

LAD Series User Manual



Economical Security/Fire Alarm PSU with Battery Charger/UPS



LAD series is an economical AC/DC low profile security power supply with UPS function. Adopting the input range from 90Vac to 264Vac (LAD-120~600:115Vac selectable by switch; LAD-120:90Vac full range input) and supports output 27.6Vdc, 41.5Vdc and 55.2Vdc. With high efficiency up to 86.5% and built-in AC, battery switch for easy maintenance. In addition, LAD-600 series not only provide TTL signals for AC OK, battery disconnect, battery reverse polarity (No damage), battery low detection, battery full and discharge, but also possess UART version so the users can monitor and control the status of the units, that enhance easy way for integration into security and fire systems directly.

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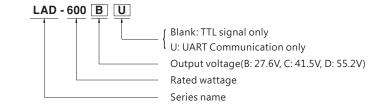
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1.Safety Guidelines

- Risk of electrical shock and energy hazard. All failure should be examined by a qualified technician. Please do not remove the case of the power supply by yourself!
- Please do not install power supplies in places with high moisture or near the water.
- Please do not install power supplies in places with high ambient temperature or near fire source. The maximum ambient temperature please refer to their specifications.
- Output current and output wattage must not exceed the rated values on specifications.
- The ground(FG) must be connected to earth ground.
- The protective earthing is used as a safeguard, the instructions shall require connection of the equipment protective earthing conductor to the installation protective earthing conductor (for example, by means of a power cord connected to a socket-outlet with earthing connection).
- Notices for battery application
 - a. Make sure charging voltage and current meet battery's specification.
 - b. Refrain from connecting new and old batteries in series.
 - c. The cables between power supply and battery should be kept as short as possible to prevent excessive voltage drop (suggested cable length: 50cm ~1000cm). Too much voltage drop will lead to longer charging period.
 - d. The power supply is suitable for lead-acid batteries (flooded water type, gel colloid type, AGM adsorption glass fibber...etc) or lithium batteries (lithium ion, lithium manganese, lithium ternary...etc).

2. Introduction

2.1 Model number



2.2 Features

- Built-in AC and battery circuit ON/OFF switches enhance safeness during maintenance.
- Built-in AC OK, Battery disconnect Battery reverse polarity, Battery low, Battery full and Discharge (Blank version only).
- Protections: Short circuit Overload/ Over voltage /Over temperature /Battery low/ Battery reverse polarity (no damage).
- Forced UPS mode for battery maintenance and improve battery life
- UART Communication (U version only)
- Built-in buzzer alarm (U version only)
- -20~ +60°C wide operating temperature
- Suitable for lead acid and lithium-ion batteries
- UL/CE/UKCA/EAC certified, Design refer to GB17945/GB4717(U version only)
- 3 years warranty

2.3 Electrical Specification

LAD-120 Series

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	MODEL			LAD-120B		LAD-120C		LAD-120D				
	OUTPUT NUMBER	CH1	CH2	CH1	CH2	CH1	CH2	CH1	CH2			
	DC VOLTAGE	13.8V	13.8V	27.6V	27.6V	41.5V	41.5V	55.2V	55.2V			
	RATED CURRENT	7.7A	1A(Battery Charger)	3.4A	1A(Battery Charger)		1A(Battery Charger)		1A(Battery Charger			
	CURRENT RANGE	0~8.7A		0~4.4A		0~2.9A		0~2.21A				
	RATED POWER	120W		121.4W		120.35W		121.99W				
	RIPPLE & NOISE (max.) Note.2			150mVp-p		240mVp-p		360mVp-p				
OUTPUT	VOLTAGE ADJ. RANGE	CH1: 10.8 ~ 14		CH1: 21.6 ~ 29		CH1: 32.4 ~ 43.		Ch1: 43.5 ~ 58				
	VOLTAGE TOLERANCE Note.3	±1.0%		±1.0%		±1.0%		±1.0%				
	LINE REGULATION	±0.5%		±0.5%		±0.5%		±0.5%				
	LOAD REGULATION	±0.5%		±0.5%		±0.5%		±0.5%				
	SETUP, RISE TIME	500ms, 40ms/23	0VAC 500n	ns, 40ms/115VAC	at full load							
	HOLD UP TIME (Typ.)	40ms/230VAC	9ms/115VAC	at full load								
	BATTERY STATIC DISCHARGE	<100µA										
	CURRENT	<100µA										
	VOLTAGE RANGE	90 ~ 264VAC	127 ~ 370V	DC								
	FREQUENCY RANGE	47 ~ 63Hz										
INPUT	EFFICIENCY (Typ.)	86%		88%		88%		88%				
INFOI	AC CURRENT (Typ.)	2.5A/115VAC	1.5A/230VA	0								
	INRUSH CURRENT (Typ.)	COLD START		55A/230VAC								
	LEAKAGE CURRENT	0.5mA / 240VA										
		CH1:105~1359		10%								
PROTECTION	OVERLOAD	Protection type :	CH1 OLP, CH2 w CH2 : Constant c	when ithout battery: hic urrent limiting; fau	it enters to UPS m total output of CH cup mode o'pvolt ult condition does nal fuse is mandal	1 + CH2 reach an age (120D shuts d not affect CH1 wo	ound 125%~135% own),re-power on rking,recovers au	output hiccup(12 to removed tomatically after fa				
		CH1:15.5~18	/	CH1:31~36V		CH1:47~55V		CH1:61~71V				
	OVER VOLTAGE			oltage, re-power o	on to removed							
	OVER TEMPERATURE			oltage, re-power of								
	BATTERY REVERSE POLARITY							a				
			reverse polarity	-	covers automatic		Iuluon is remove					
	BATTERY CUTOFF	9.5V±0.5V	10 10 01	21.5V ±0.5V		32V±0.5V		43V±0.5V				
	ACOK	TTL signal, High / Open : AC OK ; Low : AC Fail ; Ice : max. 30mA@ 50VDC										
FUNCTION	BATTERY DISCONNECT/ REVERSE POLARITY	TTL signal, High / Open : Battery disconnect/reverse polarity ; Low : Battery connect/normal; Ice : max. 30mA@ 50VDC										
ronction	BATTERY LOW	TTL signal, High / Open : Battery low ; Low : Battery normal; loe : max. 30mA@ 50VDC										
	BATTERY FULL				charging ; Ice : ma		С					
	DISCHARGE				; Ice : max. 30mA	@ 50VDC	TTL signal, High / Open : Discharge; Low : Charge ; Ice : max. 30mA@ 50VDC					
	WORKING TEMP.	-20~+60°C (R	efer to "Derating	Curve")								
	WORKING HUMIDITY	20 ~ 95% RH n	on-condensing	,								
ENVIRONMENT	WORKING HUMIDITY STORAGE TEMP., HUMIDITY											
ENVIRONMENT			n-condensing ~95% RH non-									
ENVIRONMENT	STORAGE TEMP., HUMIDITY	-30 ~ +85°C, 10 ±0.03%/°C (0 ~	n-condensing ~95% RH non- 50°C)		g X, Y, Z axes							
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G	on-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6	condensing 60min. each alon	-	approved; Desi	gn refer to GB 17	945-2010				
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS	n-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1,	condensing 30min. each alon AS/NZS62368.1	EAC TP TC 004	approved; Desi	gn refer to GB 17	945-2010				
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS I/P-O/P:3KVAC	n-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0	condensing 50min. each alon AS/NZS62368.1 C O/P-FG:0.5K	EAC TP TC 004	approved; Desi	gn refer to GB 17	945-2010				
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS I/P-O/P:3KVAC	n-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0	condensing 50min. each alon AS/NZS62368.1 C O/P-FG:0.5k 0hms / 500VDC /	EAC TP TC 004	approved; Desi						
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS I/P-O/P:3KVAC	n-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0	Condensing 60min. each alon AS/NZS62368.1 C O/P-FG:0.5k 0hms / 500VDC / Star BS E	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS		gn refer to GB 17 Test Level / No Class A					
ENVIRONMENT	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE	-30 ~ +85°C, 10 ±0.03%/°C (0 - 10 ~ 500Hz, 5G UL62368-1, BS I/P-O/P:3KVAC I/P-O/P, I/P-FG Parameter	n-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0	condensing 50min. each alon AS/NZS62368.1 C 0/P-FG:0.5k Dhms / 500VDC / Star BS f EAC BS f	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS 2 TP TC 020 EN/EN55032 (CIS	PR32),	Test Level / No					
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS I/P-0/P:3KVAC I/P-0/P;3KVAC I/P-0/P, I/P-FG Parameter Conducted Radiated	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing i0min. each alon AS/NZS62368.1 C O/P-FG:0.5k Dhms / 500VDC / Star BS I EAC BS E EAC	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS 2 TP TC 020 EN/EN55032 (CIS 2 TP TC 020	iPR32), iPR32),	Test Level / No Class A Class A					
SAFETY &	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL62368-1, BS I/P-0/P:3KVAC I/P-0/P;3KVAC I/P-0/P, I/P-FG Parameter Conducted Radiated Harmonic Curr	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing i0min. each alon AS/NZS62368.1 C O/P-FG:0.5k Dhms / 500VDC / Star BS I EAC BS E EAC	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS 2 TP TC 020 EN/EN55032 (CIS	iPR32), iPR32),	Test Level / No Class A					
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~ +85°C, 10 ±0.03%/°C (0 ~ 10 ~ 500Hz, 5G UL 62388-1, 8S I/P-0/P:3KVAC I/P-0/P:3KVAC Parameter Conducted Radiated Harmonic Curr Voltage Flicker	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing Somin. each alon AS/NZS62368.1 C O/P-FG:0.5k Dhms / 500VDC / Stat BS S EAC BS S EAC BS S EAC BS S	EAC TP TC 004 (VAC 25 °C/ 70% RH daard EN/EN55032 (CIS 2 TP TC 020 EN/EN55032 (CIS 2 TP TC 020 EN/EN55032 (CIS 2 TP TC 020 EN/EN61000-3-2	iPR32), iPR32),	Test Level / No Class A Class A Class A	te				
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~+85°C, 10 ±0.03%/°C (0- 10 ~ 500Hz, 5G UL62368-1, BS UP-0/P:3KVAC I/P-0/P:3KVAC I/P-0/P, I/P-FG Parameter Conducted Radiated Harmonic Curr Voltage Flicker Parameter	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing 50min. each alon AS/NZ562368.1 C O/P-FG:0.5k Dhms / 500VDC / Star BS f EAC BS f EAC BS f Star Star Star	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS 27 PT C 020 EN/EN55032 (CIS 17 PT C 020 EN/EN61000-3-2 en/EN61000-3-2	iPR32), iPR32),	Test Level / No Class A Class A Class A Test Level / No	te	solaci: criteri- A			
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~+85°C, 10 ±0.03%/*C (0- 10 ~ 500Hz, 5G UL62368-1, BS I/P-0/P:3KVAC UP-0/P. I/P-FG Parameter Conducted Radiated Harmonic Curr Voltage Flicker Parameter ESD	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing 30min. each alon AS/NZS62368.1 C 0/P-FG:0.5k Dhms / 500VDC / Stat BS I EAC BS I EAC BS S EAC BS S Stat Stat BS I EAC	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS TP TC 020 EN/EN61000-3-2 EN/EN61000-4-2	iPR32), iPR32),	Test Level / No Class A Class A Class A Class A Test Level / No Level 3, 8KV aii	te te ∵; Level 2, 6KV co	ontact; criteria A			
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~+85°C, 10 ±0.03%/°C (0 - 10 ~ 500Hz, 560 UL62368-1, BS I/P-0/P:3KVAC I/P-0/P, I/P-FG Parameter Conducted Radiated Harmonic Curr Voltage Flicker Parameter ESD Radiated	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing 50min. each alon ASI/N2562368. 48 COIP-FG-0.5/ 019-FG-0.5/ 0-00-FG-0.5/	EAC TP TC 004 (VAC 25 °C) 70% RH dard EN/EN55032 (CIS TP TC 020 EN/EN55032 (CIS TP TC 020 EN/EN61000-3-2 EN/EN61000-4-2 EN/EN61000-4-3	iPR32), iPR32),	Test Level / No Class A Class A Class A Test Level / No Level 3, 8KV ain Level 3, 10V/m	te r; Level 2, 6KV cc ; criteria A	onlact; criteria A			
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP, COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ~ +85°C, 10 +0.03%/C (0 10 ~ 500Hz, 50 UL62388-1, BS I/P-0/P:3KVAC I/P-0/P:3KVAC I/P-0/P:1/P-FG Parameter Conducted Radiated Harmonic Curr Voltage Flicker Parameter ESD Radiated EFT / Burst	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing i0min. each alon ASINZS62368.8 OIP-F6.0.5F Dhms / 500VDC/ BS I EAC BS I EAC BS I Stat BS I BS I	EAC TP TC 004 (VAC 25°C) 70% RH ndard EN/EN55032 (CIS 7 TP TC 020 EN/EN55032 (CIS 7 TP TC 020 EN/EN61000-3-2 EN/EN61000-4-3 EN/EN61000-4-3 EN/EN61000-4-3	PR32), PR32),	Test Level / No Class A Class A Class A Test Level / No Level 3, 8KV ain Level 3, 10V/m Level 3, 2KV ; c	te ; Level 2, 6KV co ; criteria A rriteria A				
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 -+85*C, 1(2 ±0.03%//C (0- 10 -500Hz, 5G UP-0/P:3KVAC UP-0/P:3KVAC UP-0/P:0/P-5KVAC UP-0/P:0/P-56 Parameter Conducted Radiated Harmonio Curr Voltage Flicker Parameter ESD Radiated ESD Radiated ET/ flurst Surge	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing 30min. each alon ASI/X2562368.1 C O/P-FC:05 X BS 5 ASIA BS 5 ASIA BS 5 BS 5 B BS 5 B BS 5 BS 5	EAC TP TC 004 (VAC 25 °C) 70% RH ndard NVEN55032 (CIS C TP TC 020 EN/EN55032 (CIS T TP TC 020 EN/EN61000-3-2 EN/EN61000-4-3 EN/EN61000-4-3 EN/EN61000-4-4 EN/EN61000-4-4	PR32), PR32),	Test Level / No Class A Class A Class A Class A Test Level / No Level 3, 8KV ai Level 3, 10V/m Level 3, 2KV ; c Level 3, 1KV/Li	te ; Level 2, 6KV cc ; criteria A riteria A ne-Line ;2KV/Lin				
SAFETY & EMC	STORAGE TEMP, HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE	-30 ++85°C, 110 ±0.03%//C (0- 10 - 500Hz, 56 UP-0/P3KVAC UP-0/P, UP-FG Parameter Conducted Radiated Harmonic Curr Voltage Flicker Parameter ESD Radiated EFT / Burst Surge Conducted	m-condensing ~ 95% RH non- 50°C) 10min./1cycle, 6 EN/EN62368-1, I/P-FG:2KVA0 O/P-FG:100M C	condensing 30min. each alon AS/NZ562368. 16 OIP-FG.0.5/ BS I EAC BS I EAC BS I BS	EAC TP TC 004 (VAC 25 °C/ 70% RH ndard EN/EN55032 (CIS TP TC 020 EN/EN5032 (CIS C TP TC 020 EN/EN610003-2 EN/EN61000-4-2 EN/EN61000-4-3 EN/EN61000-4-5 EN/EN61000-4-5 EN/EN61000-4-5	PR32), PR32),	Test Level / No Class A Class A Class A Test Level / No Level 3, 8KV ain Level 3, 16V/Li Level 3, 16V/Li Level 3, 16V/Li	te ; Level 2, 6KV co ; criteria A rriteria A ne-Line ;2KV/Lin riteria A				
SAFETY & EMC	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE EMC EMISSION	-30 -+85*C, 1(2 ±0.03%//C (0- 10 -500Hz, 5G UP-0/P:3KVAC UP-0/P:3KVAC UP-0/P:0/P-5KVAC UP-0/P:0/P-56 Parameter Conducted Radiated Harmonio Curr Voltage Flicker Parameter ESD Radiated ESD Radiated ET/ flurst Surge	n-condensing ~ 95% RH non- 50°C) 10min/1cycle, (10min/1cycle,	condensing i0min. each alon AS/NZ562368. 62 C OIP-FG:0.5/ Minms / 500/VDC / Stat BS I BS	EAC TP TC 004 (VAC 25 °C 70% RH ndard ENIENS5032 (CIS TP TC 020 ENIENS5032 (CIS ENIENS5032 (CIS ENIENS503 (CIS ENIENS	iPR32), iPR32),	Test Level / NC Class A Class A Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 2KV ; c Level 3, 2KV ; c Level 3, 1KV/Li Level 3, 1KV/Li Level 4, 30A/m	te ; Level 2, 6KV co ; criteria A rriteria A ne-Line ;2KV/Lin riteria A				
SAFETY & EMC (Note 4)	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE EMC EMISSION	-30 -+85°C, 1(2 ±0.03%/°C (0- 10 - 500Hz, 56 UP-0/P.3KVAC UP-0/P.3KVAC UP-0/P.10P-FG Parameter Conducted Harmonic Curr Voltage Filcker Parameter ESD Radiated EFT / Burst Surge Conducted 1509.9K hrs min	n-condensing ~ 95% RH non- 50°C) 10min /1cycle, 6 ENVENE288-1, I/P-FC;2XU00 (O/P-FG:100M (O/P-FG:100M (Note 5)	condensing 30min. each alon AS/NZ562368. 16 OIP-FG.0.5/ BS I EAC BS I EAC BS I BS	EAC TP TC 004 (VAC 25 °C 70% RH ndard ENIENS5032 (CIS TP TC 020 ENIENS5032 (CIS ENIENS5032 (CIS ENIENS503 (CIS ENIENS	iPR32), iPR32),	Test Level / NC Class A Class A Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 2KV ; c Level 3, 2KV ; c Level 3, 1KV/Li Level 3, 1KV/Li Level 4, 30A/m	te ; Level 2, 6KV co ; criteria A rriteria A ne-Line ;2KV/Lin riteria A				
SAFETY & EMC	STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE EMC EMISSION	-30 -+85°C, 110 ±0.03%/PC (0- 10 - 500/Hz, 56 U/P-0/P, U/P-3KVAC U/P-0/P, U/P-3KVAC U/P-0/P, U/P-FG Parameter ESD Radiated EFT / Burst Surge Conducted Magnetic Field Magnetic Field	n-condensing ~ 95% RH non- 50°C) 10min /1cycle, 6 ENVENE288-1, I/P-FC;2XU00 (O/P-FG:100M (O/P-FG:100M (Note 5)	condensing i0min. each alon AS/NZ562368. 62 C OIP-FG:0.5/ Minms / 500/VDC / Stat BS I BS	EAC TP TC 004 (VAC 25 °C 70% RH ndard ENIENS5032 (CIS TP TC 020 ENIENS5032 (CIS ENIENS5032 (CIS ENIENS503 (CIS ENIENS	iPR32), iPR32),	Test Level / NC Class A Class A Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 2KV ; c Level 3, 1KV/Li Level 3, 1KV/Li Level 4, 30A/m	te ; Level 2, 6KV co ; criteria A rriteria A ne-Line ;2KV/Lin riteria A				

