## 200-800W, 160 to 650V Programmable Power Supplies

https://product.tdk.com/en/power/zplus
www.emea.lambda.tdk.com/zplus





Industrial Test

Suitable for bench or 2U rack mounting, the Z+ is a very compact programmable power supply offering power levels from 200 to 800W, voltages from 160 to 650V and currents of up to 5A. Multiple remote programming methods are available including built-in USB, RS232 & RS485 and optional LAN, GPIB & isolated analogue interfaces. The units can operate in either constant current or constant voltage mode and accept a wide 85-265Vac input. The product is backed with a five year warranty.

| Features | Benefits |
|---|---|
| • 2U high | • Low Profile |
| • Built-in USB, RS-232 & RS-485 Interface | • No Additional Cost |
| • Optional LAN, GPIB & Isolated Analog Programming | • Programmable Remote Operation |
| • Bench or Rack Mount | • Flexible Mounting |
| • Constant Current or Voltage Modes | • Seamless Transition (Auto Crossover) |
| • Five Year Warranty | • Low Cost of Ownership |

## Model Selector

| Model (Note: Add appropriate suffix for the AC line cord) | Voltage Adjust Range (V) | Current Adjust Range (A) | Maximum Power (W) | Ripple Voltage (RMS) 5Hz-1MHz (mV) | Noise Voltage 20MHz BW (mV) | Ripple Current (RMS) 5Hz-1MHz (mA) | Efficiency (100-200Vac) (%) | Front Panel Output Jacks (Option) |
|---|---|---|---|---|---|---|---|---|
| Z160-1.3 | 0 - 160 | 0 - 1.3 | 208 | 10 | 100 | 1.2 | 79 / 81 | Yes |
| Z160-2.6 | 0 - 160 | 0 - 2.6 | 416 | 10 | 100 | 1.5 | 84 / 86 | Yes |
| Z160-4 | 0 - 160 | 0 - 4 | 640 | 10 | 100 | 2 | 86.5 / 88.5 | Yes |
| Z160-5 | 0 - 160 | 0 - 5 | 800 | 10 | 100 | 2 | 86.5 / 88.5 | Yes |
| Z320-0.65 | 0 - 320 | 0 - 0.65 | 208 | 25 | 150 | 0.8 | 79 / 81 | Yes |
| Z320-1.3 | 0 - 320 | 0 - 1.3 | 416 | 25 | 150 | 1 | 84 / 86 | Yes |
| Z320-2 | 0 - 320 | 0 - 2 | 640 | 30 | 150 | 1.5 | 87 / 88.5 | Yes |
| Z320-2.5 | 0 - 320 | 0 - 2.5 | 800 | 30 | 150 | 1.5 | 86.5 / 89 | Yes |
| Z375-2.2 | 0 - 375 | 0 - 2.2 | 825 | 30 | 150 | 1.5 | 87.5 / 89.5 | Yes |
| Z650-0.32 | 0 - 650 | 0 - 0.32 | 208 | 60 | 150 | 0.5 | 79 / 81 | Yes |
| Z650-0.64 | 0 - 650 | 0 - 0.64 | 416 | 60 | 150 | 0.6 | 84 / 86 | Yes |
| Z650-1 | 0 - 650 | 0 - 1 | 650 | 60 | 250 | 1 | 86.5 / 88.5 | Yes |
| Z650-1.25 | 0 - 650 | 0 - 1.25 | 812 | 60 | 250 | 1 | 87 / 89 | Yes |

## Part Number Example

**Z160 - 1.3 - LAN - L2 - U**

Series & output voltage

Output current

| | |
|---|---|
| blank | USB, RS-232/RS-485 (All models) |
| IEEE | GPIB Interface* |
| IS510 | Voltage Programming Isolated Analog Interface* |
| IS420 | Current Programming Isolated Analog Interface* |
| LAN | LAN Interface (Complies with "LXI" Class C) |

| | |
|---|---|
| blank | No front output jacks |
| -L2 | Output jacks* (insulated) |

| | AC Line cord | Plug Type |
|---|---|---|
| Blank | No AC cord supplied | - |
| U | North America cord | NEMA 5-15P |
| E | European cord | CEE 7/VII |
| J | Japan cord | JIS C8303 |
| I | Middle East cord | SI 32 |

* Requires wide body case (105mm wide)

Notes: -U option line cord preferred in the Americas.
-E option supplied with unit in Europe

