

### Data Sheet

**Total Power:** 600 W  
**# of Outputs:** Single  
**Outputs:** 12, 28, 36, 48 Vdc

### SPECIAL FEATURES

- 600 W full power at elevated temperatures
- Wide operating temperature range (-40 °C to 85 °C baseplate)
- Adjustable output
- Remote output On/Off
- AC\_OK; DC\_OK signals
- 5 V standby voltage
- Active current share
- Conduction-cooled/fanless
- I<sup>2</sup>C / PMBus
- Medical and ITE Safety<sup>3</sup>
- Suited for BF-type applications
- Active power factor correction
- Optional IP65 variant
- Optional 277 Vac input variant

### COMPLIANCE

- EMI Class B
- EN61000 Immunity

### SAFETY

- UL + CSA:** 62368-1 2<sup>nd</sup> Ed.  
ANSI ES60601-1<sup>3</sup>  
UL 8750<sup>5</sup>  
CSA-C22.2 No. 250.13<sup>5</sup>
- TÜV:** 62368-1 2<sup>nd</sup> Ed.  
60601-1 3<sup>rd</sup> Ed.<sup>3</sup>  
EN 61347-1; -2-13<sup>5</sup>
- CB Scheme:** IEC 60950-1  
IEC 60601-1  
IEC 61347-1; -2-13<sup>5</sup>
- China** CCC
- CE Mark**



### Electrical Specifications

| Input                         |   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
|-------------------------------|---|-----------|----------|----------|----------|---------------------|-----------|--------------|---------------------|-----------|--------------|---------------------|-----------|
| Input range                   | U Suffix: 90 - 264 Vac (Safety rating: 100 - 240 Vac)<br>127 - 374 Vdc <sup>4</sup><br>H Suffix: 180 - 305 Vac (Safety rating: 200 - 277 Vac)<br>254 - 420 Vdc <sup>4</sup>   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Frequency                     | 47 - 63 / 440 Hz (Safety rating: 50/60 Hz)  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Input fusing                  | Internal fuse on both L and N lines (12.5 A - U suffix; 7 A - H suffix)   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| EMI/RFI                       | FCC Class B, CISPR22/EN55022 Class B  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| MIL-STD-461F EMI <sup>1</sup> | Compliance to CE101, 102; CS101, 114, 115, 116 (with external filter <sup>1</sup> )   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Inrush current                | ≤ 25 A peak   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Power factor                  | 0.99 typical  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Harmonics                     | Meets EN61000-3-2 Class A and Class C <sup>2</sup>  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Input current                 | < 10 Arms @ 100 Vac   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Hold up time                  | 20 ms min for Main Output (230 Vac) @ 100% Load   |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Efficiency                    | 93.3% typical @ 230 Vac; 100% Load; 28 Vdc  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Leakage current <sup>3</sup>  | U Suffix: 115 µA typical (< 200 µA max per ANSI/ES60601-1 264 Vac split-phase / 60 Hz)<br>387 µA typical (< 500 µA max per IEC60601-1; 264 Vac / 50Hz)<br>H Suffix: 0.2 mA typical (< 3.5 mA max per ITE 62368-1 Standard)  |           |          |          |          |                     |           |              |                     |           |              |                     |           |
| Isolation voltage             | <table border="1"> <thead> <tr> <th></th> <th>U Suffix</th> <th>H Suffix</th> </tr> </thead> <tbody> <tr> <td>PRI-SEC:</td> <td>4,000 Vac (2X MOPP)</td> <td>3,000 Vac</td> </tr> <tr> <td>PRI-Chassis:</td> <td>1,500 Vac (1X MOPP)</td> <td>2,000 Vac</td> </tr> <tr> <td>SEC-Chassis:</td> <td>1,500 Vac (1X MOPP)</td> <td>1,500 Vac</td> </tr> </tbody> </table> |           | U Suffix | H Suffix | PRI-SEC: | 4,000 Vac (2X MOPP) | 3,000 Vac | PRI-Chassis: | 1,500 Vac (1X MOPP) | 2,000 Vac | SEC-Chassis: | 1,500 Vac (1X MOPP) | 1,500 Vac |
|                               | U Suffix  | H Suffix  |          |          |          |                     |           |              |                     |           |              |                     |           |
| PRI-SEC:                      | 4,000 Vac (2X MOPP)   | 3,000 Vac |          |          |          |                     |           |              |                     |           |              |                     |           |
| PRI-Chassis:                  | 1,500 Vac (1X MOPP)   | 2,000 Vac |          |          |          |                     |           |              |                     |           |              |                     |           |
| SEC-Chassis:                  | 1,500 Vac (1X MOPP)   | 1,500 Vac |          |          |          |                     |           |              |                     |           |              |                     |           |

