

DINergy™ MD480-1C SERIES

AC - DC DIN RAIL MOUNTABLE POWER SUPPLY
INDUSTRIAL CONTROL EQUIPMENT



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



| MODEL NO. | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) |
|--------------|---------------|----------------|----------------|----------------|-------------|-------------|
| MD480-24A-1C | 90 ~ 264 VAC | 480 WATTS | + 24 VDC | 20 A | 86% | 89% |
| MD480-48A-1C | 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 | | 3000 / 4242 | | | VAC / VDC |
| | Input-FG | | 1500 / 2121 | | | 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 model | | 403000 | | Hours |
| | | 48V model | | 416000 | | Hours |
| Altitude during operation | IEC 60068-2-13 | | | | 4850 | 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 | | | |

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| INPUT SPECIFICATIONS | | | | | | |
|---------------------------|------------------------------|-----------|------|-------------|---------|------|
| Characteristics | Conditions | | min. | typ. | max. | unit |
| Rated input voltage | Io nom | | | 115 / 230 | | 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 | | | 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 model | | 63 | | W |
| | | 48V model | | 60 | | W |
| Leakage current | Input-Output | | | | 0.25 | mA |
| | Input-FG | | | | 3.5 | mA |
| P.F.C. (Active) | Vi : 115 / 230VAC, Io nom | | | 0.99 / 0.97 | | |

| 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 | | | | ± 0.5 | % |
| Load regulation | Vi nom, Io min ... Io nom | single mode | | | ± 1 | % |
| | | parallel mode | | | ± 5 | % |
| Voltage trim range | Vi nom, 0.8 Io nom | 24V model | 22.5 | | 28.5 | VDC |
| | | 48V model | 47 | | 56 | VDC |
| Rated continuous loading | Vi nom | 24V model | 20 A @ 24Vdc / 16.8 A @ 28.5Vdc | | | |
| | | 48V model | 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 | | | | 1000 | ms |
| | Vi nom, Io nom → with 7000 µF CAP | | | | 1500 | 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 model | 35 | | | VDC |
| | | 48V model | 63 | | | VDC |
| Capacitor load | Vi nom, Io nom | | | | 7000 | µF |
| DC ON indicator threshold at start up (Green LED) | Vi nom, Io nom | 24V model | 17.6 | | 19.4 | VDC |
| | | 48V model | 37 | | 43 | VDC |
| DC LOW indicator threshold after start up (Red LED) | Vi nom, Io nom | 24V model | 17.6 | | 19.4 | VDC |
| | | 48V model | 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 (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, Io nom (Auto Recovery) | | 125 | | 140 | % |
| Output short circuit | | | Fold forward | | | |
| Degree of protection | | | IP20 | | | |

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APPROVALS AND STANDARDS

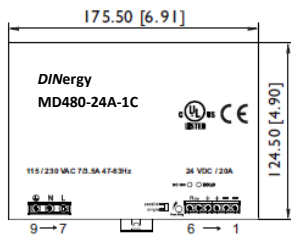
| | |
|----------------------|--|
| UL / cUL | UL 508 Listed UL 60950-1 Recognized ISA 12.12.01 (Class I, Division 2, Groups A, B, C and D) |
| CE | EN 61000-6-3, EN 55022 Class B, EN 61000-3-2 Class D, EN 61000-3-3 EN 61000-6-2, EN 55024, EN 61000-4-2 Level 4, EN 61000-4-3 Level 3 EN 61000-4-4 Level 4, EN 61000-4-5 L-N Level 3, L / N-FG Level 4 EN 61000-4-6 Level 3, EN 61000-4-8 Level 4, EN 61000-4-11 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

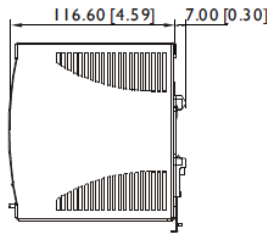
| | | |
|---------------|--------------------------------|--|
| Case size | Screw terminal type | 124.5 x 175.5 x 123.6 mm (4.9 x 6.91 x 4.87 inches) |
| | Detachable connector type | 143.5 x 175.5 x 123.6 mm (5.65 x 6.91 x 4.87 inches) |
| Case material | Metal | |
| Weight | 1920g | |
| Packing | 2.3kg ; 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

