



Application Note

1606-XL60D

- World-wide approvals (  ) for industry
- Input: AC 230V / 115V
- Output: 24V / 2.5A

- 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...132 V AC / 176...264 V AC, 160...375 V 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 at any input voltage between 95 and 264 V AC (see Output at the right side).

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

Input current	< 1.3 A (switch in 115V position) < 0.7 A (switch in 230V position)
DC input current at open output	typ. 5.3 mA at 110 V DC, 3.9 mA at 300 V DC (preserves battery sources)
Inrush current	typ. 25 A at 264 V 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	> 20 ms at 196 V AC, 24V / 2.5 A (see diagram)

Efficiency, Reliability etc.

Efficiency	typ. 87.5 % (230 V AC, 24V / 2.5 A)
Losses	typ. 8.6 W (230 V AC, 24V / 2.5 A)
MTBF	740,000 h acc. to Siemensnorm SN 29500 (24V/2.5 A, 230 V 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
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Rise time	ca. 5...20 ms, depending on load
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Overload Behavior

- Special Overload Design – no disconnection, no hiccup if overloaded (see diagram) – high overload current (up to 1.5 I_{Nom}), V_{out} is gradually reduced with increasing current.

Advantages:

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

Output

Output voltage	24V DC +5%–1% (12V 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 volt- age, please contact Rockwell Automation.	Switch	AC/DCin		I _{out}
	230V	176...264V	ACin	2.5 A
		95...176V	ACin	1.5 A
		160...375V	DCin	2.5 A
		120...160V	DCin	2.0 A
		80*...120V	DCin	1.5 A
		115V	85...132V	ACin
* For start with DC input > 95V				

* For start with DC input > 95V DC needed

Output protected against short circuit, open circuit and overload

Derating	typ. 1.5 W/K (at T _{amb} = +60°C...+70°C)
Voltage regulation	better than 2% V _{out} overall
Ripple / Noise	< 25 mV _{pp} , (20 MHz bandwidth, 50 Ω measurement)
Overvolt. protection	typ. 32V
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 49 mm x 124 mm x 102 mm (+ DIN rail)
- Free space for ventilation above/below 25 mm recommended; right 10 mm recommended (front view)
- Weight 460 g

Design advantages:

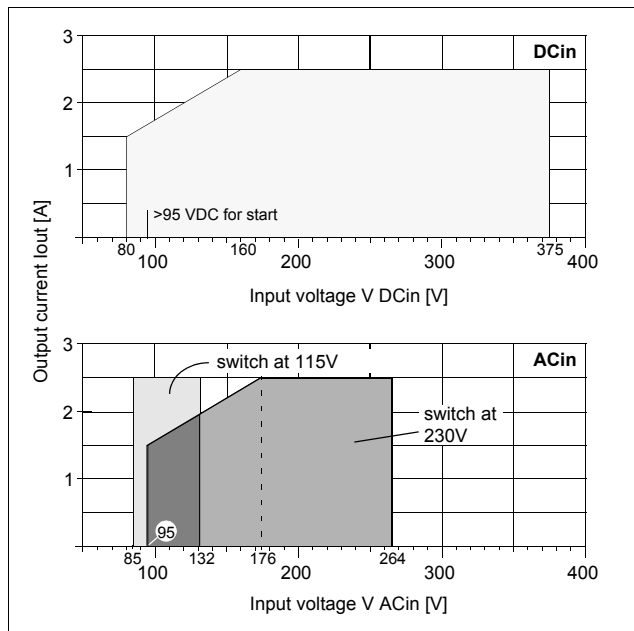
- All connection blocks are easy to reach as mounted at the front panel.
- Input and output are strictly apart from each other and so cannot be mixed up (Input below, output above).

Wire Size Input/Output:

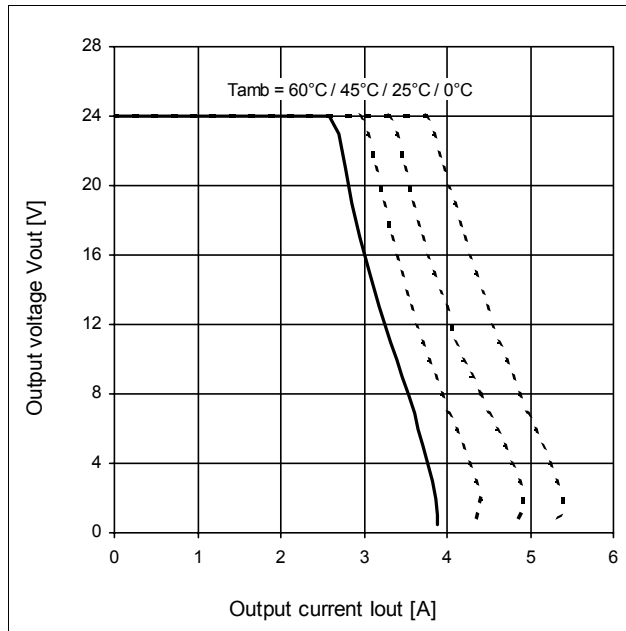
- Stranded 20...10 AWG (0.5...4 mm²), Solid 20...10 AWG (0.5...6 mm²)

Tightening Torque: 7 lbs in (0.8 Nm) recommended

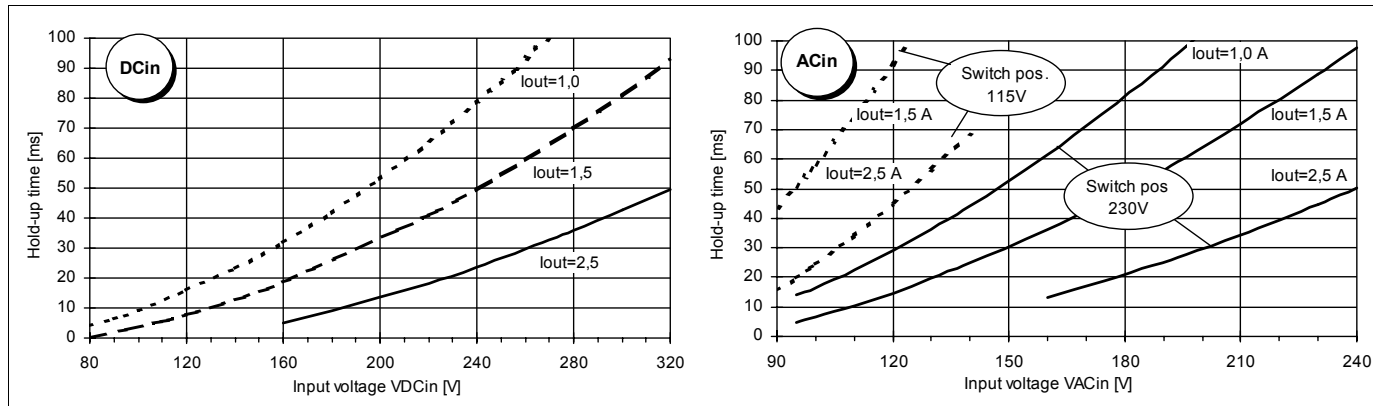
Output Current over Input Voltage (min.)



Output characteristic (min.)



Hold-up time (min.)



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

www.rockwellautomation.com

Corporate Headquarters

Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53204-5302 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