# Features

# DIN-Rail Series

- 2 and 3-phase operation
- Input voltage range: 320 – 575VAC
- Output trim range: 22.5 – 29.5VDC
- High electrical strength; high reliability
- Permanent overload and short-circuit protection
- Parallel operation capability
- International safety certification listing

RECOM

AC/DC Converter

# REDIN480/3AC

## 480 Watt 3 Phase DIN-Rail Power Supply

5 YEAR Warranty

## Description

The REDIN/3AC is a series of rugged DIN rail power supplies for two and three-phase mains operation from 320 to 575VAC without the need of a neutral connection. Four versions with a maximum current limited output deliver 5A, 10A, 20A or 40A without derating up to +55°C. The output can be grounded via a third common output terminal. The LED signal on the front panel indicates that the output voltage remains within the wide adjustable range from 22.5 to 29.5VDC. The units are covered by international safety certificates and are intended for worldwide use. In power-hungry applications, the units can be connected in parallel with no need for additional components.


## Selection Guide

| Part Number | nom. Input Voltage Range [VAC] | Output Voltage [VDC] | Output Adjustability [VDC] | Rated Current [A] | Efficiency (1) typ. [%] |
|---|---|---|---|---|---|
| REDIN480-24/3AC | 400-500 | 24 | 22.5-29.5 | 20 | 91 |

**Notes:**

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

## Model Numbering

REDIN480-__/3AC

nom. Output Power — Output Voltage

## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

| BASIC CHARACTERISTICS | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Condition** | | **Min.** | **Typ.** | **Max.** |
| Input Voltage Range | 3 phase operation<br>2 phase operation | | 320VAC<br>360VAC | 400VAC<br>400VAC | 575VAC<br>575VAC |
| Input Current | 3 phase operation | 400VAC<br>500VAC | | 3 x 1100mA<br>3 x 800mA | |
| | 2 phase operation | 400VAC<br>500VAC | | 2 x 700mA<br>2 x 600mA | |
| Inrush Current | | | | | 15A |
| Powerfactor | | | | 0.67 | |
| Return Voltage Immunity | 24 Vout | | | 35VDC | |
| No Load Power Consumption | | | | | 6W |
| Input Frequency Range | AC Input | | 45Hz | | 65Hz |
| Output Voltage Trimming | | | 22.5VDC | | 29.5VDC |
| Minimum Load | | | 0% | | |
| Start-up time | 2/3 phase operation, 400VAC | | | | 1s |
| Rise time | | | | | 2ms |
| Hold-up time | 400VAC<br>480VAC | | 17ms<br>20ms | | |
| Output Ripple & Noise | measured at 20MHz BW | | | | 10mVp-p |

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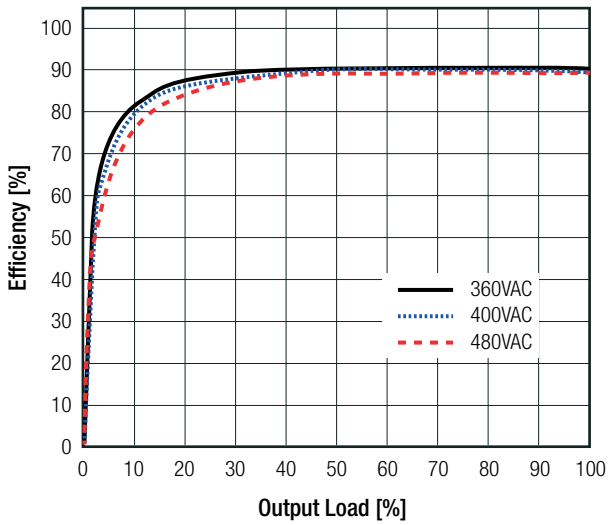
c US E196683

c UL us LISTED E470721

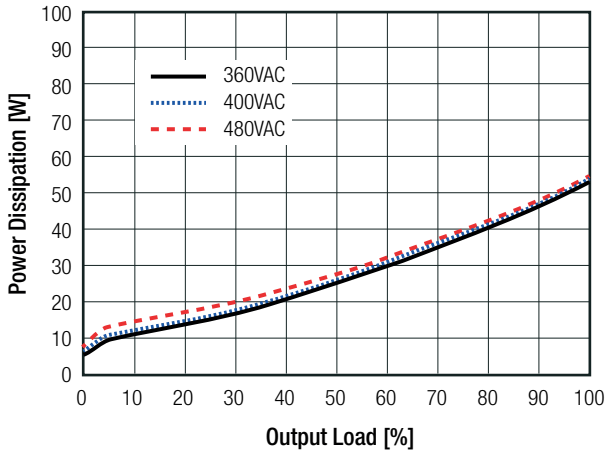
UL60950-1 certified
UL508 certified
EN60950-1 certified
CSA C22.2 No. 60950-01 certified
EN55011 compliant
EN50121-4 compliant
CSA C22.2 No.107 certified
EN61000-6-2 compliant
EN61000-6-3 compliant

## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

### Efficiency vs. Load @ 3 Phase Operation



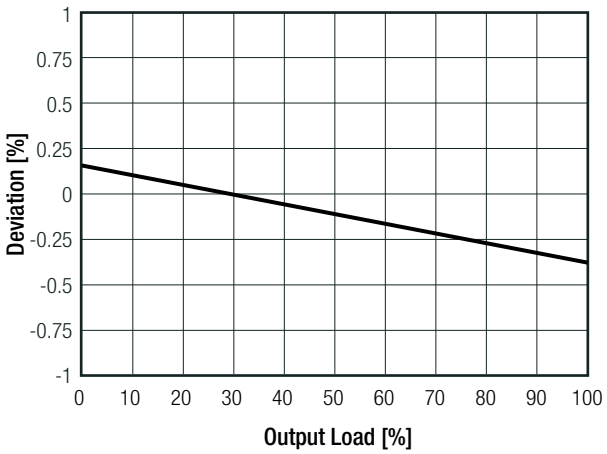

### Power Dissipation vs. Load @ 3 Phase Operation




## REGULATION

| Parameter | Condition | Value |
|---|---|---|
| Output Accuracy | | ±1.0% max. |
| Line Regulation | 10% change in input voltage | ±0.1% typ. |
| Load Regulation | 10% - 100% load | 1.0% typ., 2.0% max. |
| Transient Response | 25% load step change<br>recovery time | 200mV typ.<br>50ms typ. |

### Deviation vs. Load




## PROTECTIONS

| Parameter | Type | Value |
|---|---|---|
| Input Fuse [2] | internal | F4A, fast blow |
| Recommended backup fuse for mains protection | | 3x 6A (characersitics B)<br>3x 10A (characersitics B)<br>3x 16A (characersitics B) |
| Short Circuit Protection (SCP) | below 100mΩ | >125% typ. power limiting |
| Over Voltage Protection (OVP) | | >145% typ. auto recovery |

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## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

### PROTECTIONS

| Parameter | Type | | Value |
|---|---|---|---|
| Over Voltage Category (OVC) | | | OVC II |
| Over Temperature Protection (OTP) | | | refer to note 3 |
| Over Current Protection (OCP) | | | >120% typ. auto recovery |
| Power OK LED | "DC OK" Light green | | Vout >21.5V |
| Class of Equipment | | | Class I |
| Isolation Voltage | tested for 1 minute | I/P to O/P | 4242VDC |
| | | O/P to PE | 2300VDC |
| Isolation Resistance | | | 10MΩ min. |
| Insulation Grade | | | reinforced |

**Notes:**

Note2: Refer to local wiring regulations if input over-current protection is also required

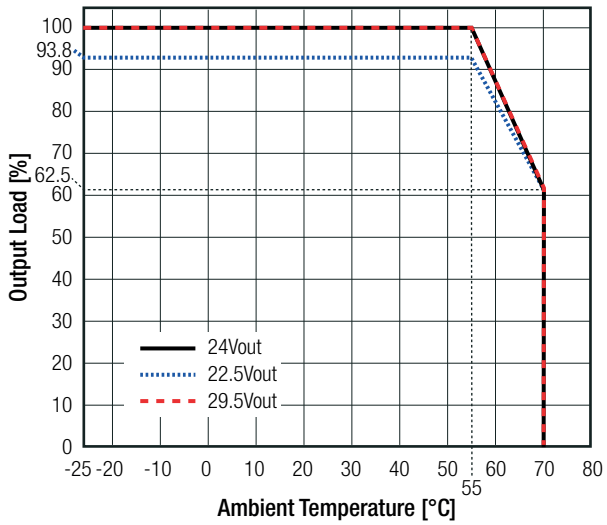
Note3: Under thermal overload conditions, the device does not switch off; instead, the output current is limited as much as necessary to return internal operating temperatures to safe limits. After the device cools down, full output capacity is automatically restored.

