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AME25-277PEVZ



Encapsulated

The AME25-277PEVZ is a whole new AC/DC converter that offers much greater cost effectiveness due to material normalization and production automation also leading to improved reliability and performance. Offering a commercial input voltage range of 85-305VAC and an output voltage range from 3.3-24V, this series will offer many benefits to your new system design.

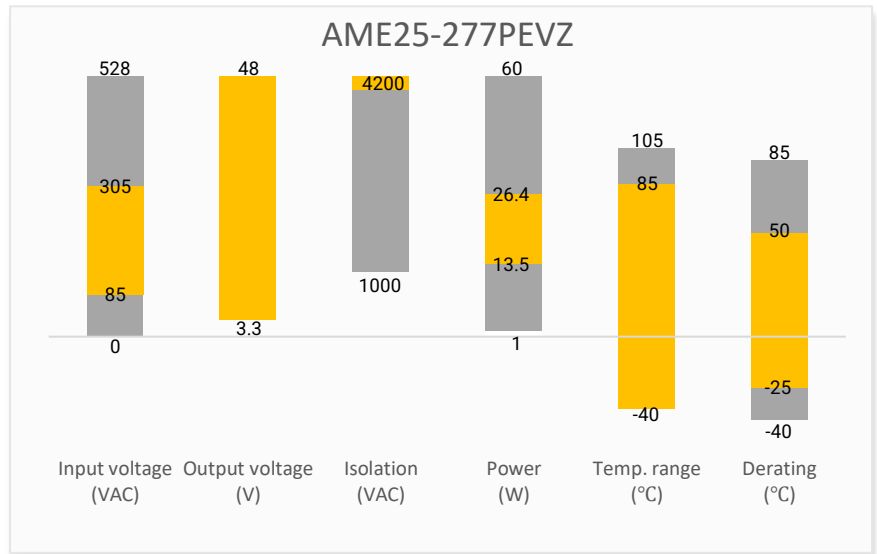
This new series offers great operating temperatures from -40°C to 85°C, also features an isolation of 4200VAC for improved reliability and system safety. Furthermore, a higher MTBF of 500,000h, output short circuit protection (OSCP), output over-current protection (OCP) and an output over-voltage protection (OVP) come standard with the series.

The AME25-277PEVZ is perfect for street lighting controls, grid power, EVSE, industrial controls, UPS, battery storage system and energy management applications.

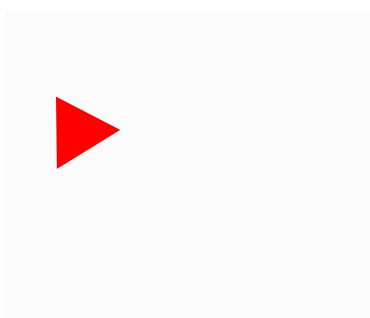
Features

- Universal Input: 85 - 305VAC/100 - 430VDC
- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 4200VAC
- Low ripple & noise, 50mV(p-p), typ.
- Output short circuit, over-current, over-voltage protection
- Regulated Output

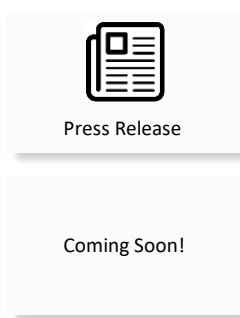
Summary



Training



Product Training Video
(click to open)



Application Notes

Applications



Power Grid



Industrial



Telecom



Instrumentation

Models & Specifications

| Single Output | | | | | | | |
|--------------------|------------------------|---------------------|------------------------|--------------------|------------------------|------------------------------|-------------------------|
| Model | Input Voltage (VAC/Hz) | Input Voltage (VDC) | Max Output wattage (W) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (μF) | Efficiency @ 230VAC (%) |
| AME25-3S277PEVZ | 85-305/47-63 | 100-430 | 13.5 | 3.3 | 4.1 | 48000 | 78 |
| AME25-5S277PEVZ | 85-305/47-63 | 100-430 | 20.5 | 5 | 4.1 | 12240 | 82 |
| AME25-9S277PEVZ # | 85-305/47-63 | 100-430 | 22.5 | 9 | 2.5 | 5600 | 82 |
| AME25-12S277PEVZ # | 85-305/47-63 | 100-430 | 25 | 12 | 2.1 | 5400 | 84 |
| AME25-15S277PEVZ | 85-305/47-63 | 100-430 | 24 | 15 | 1.6 | 2400 | 85 |
| AME25-24S277PEVZ | 85-305/47-63 | 100-430 | 26.4 | 24 | 1.1 | 1440 | 85 |
| AME25-48S277PEVZ | 85-305/47-63 | 100-430 | 24 | 48 | 0.5 | 600 | 87 |

