





















Applications

· Security system





· Public safety battery back-up

· Central monitoring system

· Industrial automation

Uninterruptible DC-UPS system



· Fire emergency and evacuation system

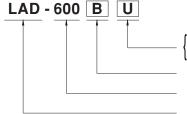
# Features

- · Built-in battery charger UPS function
- · TTL signals for status detection: AC OK, Battery disconnect, Battery reverse polarity, Battery low, Battery full and Discharge (Blank version only)
- UART Communication (U version only)
- Built-in buzzer alarm (U version only)
- Built-in AC and battery circuit ON/OFF switchs enhance safetyness during maintenance
- · Forced UPS mode for battery maintenance
- Protections: Short circuit / Overload / Over voltage / Over temperature / Battery low voltage / Battery reverse polarity (No damage)
- -20 ~ +60  $^{\circ}$ C wide operating temperature
- Output voltage adjustable (-20%~+5%) for CH1 by VR
- · Suitable for lead acid and lithium-ion batteries
- · Design refer to GB17945/GB4717(U version only) system requirement
- 1U low profile
- · 3 years warranty

## Description

LAD-600 series is a 600W economical AC/DC low profile security power supply with UPS function. Adopting the input range from 90Vac to 264Vac (115Vac/230Vac selectable by switch) and supports output 27.6V, 41.5V and 55.2Vdc. With high efficiency up to 91% 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.

# Model Encoding



Blank: TTL signal only

U: UART Communication only

Output voltage(B: 27.6V, C: 41.5V, D: 55.2V)