<sup>1</sup>Artesyn Filter PN: 700-014447-0000 (Zhongguang PN: ZGLPG-10-02M).

<sup>2</sup>Meets Class C ≥ 50% load.

<sup>3</sup>U suffix have both ITE and Medical Safeties. H suffix carries ITE approval only.

<sup>4</sup>DC input rating not part of product's Safety approval.

<sup>5</sup>LED Lighting approvals apply to all 48 V output variants.

\*\* LCC600 tested according to the medical standard IEC 60601-1-2 4th Edition.

## Electrical Specifications

| Output                        |   |   |
|-------------------------------|---|---|
| Output rating                 | See Ordering Information table  |   |
| Standby output                | 5.0 Vdc @ 1.5 A Max   |   |
| Set point                     | ± 0.5%  | Factory set point   |
| Total regulation              | Main Output: ± 2.0%<br>5 Vsb: ± 5%  | Combined Line / Load / Temperature  |
| Rated load                    | 600 W maximum   | 600 W from -40 °C to 85 °C Baseplate Temp. Derate output to 28 W @ 95 °C Baseplate Temp   |
| Minimum load                  | 0 A   | For both Main and 5 Vsb Outputs   |
| Output voltage adjust range   | See Ordering Information table  | Max power limited to 600 W  |
| Output noise                  | Main Output: 1.0% max p-p<br>5 Vsb: 60 mV max p-p                                 | Measured with 0.1 µF Ceramic and 10 µF Tantalum Cap, 20 MHz BW  |
| Remote sense                  | Compensation up to 500 mV   | Pin 10: +Vout_RS / Pin4: -Vout_RS   |
| Overcurrent protection        | 105 - 130% of full load current   | Default is Shutdown mode with Auto-retry every 2-4 sec. Output latches after 20 sec of continuous OCP fault presence. Restart after latch possible through AC recycle, Inhibit toggle or through PMBus. |
| Overvoltage protection        | 125 - 145% Vo, nom Main Output<br>125 - 130% 5 Vsb                                | Latching / AC Recycle or Inhibit toggle required for PSU restart  |
| Overtemperature protection    | > 95 °C Baseplate temperature   | Output Shutdown / Auto-recovery   |
| AC_OK                         | Open Collector; 0.8 Vdc max / 10 mA   | Active low when AC is present   |
| DC_OK                         | Open Collector; 0.8 Vdc max / 10 mA   | Active low when Main Output is within regulation  |
| Remote inhibit                | Contact Closure   | Pin 19: Open/Float = ON; Close/Ground = OFF   |
| # Units in parallel operation | Qualified up to 5 units in parallel. Consult factory if more than 5 are required. | Pin 5: IShare pin for main output only.   |
| Output dimming                | 0-10 Vdc external voltage;<br>0-100 kOhm external resistance                      | Consult with <a href="mailto:productsupport.ep@artesy.com">productsupport.ep@artesy.com</a>   |

## Environmental Specifications

|                             |   |
|-----------------------------|---|
| Operating temperature range | -40 °C to +85 °C Baseplate temperature  |
| Storage temperature         | -40 °C to +85 °C  |
| Humidity                    | 10% to 95%  |
| Altitude                    | 16,402 ft (Operating) / 50,000 ft (Non-Operating)   |
| Shock                       | MIL-STD-810F 516.5 Procedure I, VI  |
| Vibration                   | MIL-STD-810F 514.5 Cat. 4, 10   |
| Ingress protection          | IP65 (for suffix "-4P")   |
| MTBF (calculated)           | >2M Hrs, 25 °C per SR-332 Issue 3   |
| Electromagnetic immunity    | Designed to meet EN61000-4-3, -4, -5, -8, -11 (Level 3); EN61000-4-2 (Level 4); EN60601-1-2 and EN55024 |
|                             | For H suffix, Level 4 for EN61000-4-5   |

