Technical Data

Original Instructions

Switched Mode Power Supply Specifications

Bulletin 1606

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Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Product Overview

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



Special Modules

- Buffer Modules
- Redundancy Modules (1+1 or N+1 redundancies)
- DC UPS
  - Traditional UPS with battery
  - Capacitor-based UPS without batteries - Electrochemical Double Layer Capacitors (EDLC)

Power Supply Family/ Attributes[1]	Performance Power Supply 1606-XLS	Essential Power Supply 1606-XLE	DC-DC Converter 1606-XLD	Compact Power Supply 1606-XLP	Basic Power Supply 1606-XLB
					
Input Voltage	Single/multi-phase	Single/multi-phase	DC Voltage	Single/multi-phase	Single-phase
Watt Range	80...960 W	80...960 W	92...240 W	15...100 W	36...480 W
Multiple Output Voltages	12, 24, 30, 36, 48V DC	12, 24, 48V DC	24, 48V DC	5, 12, 15, 24, 48V DC	12, 24V DC
Terminations	Screw, Cam Lock Spring	Screw, Cam Lock Spring, Plug, and Push-in	Screw, Cam Lock Spring	Screw, Cam Lock Spring, Plug	Screw, Push-in
Auto Select Input	Yes	Yes	–	Yes	Yes
Power Boost	150%/ 5 s	120%	120%	–	–
DC OK Relay Output	Yes	Yes	Yes	Yes	Yes
DC OK Status Indicator	Yes	Yes	Yes	Yes	Yes
Wide Range	Yes	Yes	–	Yes	Yes
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(1) Not all features apply to all power supplies; see individual power supply descriptions for specifics.

Catalog Number Explanation

1606	-	XLE	480	E	P	-	D
		a	b	c	d		e

a	
Power Supply Type	
Code	**Description**
XLB	Basic Power Supply
XLD	DC-DC Converter
XLE	Essential Power Supply
XLP	Compact Power Supply
XLS	Performance Power Supply

e	
Multi-phase Variations	
Code	**Description**
blank	—
2	Two-phase
3	Three-phase
3C	Three-phase, conformal coating
3E	Three-phase, input voltage 400V AC
3N	Three-phase, input voltage 480V AC
D	360...900V DC Only

b	
Rated Output	
Code	**Description**
15	15 W
25	25 W
30	30 W
36	36 W
40	40 W
50	50 W
60	60 W
72	72 W
80	80 W
90	90 W
95	95 W
100	100 W
120	120 W
180	180 W
192	192 W
240	240 W
260	260 W
480	480 W
720	720 W
960	960 W

c	
Output Voltage	
Code	**Description**
A	5V DC
B	10...12 or 12...15V DC
C	Dual ± 12V and 15V DC
D	24V
E	24...28V DC
F	48...56V DC
G	36...43V DC
M	48V DC

d	
Special Features	
Code	**Description**
blank	No special features
A	ATEX
C	Conformal Coated
CH	Push-in Terminal, Conformal Coated
CL	Spring Terminals, Conformal Coated
CR	Screw Terminals, Conformal Coated, Redundancy Built-in
CRH	Push-in Terminal, Conformal Coated, Redundancy Built-in
CRL	Spring Terminals, Conformal Coated, Redundancy Built-in
CRZ	Plug/Removable, Conformal Coated, Redundancy Built-in
CZ	Plug/Removable, Conformal Coated
D	Extended DC Input
DRZ	Plug/Removable, Redundancy Built-in, Extended DC input
E	Regional Unit - Europe
H	Push-in Terminals
L	Spring-clamp Terminals
M	Remote Shutdown
N	Regional Unit - North America
P	Power Factor Correction
Q	NEC Class 2
R	Redundancy Built-in
RH	Push-in Terminal, Redundancy built-in
RL	Spring Terminals, Redundancy built-in
RZ	Plug / Removable, Redundancy built-in
S	Output Signal
T	Extended Temperature
X	Semi-regulated
Y	Load Sharing
Z	Plug / Removable Terminals

