POWER

LCM600

600 Watt Bulk Front End

Data Sheet

Total Power: 600 W
# of Outputs: Single
Outputs: 12 to 60 V
Optional 5.0 V standby

RoHS 6/6 COMPLIANT

SPECIAL FEATURES

- 600 W output power
- Low Cost
- 2.4" x 4.5" x 7.5"
- 7.41 W/cu-in
- 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 front end
- Conformal coat option
- ± 20% adjustment range
- Margin programming
- OR-ing FET
- Terminal block input option

COMPLIANCE

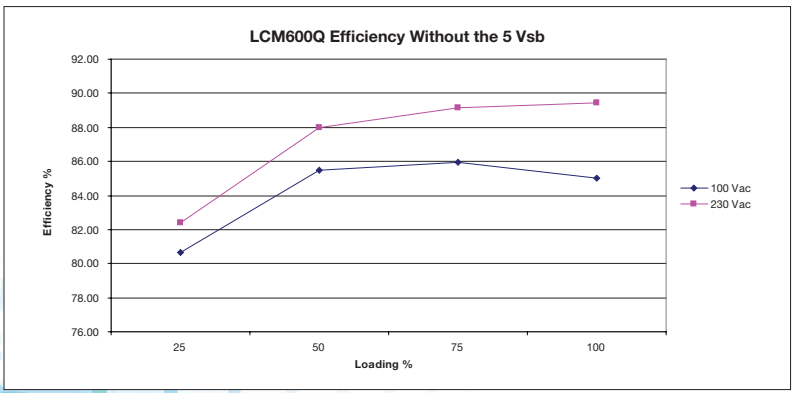
- EMI Class B
- EN61000 Immunity

SAFETY

- UL 60950-1
  1598/1433
  60601-1
- CSA 60950-1
- VDE 60950-1
  60601
- China CCC
- CB Scheme Report/Cert

Electrical Specifications

Input	
Input range:	85 - 264 Vac (Operating) 115/230 Vac (Nominal) Input through standard IEC connector/ TERMINAL BLOCK
Frequency:	47 - 440 Hz, Nominal 50/60
Input fusing:	Internal 10 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:	8 A RMS max input current, at 100 Vac
Hold up time:	20 ms minimum for Main O/P, at full rated load
Efficiency:	> 89% at full load
Leakage current:	< 0.3 mA at 264 Vac
ON/OFF power switch:	N/A
Power line transient:	MOV directly after the fuse
Isolation:	Isolation: PRI-Chassis 2500 Vdc Basic PRI-SEC 4000 VAC Reinforced 2xMOPP SEC-Chassis 500 Vdc



ARTESYN™
EMBEDDED TECHNOLOGIES

Electrical Specifications

Output		
Output rating:	See ordering information table	85 - 264 Vac
Set point:	± 0.5%	85 - 264 Vac
Total regulation range:	Main output ± 2% 5 Vsb ± 1%	Combined line/load/transient when measured at output terminal
Rated load:	600 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
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
Fan Fault Protection:		For-N option only. Will shutdown output and DC_OK

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:	20 to 90%, non-condensing. Operating. Conformal coat option available
Fan noise:	< 45 dBA, 80% load at 30 °C "-N" Low Noise Option < 35 dBA, 80% Load at 30 °C
Altitude:	Operating - 16,404.2 feet Storage - 30,000 feet
Shock:	MIL-STD-810F 516.5, Procedure I, VI. Storage
Vibration:	MIL-STD-810F 514.5, Cat. 4, 10. Storage

Ordering Information

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			
LCM600L	12 V	12 V	±0.5%	9.6 - 14.4 V	0 A	52 A	120 mV	600 W	2%
LCM600N	15 V	15 V	±0.5%	12.0 - 19.5 V	0 A	44 A	150 mV	600 W	2%
LCM600Q	24 V	24 V	±0.5%	19.2 - 28.8 V	0 A	27 A	240 mV	600 W	2%
LCM600U	36 V	36 V	±0.5%	28.8 - 43.2 V	0 A	16.7 A	240 mV	600 W	2%
LCM600W	48 V	48 V	±0.5%	38.4 - 57.6 V	0 A	14 A	280 mV	600 W	2%

*Note: Add "-T" for terminal block instead of IEC input

Add "-N" for low noise model on 12 V or 24 V models

Add "-4" for 5 V Standby output

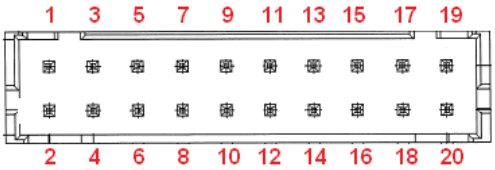
Add "-A" will be automatically added to all orders to denote new Aesthetics style chassis unless otherwise specified

Example: a 24 V with terminal block, low noise and standby with new Aesthetics would be LCM600Q-T-N-4-A

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	5V standby	11
GND	5V standby Return	12
5VSB	5V 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 CI0120P1HD0-LF



Signal Output Signal Connectors (SK2)
SK2 Mating Connector: JST Part Number PHDR-20VS;
Contact Pins: JST Part Number 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 LED is bicolor. It shall light green if the DC output is within specification, and amber if the output falls out of specification.