LAD-240 Series

MODEL		LAD-240A		LAD-240B		LAD-240C		LAD-240D)
	OUTPUT NUMBER	CH1	CH2	CH1	CH2	CH1	CH2	CH1	CH2
	DC VOLTAGE	13.8V	13.8V	27.6V	27.6V	41.5V	41.5V	55.2V	55.2V
	RATED CURRENT	16.4A	1A(Battery Charger)	7.7A	1A(Battery Charger)	4.78A	1A(Battery Charger)	3.4A	1A(Battery Charger
	CURRENT RANGE	0~17.4A		0~8.7A		0~5.78A		0~4.4A	
	RATED POWER	240.12W		240.12W		239.87W		242.88W	
	RIPPLE & NOISE (max.) Note.2			150mVp-p		240mVp-p		240mVp-p	
	VOLTAGE ADJ. RANGE	CH1: 10.8 ~ 14.5	SV/	CH1: 21.6 ~ 29		CH1: 32.4~4	13.51/	CH1: 43.5~	58V
OUTPUT	VOLTAGE TOLERANCE Note.3			+1.0%		+1.0%		+0.5%	
	LINE REGULATION	+0.5%							
	LOAD REGULATION			±0.5%		±0.5%		±0.5%	
	SETUP, RISE TIME	±1.0% 2000ms, 50ms/2	201/00 201	±0.5%	5VAC at full load	±0.5%		±0.5%	
					ovac at full load				
	HOLD UP TIME (Typ.) BATTERY STATIC DISCHARGE	16ms/230VAC	12ms/115VF	C at full load					
	CURRENT	<100µA							
	VOLTAGE RANGE	90~132VAC/1	30 ~ 264VAC by	switch 24)~370VDC (D	efault switch a	t 230\/AC)		
	FREQUENCY RANGE	47 ~ 63Hz	2041110 by	3411011 241	010100 (0	ciauli switch a	200410)		
	EFFICIENCY (Typ.)	85.5%		87.5%		88%		88%	
NPUT	AC CURRENT (Typ.)	4.4A/115VAC	2.4A/230VAC	07.576		00 /0		00 /0	
	INRUSH CURRENT (Typ.)	COLD START 6		60A/230VAC					
	LEAKAGE CURRENT	<0.5mA/240VA		OUA/23UVAC					
	LEARAGE CORRENT	CH1:105 ~ 1359		14.0%					
PROTECTION	OVERLOAD	Protection type :	CH1 OLP, CH2 CH2 : Constant	w without battery: current limiting	hen total output o Shut down o/p vo ; fault condition d	f CH1 + CH2 re ltage,re-power oes not affect (CH1 is around 105 each around 125% on to removed CH1 working, recovers connection with	~135% output ers automatica	ally after fault
		CH1:15.5~18V		CH1:31~36V		CH1:47~55	V	CH1:59~69	V
	OVER VOLTAGE	Protection type :	Shut down o/p vo	oltage, re-power	on to removed				
	OVER TEMPERATURE		Protection type : Shut down o/p voltage, re-power on to removed						
	BATTERY REVERSE POLARITY	Protected when	reverse nolarity	no damage re	covers automatic	ally after fault	condition is remove	he	
	BATTERY CUTOFF	Protected when reverse polarity , no damage, recovers automatically after fault condition is removed 9.5V±0.5V 21.5V±0.5V 32V±0.5V 43V±0.5V							
	ACOK		Open : AC OK :		e : max. 30mA@ !			101 20.01	
	BATTERY DISCONNECT/ REVERSE POLARITY	TTL signal, High / Open : Battery disconnect/reverse polarity ; Low : Battery connect/normal; Ice : max. 30mA@ 50VDC						;	
FUNCTION	BATTERY LOW	TTL signal, High / Open : Battery low ; Low : Battery normal; Ice : max. 30mA@ 50VDC							
	BATTERY FULL	TTL signal, High / Open : Battery full ; Low : Battery charging ; Ice : max. 30mA@ 50VDC							
	DISCHARGE				e ; Ice : max. 30m/				
	WORKING TEMP.	-20~+60°C (Re				•			
	WORKING HUMIDITY	20~95% RH no		,					
ENVIRONMENT	STORAGE TEMP., HUMIDITY	-30~+85°C, 10		condensina					
	TEMP. COEFFICIENT	±0.03%/°C (0~							
	VIBRATION	10~500Hz, 5G		0min. each alo	ng X. Y. Zaxes				
	SAFETY STANDARDS					annroved: D	esign refer to GB 1	7945-2010	
		I/P-O/P:3KVAC	I/P-FG:2KVA0			approved, or	calginerer to OD 1	1343-2010	
	WITHSTAND VOLTAGE								
	WITHSTAND VOLTAGE		O/P-EG-100M C	hms / 500VDC	/ 25 °C/ 70% RH				
	WITHSTAND VOLTAGE ISOLATION RESISTANCE	I/P-O/P, I/P-FG,	O/P-FG:100M C				Test Level / No	te	
			O/P-FG:100M C	Sta BS	ndard EN/EN55032 (CIS	PR32),	Test Level / No Class A	ite	
		I/P-O/P, I/P-FG, Parameter	O/P-FG:100M C	Sta BS EA BS	ndard			ite	
EMC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted		Sta BS EA BS	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS		Class A	vte	
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated		Sta BS EA BS EA	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS		Class A Class A	vte	
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre		Sta BS EA BS EA 	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS		Class A Class A		
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker		Sta BS EA BS EA Sta	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 -		Class A Class A Test Level / No	te	contact; criteria A
EMC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter		Sta BS EA BS EA Sta BS	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - - ndard		Class A Class A Test Level / No	vte ; Level 2, 6KV	contact; criteria A
EMC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter ESD Radiated		Sta BS EA BS EA Sta BS BS BS	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - - - - - - - - - - - - - - - - -		Class A Class A Test Level / No Level 3, 8KV ain Level 3, 10V/m	te ; Level 2, 6KV ; criteria A	contact; criteria A
SAFETY & EMC Note 4 & 5)	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter ESD Radiated EFT / Burst		States St	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - en/end EN/EN61000-4-2 EN/EN61000-4-3 EN/EN61000-4-4		Class A Class A Test Level / No Level 3, 8KV air Level 3, 10V/m Level 3, 2KV ; c	nte r;Level2,6KV ;criteria A riteria A	
EMC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter ESD Radiated EFT / Burst Surge		Steller BS EA BS EA BS EA Steller BS BS BS BS BS BS	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - EN/EN61000-4-3 EN/EN61000-4-3 EN/EN61000-4-4 EN/EN61000-4-4		Class A Class A Class A Test Level / NC Level 3, 8KV air Level 3, 10V/m Level 3, 2KV ; c Level 3, 1KV/Li	te ; Level 2, 6KV ; criteria A riteria A ne-Line ;2KV/L	contact; criteria A ine-FG ;criteria A
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter ESD Radiated EFT / Burst Surge Conducted		States St	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - - - EN/EN61000-4-2 EN/EN61000-4-4 EN/EN61000-4-4 EN/EN61000-4-5 EN/EN61000-4-6		Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 10V/m Level 3, 12KV i Level 3, 11XV/Li	te ; Level 2, 6KV ; criteria A riteria A ne-Line ;2KV/L riteria A	
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Harmonic Curre Voltage Flicker Parameter ESD Radiated EFT / Burst Surge Conducted Magnetic Field	ent	States St	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - - - - - - - - - - - - - - - - -	PR32),	Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 18V/Li Level 3, 18V/Li Level 3, 18V/Li Level 3, 18V/Li Level 4, 30A/m	te ; Level 2, 6KV ; criteria A riteria A ne-Line ;2KV/L riteria A	
MC	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, Parameter Conducted Radiated Harmonic Curre Voltage Flicker Parameter ESD Radiated EFT / Burst Surge Conducted	ent Telcordia SR-	States St	ndard EN/EN55032 (CIS C TP TC 020 EN/EN55032 (CIS C TP TC 020 - - - - EN/EN61000-4-2 EN/EN61000-4-4 EN/EN61000-4-4 EN/EN61000-4-5 EN/EN61000-4-6	PR32),	Class A Class A Test Level / NC Level 3, 8KV ai Level 3, 18V/Li Level 3, 18V/Li Level 3, 18V/Li Level 3, 18V/Li Level 4, 30A/m	te ; Level 2, 6KV ; criteria A riteria A ne-Line ;2KV/L riteria A	

LAD-360xU Series UART Communication Function Model(U Version)

MODEL		LAD-360BU		LAD-360CU		LAD-360DU	
	OUTPUT NUMBER	CH1	CH2	CH1	CH2	CH1	CH2
	DC VOLTAGE	27.6V	27.6V	41.5V	41.5V	55.2V	55.2V
	RATED CURRENT	11.5A	1.5A(Battery Charger)	7.14A	1.5A(Battery Charger)	5.03A	1.5A(Battery Charge
	CURRENT RANGE	0~13A		0~8.64A		0~6.53A	
	RATED POWER	358.8W		358.56W		360.46W	
	RIPPLE & NOISE (max.) Note.2			240mVp-p		240mVp-p	
OUTPUT	VOLTAGE ADJ. RANGE	CH1: 21.6 ~ 29V		CH1: 32.4 ~ 43.5V		CH1: 43.5 ~ 58V	
	VOLTAGE TOLERANCE Note.3	+1.0%		+1.0%		±0.5%	
	LINE REGULATION	±0.5%		±0.5%		±0.5%	
	LOAD REGULATION	±0.5%		±0.5%		±0.5%	
	SETUP, RISE TIME	2000ms, 50ms/230VA		115VAC at full load		10.576	
	HOLD UP TIME (Typ.)		2000ms, 30ms 12ms/115VAC at full lo				
	BATTERY STATIC DISCHARGE		1211IS/115 VAC at Iuli Io	au			
	CURRENT	<100µA					
	VOLTAGE RANGE	90 ~ 132VAC / 180 ~ 1	264VAC by switch	240~370VDC (Default switch at 230VA0	2)	
	FREQUENCY RANGE	47 ~ 63Hz				,	
	EFFICIENCY (Typ.)	86%		86.5%		86.5%	
INPUT	AC CURRENT (Typ.)	0070	230VAC				
	INRUSH CURRENT (Typ.)	COLD START 60A/1		/AC			
	LEAKAGE CURRENT	<0.5mA/240VAC					
		CH1:105~135%	CH2:90 ~ 110%				
				he unit will enter to	UPS mode when CH1 is a	around 105%~120%.	
					of CH1 + CH2 reach aro		tput shuts down
	OVERLOAD	CH1	OLP, CH2 without ba		voltage, re-power on to re		
					does not affect CH1 wor		atically after fault
PROTECTION			condition is remove	d (External fuse is n	nandatory in series conne	ection with battery fo	r protection)
PROTECTION		CH1:31~36V		CH1:47~55V		CH1:59~69V	
	OVER VOLTAGE	Protection type : Shut	down o/p voltage, re-p	ower on to removed			
	OVER TEMPERATURE	Protection type : Shut	down o/p voltage, re-p	ower on to removed			
	BATTERY REVERSE POLARITY	Protected when revers	se polarity , no damage	, recovers automatica	ally after fault condition is i	removed	
	BATTERY CUTOFF	21.5V±0.5V		32V±0.5V		43V±0.5V	
		115VAC Input : Signals AC failure and activates when input voltage <75VAC					
		Reco	Recover the main power supply when input voltage >85VAC				
	AC OK	230VAC Input : Signa	Is AC failure and activa	tes when input volta	ge <165VAC		
FUNCTION		Recover the main power supply when input voltage >175VAC					
	CHARGER CIRCUIT FAIL	Battery disconnected	t battery reverse polari	ty şignal failure			
	BUZZER ALARM		n system selectable b				
	DOZZENALANI			pattery reverse conne	ct, overload status (evacu	ation system select	able byUART)
	WORKING TEMP.	-20 ~ +60°C (Refer to	• ,				
	WORKING HUMIDITY	20 ~ 95% RH non-co	ndensing				
ENVIRONMENT	STORAGE TEMP., HUMIDITY	-30~+85°C, 10~95	% RH non-condensing	1			
	TEMP. COEFFICIENT	±0.03%/°C (0~50°C	2)				
	VIBRATION	10 ~ 500Hz, 5G 10mi	n./1cycle, 60min. eacl	h along X, Y, Z axes			
	SAFETY STANDARDS	UL62368-1, BS EN/E	N62368-1, AS/NZS623	368.1, EAC TP TC 00	4 approved; Design refer	to GB 17945-2010, 0	GB4717
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/F	-FG:2KVAC 0/P-FG	G:0.5KVAC			
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-	FG:100M Ohms / 500	VDC / 25 °C/ 70% RH	1		
		Parameter	Standard		Test Level / Note		
		Conducted	BS EN/EN5503 EAC TP TC 02	32 (CISPR32), 0	Class A		
SAFETY &	EMC EMISSION	Radiated	BS EN/EN5503 EAC TP TC 02		Class A		
EMC (Note 4 & 5)		Harmonic Current					
,		Voltage Flicker					
		Parameter	Standard		Test Level / Note		
		ESD	BS EN/EN610	00-4-2	Level 3, 8KV air ; Level 2	, 6KV contact; criteria	A
		Radiated	BS EN/EN610	00-4-3	Level 3, 10V/m ; criteria	4	
	EMC IMMUNITY	EFT / Burst	BS EN/EN610	00-4-4	Level 3. 2KV : criteria A		
		Surge	BS EN/EN610		Level 3, 1KV/Line-Line ;2	KV/Line-FG :criteria	A
		Conducted	BS EN/EN610		Level 3, 10V ; criteria A		
		Magnetic Field	BS EN/EN610		Level 4, 30A/m; criteria	۵	
	MTBF	-					
	m . DF	1394.9K hrs min. T	elcordia SR-332 (Bellco	ore); 153.3K hrs m	n. MIL-HDBK-217F (25	, ,	
OTHERS	DIMENSION	215*115*30mm (L*W	(*山)				

