



AC output side



DC input side



IEC62368-1 BS EN/EN62368-1 TPTC004 AS/NZS 62368.1



Features

- Combining AC utility, battery power source and solar charger to supply AC output
- AC utility charger up to 135A (Compatible to generator)
- UPS function (AC by-pass) without interruption, transfer time <10ms
- Can support external MPPT solar charger
- True sine wave output (THD<3%)
- High surge power up to 10KW
- Temperature controlled cooling fan
- Parallel synohronized operation up to 30KW (5+1 unit)
- AC output voltage and frequency selectable by DIP S.W
- Protections :
Input : Reverse polarity / DC low alarm / DC low shutdown / Over voltage
Output : Short circuit / Overload / Over temp.
- Battery over discharge protection (low voltage disconnect)
- -30°C~+70°C wide operating temperature
- Suitable for lead-acid or li-ion batteries
- Support MODBus-RTU(RS-485) communication
- Conformal coating
- 5 years warranty

Applications

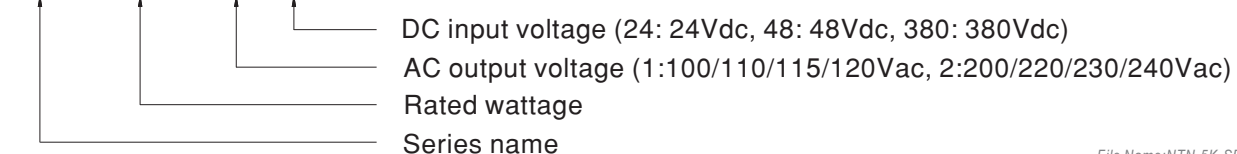
- Home and office appliance
- Power tools
- Portable equipment
- Vehicle
- Yacht
- Off-grid solar power system
- Wireless network
- Telecom or datacom system

Description

NTN-5K is a 5000W highly reliable off-grid true sine wave DC-AC power inverter with built-in AC charger and UPS function(AC by-pass). Its key features include: digital design with MCU control, streamlined control circuitry that quickly responds to environmental changes and improves reliability, high quality fan with low acoustic noise, 10KW peak power, adjustable AC output voltage and frequency, -30~+70°C wide operating temperature range, complete protection features, and etc. Combined with batteries, the NTN-5K is suitable for use in residential, commercial, marine, automobile, mine, construction site, and remote areas with no access to utility power, and the output can be used to power fans, TV, radio, phone charger, PC/laptop, lighting, induction stove, air conditioner, electromechanical tool, communication equipment, power distribution cabinet, outdoor camping equipment, marine AC power, factory equipment, and etc.

Model Encoding

NTN - 5K - 1 24



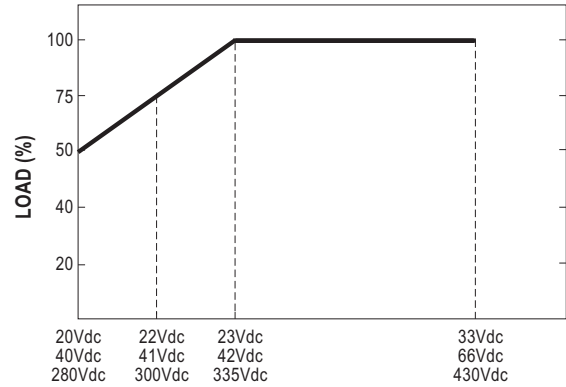
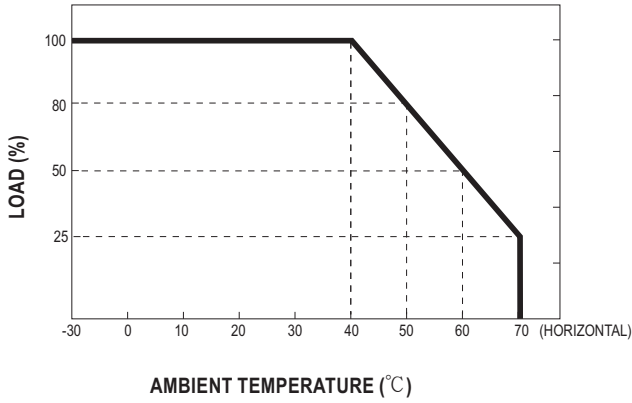
SPECIFICATION

