ARTESYN LCM1000

1000 Watt Bulk Front End



Advanced Energy's Artesyn LCM1000 provides a low cost solution to Industrial and Medical single output high power requirements. Full featured, the 2.4" x 5.2" x 10.0" enclosed form factor utilizes smart fans for self contained thermal management at very low acoustic noise levels. Digital Signal Processor control allows for a high level of modification flexibility. Voltage output for the series ranges from 10.8V - 52.8V at a continuous output power of 1000W. The LCM1000 also provides an optional 5V standby, conformal coating, and constant current operation.

SPECIAL FEATURES

- 1000 W output power
- Low cost
- 2.4" x 5.2" x 10.0"
- 7.7 Watts per cubic inch
- Industrial/Medical safety
- -40 °C to 70 °C with derating
- Optional 5 V @ 2 A housekeeping
- High efficiency: 90% typical
- Variable speed "Smart Fans"
- DSP controlled
- Full rating with reverse airflow
- Conformal coat option
- ± 10% adjustment range
- Margin programming
- OR-ing FET
- Semi F47 compliance at high line
- Low acoustic noise

COMPLIANCE

- EMI Class A; Class B with internal modification option
- EN61000 Immunity

SAFETY

- ULcUL Recognized ITE (UL/CSA62368-1)
- ULcUL Recognized Medical (ANSI/AAMI ES60601-1)
- TUV-SuD ITE + Medical (EN62368-1 and EN60601-1)
- CE LVD (EN62368-1 + ROHS)
- CB Report
  · through Demko for IEC60950-1
  · through TUV-SuD for IEC60601-1
- BSMI
- CCC Approval
- CE and UKCA Mark

** LCM1000 tested according to the medical standard IEC 60601-1-2 4th Edition.

AT A GLANCE

Total Power

1000 W

of Outputs

Single

Outputs

12 to 48 VDC
Optional 5 VDC standby

PMBus® Power Management. Defined.

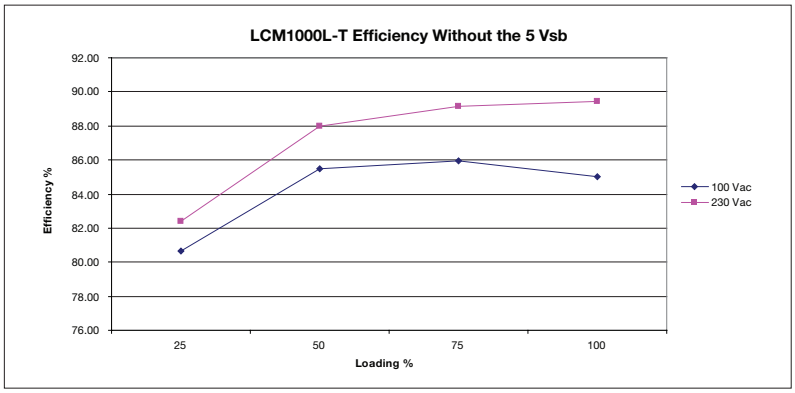
RoHS

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ELECTRICAL SPECIFICATIONS

Input	
Input Cange	90 to 264 VAC (Operating) 115/230 VAC (Nominal) TERMINAL BLOCK
Frequency	47 to 440 Hz, Nominal 50/60
Input Fusing	Internal 30 A fuses, both lines fused
Inrush Current	≤ 25 A peak, either hot or cold start
Power Factor	0.99 typical, meets EN61000-3-2
Harmonics	Meets IEC 1000-3-2 requirements
Input Current	12 A RMS max input current, at 100 VAC
Hold up time	20 mS minimum for Main O/P, at full rated load
Efficiency	> 90% typical at full load / 230 VACnominal
Leakage Current	<400 µA @ 264 VAC
Power line transient	MOV directly after the fuse
Isolation	PRI-Chassis 2087 VAC Basic PRI-SEC 4000 VAC Reinforced 2xMOPP SEC-Chassis 500 VDC



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ELECTRICAL SPECIFICATIONS (CONTINUED)