LAD-360x Series TTL Communication Function Model(Blank Version)

NPPLE & NOISE (max), Not2, 150% (P)	MODEL		LAD-360B		LAD-360C		LAD-360D			
DC VOLTAGE 27.9V 41.9V 41.9V 41.9V 52.2V 52.2V 52.2V RATED C CURRENT 11.5A 15.8MB/IIC Clarge V 0.5.63.A 15.8MB/IIC Clarge V CURRENT RANCE 0.13.A		OUTPUT NUMBER	CH1	CH2	CH1	CH2	CH1	CH2		
NATED CURRENT 11.5.4 1.5.4/Listing / Darger/ 24.000000 25.4000000000000000000000000000000000000		DC VOLTAGE						0112		
CURRENT RANCE 0 - 13.0										
NUTUR RATED POWER 358.89% 358.89% 369.49% 300.48% 300.48% NUTURE RODE (max). Name: 150% pp. 0										
VDIPUT RPPLE & NOISE (max) Holds 1000/pp 24000/pp 24000/pp <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>										
VOLTAGE ADJ. RANGE CH112 6 - 287 V CH123 4 - 435 V CH13 5 - 587 V VOLTAGE TOLERANCE NUM 10%	OUTPUT			1						
V0L1AGE TOLE FAVACE Parks 41.0%										
LINE REGULATION 40.5% mmm 40.5% mmm 40.5% mmm SETUP, RISE TIME 2005m, 50ms/250V/C 200ms, 50ms/250V/C 200ms, 50ms/250V/C 200ms, 50ms/250V/C 200ms, 50ms/250V/C 200ms, 50ms/250V/C 200ms, 50ms/250V/C 200ms/250V/C										
LOAD REGULATION 40.5%			±1.0%		±1.0%					
SETUP_RISE TIME 2000ms, Some/200/c 2000ms, Some/10 MC at full load HOLD DIFE(Typ.) 16ms/230VAC 12ms/115VAC at full load INTERY STATUDISCHARCE 90-132/AC / 180-264/AC by switch 240-370VDC (Default switch at 230VAC) FEEQUENCY RANGE 47-681/AC 47-681/AC 86.5% 86.5% 86.5% AC CURRENT (Typ.) 68/15 66.25% 86.5% 86.5% 86.5% AC CURRENT (Typ.) 68/115VAC 47/230VAC 60/230VAC Work of the switch at 230VAC) VER CURRENT (Typ.) 68/1100-1100K 60/230VAC Work of the switch at 230VAC Work of the switch at 230VAC VER VOLTAGE 40/11016-100K 60/230VAC Work of the switch at 230VAC Work of the switch at 230VAC VER VOLTAGE 40/11016-100K 60/230VAC Work of the switch at 230VAC Work of the switch at 230VAC VER VOLTAGE 40/11016-100K 60/230VAC Work of the switch at 230VAC Work of the switch at 230VAC VER VOLTAGE 40/11016-100K 60/230VAC Work of the switch at 230VAC Work of the switch at 230VAC VER VOLTAGE Production type: Switch at 300			±0.5%		±0.5%					
HOLD UP TIME (Pyp.) 16ms/230/AC 12ms/115/AC at full load VERTEX FIGURA FAINER 400-320/AC 240-370/AC (Default witch at 230/AC) FREQUENCY RAINGE 90-132/AC / 180-264/AC by switch 240-370/AC (Default witch at 230/AC) FREQUENCY RAINGE 47-65/AL 86.5% 86.5% 86.5% AC CURRENT (Typ.) 85% 0.05230/AC VERCONCY VERCONCY VERCONCY INFUSION CURRENT (Typ.) 0.057AFT 60/A100 VERCONCY VERCONCY </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>±0.5%</td> <td></td>							±0.5%			
RATERY STATE DISANAGE 4100/A VOLTAGE RANGE 90 - 1320/AC / 180 - 284/AC by switch 240 - 370/DC (Default switch at 230/AC / 100 - 201/DE /		SETUP, RISE TIME	2000ms, 50ms/230V/	AC 2000ms, 50ms	s/115VAC at full load					
CURRENT CURRENT CURRENT CURRENT VEX.102 ERANGE 90 - 132/VC (180 - 284/VC by switch 240 - 370/VD (Default switch at 230/VAC) PREQUENCY RANGE 47 - 631/t. PREQUENCY EANGE 47 - 631/t. 86.5% 86.5% 86.5% AC CURRENT (Typ.) 68/t115/VAC 44/230/VAC 86.5% 86.5% 86.5% AC CURRENT (Typ.) 60/t115 - 135% CH2.30 - 110% Not 500/t116 - 135% CH2.30 - 110% VER.VOLTAGE CH1105 - 135% CH2.30 - 110% Not 100/t10/CH1 + CH2 reach around 105% - 120%, when total output of CH1 + CH2 reach around 105% - 120%, when total output of CH1 + CH2 reach around 105% - 120%, when total output of CH1 + CH2 reach around 105% - 120%, when total output of CH1 + CH2 reach around 105% - 120%, when total output of CH1 working provides and taber 3/ht down on youtbage; repower on to removed (E14mm disk is anadator) is senies connection with batter full condition is removed (E14mm disk repower and removed (E14mm disk removed (E14mm disk remover and rema (E14mm disk removed (E14mm		HOLD UP TIME (Typ.)	16ms/230VAC							
PRUT PREQUENCY RANGE 47 - 63Hz 66.5% 66.5% PERCENCY (Typ.) 66% 66.5% 66.5% AC CURRENT (Typ.) 60% 60.4230VAC LEAKAGE CURRENT (Typ.) COLD START 60/L15VAC 60.4230VAC VERLOAD 0.5mk / 240/AC CH1:105 - 135% CH2:90 - 110% VERLOAD CH1:105 - 135% CH2:90 - 110% Wint total output of CH1 - CH2 each around 125% - 135% output shuls down CH1 OLP, CH2 without battery: Shul down oip voltage re-power on to removed CH2: Constant contain dues is madatory in series connection with battery for protection) OVER VOLTAGE Protection type : Shul down oip voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection type : Shul down oip voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection type : Shul down oip voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection type : Shul down oip voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection type : Shul down oip voltage, re-power on to removed Entervinge BATTERY VERNER POLARITY Protection type : Shul down oip voltage, re-power on to removed Entervinge BATTERY FURP Protection type : Shul down oip voltage, re-power on to removed Entervinge BATTERY FURP Protection type : Shul down oip voltage, re-power on to removed Entervinge		BATTERY STATIC DISCHARGE CURRENT	<100µA							
NPUT EFFICIENCY (Typ.) 86% 86.5% 86.		VOLTAGE RANGE	90~132VAC/180~	264VAC by switch	240~370VDC (I	Default switch at 230VA	C)			
EFFICENCY (Typ.) 86,5% 86,5% 86,5% AC CURRENT (Typ.) 02.01 START 60/L15VAC 60/230VAC LEAKAGE CURRENT (Typ.) 02.01 START 60/L15VAC 60/230VAC LEAKAGE CURRENT (Typ.) 02.01 START 60/L15VAC 60/230VAC VERUOAD CH1105 - 130% CH2.20 - 110% VERUOAD Protection type: CH1 C/C, CH2 with ballery: film dia luit enter to UPS mode when CH1 is around 105%-120%, when total output of CH1 - CH2 each around 125% - 135% output shuts down CH1 OLP, CH2 without balary: film down of yotage, re-power on to removed OVER VOLTAGE CH1:10 - CH2 without balary: film down of yotage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection type: Shut down of yotage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection on giv voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection on giv voltage, re-power on to removed CH1:159 - 69V OVER VOLTAGE This down of yotage, re-power on to removed CH1:159 - 69V OVER VOLTAGE Protection one share down of yotage, re-power on to removed CH1:159 - 69V OVER VOLTAGE This down of yotage, re-power on to removed CH1:159 - 69V DVER VOLTAGE Thisignal High/Open:		FREQUENCY RANGE	47 ~ 63Hz							
AC CURRENT (Typ.) AC CURRENT (Typ.) AC CURRENT (Typ.) COLD START 600/115/UAC 60/1230/UAC COLD COLD START 600/115/UAC 60/1230/UAC COLD COLD START 600/115/UAC COLD START 600/115/UAC COLD COLD START 600/115/UAC COLD START	NPUI	EFFICIENCY (Typ.)	86%		86.5%		86.5%			
INPUSION CURRENT (Typ.) COLD START 50//159/AC 60//230/AC LEAKAGE CURRENT <0.5mh/240/VAC				/230VAC	00.070		00.070			
LEAKAGE CURRENT <0.5mA/240VAC					WAC .					
VERLOAD CH1:05 - 135% CH2:00 - 110% VERLOAD Polecion type: CH1 UP, CH2 with battery: Shu down of voltage, re-power on to removed CH1 OLP, CH2 without battery: Shu down of voltage, re-power on to removed CH2: Constant current limiting, ratio condition constant CH1 working, recovers automatically after fault condition is removed (External fuse is mandatory in series connection with battery for protection) OVER VOLTAGE CH1:31 - 36V CH1:31 - 36V CH1:39 - 69V OVER VOLTAGE Protection type: Shut down of voltage, re-power on to removed CH1:31 - 36V CH1:39 - 69V OVER VOLTAGE Protection type: Shut down of voltage, re-power on to removed CH1:39 - 69V Protection type: Shut down of voltage, re-power on to removed BATTERY REVERSE POLARITY Protection type: Shut down of voltage, re-power on to removed 20/20.5V 43V ±0.5V BATTERY DISCONECT 21.5V±0.5V 32/20.5V 43V ±0.5V 43V ±0.5V BATTERY DISCONECT Th signal, High / Open: Battery down, Low: Battery connect/newres automatically after fault condition is removed 50VDC BATTERY DISCONECT Th signal, High / Open: Battery down, Low: Battery connect/newres town. S0MA@ 50VDC 50VDC BATTERY FULL Th signal, High / Open: Battery down, Low: Battery connect/newres town. 50MA@ 50VDC 50VBC 5				113140 004/230	VAC					
ROTERION Protection type: CH1 0LP, CH2 with battery: The mit with enter to UPS mode when CH1 is around 105%~135% output shuts down CH1 0LP, CH2 without battery: Shut down oly voltage, re-power on to removed CH2: Constant current limiting; fault condition does not affect CH1 working recovers automatically after fault conditions removed (CH2: Constant current limiting; fault condition does not affect CH1 working recovers automatically after fault conditions removed (CH2: Constant current limiting; fault condition does not affect CH1 working recovers automatically after fault conditions removed (CH2: Constant current limiting; fault condition is removed DVER VOLTAGE OVER VOLTAGE Protection type: Shut down olp voltage, re-power on to removed CH1:59 – 68V DVER VOLTAGE Protection type: Shut down olp voltage, re-power on to removed 32V2:0.5V 32V2:0.5V BATTERY REVERSE POLARITY REVERSE POLARITY Protected when reverse polarity, not damage, recovers automatically after fault condition is removed 32V2:0.5V 32V2:0.5V BATTERY DISCONNECT/ REVERSE POLARITY TTL signal, High / Open: Battery liw: Low: Battery domocontentormal; loe: max. 30mA@ 50VDC TTL signal, High / Open: Battery liw: Low: Battery connecthormal; loe: max. 30mA@ 50VDC BATTERY FUEL TTL signal, High / Open: Battery liw: Low: Battery charging; loe: max. 30mA@ 50VDC TTL signal, High / Open: Battery liw: Low: Battery charging; loe: max. 30mA@ 50VDC WORKING FUENDY 20 + 680°C (Refer to "Derating Curve") Voltage (Refer to "Derating Curve") Voltage (Refer to "Derating Cu		LEARAGE CORRERT		0110-00 4409/						
OVER VOLTAGE CH1 31 - 36V CH1 37 - 55V CH1 59 - 66V OVER VOLTAGE Protection type : Shut down of voltage, re-power on to removed OVER TEMPERATURE Protection type : Shut down of voltage, re-power on to removed attaction to removed BATTERY RUPERSE POLARIY Protected when reverse polarity, no damage, recovers automatically after fault condition is removed attaction to removed BATTERY RUPERSE POLARIY Protected when reverse polarity, no damage, recovers automatically after fault condition is removed attaction to removed BATTERY RUPERSE POLARIY Th signal, High / Open : Battery disconnect/reverse polarity : Low: Battery connect/normal; loe : max. 30mA@ 50VDC btaction to removed BATTERY PULL Th signal, High / Open : Battery diu ; Low: Battery rotarging ; Ice : max. 30mA@ 50VDC attaction to removed BATTERY PULL Th signal, High / Open : Battery diu ; Low: Battery rotarging ; Ice : max. 30mA@ 50VDC attaction to removed WORKING TEMP -20 - +60°C (Refer to 'Derating Curve') working temp 20 - 95% RH non-condensing TEMP. COEFFICIENT 20 - 95% RH non-condensing texes > 000 /		OVERLOAD	сн	1 OLP, CH2 without ba 2 : Constant current lir	when total output attery:Shut down o/p v niting; fault condition	of CH1 + CH2 reach arc roltage,re-power on to re does not affect CH1 wor	und 125%~135% ou emoved king,recovers autom	atically after fault		
OVER V0LTAGE Protection type : Shut down ofp voltage, re-power on to removed OVER TEMPERATURE Protection type : Shut down ofp voltage, re-power on to removed BATTERY REVERSE POLARITY Protected when reverse polarity, no damage, recovers automatically after fault condition is removed BATTERY CUTOFF 21.5V=0.5V 32/40.5V 43V40.5V AC OK TTL signal. High / Open: AC OK ; Low : AC Fail ; Lee : max. 30mA@ 50VDC 43V40.5V AC OK TTL signal. High / Open: Battery disconnect/reverse polarity : Low : Battery connect/normal; Lee : max. 30mA@ 50VDC BATTERY LOW TTL signal. High / Open: Discharge; Low : Charge ; Lee : max. 30mA@ 50VDC DISCHARGE TTL signal. High / Open: Discharge; Low : Charge ; Lee : max. 30mA@ 50VDC WORKING TEMP -20 - 460°C (Refer to "Derating Curve") WORKING HUMDITY 20 - 95% RH non-condensing TEMP, COEFFICIENT 403%/CC (-0 - 60°C) VIBRATION 10 - 500Hz, 501 f0min. / tsylcle, 60min. each along X, Y, Z axes SAFETY STANDARDS UL62368-1, BS EN/ENR00004-1 VIESSION Radiated BS EN/ENR00002 (CISY 70% RH Feat ENVEL Conducted BS ENVEN5032 (CISPR32), EAC TP TC 020 Class A MTEF Standard TestL	RUIECTION		CH1:31~36V							
OVER TEMPERATURE Protection type : Shut down of p voltage, re-power on to removed BATTERY RUERSE POLARIY Protected when reverse polarity, no damage, recovers automatically after fault condition is removed BATTERY RUERSE POLARIY Protected when reverse polarity, no damage, recovers automatically after fault condition is removed BATTERY CUTOFF 21.5V±0.5V 32V±0.5V 43V±0.5V BATTERY DOW Tti signal, High / Open: Battery disconnect/reverse polarity i. Low: Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY PLUL Tti signal, High / Open: Battery diu i. Low: Battery romal; Ice : max. 30mA@ 50VDC BATTERY PLUL Tti signal, High / Open: Battery diu i. Low: Battery romal; Ice : max. 30mA@ 50VDC Ice : max. 30mA@ 50VDC BATTERY PLUL Tti signal, High / Open: Battery diu i. Low: Battery romani; Ice : max. 30mA@ 50VDC Ice : max. 30mA@ 50VDC WORKING TEMP. 20 - 46°C (Refer to "Derating Curve") Ice : max. 30mA@ 50VDC Ice : max. 30mA@ 50VDC WORKING TEMP, HUMIDITY 20 - 46°C (Refer to "Derating Curve") Ice : max. 30mA@ 50VDC Ice : max. 30mA@ 50VDC SAFETY STADARDS UL62368.1, BS ENENE3208.1, EAC TP TC 0.04 approved; Design refer to GB 17945-2010 Ice : max. 30mA@ 50VDC Ice : max. 30mA@ 50VDC SAFETY STADARDS UL62368.1, BS ENENE3032 (CISPR2), EAC TP TC 0.02 Ice :		OVER VOLTAGE								
BATTERY REVERSE POLARITY BATTERY CUTOFF 21:5V:05V 32V:0.5V 43V:0.5V AC OK TTL signal, High / Open: AC OK ; Low::AC Fail; Lee: max.30mA@ 50VDC BATTERY DISCONNECT/ REVERSE POLARITY TTL signal, High / Open: Battery disconnect/reverse polarity; Low::Battery connect/normal; Lee: max.30mA@ 50VDC BATTERY UDW TTL signal, High / Open: Battery disconnect/reverse polarity; Low::Battery connect/normal; Lee: max.30mA@ 50VDC BATTERY FULL TTL signal, High / Open: Battery disconnect/reverse polarity; Low::Battery connect/normal; Lee: max.30mA@ 50VDC BATTERY FULL TTL signal, High / Open: Battery full; Low:: Battery connect/normal; Lee: max.30mA@ 50VDC DISCHARGE TTL signal, High / Open: Battery full; Low:: Battery connect/normal; Lee: max.30mA@ 50VDC WORKING TEMP. 20 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 - 485°C, 10 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 - 485°C, 10 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 40 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 40 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 50 - 050°C, 10 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 50 - 050°C, 10 - 95% RH non-condensing SAFETY STANDARDS UL6288-1, BS ENIEN62386.1, EAC TP TC 004 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE UP-0P, 10 - 95% RH con-condensing EMC EMISSION RESISTANCE IP-0P-0F-0F: 0000 Mmrs/ 5000VDC / 25°C 70% RH Farameter Standard TestLevel / Note EAC TP TC 020 Harmonic Current Voltage Flicker Voltage Flicker ESD BS ENIEN61000.4-3 Level 3, 10V/m; criteria A Badiated BS ENIEN61000.4-4		OVER TEMPERATURE								
BATTERY CUTOFF 21.5V±0.5V 32V±0.5V 43V±0.5V AC OK TTL signal. High / Open: AC OK ; Low: AC Fall; Ke: max. 30mA@ 50VDC 43V±0.5V AC OK TTL signal. High / Open: Battery disconnect/reverse polarity; Low: Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY LOW TTL signal. High / Open: Battery disconnect/reverse polarity; Low: Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY FULL TTL signal. High / Open: Discharge; Low: Charge; Ice: max. 30mA@ 50VDC DISCHARGE TTL signal. High / Open: Discharge; Low: Charge; Ice: max. 30mA@ 50VDC VORKING TEMP -20 - 460°C (Refer to "Derating Curve") VORKING TEMP. -20 - 460°C (Refer to "Derating Curve") VIBRATION 10 - 500°L; 501 00min. forylce; 60min. each along X, Y, Z axes VIBRATION 10 - 500°L; 501 00min. forylce; 60min. each along X, Y, Z axes SAFETY STANDARDS UL62368-1, BS EN/EN62368-1, FAC TP TC 004 approved; Design refer to GB 17945-2010 WITHSTAND VOLTACE IP-OP; 3K/AC UP-FG; 2K/AC OP; FG: 50° 70% RH FMC EMISSION Radiated BS EN/EN5032 (CISPR32), EAC TP TC 020 Class A FMC EMISSION Radiated BS EN/EN61000-4-3 Level / Note EMC EMISSION Radiated BS EN/EN61000-4-3 <							- 1			
AC OK TTL signal, High / Open : AC OK ; Low : AC Fail ; Lee : max. 30mA@ 50VDC BATTERY DISCONNECT/ REVERSE POLARITY TTL signal, High / Open : Battery disconnect/reverse polarity ; Low : Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY LOW TTL signal, High / Open : Battery low ; Low : Battery normal; Ice : max. 30mA@ 50VDC BATTERY FULL TTL signal, High / Open : Battery low ; Low : Battery normal; Ice : max. 30mA@ 50VDC DISCHARGE TTL signal, High / Open : Battery liw ; Low : Battery normal; Ice : max. 30mA@ 50VDC WORKING TEMP, -20 - +60°C (Refe to 'Derating Curve') WORKING TEMP, -20 - +60°C (Refe to 'Derating Curve') WORKING TEMP, -20 - +60°C (Refe to 'Derating Curve') WORKING TEMP, -20 - +60°C (Refe to 'Derating Curve') WORKING TEMP, HUMIDITY 20 - 95% RH non-condensing TENC 10 - 500Hz, 5G 10min. /Lcycle, 60min. each along X, Y, Z axes SAFETY STANDARDS UL0238-1, BS ENVENE0328-1, LAS IVZ SC238-1, EAC TP TC 004 approved; Design refer to GB 17945-2010 WITHSTAD VOLTAPS/KAPC (UP-FG. SX/AC UP-O/P, UP-FG, O/P-FG-100M Ohms / 500VDC / 25 °G 70% RH ISOLATION RESISTANCE UP-O/P, UP-FG, O/P-FG-100M Ohms / 500VDC / 25 °G 70% RH EMC EMISSION Radiated BS ENVENE05032 (CISPR32), EAC TP TC 020 Class A			······································							
