

# SL POWER GB20 SERIES

20 Watts Single Output  
Medical & Industrial Grade



Medical



Industrial

Advanced Energy's SL Power GB20 series of open-frame AC-DC power supplies comprises seven single output models. All models feature medical safety approvals and accept a universal input of 90 to 264 VAC. These compact switch-mode power supplies feature output overvoltage, overload protection, with short-circuit protection on the output. GB20 series power supplies provide 20 Watts of output power with free air convection cooling.

## AT A GLANCE

### Total Power

20 Watts

### Input Voltage

90 to 264 VAC

### # of Outputs

Single



## SPECIAL FEATURES

- 1.6" x 3.38" x 1.0"
- 20 W Open Frame and PCB-mount Power Supply
- Universal Input 90 to 264 VAC
- <0.1 W No Load Input Power
- Meets Class B Radiated & Conducted EMI, with margin
- Meets Heavy Industrial and IEC60601-1-2 4<sup>th</sup> Edition Levels of EMC
- >7 Year E-cap Life
- >1,000,000 Hours MTBF
- 3 Year Warranty

## SAFETY

- CSA/IEC/EN/UL62368-1
- CSA/IEC/EN/UL60601-1, 3<sup>rd</sup> Ed.

Note: Consult Factory for compliance information.

## ELECTRICAL SPECIFICATIONS

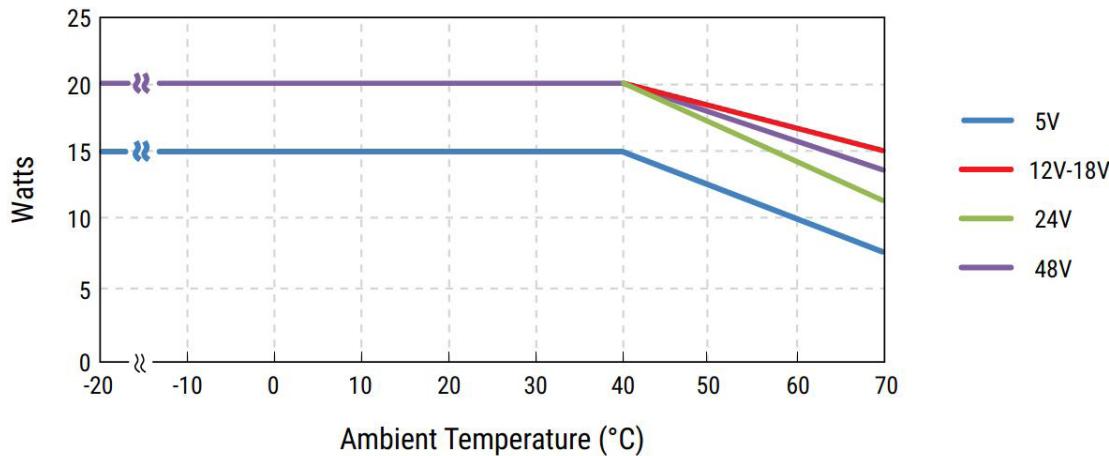
Input	
Input Range	90 to 264 VAC, 47 to 63 Hz, 1Ø
Input Current	0.5 A @ 115 VAC, 0.2 A @ 230 VAC
Inrush Current	40 A max., cold start @ 264 VAC input
Input Fuses	3.15 A, 250 VAC fuses provided in both line & neutral
Leakage Current	
Input to Earth	<500 µA @ 264 VAC, 60 Hz, NC; <1 mA @ 264 VAC, 60 Hz, SFC
Output to Earth	<100 µA @ 264 VAC, 60 Hz, NC; <500 µA @ 264 VAC, 60 Hz, SFC
Efficiency	88% typical
Isolation Voltage	Input/Ground: 1500 VAC (1 MOPP) Input/Output: 4000 VAC (2 MOPP) Output/Ground: 1500 VAC (1 MOPP)
Power Factor	0.9, min., 230 VAC, 80 to 100% load vector, 25°C ambient
Output	
Maximum Power	15 to 20 W continuous. See "Ordering Information" for specific voltage model ratings
Hold-up Time	20 ms @ 100 VAC, full load
Output Voltage	See "Ordering Information"
Total Load Regulation	See "Ordering Information"
Turn On Time	<700 ms
Transient Response	500 µs typ. for return to within 0.5% of nominal output voltage, 50% load step from 5% to 100% of rated load, $\Delta i/\Delta t < 0.2 \text{ A}/\mu\text{s}$ . Max voltage deviation = 3.5%
Reliability	
MTBF	>1,000,000 hours, full load, 110 VAC & 220 VAC input, 25°C ambient, per telcordia 332 issue 6, stress method
E-Cap Life	>7 years life based on calculations at 115 VAC/60Hz & 230 VAC/50Hz, ambient 25°C at 24 hrs/day, 365 days/year, 6 power up cycles/day
Protection	
Input Fuse	3.15 A / 250 V internal fuse in both line & neutral
Overtemperature Protection	Will shutdown upon an overtemperature condition, auto-recovery
Short Circuit Protection	Hiccup mode
Overload Protection	130% to 160% of rated output current value. Hiccup mode.
Overvoltage Protection	120% to 150% of nominal output voltage. Hiccup Mode.

