

Application Note

1606-XL120D

- World-wide approvals (  ) for industry
- Input: AC 230V/115V
- Output: 24V/ 5 A

- Power boost up to 6 A
- High overload current, no switch-off
- Wide-Range Input
- Robust mechanics and EMC

Input

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

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-SPU1C100 is recommended. In order to meet local requirements, please consult local codes and regulations for proper installation.

EN 61000-3-2 (harmonic current emissions) is fulfilled

Transient handling	Transient resistance acc. to VDE 0160 / W2 (750 V / 1.3 ms), for <i>all</i> load conditions.
Hold up time	> 37 ms at 196VAC, 24V/5 A (see Diagram)

Efficiency, Reliability etc.

Efficiency	typ. 90 % (230V AC, 24V/ 5 A)
Losses	typ. 13,3 W (230V AC, 24V/5 A)
MTBF	520,000 h acc. to Siemensnorm SN 29500 (24V/5 A, 230V AC, T _{amb} = +40 °C)
Life cycle (electrolytics)	The unit exclusively uses longlife electrolytics, specified for +105°C.

Start / Overload Behavior

Startup delay	typ. 0.1 s
Rise time	ca. 5...20 ms, depending on load

Overload Behavior	– no disconnection, no hiccup if overloaded
• Special Overload Design	– 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

Output voltage	24V DC +5% -1% (24...28V DC on request)			
Output noise suppression	Radiated EMI values below EN50081-1, even when using long, unscreened output cables.			
Ambient temperature range T _{amb}	Operation: -10°C...+70°C (>60°C: Derating) Storage: -25°C...+85°C			
Continuous loading (at T _{amb} = -10°C...+60°C, convection cooling), see also diagram. For start at T _{amb} < 0°C and low input voltage, please contact Rockwell Automation. Output is protected against short circuit, open circuit and overload	Switch	AC/DCin	I _{out}	
	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
		100-150V	DCin	2 A
	115V	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 _{amb} = +60°C...+70°C)			
Voltage regulation	better than 2% V _{out} overall			
Ripple / Noise	< 50 mV _{pp} , (20 MHz bandwidth, 50 Ω measurement)			
Overvolt. protection	typ. 29V			
Parallel operation	yes; current sharing available on request			
Power back immunity	26V			
Front panel indicator	Green LED, goes out at V _{out} < 18V			

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:

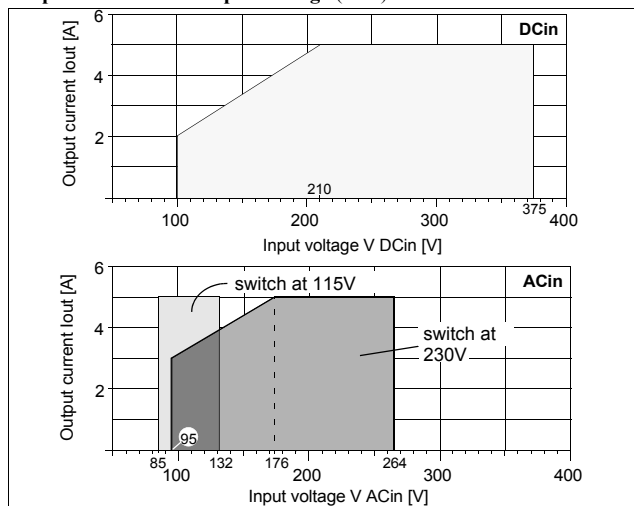
- All connection blocks are easy to reach as mounted at the front panel.
- Input and output are strictly apart from each other and so cannot be mixed up (input below, output above).