## Ordering Information

| Model Number*                 | AC Input  | Output Setpoint | Setpoint Tolerance | Output Current [A] |       | Max O/P Power [W] | Typical Efficiency** | Standby Output | Combined Line/Load Regulation | Output Ripple |
|-------------------------------|-----------|-----------------|--------------------|--------------------|-------|-------------------|----------------------|----------------|-------------------------------|---------------|
|                               |           |                 |                    | Min                | Max   |                   |                      |                |                               |               |
| LCC600-48U-4PD <sup>(1)</sup> | 90 - 264  | 54 V            | ±0.5%              | 0                  | 11.1  | 600               | 93.0%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-48U-9P                 | 90 - 264  | 48 V            | ±0.5%              | 0                  | 12.5  | 600               | 93.0%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-48H-9P                 | 180 - 305 |                 |                    |                    |       |                   |                      |                |                               |               |
| LCC600-36U-9P                 | 90 - 264  | 36 V            | ±0.5%              | 0                  | 16.7  | 600               | 92.0%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-36H-9P                 | 180 - 305 |                 |                    |                    |       |                   |                      |                |                               |               |
| LCC600-28U-9P24               | 90 - 264  | 24 V            | ±0.5%              | 0                  | 25    | 600               | 93.0%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-28U-9P                 | 90 - 264  | 28 V            | ±0.5%              | 0                  | 25*** | 600               | 93.5%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-28H-9P                 | 180 - 305 |                 |                    |                    |       |                   |                      |                |                               |               |
| LCC600-12U-9P                 | 90 - 264  | 12 V            | ±0.5%              | 0                  | 50    | 600               | 92.3%                | 5 Vdc @ 1.5 A  | 2%                            | 1%            |
| LCC600-12H-9P                 | 180 - 305 |                 |                    |                    |       |                   |                      |                |                               |               |

\*Change suffix "-9P" to "-4P" for IP65 rated enclosure with fly lead wires

\*Change suffix "-4P" to "-4PR" for IP65 rated enclosure with right angle fly lead wires (applies to 28, 36, 48 Vdc)

\*Change suffix "-4P" to "-4PV" to omit the control cable (applies to 28, 36, 48 Vdc)

\*Add suffix "24" after "P" to designate output voltage factory set to 24V (only on 28V models like LCC60028H-4P24CC)

\*Add suffix "CC" for Constant Current setting (e.g. "-4PCC"; "-9PCC").

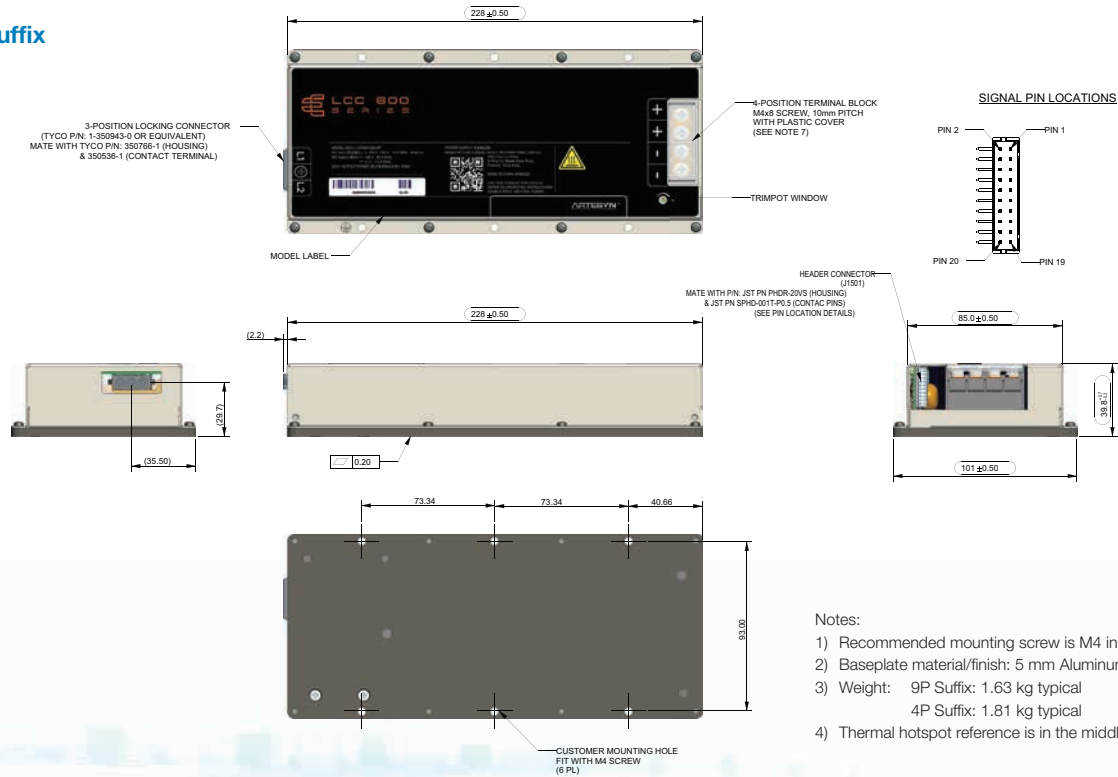
\*\*Typical efficiency at high line, factory default voltage and full load

