



IEC62368-1



BS EN/EN62368-1



TPTC004



AS/NZS 62368.1



## ■ Features

- Combining AC/DC charger, DC/AC Inverter, AC by-pass & support external MPPT solar charger
- AC utility charger up to 4520W
- UPS function (AC by-pass) without interruption, transfer time <10ms
- True sine wave output (THD<3%)
- High surge power up to 10KW
- Parallel synchronized operation up to 30KW (5+1 unit)
- Temperature controlled cooling fan
- 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) or CANBus protocol communication
- Graphical user interface controller CMU2E/CMU2E-R for status monitoring and control
- 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

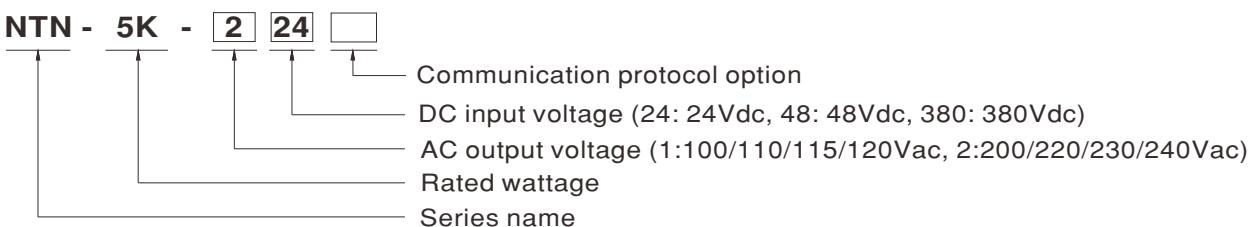
## ■ GTIN CODE

 MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

## ■ Description

NTN-5K is a 5KW 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



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

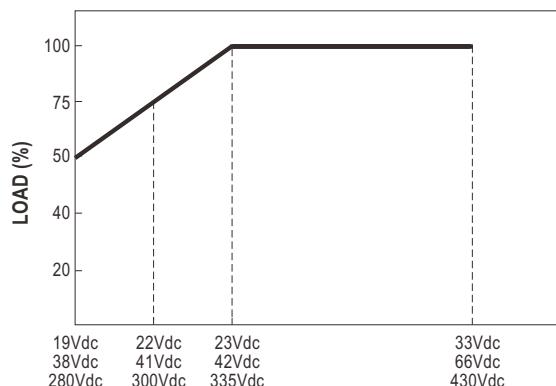
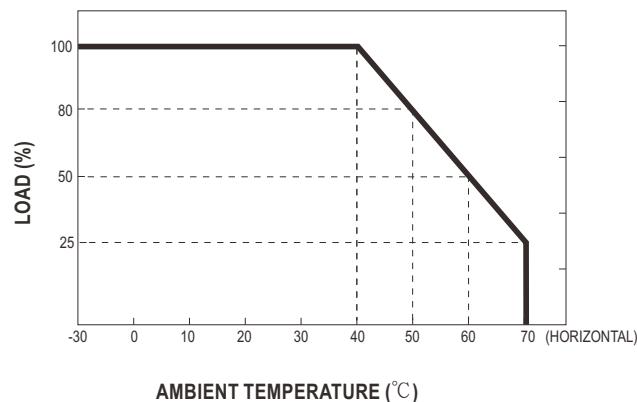
## SPECIFICATION

