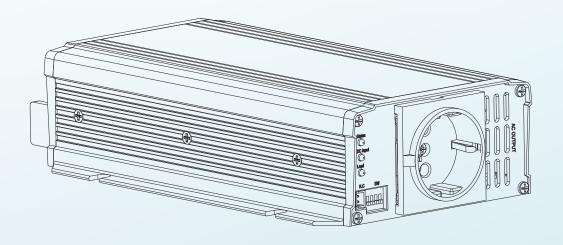




# True Sine Wave Inverter

· High Reliable Inverter ·



NTS/NTU series are MEAN WELL's new generation high-reliability offgrid DC-AC pure sine wave inverters. The whole family has NTS-250P/400P, NTS-300/450/750/1200/1700/2200/3200, and NTU-1200/1700/2200/3200 series. The whole family of NTS/NTU are fully digital designed, with three major characteristics of miniaturization, high efficiency, and intelligence. The main features are, instantaneous peak load capacity which can reach up to 2 times of output wattage, as well as AC output voltage/frequency/power saving mode adjustment capability through the DIP switch of front panel (the idle standby consumption is 1.5W). It's efficiency reaches up to 93%, and it can be operated within temperature range from -25~+70°C. Built-in remote control, able to monitor the battery voltage and the load status of the inverter through IRC1/2/3. Not only intergrated multiple intelligent protections, but also passed safety regulations such as CB/DEKRA/E13/EAC/UL/RCM/FCC/CE/UKCA. Materials and components are strictly selected and 3-year warranty is provided. It is suitable for households, vehicles, yacht and remote areas without power grids. Common application such as, lighting, air conditioning, refrigerators, hair dryers, microwave ovens, computers, televisions, hand-held power tools, motor equipment, mobile AC power... etc.

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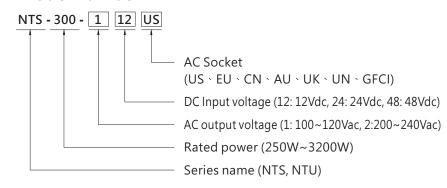
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## 1. Safety Guidelines

- Risk of electrical shock and energy hazard. All failures should be examined by the qualified technician. Please do not remove the case of the inverter by yourself.
- Please do not install the inverter in places with high moisture or near water.
- Please do not install the inverter in places with high ambient temperature or under direct sunlight.
- Please only connect batteries with the same brand and model number in one battery bank. Using batteries from different manufacturers or different capacity is strictly prohibited!
- Never allow a spark or flame in the vicinity of the batteries because they may ignite explosive gases during normal operation.
- Make sure the air flow from the fan is not obstructed at both sides (front and back) of the inverter. (Please allow at least 15cm of space)
- Please do not stack any object on the inverter.
- Please do not turn on the inverter before start the engine if inverter connected to vehicle's battery directly.

## 2.Introduction

#### 2.1 Model number



#### 2.2 Features

- Full digital design with compact size and light weight.
- True sine wave output(THD < 3%)
- Peak power up to 1.7~ 2 times
- AC voltage, frequency, power saving mode selectable.
- Multiple intelligent protections

DC Input: Reverse polarity protection/ Low DC voltage protection/ DC over voltage protection.

AC Output: Short circuit protection, over load protection, over temperature protection.

- LED indicator : Status, DC input, load status, AC input.
- Built-in Remote control
- Support IRC1/2/3 for 750~3200W models(optional)
- UPS functions( only for NTU series)
- Wide range of DC input voltage for lead acid or lithium battries.
- CB/DEKRA/E13/EAC/UL/RCM/FCC/CE/UKCA certified.
- 3 year warranty

# 2.3 Specification

## NTS-250P series

MODE	EL.			NTS-250P-112	NTS-250P-124	NTS-250P-148	NTS-250P-212	NTS-250P-224	NTS-250P-248
		RATED POWE	R(Continuous)	250W					
		OVER RATED	POWER(3 Min.)	287.5W					
		PEAK POWER	R(10 Sec.)	375W					
		SURGE POW	ER(30 Cycles)	500W					
		40.00.7407	, , ,	Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	UT	AC VOLTAGE		100 / 110 / 115	/ 120Vac selecta	ble by DIP S.W	200 / 220 / 230	/ 240Vac selecta	able by DIP S.W
		FREQUENCY		Default setting	set at 60Hz±0.	1Hz	Default setting	set at 50Hz±0.1	Hz
		FREQUENCT		50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W	
		WAVEFORM	Note.1	True sine wave	(THD<3%)				
		AC REGULAT	ION	±3.0% at rate	d input voltage				
		LED STATUS		Please refer to	section 3.4 of ins	tallation manual			
		BAT. VOLTAG	E	12V	24V	48V	12V	24V	48V
		VOLTAGE RA	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	25A	13A	7A	25A	13A	7A
		NO LOAD	NON-SAVING MODE	10W	10W	12W	10W	10W	12W
INPU	Т	DISSPATION	SAVING MODE	Default disable,	≦1.2W ~ 1.5W by r	models @ auto dete	c AC output load≦	10W will be chang	ed to saving mode
		(Typ.)	SAVING MODE	1.2W	1.3W	1.5W	1.2W	1.3W	1.5W
		OFF MODE C	URRENT DRAW	<1mA at batter	y ∼DC input must	be disconnected			
		EFFICIENCY (	Typ.) Note.1	91%	91%	92%	92%	93%	93%
		BATTERY TY	PES	Lead Acid or li-	ion				
		FUSE (INTER	NAL)	30A*2	30A*1	10A*2	30A*2	30A*1	10A*2
		ALARM SHUTDOWN RESTART		$11\pm0.3 Vdc$	22±0.5Vdc	44±1Vdc	$11\!\pm\!0.3 Vdc$	22±0.5Vdc	44±1Vdc
	_			10±0.3Vdc	20±0.5Vdc	40±1Vdc	$10\pm0.3 Vdc$	20±0.5Vdc	40±1Vdc
	DC INPUT			12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	$12.5\!\pm\!0.3 Vdc$	25±0.5Vdc	50±1Vdc
N	2		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	$15.5\!\pm\!0.3 \text{Vdc}$	31±0.5Vdc	62±1Vdc
Ĕ		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	$16.5\!\pm\!0.3 \text{Vdc}$	33±0.5Vdc	66±1Vdc
PROTECTION			RESTART	15±0.3Vdc	$30 \pm 0.5 \text{Vdc}$	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
R.		BAT. POLARI	ΓY	By internal fuse	open				
	_	OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	on to recover		
	AC OUTPUT	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	on to recover		
	300	OVER LOAD (	Tun \	105 ~ 115% loa	d for 180 sec., 11	15% ~ 150% load	for 10 sec.		
	Ă	OVER LOAD (	Typ.)	Protection type	: Shut down o/p	voltage, re-powe	on to recover		
FUNC	TION	REMOTE CON			remote control b		contact connecto	or (by RELAY)	
		WORK TEMP.	<u>.                                      </u>		efer to "Derating of				
		WORKING HU	IMIDITY	20 ~ 90% RH n	·	, a. 10 )			
ENVI			MP., HUMIDITY		22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION	,		3 10min./1cycle,		•		
		MTBF		279K hrs min.				in MII-HDRK	(-217F (25°C)
OTHE	R	MTBF         279K hrs min.         Telcordia TR/SR-332 (Bellcore);         84K hrs min.         MIL-HDBK-217F (25°           DIMENSION         186*100.5*32mm (L*W*H)			(2.77 (200)				
		PACKING			/ 14.5Kg/ 0.97CU	IFT			
		1 AURINO		o.rong, ropus	14.0Kg/ 0.07 00	1			

## NTS-400P series

MODE	L			NTS-400P-112	NTS-400P-124	NTS-400P-148	NTS-400P-212	NTS-400P-224	NTS-400P-248
		RATED POWE	R(Continuous)	400W					
		OVER RATED	POWER(3 Min.)	460W					
		PEAK POWER	(10 Sec.)	600W					
		SURGE POWE	R(30 Cycles)	800W					
		AC VOLTAGE		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	UT	AO VOLIAGE		100 / 110 / 115	/ 120Vac selecta	able by DIP S.W	200 / 220 / 230	/ 240Vac selecta	able by DIP S.W
		FREQUENCY		Default setting	Default setting set at 60Hz±0.1Hz Default setting set at 50Hz±0.1Hz				
				50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W	
		WAVEFORM	Note.1	True sine wave	(THD<3%)				
		AC REGULAT	ON	±3.0% at rate	d input voltage				
		LED STATUS		Please refer to	section 3.4 of ins	tallation manual			
		BAT. VOLTAG	E	12V	24V	48V	12V	24V	48V
		VOLTAGE RA	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	40A	20A	10A	40A	20A	10A
		NO LOAD	NON-SAVING MODE	10W	10W	12W	10W	10W	12W
INPUT	Г	DISSPATION	SAVING MODE	Default disable,	≤1.2W ~ 1.5W by	models @ auto dete	ec AC output load≦	10W will be chang	ged to saving mode
		(Typ.)	SAVING WODE	1.2W	1.3W	1.5W	1.2W	1.3W	1.5W
		OFF MODE CU	JRRENT DRAW	<1mA at batter	y ~DC input must	be disconnected			
		EFFICIENCY (	Typ.) Note.1	89%	91%	91%	91%	93%	93%
		BATTERY TYP	ES	Lead Acid or li-	ion				
		FUSE (INTER	NAL)	40A*2	30A*2	10A*2	40A*2	30A*2	10A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
		LOW SHUTDOWN		10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	RES ALA		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
N N	<u>≤</u>		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
CI	_	HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
PROTECTION			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
A.		BAT. POLARIT	Υ	By internal fuse	e open				
	⊨	OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	ООТРОТ	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	AC OU	OVERLOAD	Tum )	105 ~ 115% loa	d for 180 sec., 11	15% ~ 150% load	for 10 sec.		
	¥	OVER LOAD (	iyp.)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
FUNC	TION	REMOTE CON				by front panel dry	contact connecto	or (by RELAY)	
FUNC	IION	DRY CONTAC	Т	<u>'</u>	work ; Short : Re				
		WORK TEMP.			efer to "Derating of	curve")			
ENVIR		WORKING HU	MIDITY	20 ~ 90% RH n	on-condensing				
MENT		STORAGE TE	MP., HUMIDITY	-30 ~ +70°C / -	22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION		10 ~ 500Hz, 30	3 10min./1cycle,	60min. each alc	ng X, Y, Z axes		
		MTBF		278.7K hrs min. Telcordia TR/SR-332 (Bellcore); 84K hrs min. MIL-HDBK-217F (25°C			3K-217F (25°C)		
OTHE	R	DIMENSION		186*100.5*32n	nm (L*W*H)				
		PACKING		0.75Kg; 18pcs	/ 14.5Kg/ 0.97CU	JFT			

## NTS-300 series

MODE	=1			NTS-300-112	NTS-300-124	NTS-300-148	NTS-300-212	NTS-300-224	NTS-300-248
MODE	L			= US, GFCI,	UN		☐ = EU, CN, A	U, UK, UN	
		RATED POWE	ER(Continuous)	300W					
		OVER RATED	POWER(3 Min.)	345W					
		PEAK POWER	R(10 Sec.)	450W					
		SURGE POW	ER(30 Cycles)	600W					
		AC VOLTAGE		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	TUT	AC VOLIAGE		100 / 110 / 115	/ 120Vac selecta	ble by DIP S.W	200 / 220 / 230	/ 240Vac selecta	able by DIP S.W
		FREQUENCY		-	set at 60Hz±0.	1Hz		set at 50Hz±0.1	Hz
					able by DIP S.W		50/60Hz select	able by DIP S.W	
		WAVEFORM		True sine wave	,				
		AC REGULAT		±3.0% at rate					
		FRONT PANE			section 3.4 of ins				
		BAT. VOLTAG		12V	24V	48V	12V	24V	48V
		VOLTAGE RA		10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT		30A	15A	8A	30A	15A	8A
		NO LOAD	NON-SAVING MODE	10W	10W	12W	10W	10W	12W
INPU	Т	DISSPATION	SAVING MODE		≦1.2W ~ 1.5W by i	models @ auto dete	ec AC output load≦	10W will be chang	ed to saving mode
		(Typ.)		1.2W	1.3W	1.5W	1.2W	1.3W	1.5W
		OFF MODE C	URRENT DRAW	≦1mA					
		EFFICIENCY (	(Typ.) Note.1	90%	92%	92%	92%	93%	93%
		BATTERY TY	PES	Lead Acid or li-	ion				
		FUSE (INTER	NAL)	30A*2	30A*1	10A*2	30A*2	30A*1	10A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	_	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	DC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
z	20	ALARM		15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
읃	_	HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
일			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARI	TY	By internal fuse	open				
_		OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	5	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	占	OVER LOAD (	(Typ.)	105 ~ 115% loa	d for 180 sec., 11	15% ~ 150% load	for 10 sec.		
	AC OUTPUT	OVERLOAD	(176-)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	⋖	GFCI PROCTI	ECTION	Design refer to (Only for "GFCI" AC	UL458 socket, by request)	None			
FUNC	TION	REMOTE CON DRY CONTAC			remote control bwork; Short: Re		contact connecte	or (by RELAY)	
		WORK TEMP.		-25 ~ +65°C (Re	efer to "Derating of	curve")			
ENVII	PON-	WORKING HU	JMIDITY	20 ~ 90% RH n	on-condensing				
MENT		STORAGE TE	MP., HUMIDITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION		10 ~ 500Hz, 30	3 10min./1cycle,	60min. each ald	ong X, Y, Z axes		
		MTBF		281.9K hrs min	•	R/SR-332 (Bellco		min. MIL-HD	BK-217F (25°C)
ОТНЕ	R	DIMENSION		210*130*55mm		,			, , , ,
		PACKING			.4Kg/ 1.74CUFT				