## Related Products

| Type | Part Number | Description |
|---|---|---|
| Z+ Low Voltage Series Datasheet | Z+ Low Voltage | Z+ 10V to 100V Programmable Power Supplies |
| 19" Rack Housing | Z-NL100 | Accepts four 105mm width units or six 70mm width units |
| Dual/Triple Housing | Z-NL200 | Accepts two 105mm case units or three 70mm case units |
| Blanking Panel | Z-BP | 70mm Blanking Panel For 19" Rack |
| Blanking Panel | Z-WBP | 105mm Blanking Panel For 19" Rack |
| Cable | Z-RJ45 | Serial Link Cable (One is included with each power supply) |
| DB9 Cable | Z-485-9 | Communication Cable RS-485 |
| DB9 Cable | Z-232-9 | Communication Cable RS-232 |

## Specifications

| Model | | Z160 | Z320 | Z650 |
|---|---|---|---|---|
| **Input** | | | | |
| Input Voltage Range (Operating) | Vac | 85 - 265 | | |
| Nominal Input Voltage Range | Vac | 100 - 240 (Note: Safety certified for 90-264Vac) | | |
| Input Frequency | Hz | 47 - 63 (Note: Safety certified for 50/60Hz only) | | |
| Input Current (100/200Vac) | A | 200W: 2.76 / 1.37, 400W: 5.25 / 2.57, 600W: 10 / 4.9, 800W: 10.3 / 5.1 | | |
| Inrush Current at 200Vac (typ) (Cold Start) | A | 200W: <30, 400W: <25, 600W: <25, 800W: <30 | | |
| Leakage Current (220Vac) | mA | <1.2 | | |
| Power Factor (100/200Vac) | - | >0.99 / 0.98 | | |
| Harmonic Compliance | - | Meets IEC61000-3-2 Class A | | |
| Hold Up Time (typ) | ms | 200W: 15, 400W: 15, 600W: 15, 800W: 10 | | |
| Efficiency | - | See Model Selector Table | | |
| Conducted & Radiated EMI | - | IEC/EN61326-1, -B radiated, -A conducted, designed to meet EN55032/EN55024 | | |
| Immunity | - | See IEC61000 reports on website | | |
| Insulation Class | - | Class I | | |
| Safety Certifications and Markings | - | IEC/UL/CSA/EN61010-1,60950, CE Mark and UKCA Mark | | |
| **Output** | | | | |
| Output Voltage and Current Adjustment | - | See Model Selector Table | | |
| Load Regulation (CV Mode) | % | 0.01 of rated voltage over 0 - 100% load change | | |
| Line Regulation (CV Mode) | % | 0.01 of rated voltage over a 85 - 132 or 170 - 265Vac line change | | |
| Transient Response Recovery Time(1) | ms | 2 | | |
| Load Regulation (CC Mode) | % | 0.09 of rated current over 0 - 100% Vout change | | 0.15 of rated output current |
| Line Regulation (CC Mode) | % | 0.02 of rated current over a 85 - 132 or 170 - 265Vac line change | | |
| Ripple & Noise (CC or CV Mode) | - | See Model Selector Table | | |
| Temperature Coefficient (CV Mode) | ppm/°C | 30 (following 30 minute warm up) | | |
| Temperature Stability (CV Mode) | % | 0.02 of rated voltage over 8 hours following 30 minute warm up time | | |
| Warm-up Drift (CV Mode) | % | <0.05 of rated output voltage (after 30 min warm up period) | | |
| Temperature Coefficient (CC Mode) | ppm/°C | 100 (following 30 minute warm up) | | |
| Temperature Stability (CC Mode) | % | 0.05 of rated current over 8 hours following 30 minute warm up time | | |
| Load Regulation Thermal Drift (CC Mode) | % | < 0.05 of rated current over 30 minutes after load change | | |
| Warm-up Drift (CC Mode | % | ±0.1 of rated output current over 30 minutes following power on | | |
| Up Programming Resp Time (CV Mode) (10-90% or 90-10% of Vmax)(2) | ms | 110 | 170 | 170 |
| Down Programming Resp Time (CV Mode) Full Load (10-90% or 90-10% of Vmax)(2) | ms | 180 | 270 | 270 |
| Minimum Load | - | No minimum load required | | |
| Overcurrent Protection | - | User programmable, can be set to foldback mode | | |
| Overvoltage Protection | V | Shut down. User programmable | | |
| Overtemperature Protection | - | User selectable - latched or non-latching | | |
| Remote Sense Compensation (per wire) | V | 5 | | |
| Remote On/Off | | By applied voltage or dry contact relay (user selectable logic) | | |
| DC Good | - | Open Collector, Low on fail | | |
| Communication | - | RS232, RS485 & USB standard, IEEE488 (GPIB) & LAN optional | | |
| Indicators | - | Green LEDs: FINE, MENU, PREV, PROT, REM, OUTPUT, CV, CC<br>Red LED: PROT (OVP, UVP, OTP, FOLD, AC FAIL). | | |
| Display | | 4 digits. Accuracy 0.5% of rated voltage or current ±1 count | | |
| Parallel Operation | - | Up to 6 units | | |

