



AC side



DC side



Features

- Combining AC \rightarrow DC and DC \rightarrow AC bidirection power, **5KW full-power** operation in both directions
- Ultra-fast bidirectional time of **1ms**(AC \rightleftharpoons DC)
- Global certificates in multi-fields**
(ITE 62368-1, Energy converter 62477-1, AC Grid system 50549-1)
- 180~305VAC(277VAC available)**
- High efficiency up to 93%
- THD <3% in both conversion mode
- Parallel** operation up to **30KW(5+1 unit)**
- Support CANBus or MODBus-RTU(RS-485) protocol communication
- Complete protections: Anti-islanding protection, AC fail protection, DC OVP, OLP, OCP, OTP
- 30°C~+70°C wide operating temperature
- FAN noise < **db**
- Support 3Ø with multiple units configuration
- Conformal coating
- 5 years warranty

Applications

- Battery cell formation & grading
- V2G (Vehicle-to-grid) system
- Marine battery charger module
- Electric scooter or vehicle charger station
- Kinetic energy recovery system
- Electrolysis system
- Wastewater treatment system

Description

The BIC-5K series is a 5KW bidirectional power supply featuring AC-DC \rightleftharpoons DC-AC conversion with energy recovery functionality. This product adopts a fully digitalized design, characterized by high efficiency, intelligence, compact size, and comprehensive safety certifications. It is commonly used in applications such as battery factory grading/forming testing equipment, home energy storage systems, kinetic energy recovery systems, and distributed grids (V2G). The BIC-5K series is a high-reliability green energy power solution that supports energy saving and carbon reduction.

Model Encoding

BIC - 5K - 24

Communication protocol option

DC input voltage(24: 24Vdc, 48: 48Vdc, 96: 96Vdc, 380: 380Vdc)

Rated wattage

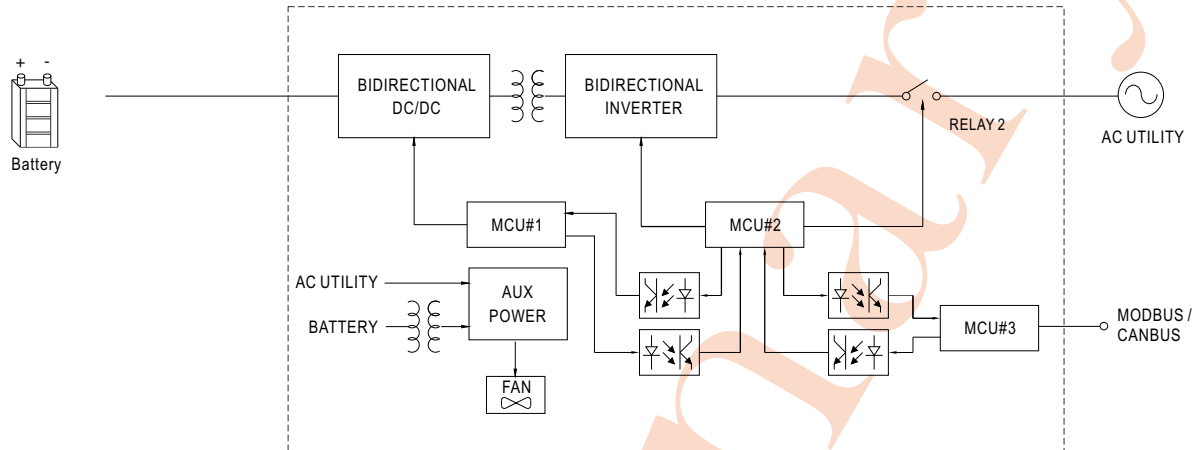
Series name

Type	Communication Protocol	Note
Blank	CANBus protocol	In Stock
MOD	MODBus protocol	In Stock