\*\*\*When Vout is adjusted down to 24 V, the supply can deliver 25 A max (600 W max). At 28 V default output setting, max lout is 21.43 A (600 W max).

<sup>(1)</sup> "D" suffix for 0-10 Vdc analog external volatge dimming (11.1 A CC limit). Consult Technical Reference Notes for additional details.

## Mechanical Drawings

### -9P Suffix

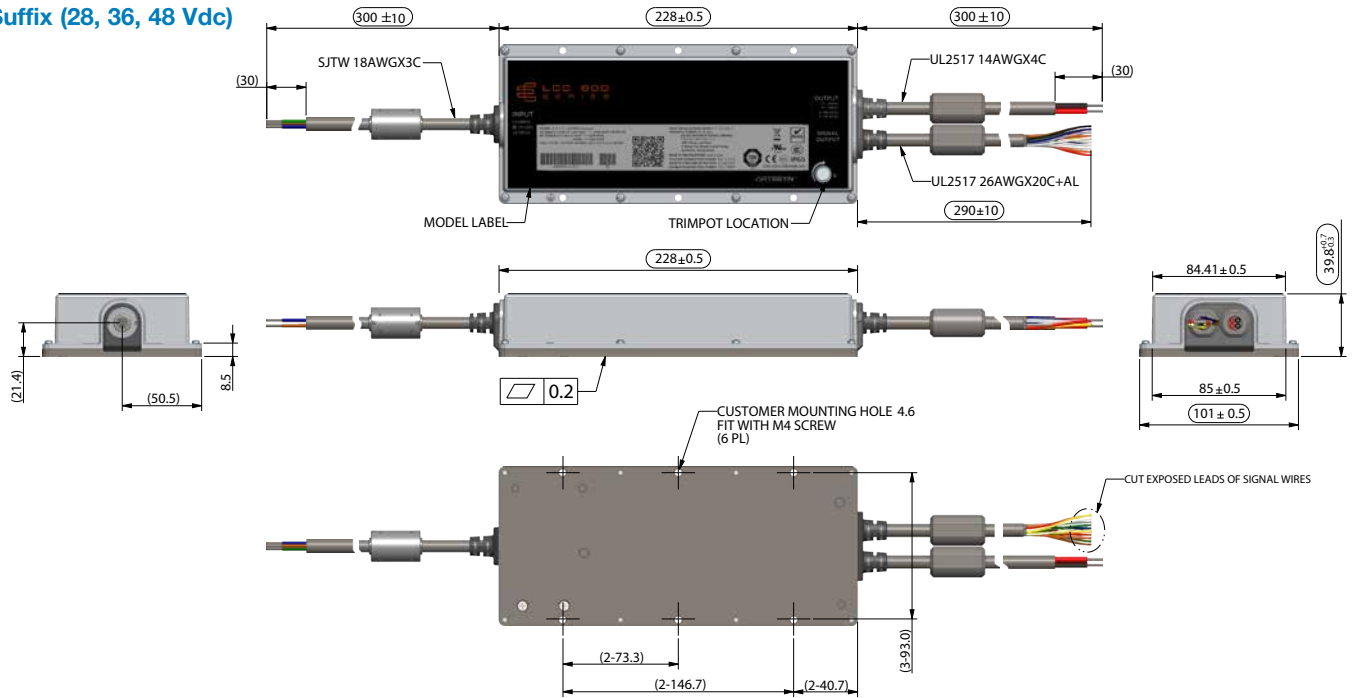