MODEL NO.		NTN-5K-224	NTN-5K-248	NTN-5K-2380		
AC OUTPUT	RATED POWER	5000W				
	OVER RATED POWER	5750W (3 min.)				
	PEAK POWER	7000W (10 sec.)	7500W (10 sec.)			
	SURGE POWER	8000W (30 cycles)	10000W (30 cycles)			
	AC VOLTAGE	Default setting set at 230VAC 200 / 220 / 230 / 240Vac selectable by DIP S.W				
	FREQUENCY	Default setting set at 50±0.1Hz 50/60Hz selectable by DIP S.W				
	WAVEFORM	Note.1 True sine wave (THD<3%)				
AC REGULATION		±3.0% at rated input voltage				
DC INPUT	DC VOLTAGE	24Vdc	48Vdc	380Vdc		
	VOLTAGE RANGE (Typ.)	20 ~ 33Vdc	40 ~ 66Vdc	280 ~ 430Vdc		
	DC CURRENT (Typ.)	240A	120A	16A		
	NO LOAD DISSIPATION (Typ.)	NON-SAVING MODE	2.5A	1.4A	0.2A	
		SAVING MODE	Default disable, auto detect AC output load ≤ 10W will be changed to saving mode <25W			
	OFF MODE CURRENT DRAW	≤ 1mA				
	EFFICIENCY (Typ.)	Note.1 91%	93%	94.5%		
BATTERY TYPES		Lead Acid or li-ion				
PROTECTION	DC INPUT	LOW	ALARM	22±0.5Vdc	44±1Vdc	300±5Vdc
			SHUTDOWN	20±0.5Vdc	40±1Vdc	280±5Vdc
			RESTART	25±0.5Vdc	50±1Vdc	335±5Vdc
		HIGH	ALARM	31±0.5Vdc	62±1Vdc	420±5Vdc
			SHUTDOWN	33±0.5Vdc	66±1Vdc	430±5Vdc
			RESTART	30±0.5Vdc	60±1Vdc	400±5Vdc
	BAT. POLARITY		No indication. after power on			
	AC OUTPUT	OVER TEMPERATURE				Shut down o/p voltage, recovers automatically after temperature goes down
		OUTPUT SHORT				Shut down o/p voltage, re-power on to recover
		OVER LOAD (Typ.)		105 ~ 115% load for 180 sec., 115% ~ 140% load for 10 sec. 105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.		
CIRCUIT BREAKER				35A		
FUNCTION		REMOTE CONTROL			Power ON-OFF remote control by front panel dry contact connector(by RELAY), Open : Normal work ; Short : Remote off	
		COMMUNICATION			MODBUS-RTU (RS-485)	
AC UPS MODE	AC INPUT RANGE		200/220/230/240Vac ± 16%, recover ± 13%			
	FREQUENCY RANGE		45 ~ 65Hz			
	TRANSFER TIME(Typ.)		10ms inverter → AC by pass			
AC CHARGER	BOOST CHARGE VOLTAGE(Vboost)(default)		28.8V	57.6V	400V	
	FLOAT CHARGE VOLTAGE(Vfloat)(default)		27.6V	55.2V	385V	
	CONSTANT CURRENT(CC)(default)		135A	70A	11.3A	
	TEMPERATURE COMPENSATION		By external NTC			
ENVIRONMENT	WORKING TEMP.		-30 ~ +70°C (Refer to "Derating curve")			
	WORKING HUMIDITY		20% ~ 90% RH non-condensing			
	STORAGE TEMP., HUMIDITY		-30 ~ +70°C / -22 ~ +158°F, 10 ~ 95% RH non-condensing			
	VIBRATION		10 ~ 500Hz, 3G 10min./1cycle, 60min. each along X, Y, Z axes			
SAFETY & EMC (Note.4)	SAFETY STANDARDS		CB IEC62368-1, CSA C22.2 No. 62368-1, TUV BS EN/EN62368-1, AS/NZS 62368.1, EAC TP TC 004 approved			
	WITHSTAND VOLTAGE		DC I/P - AC:3.0KVAC AC - FG:1.5KVAC			
	ISOLATION RESISTANCE		DC I/P - AC:100M Ohms AC - FG: 500VDC / 25°C / 70% RH			
	EMC EMISSION	Parameter	Standard	Test Level / Note		
		Radiated	BS EN/EN55032(CISPR32)	Class A		
		Conducted	BS EN/EN55032(CISPR32)	Class A		
		Harmonic Current	BS EN/EN61000-3-2	Class A		
	Voltage Flicker	BS EN/EN61000-3-3	-----			
	EMC IMMUNITY	BS EN/EN55024, BS EN/EN55035				
		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 2			
EFT / Burst		BS EN/EN61000-4-4	Level 2, 1KV			
Surge		BS EN/EN61000-4-5	Level 3, 1KV/Line-Line 2KV/Line-Earth			
Conducted		BS EN/EN61000-4-6	Level 2			
Magnetic Field		BS EN/EN61000-4-8	Level 1			
Voltage Dips and Interruptions	BS EN/EN61000-4-11	>95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods				
OTHERS	MTBF		200.9K hrs min. Telcordia TR/SR-332 (Bellcore) ; 17.8K hrs min. MIL-HDBK-217F (25°C)			
	DIMENSION		460*211*83.5mm (L*W*H)			
	PACKING		10.5Kg; 1pcs/ 10.5Kg/ 1.25CUFT			
NOTE	<p>1.Efficiency, AC regulation and THD are tested by 75% load, linear load at 25Vdc/50Vdc input voltage.</p> <p>2.All parameters not specified above are measured at 25Vdc/50Vdc/400Vdc input and 25°C of ambient temperature and set to factory setting.</p> <p>3.The tolerance of each voltage value by models is: 224→±1V; 248→±2V; 2380→±5V.</p> <p>4.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. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx</p>					