## Specifications

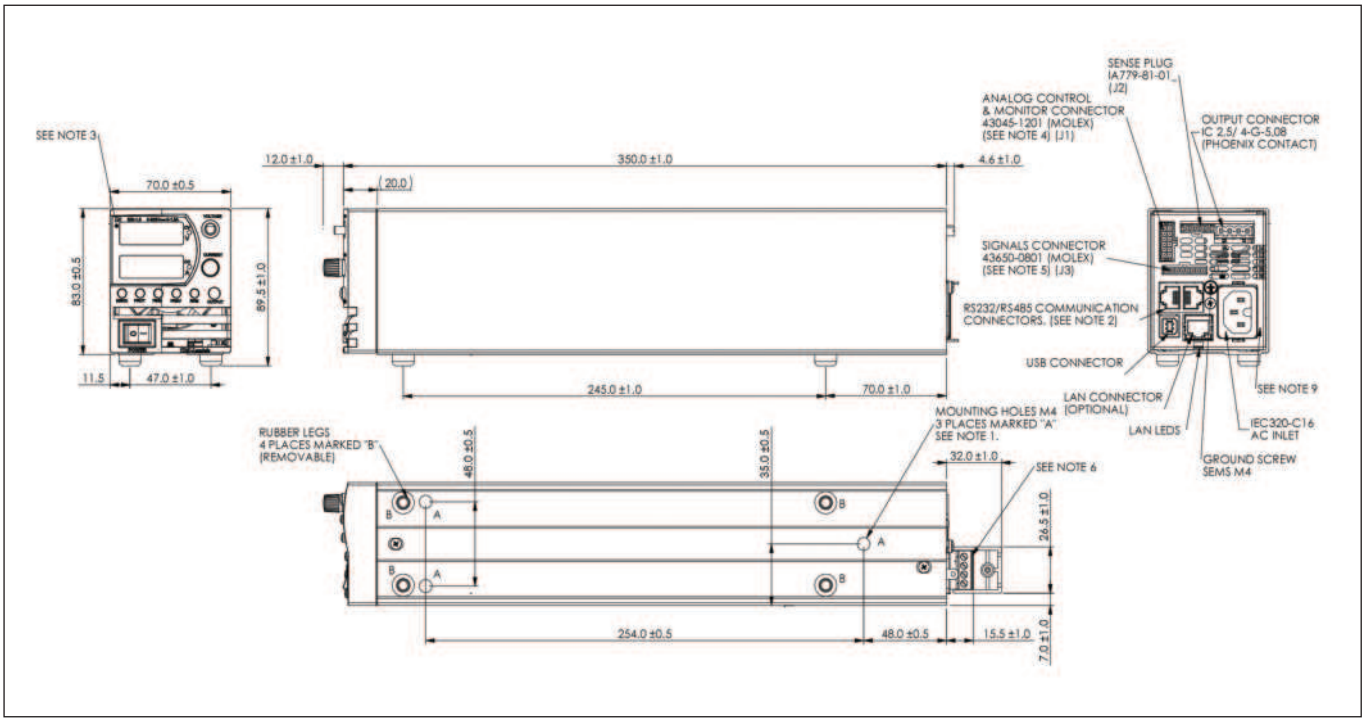
| Model | | Z160 | Z320 | Z650 |
|---|---|---|---|---|
| **Environmental** | | | | |
| Operating Temperature | °C | 0 - 50, full load | | |
| Storage Temperature | °C | -20 to +85 | | |
| Humidity (Non condensing) | %RH | 20 - 90 operating, 10 - 95 storage | | |
| Cooling | - | Internal fan | | |
| Altitude | m | 3000. Derate ambient temperature above 2000. | | |
| Withstand Voltage (For 1 minute) | Vac / Vdc | Input to Ground 2kVac, Input to Output 3kVac, Output to Ground 2828Vdc | | |
| Isolation Resistance | MΩ | >100 at 25°C, 70%RH & 500Vdc | | |
| Vibration (Non operating) | - | IEC60068-2-64 | | |
| Shock (Unpacked) | - | IEC60068-2-27: 20G half sine wave, for a duration of 11ms | | |