Note: Use suffix "ST" for chassis and suffix "STD" for DIN-Rail mounting (ex. AME25-3S277PEVZ-ST is chassis mounting and AME25-3S277PEVZ-STD is DIN-Rail mounting version).

| Input Specifications | | | | | |
|----------------------|---------------------|---------|---------|---------|----------|
| Parameters | Conditions | Minimum | Typical | Maximum | Units |
| Current | 115VAC | | | 0.6 | A |
| | 230VAC | | | 0.34 | A |
| Inrush current | 115VAC | | 20 | | A |
| | 230VAC | | 40 | | A |
| Leakage current | 270V/50Hz | | | 0.25 | mA (RMS) |
| External fuse | slow blow type,300V | | 3.15 | | A |

| Output Specifications | | | | |
|-----------------------|-----------------|---------|---------|-------------------|
| Parameters | Conditions | Typical | Maximum | Units |
| Voltage accuracy | 3.3V output | ±3 | | % |
| | Others | ±2 | | % |
| Line regulation | Full load | ±0.5 | | % |
| Load regulation | 0-100% load | ±1 | | % |
| Ripple & Noise* | 20MHz bandwidth | 50 | 100 | mV _{p-p} |
| Hold up time | 115VAC | 10 | | ms |
| | 230VAC | 60 | | ms |

* Ripple and Noise are measured at 20MHz bandwidth by using the referenced Application circuit.

| Isolation Specifications | | | | |
|--|---|---------|-------|-------|
| Parameters | Conditions | Typical | Rated | Units |
| Tested I/O voltage | 60 sec, leakage current < 5mA | | 4200 | VAC |
| Tested Input to PE voltage | 60 sec, leakage current < 5mA | | 2500 | VAC |
| Tested Output to PE voltage | 60 sec, leakage current < 5mA | | 1250 | VAC |
| Impulse voltage (I/O, Input/PE, Output/PE) | Apply 6kV impulse test voltage. Add 1.2/50us impact waveform, including three positive impulse and three negative impulse, whose time interval is no less than 5 seconds. | | 6000 | V |
| Insulation resistance (I/O, Input/PE, Output/PE) | 500VDC | | ≥ 100 | MΩ |

| General Specifications | | | | |
|---|---|--|---------|-----------------------|
| Parameters | Conditions | Typical | Maximum | Units |
| Safety class | Class I | | | |
| Overvoltage category | OVC III; Per IEC 62477, 2000m | | | |
| Over Current protection | Auto recovery | ≥ 150 | | % of I _{out} |
| Over voltage protection | 3.3V / 5V V _{out} | | 7.5 | VDC |
| | 9V V _{out} | | 15 | VDC |
| | 12V /15V V _{out} | | 20 | VDC |
| | 24V V _{out} | | 30 | VDC |
| | 48V V _{out} | | 60 | VDC |
| Short circuit protection | Hiccup, Continuous, Auto recovery | | | |
| Operating temperature | See derating graph | -40 to +85 | | °C |
| Storage temperature | | -40 to +105 | | °C |
| Lead temperature | Wave soldering | 260 ± 5 °C; time : 5 - 10s | | |
| | Hand soldering | 360 ± 10 °C; time : 3 - 5s | | |
| Power consumption | 230VAC, Others | | 0.3 | W |
| | 230VAC, 48V V _{out} | | 0.4 | W |
| Power derating | -40 °C ~ -25 °C | 3.33 | | % / °C |
| | 50 °C ~ 70 °C | 2.5 | | % / °C |
| | 70 °C ~ 85 °C | 0.67 | | % / °C |
| | 85VAC ~ 100VAC | 1 | | % / VAC |
| | 277VAC ~ 305VAC | 0.715 | | % / VAC |
| | 2000m – 5000m | 6.67 | | % / Km |
| Temperature coefficient | | ±0.02 | | % / °C |
| Cooling | Free air convection | | | |
| Humidity | Non-condensing | | 95 | % RH |
| Case material | Heat resistant black Plastic (flammability to UL 94V-0) | | | |
| Weight | PCB mountable models | 120 | | g |
| | With optional -ST mounting plate: | 170 | | |
| | With optional -STD mounting plate: | 210 | | |
| Dimensions (L x W x H) | PCB mountable models | 2.76 x 1.89 x 0.93 inches (70.0 x 48.0 x 23.5mm) | | |
| | With optional -ST mounting plate | 3.78 x 2.13 x 1.26 inches (96.1 x 54.0 x 32.0mm) | | |
| | With optional -STD mounting plate | 3.78 x 2.13 x 1.44 inches (96.1 x 54.0 x 36.6mm) | | |
| MTBF | > 300 000 hrs (MIL-HDBK -217F, t=+25°C)/Full Load | | | |
| NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. | | | | |

