

# AMR4 SERIES

AC - DC DIN RAIL MOUNTABLE POWER SUPPLY  
INDUSTRIAL CONTROL EQUIPMENT



## FEATURES

- UNIVERSAL INPUT 90~264VAC
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- LOW PROFILE FOR BUILDING AUTOMATION
- 3 YEARS WARRANTY



## MODEL LIST

| MODEL NO.                   | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) |
|-----------------------------|---------------|----------------|----------------|----------------|-------------|-------------|
| <b>Single Output Models</b> |               |                |                |                |             |             |
| AMR4-05                     | 90~264 VAC    | 35 WATTS       | + 5 VDC        | 7000 mA        | 78%         | 80%         |
| AMR4-12                     | 90~264 VAC    | 54 WATTS       | + 12 VDC       | 4500 mA        | 82%         | 84%         |
| AMR4-15                     | 90~264 VAC    | 60 WATTS       | + 15 VDC       | 4000 mA        | 83%         | 85%         |
| AMR4-24                     | 90~264 VAC    | 60 WATTS       | + 24 VDC       | 2500 mA        | 84%         | 86%         |

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

| GENERAL                       |   |                   |         |        |           |  |
|-------------------------------|---|-------------------|---------|--------|-----------|--|
| Characteristics               | Conditions                                      | min.              | typ.    | max.   | unit      |  |
| Switching frequency           | Vi nom, Io nom                                  | 45                |         | 55     | KHz       |  |
| Isolation voltage             | Input-Output                                    | 3,000/4,242       |         |        | VAC / VDC |  |
| Isolation resistance          | Input-Output, @ 500VDC                          | 100               |         |        | MΩ        |  |
| Ambient temperature           | Operating at Vi nom                             | -40               |         | + 71   | °C        |  |
| Derating (see derating curve) | Vi nom, from +56°C to +71°C                     |                   |         | 2.5    | % / °C    |  |
| Storage temperature           | Non operational                                 | -40               |         | + 85   | °C        |  |
| Relative humidity             | Vi nom, Io nom                                  | 20                |         | 95     | % RH      |  |
| Temperature coefficient       | Vi nom, Io min                                  |                   |         | ± 0.03 | % / °C    |  |
| MTBF                          | Bellcore Issue 6 @40°C, GB                      | 5V                | 672,000 |        | Hours     |  |
|                               |   | 12V               | 647,000 |        | Hours     |  |
|                               |   | 15V               | 650,000 |        | Hours     |  |
|                               |   | 24V               | 662,000 |        | Hours     |  |
| Altitude during operation     | EN 62368-1                                      |                   |         | 5,000  | m         |  |
| Dimension                     |   | L91 x W71 x D56.5 |         |        | mm        |  |
| Cooling                       | Free air convection                             |                   |         |        |           |  |
| Installation position         | Vertical ( other direction may derating using ) |                   |         |        |           |  |
| Pollution degree              |   | 2                 |         |        |           |  |

## INPUT SPECIFICATIONS

| Characteristics           | Conditions                  | min.          | typ.       | max.    | unit |
|---------------------------|-----------------------------|---------------|------------|---------|------|
| Rated input voltage       | Io nom                      | 100           |            | 240     | VAC  |
| Absolute input max. range | Ta min ... Ta max, Io nom   | AC in         | 90         | 264     | VAC  |
|                           |                             | DC in         | 120        | 375     | VDC  |
| Input current             | Vi : 115 / 230 VAC, Io nom  | 5V            | 0.7 / 0.43 |         | A    |
|                           |                             | 12V, 15V, 24V | 1.1 / 0.6  |         | A    |
| Rated input current       | Vi : 90 VAC, Io nom         | 5V            |            | 1.0     | A    |
|                           |                             | 12V, 15V, 24V |            | 1.5     | A    |
| Line frequency            | Vi nom, Io nom              | 47            |            | 63      | Hz   |
| Inrush current            | Vi : 115 / 230 VAC , Io nom |               |            | 30 / 60 | A    |
| Power dissipation         | Vi : 230 VAC, Io nom        | 5V            | 8.8        |         | W    |
|                           |                             | 12V           | 10.2       |         | W    |



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### INPUT SPECIFICATIONS

| Characteristics   | Conditions           |     | min. | typ. | max. | unit |
|-------------------|----------------------|-----|------|------|------|------|
| Power dissipation | Vi : 230 VAC, Io nom | 15V |      | 10   |      | W    |
|                   |                      | 24V |      | 9.9  |      | W    |
| Leakage current   | Input-Output         |     |      |      | 0.25 | mA   |

