

POWER

LCM1500

1500 Watt Bulk Front End

Data Sheet

Total Power: 1500 W
of Outputs: Single
Outputs: 12 to 48 V
Optional 5.0 V standby

SPECIAL FEATURES

- 1500 W output power
- Low cost
- 2.5" x 5.2" x 10.0"
- 12 Watts per cubic inch
- Industrial/Medical safety
- -40 °C to 70 °C with derating
- Optional 5 V @ 2 A housekeeping
- High efficiency: 89% typical
- Variable speed "Smart Fans"
- DSP controlled
- Conformal coat option
- ± 10% adjustment range
- Margin programming
- OR-ing FET
- 80 PLUS® certified (Q model)

COMPLIANCE

- EMI Class A
- EN61000 Immunity
- RoHS 2

SAFETY

- ULcUL Recognized ITE (UL60950-1)
- ULcUL Recognized Medical (ANSI/AAMI ES60601-1)
- TUV-SuD ITE + Medical (EN60950-1 and EN60601-1)
- CE LVD (EN60950-1 + ROHS)
- BSMI
- CB Report
 - through Demko for IEC60950-1
 - through TUV-SuD for IEC60601-1



Electrical Specifications

| Input | |
|----------------------|---|
| Input range | 90 - 264 Vac (Operating) 115/230 Vac (Nominal) TERMINAL BLOCK |
| Frequency | 47 - 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 | 18 A RMS max input current, at 100 Vac |
| Hold up time | 14 ms minimum for Main O/P, at full rated load |
| Efficiency | > 91% typical at full load / 230 Vac nominal (48V version) |
| Leakage current | < 0.4 mA at 264 Vac |
| ON/OFF power switch | N/A |
| Power line transient | MOV directly after the fuse |
| Isolation | PRI-Chassis 2500 Vdc Basic PRI-SEC 4000 VAC Reinforced 2xMOPP SEC-Chassis 500 Vdc |



Electrical Specifications

| Output | | |
|------------------------------|--------------------------------------|---|
| Output rating | See table 1 | 90 - 264 Vac |
| Set point | ± 0.5% | 90 - 264 Vac |
| Total regulation range | Main output ± 2% 5 Vsb ± 1% | Combined line/load/transient when measured at output terminal |
| Rated load | 1500 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 4 |
| 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 | -40 °C to +70 °C, linear derating to 50% from 50 °C to 70 °C |
| Storage temperature | -40 °C to +85 °C |
| Humidity | 10 to 90%, non-condensing. Operating. Conformal coat option available. |
| Fan noise | < 45 dBA, 80% load at 30 |
| Altitude | Operating - 16,405 feet (5,000 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 |

Pin Assignment

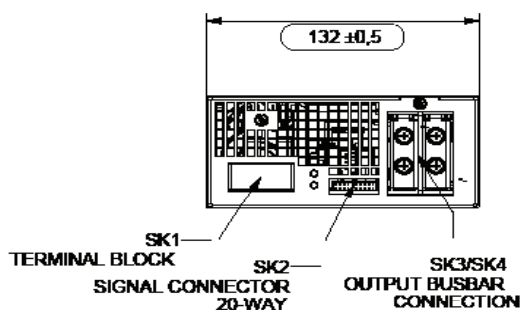
| Signals | Name Description | Pin Number(s) |
|----------|---|----------------|
| +Vout | Power rail | SK4 |
| GND | Power GND | SK5 |
| Signals | Name Description | SK2 Pin Number |
| A2 | EEPROM Address | 1 |
| -VPROG | Return connection of external supply for Margin Programming | 2 |
| A1 | EEPROM 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 | 5 V standby | 11 |
| GND | 5 V standby Return | 12 |
| 5VSB | 5 V standby | 13 |
| G_DCOK_C | Global DCOK Collector | 14 |
| GPIOA6 | EEPROM Write Protect | 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:

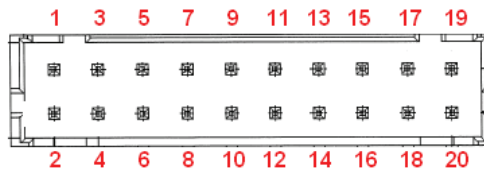
LANDWIN: PN 2050S2000 Housing and PN 2053T021V Contact

