



Application Note

1606-XL120E-3

- World-wide approvals (CE UL ULUS) for industry
- Input: 3 AC 400...500V
- Output: 24...28V/120 W

- Power boost up to 144 W
- High overload current, no switch-off
- 3 phase wide range input
- Robust mechanics and EMC

Input

Input voltage 3 AC 400...500V, $\pm 15\%$
47...63 Hz, suitable for IT power systems

Rated tolerances (at 24V/5A)
 • Continuous operat. 340...576V AC resp. 450...820V DC
 • Short term (1 min.) 300...620V AC resp. 420...890V DC

Even if one phase fails, the unit's operation with nominal current can be continued (limitations: EN 61000-3-2 (harmonic current emissions) is then not fulfilled, the unit has noise suppression level A instead of level B and the hold-up time is shorter). Continued operat. with two phases is also permissible; however, it reduces the unit's reliability and lifetime.

Input current 3 x 0.5 A
 Inrush current typ. <25A at 575V AC and cold-start

If you intend to protect the primary side of the power supply with fuses or circuit breakers, 10 A (x3) slow acting fuses (HBC) or a supplementary protectors 1492-SP3C100 are 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 (PFC)

Hold-up time >16 ms (3 phase op. at 400V AC, 24V/5 A)
>10 ms (2 phase op. at 400V AC, 24V/5 A)

Efficiency, Reliability etc.

Efficiency typ. 89% (400V AC, 24V/5 A)
 Losses typ. 15 W (400V AC, 24V/5 A)
 MTBF 410.000 h acc. to Siemensnorm 29500 (24V/5 A, 400V AC, $T_U = 40^\circ\text{C}$)
 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 typ. 2 · I_{Nom}), V_{out} is reduced with increasing current.
 • 20% power boost – 6 A 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).
- Secondary fuses operate more reliably

Output

Output voltage 24...28V DC, adjustable by (covered) front panel potentiometer, preset: 24.5V $\pm 0.5\%$
Adjusting range guaranteed

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_{amb} Storage: -25°C...+85°C

Rated continuous loading with convection cooling	Input	T_{amb}	I_{out} @ 24V	I_{out} @ 28V
3-phase	-10°C...+60°C	-10°C...+45°C	5 A	4.3 A
		-10°C...+60°C	6 A*	5.1 A*
2-phase	-10...+60	-10°C...+45°C	5 A	4.3 A
		-10°C...+45°C	6 A*	5.1 A*
Output is protected against short-circuit, open circuit and overload	DC in	-10...+60	5 A	4.3 A
		-10°C...+45°C	6 A*	5.1 A*

* short-term (<1 min) or with forced air-cooling also at 60°C admissible

Derating typ. 6W/K (at $T_{amb} = +60^\circ\text{C} \dots +70^\circ\text{C}$)

Voltage regulation better than 2% V_{out} overall

Ripple / Noise < 25 mV_{pp}, (20 MHz bandwidth, 50 Ω measurement)

Overvolt. protection typ. 33V

Parallel operation yes; current sharing available on request

Power back immunity 34V

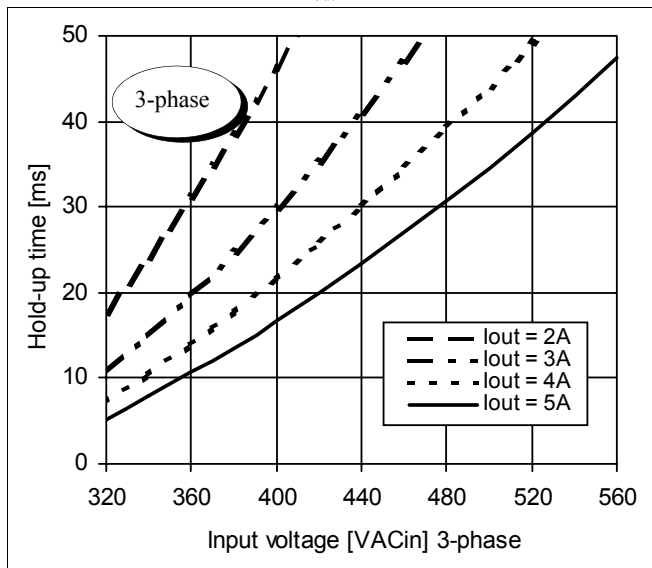
Front panel indicator Green LED, goes out at $V_{out} < 20V$