## NTS-450 series

MODE	=1			NTS-450-112	NTS-450-124	NTS-450-148	NTS-450-212	NTS-450-224	NTS-450-248
WIODL				= US, GFCI,	UN		□ = EU, CN, A	IU, UK, UN	
		RATED POWE	R(Continuous)	450W					
		OVER RATED	POWER(3 Min.)	517.5W					
		PEAK POWER	R(10 Sec.)	675W					
		SURGE POWE	ER(30 Cycles)	900W					
		40.001.74.05		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	TU	AC VOLTAGE		100 / 110 / 115	/ 120Vac selecta	able by DIP S.W	200 / 220 / 230	/ 240Vac select	able by DIP S.W
		FREQUENCY		Default setting	set at $60 \text{Hz} \pm 0$ .	1Hz	Default setting	set at 50Hz±0.	1Hz
		FREQUENCT		50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W	'
		WAVEFORM	Note.1	True sine wave	(THD<3%)				
		AC REGULAT	ION	±3.0% at rate	d input voltage				
		FRONT PANE	L LED	Please refer to	section 3.4 of ins	tallation manual			
		BAT. VOLTAG	E	12V	24V	48V	12V	24V	48V
		VOLTAGE RA	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	50A	25A	14A	50A	25A	14A
		NO LOAD	NON-SAVING MODE	10W	10W	12W	10W	10W	12W
INPU	Т	DISSPATION		Default disable,	≦1.2W ~ 1.5W by	models @ auto det	ec AC output load≦	10W will be chang	ged to saving mode
		(Typ.)	SAVING MODE	1.2W	1.3W	1.5W	1.2W	1.3W	1.5W
		OFF MODE CU	JRRENT DRAW	≦1mA					1
		EFFICIENCY (	Typ.) Note.1	88%	91%	91%	90%	93%	93%
		BATTERY TYP	PES	Lead Acid or li-	ion				1
		FUSE (INTERNAL)		40A*2	40A*1	10A*2	40A*2	40A*1	10A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	5	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	ř			12.5±0.3Vdc		50±1Vdc	12.5±0.3Vdc		50±1Vdc
	DC INPUT	RESTART ALARM		15.5±0.3Vdc		62±1Vdc	15.5±0.3Vdc		62±1Vdc
NO.	ă	HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc		66±1Vdc
Ε			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARIT		By internal fuse		00=1700	10 = 0.0 v u o	00 = 0.0 v 00	00=1700
#		OVER TEMPE		,	: Shut down o/p	voltane re-nowe	r on to recover		
	_	OUTPUT SHO			: Shut down o/p				
	AC OUTPUT	0011013110	N1		d for 180 sec., 1				
	50	OVER LOAD (	Typ.)		: Shut down o/p				
	AC	GFCI PROCTE	ECTION	Design refer to		None	i on to recover		
FUNC	TION	REMOTE CON		Power ON-OFF			contact connect	or (by RELAY)	
		WORK TEMP.	•	•	efer to "Derating				
		WORK TEMP.	IMIDITY	20 ~ 90% RH n		oui+0 )			
ENVIENT			MP., HUMIDITY		on-condensing 22 ~ +158°F, 10 ~	95% RH non oo	ndensing		
mLN I		VIBRATION	WIF., AUWIDII I						
					3 10min./1cycle,		-	in Mil LIDD	V 247E (25°C)
OT!!		MTBF		281.3K hrs min		(15K-332 (Belico	re); 85K hrs m	IIII. MIL-HDB	K-217F (25°C)
OTHE	:K	,							
		PACKING		1.3Kg; 8pcs/ 11	.4Kg/ 1.74CUFT				

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## NTS-750 series

MODE	-,			NTS-750-112	NTS-750-124	NTS-750-148	NTS-750-212	NTS-750-224	NTS-750-248
MODE	EL	AC REGULATION FRONT PANEL LED BAT. VOLTAGE VOLTAGE RANGE (Typ.) DC CURRENT (Typ.) NO LOAD DISSPATION (Typ.) OFF MODE CURRENT DRAW EFFICIENCY (Typ.) BATTERY TYPES FUSE (INTERNAL) LOW SHUTDOWN RESTART ALARM HIGH BAT. POLARITY OVER TEMPERATURE OUTPUT SHORT OVER LOAD (Typ.) GFCI PROCTECTION  REMOTE CONTROL DRY CONTACT WORK TEMP.		= US, GFCI	, UN		☐ = EU, CN, A	U, UK, UN	
		RATED POWE	R(Continuous)	750W					
		OVER RATED	POWER(3 Min.)	862.5W					
		PEAK POWER	RRATED POWER(3 Min.)  AK POWER(10 Sec.)  RGE POWER(30 Cycles)  VOLTAGE  QUENCY  VEFORM Note  REGULATION  INT PANEL LED  VOLTAGE  TAGE RANGE (Typ.)  CURRENT (Typ.)  LOAD NON-SAVING MODE  MODE CURRENT DRAW  ICIENCY (Typ.) Note  TERY TYPES  RE (INTERNAL)  ALARM  SHUTDOWN  RESTART  CONTACT  RK TEMP  RKING HUMIDITY  RRAGE TEMP., HUMIDITY  RRAGE TEMP, HUMIDITY	1125W					
		SURGE POWE	ER RATED POWER(3 Min.)  AK POWER(10 Sec.)  RGE POWER(30 Cycles)  VOLTAGE  EQUENCY  INVEFORM Note.  REGULATION ONT PANEL LED T. VOLTAGE  LTAGE RANGE (Typ.) CURRENT (Typ.) INVERTOR NON-SAVING MODE  SEPATION SAVING MODE  F MODE CURRENT DRAW FICIENCY (Typ.) Note.  TTERY TYPES  SE (INTERNAL)  W SHUTDOWN RESTART ALARM SHUTDOWN	1500W					
		AC VOLTAGE		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	PUT	AO VOLIAGE			/ 120Vac selecta	•		/ 240Vac selecta	•
		FREQUENCY			set at 60±0.1Hz	!		set at 50Hz±0.1	Hz
					able by DIP S.W		50/60Hz select	able by DIP S.W	
				True sine wave	, ,				
				±3.0% at rate					
					section 3.4 of ins	1			
				12V	24V	48V	12V	24V	48V
				10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
				75A	38A	19A	75A	38A	19A
			NON-SAVING MODE	10W	10W	12W	10W	10W	12W
INPU	T		SAVING MODE		≦1.2W ~ 1.5W by	models @ auto dete	ec AC output load≦	10W will be chang	ed to saving mode
		OVER RATED POWER(3 Min.) PEAK POWER(10 Sec.) SURGE POWER(30 Cycles) AC VOLTAGE  FREQUENCY WAVEFORM Note AC REGULATION FRONT PANEL LED BAT. VOLTAGE VOLTAGE RANGE (Typ.) DC CURRENT (Typ.) NO LOAD INSPATION (Typ.) OFF MODE CURRENT DRAW EFFICIENCY (Typ.) Note BATTERY TYPES FUSE (INTERNAL) LOW SHUTDOWN RESTART ALARM HIGH SHUTDOWN RESTART OVER LOAD (Typ.) GFCI PROCTECTION  REMOTE CONTROL DRY CONTACT WORK TEMP. WORKING HUMIDITY VIBRATION		1.2W	1.4W	1.5W	1.2W	1.4W	1.5W
		OFF MODE C	JRRENT DRAW	≦1mA					
		EFFICIENCY (	Typ.) Note.1	89%	90%	91%	91%	93%	93%
		BATTERY TYP	PES	Lead Acid or li-	ion				
		FUSE (INTERI	NAL)	40A*3	40A*2	25A*2	40A*3	40A*2	25A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	_	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	DC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
_	2		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
ē		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
22			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARI	гү	By internal fuse	e open				
ш		OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	5	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	AC OUTPUT	OVERLOSS	T )	105 ~ 115% loa	ad for 180 sec., 11	15% ~ 150% load	for 10 sec.		
	100	OVER LOAD (	iyp.)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	Ă	GFCI PROCTE	ECTION	UL458 (Only fo AC socket , by		None			
FUNC	CTION			Open : Normal	remote control b work; Short: Re ller sold separate	mote off		or (by RELAY)	
		WORK TEMP.		-25 ~ +70°C (Re	efer to "Derating of	curve")			
ENVII	RON-	WORKING HU	MIDITY	20 ~ 90% RH n	on-condensing				
MENT		STORAGE TE	MP., HUMIDITY	-30 ~ +70°C / -:	22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION		10 ~ 500Hz, 30	G 10min./1cycle,	60min. each ald	ng X, Y, Z axes		
		MTBF		238.6K hrs min	n. Telcordia TR	R/SR-332 (Bellco	re); 78K hrs m	nin. MIL-HDBK	(-217F (25°C)
ОТНЕ	R	DIMENSION		270*158*67mm		,			
					0.2Kg/ 1.77CUFT				
				J. 1					

## NTS-1200 series

MODEL	-								NTS-1200-248
				= US, GFCI,	UN		☐ = EU, CN, A	U, UK, UN	
		RATED POWE	R(Continuous)	1200W					
		OVER RATED	POWER(3 Min.)	1380W					
		PEAK POWER	R(10 Sec.)	1800W					
		SURGE POWE	R(30 Cycles)	2000W					
		40.1/01.74.05		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTPU	JT	AC VOLTAGE		100 / 110 / 115	/ 120Vac selecta	ble by DIP S.W	200 / 220 / 230	/ 240Vac select	able by DIP S.W
		FREQUENCY		Default setting	set at 60 ± 0.1Hz		Default setting	set at 50Hz $\pm$ 0.	1Hz
				50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W	'
		WAVEFORM	Note.1	True sine wave	(THD<3%)				
		AC REGULAT	ION	±3.0% at rated	d input voltage				
		FRONT PANE	L LED	Please refer to	section 3.4 of ins	tallation manual			
		BAT. VOLTAG	E	12V	24V	48V	12V	24V	48V
		VOLTAGE RA	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	120A	60A	30A	120A	60A	30A
		NO LOAD	NON-SAVING MODE	15W			25W		
INPUT		DISSPATION	SAVING MODE	Default disable	, auto detec AC	output load ≦10	W will be change	d to saving mode	е
		(Typ.)	OATING MODE	1.2W	1.4W	1.5W	1.2W	1.4W	1.5W
		OFF MODE CU	JRRENT DRAW	≦1mA					
		EFFICIENCY (	Typ.) Note.1	89%	90%	91%	90%	92%	93%
		BATTERY TYP	PES	Lead Acid or li-i	ion				
		FUSE (INTER	NAL)	40A*4	40A*2	25A*2	40A*4	40A*2	25A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	.	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	OC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
	2		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
N O		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
E			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARIT	ſΥ	By internal fuse	open				
8		OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	_	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	АС ООТРОТ	OVERLOAR	Tom \	105 ~ 115% loa	d for 180 sec., 11	15% ~ 150% load	for 10 sec.		
	30	OVER LOAD (	ryp.)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	¥	CIRCUIT BRE	AKER	15A			10A		
		GFCI PROCTE	CTION	UL458 (Only for *	'GFCI" AC socket)	None			
		DEMOTE 001		Power ON-OFF	remote control b	y front panel dry	contact connecto	or (by RELAY)	
FUNCT	ION	REMOTE CON DRY CONTAC			work ; Short : Re				
		DICT CONTAC	•	Remote control	ler sold separate	ly, Order No.: IR	C1,IRC2,IRC3		
		WORK TEMP.		-25 ~ +70°C (Re	efer to "Derating of	curve")			
ENVIRO	ON-	WORKING HU	MIDITY	20 ~ 90% RH n	on-condensing				
MENT		STORAGE TE	MP., HUMIDITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION		10 ~ 500Hz, 30	3 10min./1cycle,	60min. each ald	ng X, Y, Z axes		
		MTBF		198.9K hrs min	. Telcordia TR	SR-332 (Bellco	re); 62.0K hrs	min. MIL-HD	BK-217F (25°C)
OTHER	₹	DIMENSION		333*184*70mm	n (L*W*H)				
		PACKING		3.3Kg; 2pcs/ 7.	6Kg/ 1.16CUFT				

