

Product Details and Certifications

Product: 1606-XL480E-3W

Description: 1606-XL480E-3W: Standard Power Supply, 24-28V DC, 480 W, 3-Phase, 480V AC wide range / 450-820V DC Input Voltage



Representative Photo Only (actual product may vary based on configuration selections)

SYSTEM DATA - For Selection Assistance

Product Functionality	Power Supply
-----------------------	--------------

POWER SUPPLY SELECTION

Would you like to see selection Tips?	Yes
Family	Standard Family
Product Selection	1606-XL480E-3W: Standard Power Supply, 24-28V DC, 480 W, 3-Phase, 480V AC wide range / 450-820V DC Input Voltage

IMPORTANT INFORMATION

Please Note:	Input Specs
	Output Specs
	Dimensions
	Special Features






Certifications and Approvals



EN	55011 (Class B)
EN	55022 (Class B)
EN	61000-6-2
EN	61000-3-2 (A14)
EN	50081-1
UL508	Listed, NMTR, File No. E56639
EMC	
IEC/EN	60950
UL1950	Recognized, Guide No. QGQ2, File No. E168663
CE	Marked
EN	50178
EN	55011 (Class B)
EN	55022 (Class B)
EN	61000-6-2
EN	61000-3-2 (A14)
EN	50081-1
UL508	Listed, Guide No. NMTR, File No. E56639
EMC	
IEC/EN	60950
UL1950	Recognized, Guide No. QGQ2, File No. E168663
CE	
EN	50178
For UL Certifications Directory:	http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm

Specification Sheet for 1606-XL480E-3W

Bulletin 1606
Power Supplies
Specifications

1606-XLS Performance Specifications

					
	1606-XLS80E	1606-XLS120E	1606-XLS240E and 1606-XLS240EC	1606-XLS480E	1606-XLS480E-3 and 1606-XLS480E-3C
Output Volts/Watts	24...28V/80 W	24...28V/120 W	24...28V/120 W	24...28V/480 W	24...28V/480W
Input Voltage (47...63 Hz)	100...240V AC, 110...300V DC	100...240V AC, 110...300V DC	100...240V AC, 110...300V DC	100...240V AC, 110...300V DC	380...480V AC, 600V DC
Operational Range	85...276V AC, 88...375V DC	85...264V AC, 88...360V DC	85...276V AC, 88...375V DC	85...276V AC, 88...375V DC	323...552V AC, 450...780V DC
Hold-up Time	27...174 ms	33...59 ms	27 ms	32...51 ms	19 ms
Rated Input Current	1.4 A (100V AC), 0.82 A (240V AC)	1.4 A (100V AC), 0.65 A (240V AC)	2.8 A (100V AC), 1.2 A (240V AC)	4.6 A (100V AC), 2.5 A (240V AC)	0.9 A (380V AC), 0.65 A (480V AC)
Efficiency	typ. 90.0%	typ. 92.7%	typ. 91.8%	typ. 92.4%	typ. 94.8%
Output Voltage	24...28V	24...28V	24...28V	24...28V	24...28V
Rated Output Current	3.4 A (@ 24V) 3.0 A (@ 28V)	5 A (@ 24V) 4.5 A (@ 28V)	10 A (@ 24V) 9 A (@ 28V)	20 A (@ 24V) 17 A (@ 28V)	20 A (@ 24V) 17.5 A (@ 28V)
Reserve Power (typ. 4 s)	5.4 A (@ 24V) 5.0 A (@ 28V)	7.5 A (@ 24V) 6.7 A (@ 28V)	15 A (@ 24V) 13.5 A (@ 28V)	30 A (@ 24V) 26 A (@ 28V)	30 A (@ 24V) 26 A (@ 28V)
Ripple/Noise	<100 mV _{pp}	<50 mV _{pp}	<50 mV _{pp}	<100 mV _{pp}	<100 mV _{pp}
Operating Temperature Range (T _{amb})	-25...+70 °C >60 °C with derating				
Non-Operating Temperature Range	-40...+85 °C				
MTBF ⁺	>650 000 hours	>831 000 hours	>581 000 hours	>469 000 hours	>690 000 hours
Dimensions (W x H x D)	32 x 124 x 102 mm	40 x 124 x 117 mm	60 x 124 x 117 mm	84 x 124 x 127 mm	65 x 124 x 127 mm
Weight	420 g	620 g	900 g	1200 g	870 g
Certifications/Standards*	1, 2, 3, 5, 6, 7				
Special Features	Active PFC; Class 1 Div. 2; Semi F47				

