

# DRAN60 SERIES



AC - DC DIN RAIL MOUNTABLE  
60W CLASS 2 OUTPUT  
INDUSTRIAL CONTROL EQUIPMENT

## FEATURES

- AC/DC POWER MODULE
- UNIVERSAL INPUT 85~264VAC
- HIGH EFFICIENCY UP TO 89%
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 2 YEARS WARRANTY

## MODEL LIST

| MODEL NO.                   | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (typ.) | EFF. (min.) |
|-----------------------------|---------------|----------------|----------------|----------------|-------------|-------------|
| <b>Single Output Models</b> |               |                |                |                |             |             |
| DRAN60-05                   | 85~264 VAC    | 50 WATTS       | + 5 VDC        | 10000 mA       | 79%         | 77%         |
| DRAN60-12                   | 85~264 VAC    | 60 WATTS       | + 12 VDC       | 5000 mA        | 86%         | 84%         |
| DRAN60-24                   | 85~264 VAC    | 60 WATTS       | + 24 VDC       | 2500 mA        | 89%         | 86%         |
| DRAN60-48                   | 85~264 VAC    | 60 WATTS       | + 48 VDC       | 1250 mA        | 89%         | 86%         |

## SPECIFICATION

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

| GENERAL              |                             |             |      |      |        |     |
|----------------------|-----------------------------|-------------|------|------|--------|-----|
| Characteristics      | Conditions                  | min.        | typ. | max. | unit   |     |
| Isolation voltage    | Input / Output              | 3,000       |      |      | VAC    |     |
| Isolation resistance | Input / Output, @ 500VDC    | 100         |      |      | MΩ     |     |
| Ambient temperature  | Operating at Vi nom         | -10         |      | + 71 | °C     |     |
| Derating             | Vi nom, from +61°C to +71°C |             |      | 2.5  | % / °C |     |
| Storage temperature  | Non operational             | -25         |      | + 85 | °C     |     |
| Relative humidity    | Vi nom, Io nom              | 20          |      | 90   | % RH   |     |
| Dimension            | L90 x W40.5 x D115          |             |      |      | mm     |     |
| Cooling              | Free air convection         |             |      |      |        |     |
| Case material        | Plastic                     |             |      |      |        |     |
| INPUT SPECIFICATIONS |                             |             |      |      |        |     |
| Characteristics      | Conditions                  | min.        | typ. | max. | unit   |     |
| Rated input voltage  | Io nom                      | 100         |      | 240  | VAC    |     |
| Input voltage range  | Ta min ... Ta max, Io nom   | AC in       |      | 264  | VAC    |     |
|                      |                             | DC in       | 90   |      | 375    | VDC |
| Line frequency       | Vi nom, Io nom              | 47          |      | 63   | Hz     |     |
| Inrush current       | Io nom                      | Vi : 115VAC |      | 30   | A      |     |
|                      |                             | Vi : 230VAC |      | 60   | A      |     |

### SPECIFICATION

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

#### OUTPUT SPECIFICATIONS

| Characteristics                       | Conditions  |             | min.                       | typ. | max.  | unit |
|---------------------------------------|---|-------------|----------------------------|------|-------|------|
| Output voltage accuracy               | Vi nom, Io min ...Io nom                            |             |                            |      | ± 1   | %    |
| Minimum load                          | Vi nom  |             | 0                          |      |       | %    |
| Line regulation                       | Io nom, Vi min ...Vi max                            |             |                            |      | 0.5   | %    |
| Load regulation                       | Vi nom, Io min ...Io nom                            |             |                            |      | 0.5   | %    |
| Turn on time                          | After AC is applied to input at full resistive load |             |                            |      | 1,000 | ms   |
| Voltage fall time                     | Io nom, Vo=95% ~ 10% rated voltage                  |             |                            |      | 150   | ms   |
| Voltage rise time                     | At full resistive load                              |             |                            |      | 150   | ms   |
| Hold up time                          | Io nom  | Vi : 115VAC | 20                         |      |       | ms   |
|                                       |   | Vi : 230VAC | 30                         |      |       | ms   |
| Ripple & noise                        | Vi nom, Io nom, BW = 20MHz                          |             |                            |      | 50    | mV   |
| Voltage trim range                    | Vi nom, Wo = 50W max                                | 5V model    | 5                          |      | 5.5   | VDC  |
|                                       | Vi nom, Wo = 60W max                                | 12V model   | 12                         |      | 14    | VDC  |
|                                       | Vi nom, Wo = 60W max                                | 24V model   | 24                         |      | 28    | VDC  |
|                                       | Vi nom, Wo = 60W max                                | 48V model   | 48                         |      | 55    | VDC  |
| DC ON indicator threshold at start up | Vi nom, Io nom                                      | 5V model    | 4                          |      |       | VDC  |
|                                       |   | 12V model   | 9.6                        |      |       | VDC  |
|                                       |   | 24V model   | 19.2                       |      |       | VDC  |
|                                       |   | 48V model   | 37                         |      |       | VDC  |
| Efficiency                            | Vi nom, Io nom, Po / Pi                             |             | Up to 89% , see model list |      |       |      |