#### Notes:

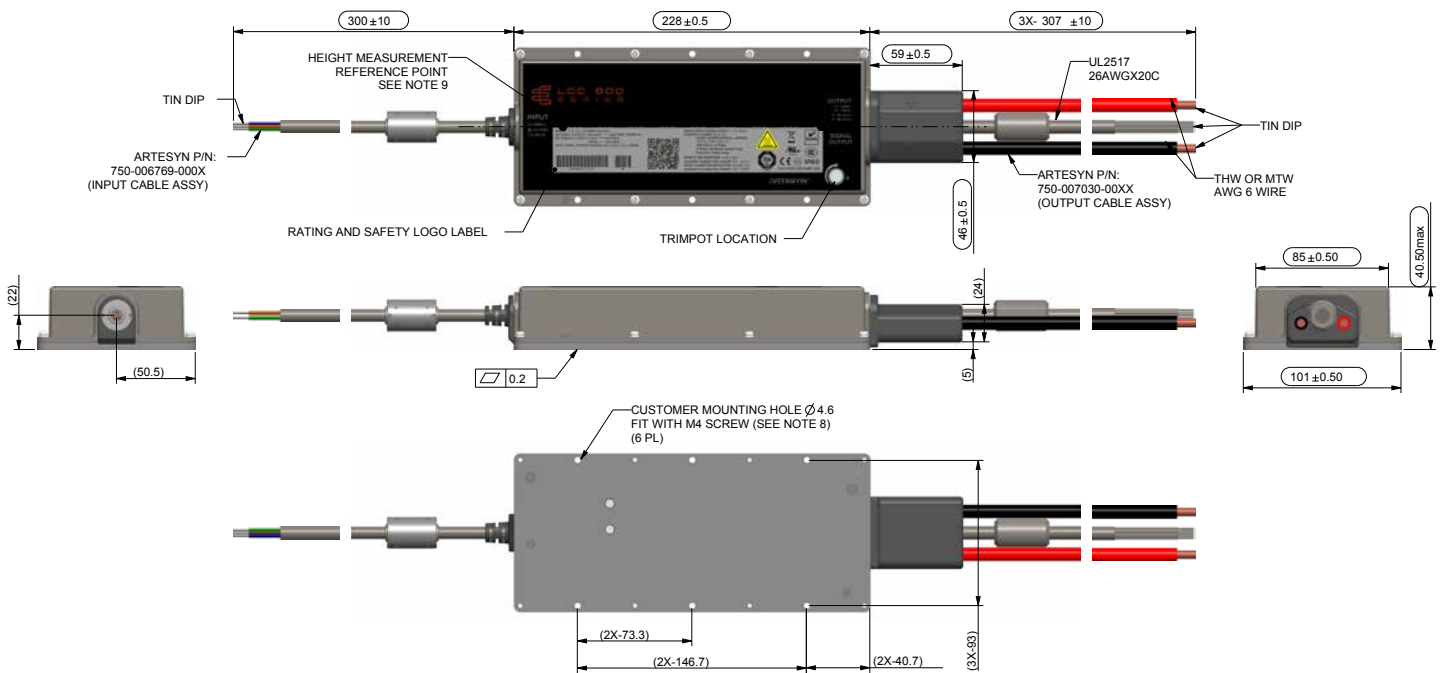
- 1) Recommended mounting screw is M4 in 6 locations; 8-10 kgf-cm torque.
- 2) Baseplate material/finish: 5 mm Aluminum with Black Anodized.
- 3) Weight: 9P Suffix: 1.63 kg typical  
4P Suffix: 1.81 kg typical
- 4) Thermal hotspot reference is in the middle of the baseplate.