MODEL NO.		NTN-5K-224 <input type="checkbox"/>	NTN-5K-248 <input type="checkbox"/>	NTN-5K-2380 <input type="checkbox"/>				
<input type="checkbox"/> =Blank, CAN								
AC OUTPUT	RATED POWER(Continuous)	5000W						
	OVER RATED POWER(3 Min.)	5750W						
	PEAK POWER(10 Sec.)	7000W	7500W					
	SURGE POWER(30 Cycles)	8000W	10000W					
	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.)	19 ~ 33Vdc	38 ~ 66Vdc	280 ~ 430Vdc				
	DC CURRENT (Typ.)	240A	120A	16A				
	NO LOAD DISSIPATION (Typ.)	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	≤2mA						
	EFFICIENCY (Typ.)	Note.1	91%	93%				
BATTERY TYPES		Lead Acid or Li-ion						
PROTECTION	DC INPUT	LOW	ALARM SHUTDOWN RESTART	22±0.5Vdc 19±0.5Vdc 25±0.5Vdc				
		HIGH	ALARM SHUTDOWN RESTART	31±0.5Vdc 33±0.5Vdc 30±0.5Vdc				
		REVERSE POLARITY		No damage, re-power on to recover after fault condition is removed				
	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.					
FUNCTION		CIRCUIT BREAKER						
AC UPS MODE		REMOTE CONTROL	Power ON-OFF remote control by front panel dry contact connector(by RELAY), Open : Remote off ; Short : Normal work					
		COMMUNICATION	MODBus-RTU (RS-485) / CANBus					
AC UPS MODE	AC INPUT RANGE	200/220/230/240Vac±16%, recover±13%						
	FREQUENCY RANGE	45 ~ 65Hz						
	TRASFER TIME(Typ.)	10ms inverter → AC by pass						
AC CHARGER	BOOST CHARGE VOLTAGE	Default 28.8Vdc		Default 57.6Vdc				
	FLOAT CHARGE VOLTAGE	Default 27.6Vdc		Default 55.2Vdc				
	CHARGE VOLTAGE RANGE	20 ~ 30Vdc		40 ~ 60Vdc				
	CONSTANT CURRENT	135A		70A				
	MAX. CHARGE POWER	4050W		4200W				
	TEMPERATURE COMPENSATION	By external NTC						
	POWER FACTOR (Typ.)	PF>0.98/230VAC at full load						
ENVIRONMENT	EFFICIENCY (Typ.)	91%	93%	94%				
	AC CURRENT (Typ.)	25A/230VAC						
	INRUSH CURRENT (Typ.)	50A/230VAC						
	LEAKAGE CURRENT(Peak)	4.7mA/264VAC						
	WORKING TEMP.	-30 ~ +70°C (Refer to "Derating curve")						
SAFETY & EMC (Note.4)	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 STANDARDS	CB IEC62368-1, CSA C22.2 No. 62368-1, TUV BS EN/EN62368-1, AS/NZS 62368.1, EAC TP TC 004 approved						
SAFETY & EMC (Note.4)	WITHSTAND VOLTAGE	DC I/P - AC:3.0KVAC AC - FG:1.5KVAC						
	ISOLATION RESISTANCE	DC I/P - AC O/P, DC I/P - FG, AC O/P - FG: 100M ohms / 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				
	EMC IMMUNITY	Voltage Flicker	BS EN/EN61000-3-3	-----				
		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				
OTHERS	Surge	BS EN/EN61000-4-5	Level 3, 1kV/Line-Line 2kV/Line-Earth					
	Conducted	BS EN/EN61000-4-6	Level 2					
NOTE	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					
	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)						
NOTE	PACKING	10.5Kg; 1pcs/ 10.5Kg/ 1.25CUFT						
	1. Efficiency, AC regulation and THD are tested by 75% load, linear load at 25Vdc/50Vdc/400Vdc 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: 224→±0.5V; 248→±1V; 2380→±5V. 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 <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> )							
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## SPECIFICATION