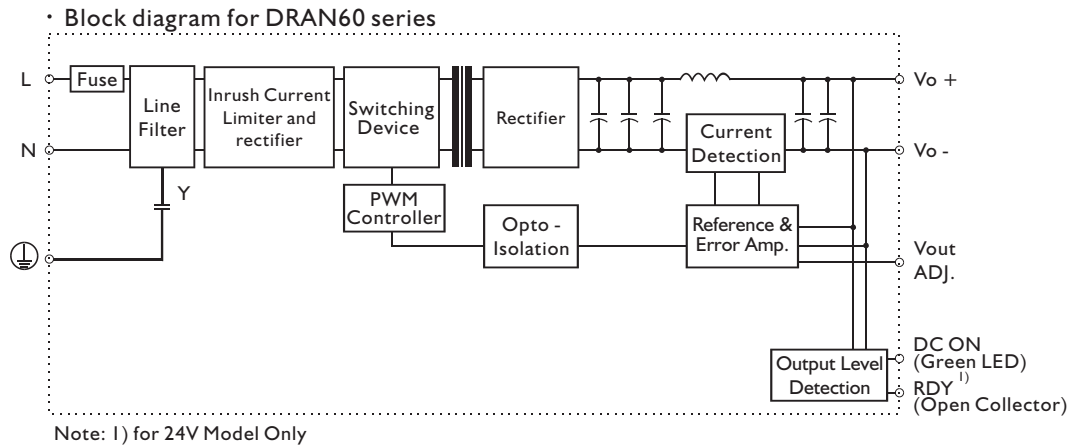
#### CONTROL AND PROTECTION

| Characteristics            | Conditions     |           | min.         | typ. | max. | unit |
|----------------------------|----------------|-----------|--------------|------|------|------|
| Rated over load protection | Vi nom         |           | 110          |      | 150  | %    |
| Over voltage protection    | Vi nom, Io nom | 5V model  | 6.0          |      | 6.8  | VDC  |
|                            |                | 12V model | 15           |      | 16.5 | VDC  |
|                            |                | 24V model | 30           |      | 33   | VDC  |
|                            |                | 48V model | 60           |      | 66   | VDC  |
| Output short circuit       | Vi nom, Io nom |           | Fold forward |      |      |      |

#### APPROVALS AND STANDARDS

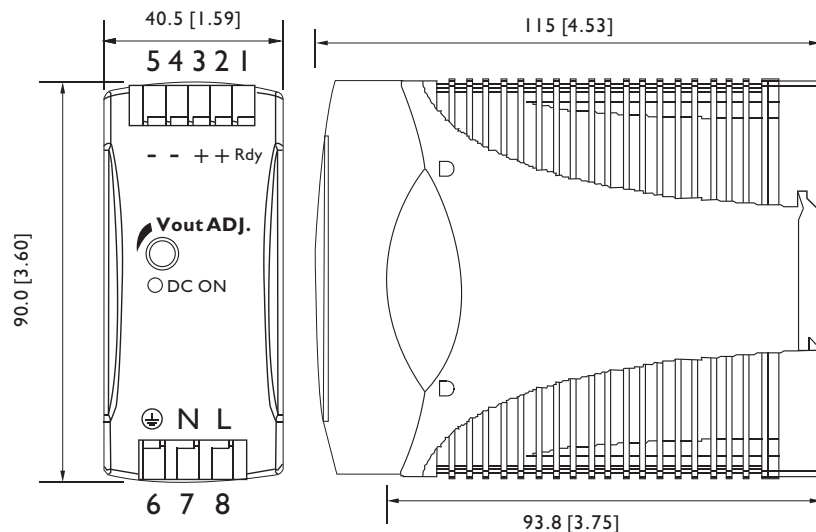
|          |   |
|----------|---|
| UL / cUL | UL508 Listed<br>UL1310 Class 2 power supply (5V, 12V w/o class 2), UL60950-1 Recognized   |
| TUV      | EN60950-1   |
| CE       | EN61000-6-3, EN55022 Class B<br>EN61000-3-2, EN61000-3-3<br>EN61000-6-2, EN55024, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5,<br>EN61000-4-6, EN61000-4-8, EN61000-4-11 |