SPECIFICATION

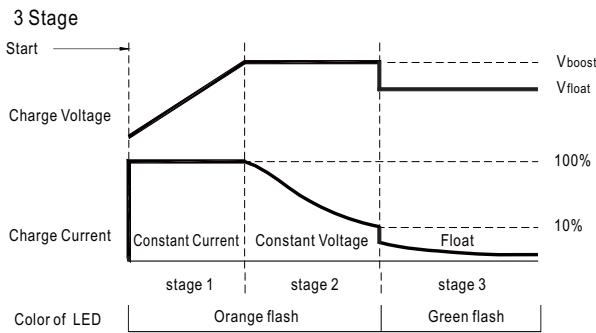
MODEL NO.		NTN-5K-124	NTN-5K-148		
AC OUTPUT	RATED POWER(Continuous)	4000W			
	OVER RATED POWER(3 Min.)	4600W			
	PEAK POWER(10 Sec.)	6000W			
	SURGE POWER(30 Cycles)	8000W			
	AC VOLTAGE	Default setting set at 110VAC 100 / 110 / 115 / 120Vac selectable by DIP S.W			
	FREQUENCY	Default setting set at 60±0.1Hz 50/60Hz selectable by DIP S.W			
	WAVEFORM <small>Note.1</small>	True sine wave (THD<3%)			
AC REGULATION		±3.0% at rated input voltage			
DC INPUT	DC VOLTAGE	24Vdc	48Vdc		
	VOLTAGE RANGE (Typ.)	20 ~ 33Vdc	40 ~ 66Vdc		
	DC CURRENT (Typ.)	240A	120A		
	NO LOAD DISSIPATION (Typ.)	NON-SAVING MODE	1.4A		
		SAVING MODE	Default disable, auto detect AC output load ≤25W will be changed to saving mode <10W		
	OFF MODE CURRENT DRAW	≤1mA			
	EFFICIENCY (Typ.) <small>Note.1</small>	89%	91%		
BATTERY TYPES		Lead Acid or li-ion			
PROTECTION	DC INPUT	LOW	ALARM	22±0.5Vdc	44±1Vdc
			SHUTDOWN	20±0.5Vdc	40±1Vdc
			RESTART	25±0.5Vdc	50±1Vdc
		HIGH	ALARM	31±0.5Vdc	62±1Vdc
			SHUTDOWN	33±0.5Vdc	66±1Vdc
			RESTART	30±0.5Vdc	60±1Vdc
	BAT. POLARITY		No indication. after power on		
	AC OUTPUT	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down	
		OUTPUT SHORT		Shut down o/p voltage, re-power on to recover	
		OVER LOAD (Typ.)		105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec. Protection type : Shut down o/p voltage, re-power on to recover	
CIRCUIT BREAKER		40A			
REMOTE CONTROL		Power ON-OFF remote control by front panel dry contact connector(by RELAY), Open : Normal work ; Short : Remote off			
COMMUNICATION		MODBus-RTU (RS-485)			
AC UPS MODE	AC INPUT RANGE		100/110/115/120Vac±16%, recover±13%		
	FREQUENCY RANGE		45 ~ 65Hz		
	TRASFER TIME(Typ.)		10ms inverter → AC by pass		
AC CHARGER	BOOST CHARGE VOLTAGE(Vboost)(default)	28.8V	57.6V		
	FLOAT CHARGE VOLTAGE(Vfloat)(default)	27.6V	55.2V		
	CONSTANT CURRENT(CC)(default)	120A	60A		
	TEMPERATURE COMPENSATION	By external NTC			
ENVIRONMENT	WORKING TEMP.		-30 ~ +70°C (Refer to "Derating curve")		
	WORKING HUMIDITY		20% ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY		-30 ~ +70°C / -22 ~ +158°F, 10 ~ 95% RH non-condensing		
	VIBRATION		10 ~ 500Hz, 3G 10min./1cycle, 60min. each along X, Y, Z axes		
SAFETY & EMC (Note.4)	SAFETY STANDARDS		CB IEC62368-1, TUV BS EN/EN62368-1 approved		
	WITHSTAND VOLTAGE		DC I/P - AC I/P:3.0KVAC DC I/P - AC O/P:3.0KVAC AC O/P - FG:1.5KVAC		
	ISOLATION RESISTANCE		DC I/P - AC:100M Ohms AC - FG: 500VDC / 25°C / 70% RH		
	EMC EMISSION	Parameter	Standard	Test Level / Note	
		Radiated	FCC	Class A	
		Conducted	FCC	Class A	
		Harmonic Current	BS EN/EN61000-3-2	Class A	
		Voltage Flicker	BS EN/EN61000-3-3	-----	
	EMC IMMUNITY	BS EN/EN55024, BS EN/EN55035			
		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 2	
		EFT / Burst	BS EN/EN61000-4-4	Level 2, 1KV	
		Surge	BS EN/EN61000-4-5	Level 3, 1KV/Line-Line 2KV/Line-Earth	
Conducted		BS EN/EN61000-4-6	Level 2		
Magnetic Field		BS EN/EN61000-4-8	Level 1		
Voltage Dips and Interruptions	BS EN/EN61000-4-11	>95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods			
OTHERS	MTBF	200.9K hrs min. Telcordia TR/SR-332 (Bellcore) ; 17.8K hrs min. MIL-HDBK-217F (25°C)			
	DIMENSION	460*211*83.5mm (L*W*H)			
	PACKING	10.5Kg; 1pcs/ 10.5Kg/ 1.25CUFT			
NOTE	<p>1.Efficiency, AC regulation and THD are tested by 75% load, linear load at 25Vdc/50Vdc input voltage. 2.All parameters not specified above are measured at 25Vdc/50Vdc/400Vdc input and 25°C of ambient temperature and set to factory setting. 3.The tolerance of each voltage value by models is: 124→±1V; 148→±2V. 4.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. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf) ※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx</p>				