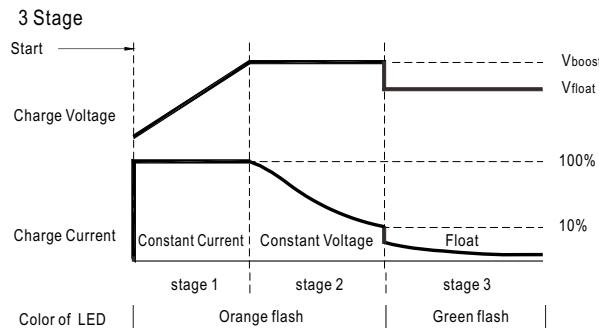
MODEL NO.		NTN-5K-124 <input type="checkbox"/>	NTN-5K-148 <input type="checkbox"/>		
		<input type="checkbox"/> =Blank, CAN			
AC OUTPUT	RATED POWER(Continuous)	4000W			
	OVER RATED POWER(3 Min.)	4600W			
	PEAK POWER(10 Sec.)	5600W	6000W		
	SURGE POWER(30 Cycles)	7000W	8000W		
	AC VOLTAGE	Default setting 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	Note.1 True sine wave (THD<3%)			
	AC REGULATION	±3.0% at rated input voltage			
DC INPUT	DC VOLTAGE	24Vdc	48Vdc		
	VOLTAGE RANGE (Typ.)	19 ~ 33Vdc	38 ~ 66Vdc		
	DC CURRENT (Typ.)	200A	100A		
	NO LOAD DISSIPATION (Typ.)	2.5A	1.4A		
	NON-SAVING MODE	Default disable, auto detect AC output load≤10W will be changed to saving mode			
	SAVING MODE	<25W			
	OFF MODE CURRENT DRAW	≤2mA			
	EFFICIENCY (Typ.) Note.1	89%	91%		
BATTERY TYPES		Lead Acid or Li-ion			
PROTECTION	DC INPUT	LOW ALARM	22±0.5Vdc		
		SHUTDOWN	19±0.5Vdc		
		RESTART	25±0.5Vdc		
	HIGH	ALARM	31±0.5Vdc		
		SHUTDOWN	33±0.5Vdc		
		RESTART	30±0.5Vdc		
	REVERSE POLARITY		No damage, re-power on to recover after fault condition is removed		
	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		
FUNCTION	CIRCUIT BREAKER	50A			
	REMOTE CONTROL	Power ON-OFF remote control by front panel dry contact connector(by RELAY), Open : Remote off ; Short : Normal work			
	COMMUNICATION	MODBus-RTU (RS-485) / CANBus			
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	Default 28.8Vdc	Default 57.6Vdc		
	FLOAT CHARGE VOLTAGE	Default 27.6Vdc	Default 55.2Vdc		
	CHARGE VOLTAGE RANGE	20 ~ 30Vdc	40 ~ 60Vdc		
	CONSTANT CURRENT	120A	60A		
	MAX. CHARGE POWER	3600W	3600W		
	TEMPERATURE COMPENSATION	By external NTC			
	POWER FACTOR (Typ.)	PF>0.98/115VAC at full load			
	EFFICIENCY (Typ.)	89%	91%		
	AC CURRENT (Typ.)	20A/110VAC			
	INRUSH CURRENT (Typ.)	25A/110VAC			
ENVIRONMENT	LEAKAGE CURRENT(Peak)	4.7mA/264VAC			
	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./cycle, 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:3.0KVAC AC - FG:1.5KVAC			
	ISOLATION RESISTANCE	DC I/P - AC O/P, DC I/P - FG, AC O/P - FG: 100M ohms / 500VDC / 25°C / 70% RH			
	EMC EMISSION	Parameter	Standard		
		Radiated	FCC		
		Conducted	FCC		
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	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 input and 25°C of ambient temperature and set to factory setting. 3. The tolerance of each voltage value by models is: 124→±0.5V; 148→±1V. 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 <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> )				
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### ■ DERATING CURVE



