




## Application Note

# 1606-XL120DR

- World-wide approvals (    ) for industry
- Input: AC 230V/115V, DC 210...375V
- Output: 24V/5A

- High overload current, no switch-off
- Wide-Range Input
- N+1 redundancy, RDY relay contact

### Input

Input voltage AC100...120/200...240V (switchable), 47...63 Hz (85...132VAC / 176...264VAC, 210...375VDC, see also "Output: Continuous Loading")

Wide-Range Input: With the switch in the 230V position the power supply unit operates at low and moderate loads (until 3 A) at any input voltage between 95 and 264V AC.

Note: At DC input, always leave the switch in the 230V position.

Input current < 2.6 A (switch in 115V position)  
< 1.4 A (switch in 230V position)

- DCin at open output typ. 5 mA (preserves battery sources)

Inrush current typ. < 15 A at 264V AC and cold start

If you intend to protect the primary side of the power supply with a fuse or a circuit breaker, a 10 A slow acting fuse (HBC) or a supplementary protector 1492-SPUI1C100 is recommended. In order to meet local requirements, please consult local codes and regulations for proper installation.

Harmonic current emissions acc. to EN 61000-3-2

Transient resistance acc. to VDE 0160 / W2 (750 V / 1.3 ms), for *all* load conditions.

Hold-up time > 37 ms at 196V AC, 24V / 5 A (see diagram)

### Efficiency, Reliability etc.

Efficiency typ. 89 % (230V AC, 24V/5 A)

Losses typ. 14.8 W (230V AC, 24V/5 A)

MTBF 480.000 h acc. to Siemensnorm SN 29500 (24V/5 A, 230V AC, T<sub>amb</sub> = +40 °C)

Life cycle (electrolytics) The unit exclusively uses longlife electrolytics, specified for +105°C.

### Construction / Mechanics

Housing dimensions and Weight

- W x H x D 64 mm x 124 mm x 102 mm (+ DIN rail)
- Free space for ventilation above/below 25 mm recommended left/right 15 mm recommended
- Weight 620 g

Design advantages:

- Input and output pluggable by means of Combicon® plug connector.

- Ensure strain relief of the plug connectors when installing the unit.
- Input and output are strictly apart from each other and so cannot be mixed up (input below, output above).
- Wire Size Input/Output: Stranded 22...12 AWG (0.2...2.5 mm<sup>2</sup>), Solid 22...12 AWG (0.2...2.5 mm<sup>2</sup>); Tightening Torque: 3.5 lbs in (0.4 Nm) recommended (pluggable)

### Output

Rated output voltage 24V DC

For balanced current sharing during parallel operation: Soft characteristic (25.2V DC ±2% at no-load, 24V DC ±0.5% at nominal load, almost linear characteristic curve)

Output noise suppression Radiated EMI values below EN50081-1, even when using long, unscreened output cables.

Ambient temperature range Operation: -10°C...+70°C (>60°C: Derating)  
T<sub>amb</sub> Storage: -25°C...+85°C

Continuous loading (at T <sub>amb</sub> = -10°C...+60°C, convection cooling), see also diagram. For start at T <sub>amb</sub> < 0°C and low input voltage, please contact PULS.	Switch	AC/DCin	I <sub>out</sub>
Output is protected against short circuit, open circuit and overload	230V	176...264V	ACin 5 A / 6 A *
		95...176V	ACin 3 A
		210...375V	DCin 5 A / 6 A *
		150...210V	DCin 3 A
Output is protected against short circuit, open circuit and overload	115V	100...150V	DCin 2 A
		85...132V	ACin 5 A / 6 A *

\* short-term 6 A (< 1 min), at 45°C or forced cooling even continuous

Derating typ. 3 W/K (at T<sub>amb</sub> = +60°C...+70°C)

Voltage regulation better than 2% V<sub>out</sub> overall

Ripple / Noise < 30 mV<sub>pp</sub>, (20 MHz bandwidth, 50 Ω measurement)

Overvolt. protection typ. 29V

Parallel operation yes, current sharing via soft characteristic (see diagram)