Output		
Output rating	See table 1	90 to 264 VAC
Set point	± 0.5%	90 to 264 VAC
Total regulation range	Main output ± 2% 5 Vsb	Combined line/load/transient when measured at output terminal
Rated load	1000 W maximum	Derate linear to 50% from 50°C to 70°C
Minimum load	Main output @ 0.0 A 5 Vsb @ 0.0 A	No loss of regulation
Output noise (PARD)	1% max p-p 50 mV max p-p	Main output 5 Vsb output Measured with a 0.1 µF Ceramic and 10 µF Tantalum Capacitor on any output, 20 MHz
Output voltage overshoot		No overshoot/undershoot outside the regulation band during on or off cycle
Transient response	< 300 µSec	50% load step @ 1 A/µs Step load valid between 10% to 100% of output rating Recovery time to within 1% of set point at onset of transient
Max units in parallel		Up to 10 w/o I-share connected, up to 4 with I-share connected.
Short circuit protection	Protected, no damage to occur	Bounce mode
Remote sense		Compensation up to 500 mV
Output isolation		Standard per safety requirements
Forced load sharing	To within 10% of all shared outputs	Analog sharing control
Overload protection (OCP)	105% to 125% 120% to 170%	Main output 5 Vsb output
Overvoltage protection (OVP)	125% to 145% 110% to 125%	12 V output 5 Vsb output
Overtemp protection	10 - 15 °C above safe operating area	Both PFC and output converter monitored

ENVIRONMENTAL SPECIFICATIONS

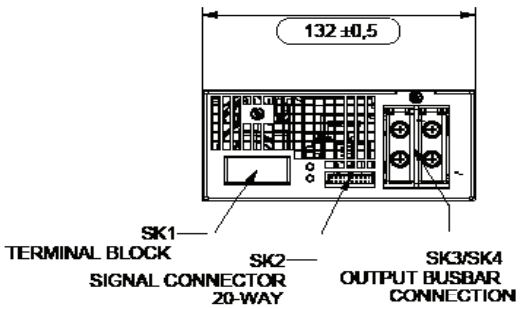
Operating temperature	-20°C to 70°C (with linear 50% derating from 50 to 70 °C)
Storage temperature	-40°C to +85°C
Humidity	20 to 90%, non-condensing. Operating. Conformal coat option available.
Fan noise	<45 dBA, 100% load at 30°C
Altitude	Operating - 16,404 feet (5000 m) Storage - 30,000 feet
Shock	MIL-STD-810F 516.5, Procedure I, VI. Storage
Vibration	MIL-STD-810F 514.5, Cat. 4, 10. Storage

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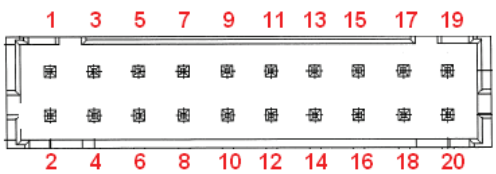
PIN ASSIGNMENT

Signals	Name Description	Pin Number(s)
+Vout	Power rail	SK3
GND	Power GND	SK4
Signals	**Name Description**	**SK2 Pin Number**
A2	EEPROM Address	1
-VPROG	Return connection of external supply for Margin Programming	2
A1	EEPROM Address	3
-Vsense	Remote Sense Return	4
ISHARE	Load share voltage	5
A0	EEPROM Address	6
SDA1	Serial Data Signal (I2C)	7
+VPROG	Positive connection of external supply for Margin Programming	8
SCL1	Serial Clock Signal (I2C)	9
+Vsense	Remote Sense Positive	10
5VSB	5V standby	11
GND	5V standby Return	12
5VSB	5V standby	13
G_DCOK_C	Global DCOK Collector	14
N/A	Unused Pin	15
G_DCOK_E	Global DCOK Emitter (GND)	16
GND	Return Ground for output signal and I2C communication	17
G_ACOK_C	Global ACOK Collector	18
INH_EN	Turn Off Main Output	19
G_ACOK_E	Global ACOK Emitter (GND)	20

Note: Mating connector for SK2 is:
LANDWIN: PN 2050S2000 Housing and PN 2053T021V Contact
CIVILUX: PN CI0120SD000 Housing and PN CI01TD21PE0 Contact



PSU Front View (24V & 48V UNITS)



Signal Output Signal Connectors (SK2)

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PIN ASSIGNMENT (CONTINUED)

LED Indicators

2 provided are clearly visible up to a 45 degree offset from vertical with office environment ambient lighting. The status is reflected in the indicator color.

