Datasheet

LCC 600

Artesyn

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POWER

LCC600

600 Watts Conduction Cooling

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
- 5V standby voltage
- Active current share
- Conduction-cooled / Fanless
- I²C / PMBus™
- Medical and ITE Safety[3]
- 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: 60950-1 2nd Ed.
  ANSI ES60601-1[3]
- TUV: 60950-1 2nd Ed.
  60601-1 3rd Ed.[3]
- CB Scheme: IEC 60950-1
  IEC 60601-1
- China CCC
- CE Mark

Electrical Specifications

Input	
Input range	U Suffix: 90 - 264 Vac (Safety rating:100 - 240 Vac) 127 - 374 Vdc[4] H Suffix: 180 - 305 Vac (Safety rating: 200 - 277 Vac) 254 - 420 Vdc[4]
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[1]	Compliance to CE101, 102; CS101, 114, 115, 116 (with external filter[1])
Inrush current	≤ 25 A peak
Power factor	0.99 typical
Harmonics	Meets EN61000-3-2 Class A and Class C[2]
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	< 200 µA (per ANSI/ES60601; 264 Vac split-phase / 60 Hz) < 400 µA (per IEC60601; 264 Vac / 50 Hz
Isolation voltage	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

1. Consult productsupport.ep@artesyn.com for external filter details.
2. Meets Class C ≥ 50% load.
3. U suffix have both ITE and Medical Safeties. H suffix carries ITE approval only.
4. DC input rating not part of product's Safety approval.

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EMBEDDED TECHNOLOGIES

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% 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 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
Over current 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.
Over voltage protection	125 - 145% Vo, nom Main Output 125 - 130% 5 Vsb	Latching / AC Recyle or Inhibit toggle required for PSU restart
Over temperature protection	> 95 °C Baseplate Temp	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.