### OUTPUT SPECIFICATIONS

| Characteristics                                     | Conditions                    |                    | min.   | typ. | max.  | unit |
|---|-------------------------------|--------------------|--|------|-------|------|
| Output voltage accuracy (Adjusted before shipment)  | Vi nom, Io max                |                    | 0  |      | + 1   | %    |
| Minimum load  | Vi nom                        |                    | 0  |      |       | %    |
| Line regulation                                     | Io nom, Vi min ...Vi max      |                    |  |      | ± 1   | %    |
| Load regulation                                     | Vi nom, Io min ...Io nom      |                    |  |      | ± 1   | %    |
| Voltage trim range                                  | Vi nom,<br>0.8 Io nom         | 5V                 | 5  |      | 5.5   | VDC  |
|   |                               | 12V                | 12   |      | 14    | VDC  |
|   |                               | 15V                | 13.5   |      | 16.5  | VDC  |
|   |                               | 24V                | 24   |      | 28    | VDC  |
| Rated continuous loading                            | Vi nom,                       | 5V                 | 7A @ 5VDC / 6.3A @ 5.5VDC                          |      |       |      |
|   |                               | 12V                | 4.5A @ 12VDC / 3.8A @ 14VDC                        |      |       |      |
|   |                               | 15V                | 4A @ 15VDC / 3.6A @ 16.5VDC                        |      |       |      |
|   |                               | 24V                | 2.5A @ 24VDC / 2.1A @ 28VDC                        |      |       |      |
| Hold up time  | Vi : 115 / 230 VAC,<br>Io nom | 5V, 12V            | 16 / 60  |      |       | ms   |
|   |                               | 15V, 24V           | 12 / 60  |      |       | ms   |
| Turn on time  | Vi nom, Io nom                |                    |  |      | 1,000 | ms   |
| Rise time   | Vi nom, Io nom                | → with 3500 μF CAP |  |      | 1,500 | ms   |
|   | Vi nom, Io nom                | → with 3500 μF CAP |  |      | 500   | ms   |
| Fall time   | Vi nom, Io nom                |                    |  |      | 150   | ms   |
| Transient recovery time                             | Vi nom, I ~ 0.5 Io nom        |                    |  |      | 2     | ms   |
| Ripple & noise                                      | Vi nom, Io nom, BW = 20MHz    |                    |  |      | 50    | mV   |
| Power back immunity                                 | Vi nom, Io nom                | 5V                 | 7.5  |      |       | VDC  |
|   |                               | 12V                | 18   |      |       | VDC  |
|   |                               | 15V                | 22   |      |       | VDC  |
|   |                               | 24V                | 35   |      |       | VDC  |
| Capacitor load                                      | Vi nom, Io nom                |                    |  |      | 3,500 | μF   |
| DC ON indicator threshold at start up (Green LED)   | Vi nom, Io nom                | 5V                 | 3.5  |      | 4.5   | VDC  |
|   |                               | 12V                | 9  |      | 10.8  | VDC  |
|   |                               | 15V                | 11   |      | 13.5  | VDC  |
|   |                               | 24V                | 19.2   |      | 21.6  | VDC  |
| DC LOW indicator threshold after start up (Red LED) | Vi nom, Io nom                | 5V                 | 3.5  |      | 4.5   | VDC  |
|   |                               | 12V                | 9  |      | 10.8  | VDC  |
|   |                               | 15V                | 11   |      | 13.5  | VDC  |
|   |                               | 24V                | 19.2   |      | 21.6  | VDC  |
| Efficiency  | Vi nom, Io nom, Po / Pi       |                    | Up to 86%, See model list and typ efficiency curve |      |       |      |

### CONTROL AND PROTECTION

| Characteristics                   | Conditions                             |     | min.                  | typ. | max. | unit |
|-----------------------------------|--|-----|-----------------------|------|------|------|
| Input fuse                        |  |     | T2A / 250VAC internal |      |      |      |
| Internal surge voltage protection | IEC 61000-4-5                          |     | Varistor              |      |      |      |
| Rated over load protection        | Vi nom (see typ current limited curve) |     | 110                   |      | 150  | %    |
| Over voltage protection           | Vi nom, Io nom<br>(Auto Recovery)      | 5V  | 5.75                  |      | 6.5  | VDC  |
|                                   |  | 12V | 15                    |      | 16.5 | VDC  |
|                                   |  | 15V | 18                    |      | 20   | VDC  |
|                                   |  | 24V | 30                    |      | 33   | VDC  |
| Output short circuit              |  |     | Fold forward          |      |      |      |
| Degree of protection              |  |     | IP20                  |      |      |      |