Safety Specifications

Parameters

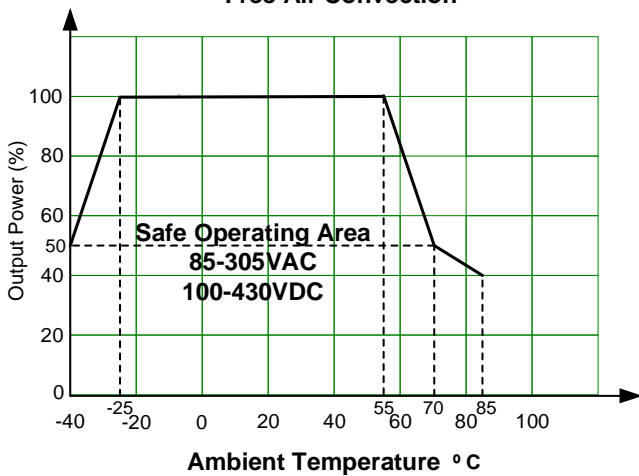
Agency approvals CE EN62368-1; UL 62368-1 (With models marked with # only)

| | | |
|--|--|---|
| Standards | Information technology Equipment | Designed to meet IEC/UL 62368-1, IEC 62477-1 |
| | EMC - Conducted and radiated emission | CISPR32 / EN55032, CLASS B |
| | Electrostatic Discharge Immunity | IEC 61000-4-2 Contact $\pm 8\text{KV}$ / Air $\pm 15\text{KV}$, Criteria A |
| | RF, Electromagnetic Field Immunity | IEC 61000-4-3 10V/m, Criteria A |
| | Electrical Fast Transient/Burst Immunity | IEC 61000-4-4 $\pm 4\text{KV}$, Criteria A |
| | Surge Immunity | IEC 61000-4-5 L-L $\pm 2\text{KV}$ /L-G $\pm 4\text{KV}$, Criteria A |
| | | IEC 61000-4-5 L-L $\pm 4\text{KV}$ /L-G $\pm 6\text{KV}$, with EMC recommended circuit, Criteria A |
| | CS, Conducted Disturbance Immunity | IEC 61000-4-6 10Vr.m.s, Criteria A |
| Voltage dips, Short Interruptions Immunity | IEC 61000-4-11 0%, 70%, Criteria B | |