DERATING CURVE



CHARGING CURVE

☉ Default 3 stage charging curve

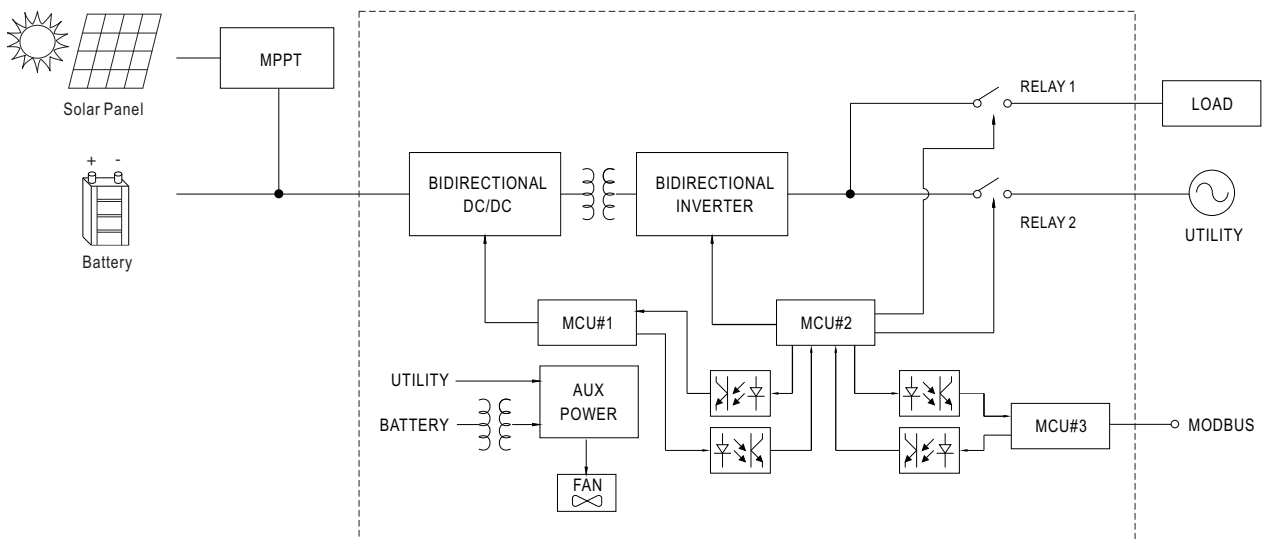


☉ Embedded 3 stage charging curves

MODEL	Description	Vboost	Vfloat	CC
24V	Default	28.8	27.6	135A
48V	Default	57.6	55.2	70A
380V	Default	400	385	11.3A

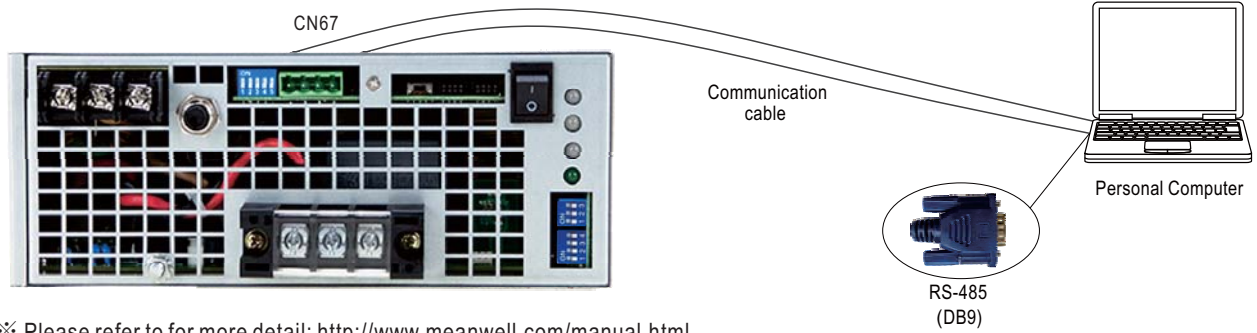
☉ Suitable for lead-acid batteries (flooded, Gel and AGM)