## SPECIFICATION

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### APPROVALS AND STANDARDS

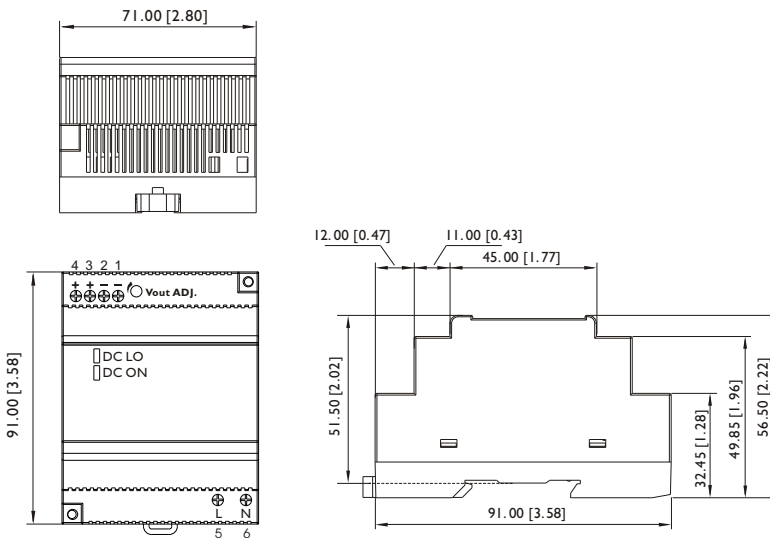
|                      |  |
|----------------------|--|
| UL / cUL             | UL 508 Listed<br>UL 60950-1, UL 1310 Class 2 Power (only 5V w/o Class 2) Recognized<br>ISA 12.12.01(Class I, Division 2, Groups A, B, C and D)   |
| TUV                  | EN 62368-1   |
| cTUVus               | UL 62368-1   |
| CE                   | EN 61000-6-3, EN 55032 Class B, EN 61000-3-2, EN 61000-3-3<br>EN 61000-6-2, EN 55024, EN 61000-4-2 Level 4, EN 61000-4-3 Level 3<br>EN 61000-4-4 Level 4, EN 61000-4-5 L-N Level 3<br>EN 61000-4-6 Level 3, EN 61000-4-8 Level 4, EN 61000-4-11<br>ENV 50204 Level 2, EN 61204-3 |
| Vibration resistance | meet IEC 60068-2-6 (Mounting on rail : 10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)   |
| Shock resistance     | meet IEC 60068-2-27 (15G, 11ms, 3 Axis, 6 Faces, 3 times for each Face)  |

### PHYSICAL CHARACTERISTICS

|               |  |
|---------------|--|
| Case size     | 91 x 71 x 56.5 mm (3.58 x 2.8 x 2.22 inches) |
| Case material | Plastic                                      |
| Weight        | 250g   |
| Packing       | 0.31kg ; 48pcs / 16kg / 2.28CUFT             |

### MECHANISM & PIN CONFIGURATION

mm [inch]



#### CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail; no tools required even to remove

#### INSTALLATION

Ventilation / Cooling  
Normal convection  
All sides 25mm free space  
For cooling recommended  
Connector size range  
AWG24-12 (0.2~2.5mm<sup>2</sup>) flexible / solid cable  
-Connector can withstand torque at maximum 6 pound-inches.  
7m/m stripping at cable end recommends.  
Use copper conductors only, 60/75 °C