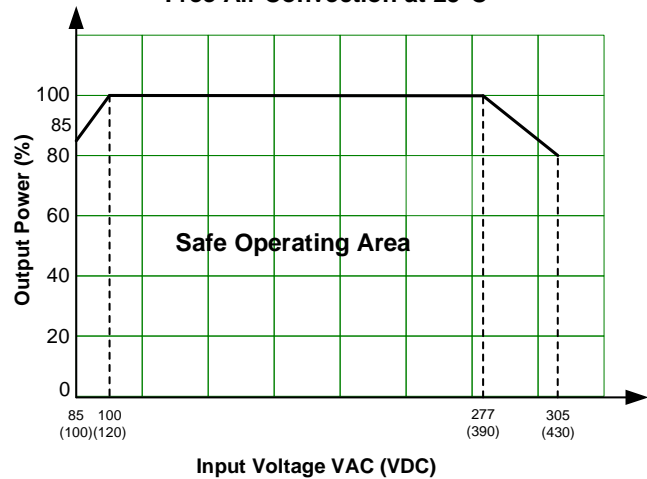
Derating



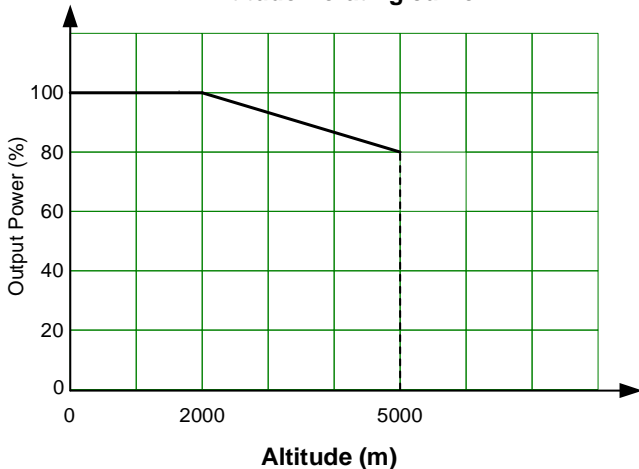
Free Air Convection



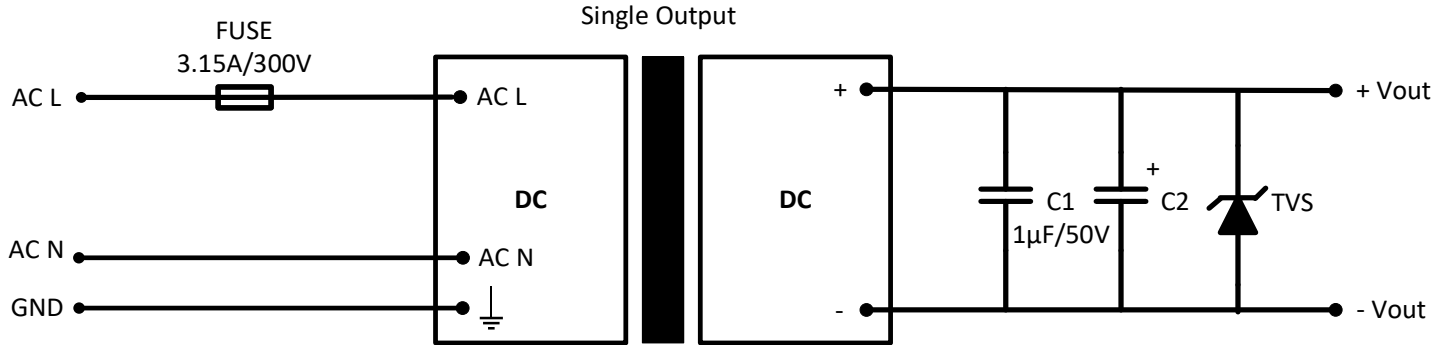
Free Air Convection at 25°C



Altitude Derating curve



Typical Application Circuit

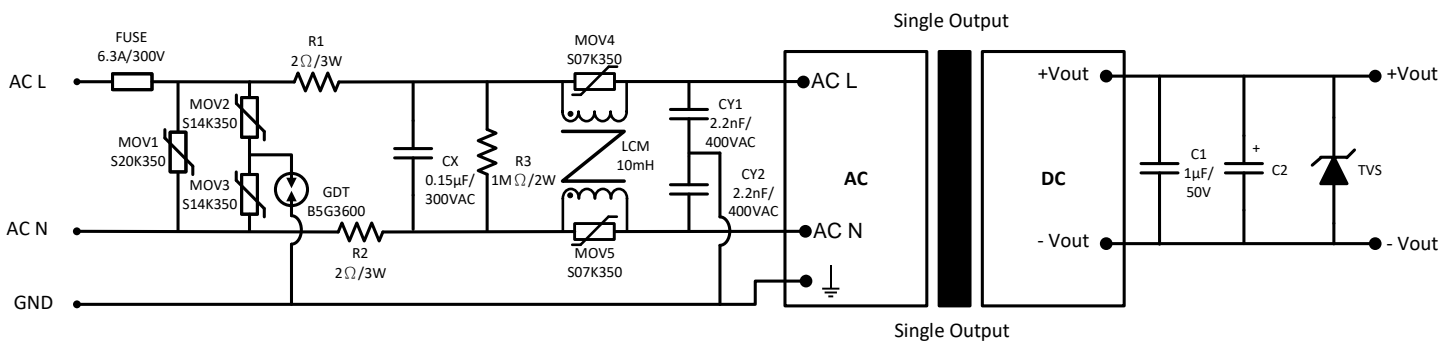


| Model | C2 | TVS |
|---------------|--------------|----------|
