



## 200W, 400W, 600W and 800W Programmable DC Power Supplies



| Features                                                        | Benefits                               |
|-----------------------------------------------------------------|----------------------------------------|
| • 2U high                                                       | Minimises system rack height           |
| • Built-in USB, RS232 & RS485                                   | Highly flexible system integration     |
| • Optional LAN, GPIB & isolated analogue programming interfaces | Choice of additional communications    |
| • Outputs up to 650Vdc                                          | Wide application coverage              |
| • Arbitrary function generation                                 | Convenient for repeated test processes |
| • 5 year warranty                                               | High reliability                       |

| Model Selector |                      |                      |               |                      |                     |                      |                           |                                   |
|----------------|----------------------|----------------------|---------------|----------------------|---------------------|----------------------|---------------------------|-----------------------------------|
| Model          | Voltage Adjust Range | Current Adjust Range | Max Power (W) | Ripple 5Hz-1MHz (mV) | Noise 20MHz BW (mV) | Ripple 5Hz-1MHz (mA) | Efficiency % (100-200VAC) | Front Panel Output Jacks (Option) |
| Z10-20         | 0 - 10               | 0 - 20               | 200           | 5                    | 50                  | 25                   | 80 / 82                   | L/L2                              |
| Z10-40         | 0 - 10               | 0 - 40               | 400           | 5                    | 50                  | 70                   | 80 / 82                   | L/L2*                             |
| Z10-60         | 0 - 10               | 0 - 60               | 600           | 5                    | 50                  | 150                  | 80 / 82                   | L/L2*                             |
| Z10-72         | 0 - 10               | 0 - 72               | 720           | 5                    | 50                  | 180                  | 80 / 82                   | L/L2*                             |
| Z20-10         | 0 - 20               | 0 - 10               | 200           | 6                    | 50                  | 15                   | 82 / 84                   | L/L2                              |
| Z20-20         | 0 - 20               | 0 - 20               | 400           | 6                    | 50                  | 40                   | 81 / 83                   | L/L2                              |
| Z20-30         | 0 - 20               | 0 - 30               | 600           | 5                    | 50                  | 75                   | 82 / 84                   | L/L2*                             |
| Z20-40         | 0 - 20               | 0 - 40               | 800           | 5                    | 50                  | 100                  | 82 / 84                   | L/L2*                             |
| Z36-6          | 0 - 36               | 0 - 6                | 216           | 6                    | 50                  | 8                    | 83 / 85                   | L/L2                              |
| Z36-12         | 0 - 36               | 0 - 12               | 432           | 6                    | 50                  | 15                   | 83 / 85                   | L/L2                              |
| Z36-18         | 0 - 36               | 0 - 18               | 648           | 5                    | 50                  | 25                   | 84 / 85                   | L/L2                              |
| Z36-24         | 0 - 36               | 0 - 24               | 864           | 5                    | 50                  | 31                   | 84 / 85                   | L/L2                              |
| Z60-3.5        | 0 - 60               | 0 - 3.5              | 210           | 7                    | 50                  | 4                    | 83 / 85                   | L/L2                              |