### ■ CHARGING CURVE

#### ◎ Default 3 stage charging curve

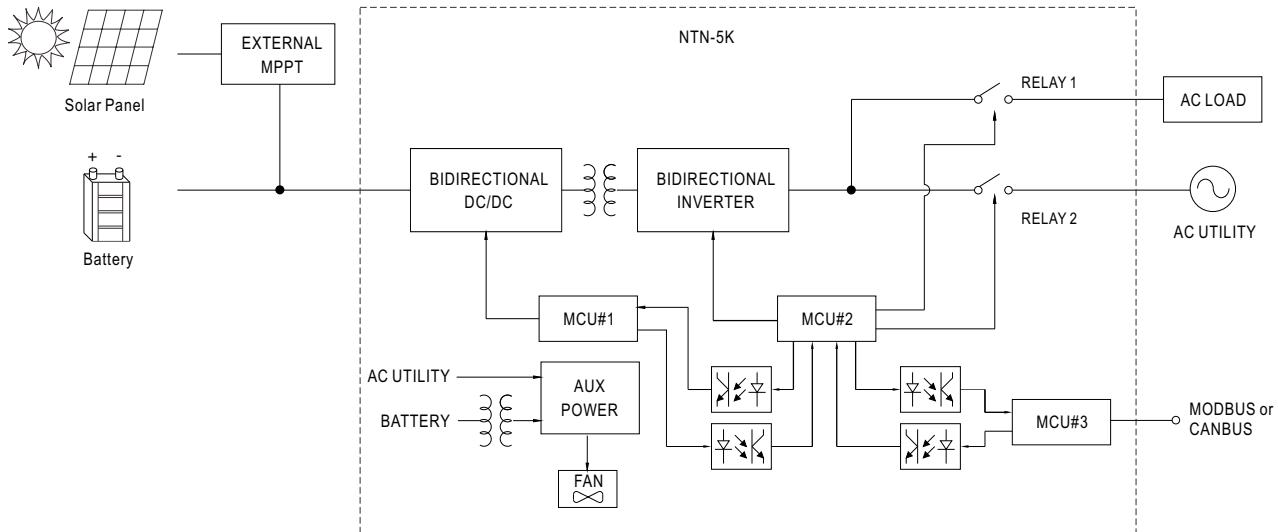


#### ◎ Embedded 3 stage charging curves

MODEL	Vboost	Vfloat	C.C	Adjustable by MODBus / CANbus
124	Default 28.8Vdc	27.6Vdc	120A max.	20~30Vdc
			135A max.	
224	Default 57.6Vdc	55.2Vdc	60A max.	40~60Vdc
			70A max.	
148	Default 400Vdc	385Vdc	11.3A max.	290~400Vdc
248			11.3A max.	
380Vdc	Default 400Vdc	385Vdc	11.3A max.	290~400Vdc

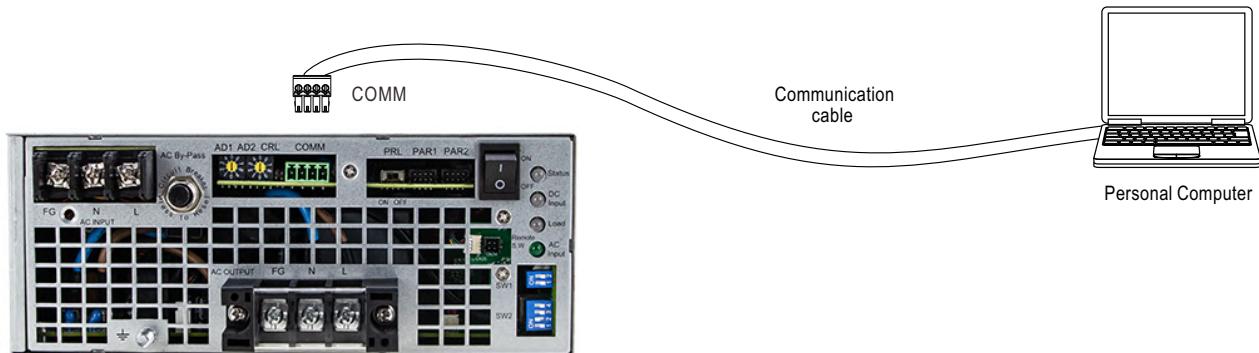
#### ◎ Suitable for lead-acid batteries (flooded, Gel and AGM) or li-ion

### ■ BLOCK DIAGRAM



## ■ Function Manual

### 1. Support MODBus / CANBus Communication

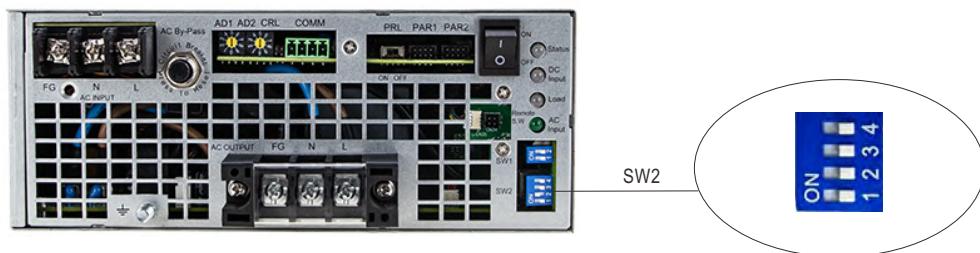


※ Please refer to the user manual for detailed instructions.