		
	1606-XLSDNET4	1606-XLSDNET8
Output Volts/Watts	24V/91 W	24V/192 W
Input Voltage (47...63 Hz)	100...240V AC; 110...300V DC	
Operational Range	85...264V AC 88...360V DC	85...276 V AC 88...375 V DC
Hold-up Time	43 ms (120V AC) 77 ms (240V AC)	38 ms (120V AC) 41 ms (240V AC)
Rated Input Current	1.1 A (100V AC) 0.5 A (240V AC)	2.3 A (100V AC) 1.0 A (240V AC)
Efficiency	typ. 92.4%	typ. 92.7%
Output Voltage	24V	
Rated Output Current	3.8 A	8 A
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 ⁺	>581 000 hours	>831 000 hours
Dimensions (W x H x D)	40 x 124 x 117 mm	60 x 124 x 117 mm
Weight	620 g	900 g
Certifications/Standards*	1, 2, 3, 5, 6, 7	
Special Features	NEC Class 2 power supply; Active PFC; ODVA Approved; Class 1 Div. 2; Semi F47	Active PFC; ODVA Approved; Class 1 Div. 2; Semi F47

* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cULRus), 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
⁺ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C
[✱] Because these catalog numbers end with "C", it indicates these devices have conformal coating.



Visit our website: www.ab.com/catalogs
 Preferred availability cat. nos. are printed in **bold**

8-9

Bulletin 1606
Power Supplies
 Specifications, Continued

1606-XLE

	1606-XLE80E	1606-XLE120E❖ and 1606-XLE120EC§	1606-XLE240E❖	1606-XLE240EP	1606-XLE240F
Output Volts/Watts	24V...28V/80 W	24V...28V/120 W	24V...28V/240 W	24V...28V/240 W	48V...52V/240 W
Input Voltage (47...63Hz)	AC 100...120V/200...240V				
Operational Range	90...132V/180...264V AC				
Hold-up Time	>60 ms (120V) >244 ms (240V)	>80 ms (120V) >78 ms (240V)	>46 ms (120V) >42 ms (240V)		
Rated Input Current	20 A (100V AC) 45 A (240V AC)	2.6 A (100V AC) 1.3 A (240V AC)	5 A (100V AC) 2.5 A (240V AC)		
Efficiency	typ. 90%	typ. 90%	typ. 91%	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	10 A @ 24V 8.6 A @ 28V		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	700 g	800 g	700 g
Certifications/Standards*	1, 2, 3, 4, 5, 6, 7				
Special Features	NEC Class 2	—			


* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cURus), 4) = CSA C22.2, No. 107-1, 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





§ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

§ Because this catalog number ends with **C**, it indicates the device has conformal coating.

❖ Available in regional voltages: add **N** to the end of the cat. no. for 90...132V, or add **E** to the end of the cat. no. for 180...264V.

