Bulletin 1606 — Power Supplies∗❄

- Quick mounting and connecting, innovative DIN-Rail mount, smallest in class
- UL Listed NEC Class 2; Class 1, Div. 2; Semi F47; ODVA Approved
- Low inrush current limiting
- PFC Active or Passive
- Wide range input; auto select input
- Superior overload design (continuous current, no hiccup)
- NEC Class 2 'Limited Power' options
- Selectable operating mode (single/parallel)
- Superior efficiency and temperature rating

Special Modules

- Brownout buffer, DC to DC converter, N+1 redundancy, DC UPS

Standards Compliance

- World-wide Certifications
- NEC Class 2
- Class 1 Div. 2 (T3A)
- cULus, CE, C-Tick, ATEX
- SEMI F47 Compatible
- ABS/GL/RINA (Marine)

Certifications

CE cULus LISTED cULus N223

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∗ Not all features apply to all power supplies; see individual power supply descriptions for specifics
❄ A more detailed list of performance specifications can be found at the Allen-Bradley web site http://www.ab.com/industrialcontrols/products/power_supplies/index.html

How to Select a Bulletin 1606 Power Supply

The Bulletin 1606 line of Power Supplies is designed with "reserve power" thereby eliminating the need to oversize your power supply to start high inrush loads.

Steps to size a Power Supply

1. Determine the "Average" continuous current of the load and the typical inrush current.

2. Select a power supply where the rated load is at/or below the current of the device and the Peak Current is less than the short-circuit rating of the power supply.

Notes:

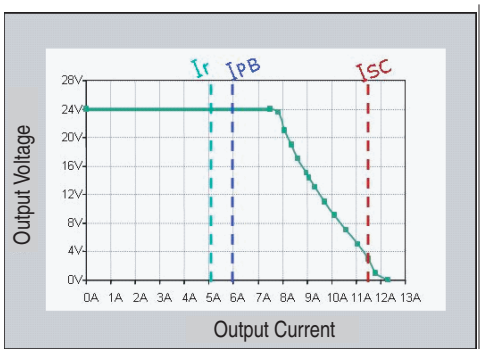
- ReservePower will deliver up to 25% additional current continuously.
- PowerBoost will deliver 150% of rated current for up to 5 s.

Example:

Application: Single Phase 120V input, 24V output, 5 A continuous current with 7.5 A inrush current

Solution: 1606-XLS120E

Output Characteristic for XLS120E (5 A) Power Supply



I_{RATED}: 5 A
$I_{SHORT\ CIRCUIT}$: >9 A
$I_{POWER\ BOOST}$: 7.5 A

Cat. No.	I_{RATED} [A]	$I_{SHORT\ CIRCUIT}$ (25 °C) [A]	$I_{POWER\ BOOST}$ or $I_{RESERVEPOWER}$ [A]
1606-XLS80E	3.3	5.2	5.4§
1606-XLS120E	5	9	7.5§
1606-XLS240E	10	21	15§
1606-XLS480E	20	30	30§
1606-XLS480E-3	20	29	30§
1606-XLSDNET4	3.8	4	—
1606-XLSDNET8	8	7	—
1606-XLE80E	3.3	5.5	3.6
1606-XLE120E	5	11	6
1606-XLE240E	10	16	12

§ Products with ReservePower.
♣ Short circuit current values are temperature dependent for the selected product; i.e., the higher the ambient temperature, the lower the short circuit current.
➢ Hiccup Overload design.