Note: All specifications are typical at 230 VAC input, full load, at 25°C ambient unless noted.

## ENVIRONMENTAL SPECIFICATIONS

Vibration	Operating: 0.003 g/Hz, 1.5 grms overall, 3 axes, 10 min/axis, 1Hz to 500Hz Non-operating: random waveform, 3 mins/axis, 3 axes and sine waveform, vib. frequency/acceleration: 10Hz to 500Hz/1g, sweep rate of 1 octave/minutes, vibration time of 10 sweeps/axes, 3 axes
Shock	Operating: Half-sine, 20 gpk, 10 ms, 3 axes, 6 shocks total Non-operating: Half-sine waveform, impact acceleration of 50g, pulse duration of 6ms, number of shocks: 3 for each of the 3 axis
Operating Temperature	-25°C to +70°C, see derating curve for operation above 40°C
Storage Temperature	-40°C to +85°C
Cooling	Convection
Relative Humidity	5% to 90%, non-condensing

## DERATING CURVE



## EMI/EMC COMPLIANCE

Conducted Emissions	EN55032, EN55011/CISPR11 Class B, FCC Part 15.107, Class B: 6db margin type, at 115VAC and 230VAC
Radiated Emissions	EN55032, EN55011/CISPR11 Class B, FCC Part 15.109, Class B: 3db margin type, at 115VAC and 230VAC
Electro-Static Discharge (ESD) Immunity on Power Ports	EN55024/IEC61000-4-2, Level 4: ±8kV contact, ±15kV air, Criteria A IEC60601-1-2 4th Edition, Table 4
Radiated RF EM Fields Susceptibility <sup>3</sup>	EN55022/EN61000-4-3, 10V/m, 80MHz to 2.7GHz, 80% AM at 1 kHz IEC60601-1-2 4th Edition, Table 4
Electrical Fast Transients (EFT)/Bursts	EN55024/IEC61000-4-4, Level 4, ±4.4kV, 100Khz rep rate, 40A, Criteria A IEC60601-1-2 4th Edition, Table 5
Surges, Line to Line (DM) and Line to Ground (CM)	EN55024/IEC61000-4-5, Level 4, ±2kV DM, ±4kV CM, Criteria A Surpasses IEC60601-1-2 4th Edition requirements
Conducted RF Immunity	EN55022/IEC61000-4-6, 3.6V/m – Level 4, (0.15MHz to 80MHz; and 12V/m) in ISM and amateur radio bands between 0.15MHz and 80MHz, 80% AM at 1KHz IEC60601-1-2 4th Edition, Table 5
Power Frequency Magnetic Field Immunity	EN55024/IEC1000-4-8, Level 4: 30A/m, 50Hz/60Hz, IEC60601-1-2 4th Edition, Table 4
Voltage Dip Immunity	EN55024/IECEN61000-4-11: -100% dip for 10ms, at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°, 100% dip for 20ms, 0°, Criteria A (Criteria B for "P" option) -100% dip for 5000ms (250/300 cycles), Criteria B -60% dip for 100ms, Criteria B -30% dip for 500ms, Criteria A IEC60601-1-2 4 <sup>th</sup> Edition, Table 5
Line Harmonic Emissions	EN55011/EN61000-3-2, class A
Flicker Test	EN61000-3-3