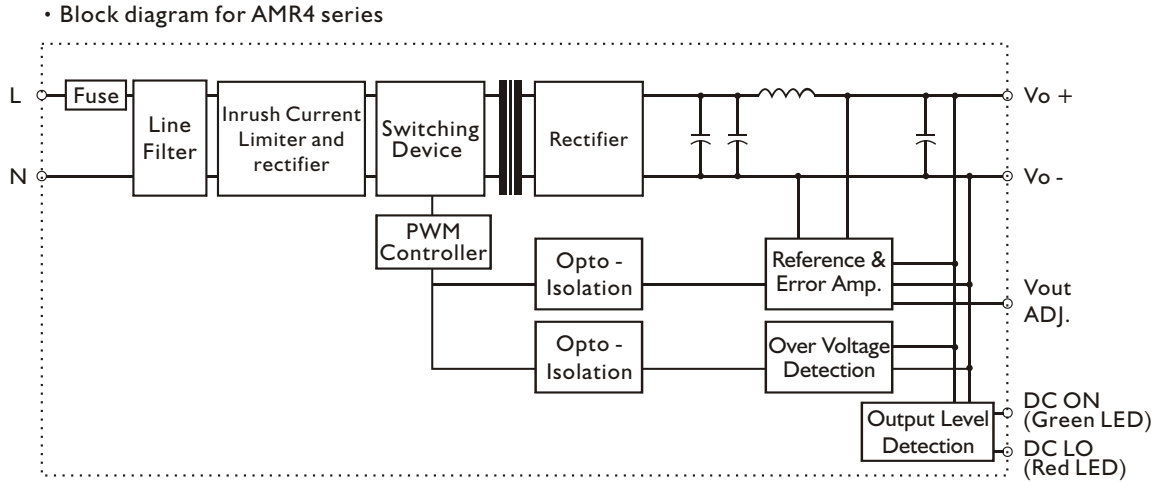
#### GENERAL TOLERANCE

|                            |             |
|----------------------------|-------------|
| 0.00[0.00] - 30.00[1.18]   | ±0.30[0.01] |
| 30.00[1.18] - 120.00[4.72] | ±0.50[0.02] |

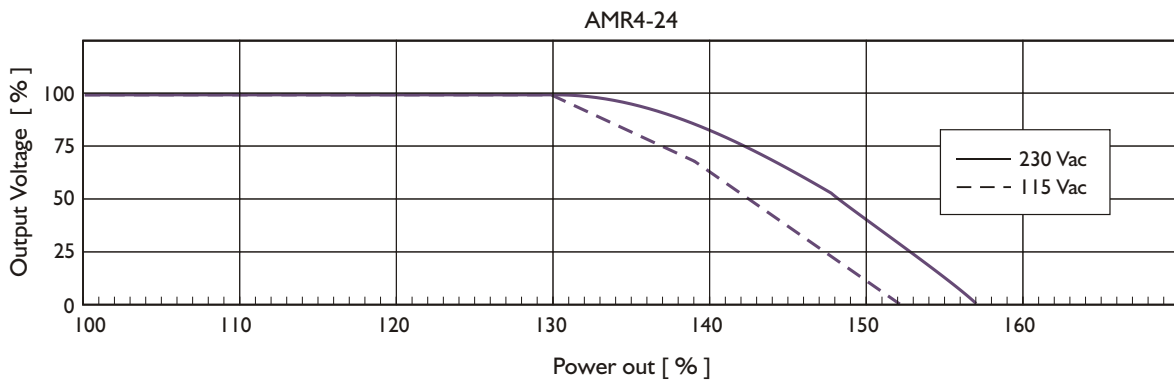
### PIN ASSIGNMENT

| PIN NO. | Designation | Description  |
|---------|-------------|--|
| 1, 2    | OUT         | - Negative output terminal                                     |
| 3, 4    |             | + Positive output terminal                                     |
| 5       | IN          | L Input terminals (phase conductor, no polarity at DC input)   |
| 6       |             | N Input terminals (neutral conductor, no polarity at DC input) |
|         | OTHER       | Vout ADJ. Trimmer-potentiometer for Vout adjustment            |
|         |             | DC ON Operation indicator LED                                  |
|         |             | DC LO DC Low indicator LED                                     |

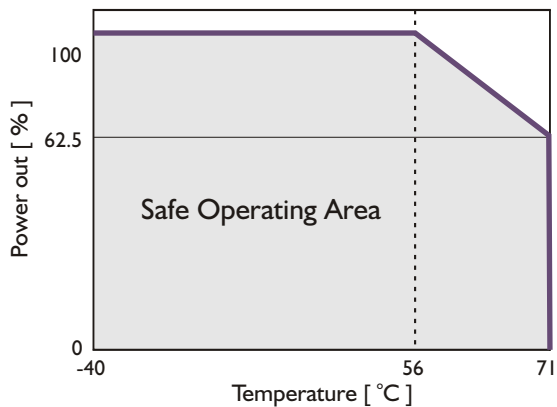
## CIRCUIT SCHEMATIC



## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



## TYP. EFFICIENCY CURVE