## CIRCUIT SCHEMATIC



## 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  
 Solid: 0.2-2.0mm<sup>2</sup> (AWG24-14)  
 (use copper conductors only)

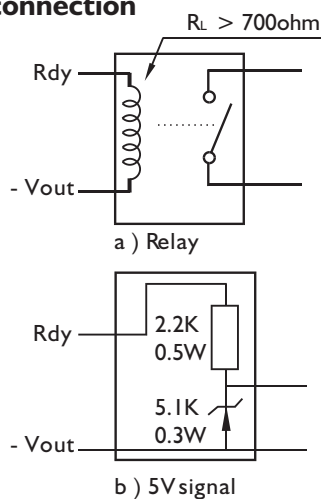
## PHYSICAL CHARACTERISTICS

|               |   |
|---------------|---|
| CASE SIZE     | 90 x 40.5 x 115 mm 3.6 x 1.59 x 4.53 inches |
| CASE MATERIAL | Plastic                                     |
| WEIGHT        | 360g  |

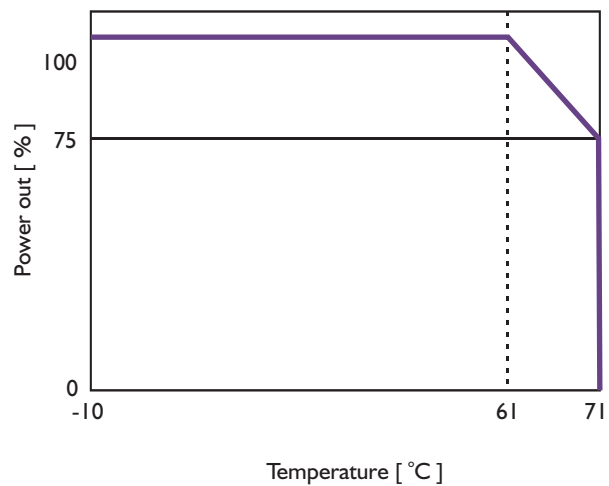
## PIN ASSIGNMENT

| PIN NO. | Designation | Description  |
|---------|-------------|--|
| 1       | RDY         | DC OK output for relay (not connect except 24V model)        |
| 2       | +           | Positive output terminal                                     |
| 3       | +           | Positive output terminal                                     |
| 4       | -           | Negative output terminal                                     |
| 5       | -           | Negative output terminal                                     |
| 6       | ⊕           | Ground this terminal to minimize high-frequency emissions    |
| 7       | N           | Input terminals (neutral conductor, no polarity at DC input) |
| 8       | L           | Input terminals (phase conductor, no polarity at DC input)   |
|         | Vout ADJ.   | Trimmer-potentiometer for Vout adjustment                    |
|         | DC ON       | Operation indicator LED                                      |

Fig. 1 Rdy connection



## DERATING



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| DRAN60-12A                  | 85~264 VAC    | 60 WATTS       | + 12 VDC       | 5000 mA        | 86%         | 84%         |
| DRAN60-24A                  | 85~264 VAC    | 60 WATTS       | + 24 VDC       | 2500 mA        | 89%         | 86%         |
| DRAN60-48A                  | 85~264 VAC    | 60 WATTS       | + 48 VDC       | 1250 mA        | 89%         | 86%         |

