

# AMRI 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.) |
|----------------------|---------------|----------------|----------------|----------------|-------------|-------------|
| Single Output Models |               |                |                |                |             |             |
| AMRI-05              | 90~264 VAC    | 7.5 WATTS      | + 5 VDC        | 1500 mA        | 72%         | 74%         |
| AMRI-12              | 90~264 VAC    | 10 WATTS       | + 12 VDC       | 830 mA         | 76%         | 78%         |
| AMRI-15              | 90~264 VAC    | 10 WATTS       | + 15 VDC       | 670 mA         | 76%         | 78%         |
| AMRI-24              | 90~264 VAC    | 10 WATTS       | + 24 VDC       | 420 mA         | 78%         | 80%         |

## 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                                  |     | 80                |         | 90     | 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 +61°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  |                   | 970,000 |        | Hours     |
|                               |                                                 | 12V |                   | 884,000 |        | Hours     |
|                               |                                                 | 15V |                   | 948,000 |        | Hours     |
|                               |                                                 | 24V |                   | 868,000 |        | Hours     |
| Altitude during operation     | IEC 60068-2-13                                  |     |                   |         | 4,850  | m         |
| Dimension                     |                                                 |     | L91 x W18 x D56.5 |         |        | mm        |
| Cooling                       | Free air convection                             |     |                   |         |        |           |
| Installation position         | Vertical ( other direction may derating using ) |     |                   |         |        |           |
| Pollution degree              |                                                 |     | 2                 |         |        |           |

## SPECIFICATION

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

### INPUT SPECIFICATIONS

| Characteristics           | Conditions                   |       | min. | typ.      | max.    | unit |
|---------------------------|------------------------------|-------|------|-----------|---------|------|
| Rated input voltage       | Io nom                       |       | 100  |           | 240     | VAC  |
| Absolute input max. range | Ta min ... Ta max,<br>Io nom | AC in | 90   |           | 264     | VAC  |
|                           |                              | DC in | 120  |           | 375     | VDC  |
| Input current             | Vi : 115 / 230 VAC, Io nom   |       |      | 200 / 135 |         | mA   |
| Rated input current       | Vi : 90 VAC, Io nom          |       |      |           | 300     | mA   |
| Line frequency            | Vi nom, Io nom               |       | 47   |           | 63      | Hz   |
| Inrush current            | Vi : 115 / 230 VAC, Io nom   |       |      |           | 15 / 30 | A    |
| Power dissipation         | Vi : 230 VAC, Io nom         | 5V    |      | 2.3       |         | W    |
|                           |                              | 12V   |      | 2.3       |         | W    |
|                           |                              | 15V   |      | 2.3       |         | W    |
|                           |                              | 24V   |      | 2.3       |         | W    |
| Leakage current           | Input-Output                 |       |      |           | 0.25    | mA   |

### OUTPUT SPECIFICATIONS

| Characteristics                                        | Conditions                             |     | min.                                               | typ. | max.  | unit    |
|--------------------------------------------------------|----------------------------------------|-----|----------------------------------------------------|------|-------|---------|
| Output voltage accuracy<br>(Adjusted before shipment)  | Vi nom, Io max                         |     |                                                    |      | ± 1   | %       |
| Minimum load                                           | Vi nom                                 |     | 0                                                  |      |       | %       |
| Line regulation                                        | Io nom, Vi min ... Vi max              |     |                                                    |      | ± 1   | %       |
| Load regulation                                        | Vi nom, Io min ... Io nom              |     |                                                    |      | ± 1   | %       |
| Hold up time                                           | Vi : 115 / 230 VAC, Io nom             |     | 10 / 30                                            |      |       | ms      |
| Turn on time                                           | Vi nom, Io nom                         |     |                                                    |      | 1,000 | ms      |
|                                                        | Vi nom, Io nom → with 3500 $\mu$ F CAP |     |                                                    |      | 1,500 | ms      |
|                                                        | Vi nom, Io nom → with 3500 $\mu$ F CAP |     |                                                    |      | 500   | ms      |
| Rise time                                              | Vi nom, Io nom                         |     |                                                    |      | 150   | 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 | $\mu$ F |
| DC ON indicator threshold<br>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<br>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 80%, See model list and typ efficiency curve |      |       |         |

### CONTROL AND PROTECTION

| Characteristics                   | Conditions                             |     | min.                  | typ. | max. | unit |
|-----------------------------------|----------------------------------------|-----|-----------------------|------|------|------|
| Input fuse                        |                                        |     | T1A / 250VAC internal |      |      |      |
| Internal surge voltage protection | IEC 61000-4-5                          |     | Varistor              |      |      |      |
| Rated over load protection        | Vi nom (see typ current limited curve) |     | 110                   |      | 165  | %    |
| 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