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## NTS-1700 series

MODE	=1			NTS-1700-112	NTS-1700-124	NTS-1700-148	NTS-1700-212	NTS-1700-224	NTS-1700-248
MIODE				= US, GFCI,	UN		☐ = EU, CN, A	U, UK, UN	
		RATED POWE	R(Continuous)	1500W			1700W		
		OVER RATED	POWER(3 Min.)	1750W			2000W		
		PEAK POWER	(10 Sec.)	2250W			2550W		
		SURGE POWE	R(30 Cycles)	3000W			3400W		
		AC VOLTAGE		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	TU	AC VOLIAGE		100 / 110 / 115	/ 120Vac selecta	ible by DIP S.W	200 / 220 / 230	/ 240Vac selecta	able by DIP S.W
		FREQUENCY		Ü	set at 60 ± 0.1Hz	!		set at 50Hz±0.	lHz
					able by DIP S.W		50/60Hz select	able by DIP S.W	
		WAVEFORM	Note.1	True sine wave	(THD<3%)				
		AC REGULATI	ON	±3.0% at rate					
		FRONT PANEI	L LED	Please refer to	section 3.4 of ins	tallation manual			
		BAT. VOLTAGI	E	12V	24V	48V	12V	24V	48V
		VOLTAGE RAI	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	150A	75A	37.5A	170A	85A	42.5A
		NO LOAD		Default disable	e, ≦1.2W ~1.5V	/ by models @ ar	uto detect AC ou	tput load≦10W	will be
INPU	Т		SAVING MODE	changed to say	ing mode				
		(Typ.)		1.2W	1.4W	1.5W	1.2W	1.4W	1.5W
		OFF MODE CU	JRRENT DRAW	≦1mA					
		EFFICIENCY (	Typ.) Note.1	89%	90%	91%	90%	92%	93%
		BATTERY TYP	ES	Lead Acid or li-	ion				
		FUSE (INTERNAL)		40A*5	30A*3	30A*2	40A*5	30A*3	30A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	_	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
	OC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
	2		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
N O		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
E			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARIT	Υ	By internal fuse	open				
#		OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	=	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	AC OUTPUT	OVERLOAD	Tun )	105 ~ 115% loa	d for 180 sec., 1	15% ~ 150% load	for 10 sec.		
	SOL	OVER LOAD (	134-)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	Ā	CIRCUIT BREA	AKER(GFCI)	15A			10A		
		GFCI PROCTE	CTION	UL458 (Only for '	'GFCI" AC socket)	None			
FUNC	TION	REMOTE CON		Open : Normal	work ; Short : Re	by front panel dry mote off ely, Order No.: IR0		or (by RELAY)	
		WORK TEMP.			efer to "Derating		· · · · · · · · · · · · · · · · · · ·		
ENVII	DON:	WORKING HU	MIDITY	20 ~ 90% RH n		/			
MENT			MP., HUMIDITY			95% RH non-co	ndensina		
		VIBRATION	,			60min. each ald	-		
		MTBF		475.5K hrs min		R/SR-332 (Bellco		min MIL. HDI	BK-217F (25°C)
OTHE	R	DIMENSION		475.5K IIIS IIIIII 400*184*70mm		1011-002 (DEIICO	10), 70.ZKIIIS	WIL-11U	DIN-Z111 (ZJ ∪)
31116		PACKING			2Kg/ 1.76CUFT				
		. AUMINO		oong, 2pc3/ 1	g, 100011				

## NTS-2200 series

MODE	=1			NTS-2200-112	NTS-2200-124	NTS-2200-148	NTS-2200-212	NTS-2200-224	NTS-2200-248		
WODE				= US, GFCI,	UN		☐ = EU, CN, A	U, UK, UN			
		RATED POWE	R(Continuous)	2200W							
		OVER RATED	POWER(3 Min.)	2530W							
		PEAK POWER	R(10 Sec.)	2750W							
		SURGE POWE	R(30 Cycles)	4400W							
		AC VOLTACE		Default setting	set at 110VAC		Default setting	set at 230VAC			
OUTP	UT	AC VOLTAGE		100 / 110 / 115	/ 120Vac selecta	able by DIP S.W	200 / 220 / 230	/ 240Vac select	able by DIP S.W		
		FREQUENCY		Default setting	set at 60 ± 0.1Hz	<u>'</u>	Default setting	set at 50Hz $\pm$ 0.	1Hz		
		TREGUENCT		50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W	'		
		WAVEFORM	Note.1	True sine wave	(THD<3%)						
		AC REGULAT	ION	±3.0% at rated	d input voltage						
		FRONT PANE	L LED	Please refer to	section 3.4 of ins	stallation manual					
		BAT. VOLTAG	E	12V	24V	48V	12V	24V	48V		
		VOLTAGE RA	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc		
		DC CURRENT	(Typ.)	220A	220A 110A 55A 220A 110A 55A						
INPU <sup>1</sup>	Т	NO LOAD DISSPATION	SAVING MODE	Default disable	, auto detec AC	output load ≦10	W will be change	d to saving mode	e		
		(Typ.)		1.2W	1.4W	1.5W	1.2W	1.4W	1.5W		
		OFF MODE CU	JRRENT DRAW	≦1mA							
		EFFICIENCY (	Typ.) Note.1	89%	91%	92%	90%	92%	93%		
		BATTERY TYP	PES	Lead Acid or li-i	ion						
		FUSE (INTERI	NAL)	40A*5	30A*3	30A*2	40A*5	30A*3	30A*2		
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc		
		LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc		
	DC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc		
	<u>≥</u>		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc		
z	Δ	HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc		
Ĕ			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc		
PROTECTION		BAT. POLARIT	ſΥ	By internal fuse open							
H.		OVER TEMPE	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover				
	-	OUTPUT SHO	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover				
	AC OUTPUT			105 ~ 115% loa	d for 180 sec., 1	15% ~ 150% load	for 10 sec.				
	.no	OVER LOAD (	Typ.)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover				
	AC	CIRCUIT BRE	AKER(GFCI)	TBD		0 . 1					
		GFCI PROCTE	, ,	UL458 (Only for °	'GFCI" AC socket)	None					
FUNC	TION	REMOTE CON DRY CONTAC		Power ON-OFF Open : Normal	remote control t work ; Short : Re	by front panel dry		or (by RELAY)			
		WORK TEMP.		-20 ~ +70°C (Re	efer to "Derating	curve")					
ENVIE	RON-	WORKING HU	MIDITY	20 ~ 90% RH ne							
MENT		STORAGE TE	MP., HUMIDITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-co	ndensing				
		VIBRATION				60min. each ald					
		MTBF		TBD							
OTHE	R	DIMENSION		400*270*98mm	n (L*W*H)						
		PACKING		TBD	, 7						

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## NTS-3200 series

MODE	=1			NTS-3200-112	NTS-3200-124	NTS-3200-148	NTS-3200-212	NTS-3200-224	NTS-3200-248
III O D L				= US, GFCI,	, UN		= EU, CN, A	U, UK, UN	
		RATED POWE	R(Continuous)	3200W			3200W		
		OVER RATED	POWER(3 Min.)	3500W			3680W		
		PEAK POWER	(10 Sec.)	4500W			4800W		
		SURGE POWE	R(30 Cycles)	6000W			6400W		
		AC VOLTAGE		Default setting	set at 110VAC		Default setting	set at 230VAC	
OUTP	TU	AO VOLIAGE		100 / 110 / 115	/ 120Vac selecta	ible by DIP S.W	200 / 220 / 230	/ 240Vac select	able by DIP S.W
		FREQUENCY			set at 60±0.1Hz	!		set at 50Hz±0.	
					able by DIP S.W		50/60Hz select	able by DIP S.W	
		WAVEFORM	Note.1		,				
		AC REGULATI	ON	±3.0% at rate					
		FRONT PANEL		Please refer to	section 3.4 of ins				
		BAT. VOLTAGE		12V	24V	48V	12V	24V	48V
		VOLTAGE RAN	NGE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
		DC CURRENT	(Typ.)	300A	150A	75A	320A	160A	80A
INPU1	Т	NO LOAD DISSPATION	SAVING MODE	Default disable	, auto detec AC	output load ≦10	W will be change	d to saving mode	•
		(Typ.)		1.2W	1.4W	1.5W	1.2W	1.4W	1.5W
		OFF MODE CU	IRRENT DRAW	≦1mA					
		EFFICIENCY (	Typ.) Note.1	89%	91%	92%	90%	92%	93%
		BATTERY TYP	ES	Lead Acid or li-	ion				
		FUSE (INTERNAL)		40A*5	30A*3	30A*2	40A*5	30A*3	30A*2
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
	DCINPUT	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
			RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
	≥ 5		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
N O	۵	HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
Ë			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc
PROTECTION		BAT. POLARIT	Υ	By internal fuse	open				
Ж.		OVER TEMPER	RATURE	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	-	OUTPUT SHOP	RT	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	AC OUTPUT	OVED : O . C	E \	105 ~ 115% loa	id for 180 sec., 1	15% ~ 150% load	for 10 sec.		
	9	OVER LOAD (1	iyp.)	Protection type	: Shut down o/p	voltage, re-powe	r on to recover		
	AC	CIRCUIT BREA	AKER(GFCI)	TBD					
		GFCI PROCTE	CTION	UL458 (Only for '	"GFCI" AC socket)	None			
FUNC	TION	REMOTE CON'		Open : Normal	work ; Short : Re	oy front panel dry mote off ely, Order No.: IR0		or (by RELAY)	
		WORK TEMP.		-20 ~ +70°C (Re	efer to "Derating	curve")			
ENVIE	PON-	WORKING HUI	MIDITY	20 ~ 90% RH n		,			
MENT		STORAGE TEN	MP., HUMIDITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-co	ndensing		
		VIBRATION				60min. each ald			
		MTBF		TBD	,		<u> </u>		
OTHE	R	DIMENSION		440*270*98mm (L*W*H)					
		PACKING		TBD	, ,				
				.55					