CIVILUX: PN C10120SD000 Housing and PN C101TD21PE0 Contact

JST: PN PHDR-20VS housing and PN: SPHD-001T-P0.5



PSU Front View (24V & 48V UNITS)



Signal Output Signal Connectors (SK2)

JST: PN PHDR-20VS housing and PN: SPHD-001T-P0.5

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 | | | |
| LCM1500L | 12 V | 12 V | ±0.5% | 10.8 - 13.2 V | 0 A | 133 A | 120 mV | 1500 W | 2% |
| LCM1500N | 15 V | 15 V | ±0.5% | 13.5 - 16.5 V | 0 A | 100 A | 150 mV | 1500 W | 2% |
| LCM1500Q ¹ | 24 V | 24 V | ±0.5% | 21.6 - 26.4 V | 0 A | 67 A | 240 mV | 1500 W | 2% |
| LCM1500R | 28 V | 28 V | ±0.5% | 25.2 - 30.8 V | 0 A | 53 A | 280 mV | 1500 W | 2% |
| LCM1500U | 36 V | 36 V | ±0.5% | 32.4 - 39.6 V | 0 A | 43 A | 360 mV | 1500 W | 2% |
| LCM1500W | 48 V | 48 V | ±0.5% | 43.2 - 52.8 V | 0 A | 33 A | 480 mV | 1500 W | 2% |