The DC_OK LED shall light green if the DC output is within specification, and shall be off if the output falls out of specification.

The AC_OK LED is green if the AC is within specification and off when out of specification.

Control Signals

AC_OK Open collector 0.5 V maximum at 10 mA. Both emitter and collector access provided.

DC_OK Open collector 0.5 V maximum at 10 mA. Both emitter and collector access provided.

PS_INHIBIT/ENABLE Signal 0.0 - 0.5 V contact closure, output OFF

ORDERING INFORMATION TABLE 1

Model Number*	Output	Nominal Output Voltage Set Point	Set Point Tolerance	Adjustment Range	Current		Output Ripple P/P (0-50 ˚C)	Max Continuous Power	Combined Line/Load Regulation
					Min	Max			
LCM1000L	12 V	12 V	±0.5%	10.8 - 13.2 V	0 A	83.3 A	120 mV	1000 W	2%
LCM1000N	15 V	15 V	±0.5%	13.5 - 16.5 V	0 A	66.7 A	150 mV	1000 W	2%
LCM1000Q	24 V	24 V	±0.5%	21.6 - 26.4 V	0 A	42.0 A	240 mV	1000 W	2%
LCM1000R	28 V	28 V	±0.5%	25.2 - 30.8 V	0 A	40.0 A	280 mV	1000 W	2%
LCM1000U	36 V	36 V	±0.5%	32.4 - 39.6 V	0 A	27.8 A	360 mV	1000 W	2%
LCM1000W	48 V	48 V	±0.5%	40.8 - 52.8 V	0 A	20.8 A	480 mV	1000 W	2%

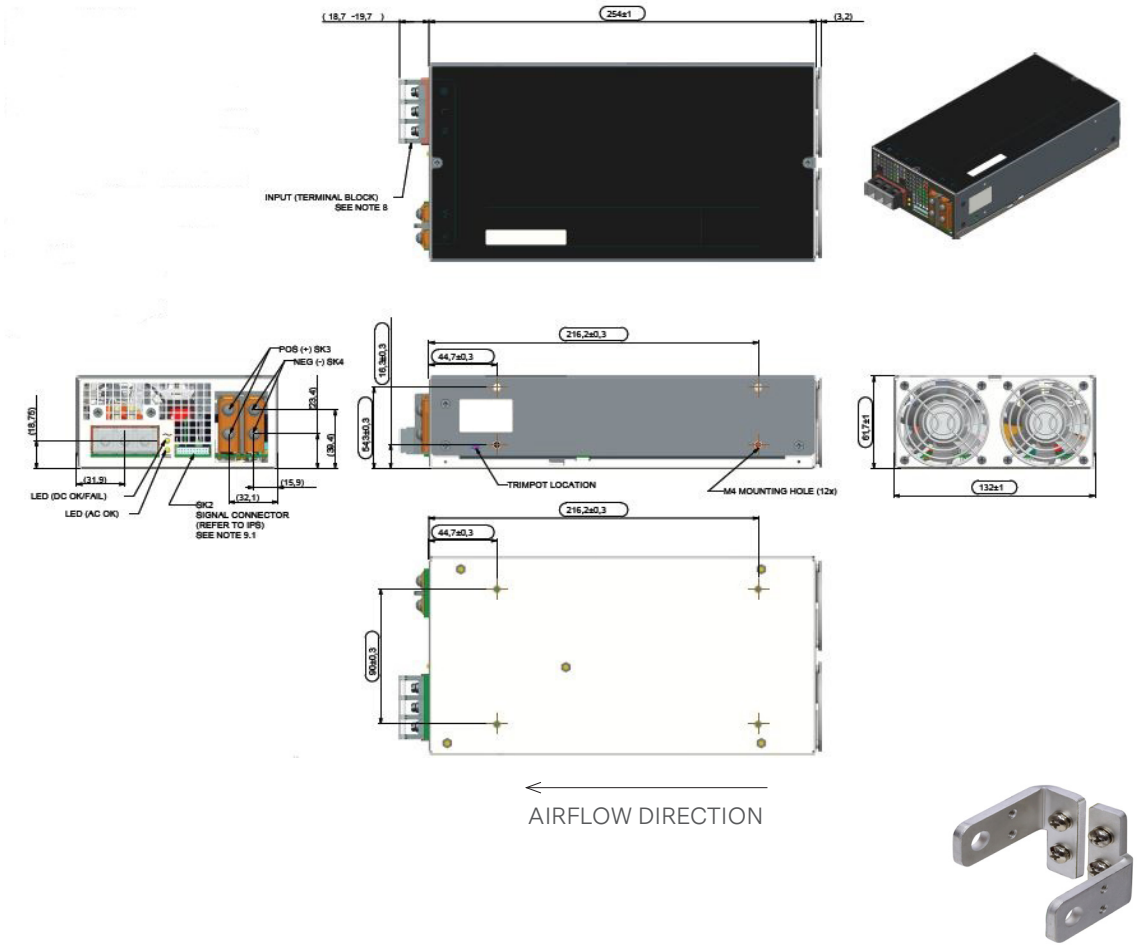
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ORDERING INFORMATION TABLE 2