BATTERY DISCONNECT/ REVERSE POLARITY TTL signal, High / Open : Battery disconced/reverse polarity: Low : Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY LOW TTL signal, High / Open : Battery low : Low : Battery connect/normal; Ice : max. 30mA@ 50VDC BATTERY FULL TTL signal, High / Open : Battery tow : Charge ; Lew : Charge ; Lew : max. 30mA@ 50VDC DISCHARGE TTL signal, High / Open : Battery tow : Charge ; Lew : Charge ; Lew : max. 30mA@ 50VDC WORKING TEMP, 20 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 20 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 01 ~ 95% RH non-condensing SAFETY STANDARDS UL6238PL 18 SENICH228PL 1ASNZ582380.1 EAC TP TC 004 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE IP-0/P, IV-FG, 0/F-G; 100M Ohms, 500VDC / 25 ′ 70% RH FMCE MISSION Radiated BENENS5032 (CISPR32), EAC TP TC 202 Class A Harmonic Current				10.0% 1 10.0		50/00	43V±0.5V			
ENCLOSE Parameter Standard SAFETY 8 Note 48.59 EMC EMISSION Radiated BS ENEN5032 (CISPR2), EACT TO 020 EMC EMISSION Radiated BS ENEN5032 (CISPR2), EACT TO 020 Class A MTER Mage Filed BS ENEN5032 (CISPR2), EACT TO 200 Class A MORE Mage Filed BS ENEN5032 (CISPR2), EACT TO 200 Class A MORE EMC EMISSION BS ENEN5032 (CISPR2), EACT TO 200 Class A MIROWERT Stone 64 BS ENEN6232 (CISPR2), EACT TO 200 Class A MIROWERT SAFETY STADARDS UE23461 BS ENEN2532 (CISPR2), EACT TO C00 Class A MIROWERT SAFETY STADARDS UE23681, BS ENEN25032 (CISPR2), EACT TO C02 Class A INC MICATION BS ENEN5032 (CISPR2), EACT TO C02 Class A EMC EMISSION Radiated BS ENEN5032 (CISPR2), EACT TO C02 Class A EMC IMMUNITY EST ENEN5032 (CISPR2), EACT TO C02 Class A EMC IMMUNITY BS ENENFINICHT EACT TO C02 Class A EMC IMMUNITY BS ENENFINICHT EACT TO C02 Class A EMC IMMUNITY BS ENENFINICHT EACT TO C02		BATTERY DISCONNECT/					Ice : max. 30mA@ 50	VDC		
BATTERY FULL TTL signal, High / Open: Battery full ; Low: Battery charging ; Ice : max. 30mA@ 50VDC DISCHARGE TTL signal, High / Open: Discharge; Low : Charge; Ice : max. 30mA@ 50VDC MORKING TEMP. 20 - 40°C (Refer to Detaing Curve") WORKING HUMIDITY 20 - 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 - 48°C, (10 - 95% RH non-condensing) TEMP. COEFFICIENT 40.03%/nC (0 - 50°C) VIBRATION 10 - 500Hz, 56 10min./tcycle, 60min. each along X, Y, Z axes VIBRATION UL623861, BS ENIEN823861, ASN25823861, EAC TP TC U>4 approved; Design refer to GB 17945-2010 WITH STAND VOLTAGE UP-0/P, UP-FG, UP-FG: 2KVAC Test Level / Note IDP-0/P, UP-FG, UP-FG: CUVAC IP-0/P, UP-FG, UP-FG: 2KVAC Test Level / Note ISOLATION RESISTANCE UP-0/P, UP-FG, UP-FG: CUSPG2) Class A KMC Conducted BS ENEN5032 (CISPR32), EAC TP TC 020 Class A Harmonic Current Voltage Flicker Voltage Flicker Voltage Flicker Voltage Flicker V	UNCTION					-				
DISCHARGE TTL signal, High / Open: Discharge; Low: Charge; Lee: max. 30mA(@ 50VDC WORKING TEMP. -20 - +60°C (Refer to "Derating Curve") WORKING TEMP. 20 - +60°C (Refer to "Derating Curve") WORKING HUMIDITY 20 - 95% RH non-condensing STORAGE TEMP., HUMIDITY -30 - +85°C, 10 - 95% RH non-condensing TEMP. COEFFICIENT ±0.03%/rC (0 - 60°C) VIBRATION 10 - 500/tL, 50 10min. ft/cycle, 60min. each along X, Y, Z axes SAFETY STANDARDS UL62368-1, BS EN/EN62368-1, AS/NZS62368.1, EAC TP TC 0.04 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE UP-0P:3KVAC OP-FG:0.5KVAC ISOLATION RESISTANCE UP-0P:3KVAC Test Lavel / Note Refer Standard Test Lavel / Note Eact TP TC 020 Conducted BS EN/EN5032 (CISPR32), EAC TP TC 020 Class A WITH STAND VOLTAGE Harmonic Current Voltage Flicker Voltage Flicker Voltage Flicker Voltage Flicker Voltage Flicker <td< td=""><td></td><td>BATTERY FULL</td><td></td><td></td><td></td><td>-</td><td></td><td></td></td<>		BATTERY FULL				-				
WORKING TEMP. -20 ~ +60°C (Refer to "Derating Curve") WORKING HUMIDITY 20 ~ 95%, RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ +85°C, 10 ~ 95%, RH non-condensing TEMP. COEFFICIENT 40.03%/C (0 ~ 50°C) VIBRATION 10 ~ 500Hz, 56 10min. / tcycle, 60min. each along X, Y, Z axes SAFETY STANDARDS UL62368-1, BS EN/EN62368-1, AC TP TC 004 approved; Design refer to GB 17945-2010 WITHSTAD VOLTAGE UP-O/P, VP-FG, O/P-FG-0.5KVAC — ISOLATION RESISTANCE UP-O/P, VP-FG, O/P-FG-0.5KVAC — ISOLATION RESISTANCE UP-O/P, VP-FG, O/P-FG-0.5KVAC — VIDE ADDRESISTANCE UP-O/P, VP-FG, O/P-FG-0.5KVAC — VIDE ADDRESISTANCE VP-O/P, VP-FG, O/P-FG-0.5KVAC — Conducted BS EN/EN65032 (CISPR32), EAC TP TC 020 Class A EMC EMISSION Radiated BS EN/EN5032 (CISPR32), EAC TP TC 020 Class A EMC EMISSION Radiated BS EN/EN65032 (CISPR32), EAC TP TC 020 Class A EMC EMISSION Radiated BS EN/EN61000-4-3 Level 3, 8/V air ; Level 2, 6KV contact; criteria A EMC IMUNITY ESD BS EN/EN61000-4-3 Level 3, 8/V air ; Level										
WORKING HUMIDITY 20 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 10 ~ 95% RH non-condensing STORAGE TEMP, HUMIDITY 30 ~ 48°C, 10 ~ 95% RH non-condensing TEMP, COEFFICIENT ±0.03%/nC (0 ~ 50°C) VIBRATION 10 ~ 500/L2, 56 10min. / tcycle, 60min. each along X, Y, Z axes SAFETY STADARDS UL622861, 18 SE NEINE22861, 1.45NZ582380, 1, EAC TP TC 0.04 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE IIP-0/P. XVAC IVP-0/P. UP-FG, 0.5KVAC IVP-0/P. XVAC IVP-0/P. VIP-FG, 0.9KVAC Test Level / Note Parameter Standard Test Level / Note EMC EMISSION Radiated BS ENEIN5032 (CISPR32), EAC TP TC 020 Class A Harmonic Current Voltage Flicker Voltage Flicker Voltage Flicker Voltage Flicker Voltage Flicker BS ENVEN61000-4-3 Level 3, 10V/m, criteria A					. onarge, ice . max. o	Survey of the sector				
NNRCMENT STORAGE TEMP., HUMIDITY -30 - +85 °C, 10 - 95% RH non-condensing TEMP. COEFFICIENT ±0.03%/rC (0 - 60°C)										
TEMP. COEFFICIENT ±0.03%/PC (0 - 50°C) VIBRATION 10 - 500Hz, 56 10min, /toycle, 60min. each along X, Y, Z axes SAFETY STANDARDS UL62368.1, BS EN/EN62368.1, AS CAT PT C 004 approved; Design refer to GB 17845-2010 WITHSTAND VOLTAGE UP-O/P: 3KVAC UP-O/P: GOV-FG 0.5KVAC ISOLATION RESISTANCE UP-O/P: UP-FG, 0/P-FG 0.0M Ohms / 500VDC / 25°C7 0% RH Test Level / Note BS EN/EN5032 (CISPR2), EAC TP TC 020 Class A Class A Harmonic Current Voltage Flicker Voltage Flicker FENC IMMUNITY ES ENVEN60004-2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A EMC IMMUNITY ES ENVEN610004-3 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS ENVEN610004-4 Level 3, 7KV / criteria A EMC IMMUNITY ES ENVEN610004-4 Level 3, 7KV / criteria A Surge BS ENVEN610004-4 Level 3, 7KV / criteria A Surge BS ENVEN610004-4 Level 3, 7KV / criteria A Surge BS ENVEN610004-4 Level 3, 7KV / criteria A Surge BS ENVEN61000										
VIBRATION 10 ~ 500Hz, 5G 10min, 1cycle, 60min, each along X, Y, Z axes SAFETY STANDARDS UL62368-1, BS ENVEN62368-1, AS/N2562368.1, EAC TP TC 0.04 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE UP-O/P, VIP-FG, 2XVAC UP-O/P, SVAC ISOLATION RESISTANCE UP-O/P, VIP-FG, 2XVAC IP-O/P, VIP-FG, 2XVAC ISOLATION RESISTANCE UP-O/P, VIP-FG, 2XVAC Cass A EMC EMISSION Radiated BS ENVEN5032 (CISPR2), EAC TP TC 020 Class A IMC Note 4 8 0 BS ENVEN5032 (CISPR2), EAC TP TC 020 Class A IMC Note 4 8 0 BS ENVEN5032 (CISPR2), EAC TP TC 020 Class A IMC Note 4 8 0 BS ENVEN5032 (CISPR2), EAC TP TC 020 Class A IMC Note 4 8 0 BS ENVEN50032 (CISPR2), EAC TP TC 020 Class A IMT BE TO STANDARDS BS ENVEN50032 (CISPR2), EAC TP TC 020 Class A IMT BE TO STANDARDS BS ENVENSION Class A IMT BE TO STANDARDS BS ENVENSION004-1 Level 3, 6VV air ; Level 2, 6VV contact; criteria A ISOLATION RESISTANCE EFT / Burst BS ENVENSION004-3 Level 3, 10V/m, criteria A ISOLATION RESISTANCE EFT / Burst BS ENVENSION004-4 Leve	INVIRONMENT				9					
SAFETY STANDARDS UL62368-1, BS EN/EN62368-1, AS/NZ562368.1, EAC TP TC 0.04 approved; Design refer to GB 17945-2010 WITHSTAND VOLTAGE UP-0P-3KVAC UP-0F-3.KVAC Test Lavel / Note ISOLATION RESISTANCE UP-0P.3KVAC UP-0P.3KVAC Test Lavel / Note VB-0/P, UP-FG, 0DP-FG: 100M Ohms / 500VDC / 25 °C 70% RH Parameter Standard Test Lavel / Note EMC EMISSION Radiated BS ENEN55032 (CISPR32), EAC TP TC 020 Class A Yoltage Flicker Voltage Flicker Voltage Flicker EMC IMMUNITY BS ENEN51000-4-2 Level / Note EMC IMMUNITY BS ENEN51000-4-3 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS ENEN51000-4-3 Level 3, 10V/m; criteria A EMC IMMUNITY ESTO BS ENEN51000-4-4 Level 3, 10V/m; criteria A Surge BS ENEN51000-4-5 Level 3, 10V/m; criteria A Conducted BS ENEN51000-4-6 Level 3, 10V/m; criteria A BS ENEN51000-4-6 Level 3, 10V/m; criteria A Surge BS ENEN510000-4-6 Level 3, 10V/m;				,						
WITHSTAND VOLTAGE UP-0/P.3KVAC UP-FG.2KVAC O/P.FG.0.5KVAC ISOLATION RESISTANCE VP-0/P.UP-FG.2KVAC O/P.FG.0.5KVAC Test Level / Note ISOLATION RESISTANCE VP-0/P.UP-FG.0/VP-FG.100M Ohms / 500VDC / 25*07 70% RH Test Level / Note EMC EMISSION BS EN/EN5032 (CISPR32), EAC TP TC 020 Class A FMC Note 4 8.50 Radiated BS EN/EN5032 (CISPR32), EAC TP TC 020 Class A Harmonic Current Voltage Flicker Radiated BS EN/EN60024 (CISPR32), EAC TP TC 020 Class A EMC IMMUNITY Fameter Standard Radiated BS EN/EN610004-3 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS EN/EN610004-3 Level 3, 10V/m; criteria A Sunge BS EN/EN610004-4 Level 3, 10V/m; criteria A Sunge BS EN/EN610004-4 Level 3, 10V/m; criteria A Sunge BS EN/EN610004-6 Level 3, 10V/m; criteria A Magnetic Field BS EN/EN610004-6 Level 3, 10V/m; criteria A Magnetic Field BS EN/EN610004-8										
ISOLATION RESISTANCE I/P-C)P, I/P-FG, 0/P-FG:100M Ohms / 500VDC / 25 'O' 70% RH Parameter Standard Test Level / Note BS EN/EN5032 (CISPR2), EAC TP TO 020 Class A EMC EMISSION Radiated BS EN/EN5032 (CISPR2), EAC TP TO 020 Class A Harmonic Current Voltage Filcker Voltage Filcker Radiated BS EN/EN5032 (CISPR2), EAC TP TO 020 Class A Harmonic Current Voltage Filcker Radiated BS EN/EN50032 (CISPR2), ESD Exet Noto EBC (IMMUNITY ESD BS EN/EN61000-4-2 Level 3, 6KV air ; Level 2, 6KV contact; criteria A EMC IMMUNITY ESD BS EN/EN61000-4-3 Level 3, 10V/m, criteria A EMC IMMUNITY BS EN/EN61000-4-4 Level 3, 10V/m, criteria A Surge BS EN/EN61000-4-6 Level 3, 10V/m, criteria A Gonducled BS EN/EN61000-4-6 Level 3, 10V/m, criteria A Magnetic Field BS EN/EN61000-4-6 Level 3, 30W, criteria A						04 approved; Design re	fer to GB 17945-201	D		
FINCE MINISSION Parameter Standard Test Level / Note Note 4.8.57 Conducted BS ENICINSO32 (CISPR32), EAC TP TC 020 Class A NMC Note 4.8.57 Radiated BS ENICINSO32 (CISPR32), EAC TP TC 020 Class A Harmonic Current Voltage Flicker FSD BS ENICING000-4-2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS ENICING000-4-3 Level 3, 10V/m; criteria A EMC IMMUNITY EST DENEN61000-4-4 Level 3, 10V/m; criteria A EMC IMMUNITY BS ENICING1000-4-5 Level 3, 10V/m; criteria A EMC IMMUNITY BS ENICING1000-4-6 Level 3, 10V/m; criteria A Magnetic Field BS ENICING1000-4-8 Level 3, 10V/m; criteria A Magnetic Field BS ENICING1000-4-8 Level 3, 10V/m; criteria A Magnetic Field BS ENICING1000-4-8 Level 3, 10V/m; criteria A Magnetic Field BS ENICING1000-4-8 Level 4, 30A/m; criteria A Magnetic Field BS ENICING1000-4-8 Level 4, 30A/m; criteria A Magnetic Field BS ENICING1000-4-8										
BAFETY 8. Conducted BS ENEN55032 (CISPR32), EAC TP TC 020 Class A EMC MISSION Radiated BS ENEN55032 (CISPR32), EAC TP TC 020 Class A EMC Note 48.51 Harmonic Current Voltage Flicker Voltage Flicker ES ENEN50004-2 Level 3, 8KV air ; Level 2, 6KV contact; oriteria A Radiated BS ENEN61000-4-2 Level 3, 8KV air ; Level 2, 6KV contact; oriteria A Radiated BS ENEN61000-4-3 Level 3, 7KV citeria A EFT / Burst BS ENEN61000-4-4 Level 3, 7KV citeria A Suge BS ENEN61000-4-6 Level 3, 10V ; criteria A Gonducted BS ENEN61000-4-6 Level 3, 10V ; criteria A Magnetic Field BS ENEN61000-4-6 Level 3, 10V ; criteria A Magnetic Field BS ENEN61000-4-6 Level 4, 30Am; criteria A Magnetic Field BS ENEN61000-4-8 Level 4, 30Am; criteria A Magnetic Field BS ENEN61000-4-8 Level 4, 30Am; criteria A DiMENSION 215*115*30mm (L*W*H Level 4, 30Am; criteria A		ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P	-FG:100M Ohms / 500	VDC / 25 °C/ 70% RH					
BAFETY 8. CMC EMISSION File (EMISSION Radiated File (EMISSION BS EN/ENSO2) (Class A EMC MODE 48.5) Radiated BS EN/ENSO23 (ClosR32), EAC TP TC 020 Class A Vidage Flicker Volage Flicker ESD BS EN/ENSO24.2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS EN/EN61000-4-2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS EN/EN61000-4-3 Level 3, 10/m; criteria A Surge BS EN/EN61000-4-4 Level 3, 10/m; criteria A Surge BS EN/EN61000-4-6 Level 3, 10/m; criteria A Magnetic Field BS EN/EN61000-4-6 Level 4, 30Am; criteria A Magnetic Field SB EN/EN61000-4-6 Level 4, 30Am; criteria A Magnetic Field SB EN/EN61000-4-6 Level 4, 30Am; criteria A Magnetic Field SB EN/EN61000-4-6 Level 4, 30Am; criteria A Magnetic Field SB EN/EN61000-4-8 Level 4, 30Am; criteria A DIMENSION 215*115*30mm (L*W*H					32 (CISPR32),					
ENC Note 4.8.5 Note 4.8.5 Marmonic Current Image Flicker	SAFFTY &	EMC EMISSION		BS EN/EN5503	32 (CISPR32),					
Voltage Flicker Voltage Flicker Voltage Flicker ESD SENVEN61000-4-2 Level 3, 6KV air; Level 2, 6KV contact; criteria A Radiated SENVEN61000-4-3 Level 3, 10V/m; criteria A EFT / Burst BS ENVEN61000-4-4 Level 3, 2KV; criteria A Surge BS ENVEN61000-4-5 Level 3, 10V; criteria A Conducted BS ENVEN61000-4-6 Level 3, 10V; criteria A Magnetic Field BS ENVEN61000-4-8 Level 4, 30A/m; criteria A MBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. ML-HDBK-217F [25) DIMENSION 215*115*30mm (L*W*H	EMC				10	0003374				
Parameter Standard Test Level / Note ESD BS EN/EN61000-4-2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS EN/EN61000-4-3 Level 3, 8KV air ; Level 2, 6KV contact; criteria A EFT/ Burst BS EN/EN61000-4-3 Level 3, 2KV ; criteria A Surge BS EN/EN61000-4-5 Level 3, 2KV ; criteria A Conducted BS EN/EN61000-4-6 Level 3, 10V ; criteria A Magnetic Field BS EN/EN61000-4-6 Level 3, 10V ; criteria A MBF 1160.5K hrs min. Felcoreia SR-332 (Belicore); 126.5K hrs min. MIL-HDBK-217F (25) DIMENSION 215*115*30mm (L*W*H	Note 4 & 5)									
ESD BS EN/EN61000-4-2 Level 3, 8KV air ; Level 2, 6KV contact; criteria A Radiated BS EN/EN61000-4-3 Level 3, 10V/m; criteria A EFT / Burst BS EN/EN61000-4-4 Level 3, 2KV ; criteria A Surge BS EN/EN61000-4-5 Level 3, 10V/m; criteria A Conducted BS EN/EN61000-4-6 Level 3, 10V/m; criteria A Magnetic Field BS EN/EN61000-4-6 Level 3, 10V/m; criteria A MTBF 1160.5K hrs min. Telcordia SR-332 (Belicore); 126.5K hrs min. MIL-HDBK-217F (25) DIMENSION 215*115*30mm (L*W*H)										
Radiated BS EN/EN61000-4-3 Level 3, 10//m; criteria A EFT / Burst BS EN/EN61000-4-4 Level 3, 20// criteria A Surge BS EN/EN61000-4-5 Level 3, 20// criteria A Conducted BS EN/EN61000-4-6 Level 3, 10// criteria A Magnetic Field BS EN/EN61000-4-6 Level 3, 10// criteria A MTBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F (25) DIMENSION 215*115*30mm (L*W*H)										
EMC IMMUNITY EFT / Burst BS EN/EN101004-4 Level 3, 2KV ; criteria A Surge BS EN/EN100004-5 Level 3, 2KV ; criteria A Conducted BS EN/EN100004-6 Level 3, 10V ; criteria A Magnetic Field BS EN/EN100004-6 Level 3, 10V ; criteria A MTBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F (25) DIMENSION 215*115*30mm (L*W*H)								aA		
Bit Surge BS EN/EN61000-4-5 Level 3, 1KV/Line-Line;2KV/Line-FG ;criteria A Conducted BS EN/EN61000-4-6 Level 3, 10V ; criteria A Magnetic Field BS EN/EN61000-4-8 Level 4, 30A/m ; criteria A MTBF 1160-5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F (25) DTHERS DIMENSION 215*115*30mm (L*W*H			Hadiatoa				A			
Surge BS EN/EN61000-4-5 Level 3, 1KV/Line-Line ;2KV/Line-FG ;onteria A Conducted BS EN/EN61000-4-6 Level 3, 1KV/Line-Line ;2KV/Line-FG Magnetic Field BS EN/EN61000-4-6 Level 4, 30A/m; onteria A MTBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F [25] DIMENSION 215*115*30mm (L*W*H		EMC IMMUNITY	EFT / Burst	BS EN/EN610	00-4-4	Level 3, 2KV ; criteria A				
Magnetic Field BS EN/EN610004-8 Level 4, 30A/m; criteria A MTBF 1160.5K hrs min. Telcordia SR-332 (Belicore); 126.5K hrs min. MIL-HDBK-217F (25) DTHERS DIMENSION 215"115"30mm (L"W"H) Telcordia SR-332 (Belicore); 126.5K hrs min.			Surge	BS EN/EN610	00-4-5	Level 3, 1KV/Line-Line ;	2KV/Line-FG ;criteria	A		
MTBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F (25) DTHERS DIMENSION 215*115*30mm (L*W*H) 126*115*30mm (L*W*H)			Conducted	BS EN/EN610	00-4-6	Level 3, 10V ; criteria A				
MTBF 1160.5K hrs min. Telcordia SR-332 (Bellcore); 126.5K hrs min. MIL-HDBK-217F (25) DTHERS DIMENSION 215*115*30mm (L*W*H) 126*115*30mm (L*W*H)			Magnetic Field	BS EN/EN610	00-4-8	Level 4, 30A/m; criteria	A			
DIMENSION 215*115*30mm (L*W*H)		MTBF								
	THERS									
		PACKING		,						

