

DINergy™ MD120-XX-3C SERIES



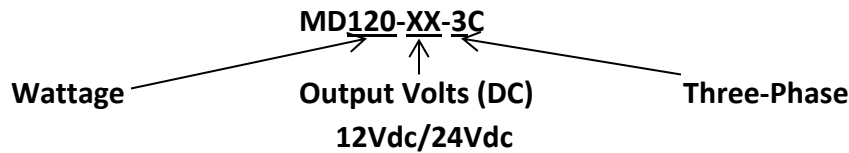
3PH AC - DC DIN RAIL MOUNTABLE POWER SUPPLY
INDUSTRIAL CONTROL EQUIPMENT

FEATURES

- 3 PHASE AC INPUT VOLTAGE
- COMPACT DESIGN
- PARALLEL FUNCTION AVAILABLE (SWITCH)
- 3 YEARS WARRANTY



SELECTION CHART



| INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) |
|-----------------------------|----------------|----------------|----------------|-------------|-------------|
| Single Output Models | | | | | |
| 3ø 340~575 VAC | 120 WATTS | + 12 VDC | 10 A | 85% | 87% |
| 3ø 340~575 VAC | 120 WATTS | + 24 VDC | 5 A | 87% | 89% |

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 | | | 70 | | 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 +61 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 | 12V | | 569,000 | | Hours |
| | | 24V | | 572,000 | | Hours |
| Altitude during operation | EN 60950-1 | | | | 5,000 | m |
| Dimension | Screw terminal type | | L124 x W74.3 x D118.8 | | | mm |
| Cooling | Free air convection | | | | | |
| Installation position | Vertical (other direction may derating using) | | | | | |
| Pollution degree | | | | 2 | | |
| INPUT SPECIFICATIONS | | | | | | |
| Characteristics | Conditions | | min. | typ. | max. | unit |
| Nominal voltage *1 | | | | 1ø or 3ø 380 / 480 VAC | | |
| Rated input voltage | Io nom | | 400 | | 500 | VAC |
| Absolute input max. range | Ta min ... Ta max, | AC in | 340 | | 575 | VAC |
| | | DC in | 480 | | 820 | VDC |
| Input current | Vi : 400 / 500 VAC, Io nom | | | 0.36 / 0.3 | | A |
| Rated input current | Vi : 340 VAC, Io nom | | | | 0.5 | A |
| Line frequency | Vi nom, Io nom | | 47 | | 63 | Hz |

*1. Single phase input is permissible, but output load is derated to 75%

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INPUT SPECIFICATIONS

| Characteristics | Conditions | min. | typ. | max. | unit |
|------------------------|----------------------|------|------|------|------|
| Inrush current | Vi nom, Io nom | | 10 | 12 | A |
| Power dissipation | Vi : 400 VAC, Io nom | 12V | 20 | | W |
| | | 24V | 16 | | W |
| Leakage current | Input-Output | | | 0.25 | mA |
| | Input-FG | | | 3.5 | mA |
| Power factor (Passive) | Vi nom, Io nom | | 0.55 | | |

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, 0.8 Io nom | 12V | 11.4 | 14.5 | VDC |
| | | 24V | 22.5 | 28.5 | VDC |
| Rated continuous loading | Vi nom | 12V | 10 A @ 12Vdc / 8.2 A @ 14.5Vdc | | |
| | | 24V | 5 A @ 24Vdc / 4.2 A @ 28.5Vdc | | |
| Hold up time | Vi nom , Io nom | 20 | | | ms |
| Turn on time | Vi nom, Io nom | | | 1,000 | ms |
| | Vi nom, Io nom → 12V model : with 7000 µF CAP 24V model : with 3500 µF CAP | | | 1,500 | ms |
| Rise time | Vi nom, Io nom | | | 150 | ms |
| | Vi nom, Io nom → 12V model : with 7000 µF CAP 24V model : 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 | | | 100 | mV |
| Power back immunity | Vi nom, Io nom | 12V | 18 | | VDC |
| | | 24V | 35 | | VDC |
| Capacitor load | Vi nom, Io nom | 12V | | 7,000 | µF |
| | | 24V | | 3,500 | µF |
| DC ON indicator threshold at start up (Green LED) | Vi nom, Io nom | 12V | 10 | 11.2 | VDC |
| | | 24V | 17.6 | 19.4 | VDC |
| DC LOW indicator threshold after start up (Red LED) | Vi nom, Io nom | 12V | 10 | 11.2 | VDC |
| | | 24V | 17.6 | 19.4 | VDC |
| Efficiency | Vi nom, Io nom, Po / Pi | | Up to 89%, See model list and typ efficiency curve | | |