Quick Guide

Bulletin 1606-(number from table) ⌘ Power Supply Quick Guide

	15...40 W	50 W	60 W	72...80 W	90...100 W	120 W	180 W	240 W	480 W	720 W	960 W
5...5.5V	XLP15A XLP25A	—	—	—	—	—	—	—	—	—	—
10...12V	XLP30B	—	—	—	—	—	—	—	—	—	—
12...15V 1-Ph	XLP15B	XLP50B	XLP60BQ XLP60BQT	—	XLP90B	—	XL180B	—	—	—	—
12...15 V 3-Ph	—	—	—	—	XLE96B	—	—	—	—	—	—
(+/-)12 and 15V	XLP36C	—	—	—	—	—	—	—	—	—	—
24...28V 1-Ph	XLP15E XLP30E XLP30EQ	XLP50E XLP50EZ	XL60D XLP60EQ XLP60EQT	XLS80E XLE80E XLP72E	XLP95E XLP100E	XLS120E XLS120EA XLE120E XLE120EC XLE120EE XLE120EN	—	XLS240E XLS240EC XLE240E XLE240EP XLE240EE XLE240EN	XLS480E XLS480EA XLS480EC XLS480EE	—	XLS960EE
24...28V 2-Ph/3-Ph	—	—	—	—	XLP90E-2 XLP100E-2	XLE120E-2	—	XL240E-3C XLE240E-3	XLS480E-3 XLS480E-3C	XL720E-3	XLE960DX-3N XLS960E-3
36...43V	—	—	—	—	—	—	—	—	XLS480G-3	—	—
48...56V 1-Ph	—	XLP50F	—	—	XLP100F	—	—	XLE240F	XLS480F	—	XLS960FE
48...56V 3-Ph	—	—	—	—	—	—	—	XLE240F-3	XLS480F-3	—	XLE960MX-3N XLS960F-3
24V Redundant	—	—	XL60DR	—	—	XL120DR	—	XL240DR	—	—	—
DeviceNet	—	—	—	XLEDNET3	XLSDNET4	—	—	XLSDNET8	—	—	—

⌘ Example: For a 24...28 Volt, 3-Phase, 120 Watt power supply, the **Cat. No.** would be **1606-XL120E-3**.

Special Applications

Bulletin Number	NEC Class 2	ABS/GL Marine	Hazardeous Location Rating, Class 1 Div 2	ODVA Requirements	Conformal Coating	ATEX
1606-XLE	XLE80E	All XLE Power Supplies	All XLE Power Supplies	XLEDNET3	XLE120EC	—
1606-XLP	XLP15A XLP15B XLP15E XLP25A XLP30B XLP30E XLP36C XLP50B XLP50E XLP50EZ XLP50F XLP72E XLP90B XLP90E-2 XLP95E	XLP15A XLP15B XLP15E XLP25A XLP30E XLP36C XLP50E XLP50EZ XLP72E XLP90B XLP100E XLP100F XLPRED	XLP15A XLP15B XLP15E XLP25A XLP30B XLP30E XLP50B XLP50E XLP50EZ XLP72E XLP90B XLP95E XLP100E XLPRED	—	—	—
1606-XLS	XLSDNET4	ALL XLS Power Supplies	All XLS Power Supplies*	XLSDNET4 XLSDNET8	XLS240EC XLS480E-C XLS480E-3C	XLS120EA XLS240EA XLS480EA

* Cat. No. 1606-XLS240K does not have Hazardeous Location Rating.

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Three-Phase

Input Voltage	Output Power [W]	Output Voltage	Output Current [A]	Input Circuit Protection	Steady State Input Current 400...480 [V AC]	Parallel Operation	DC OK Relay	Cat. No.
380…480V AC, 600V DC	480	24…28	20	6 A Slow Blow Fuse or **Cat. No. 1489-A3C060**	3 x 0.65	Yes	✓	**1606-XLS480E-3**
380…480V AC, 600V DC	480	24…28	20			Yes	✓	➢ **1606-XLS480E-3C**
360…900V DC	480	24…28	20		3 x 0.85	Yes	✓	**1606-XLS480E-D**
380…480V AC, 600V DC	480	48…56	10		3 x 0.65	Yes	✓	**1606-XLS480F-3**
380…480V AC, 600V DC	480	36…42	13.3			Yes	✓	**1606-XLS480G-3**
380…480V AC, 600V DC	960	24…28	40		3 x 1.35	Yes	✓	**1606-XLS960E-3**
380…480V AC, 600V DC	960	48...54	20			Yes	✓	**1606-XLS960F-3**