LCMXXXXY		-	A	-	B	-	C	-	###
Case Size			Input Termination		Acoustic Noise		Option Codes		Hardware Code
1-Phase input where XXXX =									
1000 = 2.4” x 5.2” x 10.0”, 1000W					Blank = Standard		Blank = No Options		Factory Assigned for Modified standards
			T = Terminal Block				1 = Conformal Coat		
Voltage Code Y =							2 - Reverse Air		
Code							3 - Opt 1 + 2		
L	12						4 = Standby		
N	15						5 = Opt 1 + 4		
Q	24						6 = Opt 2 + 4		
R	28						7 = Opt 1 + 2 + 4		
U	36						8 = Constant Current		
W	48						9 = Option 1 + 8		
							B = Option 2 + 8		
							C = Opt 1 + 2 + 8		
							D = Option 4 + 8		
							E = Option 1 + 4 + 8		
							F = Option 2 + 4 + 8		
							G = Option 1 + 2 + 4 + 8		

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MECHANICAL DRAWINGS (LCM1000Q-T, LCM1000U-T AND LCM1000W-T)



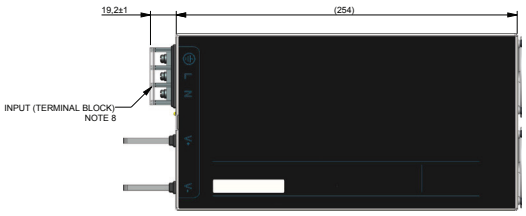
MOUNTING LOCATIONS SCREW PENETRATION DEPTH IS 4.6 mm MAX.

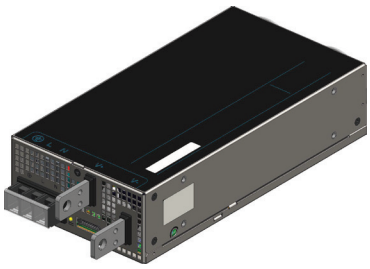
RECOMMENDED SCREW TORQUE:
M3.5 x 0.6P = 6 - 8kgf-cm
M4.0 x 0.7P = 8 - 10kgf-cm

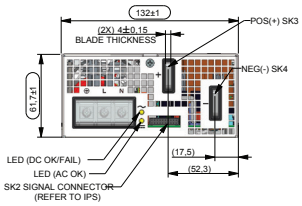
BUS BAR ADAPTER (OPTION)
P/N 500-006848-0000

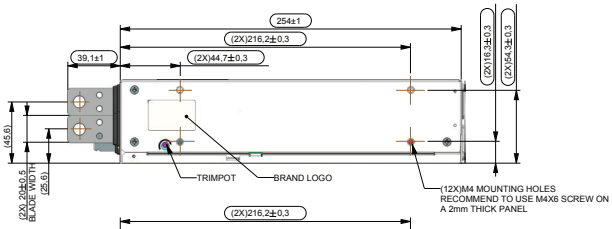
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MECHANICAL DRAWINGS (LCM1000L-T, LCM1000N-T)