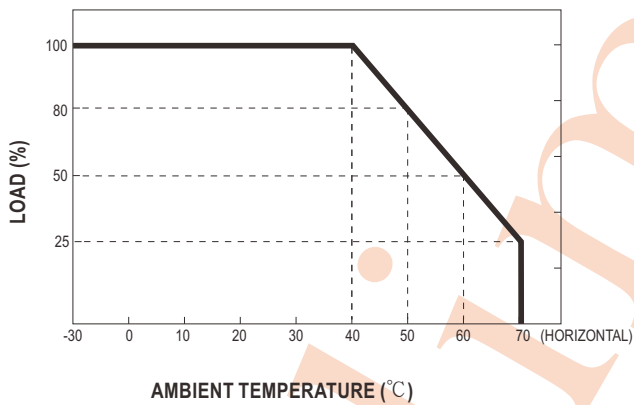
SPECIFICATION

MODEL			BIC-5K-24□	BIC-5K-48□	BIC-5K-96□	BIC-5K-380□
			□ =Blank, MOD			
AC to DC Direction	OUTPUT	DC VOLTAGE	24V	48V	96V	380V
		RATED CURRENT	208A	104A	52A	15A
		RATED POWER	4992W	4992W	4992W	5025W
		FULL POWER VOLTAGE RANGE	24 ~ 33V	48 ~ 66V	96 ~ 112V	335 ~ 430V
		VOLTAGE RANGE	19 ~ 33V	38 ~ 66V	76 ~ 112V	280 ~ 430V
		CURRENT RANGE	0 ~ 208A	0 ~ 104A	0 ~ 52A	0 ~ 15A
		LINE REGULATION	± 1.0%			
		LOAD REGULATION	± 1.0%			
		SETUP, RISE TIME	10000ms, 100ms/230VAC at full load			
	INPUT	AC VOLTAGE RANGE	180 ~ 305VAC			
		FREQUENCY RANGE	47 ~ 63Hz			
		POWER FACTOR (Typ.)	≥ 0.99/230VAC at full load			
		EFFICIENCY (Typ.) Note.2	90.5%	92.5%	92%	93%
		AC CURRENT (Typ.)	27A/230VAC			
		INRUSH CURRENT (Typ.)	120A/230VAC			
		LEAKAGE CURRENT (Peak)	7.07mA/305VAC			
		TOTAL HARMONIC DISTORTION	<3%(@load=100%/230VAC)			
DC to AC Direction	INPUT	RATED INPUT POWER	5500W			
		FULL POWER VOLTAGE RANGE	24 ~ 33V	48 ~ 66V	96 ~ 112V	335 ~ 430V
		DC VOLTAGE RANGE	19 ~ 33V	38 ~ 66V	76 ~ 112V	280 ~ 430V
		INPUT CURRENT	230A	115A	57.2A	16.4A
	OUTPUT	RATED OUTPUT POWER	5000W			
		VOLTAGE RANGE	180 ~ 305VAC determined by AC main (277VAC available)			
		FREQUENCY RANGE	47 ~ 63Hz determined by AC main			
		AC CURRENT (Typ.)	22.5A/230VAC			
		POWER FACTOR (Typ.)	0.99/230VAC at full load			
		EFFICIENCY (Typ.) Note.2	90.5%	93%	93%	93%
		TOTAL HARMONIC DISTORTION	<3%(@load=100%/230VAC)			
	PROTECTION	OVER LOAD	105 ~ 115% rated output power AC to DC Constant current limiting, shut down DC O/P voltage 5 sec. after DC O/P voltage is down low, re-power on to recover DC to AC Not accurate with constant power design			
		SHORT CIRCUIT	Shut down O/P current, re-power on to recover			
		OVER VOLTAGE	34 ~ 35V	68 ~ 70V	115 ~ 121V	435 ~ 450V
		OVER TEMPERATURE	Protection type : Shut down O/P voltage, re-power on to recover			
		ISLANDING PROTECTION	Shut down DC O/P voltage, re-power on to recover			
BIDIRECTION SWITCH TIME (Typ.)		1ms				
FUNCTION	PARALLEL	Up to 30KW(5+1) units, Please refer to the Function Manual				
	CANBUS or MODBUS	Communication provides function such as control, setting and monitoring				