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

## APPROVALS AND STANDARDS

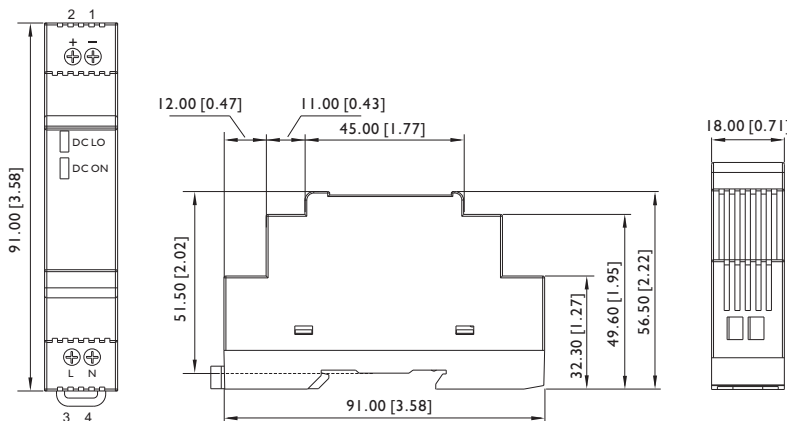
|                      |                                                                                                                                                                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UL / cUL             | UL 508 Listed<br>UL 60950-1, UL 1310 Class 2 Power Recognized<br>ISA 12.12.01(Class I, Division 2, Groups A, B, C and D)                                                                                                                                                         |
| TUV                  | EN 60950-1                                                                                                                                                                                                                                                                       |
| CE                   | EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3<br>EN 61000-6-2, EN 55024, EN 61000-4-2 Level 3, 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 by 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 18 x 56.5 mm (3.58 x 0.71 x 2.22 inches) |
| Case material | Plastic                                       |
| Weight        | 65g                                           |
| Packing       | 0.11kg ; 120pcs / 14.5kg / 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  
AWG26-12 (0.2~2.5mm<sup>2</sup>) flexible / solid cable  
-Connector can withstand torque at maximum 5 pound-inches.  
4~5mm stripping at cable end recommends.  
Use copper conductors only, 60/75 °C

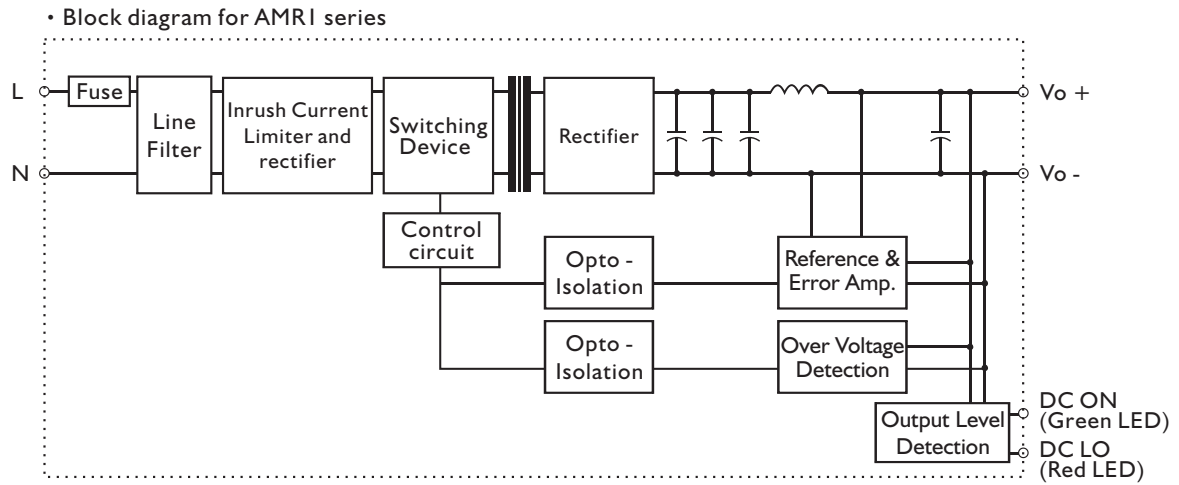
### GENERAL TOLERANCE

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

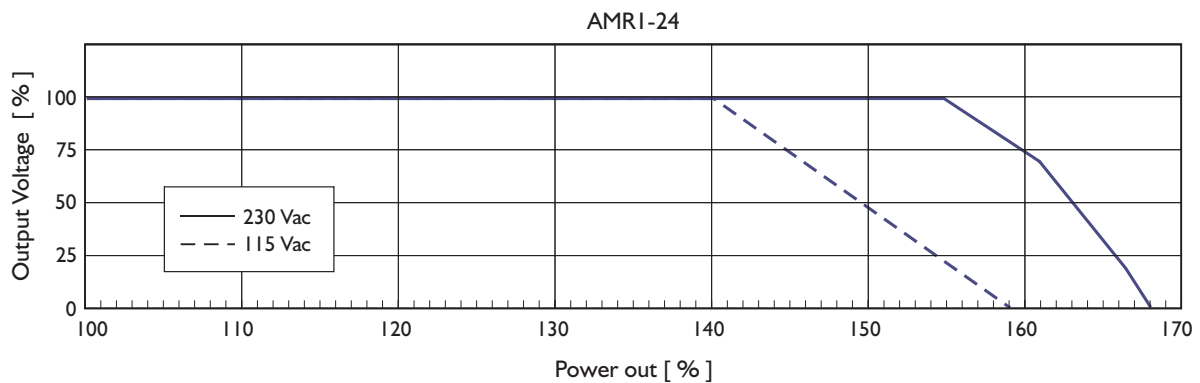
## PIN ASSIGNMENT

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

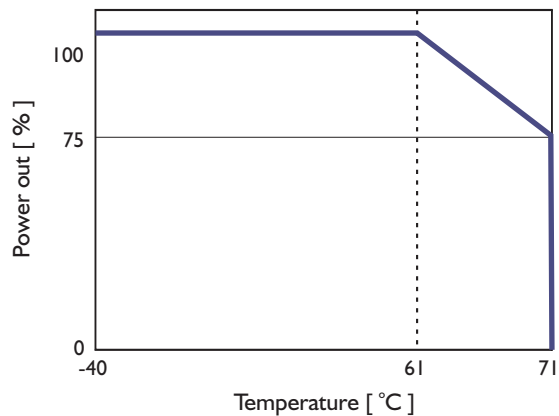
## CIRCUIT SCHEMATIC



## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



## TYP. EFFICIENCY CURVE