BLOCK DIAGRAM



■ **Function Manual**

1.Support RS-485 Communication



※ Please refer to for more detail: <http://www.meanwell.com/manual.html>

2.Remote ON-OFF Control

CN57/CN58	Remote ON-OFF	AC Output Status
Pin1:3	Short	power inverter ON
Pin1:3	Open	power inverter OFF

3.AC Output Voltage、 Frequency、 Power saving mode selectable by DIP SW



AC Output Voltage、 Frequency、 Power saving mode selectable by DIP SW			
SW1	SW2	SW3	SW4
OFF	OFF : 230Vac	ON : 60Hz	ON : Enable Saving mode
OFF	ON : 240Vac		
ON	OFF : 200Vac	OFF : 50Hz	OFF: Disable-Saving mode
ON	ON : 220Vac		

4. Three phase AC output Voltage connection selectable by DIP SW



◎3φ 4-wire / Y

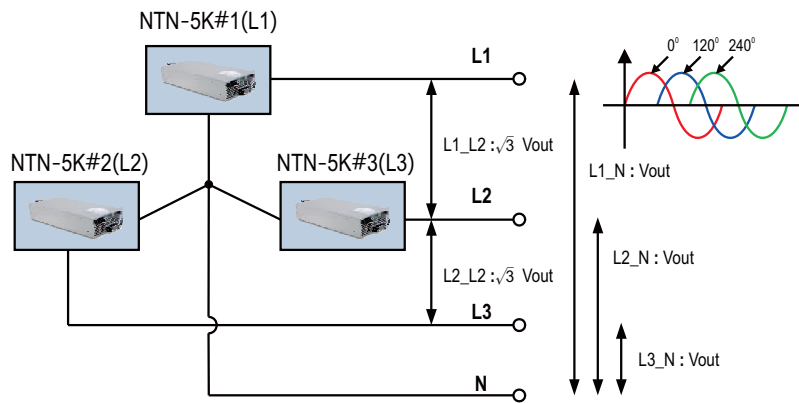


Fig 1.1

SW1	SW2	AC output phase
OFF	OFF	L1, 0°
OFF	ON	L2, +120°
ON	OFF	L3, +240°

5. Temperature compensation(3 stage only)

Temperature compensation function to prolong battery life for lead-acid batteries. Temperature compensation range is 0 ~ 40°C.

The battery temperature sensor comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage.

If the sensor is not used, the charger works normally.



6. Current Sharing

NTN-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 inverter should be paralleled using short and large diameter wiring and then connected to the load.
- ※ The total output current must not exceed the value determined by the following equation:

Maximum output current at parallel operation = (Rated current per unit) x (Number of unit) x 95% ; when parallel unit less than 6.

- ※ CN57/SW550 S.W Function pin connection

Parallel	PSU1		PSU2		PSU3		PSU4		PSU5		PSU6	
	CN57	SW550	CN57	SW550	CN57	SW550	CN57	SW550	CN57	SW550	CN57	SW550
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