## Notes:

1. The power supply is considered a component which will be installed into a final equipment.
2. All specifications are typical at nominal input, full load, at 25°C ambient unless noted. Consult factory for information regarding testing or for usage under special environments.

## ORDERING INFORMATION

Model Number <sup>2</sup>	Output Voltage	Maximum Load	Maximum Power	Ripple & Noise <sup>1</sup>	Line Regulation	Load Regulation	Input Class/Termination	Output Termination
GB20S05K01	5.0 V	3.0 A	15 W	75 mV pk-pk	± 1%	± 5%	Class I (Grounded) input, 3-pin AMP/Molex type connector for "K" and "C" versions	4-pin AMP/Molex type connector for "K" and "C" versions
GB20S07K01	7.5 V	2.0 A	15 W	75 mV pk-pk	± 1%	± 5%		
GB20S09K01	9.0 V	2.0 A	18 W	90 mV pk-pk	± 1%	± 5%		
GB20S12K01	12.0 V	1.5 A	18 W	120 mV pk-pk	± 1%	± 5%	Change "K" to "P" for PCB mount pins, class I input Change "K" to "V" for PCB mount pins, class II input	PCB mount pins for "P" and "V" versions
GB20S15K01	15.0 V	1.2 A	18 W	120 mV pk-pk	± 1%	± 5%		
GB20S24K01	24.0 V	0.8 A	20 W	240 mV pk-pk	± 1%	± 5%		
GB20S48K01	48.0 V	0.4 A	20 W	480 mV pk-pk	± 1%	± 5%		

## Notes:

1. Ripple & noise are measured at 20 MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1  $\mu$ F & 47  $\mu$ F parallel capacitor.