### ENVIRONMENTAL

| Parameter | Condition | | Value |
|---|---|---|---|
| Operating Temperature Range | @ natural convection 0.1m/s | full load | -25°C to +55°C |
| | | refer to derating graph | -25°C to +70°C |
| Maximum Case Temperature | | | +105°C |
| Temperature Coefficient | | | 0.05%/K |
| Operating Altitude | | | 2000m |
| Operating Humidity | non-condensing at 25°C | | 5%-95% RH max. |
| IP Rating | | | IP20 |
| Pollution Degree | according to EN50178 | | PD2 |
| Shock | | | 30G in all directions |
| Vibration | | | <15Hz, amplitute ±2.5mm 15Hz to 150Hz, 2.3G, 90min. |
| MTBF | according to IEC61709 | +25°C<br>+55°C | 500 x $10^3$ hours<br>60 x $10^3$ hours |

### Derating Graph

(@ Chamber and natural convection 0.1m/s)



## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

| SAFETY AND CERTIFICATIONS | | |
|---|---|---|
| **Certificate Type** | **Report / File Number** | **Standard** |
| Information Technology Equipment, General Requirements for Safety | E196683 | UL60950-1, 1st Edition: 2007<br>CSA C22.2 No. 60950-1, 1st Edition: 2006 |
| Industrial Control Equipment | E470721 | UL508, 17th-Edition<br>CSA C22.2 No. 107.1-01, 3rd-Edition |
| Information Technology Equipment - General Requirments for Safety (LVD) | | EN60950-1:2006+A2:2013 |
| EAC | RU-AT.37.02367 | TP TC 004/2011 |
| RoHS 2+ | | RoHS 2011/65/EU + AM2015/863 |
| | | |
| **EMC Compliance** | **Report / Condition** | **Standard / Criterion** |
| Industrial, scientific and medical equipment – Radio frequency disturbance characteristics – Limits and methods of measurement | | EN55011:1989 + A2:2002, Class B |
| ESD Electrostatic discharge immunity test | Air ±2, 4, 8kV<br>Contact ±2, 4, 6, 8kV | EN61000-4-2:1995 + A1:2001, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test | 10V/m (80 - 3000MHz) | EN61000-4-3:2002 + A1:2002, Criteria A |
| Fast Transient and Burst Immunity | AC Power Port: ±4kV<br>PE ±4kV<br>DC Power Port ±2kV | EN61000-4-4:1995 + A2:2001, Criteria A |
| Surge Immunity | AC Power Port: L-N ±0.5, 1, 2kV<br>L-PE ±4kV<br>DC Power Port ±0.5, 1, 2kV | EN61000-4-5:1995 + A1:2001, Criteria A, B (L-PE) |
| Immunity to conducted disturbances, induced by radio-frequency fields | AC Power Port 10V<br>DC Power Port 10V | EN61000-4-6:1996 + A1:2001, Criteria A |
| Voltage Dips and Interruptions<br>Voltage Dips and Interruptions<br>Voltage Dips and Interruptions<br>Voltage Dips and Interruptions | Voltage Dips >95%<br>Voltage Dips 60%<br>Voltage Dips 30%<br>Voltage Interruptions > 95% | EN61000-4-11:1994 + A1:2001, Criteria A<br>EN61000-4-11:1994 + A1:2001, Criteria B<br>EN61000-4-11:1994 + A1:2001, Criteria A<br>EN61000-4-11:1994 + A1:2001, Criteria B |
| Limits of Harmonic Current Emissions | | EN61000-3-2:2000, Class A |
| Limits of Voltage Fluctuations & Flicker | | EN61000-3-3:1995 + A1:2001 |
| Railway applications – Electromagnetic compatibility Part 4: Emission and immunity of the signalling and telecommunications apparatus | | EN50121-4:2006 |
| | | |
| **EMC Compliance (Generic Standards)** | **Report / Condition** | **Standard / Criterion** |
| Generic standards - Immunity standard for industrial environments | | EN61000-6-2:2005 |
| Generic standards - Emission standard for residential, commercial and light-industrial environments | | EN61000-6-3:2007 + A1:2011 |

| DIMENSION and PHYSICAL CHARACTERISTICS | | |
|---|---|---|
| **Parameter** | **Type** | **Value** |
| Material | cover<br>case | steel sheet, zinc-plated<br>aluminium |
| Unit Dimension (LxWxH) | | 152.5 x 115.0 x 130.0mm |
| Unit Weight | | 2000g typ. |