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

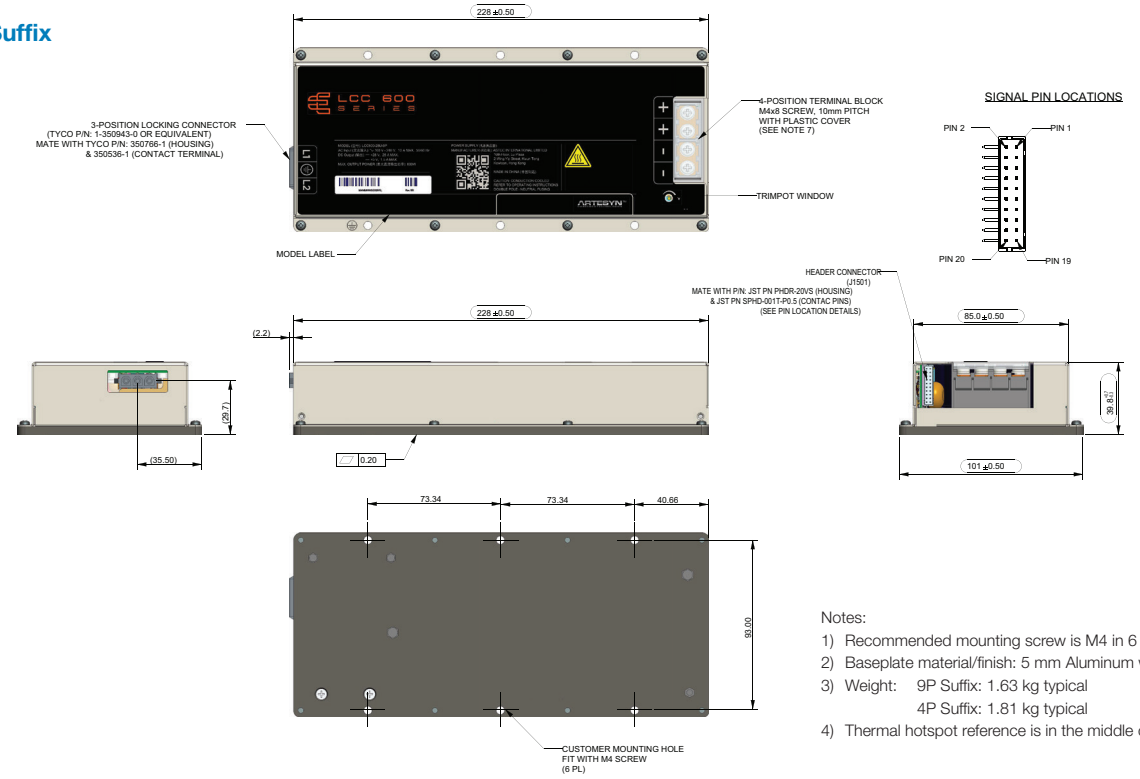
Ordering Information

Model Number*	AC Input	Output Setpoint	Setpoint Tolerance	Adjustment Range	Output Current [A]		Max O/P	Typical Efficiency**	Standby Output	Combined Line/Load Regulation	Output Ripple
					Min	Max	Power [W]				
LCC600-48U-9P	90 - 264	48 V	±0.5%	44 - 54	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%	32 - 38	0	16.7	600	92.0%	5 Vdc @ 1.5 A	2%	1%
LCC600-36H-9P	180 - 305										
LCC600-28U-9P	90 - 264	28 V	±0.5%	24 - 30	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%	12 - 15	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)
**Typical efficiency at high line, factory default voltage and full load