2. Other output voltages available, consult factory.

3. All specifications are typical at 230 VAC, full load, at 25°C ambient unless noted.

## PIN ASSIGNMENTS

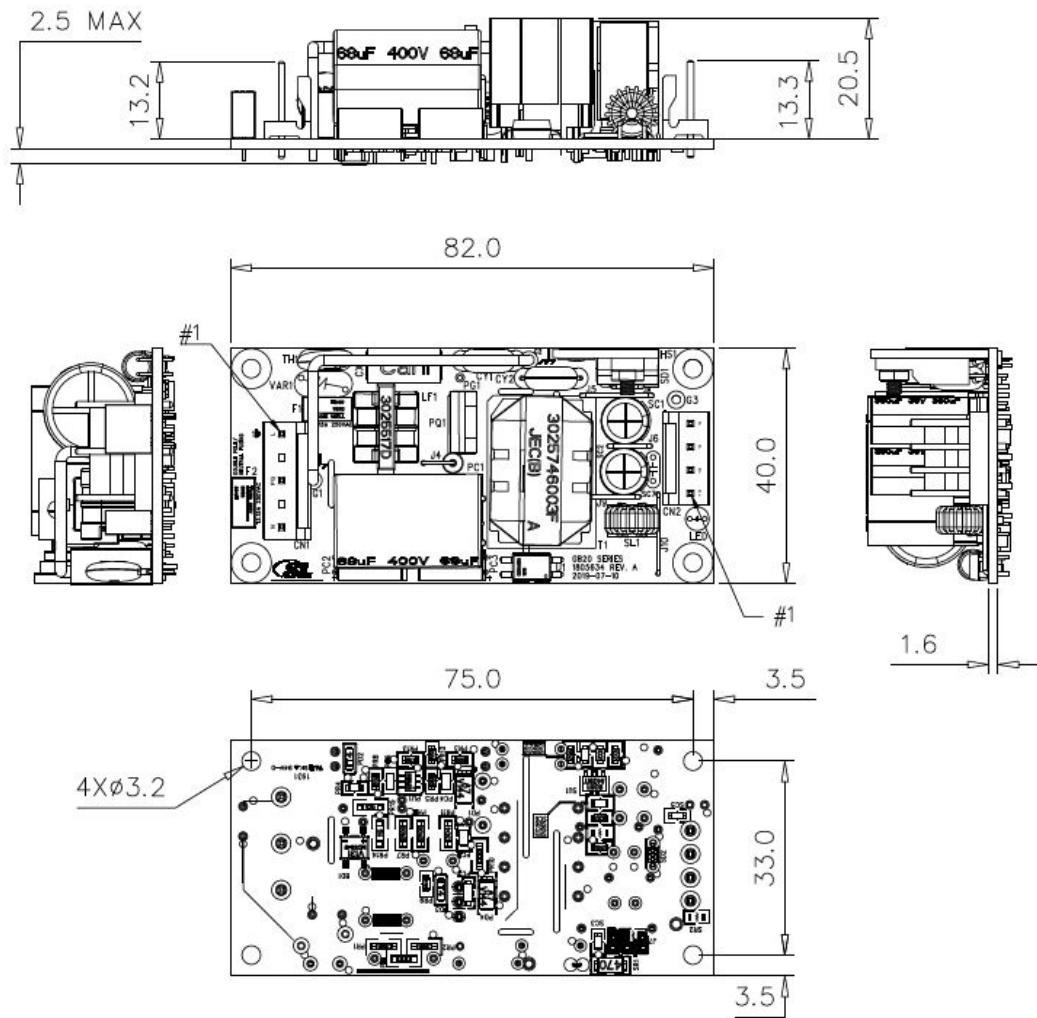
Connector	GB130Q	
Input Connector ("K"/"C" open frame)	PIN 1	AC Line
	PIN 2	Spare
	PIN 3	Ground (N/A on "C" version)
	PIN 4	Spare
	PIN 5	AC Neutral
Input Connector ("P"/"V" PCB mount)	PIN 1	AC Line
	PIN 2	AC Neutral
	PG	Ground (N/A on "V" version)
DC Output Connector ("K"/"C" open frame)	PIN 1	+Vout
	PIN 2	+Vout
	PIN 3	-Vout
	PIN 4	-Vout
DC Output Connector ("P"/"V" PCB mount)	PIN 1	+Vout
	PIN 2	+Vout
	PIN 3	-Vout
	PIN 4	-Vout

## CONNECTORS

Connector	Mating Connector
Input Connector ("K"/"C" open frame)	TE/AMP P/N 640445-5
Input Connector ("P"/"V" open frame)	Pencom PI3207 or equivalent
DC Output Connector ("K"/"C" open frame)	TE/AMP P/N 640445-4
DC Output Connector ("P"/"V" open frame)	Pencom PI3207 or equivalent