	REMOTE ON-OFF CONTROL	By electrical signal or dry contact Short: Power ON Open: Power OFF Please refer to the Function Manual in following				
	FAN SPEED CONTROL (Typ.)	Note.4	Built-in intelligent fan speed control detect by PSU's internal temperature			
		10% load with Ta=25℃	58dB	43dB	43dB	
		50% load with Ta=25℃	58dB	43dB	43dB	
	75% load with Ta=25℃	58dB	47dB	49dB	49dB	
ENVIRONMENT	WORKING TEMP.	-30 ~ +70℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	± 0.03%/℃ (0 ~ 45℃)				
	VIBRATION	10 ~ 500Hz, 3G 10min./1cycle, 60min. each along X, Y, Z axes				
SAFETY & EMC (Note.5)	SAFETY STANDARDS		CB IEC62368-1/IEC62477-1, IEC50549-1, UL62368-1, CAN/CSA C22.2 No.62368-1,TUV BS EN/EN62368-1, BS EN/EN50549-1, EAC TP TC 004 approved			
	WITHSTAND VOLTAGE		I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:500VAC			
	ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH			
			BS EN/EN55032			
	EMC EMISSION	Parameter	Standard		Test Level / Note	
		Conducted	BS EN/EN55032 (CISPR32)		Class A	
		Radiated	BS EN/EN55032 (CISPR32)		Class A	
		Harmonic Current	BS EN/EN61000-3-12		Class A	
		Voltage Flicker	BS EN/EN61000-3-3		-----	
			BS EN/EN55035, BS EN/EN61000-6-2			
	EMC IMMUNITY	Parameter	Standard		Test Level / Note	
		ESD	BS EN/EN61000-4-2		Level 3, 8KV air ; Level 2, 4KV contact	
		Radiated	BS EN/EN61000-4-3		Level 3	
		EFT / Burst	BS EN/EN61000-4-4		Level 3	
		Surge	BS EN/EN61000-6-2		2KV/Line-Line 4KV/Line-Earth	
		Conducted	BS EN/EN61000-4-6		Level 3	
		Magnetic Field	BS EN/EN61000-4-8		Level 4	
		Voltage Dips and Interruptions	BS EN/EN61000-4-11		>95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods	
OTHERS	MTBF	462.9K hrs min. Telcordia SR-332 (Bellcore) ; 46K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	460*211*83.5mm (L*W*H)				
	PACKING	10Kg; 1pcs/ 10Kg/ 1.25CUFT				
NOTE		1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Efficiency is tested 75% load, linear load at 230Vac input voltage and 24V/48V/96V/380Vdc output voltage 3. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. 4. FAN noise test set up according to ISO-7779. ※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx				

