

# DG160 Series | ITE & Medical Safety

## 160W/360W Peak

- Built-in active PFC
- UL/CSA/EN 60950-1, 2<sup>nd</sup> edition (ITE)  
ANSI/ANMI/CSA/EN 60601-1, 3<sup>rd</sup> edition (Medical)
- Efficiency: 90% typical
- Operation from -20°C to 65°C - convection
- Approved for 2xMOPP applications
- U-Frame (EU) and enclosed (EC) versions available
- 10 year warranty



GREEN POWER

## Description

The **DG160 (ITE)** and **DG160M (Medical) Series** is a 160 Watt Open Frame power supply that is 3”x 5”x 1.42” providing 8.9 Watts per cubic inch. Each unit has a built in Active Power Factor Correction and the efficiency of the series is between 89% to 91% depending on model. The DG160 is compliant with Green power, Energy Star Level VI and ErP EC 1275/2008. The Series is rated at 160 Watts free air convection cooling and up to 240 Watts with 18CFM forced air. This series is available with an optional “U” frame or covered metal enclosure.

## Specifications

### Input

Input Voltage	• 90 VAC to 264 VAC, 115/230V nominal
Input Frequency	• 47 Hz to 63 Hz
Inrush Current	• < 30/60A at 115/230 VAC, cold start, 25°C
Power Factor	• >0.9
Input Protection	• Internal T3.15 A / 250 VAC fuse in line
No Load Input Power	• < 0.5W (< 1.5W for “A” version)
Input Current	• 4A max at 115 VAC, 2A max at 230VAC

### Output

Output Voltage	• See tables on page 2
Initial Set Accuracy	• See tables on page 2
Minimum Load	• No minimum load required
Start Up Rise Time	• 2 ms typical
Hold Up Time	• > 20 ms typical
Line Regulation	• ±0.5% typical
Load Regulation	• ±1.0% typical
Ripple & Noise	• < 1% pk-pk typical, 20MHz Bandwidth
Overvoltage Protection	• latch off
Overload Protection	• auto recovery
Short Circuit Protection	• auto recovery

### Environmental

Operating Temperature	• -20°C to 65°C derating: 3.33% / °C > 50°C
Cooling	• 160W; free air convection 240W; 18CFM forced air
Operating Humidity	• 5-95% RH, non-condensing
Storage Temperature	• -40°C to +85°C
Altitude	• 0 to 3000 m

### General

Efficiency	• 90% typical at rated load
Energy Saving	• Energy Star, Level VI
Isolation	• 4000 VAC Input to Output, 2 x MOPP 1500 VAC Input to Ground, 1 x MOPP 1500 VDC Output to Ground, 1 x MOPP
Isolation Resistance	• 50 MΩ
Switching Frequency	• 120 kHz typical
MTBF	• >TBD kWhrs to MIL-HDBK-217F at 50°C

### EMC & Safety

Safety Approvals:	• UL/CSA/EN 60950-1, 2nd edition (ITE) • ANSI/AMMI/CSA/EN 60601-1, 3rd edition • CE Mark and CB report
Harmonic Currents	• EN 61000-3-2 class D
EMI	• EN55022 (CISPR 22) Class B, EN 61000-3-3
ESD Immunity	• EN 61000-4-2, 6kV/contact, 8kV/air
Radiated Immunity	• EN 61000-4-3, 10V/m with 80% AM
EFT Burst	• EN 61000-4-4, 2kV
Surge	• EN 61000-4-5, 1kV/L-L, 2kV/L-G
Conducted Immunity	• EN 61000-4-6, 10V with 80% AM
Magnetic Fields	• E61000-4-8, 10A/m
Dips & Interruptions	• EN 61000-4-11, 30% dips 10ms, 60% dips 100ms, 95% dips 5000ms

### Warranty

Manufacturer's Warranty	• 10 years. Call Tri-Mag or go to www.Tri-Mag.com for details.
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## Output Specifications