CONTROL AND PROTECTION

| Characteristics | Conditions | min. | typ. | max. | unit |
|-----------------------------------|---|--------------------------------|------|------|------|
| Input fuse | | 2 A / 600 VAC internal / phase | | | |
| Internal surge voltage protection | IEC 61000-4-5 | Varistor | | | |
| Rated over load protection | Vi nom (see typ current limited curve) | 115 | | 135 | % |
| 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, 0.8 Io nom (Auto Recovery) | 12V | 15 | 16.5 | VDC |
| | | 24V | 30 | 33 | VDC |
| Output short circuit | | Hiccup mode | | | |
| Over temperature | Detect on heat sink, shut down O/P voltage, recovers automatically after temperature goes down. | 100 | | 110 | °C |
| Degree of protection | | IP20 | | | |

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APPROVALS AND STANDARDS

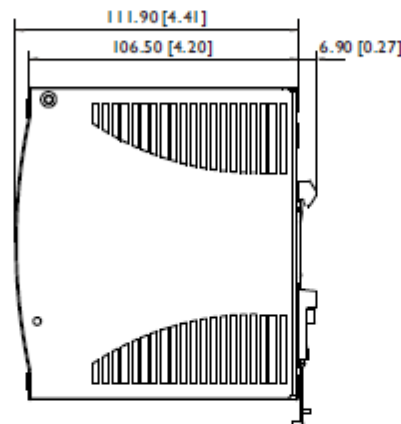
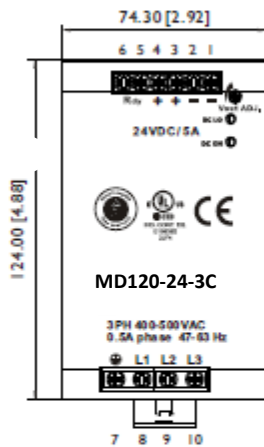
| | |
|----------------------|--|
| UL / cUL | UL 508 Listed UL 60950-1 Recognized ISA 12.12.01(Class I, Division 2, Groups A, B, C and D) |
| CE | EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3 EN 61000-6-2, EN 55024, EN 61000-4-2 Level 4, EN 61000-4-3 Level 3 EN 61000-4-4 Level 4, EN 61000-4-5 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 |
| CQC | GB4943.1, GB9254, GB17625.1 |
| 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 | Screw terminal type 124 x 74.3 x 118.8 mm (4.88 x 2.92 x 4.68 inches) |
| Case material | Metal |
| Weight | 800g |
| Packing | 0.92kg; 20 pcs / 19.5kg/ 2.02CUFT |

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.

INSTALLATION

Ventilation / Cooling
Normal convection
All sides 25mm free space
For cooling recommended
Connector size range
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 mm stripping at cable end recommends
Use copper conductors only, 60 / 75°C