## NTU-1200 series (Built-in UPS function)

ontinuous) VER(3 Min.) Sec.) 0 Cycles)  Note.1  D  (Typ.) D.) I-SAVING MODE VING MODE ENT DRAW ) Note.1	Default setting 50/60Hz select True sine wave ±3.0% at rater Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	set at 110VAC /120Vac selecta set at 60±0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins	tallation manual 48V 40 ~ 66Vdc	Default setting 50/60Hz selected 12V	set at 230VAC	
VER(3 Min.) Sec.) 0 Cycles) Note.1 D (Typ.) D.) I-SAVING MODE VING MODE	1380W 1800W 2000W Default setting 100 / 110 / 115 Default setting 50/60Hz select True sine wave ± 3.0% at rater Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	/ 120Vac selecta set at 60 ± 0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	200 / 220 / 230 Default setting 50/60Hz selecte	/ 240Vac select set at 50Hz±0. able by DIP S.W	1Hz
Sec.)  0 Cycles)  Note.1  D  (Typ.)  D.)  I-SAVING MODE  VING MODE  ENT DRAW	1800W 2000W Default setting 100 / 110 / 115 Default setting 50/60Hz select True sine wave ±3.0% at rate Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	/ 120Vac selecta set at 60 ± 0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	200 / 220 / 230 Default setting 50/60Hz selecte	/ 240Vac select set at 50Hz±0. able by DIP S.W	1Hz
Note.1  D  (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	2000W Default setting 100 / 110 / 115 Default setting 50/60Hz select True sine wave ± 3.0% at rater Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	/ 120Vac selecta set at 60 ± 0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	200 / 220 / 230 Default setting 50/60Hz selecte	/ 240Vac select set at 50Hz±0. able by DIP S.W	1Hz
Note.1  D (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	Default setting 100 / 110 / 115 Default setting 50/60Hz select True sine wave ±3.0% at rate Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	/ 120Vac selecta set at 60 ± 0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	200 / 220 / 230 Default setting 50/60Hz selecte	/ 240Vac select set at 50Hz±0. able by DIP S.W	1Hz
D (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	100 / 110 / 115 Default setting 50/60Hz select True sine wave ±3.0% at rater Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	/ 120Vac selecta set at 60 ± 0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	200 / 220 / 230 Default setting 50/60Hz selecte	/ 240Vac select set at 50Hz±0. able by DIP S.W	1Hz
D (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	Default setting 50/60Hz select True sine wave ±3.0% at rater Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	set at 60±0.1Hz able by DIP S.W (THD<3%) d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	tallation manual 48V 40 ~ 66Vdc	Default setting 50/60Hz selected 12V	set at 50Hz±0.1 able by DIP S.W	1Hz
D (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	True sine wave ±3.0% at rate Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	48V 40 ~ 66Vdc	12V	·	
D (Typ.) b.) I-SAVING MODE VING MODE ENT DRAW	±3.0% at rate Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	d input voltage section 3.4 of ins 24V 20 ~ 33Vdc	48V 40 ~ 66Vdc		241/	
(Typ.) p.) I-SAVING MODE VING MODE	Please refer to 12V 10 ~ 16.5Vdc 120A 15W Default disable	section 3.4 of ins 24V 20 ~ 33Vdc	48V 40 ~ 66Vdc		241/	
(Typ.) p.) I-SAVING MODE VING MODE	12V 10 ~ 16.5Vdc 120A 15W Default disable	24V 20 ~ 33Vdc	48V 40 ~ 66Vdc		241/	
o.) I-SAVING MODE VING MODE ENT DRAW	10 ~ 16.5Vdc 120A 15W Default disable		40 ~ 66Vdc			48V
o.) I-SAVING MODE VING MODE ENT DRAW	120A 15W Default disable			10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc
I-SAVING MODE I'ING MODE ENT DRAW	15W Default disable	007	30A	120A	60A	30A
ING MODE	Default disable		50/1	25W	50/1	30/1
ENT DRAW		auto detoc AC	output load < 10)		d to saving mode	
	<8W	, auto detec AC	output load = 101	will be change	u to saving mode	į.
Note 1	≦1mA					
/ Note.1	89%	90%	91%	90%	92%	93%
	Lead Acid or li-	ion				
	40A*4	40A*2	25A*2	40A*4	40A*2	25A*2
LARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc
HUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc
ESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc
LARM	15.5±0.3Vdc		62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc
RESTART ALARM HIGH SHUTDOWN			66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc
			60±1Vdc			
	By internal fuse	By internal fuse open				
URE	Protection type : Shut down o/p voltage, re-power on to recover					
	Protection type: Shut down o/p voltage, re-power on to recover					
	105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.					
)	Protection type	: Shut down o/p	voltage, re-power	on to recover		
R	15A			10A		
ON	UL458 (Only for	"GFCI" AC socket)	None			
CONNECTOR	Power ON-OFF	remote control b	y front panel dry	contact connecto	or (by RELAY)	
ACCESSORY				1.IRC2.IRC3		
					10Vac±16%, re	cover±13%
IGE	45 ~ 65Hz					
yp.)	10ms inverter	- AC by pa	SS			
	-25 ~ +70°C (Re	efer to "Derating of	curve")			
ITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-cor	ndensing		
				-	min. MIL-HD	BK-217F (25°C)
	333*184*70mm (L*W*H)					
OUTPUT SHORT  OVER LOAD (Typ.)  CIRCUIT BREAKER GFCI PROCTECTION  REMOTE CONTROL  ACCESSORY  AC INPUT RANGE FREQUENCY RANGE TRASFER TIME (Typ.)  WORK TEMP. WORKING HUMIDITY VIBRATION  MTBF DIMENSION		Open: Normal ACCESSORY  Remote contro  100/110/115/12  IGE	CONNECTOR  Open: Normal work; Short: Re  ACCESSORY  Remote controller sold separate  100/110/115/120Vac±16%, rec  IGE  45 ~ 65Hz  yp.)  10ms inverter → AC by par  -25 ~ +70°C (Refer to "Derating of the controller)  TY  20 ~ 90% RH non-condensing  HUMIDITY  -30 ~ +70°C / -22 ~ +158°F, 10 ~ 10 ~ 500Hz, 3G 10min./1cycle,  166.3K hrs min. Telcordia TR  333*184*70mm (L*W*H)	CONNECTOR  Open: Normal work; Short: Remote off  ACCESSORY  Remote controller sold separately, Order No.: IRC  100/110/115/120Vac±16%, recover±13%  IGE  45 ~ 65Hz  yp.)  10ms inverter ——————————————————————————————————	CONNECTOR         Open : Normal work; Short : Remote off           ACCESSORY         Remote controller sold separately, Order No.: IRC1,IRC2,IRC3           100/110/115/120Vac±16%, recover±13%         200/220/230/24           IGE         45 ~ 65Hz           yp.)         10ms inverter —— AC by pass           -25 ~ +70°C (Refer to "Derating curve")           ITY         20 ~ 90% RH non-condensing           HUMIDITY         -30 ~ +70°C / -22 ~ +158°F, 10 ~ 95% RH non-condensing           10 ~ 500Hz, 3G 10min./1cycle, 60min.each along X, Y, Z axes           166.3K hrs min.         Telcordia TR/SR-332 (Bellcore); 58.3K hrs           333*184*70mm (L*W*H)	ACCESSORY Remote controller sold separately, Order No.: IRC1,IRC2,IRC3  100/110/115/120Vac±16%, recover±13% 200/220/230/240Vac±16%, recover±13% 100 recover±16%, recover±13% 200/220/230/240Vac±16%, recover±13% 2

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# NTU-1700 series (Built-in UPS function)

MODI	F1		`	NTU-1700-112	NTU-1700-124	NTU-1700-148	NTU-1700-212	NTU-1700-224	NTU-1700-248	
MODI	CL.			= US, GFCI	UN		☐ = EU, CN, A	= EU, CN, AU, UK, UN		
		RATED POWER	(Continuous)	1500W			1700W			
		OVER RATED POWER(3 Min.)		1750W			2000W			
		PEAK POWER(10 Sec.)		2250W			2550W			
		SURGE POWER(30 Cycles)		3000W			3400W			
		AC VOLTAGE		Default setting			Default setting			
OUTF	וטי				/ 120Vac selecta	*			able by DIP S.W	
		FREQUENCY			set at 60±0.1Hz able by DIP S.W	<u>'</u>		set at 50Hz±0. able by DIP S.W		
		WAVEFORM	Note.1	True sine wave	(THD<3%)					
		AC REGULATIO	N	±3.0% at rate	d input voltage					
		FRONT PANEL	LED	Please refer to	section 3.4 of ins	stallation manual				
	BAT. VOLTAGE		12V	24V	48V	12V	24V	48V		
		VOLTAGE RAN	GE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	
		DC CURRENT (	Тур.)	150A	75A	37.5A	170A	85A	42.5A	
INPU	Т	POWER SAVING MODE		≦1.2W@standl	by saving, mode w	hen AC output loa	id ≦10W, auto wa	ike up when AC or	utput load ≥15W	
		OFF MODE CURRENT DRAW		≦1mA						
		EFFICIENCY (Typ.) Note.1		89%	90%	91%	90%	92%	93%	
		BATTERY TYPES		Lead Acid or li-	ion					
		FUSE (INTERNA	AL)	40A*5	30A*3	30A*2	40A*5	30A*3	30A*2	
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc	
	_	LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc	
	<u> </u>		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	
	DC INPUT		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	
N <sub>O</sub>		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	
Ë			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc	
PROTECTION		BAT. POLARITY		By internal fuse open						
8		OVER TEMPER	ATURE	Protection type: Shut down o/p voltage, re-power on to recover						
	=	OUTPUT SHOR	Т	Protection type : Shut down o/p voltage, re-power on to recover						
	AC OUTPUT	OVER LOAD (T	ın )	105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.						
	100	OVER LOAD (1)	yp.)	Protection type : Shut down o/p voltage, re-power on to recover						
	₹	CIRCUIT BREA	KER(GFCI)	15A			10A			
		GFCI PROCTEO	TION	UL458 (Only for	"GFCI" AC socket)	None				
FIINC	CTION	REMOTE	CONNECTOR		remote control b work; Short: Re	by front panel dry mote off	contact connecte	or (by RELAY)		
1 0140	JIION	CONTROL	ACCESSORY			ely, Order No.: IR	C1.IRC2.IRC3			
		AC INPUT RANG			20Vac±16%, red			40Vac±16%, re	cover±13%	
AC U		FREQUENCY F		45 ~ 65Hz						
MOD	E	TRASFER TIME			AC by pa	SS				
		WORK TEMP.	,		efer to "Derating					
ENIV!	RON-	WORKING HUN	IIDITY	20 ~ 90% RH n		,				
MEN		STORAGE TEM			ŭ	95% RH non-co	ndensing			
		VIBRATION	,			, 60min. each ald				
		MTBF		421.9K hrs min	•	R/SR-332 (Bellco		min. MIL-HD	BK-217F (25°C)	
ОТНЕ	ER.	DIMENSION		400*184*70mm			, ,		(20 0)	
		PACKING			2Kg/ 1.76CUFT					
PACKING			J 31 1							

## NTU-2200 series (Built-in UPS function)

MODE	:1			NTU-2200-112	NTU-2200-124	NTU-2200-148	NTU-2200-212	NTU-2200-224	NTU-2200-248	
WIODL				= US, GFCI	, UN		☐ = EU, CN, A	U, UK, UN		
		RATED POWER	(Continuous)	2200W						
		OVER RATED POWER(3 Min.)		2530W						
		PEAK POWER(10 Sec.)		2750W						
		SURGE POWER(30 Cycles)		4400W						
		AC VOLTAGE		Default setting			Default setting set at 230VAC			
OUTP	UI			100 / 110 / 115 / 120Vac selectable by DIP S.W 200 / 220 / 230 / 240Vac selectable by DIP S.V					•	
		FREQUENCY			set at 60 ± 0.1Hz	!		set at 50Hz±0.1	IHz	
		WAVEFORM	N 4	True sine wave	able by DIP S.W		30/00HZ Select	able by DIP S.W		
		AC REGULATIO		±3.0% at rate	, ,					
				section 3.4 of ins	tallation manual					
		BAT. VOLTAGE	LED	12V	24V	48V	12V	24V	48V	
		VOLTAGE RANG	GE (Typ.)	10 ~ 16.5Vdc		40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	
			, ,	220A	110A	55A	220A	110A	55A	
	DC CURRENT (Typ.) POWER SAVING MODE			by saving, mode w						
INPUT	Ī	OFF MODE CURRENT DRAW		≡1.2W@stand	by saving, mode w	nen Ao output loa	u ≡ 1011, auto wa	ke up when Ao oc	itput load = 1544	
				89%	91%	92%	90%	92%	93%	
		EFFICIENCY (Typ.) Note.1 BATTERY TYPES		Lead Acid or li-		0270	0070	0270	0070	
		FUSE (INTERNA		40A*5	30A*3	30A*2	40A*5	30A*3	30A*2	
	Τņ	1 GOL (IIVI LIKIV)	ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc	
		LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc		40±1Vdc	
		-0	RESTART	12.5±0.3Vdc		50±1Vdc	12.5±0.3Vdc		50±1Vdc	
	OC INPUT		ALARM	15.5±0.3Vdc		62±1Vdc	15.5±0.3Vdc		62±1Vdc	
z	2	нісн	SHUTDOWN	16.5±0.3Vdc		66±1Vdc	16.5±0.3Vdc		66±1Vdc	
E			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	60±1Vdc	
PROTECTION		BAT. POLARITY		By internal fuse						
PRC		OVER TEMPER		Protection type : Shut down o/p voltage, re-power on to recover						
	_	OUTPUT SHOR		Protection type: Shut down o/p voltage, re-power on to recover						
	АС ООТРОТ			105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.						
	9	OVER LOAD (Ty	/p.)	Protection type : Shut down o/p voltage, re-power on to recover						
	AC	CIRCUIT BREAK	KER(GFCI)	TBD		3.,				
		GFCI PROCTEC	TION	UL458 (Only for "GFCI" AC socket) None						
				Power ON-OFF remote control by front panel dry contact connector (by RELAY)						
FUNC	TION	REMOTE CONTROL	CONNECTOR	Open : Normal	work; Short: Re	mote off				
		CONTROL	ACCESSORY	Remote control	ller sold separate	ly, Order No.: IR	C1,IRC2,IRC3			
		AC INPUT RANG	E	100/110/115/12	20Vac±25%, red	over±12.5%	200/220/230/24	10Vac±25%, red	cover±12.5%	
AC UF		FREQUENCY R	ANGE	45 ~ 65Hz						
		TRASFER TIME	(Typ.)	10ms inverter - AC by pass						
		WORK TEMP.		-20 ~ +70°C (Re	efer to "Derating of	curve")				
ENVIR		WORKING HUM		20 ~ 90% RH n	Ū					
MENT		STORAGE TEM	P., HUMIDITY		22 ~ +158°F, 10 ~		<u> </u>			
		VIBRATION		10 ~ 500Hz, 30	3 10min./1cycle,	60min. each ald	ng X, Y, Z axes			
		MTBF		TBD						
OTHE	R	DIMENSION		400*270*98mm	1 (L*W*H)					
		PACKING		TBD						