Rated wattage Series name















## SPECIFICATION FOR TTL FUNCTION MODEL (Blank Version)

| MODEL          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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                                                           | 90 ~ 132VAC / 180 ~ 264VAC by switch 240 ~ 370VDC (Default switch at 230VAC)                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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                                                           | 12A/115VAC 7.5A/230VAC COLD START 35A/115VAC 60A/230VAC                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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                                                           | COLD START 35A/115VAC<br><0.5mA Peak / 240VAC                                                                                                                                                                                                                                                                                                                                                                                                                              | 6UA/23U\                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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12pcs/13.5Kg/0.78CUF1  Illy mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                        |                                                                                   |  |
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|                | Ripple & noise are measure     Tolerance : includes set up     Once the protection is trigger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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|                | Ripple & noise are measure     Tolerance : includes set up     Once the protection is trigger     The power supply is considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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|                | Ripple & noise are measure     Tolerance : includes set up     Once the protection is trigge     The power supply is consid a 360mm*360mm metal pla                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ad at 20MHz of bandwidth by<br>tolerance, line regulation and<br>ered, the input voltage needs<br>ered a component which will l<br>te with 1mm of thickness. Th                                                                                                                                                                                                                                                                                                            | load regulation to be discontibe installed in final equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | nected, and the cold into a final equipment.<br>The ment must be re-confi                                                                                                                                                                  | All the EMC tests ar<br>rmed that it still mee                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | e been executed best EMC directives.                                                   | y mounting the unit o<br>All the radiation tests                                  |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set up     Once the protection is trigge     The power supply is consider     a 360mm*360mm metal place require an additional 20*30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | od at 20MHz of bandwidth by<br>tolerance, line regulation and<br>ered, the input voltage needs<br>ered a component which will l                                                                                                                                                                                                                                                                                                                                            | load regulation to be discontrolled installed in the final equipmagnetic ring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | nected, and the cold into a final equipment. ment must be re-confinate the battery output                                                                                                                                                  | All the EMC tests ar<br>rmed that it still mee<br>line. For guidance o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | e been executed best EMC directives.                                                   | y mounting the unit o<br>All the radiation tests                                  |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set up     Once the protection is trigge     The power supply is consided a 360mm*360mm metal place require an additional 20*30 please refer to "EMI testing 6. This power supply does not                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ed at 20MHz of bandwidth by tolerance, line regulation and<br>rered, the input voltage needs<br>ered a component which will<br>te with 1 mm of thickness. The<br>"13 NIZN magnetic clasp or r<br>of component power supplies<br>meet the harmonic current re                                                                                                                                                                                                               | load regulation to be discontrolled installed in the final equipmagnetic ring s." (as available)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | nected, and the cold into a final equipment.<br>ment must be re-confinated to the battery output<br>ble on http://www.mea                                                                                                                  | All the EMC tests ar<br>rmed that it still meet<br>line. For guidance onwell.com)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | te been executed be ts EMC directives. In how to perform the                           | y mounting the unit of<br>All the radiation tests<br>nese EMC tests,              |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set up     Once the protection is trigg     The power supply is consid     a 360mm*360mm metal pla     require an additional 20*30     please refer to "EMI testing     This power supply does not     under the following conditio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ed at 20MHz of bandwidth by tolerance, line regulation and<br>ered, the input voltage needs<br>ered a component which will to<br>the with 1mm of thickness. The<br>*13 NIZN magnetic clasp or r<br>of component power supplies<br>meet the harmonic current re<br>ns:                                                                                                                                                                                                      | load regulation to be disconribe installed in efinal equipmagnetic ring s." (as available equirements of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | nected, and the cold into a final equipment.