Front panel indicator Green LED

RDY relay contact

- Type normally open contact
- closes when output voltage > 22.1V ±4%
- opens when output voltage < 19.8V ±4%
- Electrical isolation 500V DC to output voltage
- Contact rating 1A at 28V DC

## Start / Overload Behavior

Start-up delay	typ. 0.1 s
Rise time	ca. 5...20 ms, depending on load

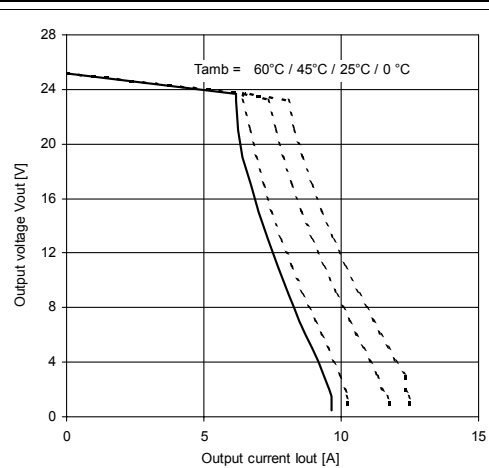
### Overload Behavior

- Special Overload Design— no disconnection, no hiccup if overloaded (see diagram)
  - high overload current (up to  $1.9 I_{Nom}$ ),  $V_{out}$  is gradually reduced with increasing current.
- 20% power boost
  - 6A short-term, at 45°C or forced cooling even continuous

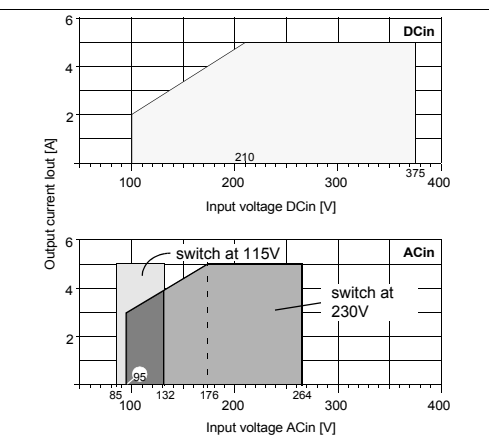
### Advantages:

- High short-circuit current, giving large 'start-up window': unit starts reliably even with awkward loads (DC-DC converters, motors).
- No 'sticking' such as can occur with fold-back characteristics
- Secondary fuses operate reliably

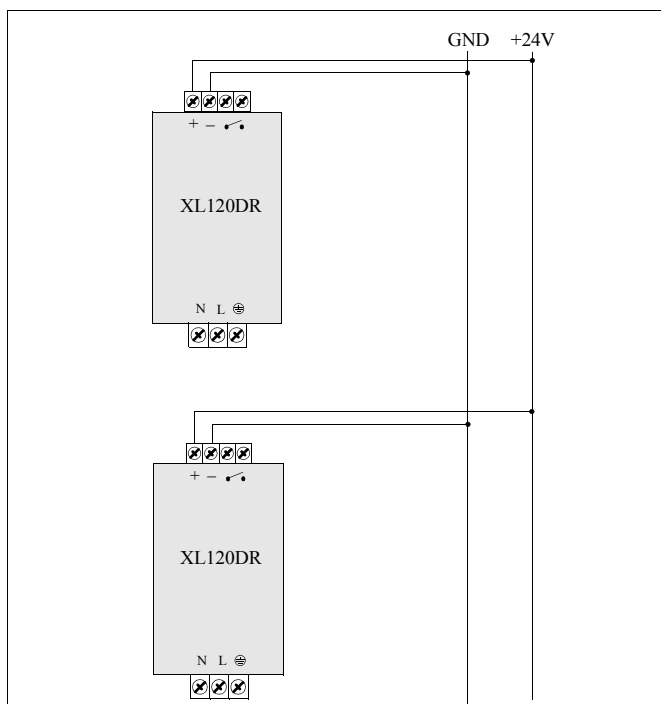
### Output characteristic (min.)



### Output Current over Input Voltage (min.)



### Power wiring



Specifications valid for 230V AC input voltage, +25°C ambient temperature, and 5 min run-in time, unless otherwise stated. They are subject to change without prior notice

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### Hold-up time (min.)

