# DRE120 SERIES

AC - DC DIN RAIL MOUNTABLE POWER SUPPLY
INDUSTRIAL CONTROL EQUIPMENT

## FEATURES

- HIGH EFFICIENCY 91%
- BUILT-IN ACTIVE PFC
- 150% PEAK LOAD CAPABILITY
- SELV COMPONENTS DESIGN
- PARALLEL FUNCTION (SWITCH SELECTABLE)
- 3 YEARS WARRANTY

c UL us LISTED IND. CONT. EQ. UL 508 | c UL us Class I, Div 2 | c UL us UL 60950-1 | TÜV SÜD c US UL 62368-1 | TÜV SÜD EN 62368-1 | TÜVRheinland CERTIFIED EN IEC 61558-1 EN 61558-2-16 www.tuv.com | CE UK CA

## SELECTION CHART

**DRE 120 - 24 x**

- 120 — Wattage
- 24 — 12 : 12V OUT, 24 : 24V OUT
- x — A : SCREW TERMINAL TYPE; B : DETACHABLE CONNECTOR TYPE

## MODEL LIST

| MODEL NO. | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) |
|---|---|---|---|---|---|---|
| **Single Output Models** | | | | | | |
| DRE120-12x | 88 ~ 264 VAC | 120 WATTS | + 12 VDC | 10 A | 88% | 90% |
| DRE120-24x | 88 ~ 264 VAC | 120 WATTS | + 24 VDC | 5 A | 89% | 91% |

## 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 | | | 100 | | KHz |
| Isolation voltage | Input-Output | | 3,000 / 4,242 | | | VAC / VDC |
| | Input-PE | | 1,768 / 2,500 | | | VAC / VDC |
| | Output-PE | | 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 | | 465,000 | | Hours |
| | | 24V | | 480,000 | | Hours |
| Altitude during operation | EN 62368-1 | | | | 5,000 | m |
| Dimension | Screw terminal type | | | L124.5 x W40 x D123.6 | | mm |
| | Detachable connector type | | | L143.5 x W40 x D123.6 | | mm |
| Cooling | Free air convection | | | | | |
| Pollution degree | | | | 2 | | |

### INPUT SPECIFICATIONS

| Characteristics | Conditions | | min. | typ. | max. | unit |
|---|---|---|---|---|---|---|
| Rated input voltage | Io nom | | 100 | | 240 | VAC |
| Input voltage range | Ta min ... Ta max, | AC in | 88 | | 264 | VAC |
| | Io nom | DC in | 120 | | 375 | VDC |
| Input current | Vi : 115 / 230 VAC, Io nom | | | 1.2 / 0.6 | | A |
| Rated input current | Vi : 88 VAC, Io nom | | | | 1.8 | A |

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## INPUT SPECIFICATIONS

| Characteristics | Conditions | | min. | typ. | max. | unit |
|---|---|---|---|---|---|---|
| Line frequency | Vi nom, Io nom | | 47 | | 63 | Hz |
| Inrush current | Vi : 115 / 230 VAC , Io nom | | | | 24 / 48 | A |
| Power dissipation | Vi : 230 VAC, Io nom | 12V | | 13.5 | | W |
| | | 24V | | 12 | | W |
| Leakage current | Input-Output | | | | 0.25 | mA |
| | Input-PE | | | | 3.5 | mA |
| Power factor (Active) | Vi : 230VAC, Io nom | | | 0.96 | | |

## 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 | single mode | | | ± 1 | % |
| | | parallel mode | | | ± 5 | % |
| Peak power 1) | Vi nom | | | | 180 | W |
| 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 @ 14.5 Vdc | | | |
| | | 24V | 5 A @ 24Vdc / 4.2 A @ 28.5 Vdc | | | |
| Hold up time | Vi nom, Io nom | | 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, 1~0.5 Io nom | | | | 3 | 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 | | | | 7,000 | 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 |
| Parallel operation | 0.1 Io min~0.9 Io max | | | | 3 | unit |
| Efficiency | Vi nom, Io nom, Po / Pi | | Up to 91%, See model list and typ efficiency curve | | | |

*NOTE 1 : The time is 60 seconds and duty cycle is about 45 %, the average output power should not exceed the rated power.*

## CONTROL AND PROTECTION

| Characteristics | Conditions | | min. | typ. | max. | unit |
|---|---|---|---|---|---|---|
| Input fuse | | | T3.15A / 250VAC internal | | | |
| Internal surge voltage protection | IEC 61000-4-5 | | Varistor | | | |
| Rated over load protection | Vi nom (see typ current limited curve) | | 160 | | | % |
| 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 60 VDC | | | | 0.3 | A |
| Over voltage protection | Vi nom, 0.8 Io nom (Shut-down protect) | 12V | 15 | | 16.5 | V |
| | | 24V | 30 | | 33 | V |
| Output short circuit | | | Hiccup mode | | | |
| Over temperature | Detect on heat sink, shut down O/P voltage, recovers automatically after temperature goes down. | | 90 | | 100 | °C |
| Degree of protection | | | IP20 | | | |