<br>ment must be re-confinated to the battery output<br>ble on http://www.mea                                                                                                                  | All the EMC tests ar<br>rmed that it still meet<br>line. For guidance onwell.com)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | te been executed be ts EMC directives. In how to perform the                           | y mounting the unit o<br>All the radiation tests<br>nese EMC tests,               |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set unitudes     Tolerance: includes set unitudes     Tolerance: includes set unitudes     Tolerance: a second a secon | ed at 20MHz of bandwidth by tolerance, line regulation and<br>rered, the input voltage needs<br>ered a component which will<br>te with 1 mm of thickness. The<br>"13 NIZN magnetic clasp or r<br>of component power supplies<br>meet the harmonic current re                                                                                                                                                                                                               | load regulation to be discontrolled installed in efficient efficient from the first section of the first section o | nected, and the cold into a final equipment. ment must be re-confit to the battery output ole on http://www.mea.outlined by BS EN/EN                                                                                                       | All the EMC tests armed that it still meet line. For guidance onwell.com) l61000-3-2. Please of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | te been executed be ts EMC directives. In how to perform the                           | y mounting the unit of<br>All the radiation tests<br>nese EMC tests,              |  |
| NOTE           | Ripple & noise are measury     Tolerance: includes set unit of the protection is triggs     The power supply is consided a 360mm '360mm metal ple require an additional 20*30 please refer to "EMI testing 6. This power supply does not under the following condition a) the end-devices is used b) the end-devices is connoc) the power supply is: - i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | aid at 20MHz of bandwidth by tolerance, line regulation and ared, the input voltage needs ered a component which will te with 1mm of thickness. The "13 NIZN magnetic clasp or rof component power supplies meet the harmonic current rens: within the European Union, a ected to public mains supply sistalled in end-devices with ar                                                                                                                                     | load regulation to be discontinuous de installed in entire final equipmagnetic ring s." (as availat equirements of the continuous discontinuous discontinuou | nected, and the cold into a final equipment, ment must be re-confit to the battery output ole on http://www.mecoutlined by BS EN/EN or greater rated nomi                                                                                  | All the EMC tests armed that it still meet<br>line. For guidance onwell.com)<br>161000-3-2. Please on all voltage, and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | e been executed be as EMC directives. In how to perform the do not use this power.     | y mounting the unit of<br>All the radiation tests<br>nese EMC tests,              |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set uncludes     Tolerance: includes set uncludes     Tolerance: includes set uncludes     Tolerance: noise a 360mm s60mm metal player an additional 20*30 please refer to "EMI testing     This power supply does not under the following conditional the end-devices is used b) the end-devices is connor) the power supply is: - i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | and at 20MHz of bandwidth by tolerance, line regulation and ared, the input voltage needs ered a component which will I te with 1 mm of thickness. The "13 NIZN magnetic clasp or or of component power supplies meet the harmonic current rens: within the European Union, a sected to public mains supply a notable of in end-devices with a belong to part of a lightling sys                                                                                           | load regulation to be discontinuous installed in e final equipmagnetic ring s." (as availation availation with 220Vac overage or constem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | nected, and the cold into a final equipment.<br>ment must be re-confi to the battery output<br>ole on http://www.mea<br>outlined by BS EN/EN<br>or greater rated nomi<br>intinuous input power                                             | All the EMC tests armed that it still meet line. For guidance o inwell.com) 161000-3-2. Please of the properties of the | e been executed be as EMC directives. In how to perform the do not use this power.     | y mounting the unit o<br>All the radiation tests<br>nese EMC tests,               |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set up     Once the protection is trigg     The power supply is consided     a 360mm*360mm metal play require an additional 20*30 please refer to "EMI testing     This power supply does not under the following conditional the end-devices is used by the end-devices is used by the power supply is:     Exception: Power supplies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | aid at 20MHz of bandwidth by tolerance, line regulation and ared, the input voltage needs ered a component which will te with 1mm of thickness. The "13 NIZN magnetic clasp or rof component power supplies meet the harmonic current rens: within the European Union, a ected to public mains supply sistalled in end-devices with ar                                                                                                                                     | load regulation to be discontinuous installed in efinal equipmagnetic ring samples." (as availab equirements of the continuous samples of the contin | nected, and the cold into a final equipment. ment must be re-confi to the battery output ble on http://www.mea outlined by BS EN/EN or greater rated nomi ntinuous input power ot need to fulfill BS E                                     | All the EMC tests armed that it still meet line. For guidance o inwell.com) 161000-3-2. Please of the properties of the | e been executed be as EMC directives. In how to perform the do not use this power.     | y mounting the unit o<br>All the radiation tests<br>nese EMC tests,               |  |
| NOTE           | Ripple & noise are measure     Tolerance: includes set unit of the protection is trigge.     The power supply is consided a 360mm 360mm metal ple require an additional 20*30 please refer to "EMI testing 6. This power supply does not under the following condition a) the end-devices is used b) the end-devices is connocted to the power supply is:      Exception: Power supplies a) professional is assumed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | and at 20MHz of bandwidth by tolerance, line regulation and ared, the input voltage needs ered a component which will I tet with 1 mm of thickness. The "13 NIZN magnetic clasp or or of component power supplies meet the harmonic current rens: within the European Union, a sected to public mains supply a nestalled in end-devices with a belong to part of a lightling sysused within the following end-quipment with a total rated in controlled heating elements v | load regulation to be discontrolled in the final equipmagnetic ring s." (as availate equirements of the final equipment of the final equipment equipmen | nected, and the cold into a final equipment. ment must be re-confi to the battery output ole on http://www.meaoutlined by BS EN/En or greater rated nomintinuous input power to need to fulfill BS eater than 1000W; power less than or eq | All the EMC tests armed that it still mee ince. For guidance o nwell.com) l61000-3-2. Please of all voltage, and greater than 75W, or N/EN61000-3-2. Jul to 200W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | e been executed b<br>is EMC directives<br>in how to perform the<br>do not use this pow | y mounting the unit of<br>All the radiation tests<br>nese EMC tests,<br>er supply |  |

