




## Application Note

# 1606-XL480F



- World-wide approvals (    ) for industry
- Input: AC 115/230V **auto select**
- Output: 48...56V/480 W

- 93% Efficiency
- Ideal for parallel operation

### Input

Input voltage	AC 100...120V/200...240V, 47...63Hz, auto select
Rated tolerances	
• Continuous	AC 85...132V or AC 184...264V
• Short-term (30s) at 48V/10A	AC 85...140V or AC 175...280V
Input current	<12A (115V range) <6A (230V range)
Inrush current	typ. <18A @ AC 264V and cold start
Fuse loading	<5A <sup>2</sup> s (cold start)
If you intend to protect the primary side of the power supply with a fuse or a circuit breaker, a 15 A slow acting fuse (HBC) or a supplementary protector 1492-SPU1C150 is recommended (1492-SP1C160 for Europe). In order to meet local requirements, please consult local codes and regulations for proper installation.	
Transient handling	Transient resistance acc. to VDE 0160 / W2 (750V / 1.3ms), for all load conditions.
Hold-up time	30ms at 48V/10A, AC 230V <sub>in</sub> 35ms at 48V/10A, AC 120V <sub>in</sub> 15ms at 48V/10A, AC 100V <sub>in</sub>

### Efficiency, Reliability etc.

Efficiency	typ. 93% (AC 230V, 48V/10A)
Losses	typ. 36.2W (AC 230V, 48V/10A)
MTBF	519.000h acc. to Siemensnorm SN29500 (48V/10A, 230V, T <sub>amb</sub> = 40°C)
Life cycle (electrolytics)	The unit exclusively uses longlife electrolytics, specified for +105°C. High reliability, as <ul style="list-style-type: none"> <li>• only five aluminium electrolytics and</li> <li>• no small aluminium electrolytics are used.</li> </ul>

### Output

Output voltage	DC 48...56V, adjustable by (covered) front panel potentiometer; preset: 48V ±0.5% Adjustment range guaranteed
Output noise suppression	Radiated EMI values below EN50081-1, even when using long, unscreened output cables.
Ambient temperature range	Operation: 0°C...+70°C (> 60°C: Derating) T <sub>amb</sub> Storage: -25°C...+85°C
Rated continuous loading with convection cooling:	
• T <sub>amb</sub> =0°C...60°C	48V/10A resp. 56V/8.6A
short-term (<30s)	48V/12.5A resp. 56V/10.7A
Derating	12W/K (at T <sub>amb</sub> = 60...70°C)
Voltage regulation	<b>better 2% over all</b>
Ripple	incl. spikes (20MHz bandwidth), 50Ω measurement
• Output charact. S	<40mV <sub>pp</sub> (<0.09%)
• Output charact. P	<80mV <sub>pp</sub> (In: AC 230V, Out: 48V/10A)
(S/P: Single/Parallel Mode)	<100mV <sub>pp</sub> (In: AC 184V, Out: 56V/8.6A)
Over-voltage protection	At 58.6V ± 2.3%: switch to hiccup mode
Front panel indicators:	
• Green LED on, when V <sub>out</sub> = V <sub>out</sub> adjusted	
• Red LED on, when V <sub>out</sub> < V <sub>out</sub> adjusted	

Parallel operation Yes, up to ten units

To achieve current sharing the output V/I characteristic can be altered to be 'softer' (47.9V at 0A, 45.6V at 10A). This is done by repositioning an external bridge connection (without opening the unit).

Power Back Immunity max. 57V

### Construction/ Mechanics

Housing dimensions and Weight	
• W x H x D	220mm x 124mm x 102mm (+ DIN rail)
• Free space for ventilation	above/below 70mm recommended left/right 25mm recommended
• Weight	1.8kg

Design advantages: All connection blocks are easy to reach as mounted on the front panel, PVC insulated cable can be used for all connections, as the connection blocks are mounted in the cooler area on the underside of the unit.

Wire Size Input/Output:

Stranded 20...10 AWG (0.5...4 mm<sup>2</sup>), Solid 20...10 AWG (0.5...6 mm<sup>2</sup>)

Tightening Torque: 7 lbs in (0.8 Nm) recommended

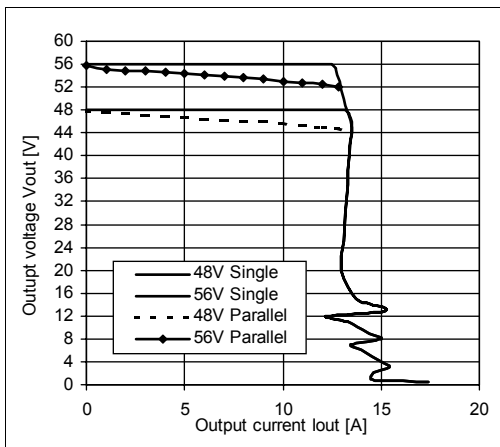
## Start / Overload Behavior

Start-up delay	typ. 0.55s
Rise time	appr. 20...80ms, depending on load
Overload behavior	Overload Design (see diagram)

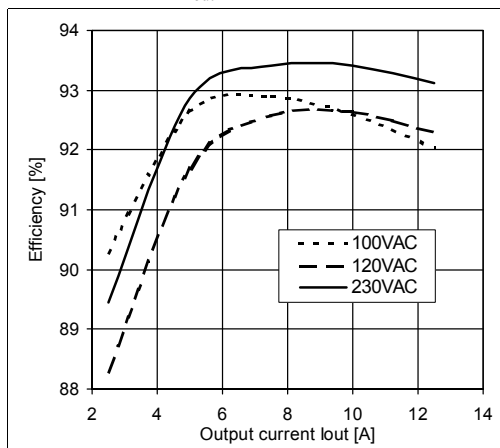
### Advantages:

- No disconnection/hiccup, thus overloading is possible also for a longer period of time (load start-up), ideal for parallel operation.
- High overload/short-circuit current due to straight characteristic; each bias point of the V/I characteristic extends 10A.
- Advantage: Due to the high and continuously supplied overload current the unit starts reliably even with awkward loads (DC-DC converters, motors). No 'sticking' can occur as, for example, with fold-back characteristics, and secondary fuses trigger more reliably.

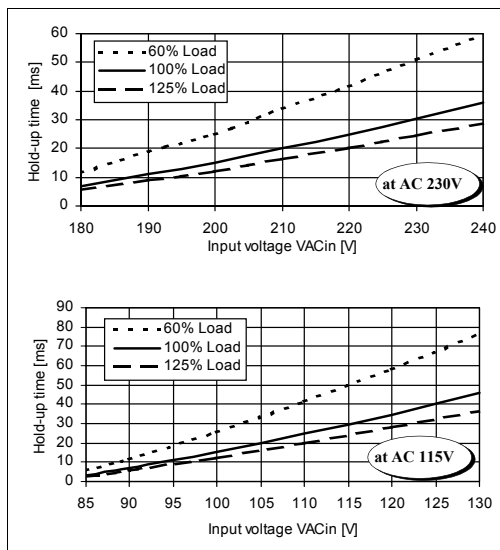
### Output characteristic (typ.)



### Efficiency (typ., at V<sub>out</sub>=48V)



### Hold-up time (min., at V<sub>out</sub>=48V)



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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