## Mechanical Drawings

### -4P Suffix (28, 36, 48 Vdc)

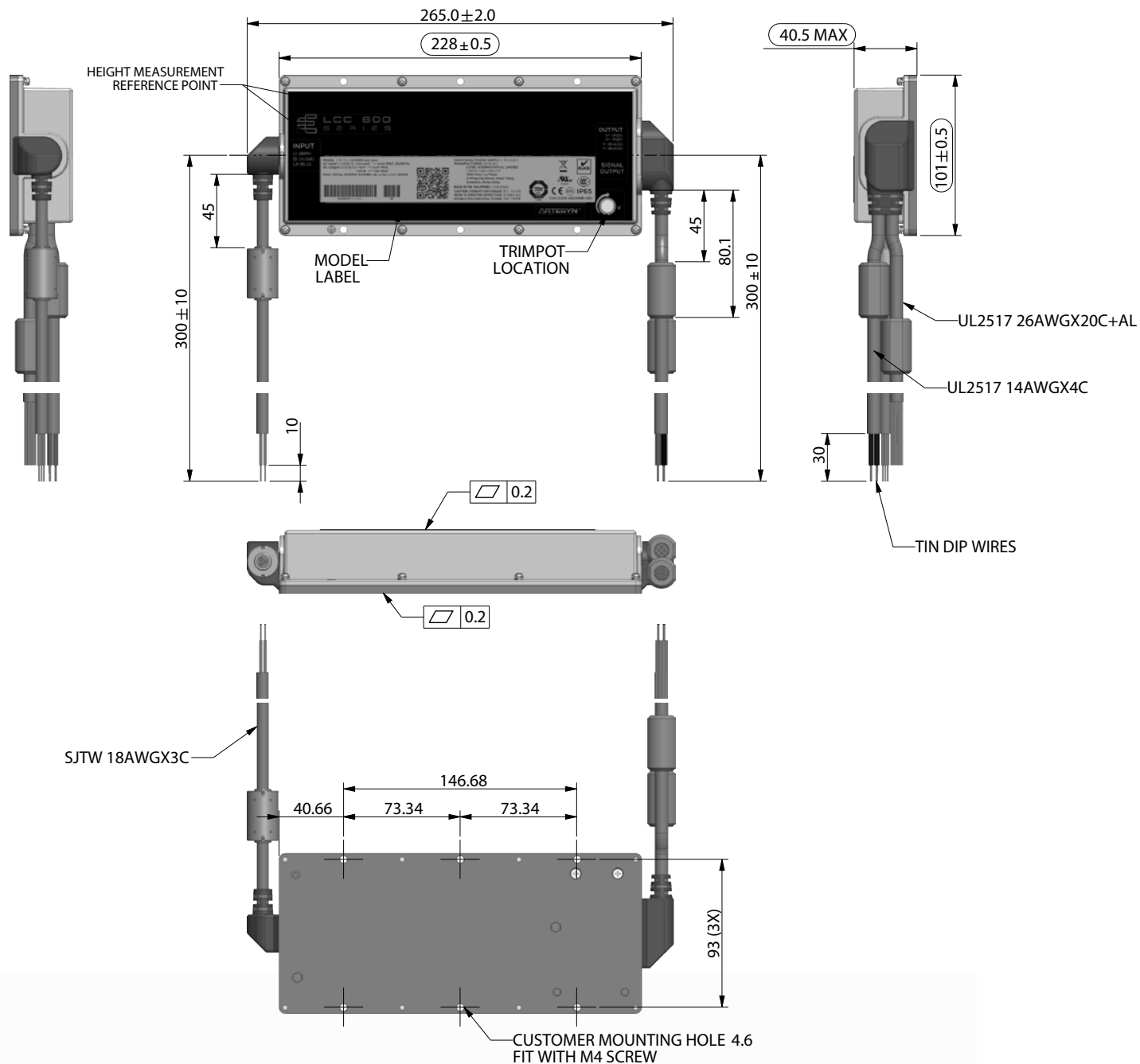


### -4P Suffix (12 Vdc)



## Mechanical Drawings

-4PR Suffix (28, 36, 48 Vdc)