File Name:LAD-600-SPEC 2023-05-15



| The ambient emperature containing of the Sylvasor man families indeed and the Sylv









## SPECIFICATION FOR UART COMMUNICATION FUNCTION MODEL (U Version)

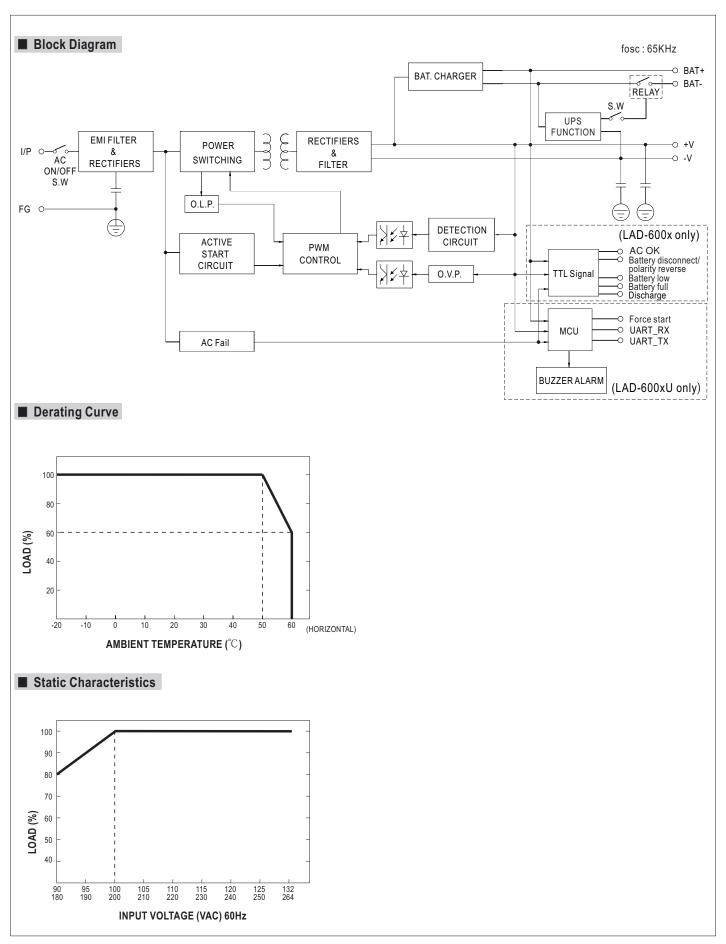
| MODEL        |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LAD-600BU                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 | LAD-600CU                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                     | LAD-600DU                                                                                                                                                                             |                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|              | 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 Charger)                                                                                                                                                                                                                                                                                                                                                                             | 11.45A                                                                                                                                                                                                                                                                                                                                                                   | 3A(Battery Charger)                                                                                                                                                                                                                                                 | 7.87A                                                                                                                                                                                 | 3A(Battery Charge                                                               |
|              | 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                                                                                                                                                                                                                                                                                                                                                                                                                        | 270mVp-p                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                 | 360mVp-p                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                     | 360mVp-p                                                                                                                                                                              |                                                                                 |
| 0011 01      | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                  | CH1: 21.6 ~ 29V                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 | CH1: 32.4 ~ 43.5V                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                     | CH1: 43.5 ~ 58V                                                                                                                                                                       |                                                                                 |
|              | VOLTAGE TOLERANCE Note.3                                                                                                                                                                                                                                                                                                                                                                                                                            | ±1.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                 | ±1.0%                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     | ±1.0%                                                                                                                                                                                 |                                                                                 |
|              | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                     | ±0.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                 | ±0.5%                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     | ±0.5%                                                                                                                                                                                 |                                                                                 |
|              | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                     | ±0.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                 | ±0.5%                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     | ±0.5%                                                                                                                                                                                 |                                                                                 |
|              | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2000ms, 50ms/230V                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AC 2000ms, 50m                                                                                                                                                                                                                                                                                                                                                                                  | ns/115VAC at full load                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | HOLD UP TIME (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                 | 16ms/230VAC 12ms/115VAC at full load                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | BATTERY STATIC DISCHARGE                                                                                                                                                                                                                                                                                                                                                                                                                            | <100μΑ                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                             | ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | VOLTAGE RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                       | 90 ~ 132VAC / 180 ~                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 264VAC by switch                                                                                                                                                                                                                                                                                                                                                                                | 240 ~ 370VDC (D                                                                                                                                                                                                                                                                                                                                                          | efault switch at 230V/                                                                                                                                                                                                                                              | AC)                                                                                                                                                                                   |                                                                                 |
|              | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                     | 47 ~ 63Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| INPUT        | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                   | 90%                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | F A (0.00) (A.0.                                                                                                                                                                                                                                                                                                                                                                                | 91%                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                     | 91%                                                                                                                                                                                   |                                                                                 |
|              | AC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12A/115VAC 7.5A/230VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                               | COLD START 35A/1                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                 | /AC                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | LEAKAGE CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CH1:105 ~ 135%                                                                                                                                                                                                                                                                                                                                                                                                                                                               | CH2:90 ~ 110%                                                                                                                                                                                                                                                                                                                                                                                   | v: The unit will enter to                                                                                                                                                                                                                                                                                                                                                | UPS mode when CH                                                                                                                                                                                                                                                    | 1 is around 105%~1                                                                                                                                                                    | 20%                                                                             |
|              | OVERLOAD Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                     | Frotection type . Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                         | OLF, OHZ WILL DALLE                                                                                                                                                                                                                                                                                                                                                                             | *                                                                                                                                                                                                                                                                                                                                                                        | f CH1 + CH2 reach ard                                                                                                                                                                                                                                               |                                                                                                                                                                                       |                                                                                 |
|              | OVERLOAD Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                     | CH-                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | OLP. CH2 without ba                                                                                                                                                                                                                                                                                                                                                                             | · ·                                                                                                                                                                                                                                                                                                                                                                      | oltage,re-power on to r                                                                                                                                                                                                                                             |                                                                                                                                                                                       | atput onuto down                                                                |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          | loes not affect CH1 wo                                                                                                                                                                                                                                              |                                                                                                                                                                                       | natically after fault                                                           |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          | ndatory in series conn                                                                                                                                                                                                                                              | -                                                                                                                                                                                     | •                                                                               |
| PROTECTION   |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CH1:31 ~ 36V                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                 | CH1:47 ~ 55V                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                     | CH1:59 ~ 69V                                                                                                                                                                          |                                                                                 |
|              | OVER VOLTAGE Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | t down o/p voltage, re                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     | 0111.00 000                                                                                                                                                                           |                                                                                 |