Model No.	Application	Output Rail	Load (A)				Voltage Accuracy	Ripple Noise	Line Reg.	Load Reg.
			Min	Rated	Max	Peak				
DG160(M)-7 DG160(M)-7A	ITE/Medical	+12V	0	13.3	20.0	26.6	+11.9V~+12.1V	<100mVpp	± 0.5%	± 1%
DG160(M)-8 DG160(M)-8A	ITE/Medical	+15V	0	10.66	16.0	21.3	+14.9V~+15.1V	<150mVpp	± 0.5%	± 1%
DG160(M)-3 DG160(M)-3A	ITE/Medical	+18V	0	8.89	13.33	17.8	+17.9V~+18.1V	<150mVpp	± 0.5%	± 1%
DG160(M)-9 DG160(M)-9A	ITE/Medical	+24V	0	6.66	10.0	13.3	+23.9V~+24.1V	<120mVpp	± 0.5%	± 1%
DG160(M)-G DG160(M)-GA	ITE/Medical	+28V	0	5.7	8.55	11.4	+27.9V~+28.1V	<120mVpp	± 0.5%	± 1%
DG160(M)-J DG160(M)-JA	ITE/Medical	+36V	0	4.45	6.66	8.9	+35.8V~+36.2V	<200mVpp	± 0.5%	± 1%
DG160(M)-14 DG160(M)-14A	ITE/Medical	+48V	0	3.35	5.0	6.67	+47.8V~+48.2V	<250mVpp	± 0.5%	± 1%

### Notes

- Output Load:**  
Convection cooling: 160W; forced-air cooling: 240W max
- Peak Load Duration:**  
360W peak rating for durations up to 5 secs. (Duty cycle <10%, avg. power <160W)
- Engineering Specification:**  
Contact Tri-Mag for full engineering specification for the specific part number used in your design application.
- Standby Power Consumption with System:**  
This is required by ENERGY STAR in U.S. and ErP regulation in Europe for appliances such as computers and displays. The latest requirement is measured input power to be less than 0.5W with system.
- Audible Noise:**  
For the DG160(M)-x energy saving series, achieving Level VI (<0.3W) standby power consumption is accomplished through burst mode operation of the controller. The burst operation frequency is dependent on load conditions and is approx. 114Hz, within the audible frequency range.
- Step Efficiency and Average Efficiency:**  
Test conditions in step efficiency are referred to 3.2.2 IPS (Internal Power Supply) of the ENERGY STAR program requirements for computers. ENERGY STAR required for efficiency @ 20%, 50%, 100% load is 84.5%, 89% and 86.5%; average efficiency is the average of step efficiency.

#### 7. Model Ordering Table:

Safety/Application	w/o Audible Noise	Energy Saving
ITE	DG160-xA (EU) or (EC)	DG160-x (EU) or (EC)
Medical	DG160M-xA (EU) or (EC)	DG160M-x (EU) or (EC)

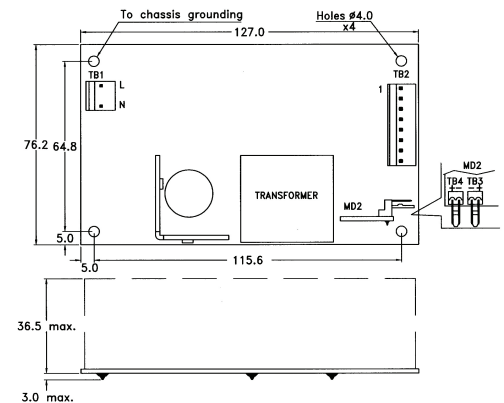
#### 8. Optional chassis enclosure ordering information:

U-Frame (EU): DG-160(M)-x(A)EU  
Enclosure (EC): DG-160(M)-x(A)EC

## Mechanical Specifications

### Notes

- Mechanical drawing dimensions in mm Tolerance: ± 0.4mm
- Size: 76.2 x 127.0 x 36.1 Max. (mm)  
3.0 x 5.0 x 1.42 Max. (inches)
- Packing: Net weight: 353 g approx. / unit
- Connections: AC Input: PCB Header: JST B2P3-VH or equivalent  
Mating Connector: JST VAR-2, VHR-3N or equivalent  
DC Output: PCB Header: JST B8P-VH or equivalent  
Mating Connector: JST VHR-8N or equivalent  
Terminal Block (optional)
- Fan/Remote sense: PCB Header: Molex 22-04-1021 (5045-02A) or equivalent  
Mating Connector: Molex 22-01-1022 (5051-02) or equivalent



2014-10