1606-XLS Performance Power Supplies



Output		Power	Input AC	Input DC	Special Features	Catalog Number
100...240V AC/DC Converters						
12V	15 A	180 W	AC 100...240V	DC 110...150V	–	1606-XLS180B
24V	3.4 A	80 W	AC 100...240V	DC 110...300V	–	1606-XLS80E
24V	3.8 A	91 W	AC 100...240V	DC 110...300V	DeviceNet/NEC Class 2	1606-XLSDNET4
24V	5 A	120 W	AC 100...240V	DC 110...300V	–	1606-XLS120E
24V	8 A	192 W	AC 100...240V	DC 110...150V	DeviceNet/NEC Class 1	1606-XLSDNET8
24V	10 A	240 W	AC 100...240V	DC 110...150V	–	1606-XLS240E
24V	10 A	240 W	AC 100...240V	DC 110...150V	–	1606-XLS240EC(1)
24V	10 A	240 W	AC 100...240V	DC 110...300V	–	1606-XLS240E-D
24V	20 A	480 W	AC 200...240V	–	–	1606-XLS480EE
24V	20 A	480 W	AC 100...240V	DC 110...150V	–	1606-XLS480E
24V	20 A	480 W	AC 100...240V	DC 110...150V	–	1606-XLS480EC(1)
24V	40 A	960 W	AC 100...240V	–	–	1606-XLS960E
24V	40 A	960 W	AC 200...240V	–	–	1606-XLS960EE
30V	8 A	240 W	AC 100...240V	DC 110...150V	–	1606-XLS240K
36V	13.3 A	480 W	AC 100...240V	DC 110...150V	–	1606-XLS480G
48V	5 A	240 W	AC 100...120V/AC 200...240V	DC 110...150V	–	1606-XLS240F
48V	5 A	240 W	AC 100...240V	DC 110...300V	Extended DC input	1606-XLS240F-D
48V	10 A	480 W	AC 100...240V	DC 110...150V	–	1606-XLS480F
48V	20 A	960 W	AC 100...240V	–	–	1606-XLS960F
48V	20 A	960 W	AC 200...240V	–	–	1606-XLS960FE
380...480V AC/DC Converters						
24V	20 A	480 W	3AC 380...480V	–	–	1606-XLS480E-3
24V	20 A	480 W	3AC 380...480V	–	–	1606-XLS480E-3C(1)
24V	40 A	960 W	3 AC 380...480V	–	–	1606-XLS960E-3
36V	13.3 A	480 W	3 AC 380...480V	–	–	1606-XLS480G-3
48V	10 A	480 W	3 AC 380...480V	–	–	1606-XLS480F-3
48V	20 A	960 W	3 AC 380...480V	–	–	1606-XLS960F-3
DC/DC Converter						
24V	20 A	480 W	–	DC 600V	For intermediate DC-bus	1606-XLS480E-D

(1) Conformal Coated Power Supply

Diode Redundancy Modules

Output		Input DC	Description	Catalog Number
DC 12...48V	20 A	DC 12...48V	Dual-input diode redundancy module	1606-XLSRED

MOSFET Redundancy Modules

Output		Input DC	Special Features	Catalog Number
DC 12...28V	40 A	DC 12...28V, 2x 20 A	Dual-input MOSFET redundancy module	1606-XLSRED4HE
DC 12...28V	40 A	DC 24...28V, 2x 20 A	Dual-input MOSFET redundancy module	1606-XLSRED40
DC 12...28V	40 A	1 x 40 A	Dual-input MOSFET redundancy module	1606-XLSREDS40HE
DC 12...28V	80 A	DC 24...28V, 2x 40 A	Dual-input MOSFET redundancy module	1606-XLSRED80
DC 12...28V	80 A	DC 12...28V, 2x 20 A	Single input MOSFET redundancy module	1606-XLSRED80HE
DC 24...56V	40 A	DC 24...56V, 2x 20 A	Dual-input MOSFET redundancy module	1606-XLSRED40HF

DC-UPS with Batteries

Output		Battery	Version	Catalog Number
24V	10 A	External, 12V, 3.9...40 Ah	Battery DC-UPS	1606-XLS240-UPS
	10 A	External, 12V, 17...130 Ah	Battery DC-UPS	1606-XLS240-UPSE
	10 A	External, 12V, 3.9...40 Ah	With additional 12V output	1606-XLS240-UPSD
	10 A	Built-in 12V, 5 Ah	DC-UPS with integrated battery	1606-XLS240-UPSC
	20 A	External, 12V, 3.9...150 Ah	DC-UPS	1606-XLS480-UPS