| 3.3 / 5V Vout | 330 µF / 16V | SMBJ7.0A |
| 9 Vout | 330 µF / 16V | SMBJ12A |
| 12 / 15 Vout | 330 µF / 25V | SMBJ20A |
| 24 Vout | 120 µF / 35V | SMBJ30A |
| 48 Vout | 68 µF / 63V | SMBJ64A |

Output Filter Components:

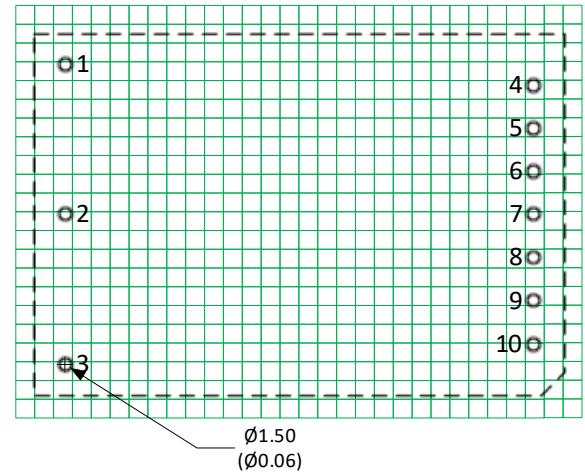
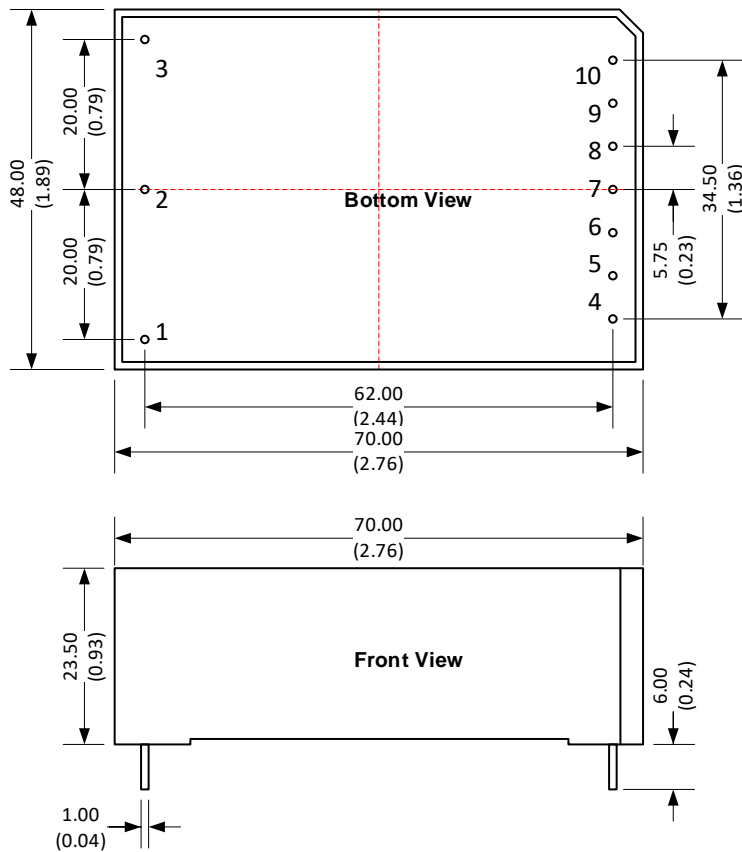
We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode.