The AC_OK LED LED is green if the AC is within specification and off when out of specification. Note: With 5 V standby, Amber also indicates that PSU is in standby mode/output off.

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.
DC_OK will de-assert when output is loss due to OCP, OVP, OTP, or Fan Fault (for -N option).
PS_INHIBIT/ENABLE Signal 0.0 - 0.5 V contact closure, output OFF

Ordering Information

LCMXXXXY		-	A	-	B	-	C	-	###
Case Size			Input Termination		Acoustic Noise		Option Codes		Hardware Code
1-Phase input where XXXX =									
600 = 2.4" x 4.5" x 7.5", 600W			Blank = IEC connector		Blank = Standard		Blank = No Options		Factory Assigned for Modiefied standards
			T = Terminal Block		N = Low Noise Fan		1 = Conformal Coat		
Voltage Code Y =							4 = 5 V Standby		
Code							5 = Opt 1 + 4		
L	12								
N	15								
Q	24								
U	36								
W	48								

Mechanical Drawings

New Mechanical Reference Drawing:

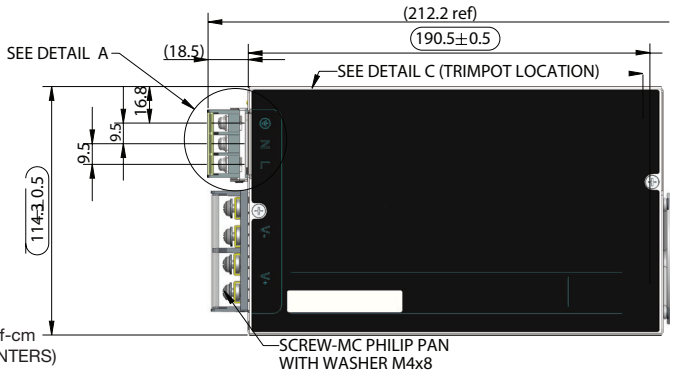
Weight: 2.84 lbs (1.29 Kg)

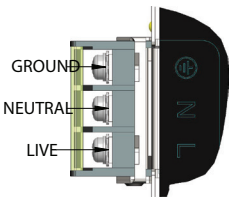
MOUNTING LOCATIONS SCREW
PENETRATION DEPTH IS 4.6 mm MAX.

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

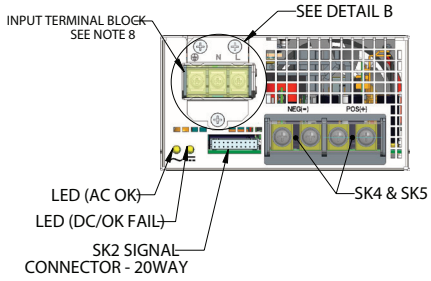
Note 7 RECOMMENDED SCREW TORQUE:
M3.5x0.6P = 6-8kgf-cm
M4.0x0.7P = 8-10kfg-cm

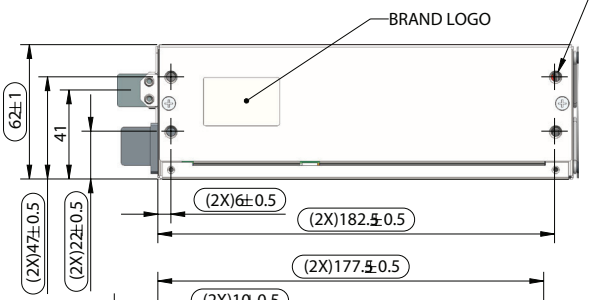
Note 8 INPUT: TERMINAL BLOCK TYPE.
M3.5 SCREW TORQUE VALUE OF 12kgf-cm
USING WIRE GAUGE 22-19 (9.5mm CENTERS)