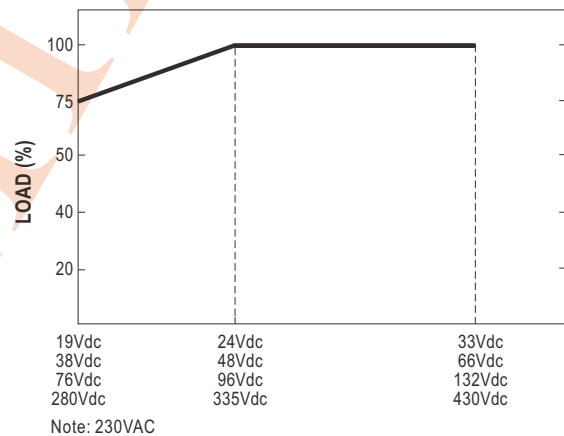
BLOCK DIAGRAM



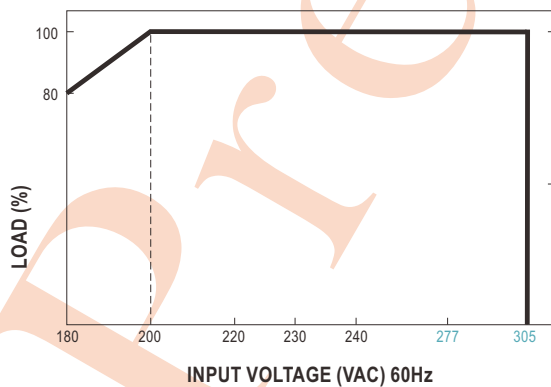
DERATING CURVE



STATIC CHARACTERISTICS



STATIC CHARACTERISTICS



1. Bidirection process

BIC-5K possesses AC to DC and DC to AC two way conversion functions. The conversion direction can be automatically detected and controlled by BIC-5K's internal firmware or manually switched by users according to different application requirements. Before entering detailed function explanation. Please refer to following definitions.

AC to DC (Energy absorbing and charging/ power supplying):

The BIC-5K converts AC energy from the grid into DC energy for the battery or the loads. The operation principle is the same as an ordinary power supply or a charger.



DC to AC (Energy recycling and discharging):

Opposite to the AC to DC conversion, the BIC-5K converts DC energy from the battery or loads into AC energy, then feeding back to the grid. AC output synchronization range is 180Vac~305Vac/47Hz~63Hz, the bidirectional power supply can work normally as long as the AC grid is within the range.



Bi-direction auto-detect mode:

This is default factory setting, BIC-5K operates as table below

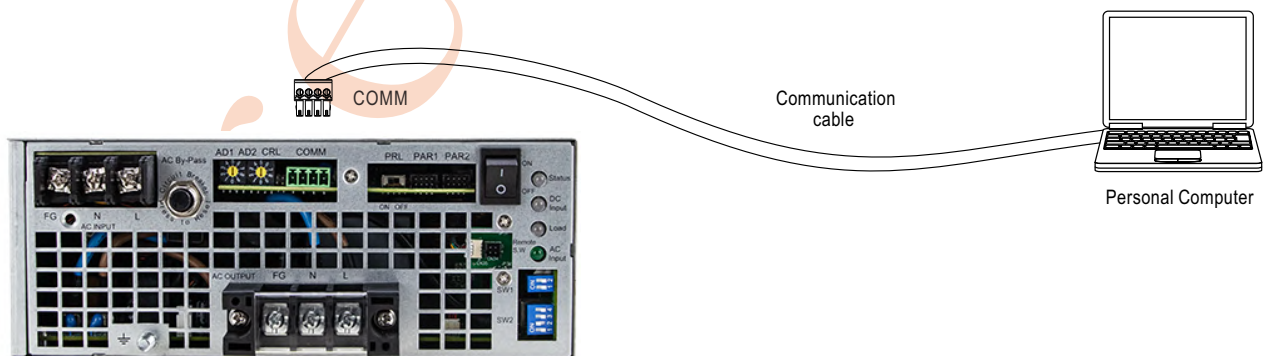
Condition	Mode
Set voltage > load voltage	AC to DC
Set voltage < load voltage	DC to AC

Bi-direction battery mode:

This mode only can be activated. Set the BIC-5K in AC to DC (charging) or DC to AC (discharging) conversion directly through command DIRECTION_CTRL below.

Command	Conversion
DIRECTION_CTRL = 00h	AC to DC (charging)
DIRECTION_CTRL = 01h	DC to AC (discharging)

2.Support CANBus / MODBus Communication



※ Please refer to the user manual for detailed instructions.