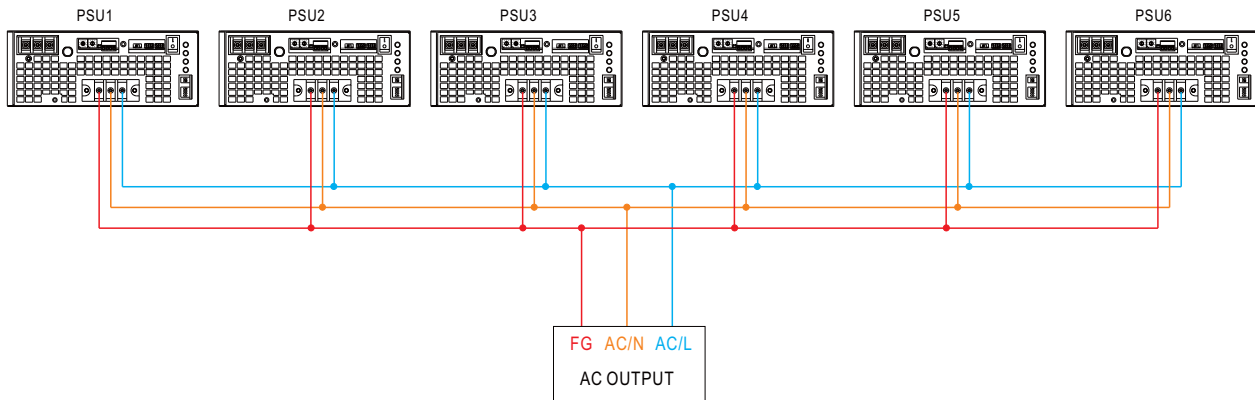
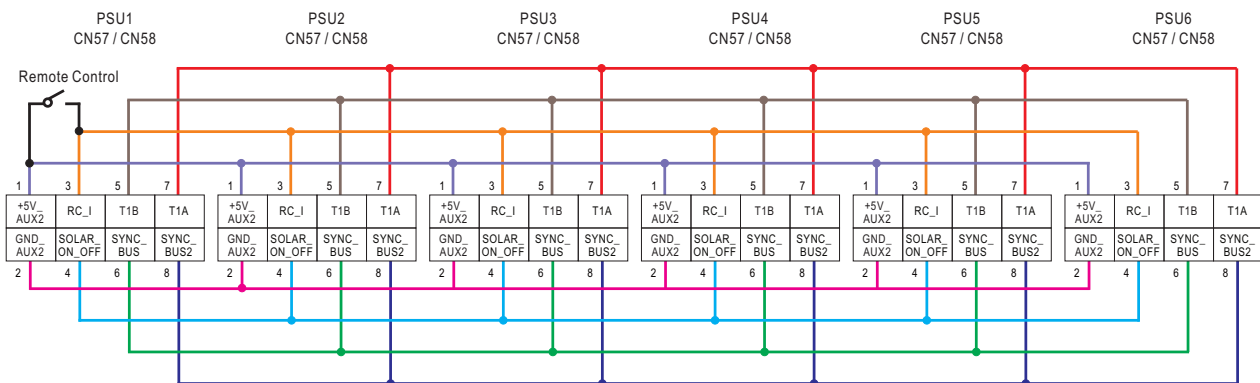


Fig 6.1



↑
If the lines of CN57 / CN58 are too long, they should be twisted in pairs to avoid the noise.

LED STATUS

Normal work:

	Green	Orange	Red
Status	Inverter OK	Remote off	Abnormal Status (See below table)
	System check	Saving mode	

	Green	Orange	Red
DC Input	25~31Vdc	22~25Vdc	<22Vdc or >31Vdc <44Vdc or >62Vdc <260Vdc or >370Vdc
	50~62Vdc	44~50Vdc	
	300~370Vdc	260~300Vdc	
	Maintain	Charging	

	Green	Orange	Red
Load	<40% load	40~80% load	>80% load

	Green	Orange	Red
AC Input	Utility OK	----	----
	Utility error	----	----
	Utility disconnected		

Abnormal status :

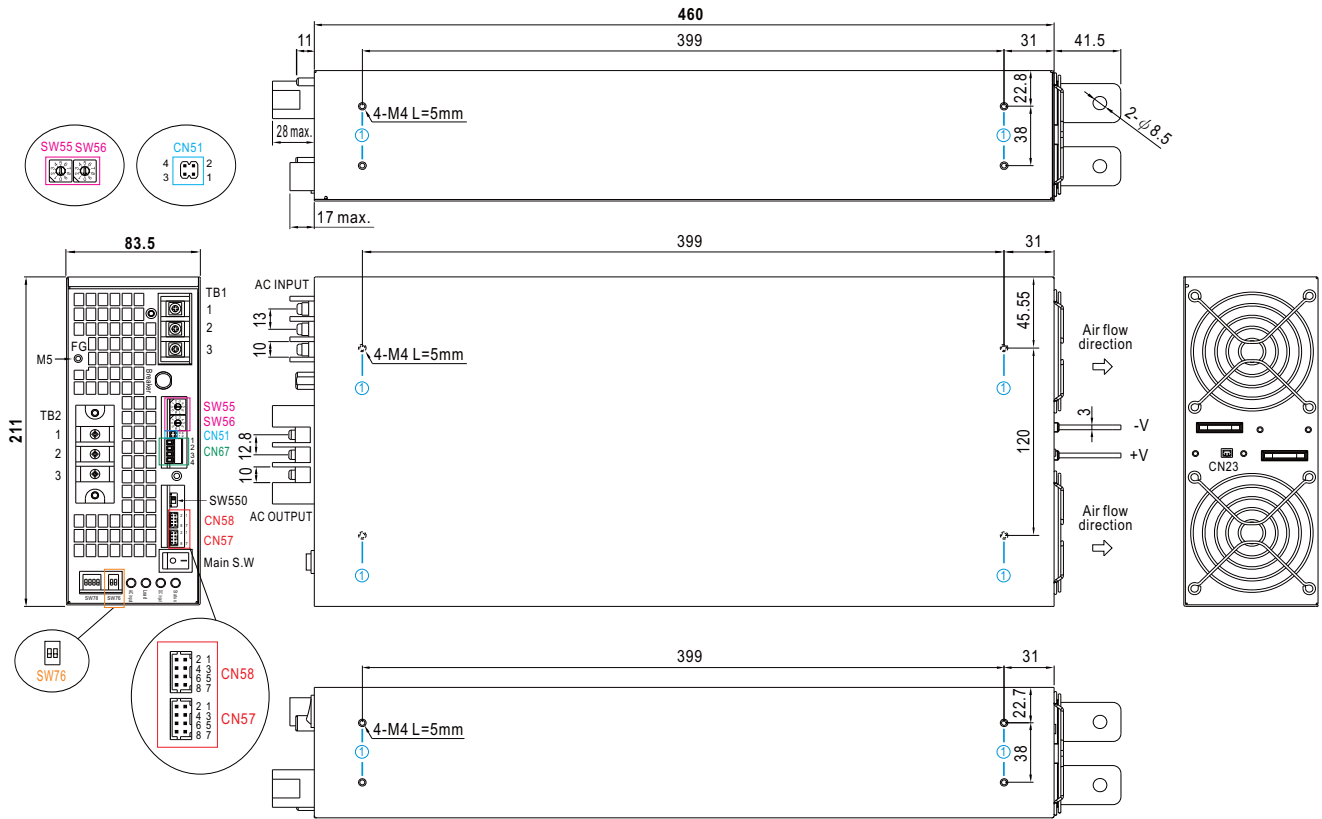
LED Indicator	Abnormal Indication
Status DC Input Load	Output overload or AC output short circuit
Status DC Input Load	Abnormal DC voltage
Status DC Input Load	Over temperature or Fan lock
Status DC Input Load	Inverter fail