### 2. Remote ON-OFF Control

PAR1/PAR2	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			
S1	S2	S3	S4
OFF	OFF: 100Vac or 200Vac	ON : 50Hz	ON : Saving mode
OFF	ON : 110Vac or 220Vac		
ON	OFF: 115Vac or 230Vac	OFF: 60Hz	OFF: Non-Saving mode
ON	ON : 120Vac or 240Vac		

4.3Ø 4W and 1Ø 3W AC output Voltage connection selectable by DIP SW



◎3Ø 4-wire / Y

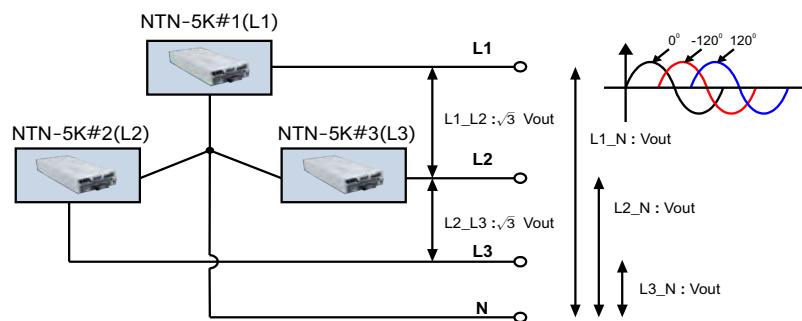


Fig 4.1

S1	S2	AC output phase
OFF	OFF	L1, 0°
OFF	ON	L2, -120°
ON	OFF	L3, +120°

Note: Please refer to 5.3 Three-phase 4-wire output on page 23 of the user manual for detailed instructions.

◎1Ø 3-wire(Split phase system only supports 124 and 148)

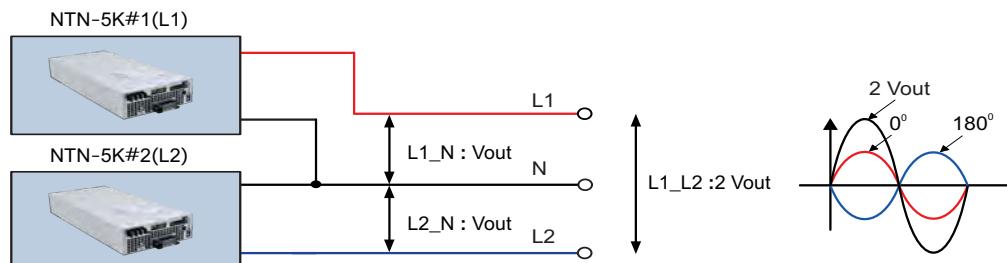


Fig 4.2

S1	S2	AC output phase
OFF	OFF	L1, 0°
ON	ON	L2, +180°

Note: Please refer to 5.4 Single-phase 3-wire Output on page 27 of the user manual for detailed instructions.

## 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.AC Output Parallel Function

NTN-5K has the built-in active current sharing function and can be connected in parallel, up to 6 units, to provide higher AC 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.

※ PAR1/PAR2, PRL Function pin connection

Parallel	PSU1		PSU2		PSU3		PSU4		PSU5		PSU6	
	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