1606-XLP Compact Specifications

				
	1606-XLP15A	1606-XLP15B	1606-XLP15E	1606-XLP25A
Output Volts/Watts	5...5.5V/15 W	12...15V/15 W	24...28V/15 W	5...5.5V/25 W
Input Voltage (47...63 Hz)	100...240V AC wide range; 85...370V DC			
Operational Range	85...264V AC			
Hold-up Time	>168 ms (230V AC) >45 ms (100V AC)	>191 ms (230V AC) >46 ms (100V AC)	>196 ms (230V AC) >47 ms (100V AC)	>170 ms (230V AC) >19 ms (100V AC)
Rated Input Current	<0.28 A (100V AC) <0.17 A (196V AC)			<0.5 A (100V AC) <0.35 A (196V AC)
Efficiency	typ. >77%	typ. >83%	typ. >88%	typ. >80%
Output Voltage	5...5.5V 5.1V preset	12...15V	24...28V	5...5.5V 5.1V preset
Rated Output Current	0.54...0.63 A	3 A	1.0...1.3 A	5 A (at 5.1V), 4.5 A (at 5.5V)
Ripple/Noise	<50 mV _{pp}	<75 mV _{pp}	<50 mV _{pp}	<50 mV _{pp}
Operating Temperature Range (T _{amb})	-10...+70 °C, >60 °C: 0.4 W/K derating			-10...+70 °C >60 °C: 0.5 W/K derating
Non-Operating Temperature Range	-40...+85 °C			
MTBF*	2 686 000 hours	3 811 000 hours	4 369 000 hours	600 000 hours
Dimensions (W x H x D)	22.5 x 75 x 91 mm			45 x 75 x 91 mm
Weight	130 g			240 g
Certifications/Standards*	1, 2, 4, 5, 7			
Special Features	NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2			

				
	1606-XLP30B	1606-XLP30E	1606-XLP36C	1606-XLP50B
Output Volts/Watts	10...12V/30 W	24...28V/30 W	±12V/±15V/36 W	12...15V/50 W
Input Voltage (47...63 Hz)	100...240V AC wide range; 85...375V DC		100...240V AC wide range; 85...375V DC	100...240V AC wide range; 85...375V DC
Operational Range	85...264V AC			
Hold-up Time	>170 ms (230V AC) >18 ms (100V AC)	>190 ms (230V AC) >19 ms (100V AC)	>180 ms (230V AC) >18 ms (100V AC)	>170 ms (230V AC) >17 ms (100V AC)
Rated Input Current	<0.6 A (100V AC) <0.25 A (240V AC)	<0.6 A (100V AC) <0.35 A (196V AC)	<0.65 A (AC 100V AC) <0.4 A (AC 196V AC)	<1.0 A (100V AC) <0.6 A (196V AC)
Efficiency	typ. 84%	typ. 87.5%	typ. 86%	typ. 90%
Output Voltage	10...12V 12V preset (with jumper), 10...12V adjustable (without jumper)	24...28V 24.5V preset	±12V (without jumper), ±15V (with jumper) ±15V preset	12...15V 15V preset (with jumper) 12...15V adjustable (without jumper)
Rated Output Current	3 A (@ 10V), 2.5 A (@ 12V)	1.3 A (@ 24.5V), 1 A (@ 28V)	0...2.8 A (@ +12V), 0...1.4 A (@ -12V), 0...2.4 A (@ +15V), 0...1.4 A (@ -15V)	4.2 A (@ 12V), 3.4 A (@ 15V)
Ripple/Noise	<10 mV _{pp}	<50 mV _{pp}	<50 mV _{pp}	<100mV _{pp}
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C: 0.6 W/K derating	-10...+70 °C >60 °C: 0.5 W/K derating	-10...+70 °C >60 °C: 1 W/K derating	-10...+70 °C >60 °C: 1 W/K derating
Non-Operating Temperature Range	-10...+70 °C >60 °C: 0.6 W/K derating	-10...+70 °C >60 °C: 0.5 W/K derating	-10...+70 °C >60 °C: 1 W/K derating	-10...+70 °C >60 °C: 1 W/K derating
MTBF*	appr. 650 000 hours		600 000 hours	appr. 600 000 hours
Dimensions (W x H x D)	45 x 75 x 91 mm			
Weight	250 g	230 g	240 g	260 g
Certifications/Standards*	1, 2, 4, 5, 7			
Special Features	NEC Class 2 power supply; Class 1 Div. 2	NEC Class 2 power supply; Class 1 Div. 2; Semi F47	Output voltage adjustable: DC ±12V without jumper or DC ±15V with jumper; NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2	Output voltage adjustable: DC 12...15V without jumper or DC 15V with jumper; NEC Class 2 power supply; Class 1 Div. 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
* MTBF determined by Siemens norm SN 29500 at full load current and 40 °C







Visit our website: www.ab.com/catalogs
Preferred availability cat. nos. are printed in **bold**