LAD-600xU Series UART Communication Function Model(U Version)

MODEL		LAD-600BU		LAD-600CU		LAD-600DU		
	OUTPUT NUMBER	CH1 C	H2	CH1	CH2	CH1	CH2	
	DC VOLTAGE		7.6V	41.5V	41.5V	55.2V	55.2V	
	RATED CURRENT	18.74A 3	A(Battery Charger)	11.45A	3A(Battery Charger)	7.87A	3A(Battery Charge	
	CURRENT RANGE			0~14.45A		0~10.87A		
	RATED POWER	600.02W		599.67W		600.02W		
	RIPPLE & NOISE (max.) Note.2			360mVp-p		360mVp-p		
OUTPUT	VOLTAGE ADJ. RANGE	CH1: 21.6 ~ 29V		CH1: 32.4 ~ 43.5V		CH1: 43.5 ~ 58V		
	VOLTAGE TOLERANCE Note.3			±1.0%		±1.0%		
	LINE REGULATION	±0.5%		+0.5%		+0.5%		
	LOAD REGULATION SETUP. RISE TIME	±0.5% 2000ms. 50ms/230VAC		±0.5%		±0.5%		
				/115VAC at full load				
	HOLD UP TIME (Typ.)	16ms/230VAC 12r	ns/115VAC at full lo	ad				
	BATTERY STATIC DISCHARGE CURRENT	<100µA						
	VOLTAGE RANGE	90~132VAC/180~26	4VAC by switch	240~370VDC (De	efault switch at 230VA	(C)		
	FREQUENCY RANGE	47 ~ 63Hz	The by Switch	240 010700 (0)	Siddit Switch at 20047	(0)		
	EFFICIENCY (Typ.)			0.07		0.00		
INPUT		90% 12A/115VAC 7.5A	/230VAC	91%		91%		
	AC CURRENT (Typ.)			0.0				
	INRUSH CURRENT (Typ.)	COLD START 35A/115		AC				
	LEAKAGE CURRENT	<0.5mA Peak/240VA0 CH1:105~135% 0	; ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;					
PROTECTION	OVERLOAD Note.4	CH2:	LP, CH2 without ba Constant current lin	when total output o ttery:Shut down o/p vo niting; fault condition d ed (External fuse is ma	f CH1 + CH2 reach are ltage,re-power on to r pes not affect CH1 wo	ound 125%~135% out emoved rking,recovers automa ection with battery for	put shuts down atically after fault	
	OVER VOLTAGE Note.4	CH1:31~36V		CH1:47~55V		CH1:59~69V		
	OVER VOLIAGE NOLE.4	Protection type : Shut d	own o/p voltage, re-	power on to removed				
	OVER TEMPERATURE Note.4	Protection type : Shut do	wn o/p voltage, re-p					
	BATTERY REVERSE POLARITY	Protected when reverse	polarity , no damag	ge, recovers automatic	ally after fault condition	n is removed		
	BATTERY CUTOFF	21.5V±0.5V		32V±0.5V		43V±0.5V		
FUNCTION	AC OK	230VAC Input : Signals	the main power sup AC failure and activa	ply when input voltage >	•87VAC <165VAC			
FUNCTION	CHARGER CIRCUIT FAIL	Battery disconnected b			TISTAG			
		Battery low(fire alarm s	, ,					
	BUZZER ALARM	AC fail, Battery low, bat			nt overload status (ev	acuation system sele	ctable by LIART)	
	WORKING TEMP.	-20 ~ +60°C (Refer to "I		ballery reverse conner	51, 0 VCH 1020 312103 (CV	actuation system sele	clable by onicity	
	WORKING HUMIDITY	20 ~ 95% RH non-cond						
	STORAGE TEMP., HUMIDITY	-30 ~ +85°C, 10 ~ 95%	•					
ENVIRONMENT	TEMP. COEFFICIENT		RH non-condensing)				
	VIBRATION	±0.03%/°C (0~50°C)						
		10 ~ 500Hz, 5G 10min./						
	SAFETY STANDARDS	UL62368-1, BS EN/EN6			approved; Design refe	to GB 17945-2010 ,	GB4717	
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-F						
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG			-			
		Parameter	BS	ndard EN/EN55032 (CISPR3)	2), Class A	Note		
SAFETY &	EMC EMISSION	Radiated	BS	C TP TC 020 EN/EN55032 (CISPR3)				
EMC		Harmonic Current	EA0	C TP TC 020				
(Note 5 & 6)		Voltage Flicker						
		Parameter	Sta	ndard	Test Level	Note		
		FSD		EN/EN61000-4-2		air : Level 2, 6KV conta	act: criteria A	
		Radiated		EN/EN61000-4-3	Level 3, 10V			
		FET / Burst		EN/EN61000-4-3				
	EMC IMMUNITY	EFT / Burst Surge		EN/EN61000-4-4 EN/EN61000-4-5	Level 3, 2KV		0	
						/Line-Line ;2KV/Line-F	G;criteria A	
		Conducted		EN/EN61000-4-6	Level 3, 10V			
		Magnetic Field		EN/EN61000-4-8	Level 4, 30A			
	MTBF	1019.6K hrs min. Teld	ordia SR-332 (Bello	ore); 144.4K hrs min.	MIL-HDBK-217F (2	5)		
	DIMENSION	225*124*41mm (L*W*H	ł)					
OTHERS	DIWIENSION							