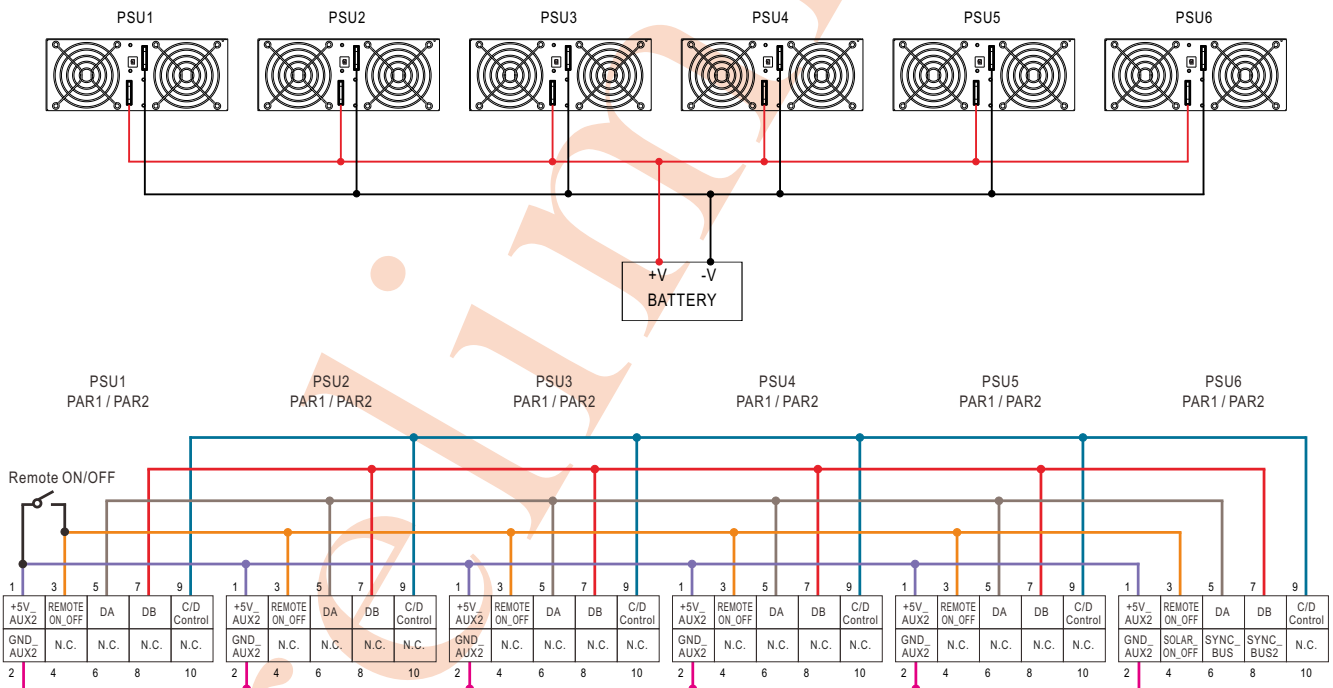
3.Parallel Function

BIC-5K has the built-in active current sharing function and can be connected in parallel, up to 6 units, to provide higher output power as exhibited below :

- ※ The power supplies should be paralleled using short and large diameter wiring and then connected to the load.
- ※ In parallel connection, power supply with the highest output Voltage will be the master unit and its Vout will be the DC bus voltage.
- ※ The total output current must not exceed the value determined by the following equation:
Maximum output current at parallel operation=(Rated current per unit) × (Number of unit) × 0.95
- ※ When the total output current is less than 5% of the total rated current, or say (5% of Rated current per unit) × (Number of unit) the current shared among units may not be balanced.
- ※ PAR1/PAR2, PRL Function pin connection

Parallel	PSU1		PSU2		PSU3		PSU4		PSU5		PSU6	
	PAR1	PRL	PAR1	PRL	PAR1	PRL	PAR1	PRL	PAR1	PRL	PAR1	PRL
1 unit	X	ON	—	—	—	—	—	—	—	—	—	—
2 unit	V	ON	V	ON	—	—	—	—	—	—	—	—
3 unit	V	ON	V	OFF	V	ON	—	—	—	—	—	—
4 unit	V	ON	V	OFF	V	OFF	V	ON	—	—	—	—
5 unit	V	ON	V	OFF	V	OFF	V	OFF	V	ON	—	—
6 unit	V	ON	V	OFF	V	OFF	V	OFF	V	OFF	V	ON