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## NTU-3200 series (Built-in UPS function)

MOD	E1			NTU-3200-112	NTU-3200-124	NTU-3200-148	NTU-3200-212	NTU-3200-224	NTU-3200-248	
WIOD	- L			= US, GFCI,	UN		☐ = EU, CN, A	U, UK, UN		
		RATED POWER	(Continuous)	3200W			3200W			
		OVER RATED P	OWER(3 Min.)	3500W			3680W			
		PEAK POWER(10 Sec.)		4500W			4800W			
		SURGE POWER	URGE POWER(30 Cycles)		6000W 6400W					
				Default setting	set at 110VAC		Default setting	set at 230VAC		
OUTF	PUT	AC VOLTAGE		100 / 110 / 115	/ 120Vac selecta	ble by DIP S.W	200 / 220 / 230	/ 240Vac select	able by DIP S.W	
		FREQUENCY		Default setting	set at 60 ± 0.1Hz		Default setting	set at 50Hz±0.1	1Hz	
		PREGOLNOT		50/60Hz select	able by DIP S.W		50/60Hz select	able by DIP S.W		
		WAVEFORM	Note.1	True sine wave	(THD<3%)					
		AC REGULATIO	N	±3.0% at rate	d input voltage					
		FRONT PANEL I	LED	Please refer to	section 3.4 of ins	tallation manual				
		BAT. VOLTAGE		12V	24V	48V	12V	24V	48V	
		VOLTAGE RANG	GE (Typ.)	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	10 ~ 16.5Vdc	20 ~ 33Vdc	40 ~ 66Vdc	
		DC CURRENT (1	Гур.)	300A	150A	75A	320A	160A	80A	
INPU	Т	POWER SAVING MODE		≤1.2W@standb	y saving, mode w	hen AC output loa	id ≦10W, auto wa	ke up when AC ou	ıtput load ≥15W	
		OFF MODE CURRENT DRAW		≦1mA						
		EFFICIENCY (Typ.) Note.1		89%	91%	92%	90%	92%	93%	
		BATTERY TYPES		Lead Acid or li-i	ion					
		FUSE (INTERNA	L)	40A*5	30A*3	30A*2	40A*5	30A*3	30A*2	
			ALARM	11±0.3Vdc	22±0.5Vdc	44±1Vdc	11±0.3Vdc	22±0.5Vdc	44±1Vdc	
		LOW	SHUTDOWN	10±0.3Vdc	20±0.5Vdc	40±1Vdc	10±0.3Vdc	20±0.5Vdc	40±1Vdc	
	DC INPUT		RESTART	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	12.5±0.3Vdc	25±0.5Vdc	50±1Vdc	
	<u>≥</u>		ALARM	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	15.5±0.3Vdc	31±0.5Vdc	62±1Vdc	
N		HIGH	SHUTDOWN	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	16.5±0.3Vdc	33±0.5Vdc	66±1Vdc	
Ĕ			RESTART	15±0.3Vdc	30±0.5Vdc	60±1Vdc	15±0.3Vdc	30±0.5Vdc	66±1Vdc 60±1Vdc	
PROTECTION		BAT. POLARITY		By internal fuse open						
A.		OVER TEMPERA	ATURE	Protection type: Shut down o/p voltage, re-power on to recover						
	-	OUTPUT SHORT	г	Protection type: Shut down o/p voltage, re-power on to recover						
	AC OUTPUT			105 ~ 115% load for 180 sec., 115% ~ 150% load for 10 sec.						
	.no	OVER LOAD (Ty	rp.)	Protection type: Shut down o/p voltage, re-power on to recover						
	AC	CIRCUIT BREAK	(ER(GFCI)	TBD		3.7				
		GFCI PROCTEC	, ,	UL458 (Only for "GFCI" AC socket) None						
				Power ON-OFF remote control by front panel dry contact connector (by RELAY)						
FUNC	CTION	REMOTE	CONNECTOR		work ; Short : Re			, , ,		
		CONTROL	ACCESSORY	Remote control	ler sold separate	ly, Order No.: IR	C1,IRC2,IRC3			
		AC INPUT RANGI	E	100/110/115/12	.0Vac±25%, rec	over±12.5%	200/220/230/24	40Vac±25%, re	cover±12.5%	
AC U		FREQUENCY R	ANGE	45 ~ 65Hz						
MOD	E	TRASFER TIME	(Typ.)	10ms inverter						
		WORK TEMP.			efer to "Derating of					
FNVI	RON-	WORKING HUM	IDITY	20 ~ 90% RH n						
MEN.		STORAGE TEM	P., HUMIDITY	-30 ~ +70°C / -2	22 ~ +158°F, 10 ~	95% RH non-co	ndensing			
		VIBRATION			3 10min./1cycle,					
		MTBF		TBD						
ОТНЕ	₽R	DIMENSION		440*270*98mm	ı (L*W*H)					
-		PACKING		TBD	, ,					

# 2.4 Safety Overview

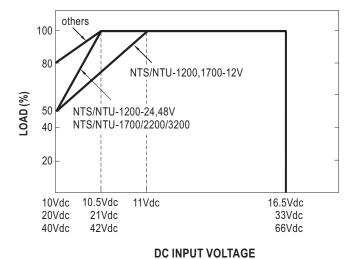
Enclosu	ıre type							
So	ocket type		To To	<b>-1:</b>	0 0	QID		
		TYPE-US	TYPE-GFCI	TYPE-UN	TYPE-EU	TYPE-CN	TYPE-AU	TYPE-UK
		In Stock	By request	In Stock	In Stock	In Stock	By request	By request
		USA	USA	UNIVERSAL	EUROPE	CHINA	AUSTRALIA	U.K
	NTS-300	DEKRA	F©					
	NTS-450		<b>Г</b> ⊌					
	NTS-750	F©	c(ŲL)us					
110Vac	NTS/NTU-1200		(Except for 48V input)	NA	NA	NA	NA	NA
	NTS/NTU-1700		F©					
	NTS/NTU-2200							
	NTS/NTU-3200							
	NTS-300			EAC	DEKRA	DEKRA	DEKRA	DEKRA
	NTS-450			(E <sub>13</sub> )	EAC	ERE	EAC	ERE
	NTS-750				E13)	E13	<b>E</b> 13	E13
220Vac	NTS/NTU-1200	NA	NA		CE	CE		CE
	NTS/NTU-1700				UK	UK	€	UKA
	NTS/NTU-2200				CA	CA	UK	CA
	NTS/NTU-3200						CA	

PCB typ	PCB type						
110Vac	NTS-250P	CP (®					
	NTS-400P	CB F©					
2201/22	NTS-250P	CD III F A CC UK					
220Vac	NTS-400P	CB [¶ €₃ & C€ ĽK					

## 2.5 Derating curve

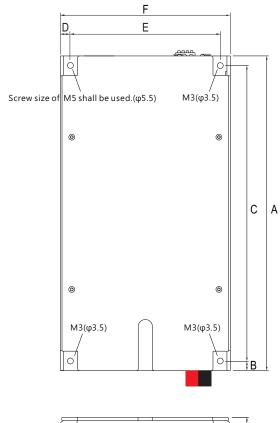
## NTS-300,NTS-450,NTS-750,NTU-1200,NTS-1200,NTU-1700 NTS-1700 NTS-250P/400P,NTS-2200/3200,NTU-2200/3200 100 90 85 80 70 LOAD (%) 50 40 30 20 Natural convection Force air with 25CFM 10 fan for NTS-250P/400P -25 -20 -10 0 10 20 30 35 40 50 60 65 70 (HORIZONTAL)

#### AMBIENT TEMPERATURE (°C)



## 2.6 Mechanical specification

## NTS-250P/400P



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Model	А	В	С	D	Е	F	G
NTS-250P	186	5.7	174.6	5.95	88.6	100.5	32
NTS-400P	186	5.7	174.6	5.95	88.6	100.5	32

Unit:mm

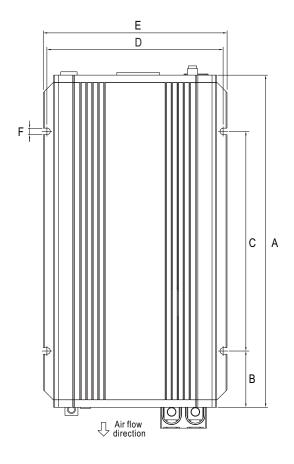
## NTS-300/450/750

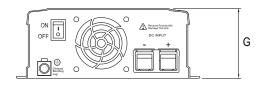
# Ε D G NTS-300 G NTS-450 G Air flow direction NTS-750

Model	А	В	С	D	Е	F	G
NTS-300	210	45	120	119	130	7	55
NTS-450	210	45	120	119	130	7	55
NTS-750	270	45	180	147	158	7	67

Unit:mm

## NTS/NTU-1200/1700

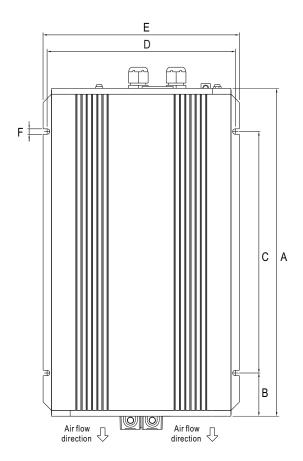


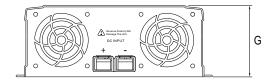


Model	А	В	С	D	Е	F	G
NTS/NTU-1200	333	56.5	220	173	184	7	70
NTS/NTU-1700	400	62.5	275	173	184	7	70

Unit:mm

## NTS/NTU-2200/3200



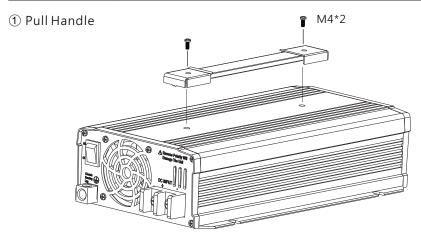


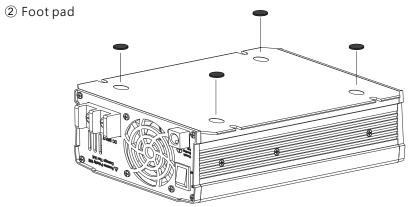
Model	А	В	С	D	Е	F	G
NTS/NTU-2200	400	TBD	TBD	259	270	7.5	98
NTS/NTU-3200	440	TBD	TBD	259	270	7.5	98

Unit:mm

# Accessories(Optional)

MW's Order No.		ltem	Quantity
RJ11-RS232			1
	1	Pull Handle	1
Carry Handle	2	Foot pad	4
	3	Screw	2





## 3.Installation & Wiring

#### 3.1 Precautions

- The unit should be mounted on a flat surface or holding rack with suitable strength.
- In order to ensure the lifespan of the unit, you should refrain from operating the unit in environment of high dust or moisture.
- NTS-450~3200/NTU-1200~3200 are design with built-in DC fan. Please make sure the ventilation is not blocked. We recommend that there should be no barriers within 15cm of the ventilating slits, which is shown as follow.