Wire Size Input/Output:

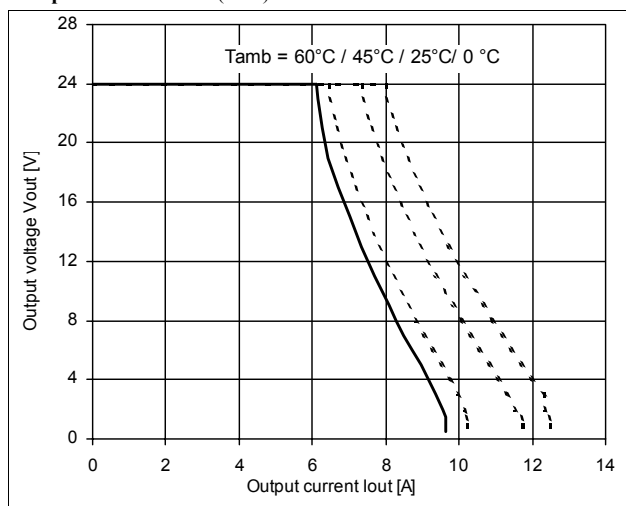
- Stranded 20...10 AWG (0.5...4 mm²), Solid 20...10 AWG (0.5...6 mm²)

Tightening Torque: 7 lbs in (0.8 Nm) recommended

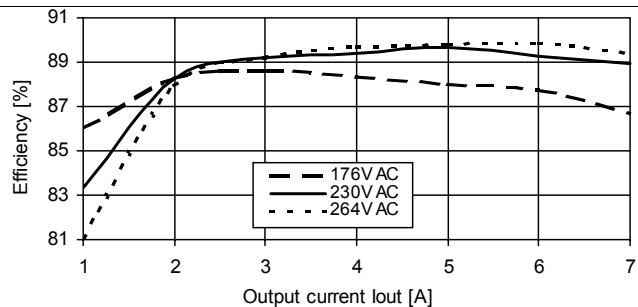
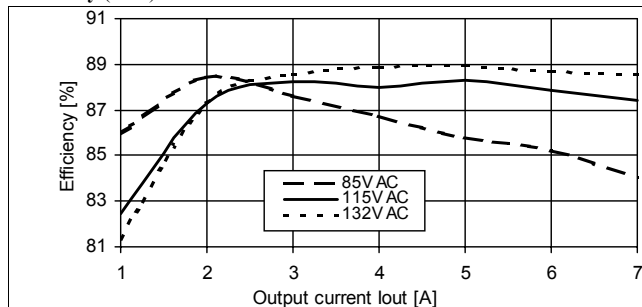
Output Current over Input Voltage (min.)



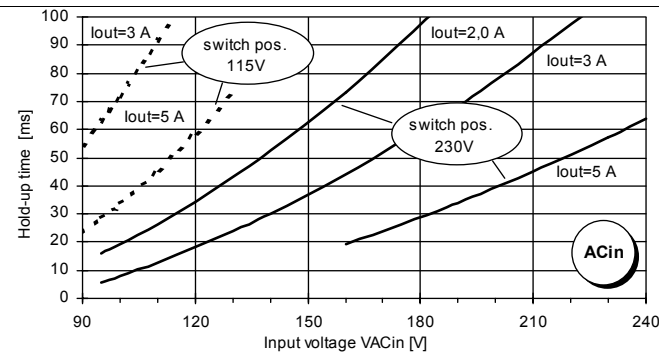
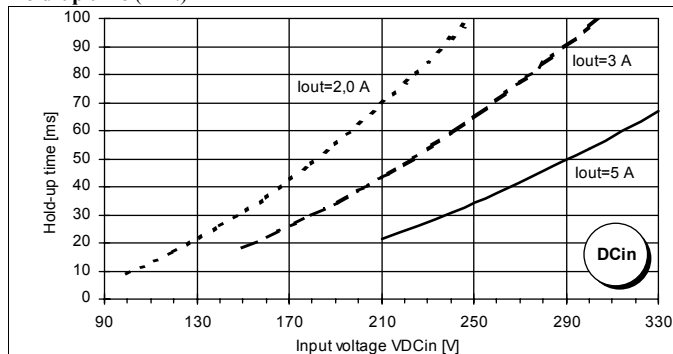
Output characteristic (min.)



Efficiency (min.)



Hold-up time (min.)



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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.