EMC Recommended Circuit



NOTE: R1 & R2 should be wire-wound resistors

Dimensions



Note : Grid 2.54*2.54 mm

Notes:

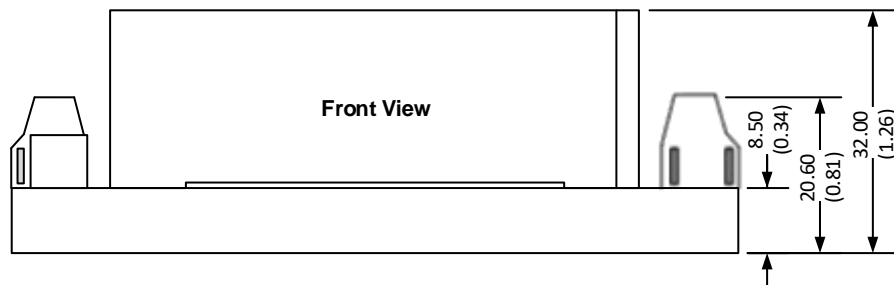
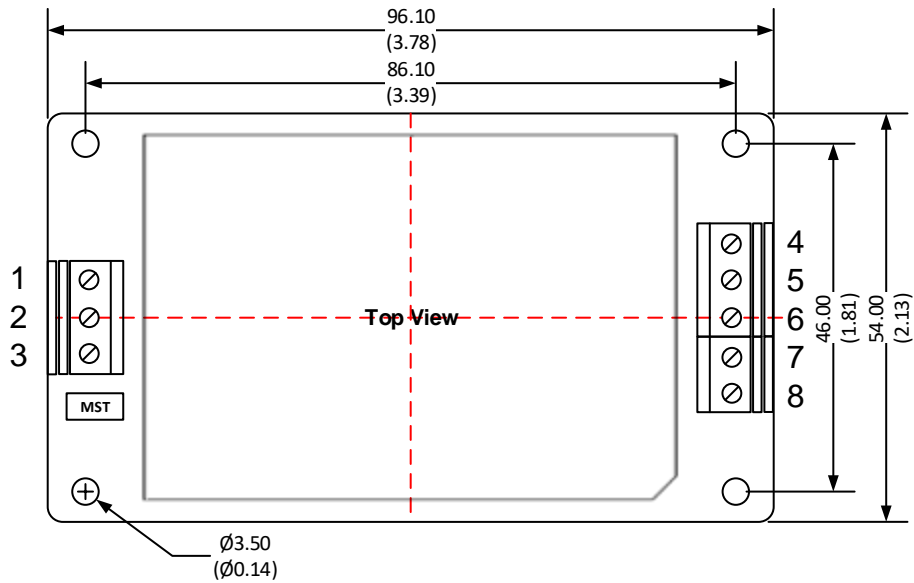
All dimensions are typical in millimeters (inches).

Pin diameter tolerances : ± 0.10 (± 0.004)

General tolerance : ± 0.50 (± 0.02)

| Pin Output Specifications | | | |
|---------------------------|--------------|-----|-----------|
| Pin | Single | Pin | Single |
| 1 | Ground | 6 | No pin |
| 2 | AC Input (N) | 7 | No pin |
| 3 | AC Input (L) | 8 | No pin |
| 4 | Trim | 9 | +V Output |
| 5 | -V Output | 10 | No pin |