## MECHANICAL DRAWING

"K" and "C" versions

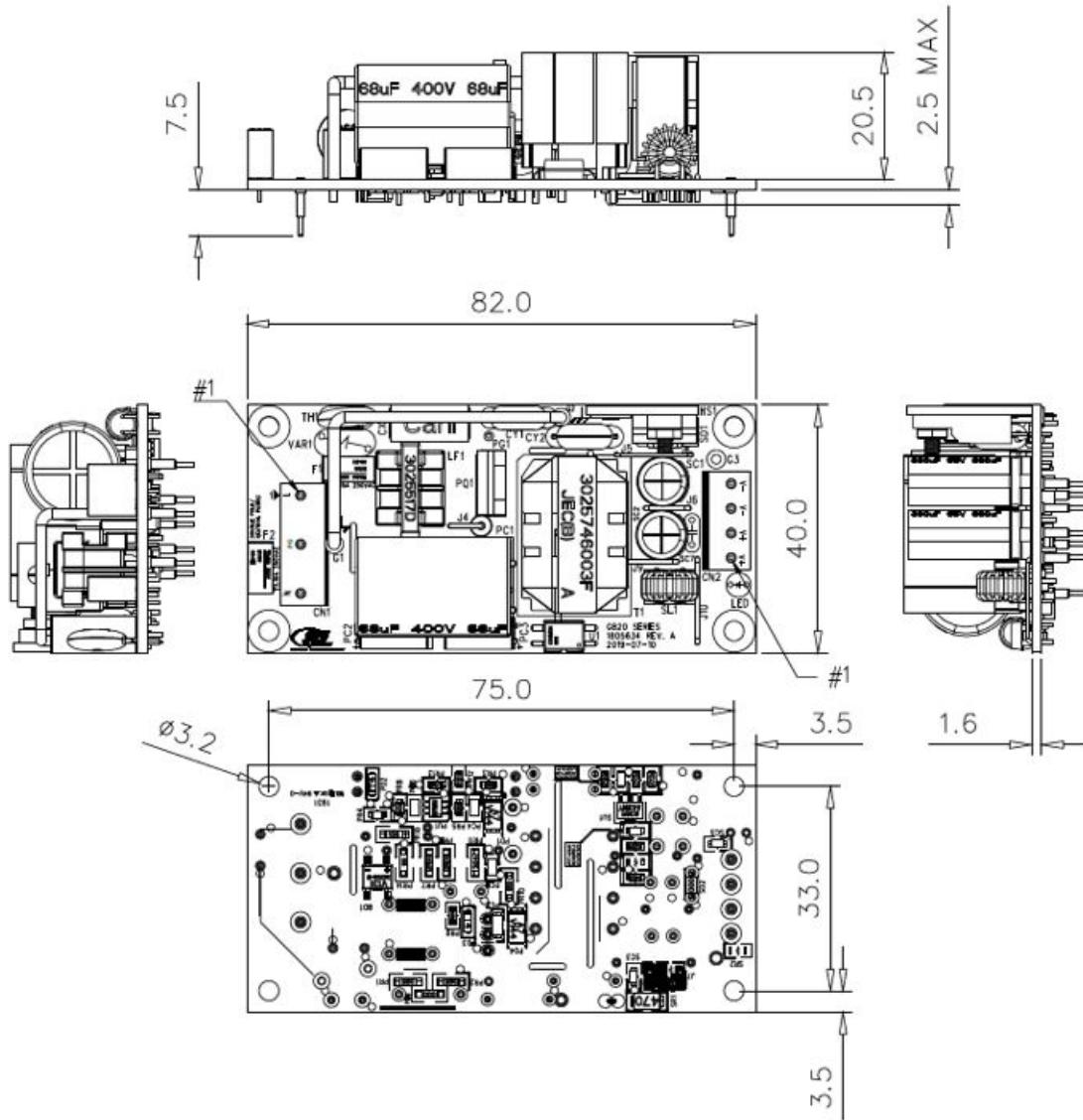


## Notes:

1. All dimensions in mm (inch)
2. Dimension: 1.60" x 3.38" x 1.0" (41mm x 86mm x 25mm)
3. Weight: 120 g

## MECHANICAL DRAWING

"P" and "V" versions



## Notes:

1. All dimensions in mm
2. Dimension: 1.60" x 3.38" x 1.0" (41mm x 86mm x 25mm)
3. Weight: 120 g



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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.

PRECISION | POWER | PERFORMANCE | TRUST

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