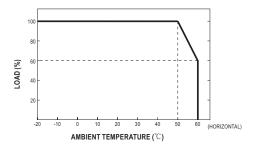
LAD-600x Series TTL Communication Function Model(Blank Version)

MODEL		LAD-600B		LAD-600C		LAD-600D		
	OUTPUT NUMBER	CH1	CH2	CH1	CH2	CH1	CH2	
	DC VOLTAGE	27.6V	27.6V	41.5V	41.5V	55.2V	55.2V	
	RATED CURRENT	18.74A	3A(Battery Charge	r) 11.45A	3A(Battery Charger)	7.87A	3A(Battery Charger	
	CURRENT RANGE	0~21.74A		0~14.45A		0~10.87A		
	RATED POWER	600.02W		599.67W		600.02W		
OUTPUT	RIPPLE & NOISE (max.) Note.2			360mVp-p		360mVp-p		
	VOLTAGE ADJ. RANGE	CH1: 21.6 ~ 29V		CH1: 32.4 ~ 43.5V		Ch1: 43.5 ~ 58V		
	VOLTAGE TOLERANCE Note.3			+1.0%		+1.0%		
	LINE REGULATION	±0.5%		±0.5%		±0.5%		
	LOAD REGULATION	+0.5%		±0.5%		±0.5%		
	SETUP, RISE TIME	±0.5% 2000ms, 50ms/230V/	2000mo E0	ms/115VAC at full load		±0.5%		
	HOLD UP TIME (Typ.) BATTERY STATIC DISCHARGE		6ms/230VAC 12ms/115VAC at full load					
	CURRENT	<100µA						
	VOLTAGE RANGE	90~132VAC/180~	264VAC by switch	240 ~ 370VDC (De	afault switch at 230VA	.C)		
	FREQUENCY RANGE	47 ~ 63Hz						
INPUT	EFFICIENCY (Typ.)	90%		91%		91%		
	AC CURRENT (Typ.)		5A/230VAC	3170		31/0		
	INRUSH CURRENT (Typ.)	12A/115VAC 7. COLD START 35A/1						
	LEAKAGE CURRENT	<0.5mA Peak/240V		NAG .				
	LEARAGE CORRENT	CH1:105~135%	CH2:90 ~ 110%					
PROTECTION	OVERLOAD Note.4		is around 105%~12 aund 125%~135% ou emoved king,recovers auton ection with battery fo	itput shuts down natically after fault				
		CH1:31~36V	CH1:31 ~ 36V CH1:47 ~ 55V CH1:59 ~ 69V					
	OVER VOLTAGE Note.4	Protection type : Shu	t down o/p voltage, r	e-power on to removed				
	OVER TEMPERATURE Note.4	Protection type : Shut down o/p voltage, re-power on to removed						
		Protected when reverse polarity, no damage, recovers automatically after fault condition is removed						
	BATTERY CUTOFF	21.5V±0.5V		32V±0.5V		43V±0.5V		
	AC OK		AC OK - Low - AC F		IVDC	101 20.01		
	BATTERY DISCONNECT/ REVERSE POLARITY	TTL signal, High/Open : AC OK ; Low : AC Fail ; lce : max. 30mA@ 50VDC TTL signal, High/Open :Battery disconnect/reverse polarity ; Low : Battery connect/rormat; lce : max. 30mA@ 50VDC						
FUNCTION	BATTERY LOW	TTL signal, High/Open : Battery low ; Low : Battery normal; Ice : max. 30mA@ 50VDC						
	BATTERY FULL	TTL signal, High/Open : Battery full ; Low : Battery charging ; Ice : max. 30mA@ 50VDC						
	DISCHARGE			Charge ; Ice : max. 30mA(
	WORKING TEMP.	-20 ~ +60°C (Refer to	"Derating Curve")					
	WORKING HUMIDITY	20~95% RH non-co	ndensing					
ENVIRONMENT	STORAGE TEMP., HUMIDITY	-30 ~ +85 °C 10 ~ 95%	6 RH non-condensing	1				
	TEMP. COEFFICIENT	±0.03%/°C (0~50°C		•				
	VIBRATION	10 ~ 500Hz, 5G 10mi		ch along X. Y. Z axes				
	SAFETY STANDARDS			368.1, EAC TP TC 004	annroved: Design refe	er to GB 17945-2010		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/F			, ,, boolgitten			
	ISOLATION RESISTANCE			0VDC / 25 °C/ 70% RH				
		Parameter		tandard	Test Level /	Note		
		Conducted	B	S EN/EN55032 (CISPR32 AC TP TC 020				
SAFETY &	EMC EMISSION	Radiated		S EN/EN55032 (CISPR32 AC TP TC 020	2), Class A			
EMC (Note 5 & 6)		Harmonic Current						
,		Voltage Flicker						
		Parameter	S	tandard	Test Level /	Note		
		ESD	B	S EN/EN61000-4-2	Level 3, 8KV	air ; Level 2, 6KV co	ntact; criteria A	
		Radiated	B	S EN/EN61000-4-3	Level 3, 10V	/m ; criteria A		
	EMC IMMUNITY	EFT / Burst	B	S EN/EN61000-4-4	Level 3, 2KV			
		Surge	B	S EN/EN61000-4-5		/Line-Line ; 2KV/Line	-FG ;criteria A	
		Conducted		S EN/EN61000-4-6	Level 3, 10V			
		Magnetic Field		S EN/EN61000-4-8	Level 4, 30A			
	MTBF							
		1154.4K hrs min. Telcordia SR-332 (Bellcore); 169.9K hrs min. MIL-HDBK-217F (25)						
OTHERS	DIMENSION	225*124*41mm (L*W	/*H)			,		

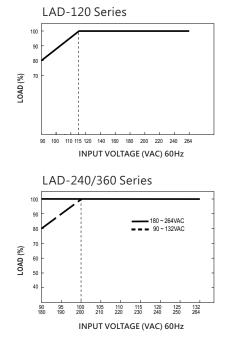
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2.5 Derating curve & static characteristic curve

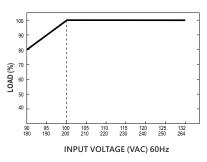
2.5.1 Derating curve



2.5.2 Static characteristic curve

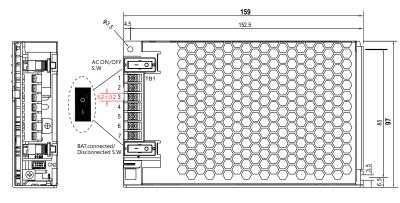


LAD-600 Series

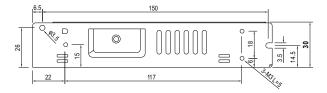


2.6 Mechanical specification

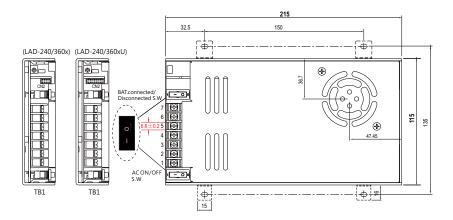
LAD-120 Series

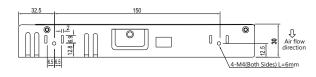


û Air flow direction

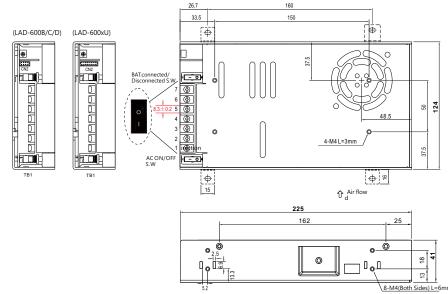


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LAD-600 Series



3.Installation Introduction

3.1 Installation requirements

- Before any installation or maintenance work, please disconnect your system from the utility. Ensure that it can't be re-connected inadvertently!
- Keep enough insulation distance between mounting screws and internal components of power supplies. Please refer to case drawing on specifications to receive the maximum length of mounting screw.
- Mounting orientations other than standard orientation or operate under high ambient temperature may increase the internal component temperature and will require a de-rating in output current. Please refer to Chapter 2.5 to receive the optimum mounting position and information about the de-rating curve.
- Fans and ventilation holes must be kept free from any obstructions. Also a 10-15 cm clearance must be kept when the adjacent device is a heat source.

3.2 Case mounting holes torque recommend dations:

Model	Screw Specification(Metric screws)	Assembly Recommended Torque(kgf-cm)
LAD-120	M3	8.8±20%
LAD- 240/360/600	M4	20.4±20%

If the recommended torque is considered too small, it is recommended to use a drop-resistant screw to increase the torsion that can be tolerated.

3.3 Wiring use

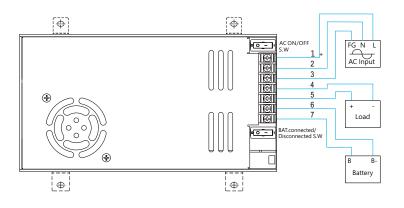
For input and output terminal block screw specifications, recommended torque and wire diameter, please refer to the table below.

Terminals	Input / output terminal block				
Series	Screw Specification	Suggested Torque	Wire		
LAD-120	M2.5	4.08kgf-cm(3.54Lb-in)	18-12AWG		
LAD-240/360	M3	5.11kgf-cm(3.54Lb-in)	16-12AWG		
LAD-600	M4	12.22kgf-cm(3.54Lb-in)	14-10AWG		

Note: Please refer to chapter 2.6 for the single terminal spacing of the terminal block.

3.4 Installation steps

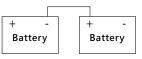
3.4.1 Please make sure the main power and backup power switches are OFF first, then connect AC input cables, DC output cables, battery charging cables to the terminal blocks.



3.4.2 Make sure all cables are well connected, then feeds the AC power to the supply, and turn the main power and backup power switches to the ON position.

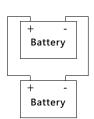
3.5 Serial and parallel connection of battery

• Serial connection: When connect 2 batteries in series, it doubles the output voltage, but the total capacity remains. EX: 2pcs of 12V 100AH in series,



become a 24V 100AH battery.

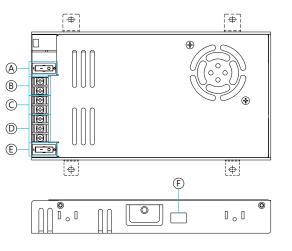
Parallel connection: When 2 batteries connected in Parallel, output voltage remains, but the total capacity becomes doubled. EX: 2pcs of 12V 100AH connect in parallel, become a 12V 200AH battery.



3

4.User Interface Panel

4.1 Panel Description





(A) BAT.connected/Disconnected S.W

It is used to connect the (B) battery charging terminal and the LAD internal circuit. When it is turned OFF, the internal circuit and the external connection are cut off.

- (B) BAT-&BAT+ To connect to external batteries.
- © DC OUTPUT-&DC OUTPUT+

To connect to applications.

D AC/L&AC/N

To connect to AC main supply.

(E) AC ON/OFF S.W

It is used to connect the D AC input terminals and the LAD internal circuit. When it is turned OFF, the internal circuit and the external connection are cut off.

(F) 115VAC/230VAC S.W

Selected based on AC main supply.

G Communication function terminal contacts

It is used to control and status monitoring, etc. For details, please refer to Chapter 4.2.1.

\oplus TTL function terminal contacts

It is used to control and status monitoring, etc. For details, please refer to Chapter 4.2.2.

4.2 Pin Assignment

4.2.1 Connector Pin No. Assignment(CN2)(LAD-360/600xU) The suitable mating terminal for CN2 is TKP DH2I-2*8 or equivalent.

4

Pin number	Funct	ion	Description	Connector
12	Short	: force start	Force the LAD to operate in UPS mode	
	open	normal work	lindue	
34	short	coordinated control	Remote UPS control	
	Open	: normal work	-	
56	Short	: lithium battery	Battery type selection	
	open	lead-acid battery	-	
78	BU	Open: fire alarm mode	Evacuation/fire alarm selection	
		Short: evacuation mode		
	CU/ DU	Open: evacuation mode		
	00	Short: firealarm mode		<u>∞</u> ∞ ∞ ∞ − 15
9	BAT1		Battery inspection	16
10	BAT2			
11	NC		-	
12	BAT3		-	
13	UART_RX		UART communication data line	-
14	UART	_TX		
16	3.3V		+3.3V(ref) for testing use only; can't supply power over 1mA for a long time	

4.2.2 Connector Pin No. Assignment(CN2)(LAD-120/240/360/600x)

The suitable mating terminal for CN2 is TKP DH2I-2*8 or equivalent.

Pin No.	Assignment(TTL Signal)	Connector	Connector	Terminal
1	AC OK			
2	Battery disconnect/ reverse polarity			
3	Battery low	2 🛛 🖄 1	TKP DH2	ткр
4	GND		or equivalent	or equivalent
5	Battery full			
6	Discharge			
7,8	Open : normal Short : forced start			

5.Function Description

The LAD series equip multiple functions, including four main functions such as DC voltage supplying power to the load, charging the battery, DC-UPS backup, and communication monitoring interface. It also has auxiliary functions such as TTL signal (AC OK, battery unconnected/reverse connection, battery undervoltage/full), linkage control, battery selection, buzzer alarm, battery detection, forced start of battery power supply, etc.

5.1 DC-UPS function

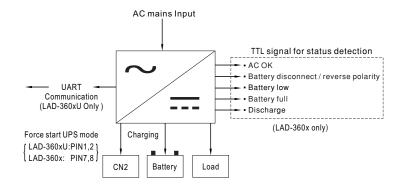
• LAD-120/240/360/600x(blank version)

When the AC main supply is abnormal, the LAD switches to the battery backup (UPS mode).