1606-XLE Essential — Single-Phase

Input Voltage	Output Power [W]	Output Voltage	Output Current [A]	Input Circuit Protection	Steady State Input Current 120/230 [V AC]	Parallel Operation ✦	DC OK Relay	Cat. No.
100…120/200…240V AC	80	24…28	3.3	10 A Slow Blow Fuse or **Cat. No. 1489-A1C100/20♣**	1.5/0.68	No	—	**1606-XLE80E**
100…120/200…240V AC	120	24…28	5		2.34/1.23	No	—	**1606-XLE120E**
100…120/200…240V AC		24…28	5		2.34/1.23	No	—	➢ **1606-XLE120EC**
90…132V AC		24…28	5		1.23/—	No	—	**1606-XLE120EN**
180…264V AC		24…28	5		—/1.17	No	—	**1606-XLE120EE**
100…120/200…240V AC	240	24…28	10		4.34/2.23	No	—	**1606-XLE240E**
90…132V AC		24…28	10		3.73/—	Yes	—	**1606-XLE240EN**
180…264V AC		24…28	10		—/2.20	No	—	**1606-XLE240EE**
100…120/200…240V AC		24…28	10		4.34/2.00	No	—	**1606-XLE240EP**
100…120/200…240V AC		48…52	5		4.34/2.23	No	—	**1606-XLE240F**

1606-XLE Essential — Three-Phase

Input Voltage	Output Power [W]	Output Voltage	Output Current [A]	Input Circuit Protection	Steady State Input Current 400...480 [V AC]	Parallel Operation ✦	DC OK Relay	Cat. No.
380…480V AC, 600V DC	96	12...15	8	6 A Slow Blow Fuse or **Cat. No. 1489-A3C060**	2 x 0.56	No	—	**1606-XLE96B-2**
380…480V AC, 600V DC	120	24…28	5		3 x 0.60			**1606-XLE120E-2**
380…480V AC, 600V DC	240	24…28	10		0.68			**1606-XLE240E-3**
380…480V AC, 600V DC	240	48...56	5		3 x 0.60			**1606-XLE240F-3**
480V AC	960	24	40		3 x 1.40			**1606-XLE960DX-3N**
480V AC	960	48	20		3 x 1.40			**1606-XLE960MX-3N**

♣ Unit has internal (not accessible/replaceable) input fuse. Additional protection is not required if used on branch circuits ≤ UL test levels.
‡ Single/parallel operation (inclined characteristic) selectable (jumper). Consult local codes and regulations for installation.
✦ Parallel use for 1 + 1 redundancy only.
➢ The **C** suffix in the Cat. No. indicates that the product has **conformal coating**.

Bulletin 1606-XLS

	1606-XLS960EE	1606-XLS960E-3	1606-XLS960F-3
Output Volts/Watts	24…28V/960 W	24…28V/960 W	24…28V/960 W
Input Voltage (47...63 Hz)	200...240V AC, 220...300V DC	380...480 V AC	200...240V AC, 220...300V DC
Operational Range	170...264V AC, 176...375V DC	380....480V AC, 600V DC	170...264V AC, 176...375V DC
Hold-up Time	32 ms	20 ms	20 ms
Rated Input Current	4.6 A	1.65 A	1.65 A
Efficiency	typ. 94.6%	typ. 95.2%	typ. 95.4%
Output Voltage	24...28V	24...28V	48...54V
Rated Output Current	40 A (@ 24V) 34 A (@ 28V)	40 A (@ 24V) 34.3 A (@ 28V)	20 A (@ 48V) 17.8 A (@ 54V)
ReservePower (typ. 4 s)	60 A (@ 24V) 51 A (@ 28V)	60 A (@ 24V) 51 A (@ 28V)	30 A (@ 48V) 26.7 A (@ 54V)
Ripple/Noise	<100 mV_{PP}	<100 mV_{PP}	<100 mV_{PP}
Operating Temperature Range (T_{amb})	-25 °C...+70 °C		
Non-Operating Temperature Range	-40 °C...+85 °C		
Dimensions (W x H x D)	125 x 124 x 127 mm	110 x 124 x 127 mm	125 x 124 x 127 mm
Weight	1800 g	1500 g	1800 g
Certifications/Standards∗	1, 2, 3, 4, 5, 6, 7, 9		
Special Features	Class 1, Div. 2, ABS/GL/RINA (Marine)		