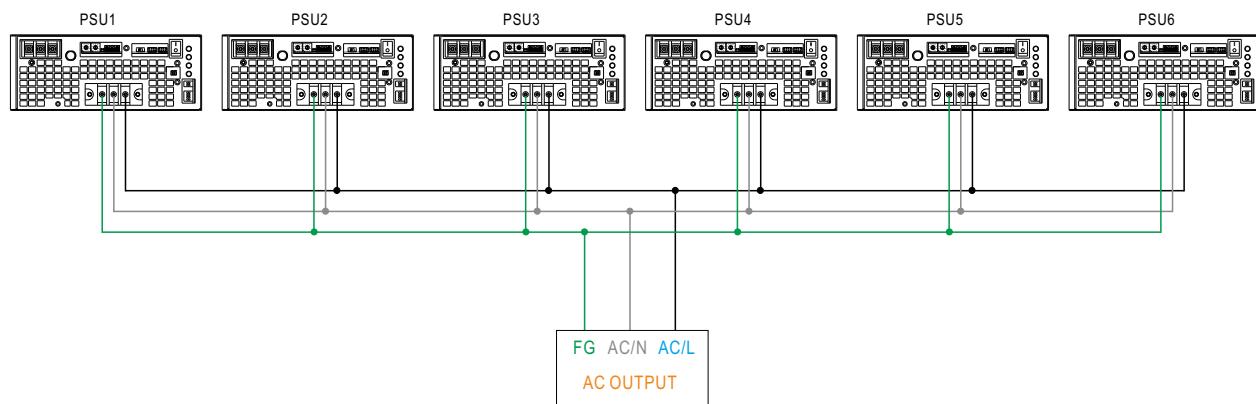
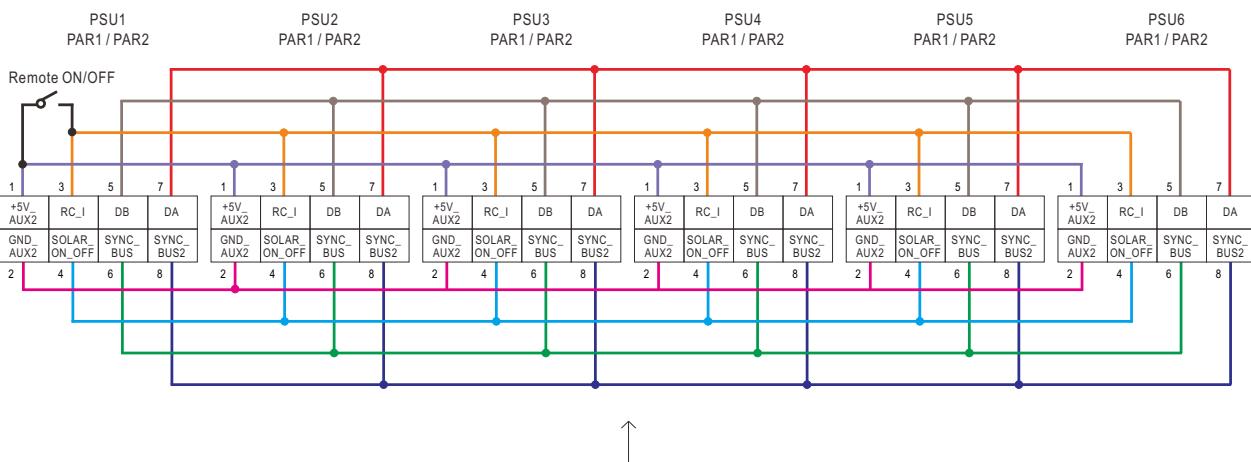


Fig 6.1



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

### ■ LED STATUS

Normal work:

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

DC Input	Green	Orange	Red
	 25~31Vdc  50~62Vdc  335~420Vdc  Maintain	 22~25Vdc  44~50Vdc  300~335Vdc  Charging	 <22Vdc or >31Vdc  <44Vdc or >62Vdc  <300Vdc or >420Vdc

Load	Green	Orange	Red
Inverter Mode	 <40% load	 40~80% load	 >80% load
Bypass Mode	 <40% load	 40~80% load	 >80% load

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

Abnormal status :