LAD-240/360/600xU(UART version)

When the DIP switch sets to 115VAC and the AC voltage drops to 75VAC, the LAD switches to battery backup.

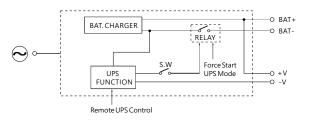
When the DIP switch is turned to 230VAC and the AC voltage drops to 165VAC, the power supply is switched to battery backup.



5.2 UART Communication Function(U version only)

The LAD various fault signals, power supply working status, single battery voltage, main voltage, output voltage and output current to the controller through the UART, and changes the power supply working status according to the controller instructions. For details. please refer to the 5.4.

5.2.1Forced Start & Remote UPS Control(U version only)



Both "forced start" and " remote UPS control "can force the power supply to operate in battery back(UPS) mode . Both can be used separately or simultaneously. When implemented at the same time, the priority of "Forced Start" is higher than "remote UPS Control".

5.2.1.1 Force start UPS mode:

According to fire safety regulation, UPS power supply must equip with force start UPS function. In case of emergency, maintenance or testing, Operators can active the UPS mode by shorting PIN1 and PIN2 of LAD-360/600xU to ensure battery power supply to the loads. When operating under UPS mode, the BAT. UVP alarm is still active, but the BAT. UVP protection is invalid, therefore, the battery will be fully dis charged until system shuts down.

PIN1&2	Status	
Short	Forced start	
Open	Normal	



• Description of force start UPS mode

(1) In the case of no AC input power supply, when the backup power switch is OFF, PIN 1 and 2 need to be short-circuited all the time, to force the UPS function to start, and keep the battery powered; when PIN 1, 2 is open, the battery power supply is disconnected.

(2) In the case of no AC input power supply, when the backup power switch is ON, PIN 1 and 2 need to be short-circuited, to force the UPS function to start, powered by battery. When PIN1, 2 are shorted and disconnected after a few seconds, the battery power is still maintained.

5.2.1.2 Remote UPS mode

Remote UPS mode:

According to fire safety regulation, UPS power supply must equip with remote UPS function. So the power supply unit can be linked to the fire alarm system, user's system will be able to detect the status of PIN3 and PIN4 LAD-360xU with UART communication. When PIN 3 and PIN 4 is shorted, the power supply will enter remote UPS mode. Therefore, the UPS mode will be active and the status signal will also send to the fire alarm system for indication. Personal or the system can use the signal as trigger threshold for other alarm systems to decide when and how to enter the emergency sequence. Under this condition, BAT. UVP alarm and protection are still active.

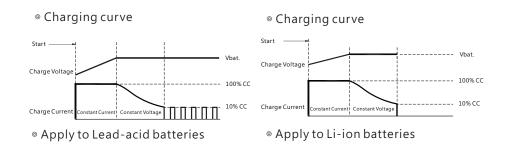
5

PIN3&4	Status	
Short	Romote UPS control	
Open	Normal	

5.2.2 Charging curves of different batteries

Two different charging curves can be determined through the short circuit and open circuit of pin 5&6.

Pin 5 & 6	Battery Type	
Short	Li-ion batteries	6
Open	Lead-acid (Pb) batteries	16



NOTE: In security applications, lead-acid batteries are generally used for floating charging. It is recommended that the charging voltage of the LAD should not exceed the floating charging voltage of the battery to ensure that the battery does not under long-term use.

5.2.3 Buzzer mode selection

5

Fire alarm system : When the battery is under voltage, the buzzer will alarm. Evacuation system: When the battery is under voltage, the battery is missing, the battery is reversely connected, and the output is overloaded, the buzzer will alarm.

Pin 7 & 8		Status	
BU Open		Fire alarm system	
00	Short	Evacuation system	
CU/DU	Short	Fire alarm system	
C0/D0	Open	Evacuation system	

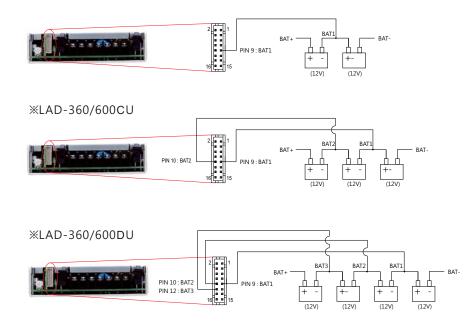


5.2.4 Battery Inspection

Read each battery voltage through UART communication, the buzzer will alarm when the battery voltage is abnormal, please refer to Chapter 5.4.1.7 & 5.4.2.5.

The way to connect the battery test point:

%LAD-360/600BU



5.2.5 UART Communication Interface(U version only)

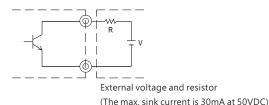
Communication provides functions such as control, setting, and monitoring.

The parameters include the backup power switch, battery undervoltage point, etc.



5.3 Function signals by TTL (Blank version)

- TTL Signal is sent out through pins from CN2.
- External voltage source is required for the TTL signal. The maximum voltage is 50VDC and the maximum sink current is 30mA.



- 5.3.1 AC OK TTL signal : detection of AC status
 - LAD-120: When the input voltage is abnormal, it sends out the AC fault signal.
 - LAD-240/360/600xU: AC input voltage can be selected by 110V/230V DIP switch.

115VAC input: When the input voltage is <75VAC, the AC fault signal will be sent, and the main voltage will be restored when the input voltage is greater than 87VAC.

230VAC input: When the input voltage is <165VAC, the AC fault signal will be sent, and the main voltage will be restored when the input voltage is greater than 175VAC.

Between pin 1 and pin 4	Description	
Low (0.3V max. at 30mA)	The signal is "Low" when the AC input is normal	
High or open (External applied voltage 50V max.)	The signal turns to be "High" when the AC input is abnormal	



5.3.2 Battery disconnected/reverse TTL signal: battery detection status

When the battery is not connected or reversely connected, the state is high/low level, and the battery status can be known by detecting this signal.

Between pin 2 and pin 4	Description
Low (0.3V max. at 30mA)	The signal is "Low" when the battery is not connected or inversely connected
High or open (External applied voltage 50V max.)	The signal turns to be "High" when the battery is connected or normal



- 5.3.3 Battery Low: Battery low detection Undervoltage protection point: A Series: 10V±0.5 B Series: 21.5V±0.5
 - C Series: 32V±0.5

D Series: 43V±0.5

Between pin 3 and pin 4	Description	
Low (0.3V max. at 30mA)	The signal is "Low" when the battery is under voltage protected	
High or open (External applied voltage 50V max.)	The signal turns to be "High" when the battery is normal	



5.3.4 Battery Full : Battery full detection

Between pin 4 and pin 5	Description		
Low (0.3V max. at 30mA)	The signal is "Low" when the charging current ${<}10\%\pm5\%$ rated current		
High or open (External applied voltage 50V max.)	The signal turns to be "High" when the charging current >11% \pm 5% rated current		



5

5.3.5 Discharge: Discharge detection

It is used to check whether the system is powered by AC power supply or backup power supply.

Note: When the backup power is working, the load current of the CH1 channel must be greater than 15% of the rated current for the TTL signal to act.

Between pin 4 and pin 6	Description
Low (0.3V max. at 30mA)	The signal is "Low" when the power supply is discharging
High or open (External applied voltage 50V max.)	The signal is "High" when the main power is working



5.3.6 Forced Start: Forced start UPS mode

According to fire safety regulation,UPS power supply must equip with force start UPS function.In case of emergency, maintenance or testing,operators can active the UPS mode by shorting PIN7 and PIN8 of LAD series. To ensure battery power supply to the loads. When operating under UPS mode, the BAT.UVP alarm is still active, but the BAT.UVP Protection is invalid. Therefore, the battery will be fully discharged until system shuts down.

Pin 7 & 8	Status
Short	Forced start UPS mode
Open	Normal



5.4 Communication monitoring function

5.4.1 UART communication

LAD-360/600U series products and external controller (Controller)/PC software can be transmitted through UART. The internal data of a single LAD-360/600U can be set and read through communication, and multiple parallel connections cannot be used in the configuration.

5.4.1.1 UART specification

Protocol adopts UART interface

This device adopts UART two-wire TX/RX Bus transmission mode. Except for Error Check (CRC-8) data, all word data must conform to the principle of High byte first transmission.

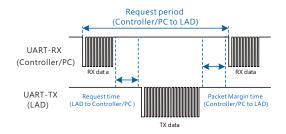
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The communication experiment layer is set as follows:

Control	Setting
Baud rate	9600
Data bits	8
stop bit	1
check bit	none
Serial flow control	none

5.4.1.2 Communication timing

Minimum request period(Controller/PC to LAD):20mSec. Maximum response time(LAD to Controller/PC to LAD): 5mSec. Minimum packet interval time(Controller/PC to LAD): 5mSec.



5.4.1.3 The basic packet structure of the UART communication protocol

UART communication consists of R/W byte, Data Length, Data address bytes, Data bytes, Error check.

(1) LAD transmission frame (LAD to Controller/PC ; Controller/PC to LAD)

R/W byte	Data Length	Data address bytes	Data bytes	Error check (CRC-8)	

(2) Definition description

Name	Narrate	Range
R/W byte	R/W decision bit	1. Read data (0x55) 2. Write data (0xAA)
Data Length	The length of the data after the R/W bit is determined	1 byte
Data address bytes	The address of the data to be transmitted	2 bytes
Data bytes	The content of the data to be transmitted	Calculated by actual bytes
CRC-8	Transmits a data CRC-8 error code (Contains R/W byte ~ Data bytes).	1 byte

Note : Cyclic Recundancy Check (CRC) is a channel coding technology that generates a short fixed-bit check code based on data such as network packets or computer files, which is mainly used to detect or verify errors that may occur after data transmission or saving, and uses the principle of division and remainder to detect errors.

LAD models currently use CRC-8 as a means of error detection, which is based on the following polynomial:

$X^{8} + X^{2} + X + 1$

Specific numerical calculations can be calculated using the checksum calculation tool from MEANWELL, which can be consulted with local business or technical service engineers.

5.4.1.4 Definition of data types

S1

S2

Data type	Narrate	Bytes	Range
U1	Unsigned char	1	0 ~ 255
U2	unsigned integer	2	0 ~ 65535

2

The data transmission patterns of this agreement are defined as follows:

-128 ~ 127

-32768 ~ 32767

5

5.4.1.5 Scratchpad Address Data Description

signed char

Signed integer

Controller/PC to LAD datasheet

R/W byte	Data address bytes	The data name	narrate	Numeric range	Data type	unit
0x55	0x0010	LAD status	LAD status flag read instruction	-	U1	-
	0x0020	Principal electrical voltage	Input voltage read instructions	0 ~ 65535	U2	-
	0x0030	Load current	Load current read instruction	0~65535	U2	-
	0x0040	Battery voltage	The total voltage of the battery series reads the instruction	0 ~ 65535	U2	-
	0x0050	Single cell battery voltage	Single-cell battery voltage read instruction	0 ~ 65535	U2	-
	0x0060	Battery undervoltage protection point	Battery UDP point read instructions	0 ~ 65535	U2	-
0xAA	0x0010	Standby excision instructions	Backup removal control	-	U1	-
	0x0020	Battery undervoltage protection point	Battery UTP point setting	0 ~ 65535	U2	0.01V
	0x0030	Buzzer control	Buzzer off control	-	U1	-
	0x0040	Standby enable command	The main standby power is normal when the communication enables the power backup control command		U1	-

Note: (1) The 0x0020 instruction written is invalid when the force startup state is forced

(2) The written 0x0050 instructions, if connected according to the battery detection point connection, in order to detect the battery voltage normally, otherwise FF will be reported

(3) Write command without memory function, restore factory settings after shutdown

LAD to Controller/PC data sheet

R/W byte	Data address bytes	The data name	narrate	Numeric range	The length of the data	unit
0x55	0x0010	LAD status	LAD status flag	Instructions for transmitting data	4 bytes	-
	0x0020	Principal electrical voltage	Input voltage	0~65535	2 bytes	0.1V
	0x0030	Load current	Load current	0~65535	2 bytes	0.01A
	0x0040	Battery voltage	Total battery series voltage	0~65536	2 bytes	0.01V
	0x0050	Single cell battery voltage	Single cell battery voltage	0~65536	8 bytes	0.01V
	0x0060 Battery undervoltage protection point		Battery ULP point read	0~65536	2 bytes	0.0

5.4.1.6 Instructions for Transmitting Data:

Data is transferred in packets, reducing transfer time and avoiding excessive data processing.

	The user reads and writes the set bit	Data address range	Address used	Note
Controller/ PC to LAD	0x55 · 0xAA	0x0001~0xFFFF	0x0010~0x0060	1. 0x55 is used for reading LAD parameters 2. 0xAA for writing to the LAD parameter configuration
LAD to Controller/ PC	0x55	0x0001~0xFFFF	0x0010~0x0060	1. Transmit the required packets according to the user's sending address

5.4.1.7 LAD_STATUS defined as follows:

The LAD_STATUS consists of two parts, LAD_STATUS_H and LAD_STATUS_L, with a total of 4 bytes, LAD_STATUS_H at the high level and LAD_STATUS_L at the low level.

LAD_STATUS_H:

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
High byte	Reserved							
Low byte	Reserved	BAT_SW_OFF						

Low byte :

Bit 0 BAT_SW_OFF: Standby switch status display

0 = The standby switch is normal

1 = Standby switch disconnected

Bit 1 – Bit 7: Currently unused, reserved (default is 0, displayed status is not supported as 0)

High byte:

Bit 0 - Bit 7 Reserved: Currently unused, reserved (default is 0, displayed status is not supported as 0)

5

LAD_STATUS_L

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
High by	e Force_Status	BAT_REV	BAT_CHGI NG	BAT_CHGFU LL	BAT_ERROR _4	BAT_ERROR _ ³	BAT_ERROR _2	BAT_ERROR _1
Low byt	e BAT_ NO_Balance	BAT_OVP	Link_Ctrl	LAD Power Supply	BAT_UVP	DISCHARG E_OLP	BAT_NC	AC_OK

Low byte:

Bit 0 AC_OK: AC input status

- 0=AC input exception
- 1=AC input is normal
- Bit 1 BAT_NC: Power-up status
 - 0 = Standby access is normal
 - 1 = Abnormal power backup access
- Bit 2 DISCHARGE_OLP: The OLP state of the main discharge
 - 0 = The main discharge is normal
 - 1 = Main discharge overload
- Bit 3 BAT_UVP: Power-up ULP protection status
 - 0 = No backup UTP protection
 - 1 = Power backup UPP protection has occurred
- Bit 4 LAD Power Supply: System power supply status
 - 0 = Main power supply status
 - 1 = Standby power supply status

- Bit 5 Link_Ctrl: Linkage control status indication
 0 = Non-linkage control state
 1 = in the linkage control state
 Bit 6 BAT_OVP: Standby OVP protection status
 0 = Non-backup OVP status
 1 = in standby OVP state
 Bit 7 BAT_NO_ Balance: Battery balanced
 0 = Battery balanced state
 - 1= Battery unbalanced state

High byte:

- Bit 0 BAT_ERROR_1: BAT1 battery status
 - 0 = BAT1 battery is normal
 - 1 = BAT1 battery abnormality
- Bit 1 BAT_ERROR_2: BAT2 battery status
 - 0 = BAT2 battery is normal
 - 1 = BAT2 battery abnormality
- Bit 2 BAT_ERROR_3: BAT3 battery status
 - 0 = BAT3 battery is normal
 - 1 = BAT3 battery abnormality
- Bit 3 BAT_ERROR_4: BAT4 battery status
 - 0 = BAT4 battery is normal
 - 1 = BAT4 battery abnormality
- Bit 4 BAT_CHGFULL: Battery full
 - 0 = Battery is not full
 - 1 = Battery full
- Bit 5 BAT_CHGING: Battery charged state
 - 0 = Battery is not charged
 - 1 = Battery charged state
- Bit 6 BAT_REV: Reverse battery state
 - 0 = Battery is not reversed
 - 1 = Reverse battery state
- Bit 7 Force_Status: Strong-on state
 - 0 = Non-force start state
 - 1 = Force start state

5.4.2 Examples of Communications

The following provides an example of reading and writing to the UART communication protocol

Note: 5.4.2.1~5.4.2.6 provides an example for reading instructions, 5.4.2.7~5.4.2.9 is a write instruction to modify the power supply and battery state, and write no memory function, and restore the factory settings after shutdown

5.4.2.1 LAD_STATUS

Brief description: read the LED status For example: to read the current status of THE LED-360DU

Request:

R/W byte Data Length		Data address bytes	Data bytes	CRC-8	
0x55	0x03	0x00 10		0x7F	

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55

- 0x03: Data Length, the length of the data after the R/W decision bit, In this instruction 0x00 10, 0x7F occupy a total of 3 bytes, so it is 0x03
- 0x00 10: Data address bytes, the address of the data to be transmitted, 0x00 10 is the LAD_STATUS address
- Data bytes: The data content to be transmitted, the field for the read instruction is empty
- 0x7F: Transmit data CRC-8 error detection code (including R/W byte ~ Data bytes), refer to 5.4.1.3 for the description of CRC-8, for which the instruction is 0x7F

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8	
0x55	0x07	0x00 10	0x00011781	0x4C	

31

- 0x55: R/W byte, R/W decision bit, for reading instructions are 0x55
- 0x07: Data Length, data length after R/W bit,

In this instruction 0x00 10, 0x00 01 17 81 and 0x4C occupy a total of 7 bytes, so it is 0x07

- 00 10: Data address bytes, the data address transmitted by LAD, 0x00 10 is the LAD_STATUS address
- 00 01 17 81: Data bytes, data content transmitted by LAD, this is the actual reading value of the

00 01 is LAD_STATUS_H, converted to binary is:

0000000	0000001
high byte	low byte

17 81 is LAD_STATUS_	L, converted to binary is:
----------------------	----------------------------

00010111	1000001
High byte	low byte

The current STATUS of LAD-360DU can be derived from the definition of the LAD_STATUS as follows:

LAD_STATUS_H: only the bit 0 of low byte has practical significance, which is 1 in this instruction, which means that the standby switch is disconnected at this time

LAD_STATUS_L: the status is as follows (gray background content).