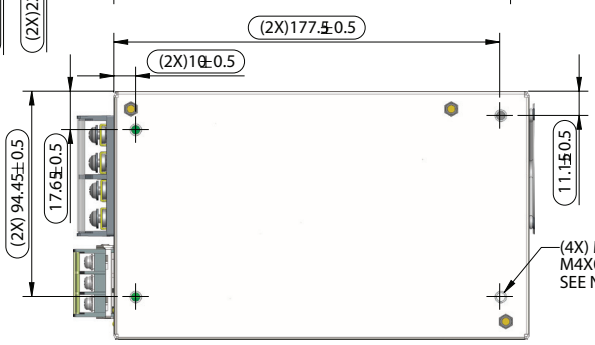


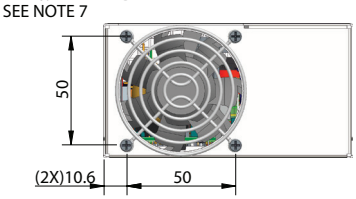


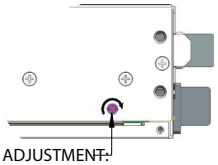
DETAIL A
SCALE 1.500





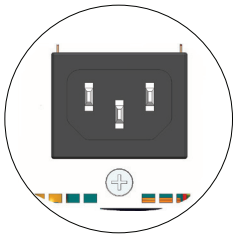






VOLTAGE ADJUSTMENT:
CLOCKWISE - INCREASE VOLTAGE
COUNTER CLOCKWISE - DECREASE VOLTAGE

DETAIL C
(TRIMPOT LOCATION)



DETAIL B
AC INLET VERSION

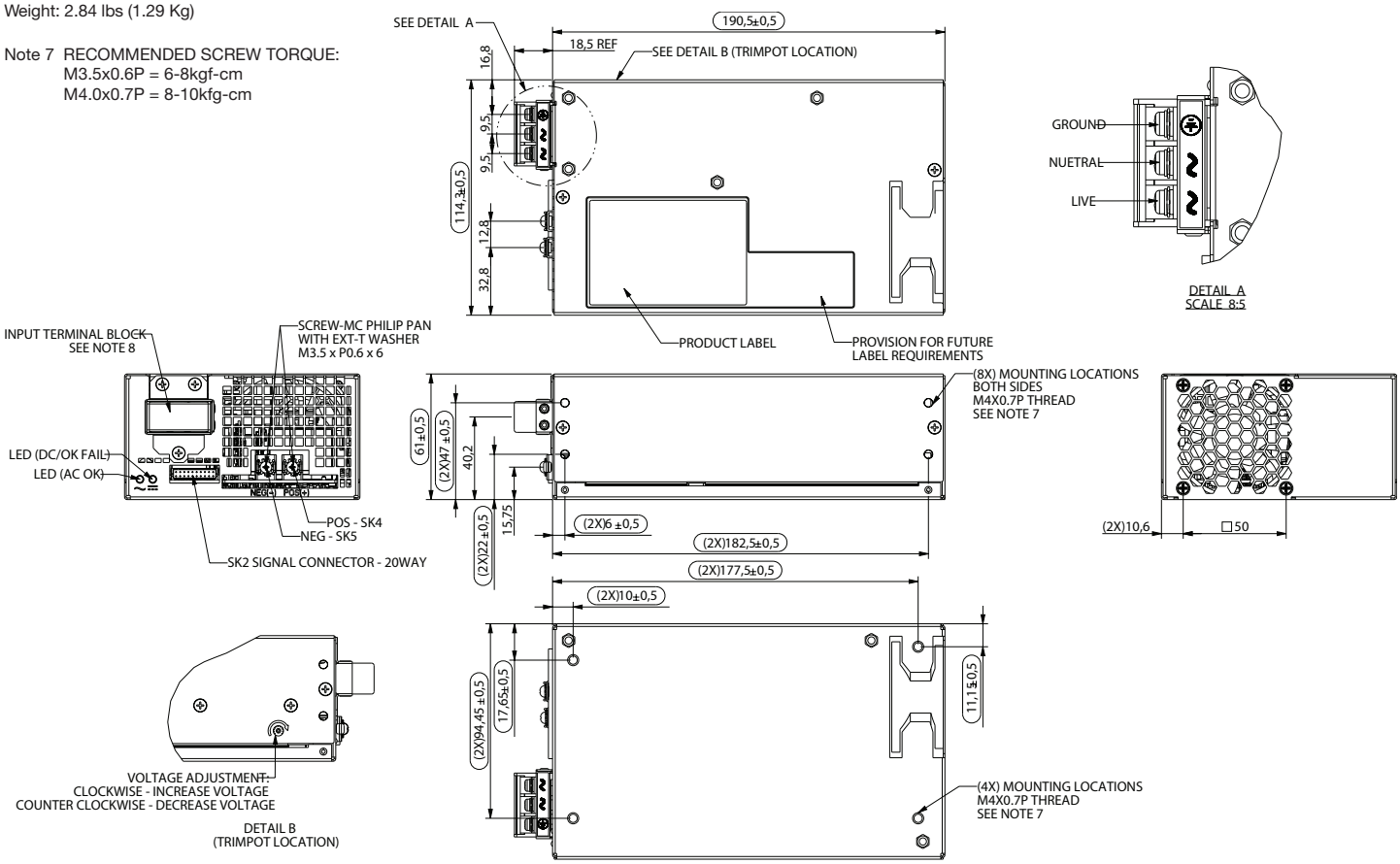
NOTE: OPTIONAL BARRIER STRIP OUTPUT TERMINAL AVAILABLE
OPTIONAL MOLEX TYPE CONNECTOR OUTPUT AVAILABLE