Mechanical Drawings

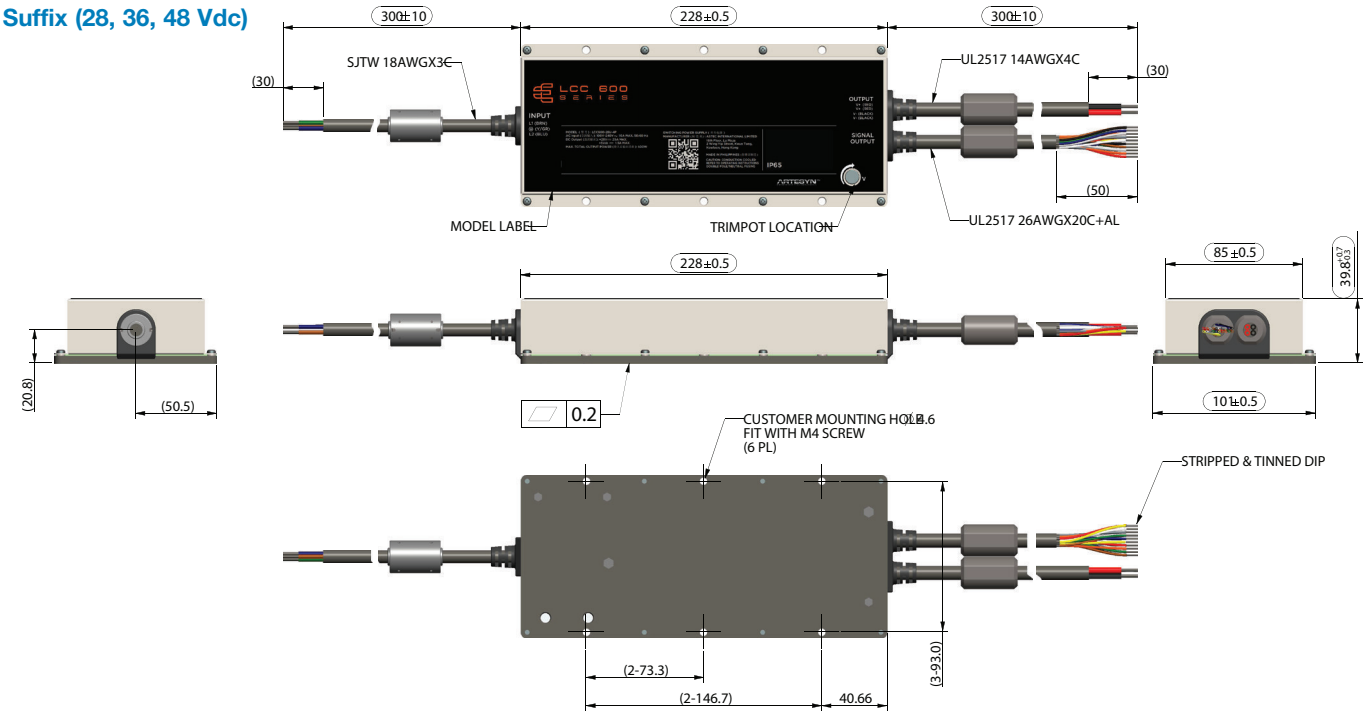
-9P Suffix



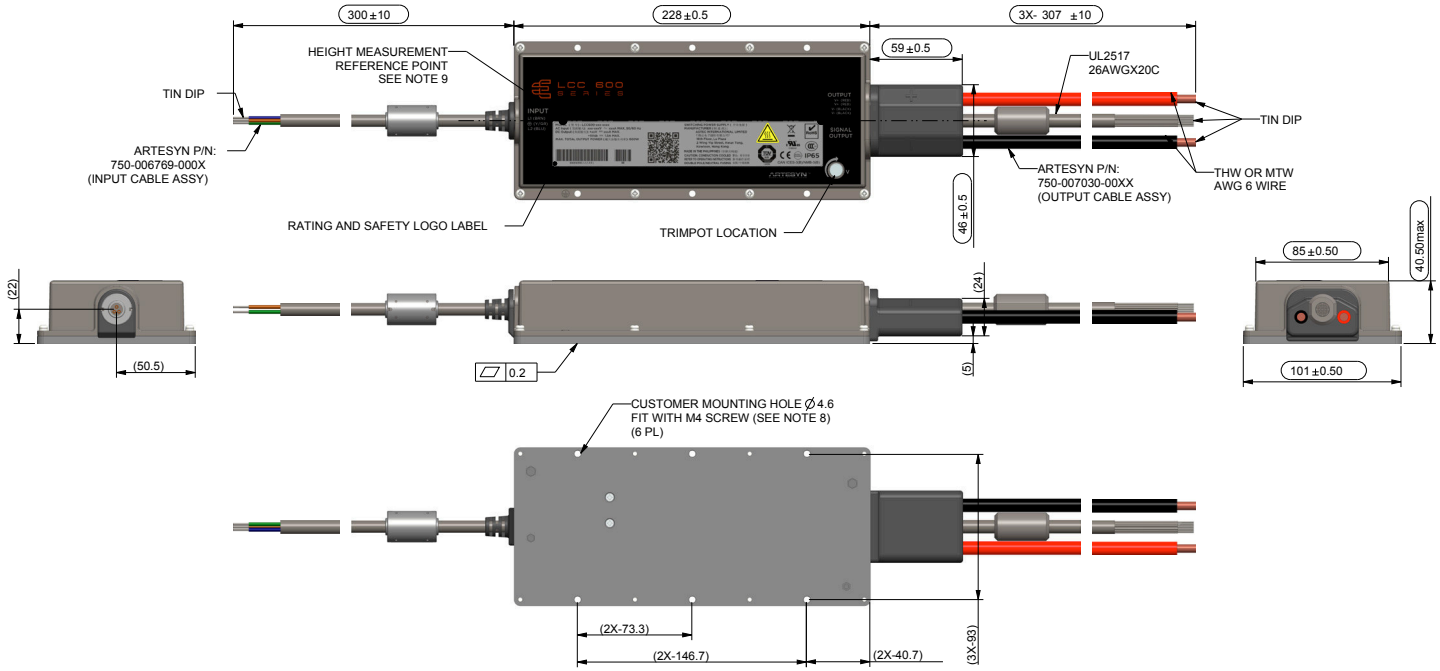
Notes:
1) Recommended mounting screw is M4 in 6 locations; 8-10 kgf-cm torque.
2) Baseplate material/finish: 5 mm Aluminum with Black Anodized.
3) Weight: 9P Suffix: 1.63 kg typical
   4P Suffix: 1.81 kg typical
4) Thermal hotspot reference is in the middle of the baseplate.

Mechanical Drawings

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



-4P Suffix (12 Vdc)



Pin Assignment (INPUT)

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

Pin Assignment (MAIN OUTPUT)

	-9Px Suffix		-4Px Suffix (28, 36, 48 Vdc)		-4Px Suffix (12 Vdc)	
DESCRIPTION	DESIGNATION	NOTES	DESIGNATION	NOTES	DESIGNATION	NOTES
Main Output	+Vout	4 Position Terminal Block: M4 Screw/10mm Pitch; 12kgf-cm Torque; Accepts 14-16AWG Ring Tongue - Spade Terminals MOLEX BB-124-08 (19141-0058) or EQUIVALENT	Red	14AWGX4C; PVC jacket; 105 °C / 300 V	Red	6AWG Multi-Strand; PVC jacket; 105 °C / 600 V
			Red			
Main Output Return GND	-Vout		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 Connector: JST PN PHDR-20VS Contact Pins: JST PN SPHD-001T-P0.5	BLACK	26AWGX20C+AL; PVC jacket; 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^2C)	7		BLUE	
SPARE_1	Spare/Unused Pin	8		VIOLET	
SCL	Serial clock Signal (I^2C)	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^2C 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	