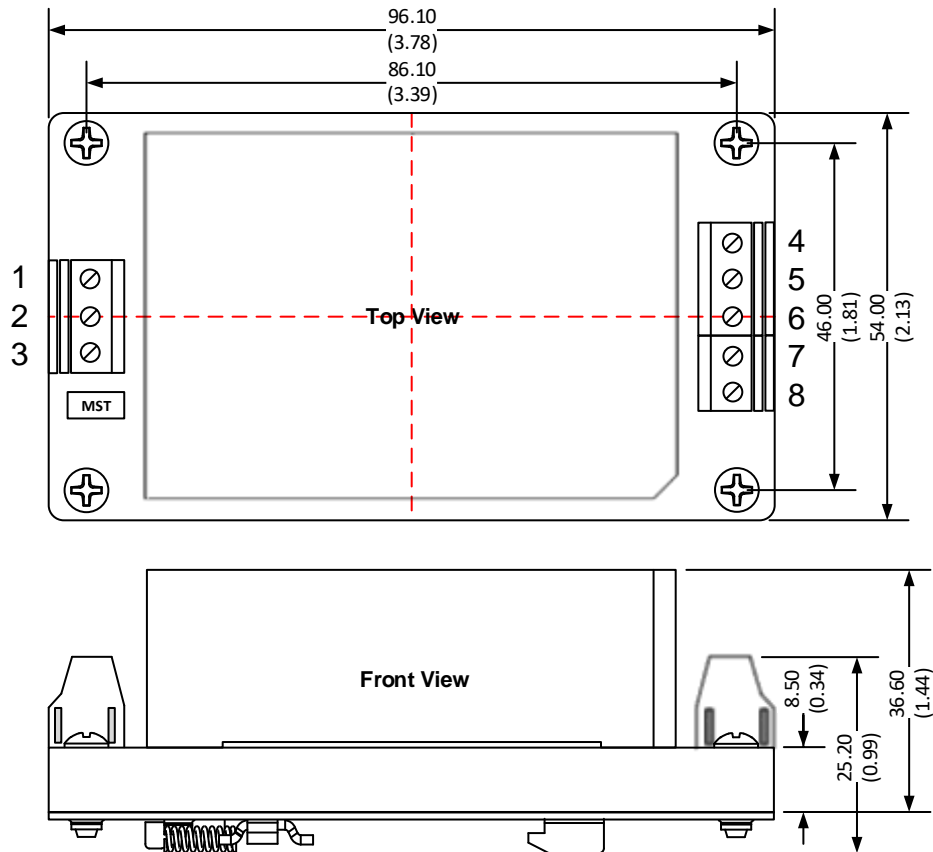
Dimensions with ST Optional



Notes:
All dimensions are typical in millimeters (inches).
Wire range : 24-12 AWG
Tightening torque : Max 0.4 N.m
General tolerance ± 1.00 : (± 0.04)

| Pin Output Specifications | | | |
|---------------------------|--------------|-----|-----------|
| Pin | Single | Pin | Single |
| 1 | Ground | 5 | NC |
| 2 | AC Input (N) | 6 | Trim |
| 3 | AC Input (L) | 7 | NC |
| 4 | -V Output | 8 | +V Output |

Dimensions with STD Optional



Notes:

All dimensions are typical in millimeters (inches).
 Mounting rail : TS35, rail need to connect safety ground
 Wire range : 24-12 AWG
 Tightening torque : Max 0.4 N.m
 General tolerance ± 1.00 : (± 0.04)

| Pin Output Specifications | | | |
|---------------------------|--------------|-----|-----------|
| Pin | Single | Pin | Single |
| 1 | Ground | 5 | NC |
| 2 | AC Input (N) | 6 | Trim |
| 3 | AC Input (L) | 7 | NC |
| 4 | -V Output | 8 | +V Output |

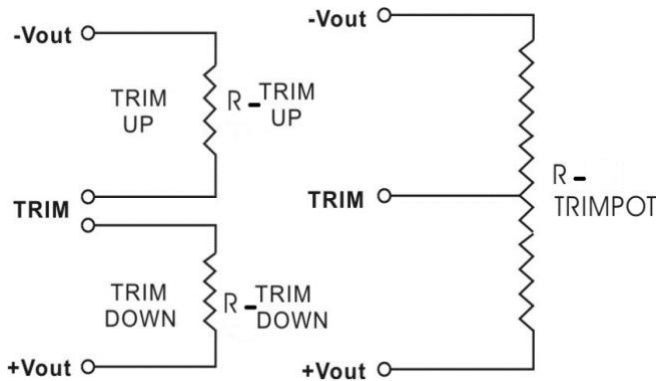
Trimming



Output voltage can be externally trimmed by utilizing the methods as shown below

Fixed Resistor

Variable Potentiometer



Leave open if not used.

AME25-3S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----------|---------|---------|--------|--------|--------|--------|--------|--------|--------|
| Vout (VDC) | 3.267 | 3.234 | 3.201 | 3.168 | 3.135 | 3.102 | 3.069 | 3.036 | 3.003 | 2.970 |
| Rt down (KΩ) | 240.741 | 154.964 | 113.111 | 88.321 | 71.927 | 60.280 | 51.580 | 44.834 | 39.450 | 35.053 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 3.333 | 3.366 | 3.399 | 3.432 | 3.465 | 3.498 | 3.531 | 3.564 | 3.597 | 3.630 |
| Rt up (KΩ) | 2987.087 | 256.530 | 133.563 | 90.076 | 67.832 | 54.320 | 45.243 | 38.725 | 33.817 | 29.988 |