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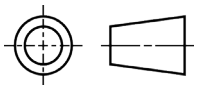
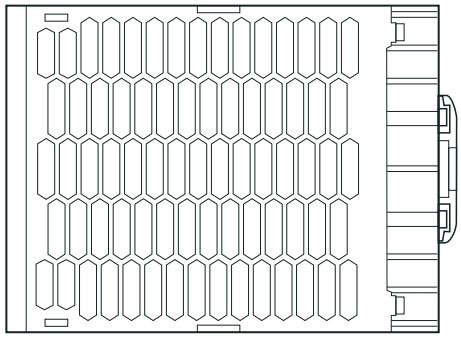
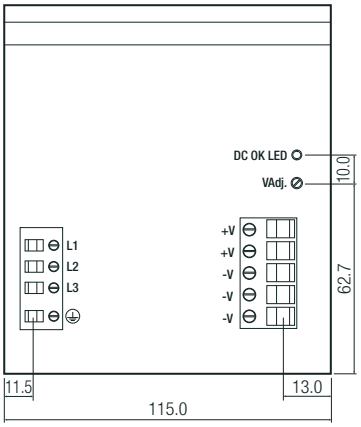
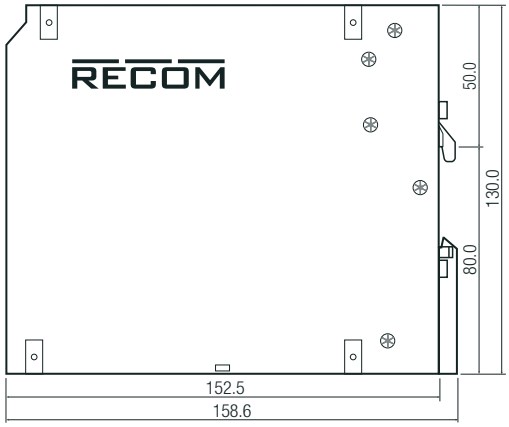
## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

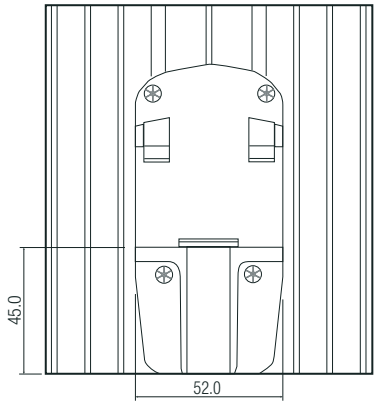
### Dimension Drawing (mm)








| Terminals and Wiring | |
|---|---|
| Type | Screw Connector |
| Solid Wire Input | 0.2 - 2.5mm² |
| Solid Wire Output | 0.5 - 6.0mm² |
| Stranded Wire Input (4) | 0.2 -2.5mm² |
| Stranded Wire Output (4) | 0.5 - 4mm² |
| American Wire Gauge Input | AWG 24-14 |
| Amerivan Wire Gauge Output | AWG 12-10 |
| Wire Stripping Length Input | 9mm |
| Wire Stripping Length Output | 14mm |
| Screwdriver (slotted / cross) | 3.5mm |
| Recommended tightening torque Input | 0.4Nm-0.5Nm |
| Recommended tightening torque Output | 0.5Nm-0.6Nm |
| Tolerance: X.X ±0.5mm | |