|              | OVER TEMPERATURE Note 4                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 | -power on to removed                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | OVER TEMPERATURE Note.4 BATTERY REVERSE POLARITY                                                                                                                                                                                                                                                                                                                                                                                                    | 71                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 0 .                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                          | cally after fault condition                                                                                                                                                                                                                                         | un in romoved                                                                                                                                                                         |                                                                                 |
|              | BATTERY CUTOFF                                                                                                                                                                                                                                                                                                                                                                                                                                      | 21.5V±0.5V                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ise polarity, no dama                                                                                                                                                                                                                                                                                                                                                                           | 32V±0.5V                                                                                                                                                                                                                                                                                                                                                                 | sally after fault condition                                                                                                                                                                                                                                         | 43V±0.5V                                                                                                                                                                              |                                                                                 |
|              | DATIENT CUTOFF                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Jo AC failure and activ                                                                                                                                                                                                                                                                                                                                                                         | rates when input voltage                                                                                                                                                                                                                                                                                                                                                 | 75 / A C                                                                                                                                                                                                                                                            | 43V±0.5V                                                                                                                                                                              |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          | •                                                                                                                                                                                                                                                                   |                                                                                                                                                                                       |                                                                                 |
|              | AC OK                                                                                                                                                                                                                                                                                                                                                                                                                                               | Recover the main power supply when input voltage >87VAC                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| FUNCTION     |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 230VAC Input : Signals AC failure and activates when input voltage <165VAC  Recover the main power supply when input voltage >175VAC                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| i ditarion   | CHARGER CIRCUIT FAIL                                                                                                                                                                                                                                                                                                                                                                                                                                | Battery disconnected, battery reverse polarity, signal failure                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Battery low( fire alarm system selectable by UART)                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | BUZZER ALARM                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          | ct, overload status (ev                                                                                                                                                                                                                                             | acuation system sele                                                                                                                                                                  | ectable by UART)                                                                |
|              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                       | -20 ~ +60°C (Refer to "Derating Curve")                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20 ~ 95% RH non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| ENVIRONMENT  | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                             | -30 ~ +85°C, 10 ~ 95% RH non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                   | ±0.03%/°C (0~50°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                           | 10 ~ 500Hz, 5G 10m                                                                                                                                                                                                                                                                                                                                                                                                                                                           | in./1cycle, 60min. eac                                                                                                                                                                                                                                                                                                                                                                          | h along X, Y, Z axes                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                    | UL62368-1, BS EN/E                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N62368-1, AS/NZS623                                                                                                                                                                                                                                                                                                                                                                             | 368.1, EAC TP TC 004                                                                                                                                                                                                                                                                                                                                                     | approved; Design refer                                                                                                                                                                                                                                              | to GB 17945-2010,0                                                                                                                                                                    | GB4717                                                                          |
|              | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P-O/P:3KVAC I/F                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -FG:2KVAC O/P-F0                                                                                                                                                                                                                                                                                                                                                                                | G:0.5KVAC                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                | I/P-O/P, I/P-FG, O/P-                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FG:100M Ohms / 500                                                                                                                                                                                                                                                                                                                                                                              | VDC / 25°C/ 70% RH                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sta                                                                                                                                                                                                                                                                                                                                                                                             | ndard                                                                                                                                                                                                                                                                                                                                                                    | Test Level /                                                                                                                                                                                                                                                        | Note                                                                                                                                                                                  |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Conducted                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 | EN/EN55032 (CISPR3                                                                                                                                                                                                                                                                                                                                                       | 2), Class A                                                                                                                                                                                                                                                         |                                                                                                                                                                                       |                                                                                 |
|              | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                        | Oonducted                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 | C TP TC 020                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| SAFETY &     |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Radiated                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                 | EN/EN55032 (CISPR3                                                                                                                                                                                                                                                                                                                                                       | 2), Class A                                                                                                                                                                                                                                                         |                                                                                                                                                                                       |                                                                                 |
| EMC          |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 | TP TC 020                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
| (Note 5 & 6) |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Harmonic Current                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Voltage Flicker                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     | N-4-                                                                                                                                                                                  |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                 | ndard                                                                                                                                                                                                                                                                                                                                                                    | Test Level /                                                                                                                                                                                                                                                        |                                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ESD                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                 | EN/EN61000-4-2                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                     | air; Level 2, 6KV co                                                                                                                                                                  | ontact; criteria A                                                              |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Radiated                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BS                                                                                                                                                                                                                                                                                                                                                                                              | EN/EN61000-4-3                                                                                                                                                                                                                                                                                                                                                           | Level 3, 10V                                                                                                                                                                                                                                                        | /m ; criteria A                                                                                                                                                                       |                                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | EET (D :                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                 | ENUENIO40CC : :                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |                                                                                 |