Power Derating Curves

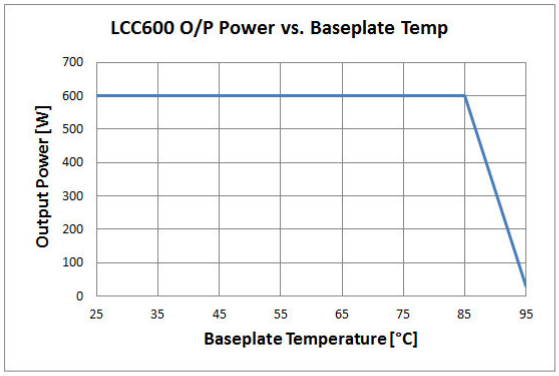


Figure 1. Output Power vs. Baseplate Temperature

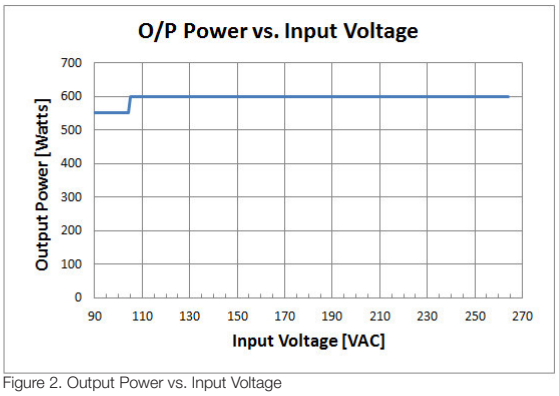


Figure 2. Output Power vs. Input Voltage

Efficiency Curves

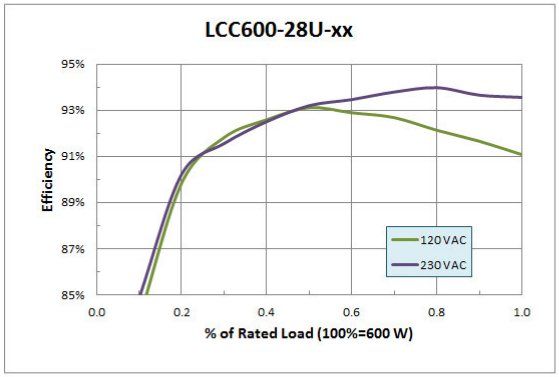


Figure 3. Typical Efficiency for 28 V output

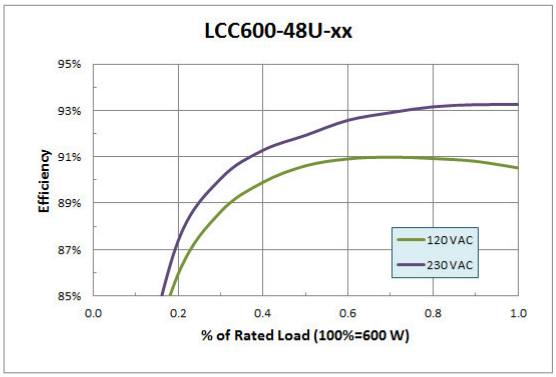


Figure 4. Typical Efficiency for 48 V output

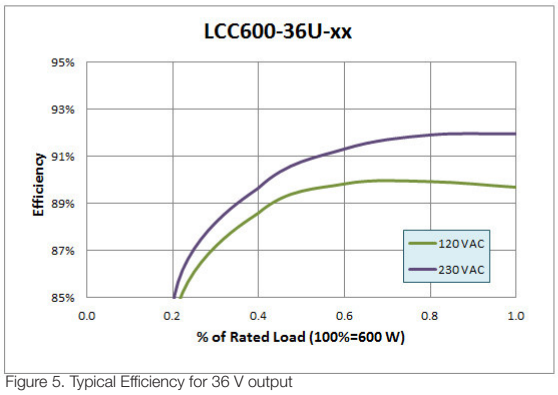


Figure 5. Typical Efficiency for 36 V output

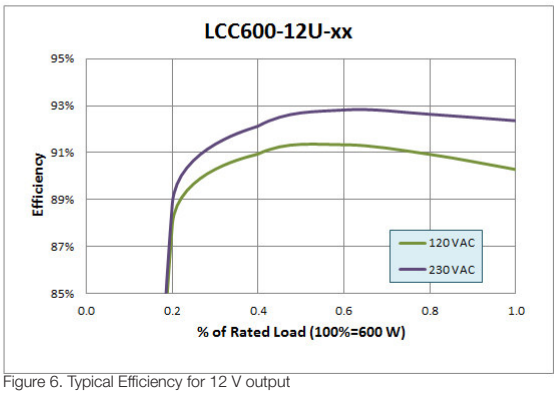


Figure 6. Typical Efficiency for 12 V output

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