Bulletin 1606
Power Supplies
 Specifications, Continued

1606-XLP Compact Specifications, Continued

						
	1606-XLP50E	1606-XLP50EZ	1606-XLP50F	1606-XLP72E	1606-XLP90B	1606-XLP90E-2
Output Volts/Watts	24...28V/50 W		48...56V/50 W	24...28V/72 W	12...15V/90 W	24...28V/90 W
Input Voltage (47...63 Hz)	100...240V AC wide range; 85...375V DC			100...120/220...240V AC manual select; 220...375V DC	100...120/220...240V AC; 220...375V DC	2Ø, 380...480V AC
Operational Range	85...264V AC			85...132/184...264V AC		323...552V AC
Hokl-up Time	>171 ms (230V AC) >17 ms (100V AC)		>170 ms (230V AC) >17 ms (100V AC)	>40 ms (230V AC) >25 ms (100V AC)	>40 ms (230V AC) >20 ms (196V AC, 100V AC)	>52 ms (400V) >93 ms (480V)
Rated Input Current	<1.0 A (100V AC) <0.6 A (196V AC)			<1.6 A (100V AC) <0.8 A (220V AC)	<1.9 A	<0.42 A (400V) <0.36 A (480V)
Efficiency	typ. 88.5%		typ. 90%	typ. 89%	typ. 88.5%	typ. 89%
Output Voltage	24...28V 24.5V preset		48...56V 48V preset	24...28V 24.5V preset (at 2.9 A)	12...15V Preset at 12V	24...28V Preset at 24.5V
Rated Output Current	2.1 A (@ 24.5V), 1.8 A (@ 28V)		1.05 A (@ 48V), 0.9 A (@ 56V)	3 A (@ 24V), 2.6 A (@ 28V)	7.5 A (@ 12V), 6 A (@ 15V)	3.75 A (@ 24V), 3.2 A (@ 28V)
Ripple/Noise	<50 mV _{pp}		<200 mV _{pp}	<50 mV _{pp}	<50 mV _{pp}	<50 mV _{pp}
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C: 1 W/K derating			-10...+70 °C >60 °C: 1.5 W/K derating		-10...+70 °C >60 °C: 2 W/K derating
Non-Operating Temperature Range	-40...+85 °C					
MTBF ¹	appr. 600 000 hours			appr. 600 000 hours	appr. 500 000 hours	appr. 500 000 hours
Dimensions (W x H x D)	45 x 75 x 91 mm			45 x 75 x 91 mm	73 x 75 x 103 mm	73 x 75 x 103 mm
Weight	240 g			260 g	360 g	360 g
Certifications/Standards*	1, 2, 3, 4, 5, 6			1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7
Special Features	NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2; Semi F47	Removeable Terminations; NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2	NEC Class 2 power supply	NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2	NEC Class 2 power supply; ABS/GL/RINA (Marine); Class 1 Div. 2	NEC Class 2 power supply

8

				
	1606-XLP95E	1606-XLP100E	1606-XLP100F	1606-XLP100E-2
Output Volts/Watts	24...28V/95 W		24...28V/100 W	48...56V/100 W
Input Voltage (47...63 Hz)	100...120/220...240V AC auto select; 220...375V DC			2Ø, 380...480V AC
Operational Range	85...132/184...264V AC			323...552V AC
Hold-up Time	>40 ms (230V AC) >20 ms (100V AC)		>48 ms (400V) >85 ms (480V)	>48 ms (400V) >85 ms (480V)
Rated Input Current	<2.0 A (100V AC) <0.95 A (220V AC)		<2.1 A (100V AC) <1.0 A (220V AC)	<0.46 A (400V) <0.40 A (480V)
Efficiency	typ. 90%		typ. 91%	typ. 89%
Output Voltage	24...28V 24.5V preset		48...56V 48V preset	24...28V Preset at 24.5V
Rated Output Current	3.9 A (@ 24.5V), 3.2 A (@ 28V)		4.2 A (@ 24.5V), 3.6 A (@ 28V)	2.1 A (@ 48V), 1.8 A (@ 56V)
Power Boost	—		—	—
Ripple/Noise	<50 mV _{pp}		<50 mV _{pp}	<50 mV _{pp}
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C: 2 W/K derating			
Non-Operating Temperature Range	-40...+85 °C			
MTBF ¹	appr. 600 000 hours			
Dimensions (W x H x D)	73 x 75 x 103 mm			
Weight	360 g			
Certifications/Standards*	1, 2, 3, 4, 5, 6, 7			
Special Features	NEC Class 2 power supply; Class 1 Div. 2		Single/parallel operation (inclined characteristic) select on front panel; ABS/GL/RINA (Marine); Class 1 Div. 2; Semi F47	Single/parallel operation (inclined characteristic) select on front panel; 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
¹ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