- Light
- Light off
- Flash

MECHANICAL SPECIFICATION

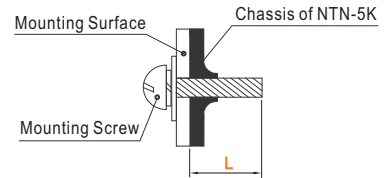
Case No.223

Unit:mm

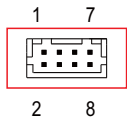


※ Mounting Instruction

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



※ Control Pin No. Assignment (CN57, CN58) : HRS DF11-08DP-2DS or equivalent



Mating Housing	HRS DF11-08DS or equivalent
Terminal	HRS DF11-08SC or equivalent

Pin No.	Function	Description
1	+5V_AUX2	Auxiliary voltage output, 4.5~5.5V, referenced to GND-AUX (pin2).
2	GND_AUX2	Auxiliary voltage output GND.
3	RC_I	The unit can turn the output ON/OFF by dry contact between Remote ON/OFF and +5_AUX2.(Note) Short : Power ON ; Open : Power OFF
4	SOLAR_ON_OFF	External MPPT charger control.
5	T1B	Data line used for parallel control.
6	SYNC_BUS	Phase synchronization used for parallel control.
7	T1A	Data line used for parallel control.
8	SYNC_BUS2	Mode synchronization used for parallel control.

Note: Isolated signal, referenced to GND_AUX2

※ Terminal Pin No. Assignment (TB1, TB2)

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

※ AC IN Connector Pin No. Assignment (CN67):

Pin No.	Function	Description
1	GND-AUX	Auxiliary voltage output GND.
2	DA	Data line used in MODBus interface.
3	DB	Data line used in MODBus interface.
4	+5V_AUX	Auxiliary voltage output, 4.5~5.5V, referenced to GND-AUX (pin1)


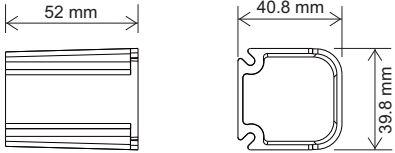


※ Control Pin No. Assignment (CN51):

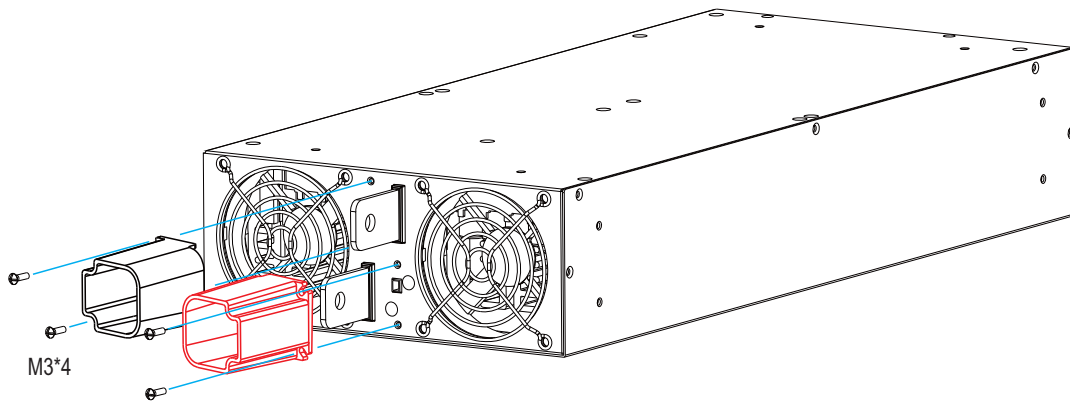
Pin No.	Function	Description
1,3	RL	Short: Termination resistors(120Ω) For MODBus \ Communication, please use Jumper (pin1,3)