Battery Modules for DC-UPS

Description	Dimensions	Catalog Number
12V, 5 Ah battery replacement for 1606-XLS240-UPSC	90 x 106 x 70 mm (3.54 x 4.17 x 2.76 in.)	1606-XLSBAT5
12V, 7 Ah battery replacement for 1606-XLSBATASSY1, -XLSBATASSY1W, and -XLSBATASSY3	151 x 98 x 65 mm (5.94 x 3.85 x 2.56 in.)	1606-XLSBAT1
12V, 7 Ah battery module for 1606-XLS2408-UPS_	155 x 124 x 112 mm (6.10 x 4.88 x 4.41 in.)	1606-XLSBATASSY1
12V, 7 Ah battery module	158 x 132 x 98 mm (6.22 x 5.20 x 3.86 in.)	1606-XLSBATASSY1W
12V, 26 Ah battery module for 1606-XLS240-UPS_	214 x 179 x 158 mm (8.42 x 7.05 x 6.22 in.)	1606-XLSBATASSY2
24V, 7 Ah battery module for 1606-XLS480-UPS_	137 x 186 x 143 mm (5.39 x 7.32 x 5.63 in.)	1606-XLSBATASSY3
24V, 12 Ah battery module for 1606-XLS480-UPS_	203 x 186 x 143 mm (7.99 x 7.32 x 5.63 in.)	1606-XLSBATASSY4
Same as 1606-XLSBATASSY1 battery module but without battery	155 x 124 x 112 mm (6.10 x 4.88 x 4.41 in.)	1606-XLSBATBR1
Same as 1606-XLSBATASSY1W battery module but without battery	158 x 132 x 98 mm (6.22 x 5.20 x 3.86 in.)	1606-XLSBATBR1W
Same as 1606-XLSBATASSY2 battery module but without battery	214 x 179 x 158 mm (8.42 x 7.05 x 6.22 in.)	1606-XLSBATBR2
Same as 1606-XLSBATASSY3 battery module but without battery	137 x 186 x 143 mm (5.39 x 7.32 x 5.63 in.)	1606-XLSBATBR3
Same as 1606-XLSBATASSY4 battery module but without battery	203 x 186 x 143 mm (5.39 x 7.32 x 5.63 in.)	1606-XLSBATBR4
Sensor board with PT1000 temperature sensor and center-tap fuse	23 x 15 x 110.5 mm (0.91 x 0.59 x 4.35 in.)	1606-XLSBATSEN

DC-UPS with Capacitor Storage

Output		Capacitor Storage	Catalog Number
24V	20 A	6 kWs, typical buffer time 9 s at 15 A	1606-XLSCAP24-6
	40 A	12 kWs, typical buffer time 18 s at 15 A	1606-XLSCAP24-12

Buffer Modules with Capacitor Storage

Output		Capacitor Storage	Catalog Number
DC 24V	20 A	0.2 kWs, typical buffer time 310 ms at 20 A	1606-XLSBUFFER24
	40 A	0.32 kWs, typical buffer time 250 ms at 40 A	1606-XLS960BUFFER
DC 48V	20 A	0.2 kWs, typical buffer time 150 ms at 20 A	1606-XLSBUFFER48

1606-XLE Essential Power Supplies



Output		Power	Input AC	Input DC	Special Features	Catalog Number
100...240V AC/DC Converters						
12V	10 A	120 W	AC 100...240V	DC 110...150V	–	1606-XLE120B
12V	16 A	192 W	AC 100...240V	DC 110...150V	Remote Shut-down	1606-XLE192BM
12V	16 A	192 W	AC 100...240V	DC 110...300V	–	1606-XLE192BDM
24V	3.3 A	80 W	AC 100...240V	DC 110...300V	Remote Shut-down	1606-XLE80E
24V	5 A	120 W	AC 100...240V	DC 110...150V	–	1606-XLE120E
24V	5 A	120 W	AC 100...240V	DC 100...150V	Conformal Coated	1606-XLE120EC
24V	5 A	120 W	AC 100...240V	DC 110...150V	Spring clamps	1606-XLE120EL
24V	5 A	120 W	AC 100...240V	DC 110...150V	Push-in clamps	1606-XLE120EH
24V	5 A	120 W	AC 100...240V	DC 110...300V	–	1606-XLE120ED
24V	5 A	120 W	AC 100...240V	–	–	1606-XLE120EN
24V	5 A	120 W	AC 200...240V	–	–	1606-XLE120EE
24V	10 A	240 W	AC 100...240V	DC 110...150V	–	1606-XLE240E
24V	10 A	240 W	AC 100...240V	DC 110...150V	Conformal Coated	1606-XLE240EC
24V	10 A	240 W	AC 100...240V	DC 110...150V	Spring clamps	1606-XLE240EL
24V	10 A	240 W	AC 100...240V	DC 110...150V	Push-in clamps	1606-XLE240EH
24V	10 A	240 W	AC 100...240V	DC 110...300V	Extended DC input	1606-XLE240EP
24V	10 A	240 W	AC 100...120V	–	–	1606-XLE240EN
24V	10 A	240 W	AC 100...240V	–	–	1606-XLE240EE
24V	20 A	480 W	AC 100...240V	DC 110...150V	Conformal Coated	1606-XLE480EPC
24V	20 A	480 W	AC 100...240V	DC 110...150V	–	1606-XLE480EP
24V	20 A	480 W	AC 100...240V	DC 110...150V	Spring clamps	1606-XLE480EL
24V	20 A	480 W	AC 100...240V	DC 110...150V	Push-in clamps	1606-XLE480EH
24V	20 A	480 W	AC 100...240V	DC 110...150V	Remote shutdown	1606-XLE480EM
48V	2.5 A	120 W	AC 100...240V	DC 110...150V	–	1606-XLE120F
48V	5.4 A	259 W	AC 100...240V	DC 110...150V	–	1606-XLE260F
48V	10 A	260 W	AC 100...240V	DC 110...150V	–	1606-XLE480FP
380...480V AC/DC Converters						
12V	8 A	96 W	2 AC 380...480V	–	–	1606-XLE96B-2
24V	5 A	120 W	2 AC 380...480V	–	–	1606-XLE120E-2
24V	10 A	240 W	3 AC 380...480V	–	–	1606-XLE240E-3
24V	40 A	960 W	3 AC 480V	–	Semi-regulated	1606-XLE960DX-3N
48V	5 A	240 W	3 AC 380...480V	–	–	1606-XLE240F-3
48V	20 A	960 W	3 AC 400V	–	Semi-regulated	1606-XLE960MX-3N