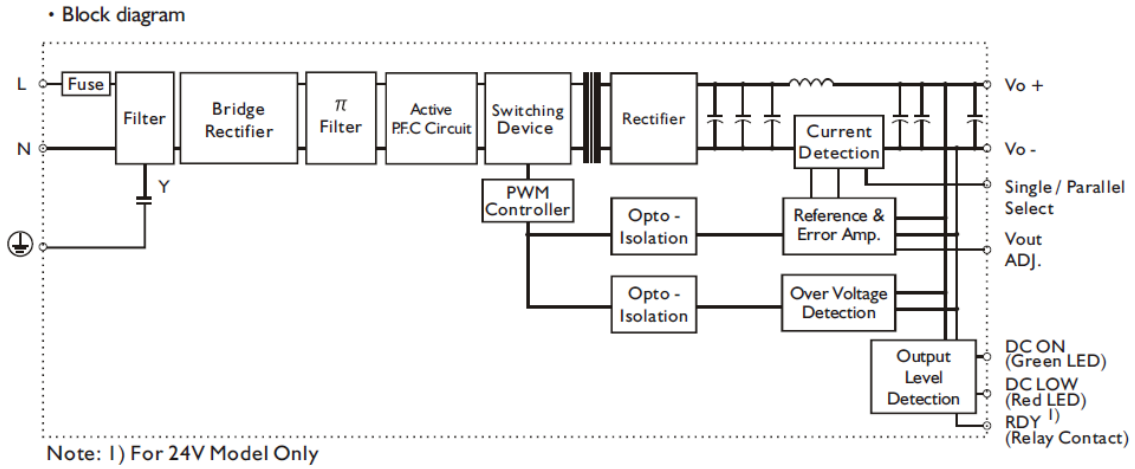
Ventilation / Cooling
Normal convection
All sides 25mm free space
For cooling recommended
Connector size range
Screw terminal:
AWG24-10 (0.2~4mm²) flexible / solid cable,
-Input connector can withstand torque at maximum 9 pound-inches.
-Output connector can withstand torque at maximum 5.5 pound-inches.
8 m/m stripping at cable end recommends
Detachable connector:
AWG24-12 (0.2~2.5mm²) 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

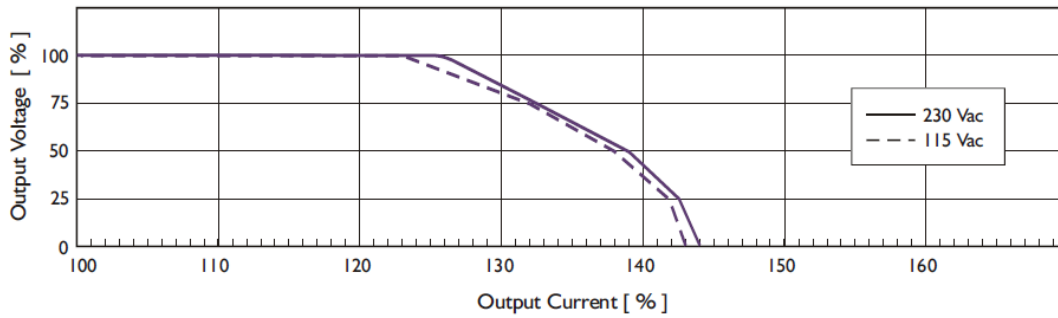
| PIN NO. | Designation | Description |
|---------|--|---|
| 1, 2 | OUT | V - Negative output terminal |
| 3, 4 | | V + Positive output terminal |
| 5 | | RDY A normal open relay contact for DC ON level control |
| 6 | | (Never connect except 24V model) |
| 7 | IN | L Input terminals (phase conductor, 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 |
| | OTHER | 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 | |

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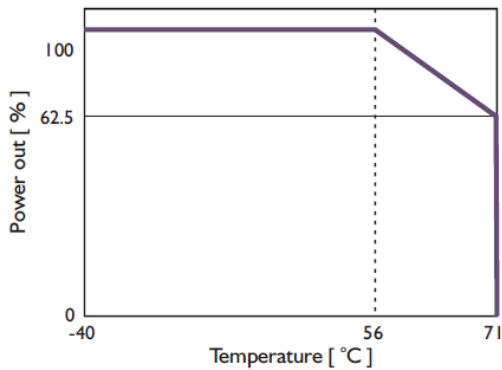
CIRCUIT SCHEMATIC



TYP. CURRENT LIMITED CURVE



DERATING CURVE



TYP. EFFICIENCY CURVE