## Specifications

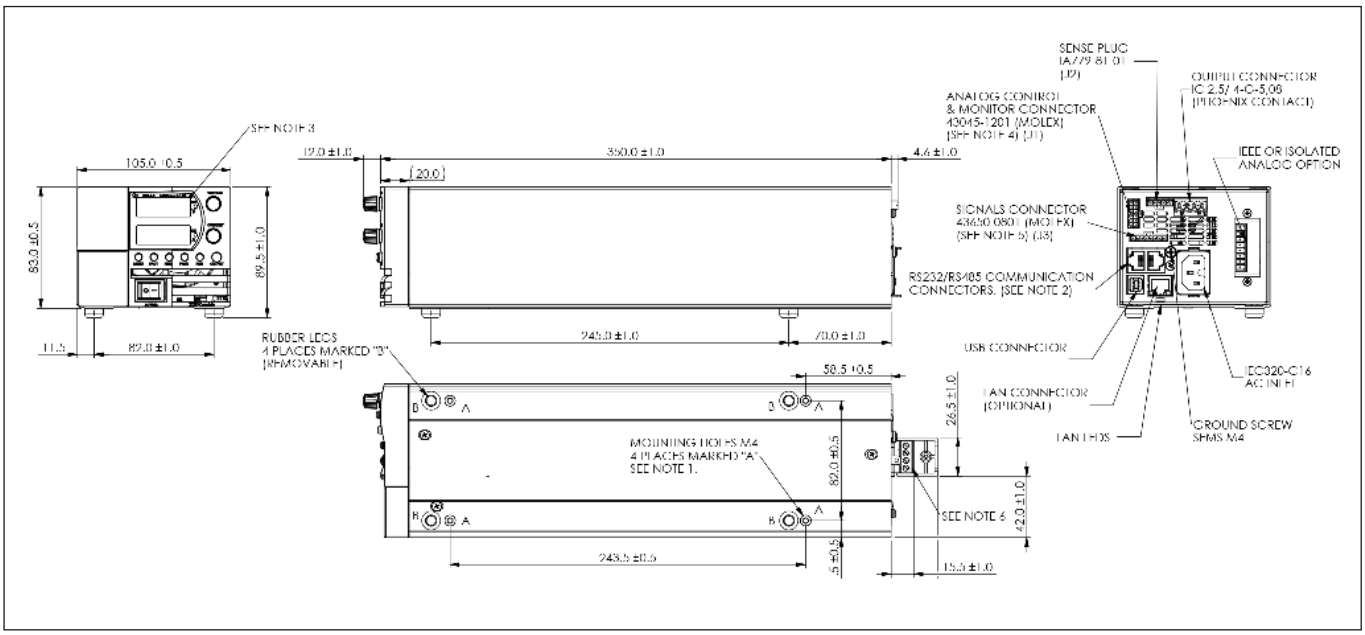
| Model | | 200W | 400W | 600W | 800W |
|---|---|---|---|---|---|
| **Other** | | | | | |
| Weight (Typ) | g | Standard body 1,900; Wide Body 2,400 | | Standard body 2,100; Wide Body 2,600 | |
| Size (WxHxD) | mm | Standard body: 70 x 83 x 350: Wide Body 105 x 83 x 350 | | | |
| Size (WxHxD) | Inches | Standard body: 2.76 x 3.27 x 13.78: Wide Body 4.13 x 3.27 x 13.78 | | | |
| Connectors | | See outline drawings | | | |
| Case Material | - | Metal case, plastic front panel | | | |
| MTBF - MIL HDBK-217F(3) | Hours | 75,839 | 75,667 | 76,274 | 76,274 |
| Warranty | Years | 5 | | | |

Notes
See website for detailed specifications, test methods and installation manual
(1) Recovery to within 0.5% of rated voltage after a load change of 10-90% (Output current 10-100% of Imax)
(2) 200W models. See specification on website for 400, 600 & 800W models
(3) Ground, Fixed. Excludes fan. See reliability data on website

## Z+ Outline Drawing (70mm wide)




## Z+ Outline Drawing (105mm wide) with Optional IEEE, Isolated Analog Interface





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