




## 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")
---------------	--

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 <sub>amb</sub> = +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 <sub>Nom</sub> ), V <sub>out</sub> 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, unshielded output cables.		
Ambient temperature range T <sub>amb</sub>	Operation: -10°C...+70°C (>60°C: Derating) 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 Rockwell Automation.	Switch	AC/DCin	I <sub>out</sub>
	230V	176-264V 95-176V 210-375V 150-210V 100-150V	ACin 5 A / 6 A * ACin 3 A DCin 5 A / 6 A * DCin 3 A 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 <sub>amb</sub> = +60°C...+70°C)		
Voltage regulation	better than 2% V <sub>out</sub> overall		
Ripple / Noise	< 50 mV <sub>pp</sub> , (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 <sub>out</sub> < 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:

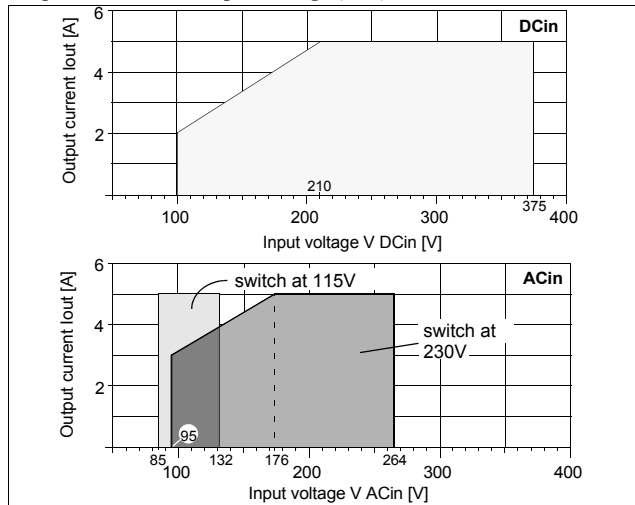
- All connection blocks are easy to reach as mounted at the front panel.
- Input and output are strictly apart from each other and so cannot be mixed up (input below, output above).

### Wire Size Input/Output:

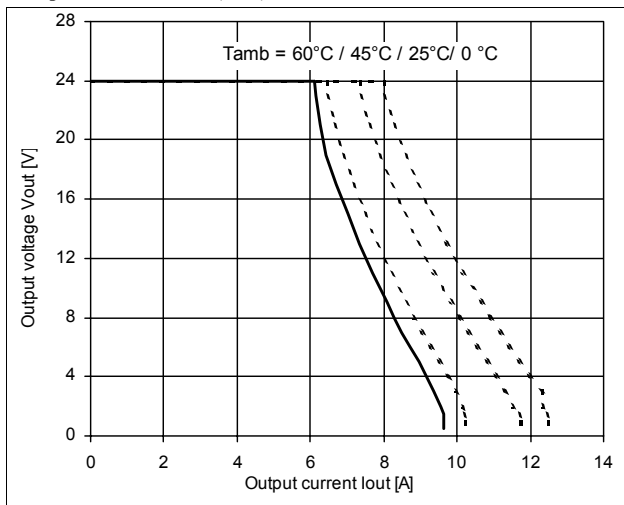
- Stranded 20...10 AWG (0.5...4 mm<sup>2</sup>), Solid 20...10 AWG (0.5...6 mm<sup>2</sup>)

Tightening Torque: 7 lbs in (0.8 Nm) recommended

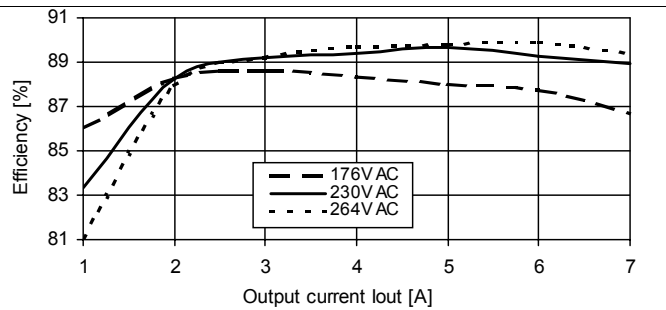
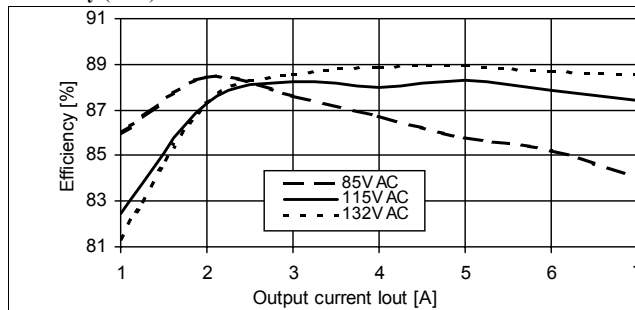
### Output Current over Input Voltage (min.)



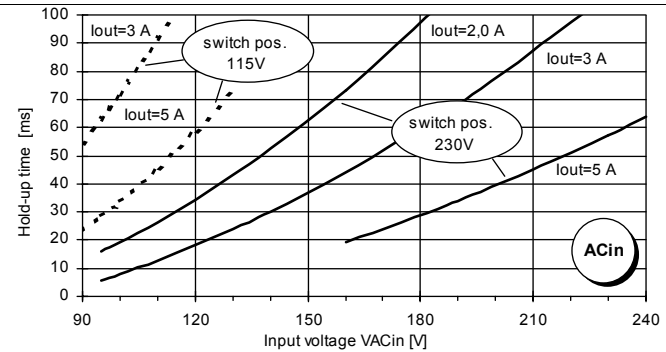
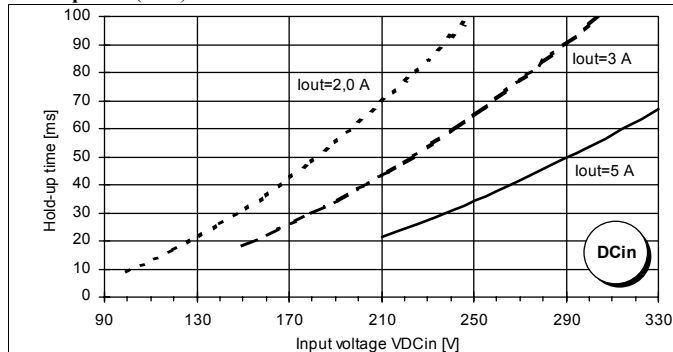
### Output characteristic (min.)



### Efficiency (min.)



### Hold-up time (min.)



[www.rockwellautomation.com](http://www.rockwellautomation.com)

### Corporate Headquarters

Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

### Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36-BP 3A/B, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

### Headquarters for Dodge and Reliance Electric Products

Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433

Europe: Rockwell Automation, Brühlstraße 22, D-74834 Elztal-Dallau, Germany, Tel: (49) 6261 9410, Fax: (49) 6261 1774

Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 351 6723, Fax: (65) 355 1733

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.