-phase four-wire system center line input

9.3. Communication port

9.3.1. Voltage and current port schematic and definition (reserved)



Name	Terminal symbol	Terminal function Description
Grid Current Sampling Interface (CT)	A +	Connect the S1 end of the A-phase CT
	A −	Connect the S2 end of phase A CT
	B +	Connect to S1 end of B-phase CT
	B −	Connect to the S2 end of B-phase CT
	C +	Connected to S1 end of C-phase CT
	C −	Connect the S2 end of C-phase CT
Grid Voltage Sampling Interface (VG)	A	Phase A grid voltage sampling input
	NC	No access required
	B	Phase B grid voltage sampling input
	NC	No access required
	C	Phase C grid voltage sampling input
	NC	No access required
	N	N-phase grid voltage sampling input

Note: This terminal is a reserved interface and does not need to be connected.

9.3.2. COM communication port indicates

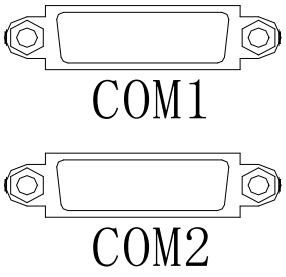
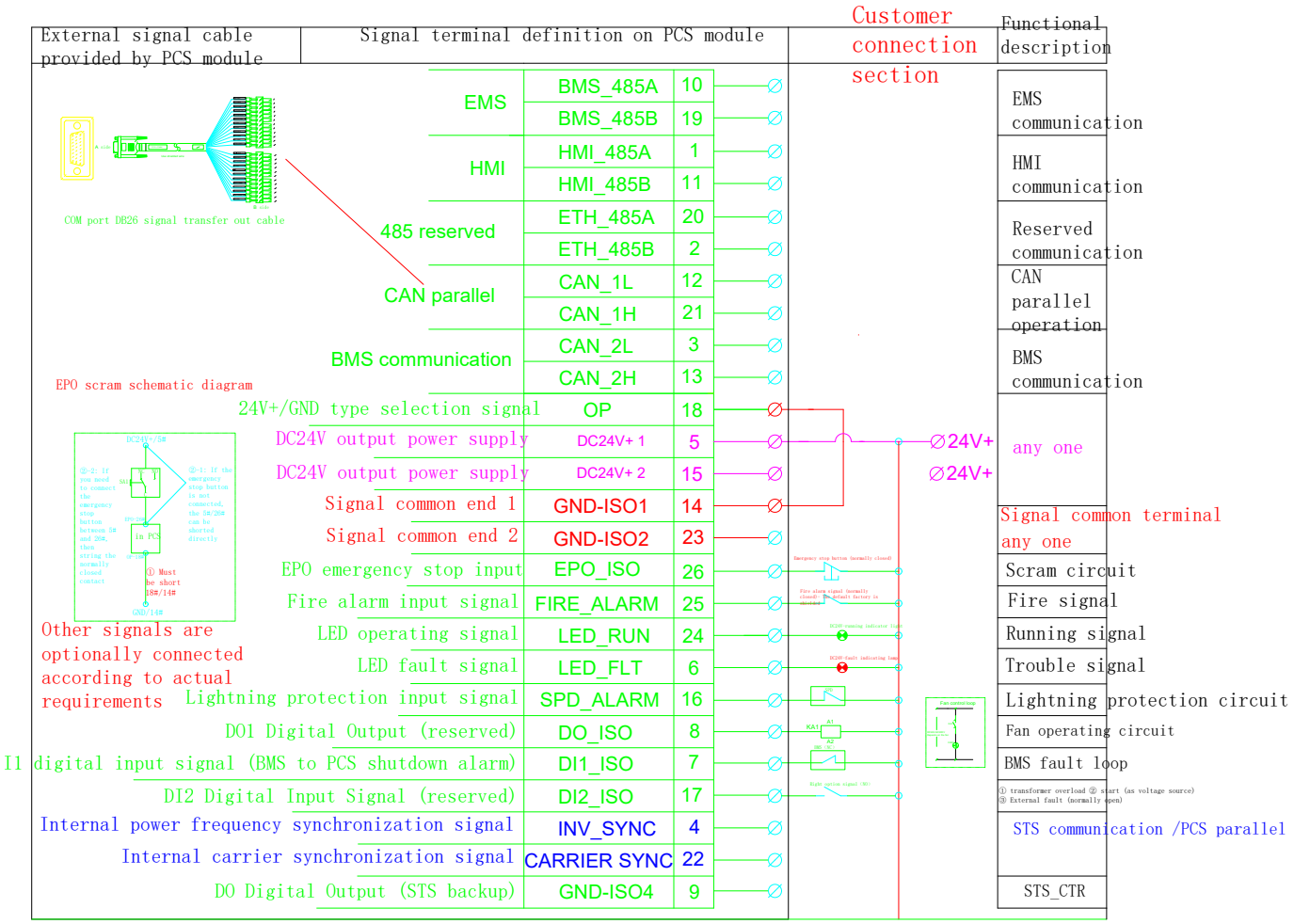


Figure 9-1 COM port

9.3.3. COM (26-PIN signal terminal) Signal port definition

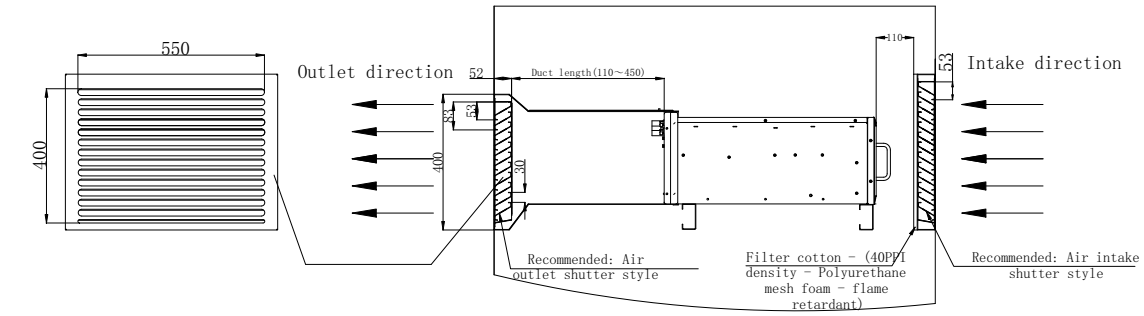


Note 1: The DB26 cable comes with the shipment and has a default length of 1.5m.

Note 2: DB26 cable can be customized according to customer requirements.

Figure 9-2 COM (26-pin signal terminal) signal port definition and cable connection

10.Air duct heat dissipation reference



Schematic diagram of shutter size for inlet and outlet air door panels

The profile of PCS module in the cabinet

Figure 10-1 Heat dissipation of a 105 KW-PCS air duct