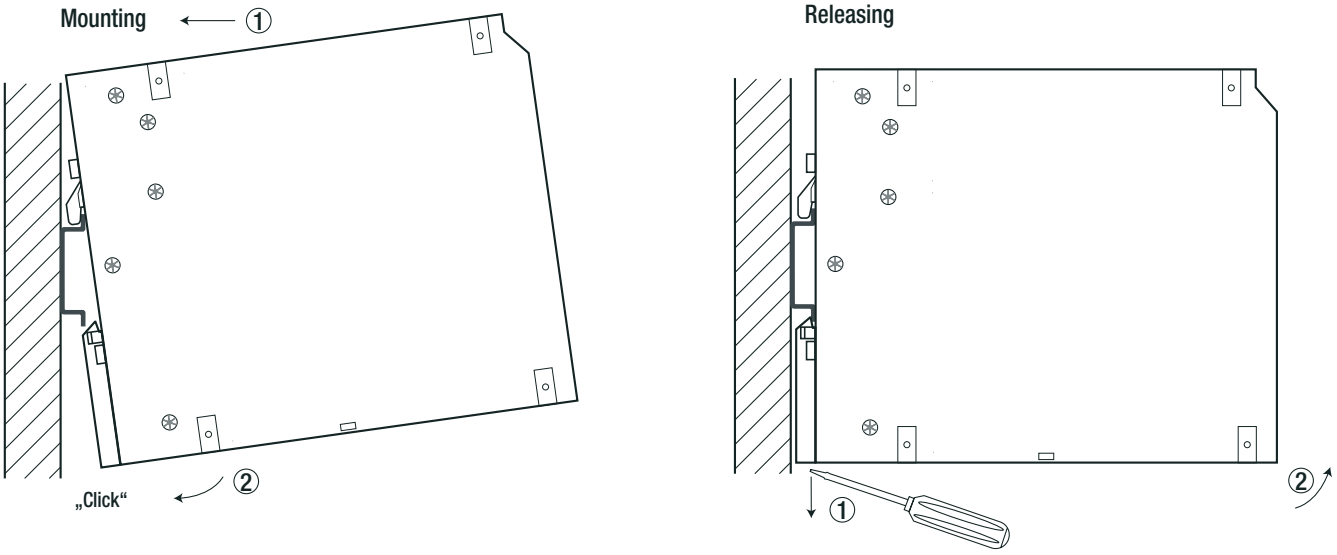
**Notes:**

Note4: The use of sleeve or ferrule terminations is recommended

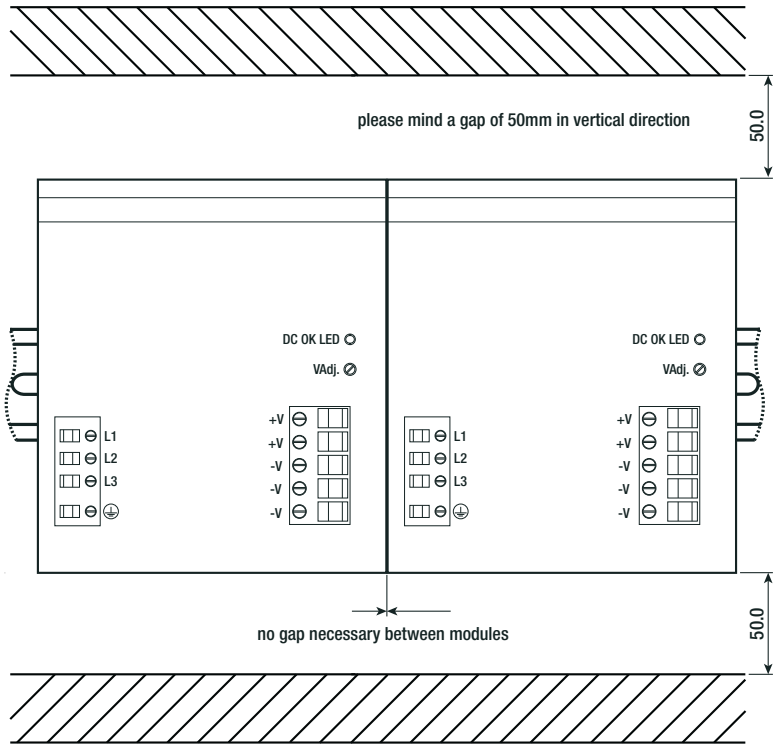
## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

### INSTALLATION and APPLICATION

#### Mounting Instruction (4)




#### Mounting Multiple Power Supplies (5)




**Notes:**

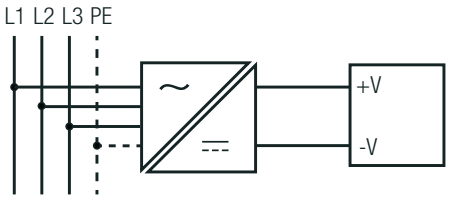
Note5: The power supply unit can be snapped onto all DIN Rails in according with EN60715 and has to be mounted vertically

Note6: To guarantee sufficient convection, it is recommended to mint a 50.0 mm gap in vertical direction

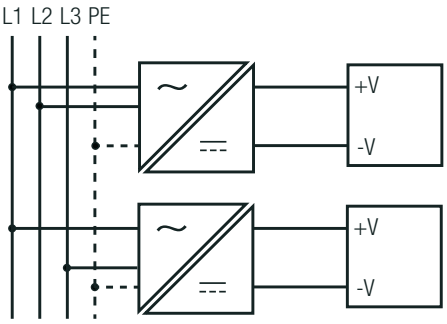
## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