Construction / Mechanics

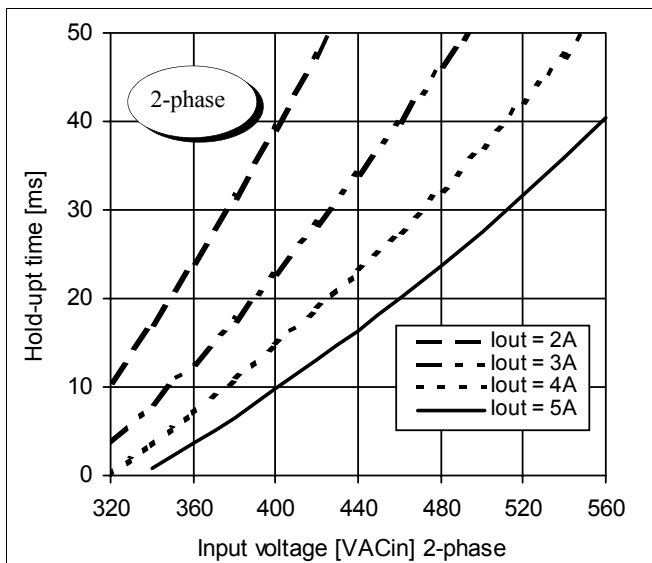
Housing dimensions and Weight

- W x H x D 73 mm x 124 mm x 117 mm (+ DIN rail)
- Free space for ventilation above/below 50 mm recommended, left/right 15 mm
- Weight 730 g

Hold-up time, 3-phase (min., at $V_{out}=24V$)



Hold-up time, 2-phase (min., at $V_{out}=24V$)



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Design advantages:

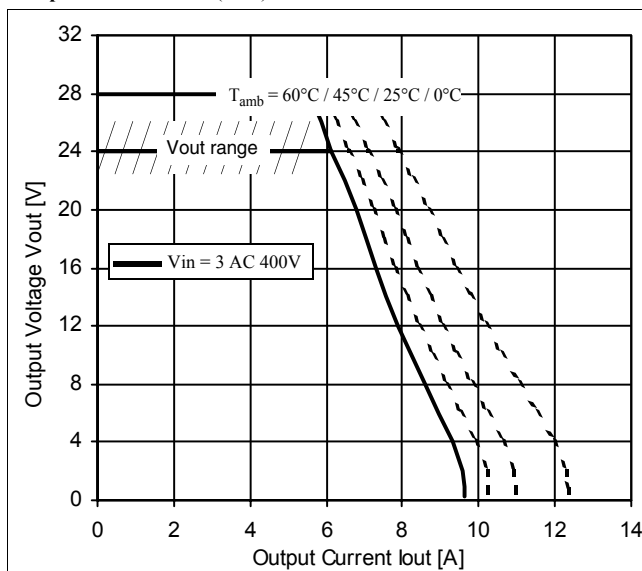
- All connection blocks are easy to reach as mounted at the front panel.
- Input and output are strictly apart from each other and so cannot be mixed up (Input below, output above).

Wire Size Input/Output:

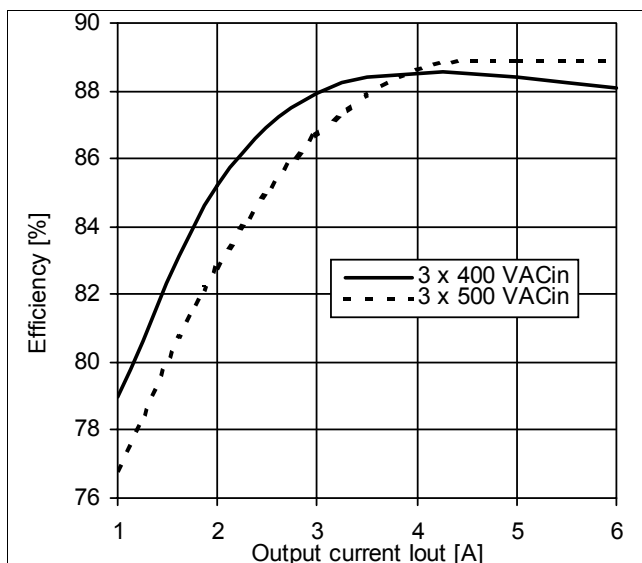
- Stranded 20...10 AWG (0.5...4 mm²), Solid 20...10 AWG (0.5...6 mm²)

Tightening Torque: 7 lbs in (0.8 Nm) recommended

Output characteristic (min.)



Efficiency (typ., at $V_{out}=24V$)



Specifications valid for 3x400V AC input voltage, +25°C ambient temperature, and 5 min run-in time, unless otherwise stated. They are subject to change without prior notice.