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## APPROVALS AND STANDARDS

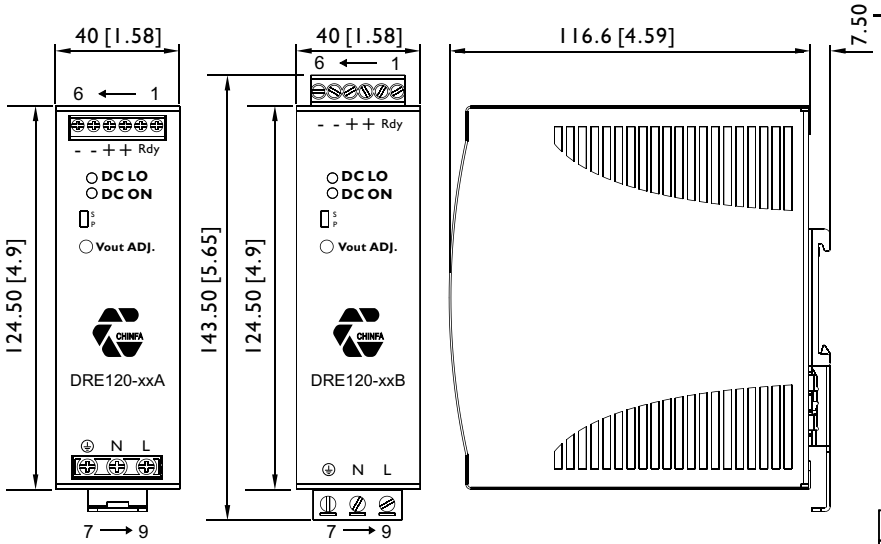
| | |
|---|---|
| UL / cUL | UL 508 Listed<br>UL 60950-1 Recognized<br>ISA 12.12.01 (Class I, Division 2, Groups A, B, C and D) |
| TUV | BS EN / EN 62368-1, EN 61558-1, EN 61558-2-16 (meet EN 60204-1) |
| cTUVus | UL 62368-1 |
| CE | BS EN / EN 61000-6-3, BS EN / EN 55032 Class B, BS EN / EN 61000-3-2 Class D, BS EN / EN 61000-3-3<br>BS EN / EN 61000-6-2, BS EN / EN 55035, BS EN / EN 61000-4-2 Level 4, BS EN / EN 61000-4-3 Level 3<br>BS EN / EN 61000-4-4 Level 4, BS EN / EN 61000-4-5 Level 4<br>BS EN / EN 61000-4-6 Level 3, BS EN / EN 61000-4-8 Level 4, BS EN / EN 61000-4-11<br>DD ENV / ENV 50204 Level 2, BS EN /EN 61204-3 |
| Vibration resistance | meet IEC 60068-2-6 (Mounting on rail : Random wave, 10-500 Hz, 2G, each along X, Y, Z axes 10 min / cycle, 60 min ) |
| Shock resistance | meet IEC 60068-2-27 (Half sine wave, 4G, 22ms, 3 axes, 6 Faces, 3 times for each face) |

# PHYSICAL CHARACTERISTICS

| | | |
|---|---|---|
| Case size | Screw terminal type | 124.5 x 40 x 123.6 mm (4.9 x 1.58 x 4.87 inches) |
| | Detachable connector type | 143.5 x 40 x 123.6 mm (5.65 x 1.58 x 4.87 inches) |
| Case material | Metal | |
| Weight | 610g | |
| Packing | 0.65kg ; 24pcs / 16.5kg / 2.01CUFT | |

# 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
Screw terminal:
AWG24-10 (0.2~4mm$^2$ ) flexible / solid cable,
-Input connector can withstand torque at maximum 9 pound-inches.
-Output connector can withstand torque at maximum 6 pound-inches.
8 m/m stripping at cable end recommends
Detachable connector:
AWG24-12 (0.2~2.5mm$^2$ ) 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

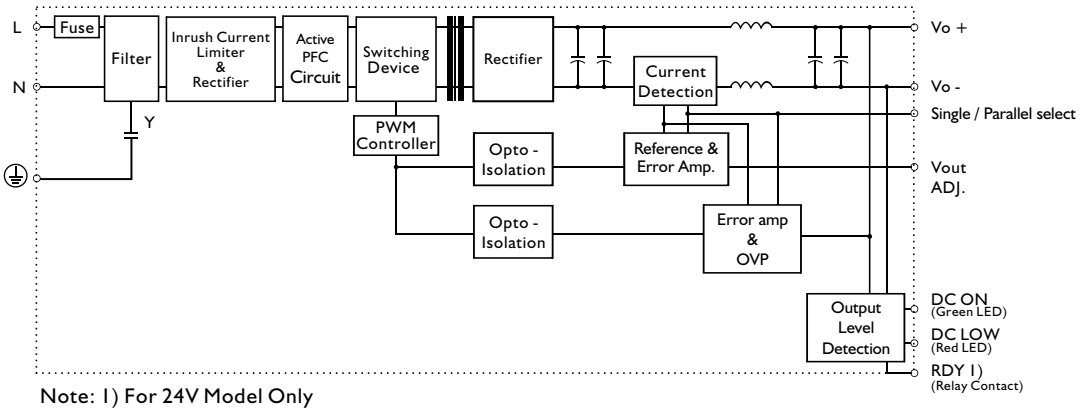
| GENERAL TOLERANCE | |
|---|---|
| 0.00[0.00] - 30.00[1.18] | ±0.30[0.01] |
| 30.00[1.18] - 120.00[4.72] | ±0.50[0.02] |