## Pin Assignment (INPUT)

| DESCRIPTION | -9Px Suffix |  | -4Px Suffix |   |
|-------------|-------------|--|-------------|---|
|             | DESIGNATION | NOTES  | DESIGNATION | NOTES   |
| Live        | L1          | Mating Connector:<br>350766-1 (Housing);<br>350536-1 (Contact Terminals) | Brown       | SJTW 18AWGX3C;<br>PVC jacket;<br>105 °C / 300 V |
| Neutral     | L2          |  | Blue        |   |
| Ground      | G           |  | Y/GR        |   |

## Pin Assignment (MAIN OUTPUT)

| DESCRIPTION               | -9Px Suffix |  | -4Px Suffix (28, 36, 48 Vdc) |  | -4Px Suffix (12 Vdc) |   |
|---------------------------|-------------|--|------------------------------|--|----------------------|---|
|                           | DESIGNATION | NOTES  | DESIGNATION                  | NOTES                                      | DESIGNATION          | NOTES   |
| Main Output               | +Vout       | 4 Position Terminal Block: M4<br>Screw/10mm Pitch; 12kgf-cm<br>Torque; Accepts 14-16AWG<br>Ring Tongue - Spade Terminals<br>MOLEX BB-124-08 (19141-<br>0058) or EQUIVALENT | Red                          | 14AWGX4C;<br>PVC jacket;<br>105 °C / 300 V | Red                  | 6AWG Multi-Strand;<br>PVC jacket;<br>105 °C / 600 V |
| Main Output<br>Return GND | -Vout       |  | Black                        |  | Black                |   |
|                           |             |  | Black                        |  | Black                |   |

## Pin Assignment

| J1501 - Signal & Control |  | -9Px Suffix |   | -4Px Suffix  |  |
|--------------------------|--|-------------|---|--------------|--|
| SIGNALS                  | DESCRIPTION  | PIN #       | NOTES   | WIRE COLOR   | NOTES  |
| A2_OUT                   | EEPROM Address   | 1           | J1501 Mating<br>Connector:<br>JST PN<br>PHDR-20VS<br><br>Contact Pins:<br>JST PN SPHD-<br>001T-P0.5 | BLACK        | 26AWGX20C+AL;<br>PVC jacket;<br>105 °C / 300 V |
| GND                      | Ground   | 2           |   | BROWN        |  |
| A1_OUT                   | EEPROM Address   | 3           |   | RED          |  |
| -VOUT_RS                 | Remote Sense Return (Main O/P)                               | 4           |   | ORANGE       |  |
| ISHARE                   | Load Share Voltage   | 5           |   | YELLOW       |  |
| A0_OUT                   | EEPROM Address   | 6           |   | GREEN        |  |
| SDA                      | Serial Data Signal (I <sup>2</sup> C)                        | 7           |   | BLUE         |  |
| SPARE_1                  | Spare/Unused Pin (Dimming input for "-4PD" suffix)           | 8           |   | VIOLET       |  |
| SCL                      | Serial clock Signal (I <sup>2</sup> C)                       | 9           |   | GRAY         |  |
| +VOUT_RS                 | Remote Sense (Main O/P)                                      | 10          |   | WHITE        |  |
| 5VSB                     | 5V Standby (1.5A Max)  | 11          |   | PINK         |  |
| SGND                     | 5V Standby Return  | 12          |   | LIGHT BLUE   |  |
| SPARE_2                  | Spare/Unused Pin   | 13          |   | WHITE/VIOLET |  |
| G_DCOK_C                 | Global DC_OK Collector                                       | 14          |   | WHITE/YELLOW |  |
| WP                       | EEPROM Write Protect   | 15          |   | WHITE/ORANGE |  |
| G_DCOK_E                 | Global DC_OK Emitter (GND)                                   | 16          |   | WHITE/BLACK  |  |
| GND                      | Return GND for O/P Signal and I <sup>2</sup> C communication | 17          |   | WHITE/RED    |  |
| G_ACOK_C                 | Global AC_OK Collector                                       | 18          |   | WHITE/BROWN  |  |
| INH_EN                   | Output Inhibit_Enable Pin (turns output off)                 | 19          |   | WHITE/GREEN  |  |
| G_ACOK_E                 | Global AC_OK Emitter (GND)                                   | 20          |   | WHITE/BLUE   |  |