Mechanical Drawings – Terminal Block Input

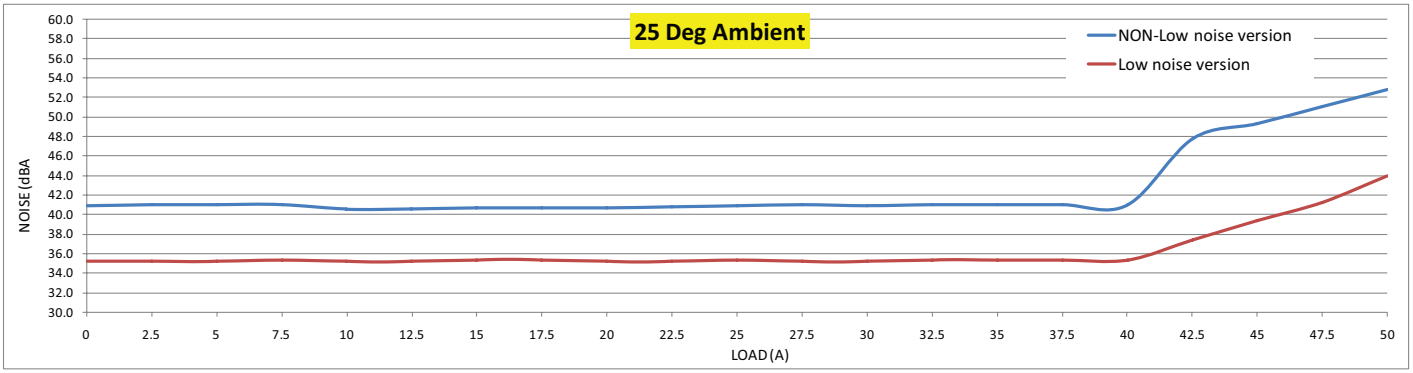
Old Mechanical Reference Drawing:

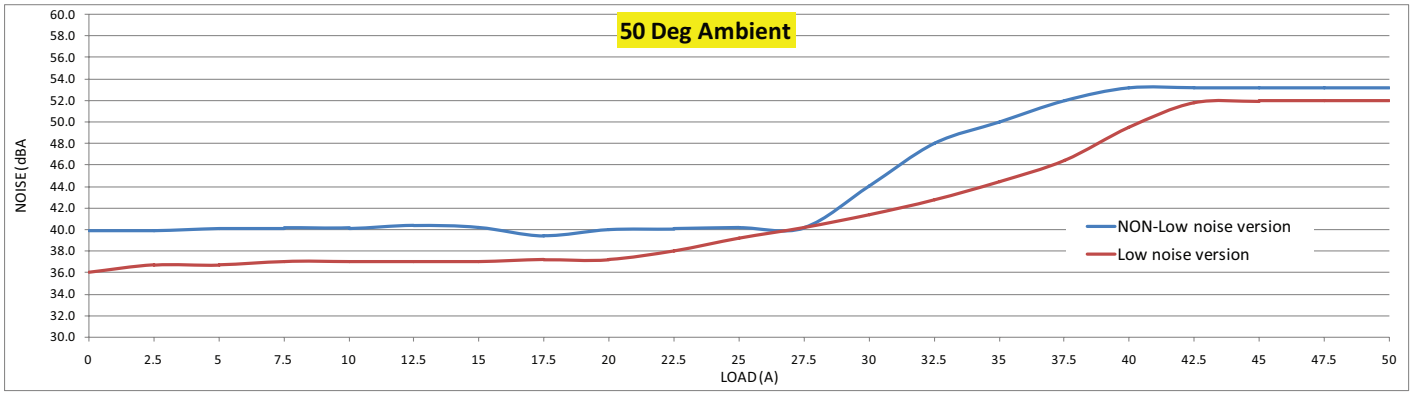
Weight: 2.84 lbs (1.29 Kg)