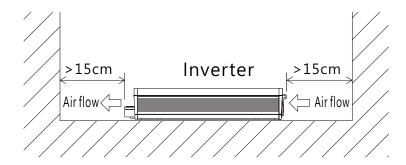


Figure 3-1 set-up recommendation

## 3.2 System Block Diagram

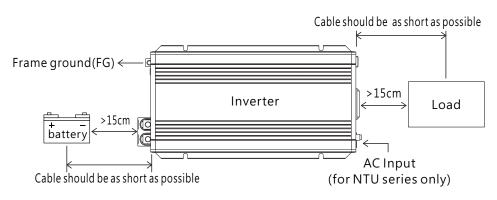


Figure 3-2 System Block Diagram

## 3.3 Installation procedures

- 1 Please turn off the inverter first.
- 2 Select proper cable for connection between battery and inverter by referring to section 3.4
- 3 Connect the positive polarity of battery to the positive terminal of inverter, and connect the negative polarity of battery to the negative terminal of inverter.



4 Turn the power switch to "ON" position, as soon as it shows green in status's LED, then it's ready.

#### 3.4 Cable selection

Wire connections should be as short as possible and less than 1.5 meter is highly recommended. Make sure that suitable wires are chosen based on safety requirement and rating of current. Small cross section will result in lower efficiency, less output power and the wires may also become overheated and cause danger. Please refer to table 3-1.

Rated current(A)	Corss section(mm²)	AWG
10A ~ 13A	1.25	16
13A ~ 16A	1.5	14
16A ~ 25A	2.5	12
25A ~ 32A	4	10
32A ~ 40A	6	8
40A ~ 63A	10	6
63A ~ 80A	16	4
80A ~ 100A	25	2
100A ~ 125A	35	1
125A ~ 160A	50	0

Table 3-1 Cable recommendiation

## 3.5 Battery selection

Battery types: Lead acid or lithium ion batteries

Voltage range: 10~16.5Vdc (12V), 20~33Vdc (24V), 40~66Vdc (48V)

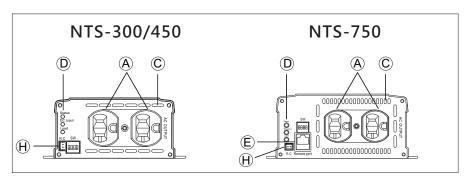
Battery capacity: Please refer to the following table.

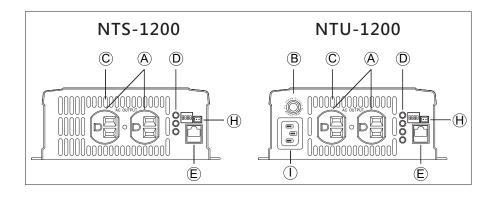
Model/Output	112	212	124	224	148	248	
NTS-250P	85Ah or above		45Ah d	45Ah or above		25Ah or above	
NTS-300	100Ah	or above	50Ah d	or above	30Ah c	rabove	
NTS-400P	150Ah or above		70Ah or above		35Ah c	rabove	
NTS-450	170Ah or above		85Ah or above		45Ah or above		
NTS-750	250Ah or above		130Ah or above		65Ah or above		
NTS/NTU-1200	400Ah or above		200Ah or above		100Ah or above		
NTS/NTU-1700	500Ah or above		250Ah or above		125Ah or above		
NTS/NTU-2200	735Ah or above		370Ah or above		185Ah or above		
NTS/NTU-3200	1000Ah	or above	500Ah or above		250Ah or above		

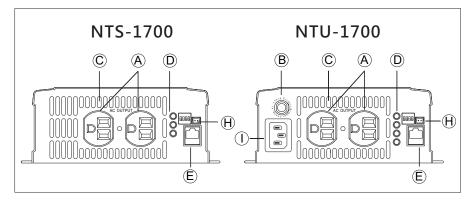
#### 4. User Interface

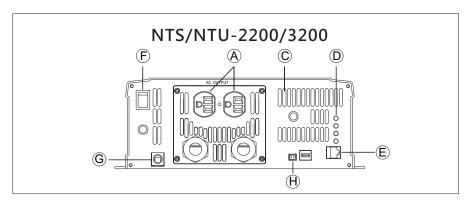
## 4.1 AC panel

- (A) AC output socket: Please refer to Pg. 16 for varies socket for different regions.
- (B) No fuse breaker with reset button (only for NTU-1200/1700/2200/3200 GFCI series; NTU-1200/1700/2200/3200 series):
  Under "bypass mode", when the AC output is shorted or the load current exceeds the rated current of the No fuse breaker, the breaker will trip and that stops bypassing energy for the utility thus prevent possible danger. When the abnormal condition is cleared, the user can press down on the reset button to resume operation.
- © **Ventilation slits:** The inverter requires good ventilation for proper operation and prolonging its lifetime.
- ① **LED indicators**: Indicate the status of inverter and the load condition.
- (E) Communication port: For remote monitoring purpose, the unit can be connected to a PC through this communication port by using the or a cable and monitoring software. Also for remote control purpose, the unit can be connected to the IRC module through this port.
- (F) Power ON/OFF switch: The inverter will turn ON if the switch is in the ON position, and vice versa.
- **G** FG connection
- (H) Remote ON/OFF: Inverter will turn on if the pins of RC connector is open. And, inverter will turn off if the pins are shorted.
- (1) AC bypass socket: When AC mains is available, by connecting the AC mains to the AC socket, it will enable AC bypass function, which the energy will provide to load from AC mains directly.



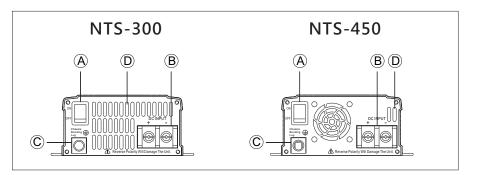


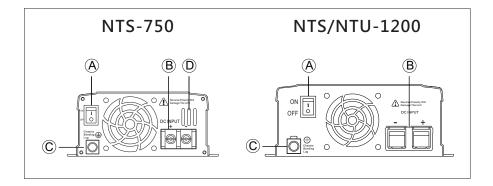


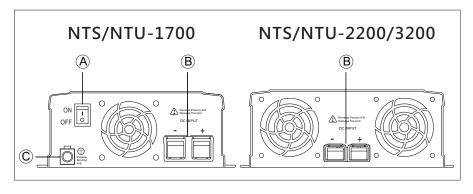


## 4.2 DC input panel

- (A) POWER ON/OFF switch: The inverter will turn ON if the switch is in the ON position, and vice versa.
- B Input terminals (+), (-)
- © Frame ground (FG)
- D Ventilation slits: The inverter requires suitable ventilation to work properly. Please make sure there is good ventilation and the lifespan of the inverter can preserved.







### 4.3 LED Indicator

Status indicator:

The LED is used to indicate the status of inverter, including inverter OK, remote on/off and power saving mode.

	Green	Orange	Red	
Status	<ul><li>Inverter OK</li></ul>	Remote off  Saving mode	<ul> <li>Abnormal Status (See below table)</li> </ul>	

DC Input Indicator:

It is used to show the input status of inverter.

Green light:

When input voltage is greater than 12.5V(12V)/25V(24V) 50V(48V).

Orange light:

When input voltage is within  $11V\sim12.5V(12V)/22V\sim25V(24V)/44V\sim50V(48V)$ . Red light :

When input voltage is lower than 11V(12V)/22V(24V)/44V(48V) or over it's specification. It flashes and warning sound will be activated.

	Green	Orange	Red
DC Input	• 12.5~15.5Vdc	• 11~12.5Vdc	• <11Vdc or >15.5Vdc
DC IIIput	• 25~31Vdc	22~25Vdc	● <22Vdc or >31Vdc
	• 50~62Vdc	44~50Vdc	● <44Vdc or >62Vdc

Load Condition Indicator:

Itr represents the magnitude of output loads Green light: When load is lesser than 40%.

Orange light: When load is between 40%~80%.

Red light: When load is greater than 80%.

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

AC Input Indicator:

Represents the magnitude of AC main.

Green light:

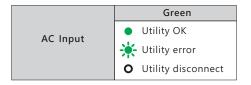
When AC mains is connected and the voltage is present normally.

Flash in green light:

When the mains is connected but the voltage exceeds  $\pm 10\%$  of the rated voltage, the green light will start flashing for warning.

Light off:

when the mains is disconnected or not connected, LED will be in off.



Light



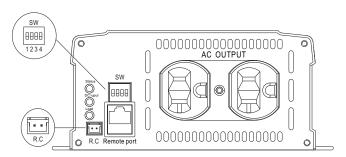
O Light off

## 5. Explanation of Operation

# 5.1 Procedure of setting Operating Mode, Output Voltage, Frequency, and Saving Mode

#### 5.1.1 Output Voltage and Frequency Setting

Factory settings are either 110Vac/60Hz or 230Vac/50Hz, users are able to adjust the voltage and frequency, through the DIP switch of position 1,2,3,4 on the AC panel.



Type-US

AC Output Voltage、 Frequency、 Power Saving Mode、 Selectable by DIP SW						
SW1	SW2	SW3	SW4			
OFF	OFF: 100Vac or 200Vac	ON:50Hz	ON - Dower coving made			
OFF	ON: 110Vac or 220Vac	ON : 50HZ	ON: Power saving mode			
ON	OFF: 115Vac or 230Vac	055-0011-	OFF: Non newer seving made			
ON	ON: 120Vac or 240Vac	OFF: 60Hz	OFF: Non-power saving mode			

## 5.1.2 Power Saving Mode setting

When the inverter is in no load status, in order to reduce battery energy consumption by inveter accidentally, Position 4 of DIP S.W. on the panel of inverter, can be adjusted to the "ON" position. When this mode is activated, if the load is less than 10W, the inverter will turn off the output and enter the power saving mode after 3 second. In the power saving mode, the inverter MCU will periodically detect the output load status. When a load greater than 25W is connected, the inverter will switch back to normal mode and start output again. (Non-power saving mode is used as factory setting)

#### 5.1.3 Remote ON/OFF

R.C Switch			
Open	Normal work		
Short	Remote off		

#### 5.2 Function Difference

Funtion/model	NTS-250P/400P	NTS-300/450	NTS-750/1200/1700/2200/3200	NTU-1200/1700/2200/3200
Support IRC	X	X	•	•
Support RS-232	X	X	•	•
Support UART	•	X	×	X
UPS Function	X	X	×	•

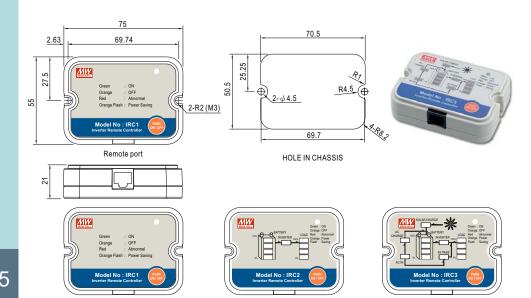
#### Standard

## 5.3 IRC1/IRC2/IRC3 Remote Control Unit

- IRC1/IRC2/IRC3 is the monitoring and control unit used for the inverter series.
- IRC1/IRC2/IRC3 can decode the RS-232 signals sent by the inverter series and display through digital meters.

Note: Part of the control signals will not function properly due to different compliance of each model.