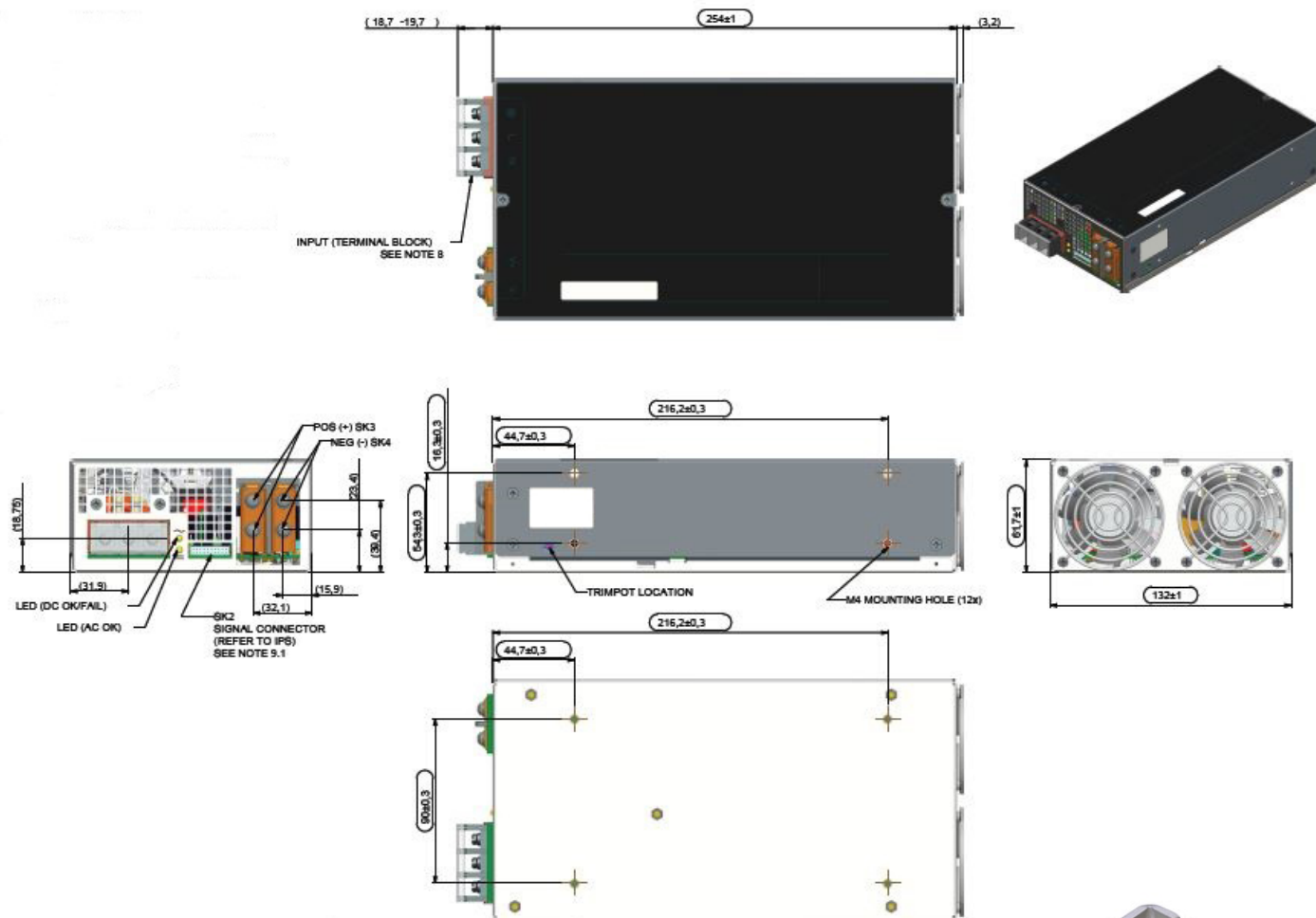
¹ 80 PLUS® certified

Ordering Information Table 2

| LCMXXXXY | - | A | - | B | - | C | - | ### |
|------------------------------------|----|--------------------|---|------------------|---|-----------------------|---|---|
| Case Size | | Input Termination | | Acoustic Noise | | Option Codes* | | Hardware Code |
| 1-Phase input where XXXX = | | | | | | | | |
| 1500 = 2.4" x 5.0" x 10.0", 1500 W | | | | 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 = 5V 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 = Opt 1 + 8 | | |
| | | | | | | B = Opt 2 + 8 | | |
| | | | | | | C = Opt 1 + 2 + 8 | | |
| | | | | | | D = Opt 4 + 8 | | |
| | | | | | | E = Opt 1 + 4 + 8 | | |
| | | | | | | F = Opt 2 + 4 + 8 | | |
| | | | | | | G = Opt 1 + 2 + 4 + 8 | | |

* Some option code combinations may not be configured yet and will require extra leadtime the first time they are requested.

Mechanical Drawings (LCM1500Q-T, LCM1500R-T, LCM1500U-T and LCM1500W-T)