Diode Redundancy Modules

Output		Input DC	Description	Catalog Number
DC 24...48V	20 A	DC 24...48V	Dual-input diode redundancy module	1606-XLERED

MOSFET Redundancy Modules

Output		Input DC	Special Features	Catalog Number
DC 12…28V	20 A	DC 12…28V, 2x 20 A	Dual-input MOSFET redundancy module	1606-XLERED20
DC 24…28V	20 A	DC 24…28V, 2x 10 A	Dual-input MOSFET redundancy module	1606-XLERED20Y

Power Supplies with Integrated Decoupling Function

Output		Power	Input DC	Special Features	Catalog Number
DC 24V	10 A	240 W	DC 110…150V	Spring clamps	1606-XLE240ERL
DC 24V	10 A	240 W	DC 110…150V	Hot-swap connectors	1606-XLE240ERZ
DC 24V	10 A	240 W	DC 110…150V	Hot-swap connectors	1606-XLE240ECRZ
DC 24V	10 A	240 W	DC 110…300V	Hot-swap connectors	1606-XLE240EDRZ
DC 24V	20 A	480 W	DC 110…150V	Spring clamps	1606-XLE480ERL
DC 24V	20 A	480 W	DC 110…150V	Hot-swap connectors	1606-XLE480ERZ
DC 24V	20 A	480 W	DC 110…300V	Hot-swap connectors	1606-XLE480EDRZ
DC 24V	20 A	480 W	DC 110…150V	Hot-swap connectors	1606-XLE480ECRZ

1606-XLD DC-DC Converters



Output		Power	Input DC	Special Features	Catalog Number
24V	3.8 A	92 W	DC 24V	NEC Class 2	1606-XLDC92D
	5 A	120 W	DC 48V	–	1606-XLDF120E
	10 A	240 W	DC 48V	–	1606-XLDD240E
48V	5 A	240 W	DC 48V	–	1606-XLDF240F

1606-XLP Compact Power Supplies



Output		Power	Input AC	Input DC	Special Features	Catalog Number
100...240V AC/DC Converters						
5V	3 A	15 W	AC 100...240V	DC 110...300V	–	1606-XLP15A
	5 A	25 W			–	1606-XLP25A
12V	1.3 A	15 W			–	1606-XLP15B
	2.5 A	30 W			–	1606-XLP30B
	4.2 A	50 W			–	1606-XLP50B
	4.5 A	54 W			–	1606-XLP60BQ
	4.5 A				-40 °C (-40 °F) operation	1606-XLP60BQT
	7.5 A	90 W	AC 100...120 / 220...240V	DC 290V	–	1606-XLP90B
±12V	2.5 A	36 W		DC 110...300V	Dual-output voltage	1606-XLP36C
24V	0.63 A	15 W		DC 110...300V	–	1606-XLP15E
	1.3 A	30 W		DC 110...300V	–	1606-XLP30E
	1.3 A			DC 110...300V	–	1606-XLP30EQ
	2.1 A	50 W		DC 110...300V	–	1606-XLP50E
	2.1 A	50 W		DC 110...300V	With plug connector	1606-XLP50EZ
	2.5 A	60 W		DC 110...300V	–	1606-XLP60EQ
	2.5 A	60 W		DC 110...300V	-40°C (-40 °F) operation	1606-XLP60EQT
	2.5 A	60 W	AC 100...120 / 220...240V	DC 290V	–	1606-XLP72E
	3.9 A	95 W	AC 100...120 / 220...240V	DC 290V	NEC Class 2	1606-XLP95E
	4.2 A	100 W	AC 100...240V	DC 290V	–	1606-XLP100E
48V	1.1 A	50 W	AC 100...240V	DC 110...300V	–	1606-XLP50F
	2.1 A	100 W	AC 100...120V/AC 200...240V	DC 290V	–	1606-XLP100F
380...480V AC/DC Converters						
24V	3.75 A	90 W	2 AC 380...480V	–	NEC Class 2	1606-XLP90E-2
	4.2 A	100 W	2 AC 380...480V	–	–	1606-XLP100E-2