∗ 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cURus), 4) = CSA C22.2, No. 60950, 5) Safety standards = IEC/EN 60950, EN 50178, 6) EMC standards = EN 55011 (Class B), EN 55022 (Class B), EN 61000-6-2, 7) EMC standards = EN 61000-3-2 (A14), EN 50081-1, 9) ABS/GL/RINA (Marine)
♣ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

	1606-XLE80E	1606-XLE120E 1606-XLE120EC⌘	1606-XLE120EE	1606-XLE120EN	1606-XLE240E	1606-XLE240EE	1606-XLE240EN	1606-XLE240EP	1606-XLE240F
Output Volts/Watts	24V...28V/80 W	24V...28V/120 W	24V...28V/120 W	24V...28V/120 W	24V...28V/240 W	24V...28V/240 W	24V...28V/240 W	24V...28V/240 W	48V...52V/240 W
Input Voltage (47...63 Hz) [V AC]	100...120/200...240	100...120/200...240	200...240	100...120	100...120/200...240	200...240	100...120	100...120/200...240	
Operational Range [V AC]	90...132/180...264	90...132	180...264	90...132	90...132/180...264	180...264	90...132	90...132/180...264	
Hold-up Time	>60 ms (120V) >244 ms (240V)	>80 ms (120V) >78 ms (240V)	>80 ms (120V)	>78 ms (240V)	>46 ms (120V) >42 ms (240V)	>45 ms (240V)	>46 ms (120V)	>46ms (120V) >42ms (240V)	>46ms (120V) >42ms (240V)
Rated Input Current	1.24 A (100V AC) 0.68 A (240V AC)	2.6 A (100V AC) 1.3 A (240V AC)	2.6 A	1.4 A	5 A (100V AC) 2.5 A (240V AC)	2.7 A	5 A	<5.0 A (115V)/ <2.3 A (230V)	<1.3 A (115V)/ <0.7 A (230V)
Efficiency	typ. 90%	typ. 90%	typ. 90%	typ. 90.2%	typ. 91%	typ. 91.6 %	typ. 90.8 %	typ. 91%	typ. 92%
Output Voltage	24...28V								48...52V
Rated Output Current	3.3 A @ 24V 2.9 A @ 28V	5 A @ 24V 4.3 A @ 28V	5 A @ 24V	5 A @ 24V	10 A @ 24V 8.6 A @ 28V	10 A @ 24V	10 A @ 24V	10 A	5 A @ 48V 4.6 A @ 52V
Ripple/Noise	<50 mV_{PP}								
Operating Temperature Range (T_{amb})	-25...+70 °C, >60 °C with derating								
Non-Operating Temperature Range	-40...+85 °C								
MTBF♣	>700 000 hours								
Dimensions (W x H x D)	32 x 124 x 102 mm	32 x 124 x 117 mm			60 x 124 x 117 mm				
Weight	430 g	500 g	500 g	500 g	700 g	700 g	700 g	800 g	700 g
Certifications/Standards∗	1, 2, 3, 4, 5, 6, 7, 9								
Special Features	NEC Class 2	—							

∗ 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cURus), 4) = CSA C22.2, No. 60950, 5) Safety standards = IEC/EN 60950, EN 50178, 6) EMC standards = EN 55011 (Class B), EN 55022 (Class B), EN 61000-6-2, 7) EMC standards = EN 61000-3-2 (A14), EN 50081-1, 9) ABS/GL/RINA (Marine)
♣ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C.
⌘ Indicates conformal coating.