| Z60-7          | 0 - 60               | 0 - 7                | 420           | 7                    | 50                  | 8                    | 83 / 85                   | L/L2                              |
| Z60-10         | 0 - 60               | 0 - 10               | 600           | 12                   | 50                  | 8                    | 83 / 85                   | L/L2                              |
| Z60-14         | 0 - 60               | 0 - 14               | 840           | 12                   | 60                  | 28                   | 83 / 85                   | L/L2                              |
| Z100-2         | 0 - 100              | 0 - 2                | 200           | 8                    | 80                  | 3                    | 83 / 85                   | L2                                |
| Z100-4         | 0 - 100              | 0 - 4                | 400           | 8                    | 80                  | 3                    | 84 / 86                   | L2                                |
| Z100-6         | 0 - 100              | 0 - 6                | 600           | 15                   | 80                  | 5                    | 84 / 86                   | L2                                |
| Z100-8         | 0 - 100              | 0 - 8                | 800           | 15                   | 80                  | 12                   | 84 / 86                   | L2                                |
| Z160-1.3       | 0 - 160              | 0 - 1.3              | 208           | 10                   | 100                 | 1.2                  | 79 / 81                   | L2                                |
| Z160-2.6       | 0 - 160              | 0 - 2.6              | 416           | 10                   | 100                 | 1.5                  | 84 / 86                   | L2                                |
| Z160-4         | 0 - 160              | 0 - 4                | 640           | 10                   | 100                 | 2                    | 86.5 / 88.5               | L2                                |
| Z160-5         | 0 - 160              | 0 - 5                | 800           | 10                   | 100                 | 2                    | 86.5 / 88.5               | L2                                |
| Z320-0.65      | 0 - 320              | 0 - 0.65             | 208           | 25                   | 150                 | 0.8                  | 79 / 81                   | L2                                |
| Z320-1.3       | 0 - 320              | 0 - 1.3              | 416           | 25                   | 150                 | 1                    | 84 / 86                   | L2                                |
| Z320-2         | 0 - 320              | 0 - 2                | 640           | 30                   | 150                 | 1.5                  | 87 / 88.5                 | L2                                |
| Z320-2.5       | 0 - 320              | 0 - 2.5              | 800           | 30                   | 150                 | 1.5                  | 86.5 / 89                 | L2                                |
| Z375-2.2       | 0 - 375              | 0 - 2.2              | 825           | 30                   | 150                 | 1.5                  | 87.5 / 89.5               | L2                                |
| Z650-0.32      | 0 - 650              | 0 - 0.32             | 208           | 60                   | 150                 | 0.5                  | 79 / 81                   | L2                                |
| Z650-0.64      | 0 - 650              | 0 - 0.64             | 416           | 60                   | 150                 | 0.6                  | 84 / 86                   | L2                                |
| Z650-1         | 0 - 650              | 0 - 1                | 650           | 60                   | 250                 | 1                    | 86.5 / 88.5               | L2                                |
| Z650-1.25      | 0 - 650              | 0 - 1.25             | 812           | 60                   | 250                 | 1                    | 87 / 89                   | L2                                |