Note 7 RECOMMENDED SCREW TORQUE:
M3.5x0.6P = 6-8kgf-cm
M4.0x0.7P = 8-10kfg-cm



Low Noise VS Non-Low Noise LCM600 Model





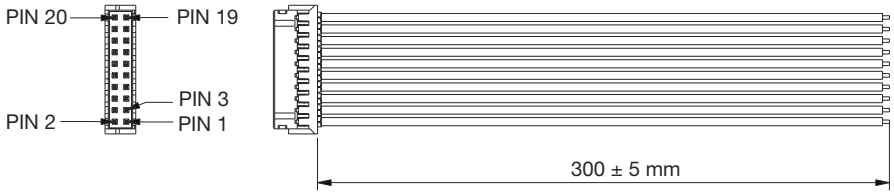
NON-Low noise version

	25°C ambient			50°C ambient		
LOAD (A)	fan (V)	RPM	noise (dbA)	fan (V)	RPM	noise (dbA)
0	6.254	3558.0	40.9	6.228	3460.9	39.9
2.5	6.257	3559.8	41.0	6.228	3460.9	39.9
5	6.262	3562.0	41.0	6.230	3494.3	40.1
7.5	6.263	3562.0	41.0	6.242	3526.6	40.1
10	6.242	3528.9	40.5	6.242	3526.6	40.1
12.5	6.251	3530.9	40.6	6.237	3515.6	40.4
15	6.251	3538.3	40.7	6.229	3504.9	40.2
17.5	6.226	3538.2	40.7	6.205	3482.8	39.4
20	6.223	3541.0	40.7	6.217	3490.1	40.0
22.5	6.242	3545.1	40.8	6.227	3493.8	40.1
25	6.253	3553.9	40.9	6.234	3504.3	40.2
27.5	6.254	3564.1	41.0	6.212	3501.7	40.2
30	6.253	3552.2	40.9	6.642	3787.4	44.1
32.5	6.264	3559.7	41.0	7.893	4652.3	48.0
35	6.262	3559.6	41.0	9.153	5463.4	50.0
37.5	6.262	3560.8	41.0	11.035	6600.2	52.0
40	6.262	3559.8	41.0	11.605	6993.9	53.2
42.5	7.637	4521.2	47.8	11.608	6997.2	53.2
45	8.919	5362.2	49.3	11.608	6997.2	53.2
47.5	10.068	6139.5	51.0	11.608	6997.2	53.2
50	11.362	6893.4	52.8	11.608	6997.2	53.2

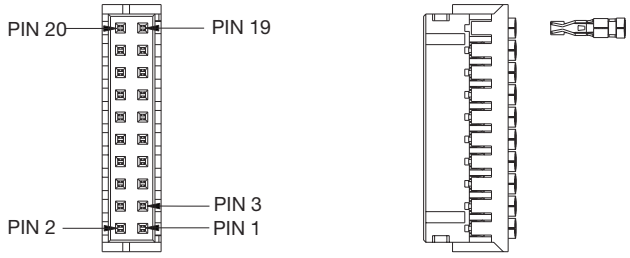
Low noise version

	25°C ambient			50°C ambient		
PWM	LOAD (A)	RPM	noise (dbA)	LOAD (A)	RPM	noise (dbA)
0%	0	3028	35.2	0	3180	36.0
5%	2.5	3028	35.2	2.5	3300	36.7
10%	5	3028	35.2	5	3300	36.7
15%	7.5	3060	35.4	7.5	3360	37.0
20%	10	3028	35.2	10	3360	37.0
25%	12.5	3028	35.2	12.5	3360	37.0
30%	15	3060	35.4	15	3360	37.0
35%	17.5	3060	35.4	17.5	3388	37.2
40%	20	3028	35.2	20	3388	37.2
45%	22.5	3028	35.2	22.5	3540	38.0
50%	25	3060	35.4	25	3840	39.2
55%	27.5	3028	35.2	27.5	4104	40.2
60%	30	3028	35.2	30	4408	41.4
65%	32.5	3060	35.4	32.5	4736	42.7
70%	35	3060	35.4	35	5184	44.5
75%	37.5	3060	35.4	37.5	5728	46.4
80%	40	3060	35.4	40	6688	49.5
85%	42.5	3420	37.4	42.5	7560	51.8
90%	45	3868	39.3	45	7584	51.9
95%	47.5	4376	41.3	47.5	7584	51.9
100%	50	5040	43.9	50	7584	51.9

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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