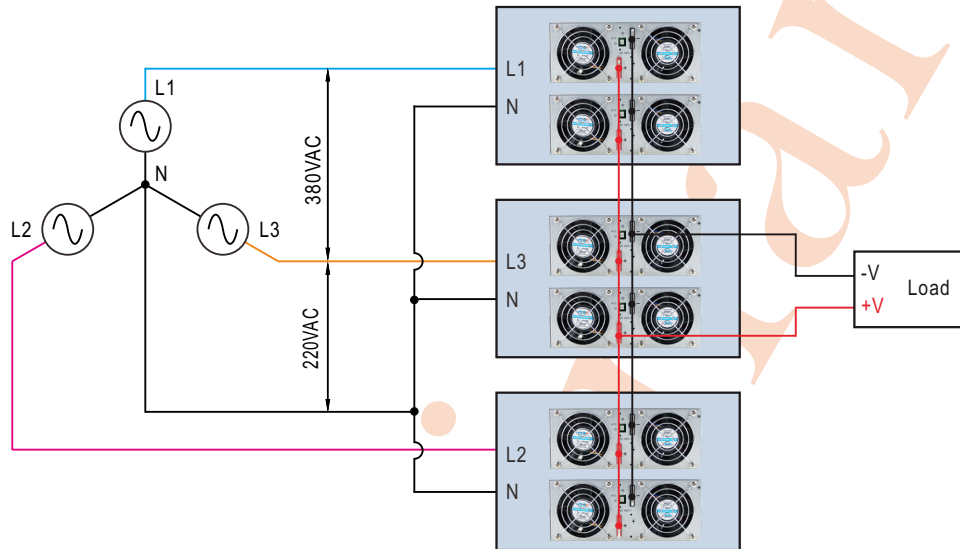
(V : PAR1 connected ; X : PAR1 not connected)



If the lines of PAR1 / PAR2 are too long, they should be twisted in pairs to avoid the noise.

4.3Ø 4W / Y

The BIC-5K can be installed in a 3-phase 4-wire AC power system. To ensure more balanced operation of multiple BIC-5K units within the system, it is recommended to evenly distribute the bidirectional power supplies across each phase. For example, if 6 units need to be installed, they should be split into 2 for each phase.