\* Note: Front panel output jacks fuse limited to 24A

| Specification                                    |           | Z10                                                                                                    | Z20    | Z36    | Z60    | Z100    |
|--------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------|--------|--------|--------|---------|
| Load Regulation                                  | CV        | 2mV + 0.01% of rated voltage over 0 - 100% load change                                                 |        |        |        |         |
| Line Regulation                                  | CV        | 2mV + 0.01% of rated voltage over a 85 - 132 or 170 - 265VAC line change                               |        |        |        |         |
| Recovery Time (1)                                | CV        | 1ms                                                                                                    |        |        |        |         |
| Temperature Coefficient                          | CV        | 30ppm/C following 30 minute warm up                                                                    |        |        |        |         |
| Temperature Stability                            | CV        | 0.02% of rated voltage over 8 hours following 30 minute warm up time                                   |        |        |        |         |
| Warm up Drift (2)                                | CV        | <0.05% of rated voltage + 2mV of rated output voltage                                                  |        |        |        |         |
| Load Regulation                                  | CC        | 5mA + 0.01% of rated current over 0 - 100% Vout change                                                 |        |        |        |         |
| Load Regulation thermal drift                    | CC        | < 0.05% of rated current over 30 minutes after load change                                             |        |        |        |         |
| Line Regulation                                  | CC        | 2mA + 0.01% of rated current over a 85 - 132 or 170 - 265VAC line change                               |        |        |        |         |
| Temperature Coefficient                          | CC        | 100ppm/C of rated current after 30 minute warm up time                                                 |        |        |        |         |
| Temperature Stability                            | CC        | 0.05% of rated current over 8 hours following 30 minute warm up time                                   |        |        |        |         |
| Warm up Drift (2)                                | CC        | < +/- 0.1% of rated current                                                                            |        |        |        |         |
| Vout & Iout programming & readback resolution    | Digitally | < 0.012% of rated voltage/current                                                                      |        |        |        |         |
| Vout & Iout programming & readback accuracy      | Digitally | < 0.05% of rated voltage, < 0.1% of rated current                                                      |        |        |        |         |
| Voltage & Current Programming                    | Analog    | By either Voltage (0-5V or 0-10V) or Resistance (0-5k or 0-10k)                                        |        |        |        |         |
| Voltage & Current Monitoring                     | Analog    | 0-5V or 0-10V Voltage (user selectable), +/-1% accuracy                                                |        |        |        |         |
| Overvoltage Shutdown (user programmable)         | V         | 0.5 - 12                                                                                               | 1 - 24 | 2 - 40 | 5 - 66 | 5 - 110 |
| Overtemperature Protection                       | -         | User selectable - latched or non-latching                                                              |        |        |        |         |
| Display - Voltage                                | -         | 4 digits. Accuracy 0.5% of rated voltage or current +/- 1 count                                        |        |        |        |         |
| Remote On/Off                                    | -         | By applied voltage or dry contact relay (user selectable logic)                                        |        |        |        |         |
| Output Good                                      | -         | Low on fail                                                                                            |        |        |        |         |
| Remote Sense Compensation (per wire)             | V         | 1                                                                                                      | 1      | 2      | 3      | 5       |
| Communication Interface                          | -         | RS232, RS485 & USB standard, IEEE488 (GPIB) & LAN optional                                             |        |        |        |         |
| Series Operation                                 | -         | Up to two identical units (with external diodes)                                                       |        |        |        |         |
| Parallel Operation                               | -         | Up to six units in master-slave configuration                                                          |        |        |        |         |
| Input Voltage / Frequency (3)                    | VAC       | 85-265VAC, 47-63Hz                                                                                     |        |        |        |         |
| Inrush Current                                   | A         | < 30A                                                                                                  |        |        |        |         |
| Hold Up Time (Typical)                           | ms        | 16ms                                                                                                   |        |        |        |         |
| Power Factor Correction                          | -         | Complies with EN61000-3-2 Class A (0.99 typ)                                                           |        |        |        |         |
| Operating Temperature                            | °C        | 0 - 50°C                                                                                               |        |        |        |         |
| Storage Temperature                              | °C        | -20 to +85°C                                                                                           |        |        |        |         |
| Humidity (non condensing)                        | %RH       | Operating: 10 - 90%RH, Storage 10 - 95%RH                                                              |        |        |        |         |
| Cooling                                          | -         | Variable speed fan                                                                                     |        |        |        |         |
| Withstand Voltage                                | VAC       | I/P to GND 2kVAC, I/P to O/P 3kVAC, O/P to GND 1380VDC 1 min                                           |        |        |        |         |
| Insulation Resistance                            | Ω         | >100MΩ at 25°C & 70%RH                                                                                 |        |        |        |         |
| Vibration (non operating)                        | -         | IEC60068-2-64                                                                                          |        |        |        |         |
| Shock                                            | G         | <20G, half sine, 11ms. IEC60068-2-27                                                                   |        |        |        |         |
| Safety Agency Certifications                     | -         | UL61010-1, EN61010-1, IEC61010 (Designed to meet UL/EN60950-1)                                         |        |        |        |         |
| Immunity                                         | -         | IEC61326                                                                                               |        |        |        |         |
| Conducted Emission                               | -         | IEC/EN61326-1 Industrial Location - B, FCC part 15-B, VCCI-B                                           |        |        |        |         |
| Radiated Emission                                | -         | IEC/EN61326-1 Industrial Location - A, FCC part 15-A, VCCI-A                                           |        |        |        |         |
| Size (H x W x D) (Excluding handles and busbars) | mm        | Standard body 83 x 70 x 350mm; Wide Body 83 x 105 x 350mm                                              |        |        |        |         |
| Weight                                           | kg        | 200W & 400W: Standard body 1.9kg, Wide body 2.4kg<br>600W & 800W: Standard body 2.1kg, Wide body 2.6kg |        |        |        |         |
| Warranty                                         | yrs       | 5                                                                                                      |        |        |        |         |