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| Isolation voltage    | Input / Output              | 3,000       |      |      | VAC    |  |
| Isolation resistance | Input / Output, @ 500VDC    | 100         |      |      | MΩ     |  |
| Ambient temperature  | Operating at Vi nom         | -10         |      | + 71 | °C     |  |
| Derating             | Vi nom, from +61°C to +71°C |             |      | 2.5  | % / °C |  |
| Storage temperature  | Non operational             | -25         |      | + 85 | °C     |  |
| Relative humidity    | Vi nom, lo nom              | 20          |      | 90   | % RH   |  |
| Dimension            | L90 x W40.5 x D115          |             |      |      | mm     |  |
| Cooling              | Free air convection         |             |      |      |        |  |
| Case material        | Plastic                     |             |      |      |        |  |
| INPUT SPECIFICATIONS |                             |             |      |      |        |  |
| Characteristics      | Conditions                  | min.        | typ. | max. | unit   |  |
| Rated input voltage  | Io nom                      | 100         |      | 240  | VAC    |  |
| Input voltage range  | Ta min ... Ta max, Io nom   | AC in       | 85   | 264  | VAC    |  |
|                      |                             | DC in       | 90   | 375  | VDC    |  |
| Line frequency       | Vi nom, lo nom              | 47          |      | 63   | Hz     |  |
| Inrush current       | Io nom                      | Vi : 115VAC |      | 30   | A      |  |
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| Characteristics                       | Conditions  | min.                       | typ. | max.  | unit |
|---------------------------------------|---|----------------------------|------|-------|------|
| Output voltage accuracy               | Vi nom, Io min ...Io nom                            |                            |      | ± 1   | %    |
| Minimum load                          | Vi nom  | 0                          |      |       | %    |
| Line regulation                       | Io nom, Vi min ...Vi max                            |                            |      | 0.5   | %    |
| Load regulation                       | Vi nom, Io min ...Io nom                            |                            |      | 0.5   | %    |
| Turn on time                          | After AC is applied to input at full resistive load |                            |      | 1,000 | ms   |
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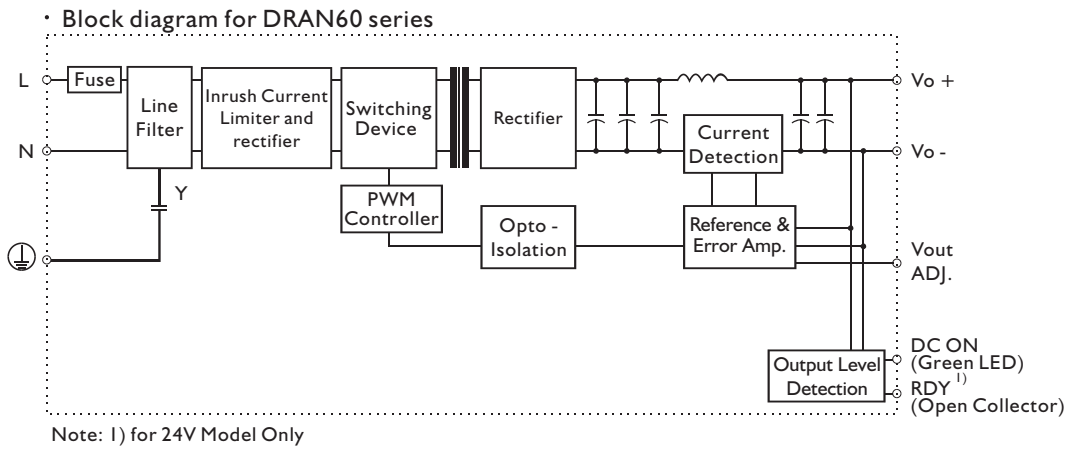
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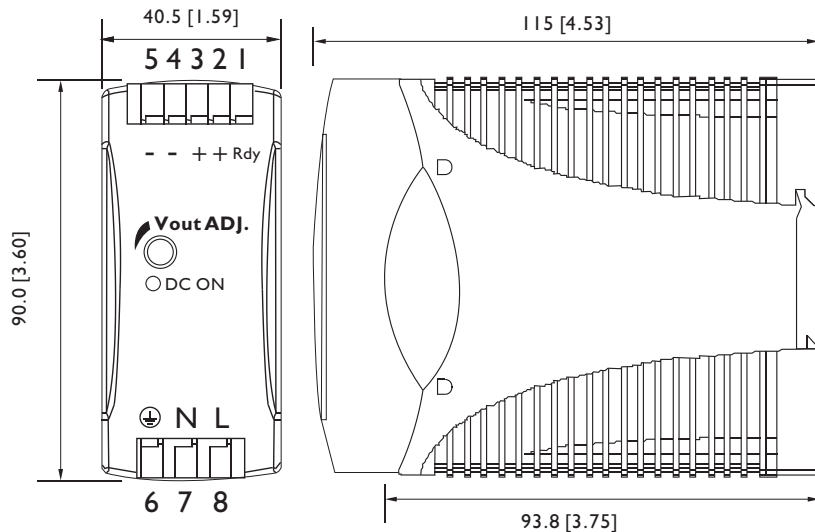
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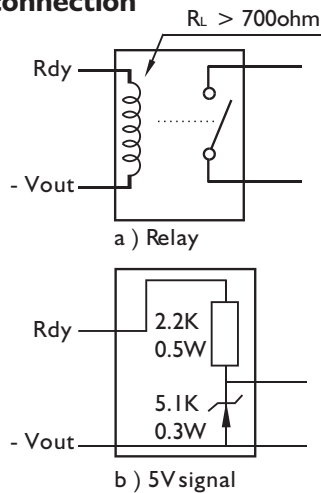
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