|              | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                        | EFT / Burst                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                 | EN/EN61000-4-4                                                                                                                                                                                                                                                                                                                                                           | Level 3, 2KV                                                                                                                                                                                                                                                        | <u>'</u>                                                                                                                                                                              |                                                                                 |
|              | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                        | Surge                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | BS                                                                                                                                                                                                                                                                                                                                                                                              | EN/EN61000-4-5                                                                                                                                                                                                                                                                                                                                                           | Level 3, 1KV                                                                                                                                                                                                                                                        | /Line-Line ;2KV/Line                                                                                                                                                                  | -FG ;criteria A                                                                 |
|              | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                        | Surge<br>Conducted                                                                                                                                                                                                                                                                                                                                                                                                                                                           | BS I                                                                                                                                                                                                                                                                                                                                                                                            | EN/EN61000-4-5<br>EN/EN61000-4-6                                                                                                                                                                                                                                                                                                                                         | Level 3, 1KV<br>Level 3, 10V                                                                                                                                                                                                                                        | /Line-Line ;2KV/Line<br>; criteria A                                                                                                                                                  | -FG ;criteria A                                                                 |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Surge<br>Conducted<br>Magnetic Field                                                                                                                                                                                                                                                                                                                                                                                                                                         | BS BS BS                                                                                                                                                                                                                                                                                                                                                                                        | EN/EN61000-4-5<br>EN/EN61000-4-6<br>EN/EN61000-4-8                                                                                                                                                                                                                                                                                                                       | Level 3, 1KV<br>Level 3, 10V<br>Level 4, 30A                                                                                                                                                                                                                        | /Line-Line ;2KV/Line<br>; criteria A<br>/m ; criteria A                                                                                                                               | e-FG ;criteria A                                                                |
|              | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                | Surge Conducted Magnetic Field 1019.6K hrs min.                                                                                                                                                                                                                                                                                                                                                                                                                              | BS BS BS BS Telcordia SR-332 (Bel                                                                                                                                                                                                                                                                                                                                                               | EN/EN61000-4-5<br>EN/EN61000-4-6<br>EN/EN61000-4-8                                                                                                                                                                                                                                                                                                                       | Level 3, 1KV<br>Level 3, 10V<br>Level 4, 30A                                                                                                                                                                                                                        | /Line-Line ;2KV/Line<br>; criteria A<br>/m ; criteria A                                                                                                                               | e-FG ;criteria A                                                                |
| OTHERS       | MTBF<br>DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                   | Surge Conducted Magnetic Field 1019.6K hrs min. 225*124*41mm (L*W                                                                                                                                                                                                                                                                                                                                                                                                            | BS BS BS Telcordia SR-332 (Bel                                                                                                                                                                                                                                                                                                                                                                  | EN/EN61000-4-5<br>EN/EN61000-4-6<br>EN/EN61000-4-8                                                                                                                                                                                                                                                                                                                       | Level 3, 1KV<br>Level 3, 10V<br>Level 4, 30A                                                                                                                                                                                                                        | /Line-Line ;2KV/Line<br>; criteria A<br>/m ; criteria A                                                                                                                               | -FG ;criteria A                                                                 |
| OTHERS       | MTBF DIMENSION PACKING                                                                                                                                                                                                                                                                                                                                                                                                                              | Surge Conducted Magnetic Field 1019.6K hrs min. 225*124*41mm (L*W 1.02Kg; 12pcs/13.5K                                                                                                                                                                                                                                                                                                                                                                                        | BS B                                                                                                                                                                                                                                                                                                                                                        | EN/EN61000-4-5<br>EN/EN61000-4-6<br>EN/EN61000-4-8<br>Icore); 144.4K hrs n                                                                                                                                                                                                                                                                                               | Level 3, 1KV. Level 3, 10V Level 4, 30A nin. MIL-HDBK-217                                                                                                                                                                                                           | /Line-Line ;2KV/Line<br>; criteria A<br>/m ; criteria A<br>F (25°C)                                                                                                                   | s-FG ;criteria A                                                                |
| OTHERS       | MTBF DIMENSION PACKING  1. All parameters NOT specia 2. Ripple & noise are measur 3. Tolerance: includes set up 4. Once the protection is trigg 5. The power supply is consid a 360mm "860mm metal pic require an additional 20*30 please refer to "EMI testing 6. This power supply does not under the following conditio a) the end-devices is used b) the end-devices is conn c) the power supply is: - i                                        | Surge Conducted Magnetic Field 1019.6K hrs min. 225*124*41mm (L*W 1.02Kg; 12pcs/13.5K Ily mentioned are mead at 20MHz of bandw tolerance, line regulaered, the input voltageered a component with with 1mm of thickr *13 NIZN magnetic cof component power meet the harmonic criss: within the European ected to public mains installed in end-device                                                                                                                        | BSI  BSI  Telcordia SR-332 (Bel  "H)  g/0.78CUFT  asured at 230VAC in invidth by using a 12" t iton and load regulati e needs to be disconr ich will be installed in ess. The final equipn lasp or magnetic ring supplies." (as availat urrent requirements o  Union, and supply with 220Vac is s with average or coi                                                                           | EN/EN61000-4-5 EN/EN61000-4-6 EN/EN61000-4-8 Icore); 144.4K hrs r  but, rated load and 25 wisted pair-wire termion. ected, and the cold r to a final equipment. hent must be re-confi to the battery output of http://www.mea utflined by BS EN/EN or greater rated nomin                                                                                                | Level 3, 1KV. Level 3, 10V Level 4, 30A nin. MIL-HDBK-217 5°C of ambient tempe nated with a 0.1µf & 4 All the EMC tests are rmed that it still meets line. For guidance on included the control of the control of the control                                       | Line-Line; 2KV/Line; criteria A /m; criteria A /m; criteria A F (25°C)  rature. F/µf parallel capacite minutes before res been executed by EMC directives. Al how to perform the      | or.  ttarting.  mounting the unit or  If the radiation tests ese EMC tests,     |
|              | MTBF DIMENSION PACKING  1. All parameters NOT specia 2. Ripple & noise are measur 3. Tolerance: includes set up 4. Once the protection is trigg 5. The power supply is consid a 360mm'360mm metal pla require an additional 20*30 please refer to "EMI testing 6. This power supply does not under the following conditio a) the end-devices is used b) the end-devices is conn c) the power supplies:  Exception: Power supplies a) professional e | Surge Conducted Magnetic Field 1019.6K hrs min. 225*124*41mm (L*M 1.02Kg; 12pcs/13.5K Illy mentioned are med at 20MHz of bands tolerance, line regula ered, the input voltage ered a component wit title with 1mm of thickr *13 NIZN magnetic c of component power meet the harmonic ci ns: within the European ected to public mains ected to public mains ected in end-device belong to part of a lig used within the follow equipment with a total controlled heating ele | BSI  BSI  Telcordia SR-332 (Bel  "H)  g/0.78CUFT  saured at 230VAC in width by using a 12" ti tion and load regulati on eeds to be discorn ich will be installed in ess. The final equipn asp or magnetic ring supplies." (as availat urrent requirements o  Union, and supply with 220Vac a se with average or con thing system ing end-devices do n rated input power graments with a rated p | EN/EN61000-4-5 EN/EN61000-4-6 EN/EN61000-4-8 Ilcore); 144.4K hrs r  out, rated load and 25 wisted pair-wire termi on. heeted, and the cold r hote a final equipment. hent must be re-confi to the battery output le on http://www.mea utlined by BS EN/EN  or greater rated nomin intinuous input power ot need to fulfill BS E eater than 1000W; hower less than or eqi | Level 3, 1KV. Level 3, 10V Level 4, 30A nin. MIL-HDBK-217  5°C of ambient tempe nated with a 0.1µf & 4 machine will wait for 3 All the EMC tests are rmed that it still meets line. For guidance on nal voltage, and greater than 75W, or NVEN61000-3-2 ual to 200W | Line-Line; 2KV/Line; criteria A /m; criteria A /m; criteria A F (25°C)  rature. Type parallel capacite minutes before reserve been executed by EMC directives. All how to perform the | or.  tarting.  mounting the unit all the radiation tests see EMC tests,  supply |