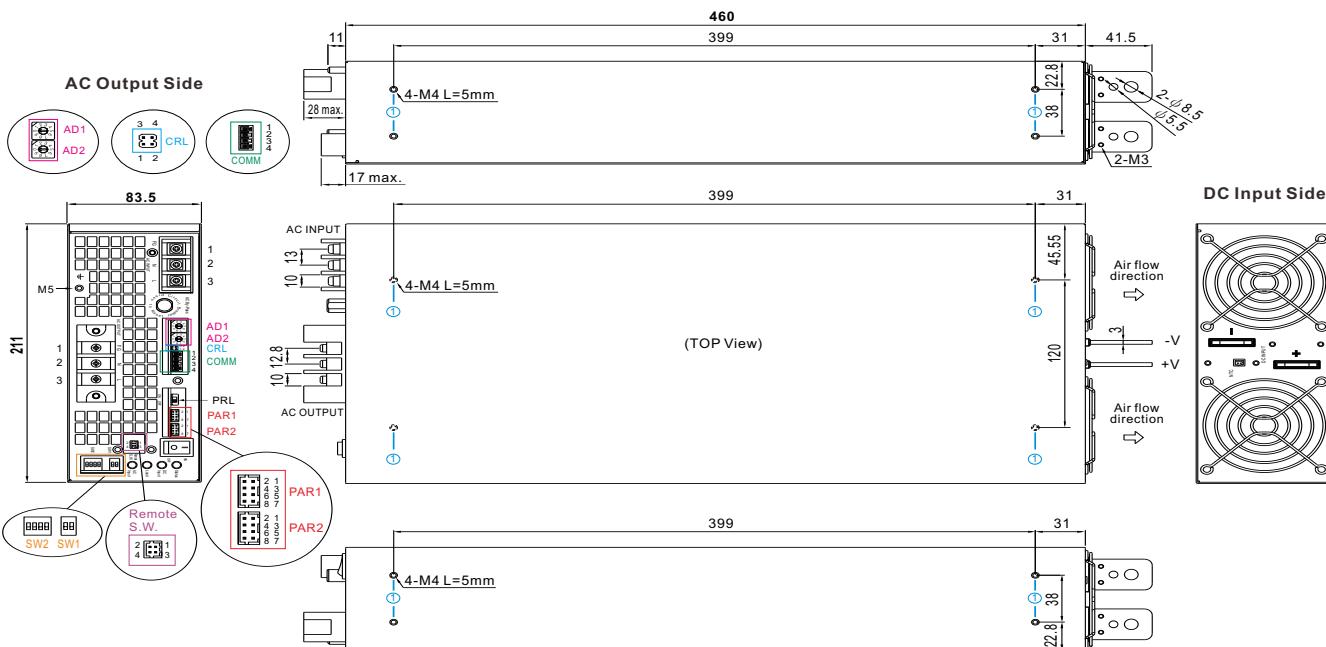
LED Indicator	Abnormal Indication
 Status  DC Input  Load	Output overload or AC output short circuit
 Status  DC Input  Load	Abnormal DC voltage
 Status  DC Input  Load	Over temperature or Fan lock
 Status  DC Input  Load	Inverter fail

-  Light
-  Light off
-  Flash

#### ■ MECHANICAL SPECIFICATION

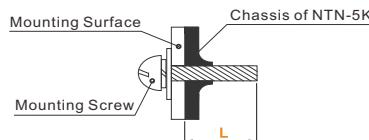
(Unit: mm, tolerance  $\pm 0.5$ mm)

Case No.223



#### ※ Mounting Instruction

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



#### ※ Terminal Pin No. Assignment

X Terminal 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 (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):



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.

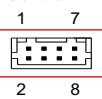
※ Control Pin No. Assignment (Remote S W) : HBS DE11-04DP-2DS or equivalent



Mating Housing	HRS DF11-04DS or equivalent
Terminal	HRS DF11-**SC or equivalent

Pin No.	Function	Description
1,2,3,4	REMOTE SWITCH	The unit can be remotely turned the output ON/OFF by dry contact between Pin1,2 & 3,4. Power ON : Short Pin1 to 2 and Pin3 to 4 ; Power OFF : Pin1 ~ Pin4 open.

※ Control Pin No. Assignment (PAR1, PAR2) : HRS DF11-08DP-2DS or equivalent



Mating Housing	HRS DF11-08DS or equivalent
Test fixture	HRS DF11-100, HRS DF11-100-1

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 +5V_AUX2.(Note) Short : Power ON ; Open : Power OFF
4	SOLAR_ON_OFF	External MPPT charger control, referenced to GND_AUX2 (pin2).
5	DA	Data line used for parallel control.
6	SYNC_BUS	Phase synchronization used for parallel control.
7	DB	Data line used for parallel control.
8	SYNC_BUC3	Mode synchronization used for parallel control.

Note: Input signal referenced to GND. AI/HX2

## ■ Accessory List

※ NTC Sensor and Remote Control mating along with NTN-5K (Standard accessory)

Item		Quantity
①	NTC sensor wire 	1
②	NTC mating wire 	1
Connection Diagram		
Connect to NTN-5K	Extend cable by customer	Connect to battery
		
	Connected	

※ Remote Control mating along with NTN-5K (Standard accessory)

Item		Quantity
①	Remote S.W mating wire 	1
②	Remote S.W mating wire 	1
Connection Diagram		
Connect to remote switch	Extend cable by customer	Connect to NTN-5K
		
	Connected	

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

Item		Quantity
①		1
②		1
③		4