## Thermal Sensing

| Location   | PMBus ADDR | Max Temp |
|--|------------|----------|
| Internal Secondary Output (near base plate)      | 8Dh        | 111 °C   |
| Internal Primary Hotspot (at FET Heatsink)       | 8Eh        | 124 °C   |
| Internal Primary Input Hotspot (near base plate) | 8Fh        | 101 °C   |

## Power Derating Curves



Figure 1. Output Power vs. Baseplate Temperature



Figure 2. Output Power vs. Input Voltage

## Efficiency Curves



Figure 3. Typical Efficiency for 28 V output



Figure 4. Typical Efficiency for 48 V output

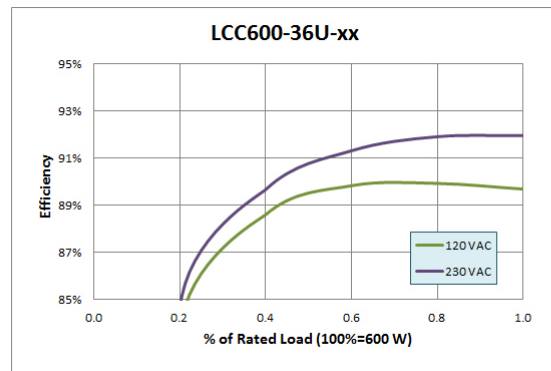


Figure 5. Typical Efficiency for 36 V output

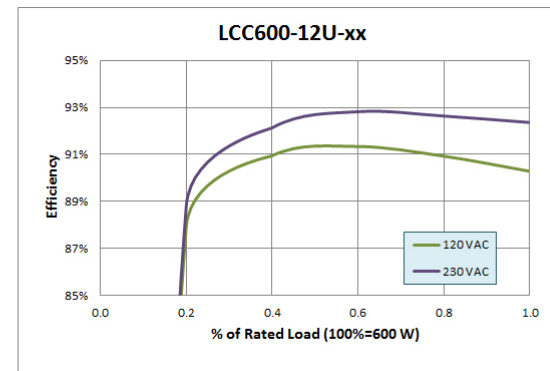

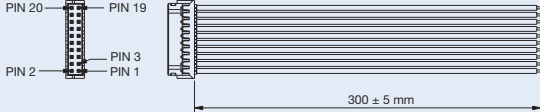
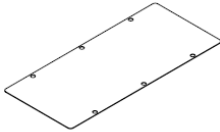


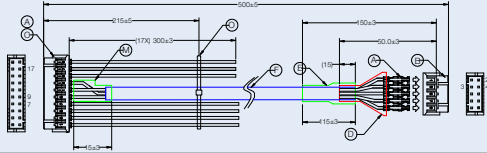
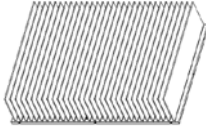


Figure 6. Typical Efficiency for 12 V output

## MTBF vs. Ambient Temperature



| Ambient Temperature | MTBF      |
|---------------------|-----------|
| 25 °C               | 2,000,000 |
| 35 °C               | 1,000,000 |
| 45 °C               | 500,000   |
| 55 °C               | 250,000   |
| 65 °C               | 125,000   |
| 75 °C               | 62,500    |
| 85 °C               | 31,250    |

| ACCESSORIES           |  |   |
|-----------------------|--|---|
| Orderable Part Number | Description  | Diagram   |
| 70-841-030            | For Suffix "-9P" AC Input Mating Connector Cable Assembly (w/ 0.3 m wire length)                                 |    |
| 73-788-001            | J1501 (20 Pin Control Signal) Mating Connector with 0.3 m wires attached for "-9P" suffix                        |     |
| 70-841-031            | Pre-Cut thermal insulator (Laird TFLEX HR220FG)  |    |
| 700-014447-0000       | MIL-STD-461F AC input In-line EMI filter (Zhongguang ZGLPG-10-02M)   |    |
| 73-769-002            | USB to I²C High Speed Adaptor for PMBus Communication  |   |
| 73-769-007            | J1501 (20 Pin) Mating connector with 10 Pin header termination for use with 73-769-002                           |   |
| 466-003103-0000       | Test Heatsink for unit characterization. Size: 331 x 220 x 69 mm; Aluminum with natural finish; Weight = 1.7 kgs |  |

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