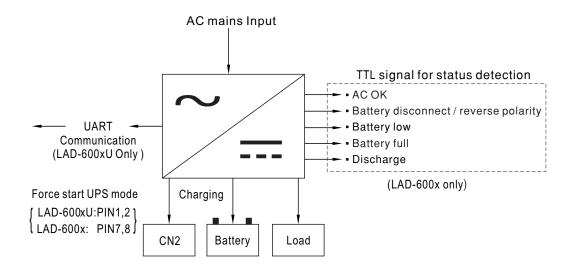




## ■ Suggested Application

#### 1.DC-UPS function

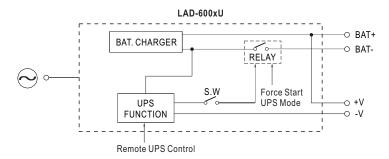
When AC voltage drops below 75/165VAC, The UPS function will activate and power source switch battery backup.



## 2.UART Communication Function (U version only)

The power supply uploads 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 user manual.

#### 2.1 Forced Start & Remote UPS Control(U version only)



#### 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, personal can active the UPS mode of by shorting PIN1 and PIN2 of LAD-600xU to ensure the energy supply to the loads. When operating under UPS mode, the BAT. UVP alarm is still active, but the BAT. UVP protection will be disable, therefore, the battery will be fully discharged until system shuts down.

| Pin 1 & 2 | Status       |
|-----------|--------------|
| Short     | Forced start |
| Open      | Normal       |



#### Note:

File Name:LAD-600-SPEC 2023-05-15









<sup>1</sup>st priority of UPS mode: Force start UPS function by internal relay.



#### ※ 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-600xU 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.

| Pin 3 & 4 | Status             |
|-----------|--------------------|
| Short     | Remote UPS control |
| Open      | Normal             |



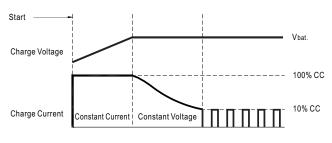
2nd priority of UPS mode: UPS function can be activate by controlling with this signal, since the controller is still normal, the relay can be controlled through communication protocol.

#### 2.2 Charging Curve for Different Battery(U version only)

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

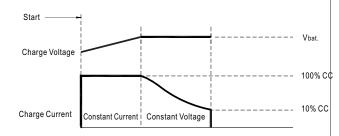


#### O Charging curve





#### O Charging curve



O Apply to Li-ion batteries

## 2.3 Mode Selection for Buzzer(U version only)

| Pin 7 & 8 | Status            |
|-----------|-------------------|
| Short     | Fire alarm system |
| Open      | Evacuation system |



#### Note:

LAD-600BU Open circuit for fire alarm, Short circuit for evacuation; LAD-600CU/DU Open circuit for evacuation, Short circuit for fire alarm.





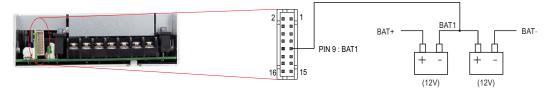


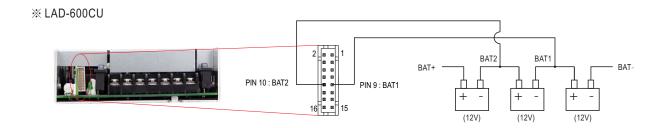


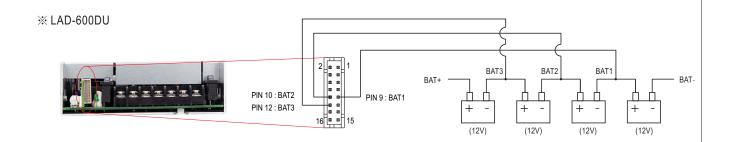


#### 2.4 Battery Inspection

#### **% LAD-600BU**







## 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.

PIN 14 : UART\_TX PIN 13 : UART\_RX



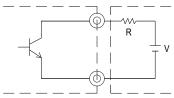






## 3. Function signals by TTL and UART

- 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.



External voltage and resistor

(The max. sink current is 30mA at 50VDC)

#### 3.1 AC OK: Detection of AC status

• TTL Signal for Blank version

| Between pin 1 and pin 4                          | Description                                                 |
|--------------------------------------------------|-------------------------------------------------------------|
| Low<br>(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 |



• Signal for UART Version

AC OK is achievable through UART communication protocol, please refer to for more detail: http://www.meanwell.com/manual.html

# 3.2 Battery Disconnected/Reverse Polarity: Battery status detection

• TTL Signal for Blank version

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



Note. The signals of battery disconnected and reverse polarity can only be detected during the first power transmission , it is can not be detected at any time.