#### Notes:

- (1) Recovery to within 0.5% of rated voltage after a load change of 10-90% (Output current 10-100% of I<sub>max</sub>)
- (2) During 30 minute warm up time after power on

See [www.emea.tdk-lambda.com/zplus](http://www.emea.tdk-lambda.com/zplus) for further information

| Specification                                    |           |                                                                      |         |         |
|--------------------------------------------------|-----------|----------------------------------------------------------------------|---------|---------|
| Model                                            |           | Z160                                                                 | Z320    | Z650    |
| Load Regulation                                  | CV        | 0.01% of rated voltage over 0 - 100% load change                     |         |         |
| Line Regulation                                  | CV        | 0.01% of rated voltage over 0 - 100% input change                    |         |         |
| Recovery Time (1)                                | CV        | 2ms                                                                  |         |         |
| Temperature Coefficient                          | CV        | 30ppm/°C following 30 minute warm up                                 |         |         |
| Temperature Stability                            | CV        | 0.02% of rated voltage over 8 hours following 30 minute warm up time |         |         |
| Warm up Drift (2)                                | CV        | <0.05% of rated voltage of rated output voltage                      |         |         |
| Load Regulation                                  | CC        | 0.09% of rated current over 0 - 100% Vout change                     |         |         |
| Load Regulation thermal drift                    | CC        | < 0.05% of rated current over 30 minutes after load change           |         |         |
| Line Regulation                                  | CC        | <0.02% of rated current over a 85 - 132 or 170 - 265VAC line change  |         |         |
| Temperature Coefficient                          | CC        | 100ppm/°C of rated current after 30 minute warm up time              |         |         |
| Temperature Stability                            | CC        | 0.05% of rated current over 8 hours following 30 minute warm up time |         |         |
| Warm up Drift(2)                                 | CC        | <±0.1% of rated current                                              |         |         |
| Vout & Iout programming & readback resolution    | Digitally | < 0.012% of rated voltage/current                                    |         |         |
| Vout & Iout programming & readback accuracy      | Digitally | 0.05% of rated voltage + 0.05% of actual, 0.2% of rated current      |         |         |
| Voltage & Current Programming                    | Analog    | By either Voltage (0-5V or 0-10V) or Resistance (0-5k or 0-10k)      |         |         |
| Voltage & Current Monitoring                     | Analog    | 0-5V or 0-10V Voltage (user selectable), ±1% accuracy                |         |         |
| Overvoltage Shutdown (user programmable)         | V         | 5 - 176                                                              | 5 - 353 | 5 - 717 |
| Overtemperature Protection                       | -         | User selectable - latched or non-latching                            |         |         |
| Display - Voltage                                | -         | 4 digits. Accuracy 0.5% of rated voltage or current ± 1 count        |         |         |
| Remote On/Off                                    | -         | By applied voltage or dry contact relay (user selectable logic)      |         |         |
| Output Good                                      | -         | Low on fail                                                          |         |         |
| Remote Sense Compensation (per wire)             | V         | 5                                                                    | 5       | 5       |
| Communication Interface                          | -         | RS232, RS485 & USB standard, IEEE488 (GPIB) & LAN optional           |         |         |
| Series Operation                                 | -         | Up to two identical units (with external diodes)                     |         |         |
| Parallel Operation                               | -         | Up to six units in master-slave configuration                        |         |         |
| Input Voltage / Frequency                        | -         | 85-265VAC, 47-63Hz                                                   |         |         |
| Inrush Current                                   | -         | < 30A                                                                |         |         |
| Hold Up Time (Typical)                           | ms        | 16ms                                                                 |         |         |
| Power Factor Correction                          | -         | Complies with EN61000-3-2 Class A (0.99 typ)                         |         |         |
| Operating Temperature                            | °C        | 0 - 50°C                                                             |         |         |
| Storage Temperature                              | °C        | -20 to +85°C                                                         |         |         |
| Humidity (non condensing)                        | %RH       | Operating: 20 - 90%RH, Storage 10 - 95%RH                            |         |         |
| Cooling                                          | -         | Variable speed fan                                                   |         |         |
| Withstand Voltage                                | -         | I/P to GND 2kVAC, I/P to O/P 3kVAC, O/P to GND 1380VDC 1 min         |         |         |
| Insulation Resistance                            | -         | >100M at 25°C & 70%RH                                                |         |         |
| Vibration (non operating)                        | -         | IEC60068-2-64                                                        |         |         |
| Shock                                            | -         | <20G, half sine, 11ms. IEC60068-2-27                                 |         |         |
| Safety Agency Certifications                     | -         | UL61010-1, EN61010-1, IEC61010 (Designed to meet UL/EN60950-1)       |         |         |
| Immunity                                         | -         | IEC61326                                                             |         |         |
| Conducted EMI                                    | -         | IEC/EN61326-1 Industrial location B, FCC part 15-B, VCCI-B           |         |         |
| Radiated EMI                                     | -         | IEC/EN61326-1 Industrial location A, FCC part 15-A, VCCI-A           |         |         |
| Size (H x W x D) (Excluding handles and busbars) | mm        | Standard body 83 x 70 x 350mm; Wide Body 83 x 105 x 350mm            |         |         |
| Weight                                           | kg        | 200W & 400W Standard body 1.9kg; Wide Body 2.4kg                     |         |         |
| Warranty                                         | yrs       | 5                                                                    |         |         |