Visit our website: www.ab.com/catalogs

Preferred availability cat. nos. are printed in **bold**



1606-XL Single Phase Specifications

						
	1606-XL60D	1606-XL180B	1606-XL480EP	1606-XL480EPT	1606-XL480GP	1606-XL480F
Output Volts/Watts	24V/60 W	12...15V/180 W	24...28V/480 W		36...43V/480 W	48...56V/480 W
Input Voltage (47...63 Hz)	100...120/200...240V AC manual select; 160...375V DC	100...120/220...240V AC 240...375V DC	100...120/200...240V AC			
Operational Range	85...132/176...264V AC	85...132/176...264V AC	85...132/184...264V AC			
Hold-up Time	>20 ms (196V AC)	>81 ms (230V AC) >84 ms (120V AC) >45 ms (100V AC)	30 ms (120/230V AC)		>27 ms (230V AC)	30 ms (230V AC)
Rated Input Current	<1.3 A (115V)/<0.7 A (230V)	<5 A (115V)/<2.3 A (230V)	10 A (115V)/5 A (230V)			
Efficiency	typ. 87.5%	typ. >87%	typ. 90.5%		typ. 92%	typ. 93%
Output Voltage	24V	12...15V Preset at 12V	24...28V Front panel potentiometer		36...43V Front panel potentiometer	48...56V Front panel potentiometer
Rated Output Current	2.5 A	15 A (@ 12V), 12 A (@ 15V)	20 A (@ 24V), 18 A (@ 28V)		13.3 A (@ 36V), 11.2 A (@ 43V)	10 A (@ 48V), 8.6 A (@ 56V)
Power Boost	—	18 A	25 A (22 A)		16.6 A (14 A)	12.5 A (10.7 A)
Ripple/Noise	<25 mV _{pp}	<50 mV _{pp}	< 20 mV _{pp} (single operation) <40 mV _{pp} (parallel operation)		<30 mV _{pp} (single operation) <80 mV _{pp} (parallel operation)	<40 mV _{pp} (single operation) <80 mV _{pp} (parallel operation)
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C with derating	0...70 °C >60 °C with derating	0...+70 °C >60 °C with derating			
Non-Operating Temperature Range	-40...+85 °C	0...70 °C >60 °C with derating	-40...+85 °C			
MTBF*	740 000 hours	<425 000 hours	519 000 hours			
Dimensions (W x H x D)	49 x 124 x 102 mm	120 x 124 x 102 mm	220 x 124 x 102 mm			
Weight	460 g	980 g	2500 g			1800 g
Certifications/Standards*	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6, 7			1, 2, 3, 4, 5, 6
Special Features	NEC Class 2 power supply; Semi F47	—	PFC choke; Overload behavior selectable; (hicup/continuous current); ‡	PFC choke; ‡	Selectable single/parallel operation (inclined characteristic); PFC choke; ‡	‡