# PIN ASSIGNMENT

| PIN NO. | Designation | | Description |
|---|---|---|---|
| 1<br>2 | OUT | RDY | A normal open circuit of PhotoMOS Relay<br>(24V model only) |
| 3, 4 | OUT | V + | Positive output terminal |
| 5, 6 | OUT | V - | Negative output terminal |
| 7 | IN | ⏚ | Ground this terminal to minimize high-frequency emissions |
| 8 | IN | N | Input terminals (neutral conductor, no polarity at DC input) |
| 9 | IN | L | Input terminals (phase conductor, no polarity at DC input) |
| | OTHER | DC ON | Operation indicator LED |
| | OTHER | DC LO | DC LOW voltage indicator LED |
| | OTHER | Vout ADJ. | Trimmer-potentiometer for Vout adjustment |
| | OTHER | S / P | Single / Parallel select switch |

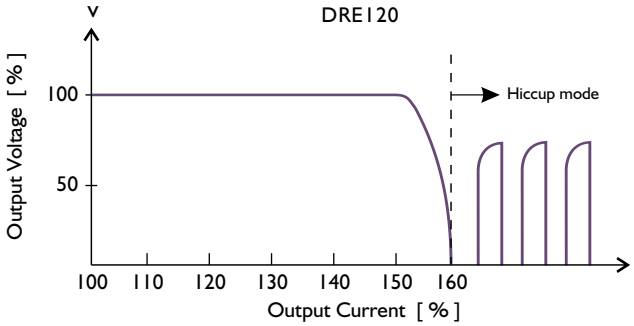
## CIRCUIT SCHEMATIC

• Block diagram for DRE120 series

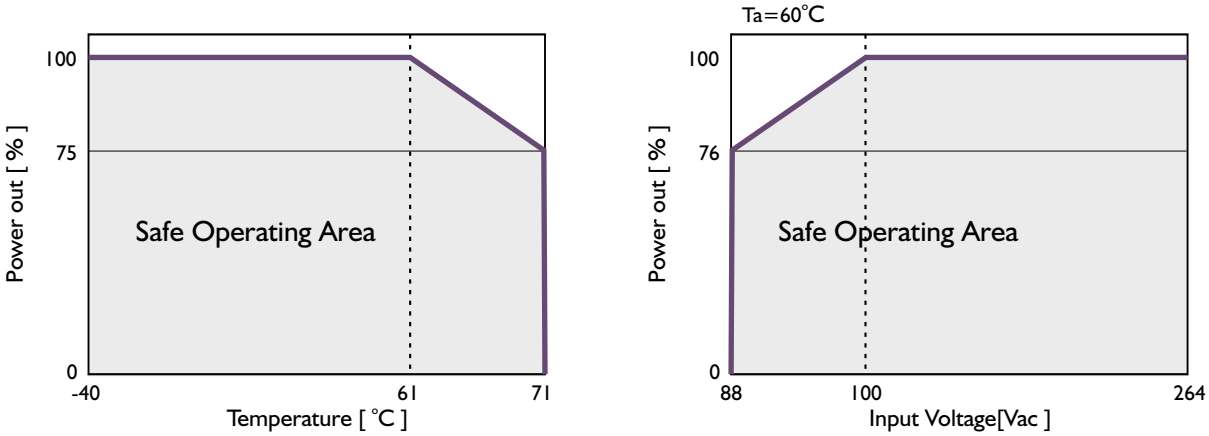


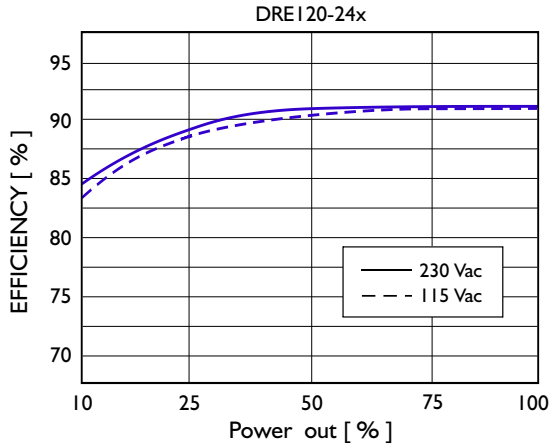

Note: 1) For 24V Model Only

## TYP. CURRENT LIMITED CURVE




## DERATING CURVE




## TYP. EFFICIENCY CURVE