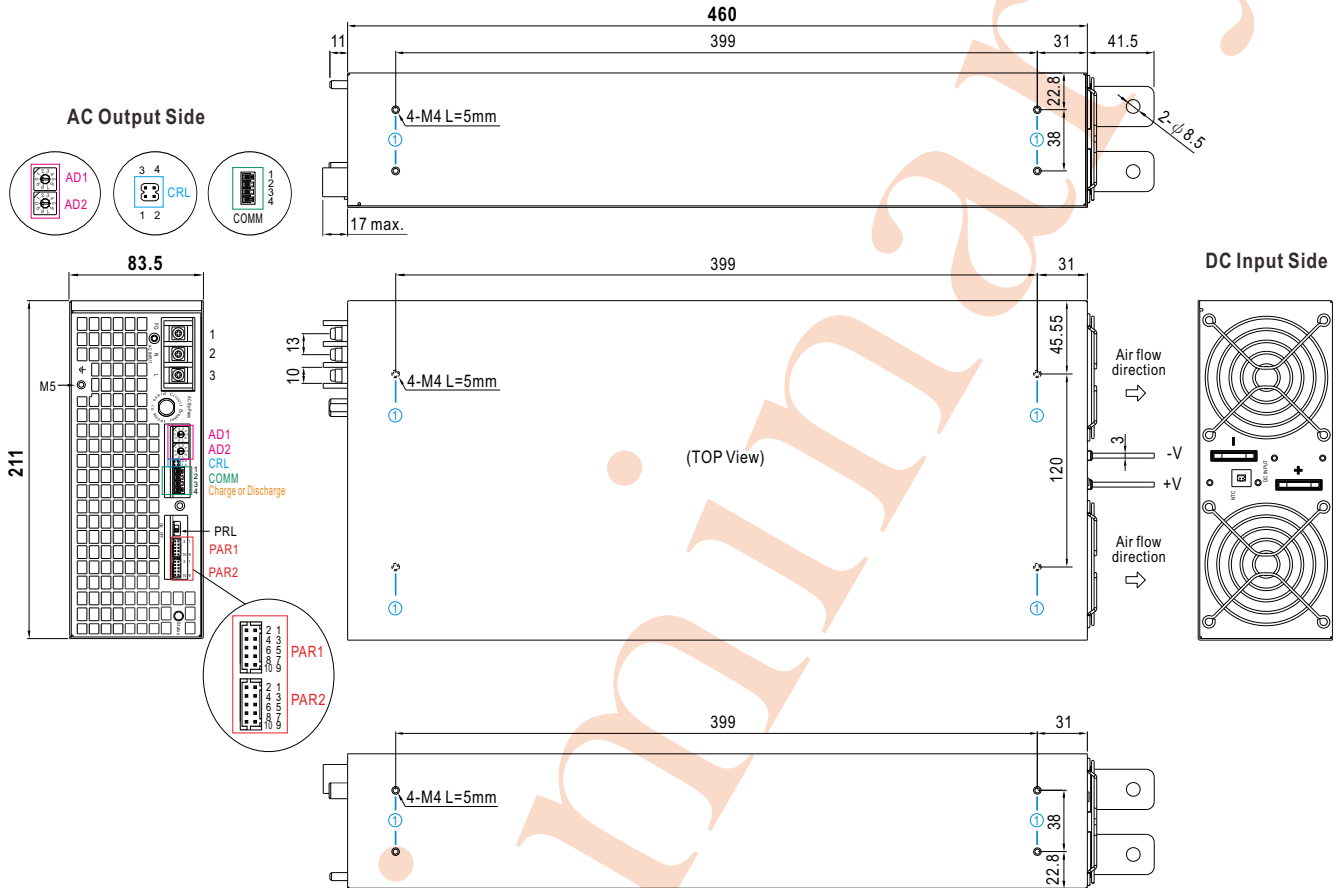


5.Remote ON-OFF Control

PAR1/PAR2	Remote ON-OFF	AC Output Status
Pin1:3	Short	Power inverter ON
Pin1:3	Open	Power inverter OFF

Case No.223

MECHANICAL SPECIFICATION

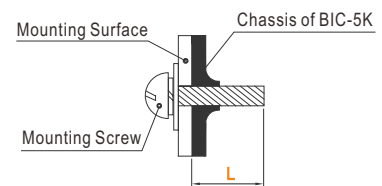
(Unit: mm , tolerance $\pm 0.5\text{mm}$)


※ Mounting Instruction

Hole No.	Recommended Screw Size	MAX. Penetration Depth L	Recommended mounting torque
①	M4	5mm	7~10Kgf-cm

※ Terminal Pin No. Assignment

Pin No.	Assignment	Terminal	Maximum mounting torque
1	FG	1 2 3	18Kgf-cm
2	AC/N		
3	AC/L		



※ LED Status Indicators

LED	Description
Green	AC to DC Direction, functions as regular power supply.
Green	DC to AC Direction, functions as grid inverter.
Red	Abnormal status (Over temperature protection, Overload protection, Fan fail.)
Orange	Standby during startup

● Light
 Flash

※ AC IN Connector Pin No. Assignment (COMM):

Pin No.	Function	Description
1	GND-AUX	Auxiliary voltage output GND.
2	D+/CANH	For MODBus model: Data line used in MODBus interface.(Note) For CANBus model: Data line used in CANBus interface.(Note)
3	D-/CANL	For MODBus model: Data line used in MODBus interface.(Note) For CANBus model: Data line used in CANBus interface.(Note)
4	+5V_AUX	Auxiliary voltage output, 4.5~5.5V, referenced to GND-AUX (pin1)

Note: Isolated signal, referenced to GND_AUX2

※ Control Pin No. Assignment (CRL):