### 2 Phase and 3 Phase Operation

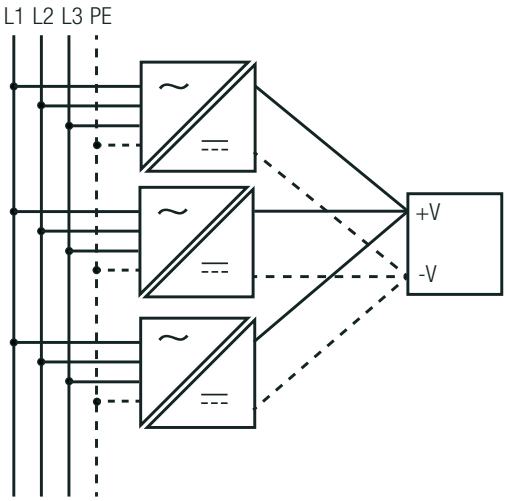
3 Phase




2 Phase




### Parallel Operation and Phase Redundancy

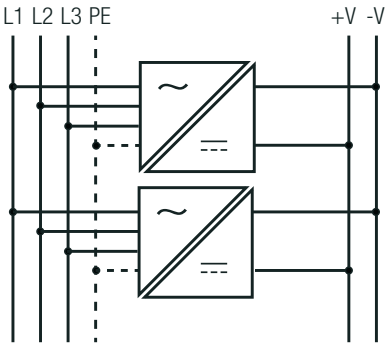



Load:
90% of n x $I_{Nom}$

**Parallel Operation**

1) Adjust each power supply to the exact same output voltage with same load and cooling conditions.
2) Use the same wire length for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
3) To prevent high reverse currents in the event of a secondary output fault, it is recommended to install a protective circuit at the output of each device when more than two power supplies are connected in parallel (e.g. decoupling diode or DC fuse).

For n parallel connected devices, the output current can be increased to 90% of n x $I_{nom}$. A maximum of 5 devices can be connected in parallel.



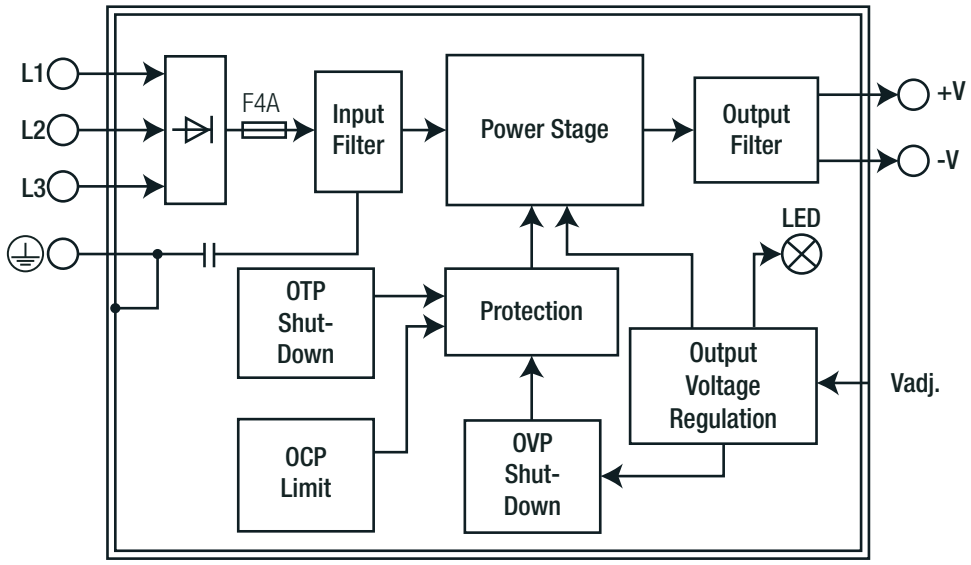

Max. load
120W

**Phase redundancy**

1) If any single phase fails, operation is still guaranteed.

## Specifications (measured @ Ta= 25°C, nom.Vin, full load and after warm-up unless otherwise stated)

### Block Diagramm




### PACKAGING INFORMATION

| Parameter | Type | Value |
|---|---|---|
| Packaging Dimension (LxWxH) | cardboard box | 213.0 x 190.0 x 127.0mm |
| Packaging Quantity | | 1 pcs |
| Storage Temperature Range | | -40°C to +85°C |
| Storage Humidity | non-condensing | 95% RH max. |

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