					-	-	-		
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit O
		Strong start state	Battery reverse connection status	Battery charge status	Battery full	BAT4 battery status	BAT2 battery status	BAT3 battery status	BAT1 battery status
High	1	Strong start state	Battery reverse connection status	Battery charge status	Battery full	BAT4 battery status	BAT2 battery status	BAT3 battery status	BAT1 battery status
byte	0	Non-forced state	The battery is not reversed	The battery is not charged	The battery is not full	The BAT4 battery is normal	The BAT3 battery is norma	The BAT2 battery is normal	The BAT1 battery is normal
		Battery balanced state	Standby OVP protection status	Linkage control status display	System power supply status	Standby UTP protection status	Main discharge OLP status	Standby status	AC OK
Low byte	1	Non-cell balanced state	It is in the backup OVP protection state	In the linkage control state	Standby power supply status	A backup ULP protection state has occurred	The main road discharge is overloaded	The power backup access is abnormal	AC input is ok
	0	Battery balanced state	Non-backup OVP protection status	Non-linkage control state	The main power supply status	No backup UTP protection	The main circuit discharge is normal	The backup power is connected normally	AC input exception

0x4C: Transmit data CRC-8 error code, refer to 5.4.1.3 for CRC-8 The CRC-8 error detection code for the LAD response is calculated by the LAD's own MCU 5

5.4.2.2 Main electrical voltage

Brief description: Input voltage read instructions For example: to read the LAD-360DU input voltage Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x03	0x00 20		0xEF

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55 0x03: Data Length, the length of the data after the R/W decision bit In this instruction 0x00 20, 0xEF occupy a total of 3 bytes, so it is

- 0x00 20: Data address bytes, the data address to be transmitted, 0x00 20 is the main voltage address
- 0xEF: Transmit data CRC-8 error detection code (including R/W byte ~ Data bytes), refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0xEF

⁰x03

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x05	0x00 20	0x08 FE	0x97

- 0x55: R/W byte, R/W decision bit, for reading instructions are 0x55 0x05: Data Length, the length of the data after the R/W decision bit
 - In this instruction 0x00 30, 0x08 FE, 0x35 occupy a total of 5 bytes, so it is 0x05
- 0x00 20: Data address bytes, data address transmitted by LAD, 0x00 20 is the main voltage address
- 0x08 FE:Data bytes, the data content transmitted by LAD, which is the actual reading value of the main electrical voltage

0x08 FE corresponds to the decimal number of 2302, check the 5.4.1.5 table, you can get that the corresponding unit of this command is 0.1V, that is, the input voltage at this time is 2302*0.1V=230.2V

0x97: Transmit data CRC-8 error code, refer to the instructions on CRC-8 in 5.4.1.3

The CRC-8 error detection code for the LAD response is calculated by the LAD's own MCU

5.4.2.3 Load current

Brief description: Load current read instruction For example: to read the LED-360DU load current

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x03	0x00 30		0x9F

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55 0x03: Data Length, the length of the data after the R/W decision bit In this instruction 0x00 30, 0x9F occupy a total of 3 bytes, so it is 0x03 0x00 30: Data address bytes, the address of the data to be transmitted,

0x00 30 is the load current address

0x9F: Transmit the data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0x9F

Response:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x05	0x00 30	0x0291	0xBD

5.4.2.4 Battery voltage

Brief description: Battery voltage read instructions

For example: to read the battery voltage to which the LAD-360DU is connected

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x03	0x00 40		0xC8

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55

0x03: Data Length, the length of the data after the R/W decision bit In this instruction 0x00 40, 0xC8 occupy a total of 3 bytes, so it is 0x03

- 0x00 40: Data address bytes, the address of the data to be transmitted, 0x00 40 is the battery voltage address
- 0xC8: Transmit data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0xC8

5

Response:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x05	0x0040	0x12B6	0x33

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55 0x05: Data Length, the length of the data after the R/W decision bit In this instruction 0x00 40, 0x12 B6, 0x33 occupy a total of 5 bytes, so it is 0x05

- 0x00 40: Data address bytes, the data address transmitted by LAD, 0x00 40 is the battery voltage address
- 0x12 B6: Data bytes, lad transmitted data content, this is the actual reading value of the battery voltage

0x12 B6 corresponds to the decimal number of 4790, check the

5.4.1.5 table, you can get that the corresponding unit of this

command is 0.01V, that is, the battery voltage at this time is 4790 \star 0.01V = 47.9V

0x33: Transmit data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3

The CRC-8 error detection code for the LAD response is calculated by the LAD's own MCU

5.4.2.5 Single cell battery voltage

Brief description: Battery voltage read instructions For example: to read the voltage of a single cell connected to the LAD-360DU

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x03	0x00 50		0xB8

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55

- 0x03: Data Length, the length of the data after the R/W decision bit In this instruction 0x00 50, 0xB8 occupy a total of 3 bytes, so it is 3 bytes
- 0x00 50: Data address bytes, the data address to be transmitted, 0x00 50 is the single-cell battery voltage address
- 0xB8: Transmit data CRC-8 error code, refer to the description of CRC-8 in 5.4.1.3, for which the instruction is 0xB8

Response:

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R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x11	0x00 50	0x04 F0 04 F2 05 0C 05 10	0xAA

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55

- 0x11: Data Length, the length of the data after the R/W decision bit 0x00 50, 0x04 F0 04 F2 05 0C 05 10, 0xAA occupy a total of 11 bytes, so it is 0x11
- 0x00 50: The data address transmitted by LAD, 0x00 50 is the single-cell battery voltage address
- 0x04 F0 04 F2 05 0C 05 05 10: Data bytes, lad transmitted data content,

this is the actual reading value of a single cell voltage, occupying 8 bytes (each battery occupies 2 bytes, from left to right is battery 1 to 4).

Convert to decimal:

04 F0 : 1264

- 04 F2 : 1266
- 05 0C : 1292

05 10 : 1296

Check the table 5.4.1.5, and the corresponding unit of this command is 0.01V, that is, the voltage of the four batteries is 12.64V, 12.66V, 12.92V, and 12.96V, respectively

0xAA: Transmit data CRC-8 error detection code, refer to the description of CRC-8 in 5.4.1.3

The CRC-8 error detection code for the LAD response is calculated by the LAD's own MCU

5.4.2.6 Battery undervoltage protection points

Brief description: Battery undervoltage protection point read instructions For example: to read the battery voltage protection point of the LAD-360DU

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x03	0x00 60		0x28

0x55: R/W byte, R/W decision bit, for reading instructions are 0x550x03: Data Length, the length of the data after the R/W decision bit

0x00 60, 0x28 occupies a total of 3 bytes, so it is 0x03 0x00 60: Data address bytes, the data address to be transmitted, 0x00 60

is the address of the battery undervoltage protection point

0x28: Transmit data CRC-8 error detection code, refer to the instructions

on CRC-8 in 5.4.1.3, for which the instruction is 0x28

Response:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0x55	0x05	0x00 60	0x0E E8	0x0D

0x55: R/W byte, R/W decision bit, for reading instructions are 0x55 0x05: Data Length, the length of the data after the R/W decision bit

0x00 60, 0x0E E8, 0x0D occupy a total of 5 bytes, so it is 0x05

0x00 60: Data address bytes, the data address transmitted by LAD, 0x00 60 $\,$

is the address of the battery undervoltage protection point

- 0x0E E8: Data bytes, lad transmitted data content, this is the actual reading value of the battery undervoltage protection point 0x0E E8 corresponds to the decimal number of 3821, check the 5.4.1.5 table, you can get the corresponding unit of this command is 0.01V, that is, the battery undervoltage protection point at this time is 3821 * 0.01V = 38.21V
- 0x0D: Transmit data CRC-8 error detection code, refer to the description of CRC-8 in 5.4.1.3
 - The CRC-8 error detection code for the LAD response is calculated by the LAD's own MCU

5.4.2.7 Backup removal control

Brief description: Backup removal control, which is invalid when forced to start

For example, turn off the standby power supply function of the LAD-360DU

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0xAA	0x04	0x0010	0x01	0x26

0xAA: R/W byte, R/W decision bit, for write instructions are 0xAA 0x04: Data Length, the length of the data after the R/W bit

- 0x00 10, 0x01, and 0x26 occupy a total of 4 bytes, so it is 0x04 0x00 10: Data address bytes, the data address to be transmitted, 0x00 10 is the backup cut control address
- 0x01: Data bytes, the content of the data to be transmitted, 0x01 represents the shutdown of the backup power supply function 0x26: Transmit the data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0x26

5.4.2.8 Battery undervoltage protection point

Brief description: Set the undervoltage protection point of the battery For example, the undervoltage protection point of the LAD-360DU is set to 43.2V

Request:

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R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0xAA	0x05	0x00 20	0x0E E8	0x0D

0xAA: R/W byte, R/W decision bit, for write instructions are 0xAA 0x05: Data Length, the length of the data after the R/W decision bit

0x00 20, 0x0E E8, 0x0D occupy a total of 5 bytes, so it is 0x05

- 0x00 20: Data address bytes, the data address to be transmitted, 0x00 20 is the address of the battery undervoltage protection point
- 0x0E E8: Data bytes, the data content to be transmitted, check the table 5.4.1.5, you can get the corresponding unit of this command is 0.01V, that is, the decimal number of the data to be transmitted is 43.2/0.01=4320, and the corresponding hexadecimal number is 0x0E E8
- 0x0D: Transmit data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0x68

5.4.2.9 Buzzer Shutdown Control

Brief description: Turn off the LAD buzzer function, the corresponding instructions are as follows:

01: Buzzer off

00: Buzzer on

For example:

Turn off the buzzer of the LAD-360DU

Request:

R/W byte	Data Length	Data address bytes	Data bytes	CRC-8
0xAA	0x04	0x00 30	0x01	0x8F

0xAA: R/W byte, R/W decision bit, for write instructions are 0xAA 0x04: Data Length, the length of the data after the R/W bit

0x00 30, 0x01, 0x8F occupy a total of 4 bytes, so it is 0x04 0x00 30: Data address bytes, the address of the data to be transmitted,

0x00 30 is the address where the buzzer turns off control

- 0x01: Data bytes, the data content to be transmitted, 0x01 the corresponding buzzer is turned off
- 0x8F: Transmit the data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0x8F

Turn on the buzzer of the LAD-360DU

Request:

0xAA	0x04	0x00 30	0x00	0x88
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0xAA: R/W byte, R/W decision bit, for write instructions are 0xAA 0x04: Data Length, the length of the data after the R/W decision bit, occupies 1 byte

0x00 30, 0x00, and 0x88 occupy a total of 4 bytes, so it is 0x04 0x00 30: Data address bytes, the address of the data to be transmitted,

0x00 30 is the address where the buzzer turns off control

- 0x00: Data bytes, the content of the data to be transmitted, 0x00 the corresponding buzzer is turned off
- 0x88: Transmit the data CRC-8 error detection code, refer to the instructions on CRC-8 in 5.4.1.3, for which the instruction is 0x88

6.Protections and Failure Correction

6.1 Protections

6.1.1 Output over load protection

Model	Channel	Protection method		
LAD-120	CH1	CH2 is connected to the battery	When CH1 is at 105%~120, it enters UPS mode. When the total output of CH1+CH2 reaches 125%~135%, and it enters hiccup mode(For D type, shuts down output).	
		CH2 is not connected to the battery	Enter hiccup mode (D series closes output), can be recovered after restart.	
	CH2	Constant current limiting, recovers automatically after fault condition removed.Fault condition does not affect CH1 output.When connected in series with the battery, an external fuse must be installed to protect the battery.		
LAD- 240/360/600	500 CH1	CH2 is connected to the battery	When CH1 is at 105%~120, it enters UPS mode, the total output of CH1+CH2 reaches 125%~135%, and shuts down output.	
		CH2 is not connected to the battery	Turn off the output voltage, it can be recovered after restart.	
	CH2	Constant current limiting, recovers automatically after fault condition removed.Fault condition does not affect CH1 output.When connected in series with the battery, an external fuse must be installed to protect the battery.		

6.1.2 Over temperature protection

When the automatic turns of the power supply is too high, the power supply off the output. Recycle AC power to recover the output after the power supply cooled down.

6.1.3 Output overvoltage protection

When the output voltage is too high and reaches the OVP protection point, the power supply turns off the output Recycle AC power to recover the output.

Once the LAD-600 triggers the protection, the output recovers after recycling AC power and 3 minutes of cold standby.

6.1.4 Low battery voltage protection

When the battery voltage is too low, the power supply turns off the

output.

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Model	Battery off voltage	
A type	10±0.5V	
B type	21.5±0.5V	
C type	32±0.5V	
D type	43±0.5V	

6.1.5 Battery reverse connection protection

When the battery is reversely connected, the power supply is protected against reverse connection by the internal MOSFET, the output of the power supply is turned off, the power supply does not damage, and automatic recover after the abnormal condition is removed.

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6.2 Failure Correction

Status	Possible Reason	Method of exclusion
Battery backup function fails	Battery is not connected or the voltage of battery is too low	Check the wiring is good, check whether the battery specifications match the replaced battery
Can't force start	CN2: The wires are not in good contact	Check CN2 Pin 7&8 of LAD-X series or CN2 Pin 1&2 of LAD-xU is well connected
When the AC power supply is normal, it automatically shuts down	OTP	Cool down LAD for 3 minutes before restarting
	OVP	Check whether the battery specifications match
	Short	Restart after eliminating short circuit
The battery is still not fully charged after a long charge	Batteries are aged or damaged	Replace new battery
	Output wire diameter is too thin	Choose appropriate thickness of wire
	Incorrect charging curve setting	Reconfirm the battery charging curve

Note: Please contact MEAN WELL's distributor if above faulty conditions are not corrected.

7.Warranty

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

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8. Environmental declaration information

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