MODEL		IRC1	IRC2	IRC3			
	DIGITAL METER		Display the battery level, output load le	vel, and operating status of inverter unit			
OUTPUT	CONTROL OUTPUT	Remote ON/OFF for inverter uni	t				
	LED INDICATOR	Remote turn ON(Green); Remo	te turn Off(Orange) ; Abnormal (Re	ed) ; Saving mode (Orange flash)			
	REMOTE ON/OFF CONTROL	The controlled inverter unit can b	ed inverter unit can be turned ON/OFF on the remote control panel for IRC1 / IRC2 / IRC3				
	POWER SAVING CONTROL	Power saving enable / disable a	ctivation				
FUNCTION	SUITABLE SERIES	TS-700 / 1000 / 1500 / 3000 TN-1500 / 3000 NTS-750 / 1200 / 1700 / 2200 / 3200 NTU-1200 / 1700 / 2200 / 3200	TS-700 / 1000 / 1500 / 3000 NTS-750 / 1200 / 1700 / 2200 / 3200 NTU-1200 / 1700 / 2200 / 3200	TN-1500 / 3000 NTS-750 / 1200 / 1700 / 2200 / 3200 NTU-1200 / 1700 / 2200 / 3200			
	WORKING TEMP.	-20 ~ +50°C					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
ENVIRONMENT	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH non-	condensing				
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
EMC	EMC EMISSION	Compliance to EN55032 class A	, EN61000-3-2,3, FCC PART 15 c	lass A			
EIVIC	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,6,8					
OTHER	DIMENSION (L*W*H) (Unit:mm)	186*100.5*32mm (L*W*H)					
OTHER	PACKING	ACKING 0.75Kg; 18pcs/ 14.5Kg/ 0.97CUFT					
NOTE	1. The remote control can not re-power on for inverter at abnormal status. 2. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).  3. Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx						



#### 5.4 RS-232/UART Protocol

RS-232/UART communication can be used between NTS/NTU series products and external controller (Controller) or PC software. The internal data of a single NTS/NTU unit can be read through RS-232 or UART, but multiple units on a bus is not allowed.

The RS-232/UART parameters of NTS/NTU series are defined as follows:

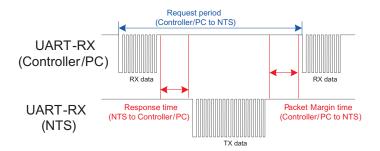
Parameter	Setting
Baud Rate	9600
Data Bits	8
Stop Bit	1
Parity	None
Flow Control	None

Definition of MEAN WELL RS-232 protocol:

Command Code	Туре	Command name			
Q	R	Status Inquiry			
С	W	Remote Control			
V	R/W	Write voltage/Frequency			
		Write: Need to enable with "pU" command first			
рU	W	Enable/disable setting mode (for command "V" )			
I	R	INVERTER Information			
W	W	Write Information into INVERTER EEPROM			

#### Communication sequence

Min. request period (Controller/PC to NTU/NTS): 500mSec · Max. response time (NTU/NTS to Controller/PC): 15mSec · Min. packet margin time (Controller/PC to NTU/NTS): 10mSec ·



The write format and reply format of communication protocol

NTS/NTU communications are transmitted by using ASCALL codes. The end character of communication command is CR(0x0D), also CRLF (0x0D 0x0A) is the most common end character. Therefore, when decoding data, pay attention to whether LF (0x0A) is included and clear it to avoid data confusion. To improve transmission quality, some commands contain Checksum.

The Checksum is calculated as follows:

- 1 Reset the Checksum in the Checksum data to zero.
- 2 Add all the data before Checksum data, Including V or I commands.
- ③ If the total data is less than 2 bytes, add 0 to make up 2 bytes.

For example, the V command sets the inverter output to 110VAC/50Hz. The format of the V instruction is as follows:

0	1-3	4	5-7	8-9	10
V(0x56)	Voltage	SP(0x20)	Frequency	Checksum	CR(0x0D)

Fill in the instructions in the above format and the instruction data except checksum is as follows:

V(0x56)	1(0x31)	1(0x31)	0(0x30)	SP(0x20)	0(0x30)	5(0x35)	0(0x30)	checksum	CR(0x0D)	
---------	---------	---------	---------	----------	---------	---------	---------	----------	----------	--

- (1) Reset the Checksum data to zero
- ② The checksum data is the sum of all written data Sum = 56 + 31 + 31 + 30 + 20 + 30 + 35 + 30 = 19D
- ③ Checksum = 01 9D

The format of the V command is as follows:

V(0x56)	1(0x31)	1(0x31)	0(0x30)	SP(0x20)	0(0x30)	5(0x35)	0(0x30)	0x019D	CR(0x0D)
---------	---------	---------	---------	----------	---------	---------	---------	--------	----------

Note: For details about the format of the V command, see the following write / read format and definition description.

The Q command: Used to confirm the inverter status, the parameters can be output voltage, output load percent (Digital), battery voltage, battery capacity, heat sink temperature, utility power voltage, output power frequency, DC bus, output load percent (Analog) and etc.

#### Write format:

0	1		
Q(0x51)	CR(0x0D)		

#### Reply format:

0	1~3	4	5~7	8	9~12	13	14~16
((0x28)	O/P Voltage	SP(0x20)	O/P load (Digital)	SP(0x20)	Battery voltage	SP(0x20)	Battery capacity
17	18~21	22	23~25	26	17~30	31	32~34
SP(0x20)	Heat Sink Temperature	SP(0x20)	Utility Power Volt.	SP(0x20)	Output Power Freq.	SP(0x20)	DC BUS Voltage
35	36~38	39	40	41	42	43	44
SP(0x20)	O/P Load (Analog)	SP(0x20)	b0	b1	b2	b3	b4
45	46	47	48	49	50	51	52
b5	b6	b7	b8	b9	b10	b11	b12
53	54	55	56	57	58	59	60
b13	b14	b15	b16	b17	b18	) ( 0x29 )	CR(0X0D)

### Definition of command(Q)

	te data flow nmand Q	(VVV b0b1b2b3	QQQ b4b5b6	SS.S BBB TT.T MMM RR. 6b7b8b9b10b11b12b13b1	R DDD PPF 4b15b16b1	7b18)
Data byte	Funtion name	Description	R/W	Range	Data type	Uint
VVV,3	O/P Voltage	O/P Voltage	R	0~250Vac	U1	ASCII
QQQ,3	O/P load percent (Digital)	O/P load percent (Digital)	R	0% = 000 $0 < \sim \le 30\% = 025$ $31 < \sim \le 50\% = 050$ $51 < \sim \le 75\% = 075$ $76 < \sim \% = 100$	U1	ASCII
SS.S,4	Battery voltage	Battery voltage	R	12: 0~17.0Vdc 24: 0~34.0Vdc 48: 0~68.0Vdc	U1	ASCII
BBB,3	Battery capacity	Battery capacity	R	$0 \le \sim <25\% = 025$ $26 < \sim \le 50\% = 050$ $51 < \sim \le 75\% = 075$ $76 < \sim \le 100\% = 100$	U1	ASCII
TT.T,4	Heat Sink Temperature	Heat Sink Temperature	R	0~99.9℃	U1	ASCII
MMM,3	Utility Power Voltage	Utility Power Voltage	R	0~250Vac	U1	ASCII
RR.R,4	Output Power Frequency	Output Power Frequency	R	40.0~70.0 Hz	U1	ASCII
DDD,3	DC BUS Voltage	DC BUS Voltage	R	OV	U1	ASCII
PPP,3	O/P load Percent (Analog)	O/P load Percent (Analog)	R	0~100%	U1	ASCII
b0,1	INVERTER Mode	INVERTER Mode	R	1: INVERTER Mode	U1	ASCII
b1,1	Bypass Mode	Bypass Mode	R	1: Bypass Mode	U1	ASCII
b2,1	Utility Power supply	Utility Power supply	R	1: Utility Power	U1	ASCII

Data byte	Funtion name	Description	R/W	Range	Data type	Uint
b3,1	Utility Charger Enable	Utility Charger Enable	R	1: Enable	U1	ASCII
b4,1	Solar Charger Enable	Solar Charger Enable	R	1: Enable	U1	ASCII
b5,1	Saving Mode Occurred	Saving Mode Occurred	R	1: Saving Mode	U1	ASCII
b6,1	Battery Exhausted Mode	Battery Exhausted Mode	R	1: Battery low	U1	ASCII
b7,1	Shutdown Mode (Battery used up)	Shutdown Mode (Battery used up)	R	Shutdown Mode (Battery used up)	U1	ASCII
b8,1	Battery OVP	Battery OVP	R	1: Battery OVP	U1	ASCII
b9,1	Remote Shutdown	Remote Shutdown	R	1: Remote Shutdown	U1	ASCII
b10,1	OLP 100 ~ 115 %	OLP 100 ~ 115 %	R	1: Occurred OLP 100%~	U1	ASCII
b11,1	OLP 115 ~ 150 %	OLP 115 ~ 150 %	R	1: Occurred OLP 115%~	U1	ASCII
b12,1	OLP 150% ~	OLP 150% ~	R	1: Occurred OLP 150%~	U1	ASCII
b13,1	ОТР	ОТР	R	1: Inverter OTP 2: Fan lock protection	U1	ASCII
b14,1	INV UVP	INV UVP	R	1: INV UVP protection	U1	ASCII
b15,1	INV OVP	INV OVP	R	1: INV OVP protection	U1	ASCII
b16,1	INV Fault	INV Fault	R	1: INV Fault	U1	ASCII

Data byte	Funtion name	Description	R/W	Range	Data type	Uint
b17,1	EEPROM error code	EEPROM error code	R	1: EEPROM error	U1	ASCII
b18,1	System Shutdown	System Shutdown	R	1: Shutdown	U1	ASCII

The C command: Used to remote control inverter.

#### Write format:

#### Remote OFF

0	1	2	3	4	5	6	6	8
C(0x43)	1(31)	0(30)	0(30)	0(30)	0(30)	0(30)	0(30)	0(30)
9	10	11	12	13	14	15	16	
0(30)	0(30)	0(30)	0(30)	0(30)	0(30)	0(30)	CR(0x0D)	

#### Remote ON

0	1	2	3	4	5	6	6	8
C(0x43)	0(30)	1(31)	0(30)	0(30)	0(30)	0(30)	0(30)	0(30)
9	10	11	12	13	14	15	16	
0(30)	0(30)	0(30)	0(30)	0(30)	0(30)	0(30)	CR(0x0D)	

# Reply format :

0 C(0x43)

## Definition of command(C)

_	e data flow nmand C	(Cb0b1b2b3b4b5b6b7b8b9b10b11b12b13b14)							
Data byte	Funtion name	Description	R/W	Range	Data type	Uint			
b0,1	Shut down	Shut down	W	1: Remote Shutdown	U1	ASCII			
b1,1	Turn on INVERTER	Turn on INVERTER	W	1: Remote On INV	U1	ASCII			
b2,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII			
b3,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII			
b4,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII			
b5,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII			
b6,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII			

Data byte	Funtion name	Description	R/W	Range	Data type	Uint
b7,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b8,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b9,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b10,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b11,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b12,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b13,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII
b14,1	Preserved	Preserved		Fixed" 0x30"	U1	ASCII

The V command: Used to change output voltage and frequency. You need to send the "pU" command to unlock it before executing the V command.

#### Write format:

/ \ ft = 11 = 2 = 1	
$ \begin{array}{c c} 1 & pU(0x70 \\ \hline 0x55) & CR(0x0D) \end{array} $ (After sen changing)	ding data, delay at least 20ms before the voltage and current.)

	0	1~3	4	5~7	89	10
2	V(0x56)	Voltage	SP(0x20)	Frequency	Checksum	CR(0x0D)

#### Reply format:

If the transmission parameters are correct, the inverter replies:

0	1~3	4	5~7	89	10
#(0x23)	Voltage	SP(0x20)	Frequency	Checksum	CR(0x0D)

If the transmission parameters are not correct, the inverter replies as follows, please confirm and retry.

	0	1	2	3	4	5	6	7	8
ſ	#(0x23)	V(0x56)	SP(0x20)	C(0x43)	M(0x4D)	D(0x44)	SP(0x20)	E(0x43)	R(0x52)
	0	1	2	3	4				
	R(0x52)	O(0x4F)	R(0x52))	Checksum	CR(0x0D)				

### Definition of command(V)

	data flow					
_	data flow nmand V	(VWWV	/ FFF)			
Data byte	Funtion name	Description	R/W	Range	Data type	Uint
		To set any	W/R	110 Series 100~127 : 100~127Vac		
WWW,3	Voltage setting	AC Voltage within the range		220 Series 200~240 : 200~240Vac	U1	ASCII
				000: Restore factory voltage setting (DIP switch setting mode) (Note)		
FFF,3	Frequency setting	Frequency setting	W/R	050:50Hz 060:60Hz 000: Restore factory frequency setting (DIP switch setting mode) (Note)	U1	ASCII
2	Checksum	Checksum				

Note: After setting voltage or frequency by "V" command, disconnect communication, the product can still maintain the set value. If you want to switch back to DIP switch settings. Please send 0(0x30)0(0x30)0(0x30) for voltage and frequency, and the new setting will take effect after restart.