GENERAL TOLERANCE

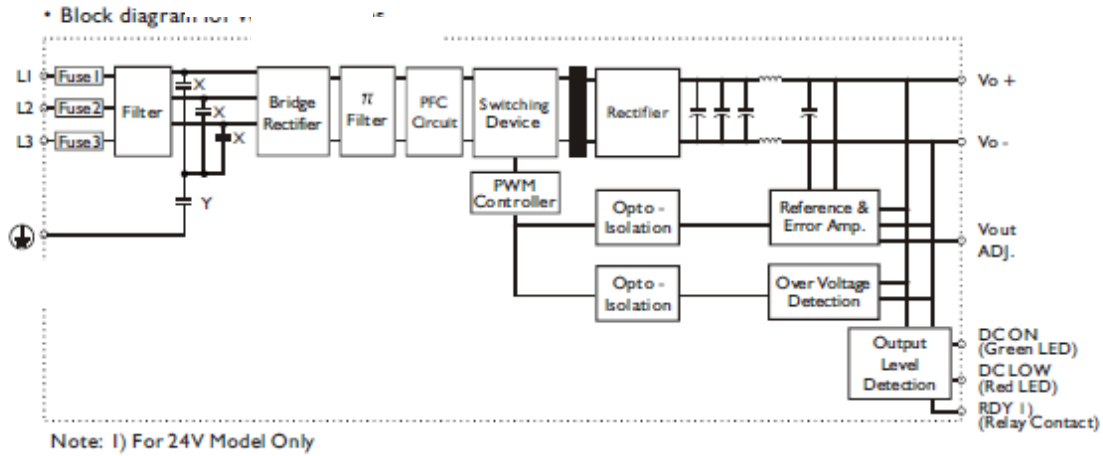
| | |
|--------------------------------|--------------|
| 0.00 [0.00] - 30.00 [1.18] | ±0.30 [0.01] |
| 30.00 [1.18] - 120.00 [4.72] | ±0.50 [0.02] |
| 120.00 [4.72] - 400.00 [15.75] | ±0.80 [0.03] |

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 (Never connect except 24V model) |
| 6 | IN | ⊕ Ground this terminal to minimize high-frequency emissions |
| 7 | | L1 Input terminals |
| 8 | | L2 Input terminals |
| 9 | | L3 Input terminals |
| 10 | OTHER | DC ON Operation indicator LED |
| | | DC LO DC LOW voltage indicator LED |
| | | Vout ADJ. Trimmer-potentiometer for Vout adjustment |

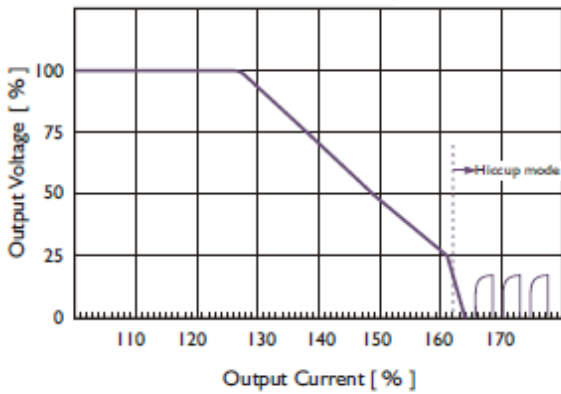
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CIRCUIT SCHEMATIC

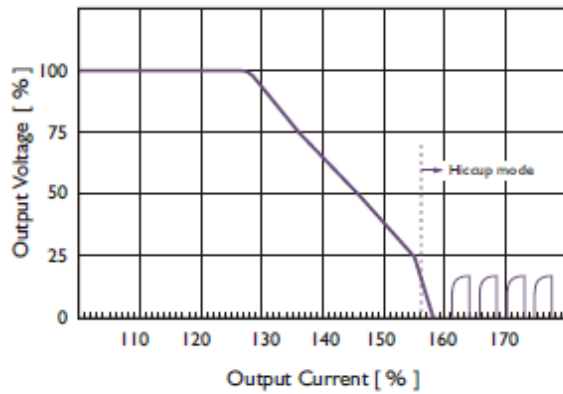


TYP. CURRENT LIMITED CURVE

MD120-24-3C / 400vAC



MD120-24-3C / 500vAC



TYP. EFFICIENCY CURVE

MD120-24-3C

