

# DRA480 SERIES



AC - DC DIN RAIL MOUNTABLE POWER SUPPLY  
INDUSTRIAL CONTROL EQUIPMENT

## FEATURES

- ACTIVE PFC FUNCTION
- PARALLEL FUNCTION (SWITCH SELECTABLE)
- UNIVERSAL INPUT VOLTAGE
- SELV COMPONENTS DESIGN
- 3 YEARS WARRANTY



## SELECTION CHART

**DRA 480 - 24 x**

Wattage

24 : 24V OUT  
48 : 48V OUT

A : SCREW TERMINAL TYPE

B : DETACHABLE CONNECTOR TYPE

## MODEL LIST

| MODEL NO.                   | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) |
|-----------------------------|---------------|----------------|----------------|----------------|-------------|-------------|
| <b>Single Output Models</b> |               |                |                |                |             |             |
| DRA480-24x                  | 90 ~ 264 VAC  | 480 WATTS      | + 24 VDC       | 20 A           | 86%         | 89%         |
| DRA480-48x                  | 90 ~ 264 VAC  | 480 WATTS      | + 48 VDC       | 10 A           | 87%         | 90%         |

## 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                                  |                          | 60      |        | KHz       |  |
| Isolation voltage             | Input-Output                                    | 3,000 / 4,242            |         |        | VAC / VDC |  |
|                               | Input-FG  | 1,500 / 2,121            |         |        | VAC / VDC |  |
|                               | Output-FG                                       | 500 / 710                |         |        | 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 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                      | 24V                      | 469,000 |        | Hours     |  |
|                               |   | 48V                      | 521,000 |        | Hours     |  |
| Altitude during operation     | EN 60950-1                                      |                          |         | 5,000  | m         |  |
| Dimension                     | Screw terminal type                             | L124.5 x W175.5 x D123.6 |         |        | mm        |  |
|                               | Detachable connector type                       | L143.5 x W175.5 x D123.6 |         |        | 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                       |       |      | 115 / 230   |         | 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   |       |      | 4.9 / 2.5   |         | A    |
| Rated input current       | Vi : 90 / 180 VAC, Io nom    |       |      |             | 7 / 3.5 | A    |
| Line frequency            | Vi nom, Io nom               |       | 47   |             | 63      | Hz   |
| Inrush current            | Vi : 115 / 230 VAC , Io nom  |       |      |             | 25 / 50 | A    |
| Power dissipation         | Vi : 230 VAC, Io nom         | 24V   |      | 63          |         | W    |
|                           |                              | 48V   |      | 60          |         | W    |
| Leakage current           | Input-Output                 |       |      |             | 0.25    | mA   |
|                           | Input-FG                     |       |      |             | 3.5     | mA   |
| PFC (Active)              | Vi : 115 / 230VAC, Io nom    |       |      | 0.99 / 0.97 |         |      |

### OUTPUT SPECIFICATIONS

| Characteristics  | Conditions                        |               | min.   | typ. | max.  | unit |
|--|-----------------------------------|---------------|--|------|-------|------|
| Output voltage accuracy<br>(Adjusted before shipment)  | Vi nom, Io max                    |               | 0  |      | + 1   | %    |
| Minimum load   | Vi nom                            |               | 0  |      |       | %    |
| Line regulation  | Io nom, Vi min ...Vi max          |               |  |      | ± 0.5 | %    |
| Load regulation  | Vi nom,<br>Io min ...Io nom       | single mode   |  |      | ± 1   | %    |
|  |                                   | parallel mode |  |      | ± 5   | %    |
| Voltage trim range                                     | Vi nom,<br>0.8 Io nom             | 24V           | 22.5   |      | 28.5  | VDC  |
|  |                                   | 48V           | 47   |      | 56    | VDC  |
| Rated continuous loading                               | Vi nom                            | 24V           | 20 A @ 24Vdc / 16.8 A @ 28.5Vdc                    |      |       |      |
|  |                                   | 48V           | 10 A @ 48Vdc / 8.5 A @ 56Vdc                       |      |       |      |
| Hold up time   | Vi : 115 / 230 VAC , Io nom       |               | 25 / 30  |      |       | ms   |
| Turn on time   | Vi nom, Io nom                    |               |  |      | 1,000 | ms   |
|  | Vi nom, Io nom → with 7000 μF CAP |               |  |      | 1,500 | ms   |
| Rise time  | Vi nom, Io nom                    |               |  |      | 150   | ms   |
|  | Vi nom, Io nom → with 7000 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        |               |  |      | 100   | mV   |
| Power back immunity                                    | Vi nom, Io nom                    | 24V           | 35   |      |       | VDC  |
|  |                                   | 48V           | 63   |      |       | VDC  |
| Capacitor load   | Vi nom, Io nom                    |               |  |      | 7,000 | μF   |
| DC ON indicator threshold<br>at start up (Green LED)   | Vi nom, Io nom                    | 24V           | 17.6   |      | 19.4  | VDC  |
|  |                                   | 48V           | 37   |      | 43    | VDC  |
| DC LOW indicator threshold<br>after start up (Red LED) | Vi nom, Io nom                    | 24V           | 17.6   |      | 19.4  | VDC  |
|  |                                   | 48V           | 37   |      | 43    | VDC  |
| Parallel operation                                     | 0.1 Io min ~ 0.9 Io max           |               |  |      | 3     | unit |
| Efficiency   | Vi nom, Io nom, Po / Pi           |               | Up to 90%, See model list and typ efficiency curve |      |       |      |