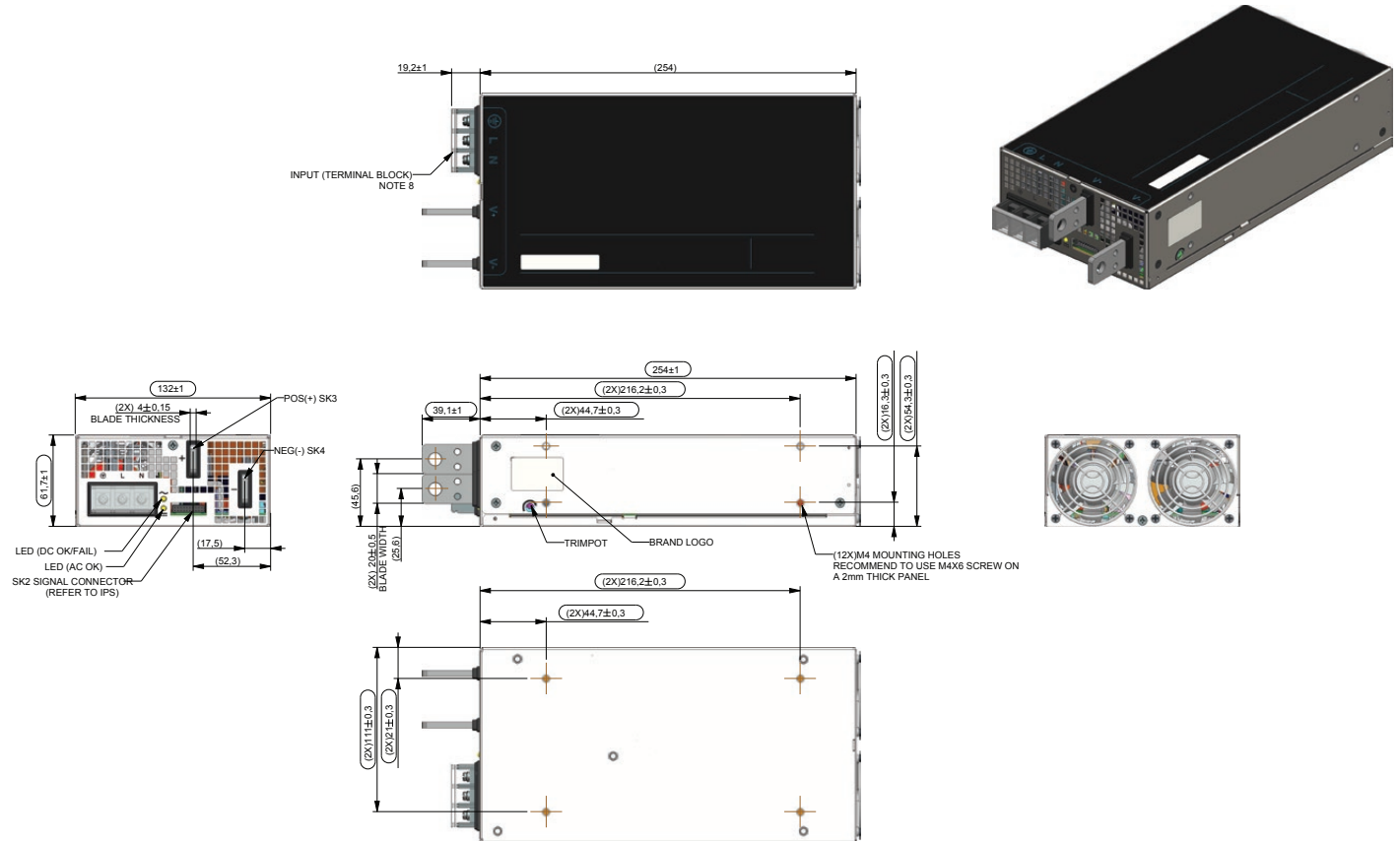
MOUNTING LOCATIONS SCREW PENETRATION DEPTH IS 4.6 mm MAX.

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



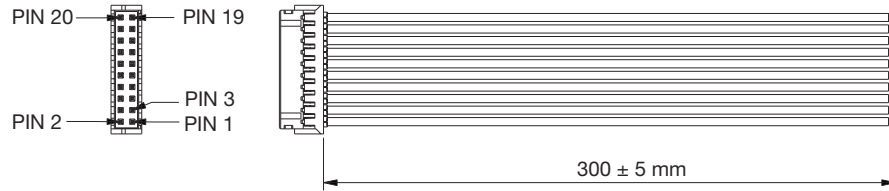
Bus bar adapter (option)

Mechanical Drawings (LCM1500L-T and LCM1500N-T)

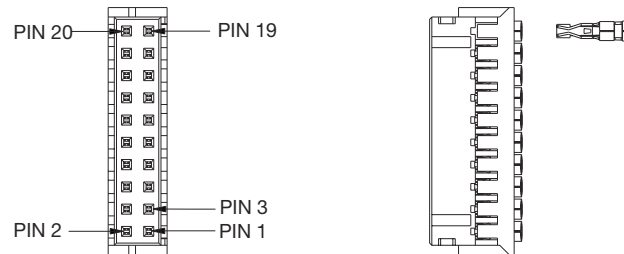


- Notes:
1. Parts must be completely assembled.
 2. For label printing details, refer to ips.
 3. Quality controlled dimensions. These dimensions to be included in the mechanical cpk of 1.33
 4. Casing parts used must have matching color. In order to ensure color matching of parts, it is required that 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 = 8-10kgf-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)

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 Technologies Standards with reports available upon request.

WARRANTY

Artesyn Embedded Technologies 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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