* 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

‡ Low inrush current

‡ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

Bulletin 1606
Power Supplies
Specifications, Continued

1606-XL Three Phase Specifications

						
	1606-XL120E-3	1606-XL240E-3 and 1606-XL240E-3C	1606-XL480F-3H	1606-XL720E-3	1606-XL960E-3	1606-XL960E-3S
Output Volts/Watts	24...28V/120 W	24...28V/240 W	48...56V/480 W	24...28V/720 W	24...28V/960 W	
Input Voltage (47...63 Hz)	3Ø, 400...500V AC wide range; 450...820V DC	3Ø, 400...500V AC wide range; 450...820V DC	3Ø, 400V AC; 450...700V DC	3Ø, 400...500V AC wide range; 450...820V DC	3Ø, 400...500V AC wide range	
Operational Range	340...576V AC		340...479V AC	340...576V AC		
Hold-up Time	>16 ms (3Ø 400V AC) >10 ms (2Ø 400V AC)	>24 ms (3Ø 400V AC) >20 ms (2Ø 400V AC)	>11 ms	>10 ms (3Ø 400V AC)	>15 ms (3Ø 400V AC)	
Rated Input Current	3 x 0.5 A	3 x 0.8/0.7 A @ 400/500V	3 x 1.5 A	3 x 2.0 A	3 x 3.0 A	
Efficiency	typ. 89%	typ. 92%	typ. 92%	typ. 92.5%	typ. 92.5%	
Output Voltage	24...28V 24.5V preset	24...28V 24.5V preset	48...56V 48.1V preset	24...28V front panel potentiometer	24...28V front panel potentiometer	
Rated Output Current	5 A (@ 24V), 4.3 A (@ 28V)	10 A (@ 24V), 8.6 A (@ 28V)	10 A (@ 48V), 9 A (@ 56V)	30 A (@ 24V), 26 A (@ 28V)	40 A (@ 24V), 35 A (@ 28V)	
Power Boost	6 A	12 A (up to 288 W)	12.5 A	33 A	45 A	
Ripple/Noise	<25 mV _{pp}	<30 mV _{pp}	<50 mV _{pp}	<20 mV _{pp} (single operation) <40 mV _{pp} (parallel operation)	<50 mV _{pp}	
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C with derating	0...+70 °C >60 °C with derating	0...+70 °C >60 °C with derating			
Non-Operating Temperature Range	-40...+85 °C		-40...+85 °C			
MTBF	410 000 hours	543 000 hours (3Ø), 525 000 hours (2Ø)	310 000 hours	425 000 h @ 400V AC, 360 000 h @ 480V AC	305 000 hours	268 000 hours
Dimensions (W x H x D)	73 x 124 x 117 mm	89 x 124 x 117 mm	220 x 124 x 102 mm	240 x 124 x 112 mm	275 x 124 x 117 mm	
Weight	730 g	980 g	1800 g	2000 g	3300 g	
Certifications/Standards*	1, 2, 3, 4, 5, 6, 7					
Special Features	PFC choke	Overload behavior selectable (FUSE Mode/continuous current); 2-phase operation (inclined characteristic); Single/parallel operation (inclined characteristic); PFC choke; ‡	Single/parallel operation (inclined characteristic) selectable (jumper); PFC choke; ‡	PFC choke; ‡	Single/parallel operation (inclined characteristic) selectable (jumper); passive load sharing; PFC choke; ‡	Parallel operation through active current sharing; Output signals (Power-Fail, Shut-Down, internal current measurement, overtemperature warning); PFC choke; ‡, ‡

* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cULus), 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

‡ Low inrush current

‡ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

‡ Because this catalog number ends with "C", it indicates the device has conformal coating.

"Shut Down" Input

Function: Turning the unit on or off using logic signal (remote monitoring). Unit switches off when input is connected to "Signal GND" terminal (DU ≤ 1V) or the input has a voltage of +20...28V with respect to the "Signal GND" terminal (max. 20 mA).

"DC Ok" Output

Function: Indicating whether the unit is operating properly. Output can directly energize a relay or a control light.
Signaling: Output signal is at a "high" level (24V, current source) in normal operation (no overload, overheating, short circuit). When the output signal switches to "low" level (no power at output), Vout remains for 5 ms (nominal) at nominal load.
Connection (signal common): Connection is made with respect to the "Signal GND" terminal (signal output).
Important: Do not connect to the power output (terminals + and -).

Permissible load: resistance - min. 300 Ω, e.g. 24V relay, control lights (LEDs need no series resistance), Evaluation logic.
For 5V signal: In order to receive a 5V signal, switch a 5V Zener diode (0.5 W) and 1 kΩ, resistance in parallel between this output and the "Signal GND" terminal.