※ SW55, SW56 switch for MODBus interface address setting, please refer to the user manual for more details

■ **Accessory List**

※ Terminal protector mating along with NTN-5K (Standard accessory)

	Item	Quantity
①	 	1
②		1
③		4



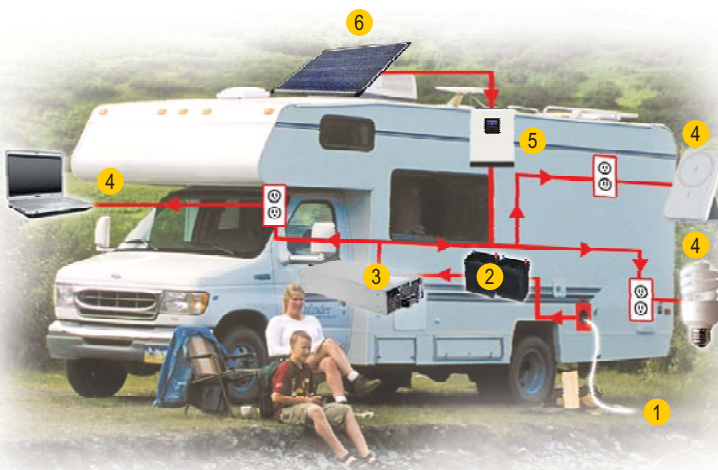
■ TYPICAL APPLICATION



- 1 Battery Bank
- 2 Off-Grid DC/AC Inverter (NTN series)
- 3 AC Outlet

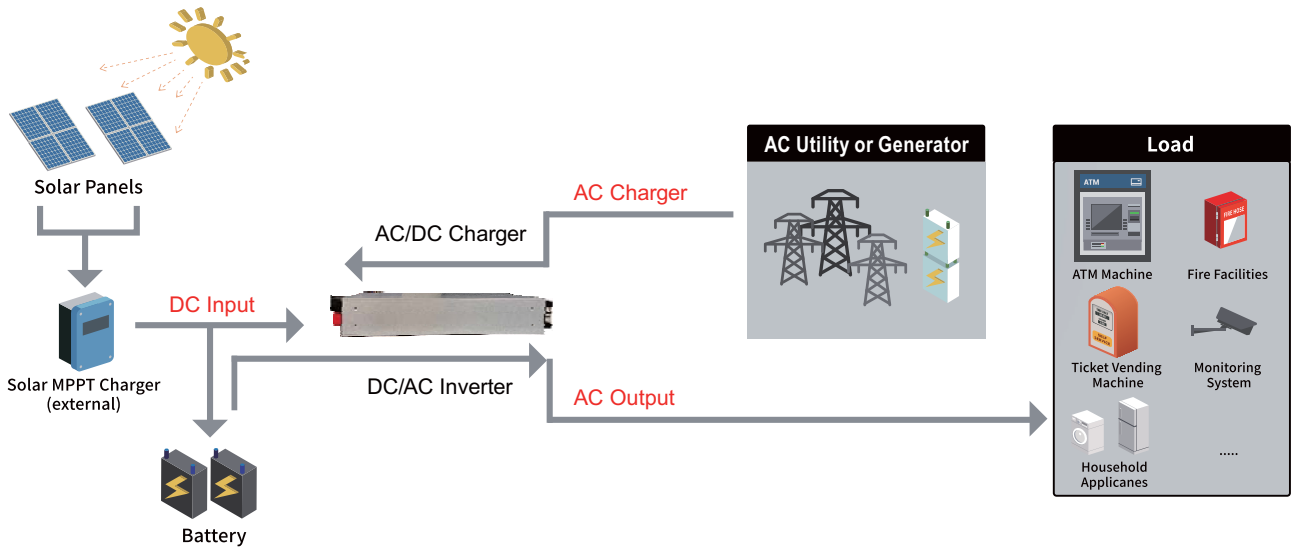


- 1 Utility Input (Shore)
- 2 Battery Bank
- 3 Off-Grid DC/AC Inverter (NTN series)
- 4 AC Outlet



- 1 Utility Inlet
- 2 Battery Bank
- 3 Off-Grid DC/AC Inverter (NTN series)
- 4 AC Outlet
- 5 MPPT Charger (External)
- 6 Solar Panel (External)

SYSTEM CONFIGURATION



- 1 Battery Bank
- 2 Off-Grid DC/AC Solar Inverter (NTN series)
- 3 AC Outlet