The I command: Used to read inverter information. The parameters contain the inverter output voltage, frequency, model code, equalization voltage, floating voltage, alarm voltage, shutdown voltage and etc.

## Write format:

0	1
I(0x49)	CR(0x0D)

## Reply format:

1 )							
0	1	2	3	4~7	8	9~12	13
#(0x23)	Voltage & Freq.	Saving mode	Model Code	Equalization Volt.	SP(0x20)	Floating Volt.	SP(0x20)
14~17	18	19~22	23	24~27	28	29~38	39
Alarm Volt.	SP(0x20)	Shutdown Volt.	SP(0x20)	Transfer Volt.	SP(0x20)	Manufacture Country	SP(0x20)
40~58	59	60~68	69	70~82	83	84	85
Serial Number	SP(0x20)	Revision	SP(0x20)	Model Name	SP(0x20)	Battery First Flag	SP(0x20)

86~95	96 97	98
Date	Checksum	CR(0x0D)

The W command: Used to modify inverter specifications. Such as alarm voltage, shutdown voltage, serie number, model name and etc.

#### Write format:

0	1	2	3	4~7	8	9~12	13
W(0x57)	Voltage & Freq.	Saving mode	Model Code	Equalization Volt.	SP(0x20)	Floating Volt.	SP(0x20)
14~17	18	19~22	23	24~27	28	29~38	39
Alarm Volt.	SP(0x20)	Shutdown Volt.	SP(0x20)	Transfer Volt.	SP(0x20)	Manufacture Country	SP(0x20)
40~58	59	60~68	69	70~82	83	84	85
Serial Number	SP(0x20)	Revision	SP(0x20)	Model Name	SP(0x20)	Battery First Flag	SP(0x20)
86~95	96 97	98	_				
Date	Checksum	CR(0x0D)					

#### Reply format:

If the transmission parameters are correct, the inverter replies:

0	1	2	3	4~7	8	9~12	13
#(0x23)	Voltage & Freq.	Saving mode	Model Code	Equalization Volt.	SP(0x20)	Floating Volt.	SP(0x20)
14~17	18	19~22	23	24~27	28	29~38	39
Alarm Volt.	SP(0x20)	Shutdown Volt.	SP(0x20)	Transfer Volt.	SP(0x20)	Manufacture Country	SP(0x20)
40~58	59	60~68	69	70~82	83	84	85
Serial Number	SP(0x20)	Revision	SP(0x20)	Model Name	SP(0x20)	Battery First Flag	SP(0x20)
86~95	96 97	98					
Date	Checksum	CR(0x0D)					

If the transmission parameters are not correct, the inverter replies as follows, Please confirm and retry.

0	1	2	3	4	5	6	7	8
#(0x23)	W(0x57)	SP(0x20)	C(0x43)	M(0x4D)	D(0x44)	SP(0x20)	E(0x43)	R(0x52)
0	1	2	3	4				
R(0x52)	O(0x4F)	R(0x52))	Checksum	CR(0x0D)				

## Definition of command(I \cdot W)

	e data flow nmand I、W			F.F AA.A SS.S TT.T MEAN vv.v XXXXXXXXXXXX B MN		
Data byte	Funtion name	Description	R/W	Range	Data type	Uint
V,1	Voltage & Freq. setting	Voltage & Freq. setting	R	100V(200V)/50Hz=00 110V(220V)/50Hz=01 115V(230V)/50Hz=02 120V(240V)/50Hz=03 100V(200V)/60Hz=04 110V(220V)/60Hz=05 115V(230V)/60Hz=06 120V(240V)/60Hz=07 (Defined by DIP SW)(Note1)	U1	Binary
D,1	Saving mode	Saving mode	R	Disable=00 Enable=01 (Defined by DIP SW)(Note1)	U1	Binary
M,1	Model Code	Model Code	R	112=00 124=01 148=02 212=03 224=04 248=05 (Defined by DIP SW)(Note1)	U1	Binary
EE.E,4	Equalization Volt.	Equalization Volt.	W/R	12: 9.0~15.0Vdc 24: 18.0~30.0Vdc 48: 36.0~60.0Vdc (Unsupported)(Note2)	U1	ASCII
FF.F,4	Floating Volt.	Floating Volt.	W/R	12: 9.0~15.0Vdc 24: 18.0~30.0Vdc 48: 36.0~60.0Vdc (Unsupported)(Note2)	U1	ASCII
AA.A,4	Alarm Volt.	Alarm Volt.	W/R	12: 9.9~12.5Vdc 24: 19.8~25.0Vdc 48: 39.6~50.0Vdc (Note3)	U1	ASCII

Data byte	Funtion name	Description	R/W	Range	Data type	Uint
SS.S,4	Shutdown Volt.	Shutdown Volt.	W/R	12: 9.7~12.0Vdc 24: 19.4~24.0Vdc 48: 38.8~48.0Vdc (Note 3)	U1	ASCII
TT.T,4	Transfer Volt.	Transfer Volt.	W/R	12: 9.0~15.0Vdc 24: 18.0~30.0Vdc 48: 36.0~60.0Vdc (Unsupported)(Note2)	U1	ASCII
10	Manufacture Country	Manufacture Country	W/R	MEANWELL (Note4)	U1	ASCII
19	Serial Number	Serial Number	W/R	LOC-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	U1	ASCII
9	Revision	Revision	R	REV:vv.v (Defined by Firmware, not changeable)	U1	ASCII
13	Model Name	Model Name	W/R	Define by each model (max of 14 digits)	U1	ASCII
B,1	Battery First Flag	Battery First Flag	W/R	0 = Disable 1= Enable	U1	ASCII
10	Date	Date	W/R	Date: MM/DD/YYYY	U1	ASCII
2	Checksum	Checksum				

- 1 The read value can be any arbitrary code, the BYTE length must be met when writing data, and the value can be arbitrary.
- $\bigcirc$  If the related parameters are unsupported  $\cdot$  please set the maximum voltage when writing :

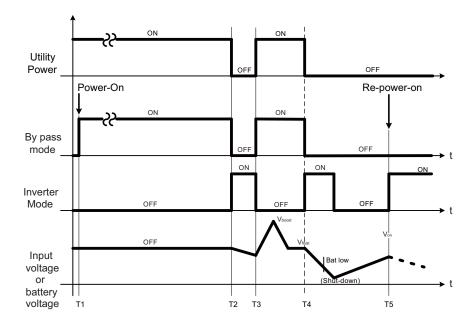
12V: 15.0V (0x31 0x35 0x2E 0X30) 24V: 30.0V (0x33 0x30 0x2E 0x30) 48V: 60.0V (0x36 0x30 0x2E 0x30)

- 3 The battery voltage setting must meet the following conditions:12.5V ≥ Alarm\_Volt. > Shutdown\_Volt. ≥ 9.7V. And Alarm\_Volt. Shutdown\_Volt. ≥ 0.2V. If the above conditions are not met, the setting is invalid.
- 4 If the data cannot fill the number of bytes set by the instruction ,please write in blank code(0x20) after the write data. For example, the manufacturer "MEANWELL" has 8 bits, and 2 bits need to be added. The ASCII code is:

M(0x4D) E	E(0x45)	A(0x41)	N(0x4E)	W(0x57)	E(0x45)	L(0x4C)	0(0x20)	0(0x20)	
-----------	---------	---------	---------	---------	---------	---------	---------	---------	--

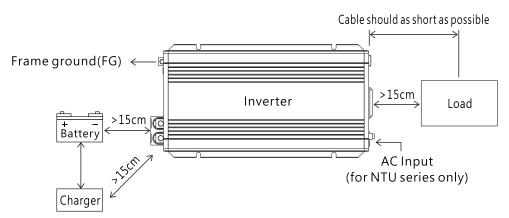
## 5.5 UPS Mode(only for NTU series)

#### 5.5.1 Explanation of UPS mode



- T1: After the user turns on the NTU-1200/1700/2200/3200, if it detects that the mains voltage is normal, the NTU will enter the bypass mode, so the load will be supplied by the mains directly. While battery is in a fully charged status.
- T2: If the AC mains fails or when the voltage of AC mains exceeds  $\pm 16\%$  of the setting, the NTU will immediately switch to inverter mode, to ensure customer's equipment will not be affected. Take NTU-1200-124(default 110Vac) as an example, when the voltage of AC mains is greater then 127.6Vac or less than 92.4Vac, NTU-1200-124 will enter the inverter mode to keep equipment running, and the energy is consumed from the battery.
- T3: If the AC mains has returned to a range within +/-13% of the NTU's set value, the NTU will switch to bypass mode again and supply power from the mains to the load. In the meantime, the battery can be charged through an external charger.
- T4: When the voltage of battery pack is consumed to the lower limit of the inverter's operating range, and the AC main still not valid. At this time, the battery charger cannot provide energy any more, so the inverter will keep operate until the battery voltage has consumed till the lower limit of the inverter's operating voltage. Eventually, inverter will shutdown.
- T5: When the voltage of battery returned to operating range, inverter will restart automatically.
- T6: When the NTU-1700/2200/3200 series inverter works in bypass mode, the inverter must be connected to the battery pack to start the fan to dissipate heat.
- 5.5.2 UPS System Block Diagram

When NTU works in bypass mode, the charger can maintain the battery voltage and provide enough power when the AC mains is abnormal. If the AC mains returns from abnormally, the charger can also provide the power that lost when operating in inverter mode. For connection, please select wires or cable with a suitable wire diameter according to the output current when connect the battery and inverter. Please refer to table 3-1 for connection.



(Suggest to work accompany with MEAN WELL NPB/NPP chargers)

## 6. Protections and Failure Correction

#### **6.1 Protection Funtion:**

#### AC Output Protection:

- AC Output Over Load Protection:

  When overloaded, the inverter is able to supply power for a period of time.

  If the load does not drop back to the normal range the OLP will be triggered.
  - If the load does not drop back to the normal range, the OLP will be triggered and turn off the inverter. Once the OLP condition is removed, re-power on the inverter to start operation again.
- AC Output Short Circuit Protection:
   When short-circuit occurs or the load increasing significantly, the inverter will
   turn off for protection. After removing the fault condition, re-power on the
   inverter to start operation.

#### DC Input Protection:

- DC Polarity Protection :
  - When connecting the DC polarity reversely, the internal fuse will blow for protection. The unit then must return to MEAN WELL's distributor for further support.
- Low DC Input Protection:
  - When DC input is lower than the operating range, inverter will turn off automatically for protection.
- Over Voltage of DC Input:
  - When the voltage of DC input over the operating range, the inverter will turn off for protection. After the fault condition is removed, inverter will restart automatically. If the inverter cannot operate normally afterwards, it represents that the inverter is damaged. Please return the unit to MEAN WELL's distributor if needed.

#### Inverter Protection:

• Over temperature protection(OTP): When the temperature inside the inverter raise to a certain level, the inverter will turn off for protection. After the temperate dropped back to operating range, re-power the inverter for operation.

#### 6.2 Failure Correction

Once failure condition occurs, the LED on panel of inverter will show different LED light for indication. Fault condition can be separated into 4 categories, AC output protection, DC input protection, over temperature protection or other. Please refer to the following table for fault indication and correction. If the fault condition cannot be solved, please contact MEAN WELL's distributor for further assistance.

fault signal	Possible cause	Suggestions for Fault correction
Status • DC Input • Load **	Over load protection	Check if the load requires high startup current, such as inductive or capacitance loads. After the fault condition is remover, repower the inverter for operation.
	Short circuit protection	Check if the load requirement exceed the rated value or if the circuit is shorted.
Status  DC Input ** Load  O	Aged battery or malfunction	Change a new battery
	Wrong battery capacitance	Re check if the parameter of battery suits inverter's operating parameter
Status  DC Input   Load	Over temperature protection	Remove subject away from venthole if any. If it's due to high ambient, please lower the temperate or load to proceed. After the fault condition is remove, re-power inverter for operation.
Status ** DC Input O Load O	Other fault condition that's not defined	Contact MEAN WELL's distributor

Note: 🛑 Light

Flash

O Light off

## 7. Warranty

This product provide three years warranty under normal usage. Do not replace parts or any form of modification to the product in order to keep the warranty effectively.

 MEAN WELL posses the right to adjust the content of this manual. Please refer to the latest version of our manual on our website. https://www.meanwell.com