#### Notes:

- (1) Recovery to within 0.5% of rated voltage after a load change of 10-90% (Output current 10-100% of I<sub>max</sub>)  
 (2) Over 30 minute warm up time after power on

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## Factory Installed Options

|                                                                                                                   | Option Code |
|-------------------------------------------------------------------------------------------------------------------|-------------|
| <b>For models up to 60V only:</b><br>Front panel output jacks (binding post style $\varnothing$ 4mm) <sup>1</sup> | -L          |
| <b>For all models:</b> <sup>2</sup><br>Front panel insulated output sockets ( $\varnothing$ 4mm) <sup>1</sup>     | -L2         |
| <b>Only one of the options below can be included:</b><br>GPIB Interface <sup>1</sup>                              | -IEEE       |
| Voltage Programming Isolated Analog Interface <sup>1</sup>                                                        | -IS510      |
| Current Programming Isolated Analog Interface <sup>1</sup>                                                        | -IS420      |
| LAN Interface (Complies with "LXI" Class C)                                                                       | -LAN        |

1:Requires wide body (105mm) case style 2:Front panel output jacks fuse limited to 24A

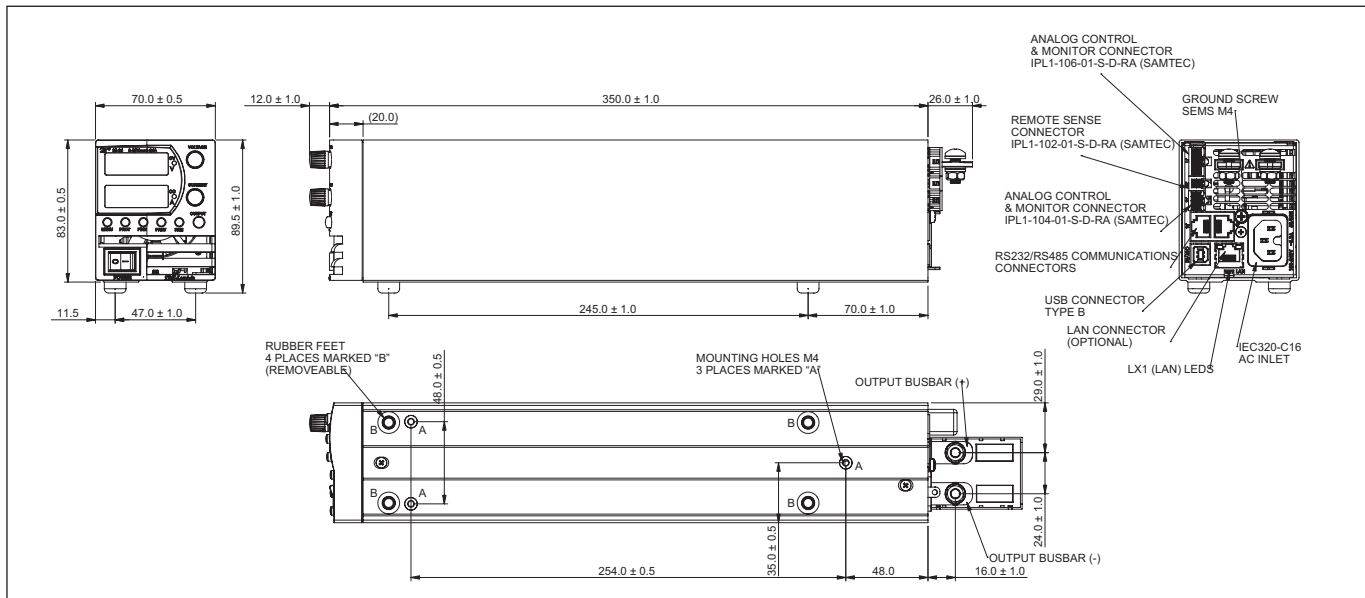
## Part Number Examples

Z10-20-LAN-L Z650-0.64

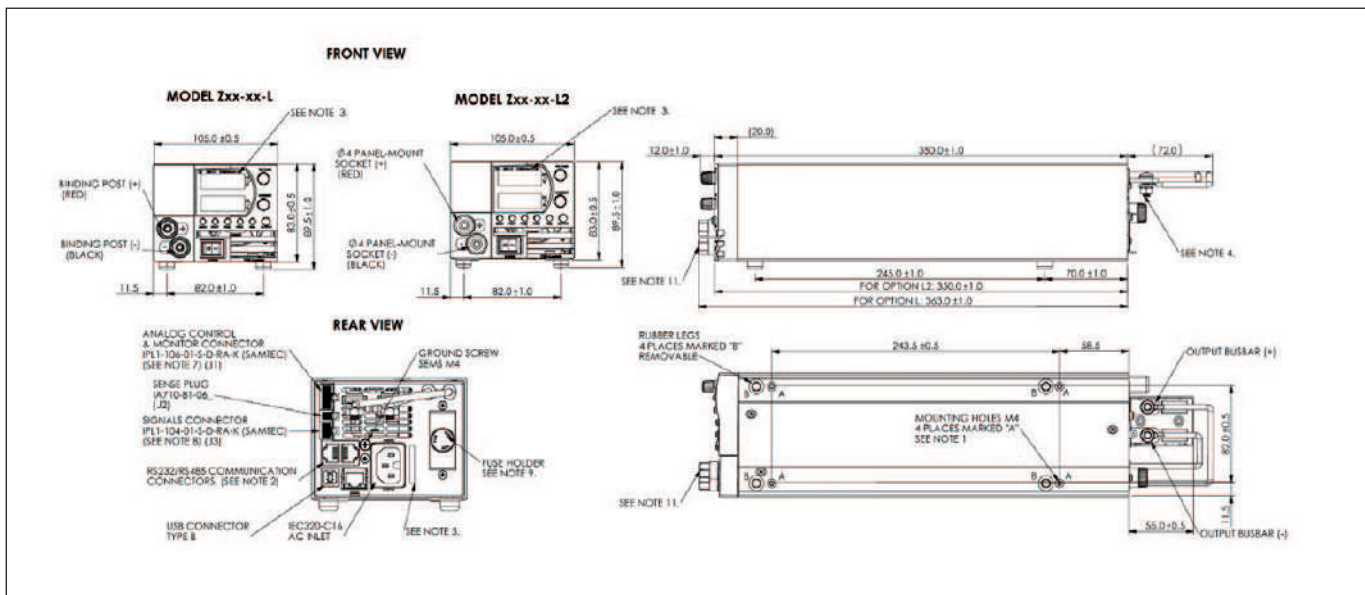
## Accessories

|                                                                                       | Part Number |
|---------------------------------------------------------------------------------------|-------------|
| <b>19" Rack Housing</b><br>(Accepts four 105mm width units or six 70mm width units)   | Z-NL100     |
| 70mm Blanking Panel For 19" Rack                                                      | Z-BP        |
| 105mm Blanking Panel For 19" Rack                                                     | Z-WBP       |
| <b>Dual/Triple Housing</b><br>(Accepts two 105mm case units or three 70mm case units) | Z-NL200     |
| Serial Link Cable (One is included with each power supply)                            | Z-RJ45      |
| Communication Cable RS485                                                             | Z-485-9     |
| Communication Cable RS232                                                             | Z-232-9     |
| British AC Cord                                                                       | Z-GB        |
| European AC Cord                                                                      | Z-E         |