"Thermal Alarm" Output

Function: Output gives warning shortly before and while overtemperature state occurs. Output can directly control a relay or a control light.
Signaling: Output signal is at a "high" level (24V, current source) in normal operation (no overtemperature). At overtemperature, the output switches to "low". Only when the temperature in the unit increases further will the unit reduce its output current (power output).
Connection and permissible load: same as for "DC ok" output.

"Current Monitor" Output

Function: Measuring the output current (power output). Output signal is proportional to the output current of the unit.
Connection: Made with respect to the "Signal GND" terminal (signal output).
Important: Do not connect to the power output (terminals + and -).
Signaling: Voltage measuring: Voltage at signal output is 1V per 10 A output current (Ri(voltmeter) > 100 k ohm). Current measurement: Current at signal output is 1 mA per 10 A output current (Ri(ammeter) < 100 W).

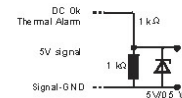
"Current Balance" In-/Output

Function: Using these terminals, parallel operating units ensure an equal load sharing (active balancing). Balancing also works reliably with decoupling diodes at the power output (redundancy).






Connection: Connect together "Current Balance" outputs of all units involved.
Important: Signal common here is the - terminal of the power output, not the "Signal GND". Do not connect the "Signal GND" terminals to each other!

"Signal GND" Terminal

Function: Grounding terminal for all signal terminals (not for "Current Balance").
Connection instructions: Do not connect this terminal with terminals + or - of the unit (not even over a load; risk of overload). Do not connect this terminal with terminals of other units (not even with the "Signal GND" terminal of another unit).
Permissible load: Maximum current load 0.3 A. Terminal is fused internally with a self-healing fuse (polyswitch).




1606-XL Special Modules

					
	Buffer Module	UPS	DC/DC Converter	N+1 Redundancy	N+1 Redundancy
	1606-XLBUFFER	1606-XLS240-UPS	1606-XLDC40A	1606-XL60DR	1606-XL120DR
Output Volts/Watts	22.5V...27.8V/480 W	22.5V...30V/240 W	DC 5.1V ±1%	24V/60 W	24V/120 W
Input Voltage (47...63 Hz)	24V DC (24...28.8V DC)	24V DC (22.5...30V DC)	18...36V DC	100...120V/200...240V AC manual select; 160...375V DC	100...120/200...240V AC manual select; 210...375V DC
Operational Range	23...35V DC	22.5...30V DC	18...36V DC	—	65...132/176...264V AC
Hold-up Time	>0.2 s (20 A)	battery dependent	>10 ms (DC 24 Vin)	>20 ms (AC 196V)	>37 ms (AC 196V)
Rated Input Current	charging current <600 mA	<0.12 A (standby) <1.3 A (charging)	<2.9 A/<1.5 A	<1.3 A (115V)/<0.7 A (230V)	<2.6 A (115V)/<1.4 A (230V)
Efficiency	N/A	N/A	typ. 82%	typ. 86.5%	typ. 89%
Output Voltage	Vin -1V; 23...27.8V 22.5V fixed	22.4V	5.1V DC ±1% selectable 4.5...5.5V	24V	24V
Rated Output Current	0...20 A	10 A	8 A	2.5 A	5 A
Power Boost	—	15 A	—	—	6 A
Ripple/Noise	<200 mV _{pp}	—	<50 mV _{pp}	<30 mV _{pp}	<30 mV _{pp}
Operating Temperature Range (T _{amb})	-10...+70 °C >60 °C with derating	-25...+60 °C	0...+70 °C >60 °C with derating	-10...+70 °C >60 °C with derating	-10...+70 °C >60 °C with derating
Non-Operating Temperature Range	-40...+85 °C				-40...+85 °C
MTBF§	480 000 hours	—	510 000 hours	700 000 hours	480 000 hours
Dimensions (W x H x D)	64 x 124 x 102 mm	49 x 124 x 117	49 x 124 x 102 mm	49 x 124 x 102 mm	64 x 124 x 102 mm
Weight	740 g	530 g	470 g	470 g	620 g
Certifications/Standards*	1, 2, 3, 5, 6	1, 2, 3, 5, 6	1, 5, 6	1, 2, 3, 5, 6	1, 2, 3, 5, 6, 7
Special Features	Selectable buffered voltage; ‡	Inhibit replacement battery buffering	MOSFET inverse battery protection; ‡	RDY relay contact; N+1 redundancy; plug connectors; NEC Class 2 power supply	RDY relay contact; N+1 redundancy; plug connectors

* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cULRus), 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 50091-1
‡ Low inrush current
§ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

Bulletin 1606
Power Supplies
Specifications, Continued

1606-XL Special Modules, Continued

						
	N+1 Redundancy	N+1 Redundancy	N+1 Redundancy	N+1 Redundancy	N+1 Redundancy	
	1606-XL240DR	1606-XLRED20-30	1606-XLRED40	1606-XLPRED	1606-XLSRED	1606-XLERED
Output Volts/Watts	24V/240 W	30 A Dual redundancy module	40 A Single redundancy module	10 A Dual redundancy	20 A Dual redundancy	
Input Voltage (47...63 Hz)	AC 100...120/200...240V manual select; DC 240...375V	DC 24V (max. 35V)		DC 10...60V	DC 10...60V	
Operational Range	85...132/176...264 V AC	18...36 V DC		10...60V DC	10...60V DC	
Hold-up Time	>25 ms (AC 196V)	—	—	—	—	
Rated Input Current	<6 A (115V)/<2.8 A (230V)	20...30 A (max. 35 A)	0...40 A (max. 50 A)	Single input: 10 A max. Dual input: 16 A max. total	Single input: 20 A max. Dual input: 20 A max. total	
Efficiency	typ. 89%	typ. >97%	typ. >97%	—	—	
Output Voltage	24V	Vin -0.5V typ.	Vin -0.6V typ.	Vin -0.9V typ.	Vin -0.9V typ.	
Rated Output Current	10 A	20...30 A (max. 35 A)	0...40 A (max. 50 A)	0...10 A	0...20 A	
Power Boost	12 A	—	—	—	—	
Ripple/Noise	<30 mVpp	—	—	—	—	
Operating Temperature Range (Tamb)	0...+70 °C >60 °C with derating	-10 °C...+70 °C		-40 °C...+70 °C >60 °C with derating	-25 °C...+70 °C >60 °C with derating	
Non-Operating Temperature Range	-40...+85 °C					
MTBF§	390.000 hours	—	—	—	—	
Dimensions (W x H x D)	120 x 124 x 102 mm	48 x 124 x 102 mm	48 x 124 x 117 mm	45 x 75 x 91 mm	32 x 124 x 102 mm	32 x 124 x 117 mm
Weight	980 g	625 g	646 g	136 g	290 g	350 g
Certifications/Standards*	1, 2, 3, 5, 6	1, 2, 3, 6		1, 2, 3, 6	1, 2, 3, 6	
Special Features	RDY relay contact; N+1 redundancy; plug connectors	Dual redundancy module for 2x35 A; N+1 redundancy	Single redundancy module for 2.5-50 A; N+1 redundancy	Redundancy for DC 10...60V applications; ABS/GL/RINA (Marine); Class 1 Div. 2	Redundancy for DC 10...60V applications; Class 1 Div. 2	Redundancy for DC 10...60V applications; Class 1 Div. 2; DC OK

* 1) = CE, 2) = UL 508 (cULus LISTED), 3) = UL 1950 (cURus), 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
§ MTBF determined by Siemens norm SN 29500 at full load current and 40 °C

8

Short Circuit Ratings Data Sheet for 1606-XL480E-3W

Operational Rating	SCCR				Rating Reference	File Ref: UL	File Ref: CSA	UL508A	Comments
	120V [kA]	240V [kA]	277V [kA]	480Y/277V [kA]				Category Code	
--	--	--	--	--	--	E56639	--	NMTR	Not applicable due to UL 508A exemption.
--	--	--	--	--	--	E168663	--	QGGQ2	Not applicable due to UL 508A exemption.
--	--	--	--	--	--	E56639	--	NMTR	Not applicable due to UL 508A exemption.
--	--	--	--	--	--	E168663	--	QGGQ2	Not applicable due to UL 508A exemption.