### CONTROL AND PROTECTION

| Characteristics                   | Conditions                                       |     | min.                   | typ. | max. | unit |
|-----------------------------------|--|-----|------------------------|------|------|------|
| Input fuse                        |  |     | T10A / 250VAC internal |      |      |      |
| Internal surge voltage protection | IEC 61000-4-5                                    |     | Varistor               |      |      |      |
| Rated over load protection        | Vi nom (see typ current limited curve)           |     | 110                    |      | 140  | %    |
| Power Rdy<br>(for 24V model only) | Threshold voltage of contact closed(at start up) |     | 17.6                   |      | 19.4 | VDC  |
|                                   | Electrical isolation                             |     | 500                    |      |      | VDC  |
|                                   | Contact rating at 60VDC                          |     |                        |      | 0.3  | A    |
| Over voltage protection           | Vi nom, 0.8 Io nom<br>(Auto Recovery)            | 24V | 30                     |      | 33   | V    |
|                                   |  | 48V | 60                     |      | 66   | V    |
| 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

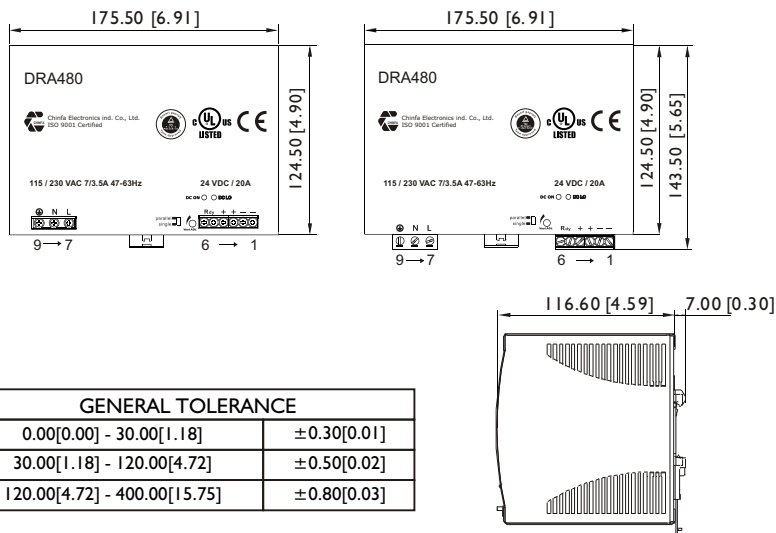
|                      |  |
|----------------------|--|
| UL / cUL             | UL 508 Listed<br>UL 60950-1 Recognized<br>ISA 12.12.01(Class I, Division 2, Groups A, B, C and D)  |
| TUV                  | EN 60950-1<br>EN 61558-1, EN 61558-2-16 (meet EN 60204-1)  |
| CE                   | EN 61000-6-3, EN 55022 Class B, EN 61000-3-2 Class D, 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, L / N-FG Level 4<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 |
| CCC                  | GB4943.1, GB9254, GB17625.1  |
| 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     | Screw terminal type       | 124.5 x 175.5 x 123.6 mm (4.9 x 6.91 x 4.87 inches)  |
|               | Detachable connector type | 143.5 x 175.5 x 123.6 mm (5.65 x 6.91 x 4.87 inches) |
| Case material |                           | Metal  |
| Weight        |                           | 1920g  |
| Packing       |                           | 2.3kg ; 8pcs / 20kg / 2.35CUFT                       |

### MECHANISM & PIN CONFIGURATION

mm [inch]



| 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] |
| 120.00[4.72] - 400.00[15.75] | ±0.80[0.03] |

#### CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

#### INSTALLATION

**Ventilation / Cooling**  
Normal convection  
All sides 25mm free space  
For cooling recommended

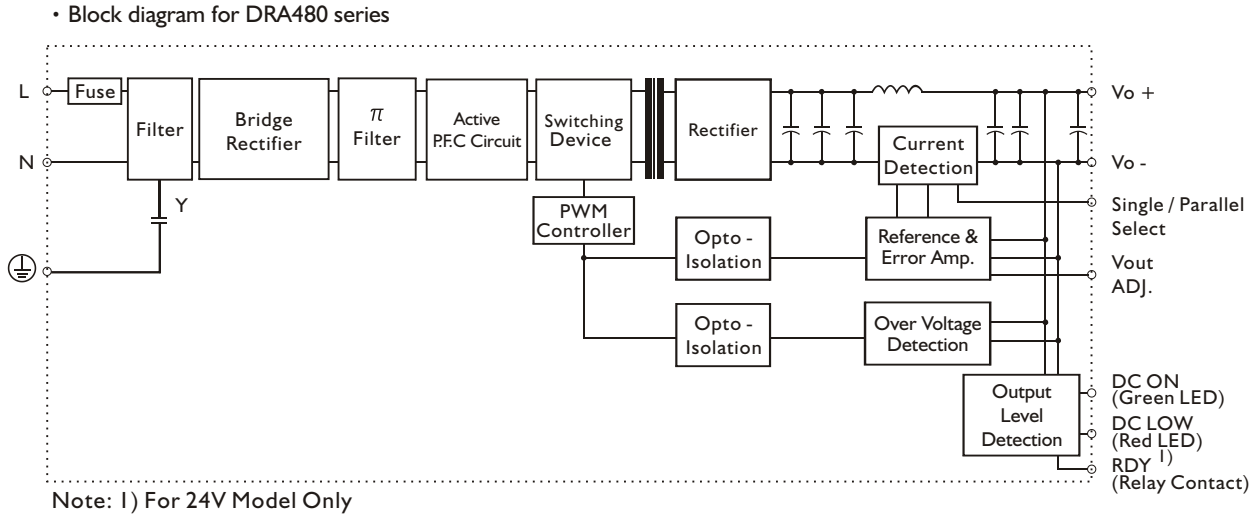
**Connector size range**  
Screw terminal:  
AWG24-10 (0.2~4mm<sup>2</sup>) flexible / solid cable,  
-Input connector can withstand torque at maximum 9 pound-inches.  
-Output connector can withstand torque at maximum 5.5 pound-inches.  
8 m/m stripping at cable end recommends

Detachable connector:  
AWG24-12 (0.2~2.5mm<sup>2</sup>) flexible / solid cable,  
-Input connector can withstand torque at maximum 4.5 pound-inches.  
-Output connector can withstand torque at maximum 7 pound-inches.  
4~5 m/m stripping at cable end recommends  
Use copper conductors only, 60 / 75°C

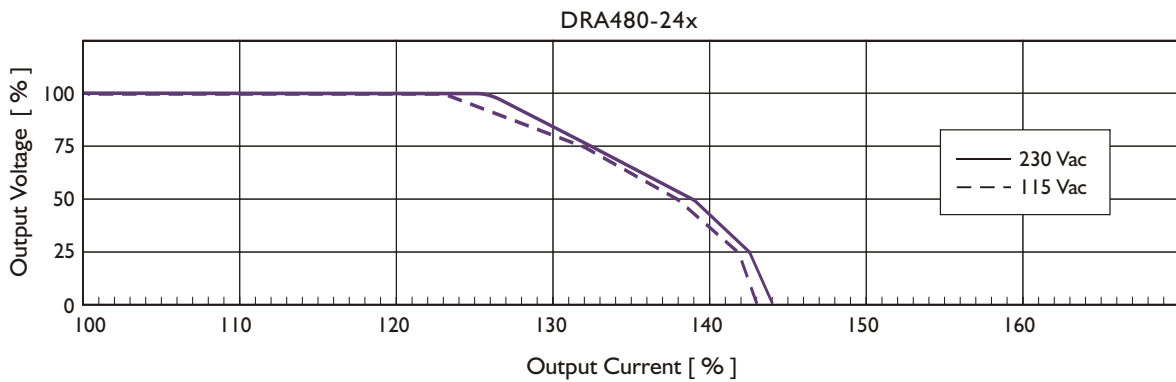
### PIN ASSIGNMENT

| PIN NO. | Designation | Description  |
|---------|-------------|--|
| 1, 2    | V -         | Negative output terminal                                     |
| 3, 4    | V +         | Positive output terminal                                     |
| 5       | RDY         | A normal open relay contact for DC ON level control          |
| 6       |             | (Never connect except 24V model)                             |
| 7       | L           | Input terminals (phase conductor, no polarity at DC input)   |
| 8       | N           | Input terminals (neutral conductor, no polarity at DC input) |
| 9       | ⊕           | Ground this terminal to minimize high-frequency emissions    |
|         | DC ON       | Operation indicator LED                                      |
|         | DC LO       | DC LOW voltage indicator LED                                 |
|         | Vout ADJ.   | Trimmer-potentiometer for Vout adjustment                    |
|         | S / P       | Single / Parallel select switch                              |

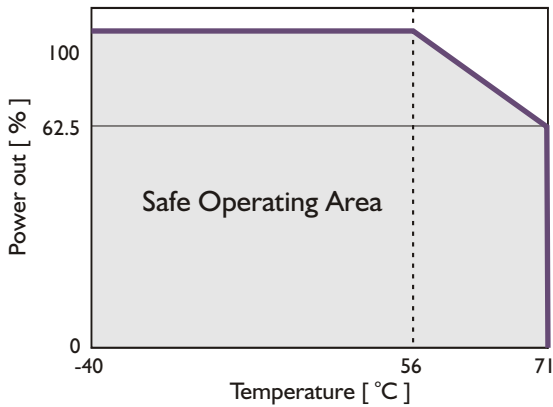
## CIRCUIT SCHEMATIC



## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



## TYP. EFFICIENCY CURVE