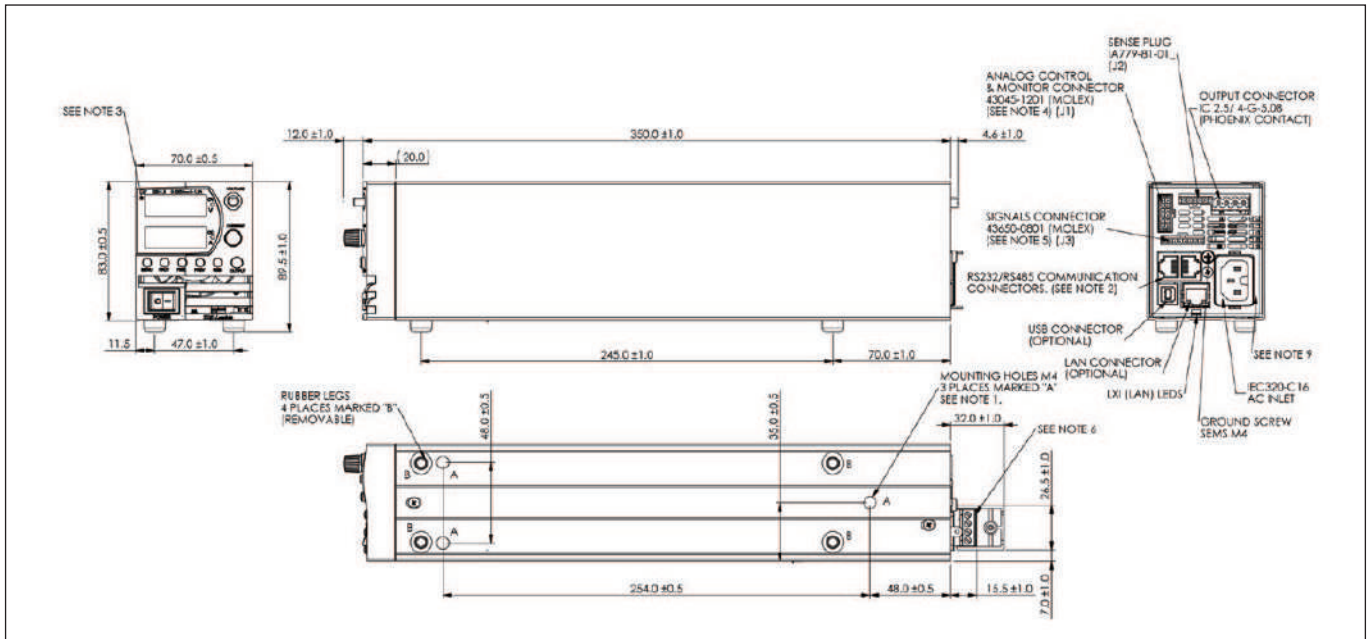
## Z+ Outline Drawing



## Z+ with L or L2 Option Outline Drawing

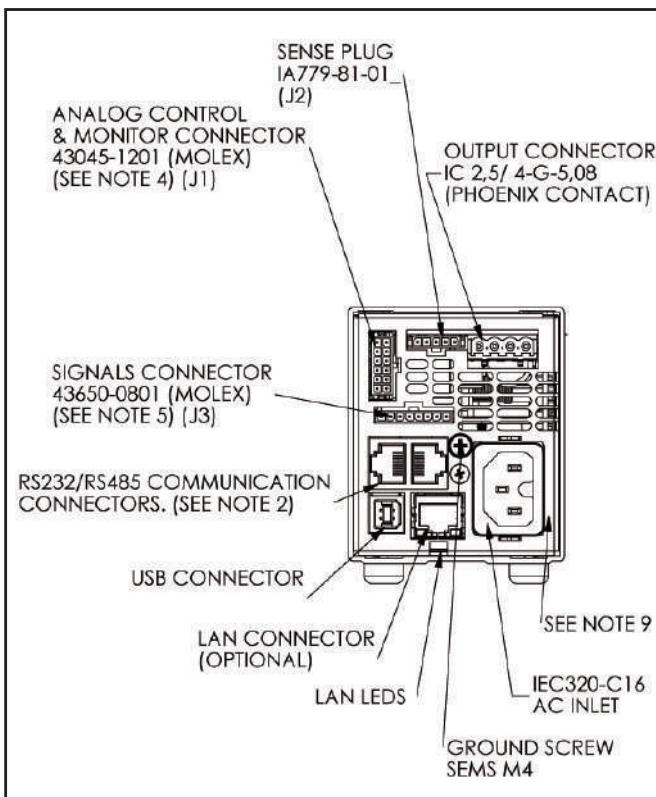


## Z+ HV Outline Drawing

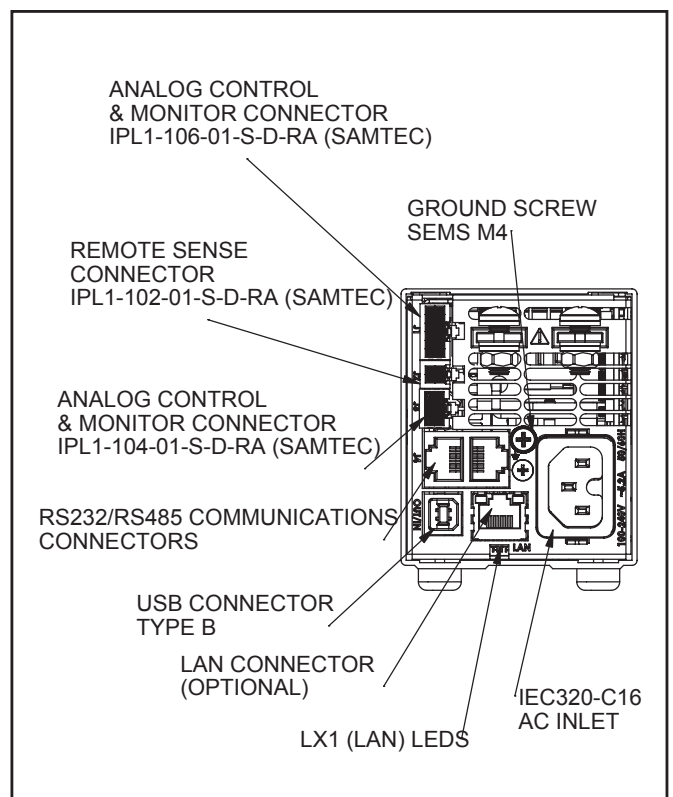


See Longform Datasheet for rack & wide body dimensions [www.emea.tdk-lambda.com/zplus](http://www.emea.tdk-lambda.com/zplus)

## Z+ Connections high voltage models 160V and above



## Z+ Connections low voltage models up to 100V







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