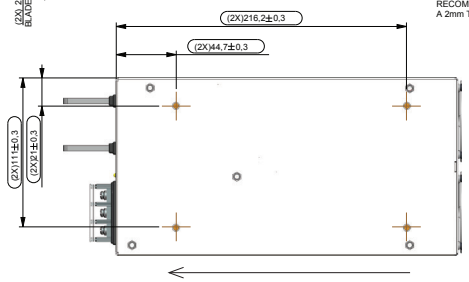












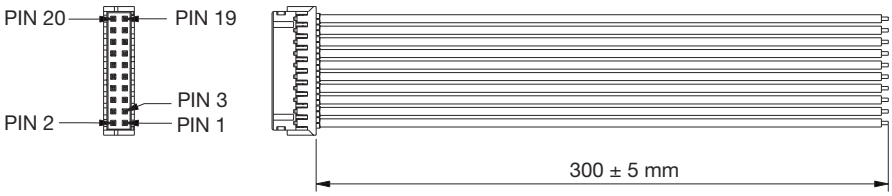
AIRFLOW DIRECTION

Notes:

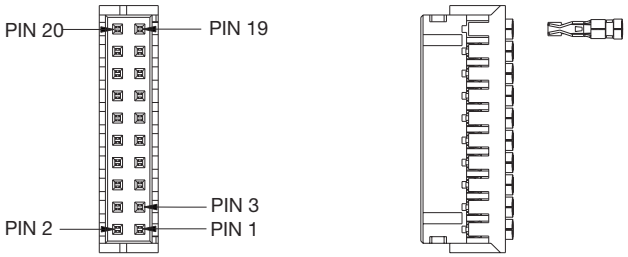
1. Parts must be completely assembled.
2. For label printing details, refer to ips.
3. Quality controlled dimensions. These dimensions to be included in the mechanical cpk of 1.33
4. Casing parts used must have matching color. In order to ensure color matching of parts, it is required that the raw material that will be processed by the fabricator will come from the same supplier and the sheetmetal fabricator for all matching parts must be the same. To avoid color variations on the same lot delivered, all parts with matching color requirement should be delivered as a set by the fabricator.
5. Sheared edges visible to the customer should have no rust formation. If rust formation is present then a concealing layer of silver ink or some other substitute should be applied on the rusted area.
6. Mounting locations screw penetration depth is 4.6Mm max.
7. Recommended screw torque:
   M3.5X0.6P = 6-8kgf-cm
   M4.0X0.7P = 8-10kfg-cm
8. Input: terminal block type. M4 screw torque value of 16kgf-cm using wire gauge 18-10 (13mm centers)
9. Suitable mating connectors:
   9.1 For sk2:
   A) 764-002569-0000 mat-kit hsg-20way (landwin)
   451-004792-0000 Hsg-dr 20ckt (lwe pn: 2050s2000)
   451-000709-0000 Crimp term (lwe pn: 2053t021v)
   B) 764-003275-0000 mat-kit hsg-20way (civilux)
   451-004793-0000 Hsg-20way (cx pn: ci0120sd000)
   451-000703-0000 Term-#22~28 (cx pn: ci01td21pe0)

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ACCESSORIES



Order kit part number 73-788-001 for control connector interface with .3m wires attached



Order kit part number 73-788-002 for control connector interface with unloaded housing and 20 pins

MISCELLANEOUS SPECIFICATIONS

BURN-IN

100% Burn-in at 45 °C, at 80 - 90 % load. Duration of burn-in determined by Quality Assurance Procedures.

MTBF

The power supply has a minimum MTBF of 300K hours using the Bell core 332, issue 6 specification @ 25 °C and 40 °C, ambient, at full load. With the power supply installed in a system in a 25 °C ambient environment and operating at full load, capacitor life shall be 10 years, minimum for ALL electrolytic capacitors contained within this power supply. The power supply shall demonstrate a MTBF level of > 500,000 hours.

QUALITY ASSURANCE

Full QAV testing shall be conducted in accordance with Artesyn Embedded Power Standards with reports available upon request.

WARRANTY

Artesyn Embedded Power shall warrant the power supply to be free of defects in materials and workmanship for a minimum period of three years from the date of shipment, when operated within specifications. The warranty shall be fully transferable to the end owner of the equipment powered by the supply.

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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

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