AME25-5S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----------|---------|---------|---------|--------|--------|--------|--------|--------|--------|
| Vout (VDC) | 4.950 | 4.900 | 4.850 | 4.800 | 4.750 | 4.700 | 4.650 | 4.600 | 4.550 | 4.500 |
| Rt down (KΩ) | 174.844 | 115.508 | 85.188 | 66.781 | 54.419 | 45.545 | 38.864 | 33.654 | 29.476 | 26.052 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 5.060 | 5.100 | 5.150 | 5.200 | 5.250 | 5.300 | 5.350 | 5.400 | 5.450 | 5.500 |
| Rt up (KΩ) | 3405.559 | 411.051 | 195.327 | 127.862 | 94.906 | 75.373 | 62.451 | 53.269 | 46.408 | 41.087 |

AME25-9S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|---------|---------|---------|---------|---------|---------|---------|--------|--------|--------|
| Vout (VDC) | 8.910 | 8.820 | 8.730 | 8.640 | 8.550 | 8.460 | 8.370 | 8.280 | 8.190 | 8.100 |
| Rt down (KΩ) | 682.347 | 378.845 | 259.708 | 196.082 | 156.501 | 129.500 | 109.904 | 95.034 | 83.365 | 73.964 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 9.090 | 9.180 | 9.270 | 9.360 | 9.450 | 9.540 | 9.630 | 9.720 | 9.810 | 9.900 |
| Rt up (KΩ) | 485.777 | 200.712 | 126.214 | 91.902 | 72.168 | 59.348 | 50.351 | 43.689 | 38.557 | 34.482 |

AME25-12S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Vout (VDC) | 11.880 | 11.760 | 11.640 | 11.520 | 11.400 | 11.280 | 11.160 | 11.040 | 10.920 | 10.800 |
| Rt down (KΩ) | 1187.734 | 717.345 | 509.879 | 393.046 | 318.102 | 265.944 | 227.552 | 198.111 | 174.817 | 155.927 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 12.120 | 12.240 | 12.360 | 12.480 | 12.600 | 12.720 | 12.840 | 12.960 | 13.080 | 13.200 |
| Rt up (KΩ) | 1184.255 | 350.655 | 205.454 | 145.120 | 112.075 | 91.219 | 76.859 | 66.369 | 58.369 | 52.068 |

AME25-15S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Vout (VDC) | 14.850 | 14.700 | 14.550 | 14.400 | 14.250 | 14.100 | 13.950 | 13.800 | 13.650 | 13.500 |
| Rt down (KΩ) | 893.077 | 571.417 | 417.212 | 326.705 | 267.184 | 225.063 | 193.684 | 169.404 | 150.057 | 134.280 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 15.150 | 15.300 | 15.450 | 15.600 | 15.750 | 15.900 | 16.050 | 16.200 | 16.350 | 16.500 |
| Rt up (KΩ) | 2105.383 | 286.791 | 153.446 | 104.544 | 79.162 | 63.621 | 53.128 | 45.566 | 39.858 | 35.397 |

AME25-24S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Vout (VDC) | 23.760 | 23.520 | 23.280 | 23.040 | 22.800 | 22.560 | 22.320 | 22.080 | 21.840 | 21.600 |
| Rt down (KΩ) | 1063.929 | 700.514 | 518.971 | 410.098 | 337.538 | 285.720 | 246.862 | 216.643 | 192.470 | 172.694 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 24.240 | 24.480 | 24.720 | 24.960 | 25.200 | 25.440 | 25.680 | 25.920 | 26.160 | 26.400 |
| Rt up (KΩ) | 68999.000 | 248.097 | 123.774 | 82.233 | 61.443 | 48.964 | 40.642 | 34.696 | 30.236 | 26.767 |

AME25-48S277PEVZ

| Trim down % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Vout (VDC) | 47.520 | 47.040 | 46.560 | 46.080 | 45.600 | 45.120 | 44.640 | 44.160 | 43.680 | 43.200 |
| Rt down (KΩ) | 1352.055 | 871.467 | 639.143 | 502.197 | 411.899 | 347.882 | 300.130 | 263.143 | 233.650 | 209.583 |
| Trim up % | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Vout (VDC) | 48.480 | 48.960 | 49.440 | 49.920 | 50.400 | 50.880 | 51.360 | 51.840 | 52.320 | 52.800 |
| Rt up (KΩ) | 1094.199 | 123.623 | 65.071 | 43.951 | 33.063 | 26.421 | 21.946 | 18.727 | 16.300 | 14.405 |

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