4 2



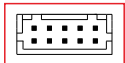
3 1

Pin No.	Function	Description
1,3	RL	Short: Termination resistors(120Ω) For MODBus/CANBus communication, please use Jumper (pin1,3)
2,4	NC	No need to communicate, please use Jumper (pin2,4)

※ AD1,AD2 switch for MODBus/CANBus interface address setting, please refer to the user manual for more details

※ Control Pin No. Assignment (PAR1,PAR2) : HRS DF11-10DP-2DS or equivalent

1 9



2 10

Mating Housing	HRS DF11-10DS or equivalent
Terminal	HRS DF11-10SC or equivalent

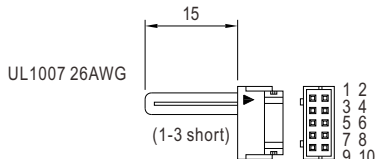
Pin No.	Function	Description
1	+5V_AUX2	Auxiliary voltage output, 4.5~5.5V, referenced to GND_AUX2 (pin2). (Only for REMOTE ON-OFF)
2	GND_AUX2	Auxiliary voltage output GND_AUX2 (pin2).
3	REMOTE ON_OFF	The unit can turn the output ON/OFF by dry contact between Remote ON/OFF and +5_AUX2.(Note 1) Short : Power ON ; Open : Power OFF
4	N.C.	-----
5	DA	Data line used for parallel control.
6	N.C.	-----
7	DB	Data line used for parallel control.
8	N.C.	-----
9	C/D Control	High (4.5 ~ 5.5V) : Battery Charging mode (Note 2) Low (0 ~ 0.5V) : Battery Discharging mode (Note 2)
10	N.C.	-----

Note 1: Isolated signal, referenced to GND_AUX2.

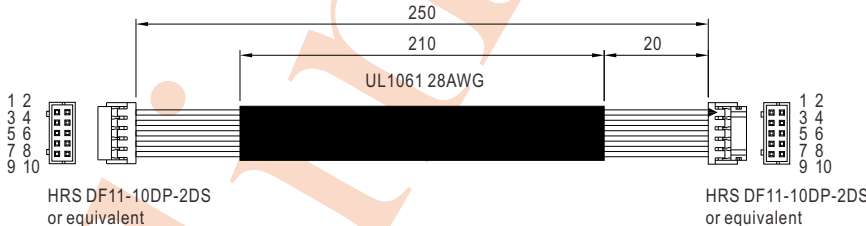
Note 2: Only for battery mode use.

■ Accessory List




※ Remote Control short wire for BIC-5K (Standard accessory)

Item										Quantity																			
①	Remote control short wire										1																		
																													
	HRS DF11-10DP-2DS or equivalent																												
	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Green</td><td>NC</td><td>Green</td><td>NC</td><td>NC</td><td>NC</td><td>NC</td><td>NC</td><td>NC</td><td>NC</td></tr></table>											1	2	3	4	5	6	7	8	9	10	Green	NC	Green	NC	NC	NC	NC	NC
1	2	3	4	5	6	7	8	9	10																				
Green	NC	Green	NC	NC	NC	NC	NC	NC	NC																				

※ Parallel function mating wire for BIC-5K (Standard accessory)

Item										Quantity																					
①	<p>Parallel wire</p>  <p>UL1061 28AWG</p> <p>HRS DF11-10DP-2DS or equivalent</p> <p>HRS DF11-10DP-2DS or equivalent</p> <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Red</td><td>Black</td><td>Green</td><td>NC</td><td>Blue</td><td>NC</td><td>Yellow</td><td>NC</td><td>Brown</td><td>NC</td></tr></table>										1	2	3	4	5	6	7	8	9	10	Red	Black	Green	NC	Blue	NC	Yellow	NC	Brown	NC	1
	1	2	3	4	5	6	7	8	9	10																					
	Red	Black	Green	NC	Blue	NC	Yellow	NC	Brown	NC																					

※ Terminal protector mating along with BIC-5K (Option)

Item		Quantity
①		1
②		
③		4