• Signal for UART Version

Battery Disconnected/Reverse Polarity is achievable through UART communication protocol, please refer to for more detail: http://www.meanwell.com/manual.html









## 3.3 Battery Low: Battery low detection

• TTL Signal for Blank version

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



• Signal for UART Version  $Battery\ Low\ is\ achievable\ through\ UART\ communication\ protocol, please\ refer\ to\ for\ more\ detail:$ http://www.meanwell.com/manual.html

## 3.4 Battery Full: Battery full detection

• TTL Signal for Blank version

| Between pin 4 and pin 5                             | Description                                               |
|-----------------------------------------------------|-----------------------------------------------------------|
| Low<br>(0.3V max. at 30mA)                          | The signal is "Low" when the battery is fully charged     |
| High or open<br>(External applied voltage 50V max.) | The signal turns to be "High" when the battery is charged |



• Signal for UART Version Battery Full is achievable through UART communication protocol, please refer to for more detail: http://www.meanwell.com/manual.html





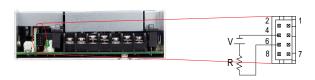




## 3.5 Discharge: Discharge detection

• TTL Signal for Blank version

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



• Signal for UART Version Discharge is achievable through UART communication protocol, please refer to for more detail: http://www.meanwell.com/manual.html

#### 3.6 Forced Start: Forced start UPS mode

• TTL Signal for Blank version

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



• Signal for UART Version

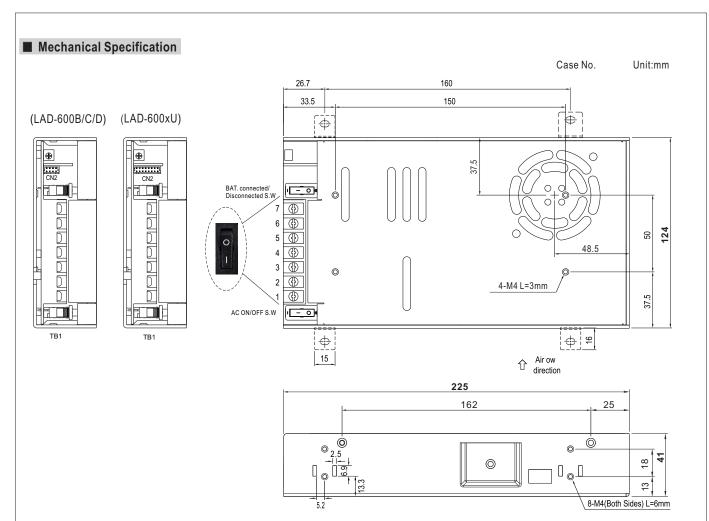
Forced Start is achievable through UART communication protocol, please refer to for more detail: http://www.meanwell.com/manual.html











## ※ Connector Pin No. Assignment(CN2) (LAD-600x)

| Pin No. | Assignment(TTL Signal)                         | Mating Housing           | Terminal             |
|---------|------------------------------------------------|--------------------------|----------------------|
| 1       | AC OK                                          |                          |                      |
| 2       | Battery disconnect/<br>reverse polarity        |                          |                      |
| 3       | Battery low                                    | TKD DUIG                 | TVD                  |
| 4       | GND                                            | TKP DH2<br>or equivalent | TKP<br>or equivalent |
| 5       | Battery full                                   | or equivalent            | or equivalent        |
| 6       | Discharge                                      |                          |                      |
| 7,8     | Open : normal<br>Short : forced start UPS mode |                          |                      |

## X Terminal Pin No. Assignment(TB1)

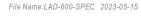
|         | =            |
|---------|--------------|
| Pin No. | Assignment   |
| 1       | AC/L         |
| 2       | AC/N         |
| 3       | FG ±         |
| 4       | DC OUTPUT -V |
| 5       | DC OUTPUT +V |
| 6       | BAT -        |
| 7       | BAT +        |

DC OUTPUT -V and BAT - can not be shorted.

#### Connector Pin No. Assignment(CN2) (LAD-600xU)

| Pin No. | Assignment                        | Mating Housing | Terminal      |
|---------|-----------------------------------|----------------|---------------|
| 1,2     | Short: forced start               | TKP DH2        | TKP           |
| 1,2     | Open : normal                     |                |               |
| 3,4     | Short : Remote UPS control        |                |               |
| 3,4     | Open : normal                     |                |               |
| 5.0     | Short : Li- ion batteries         |                |               |
| 5,6     | Open : Lead-acid (Pb) batteries   |                |               |
| 7,8     | Fire alarm/<br>Evacuatione option |                |               |
| 9       | BAT1                              | or equivalent  | or equivalent |
| 10      | BAT2                              |                |               |
| 11      | NC                                |                |               |
| 12      | BAT3                              |                |               |
| 13      | UART_RX                           |                |               |
| 14      | UART_TX                           |                |               |
| 15      | GND                               |                |               |
| 16      | 3.3V                              |                |               |

+3.3V(ref) for testing use only; can't supply power over 1mA for a long time









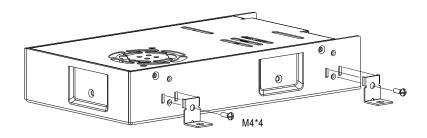


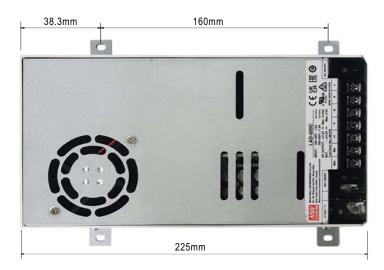
# ■ Accessory List

Bracket (Optional accessory, Should ordered seperately)

| MW's Order No. | Item | Quantity       |
|----------------|------|----------------|
| DGG2MHS012     |      | 4pcs/per model |

# ■ Installation Diagram









File Name:LAD-600-SPEC 2023-05-15