Diode Redundancy Modules

Output		Input DC	Description	Catalog Number
DC 12...48V	10 A	DC 12...48V	Dual-input diode redundancy module	1606-XLPRED

1606-XLB Basic Power Supplies



Output		Power	Input AC	Input DC	Special Features	Catalog Number
12V	5 A	60 W	AC 100...240V	–	Push-in clamps	1606-XLB60BH
24V	1.5 A	36 W	AC 100...240V	–	Push-in clamps	1606-XLB36EH
24V	2.5 A	60 W	AC 100...240V	–	Push-in clamps	1606-XLB60EH
24V	2.5 A	60 W	AC 100...240V	–	–	1606-XLB60E
24V	3.75 A	90 W	AC 100...240V	–	Push-in clamps	1606-XLB90EH
24V	3.75 A	90 W	AC 100...240V	–	–	1606-XLB90E
24V	3.75 A	90 W	AC 100...240V	–	NEC Class 2	1606-XLB90EQ
24V	5 A	120 W	AC 100...240V	–	–	1606-XLB120E
24V	10 A	240 W	AC 100...240V	–	–	1606-XLB240E
24V	20 A	480 W	AC 100...240V	–	–	1606-XLB480E

Diode Redundancy Modules

Output		Input DC	Description	Catalog Number
DC 12...28V	20 A	DC 12...28V	Dual-input diode redundancy module	1606-XLBRED20

Mounting Brackets

Description	Catalog Number
Mounting bracket for direct wall or panel mounting without DIN rail	1606-XLA-UPSC
	1606-XLA-W45
	1606-XLA-XLE
	1606-XLB
	1606-XLC
Mounting bracket for sideways installation with or without a DIN rail	1606-XLA-S37
	1606-XLA-S44
	1606-XLA-S63
	1606-XLA-S76
	1606-XLA-S85

Notes:

1606-XLS Performance Power Supplies

100....240V AC/DC

Catalog Number	1606-XLS180B	1606-XLS80E	1606-XLSDNET4	1606-XLS120E 1606-XLS120EA	1606-XLSDNET8	1606-XLS240E 1606-XLS240EA 1606-XLS240EC 1606-XLS240E-D
Output Voltage, Nom	12V	24V	24V	24V	24V	24V
Output Current, Nom	15 A	3.4 A	3.8 A	5 A	8 A	10 A
Adjustment Range	12...15V	24...28V	24V	24...28V	24...24.5V	24...28V
Output Current Range	15...13.5 A	3.4...3A	3.8 A	5...4.5 A	8 A	10...9A
Output Power	180 W	80 W	91 W	120 W	192 W	240 W
Power Reserves	50%	50%	–	50%	–	50%
Ripple and Noise Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
DC Input Voltage	DC 110...150V	DC 110...300V	DC 110...300V	DC 100...300V	DC 110...150V	DC 110...300V (-XLS240ED) DC 110...150V(-XLS240E, -XLS240EA, -XLS240EC)
Power Factor, Typ	0.92	0.47	0.90	0.91	0.92	0.92
Input Inrush Current Limiter	Active	Active	Active	Active	Active	Active
Input Inrush Current(1)	4 A/7 A	5A/10 A	9A/11A	9 A/11 A	4 A/7 A	4 A/7A
External Input Fuse, Min	B-6 A or C-4 A	B-6A or C-6A	B-6A or C-3A	B-6 A or C-3 A	B-6 A or C-4 A	B-6 A or C-4 A
Efficiency, Typ	91.8%	90.0%	92.0%	92.7%	93.4%	93.5%
Power Losses, Typ	16.1 W	9.1 W	7.9 W	9.4 W	13.6 W	16.7 W
MTBF(2)	631 kh	1451 kh	831 kh	831 kh	581 kh	581 kh
Lifetime Min (+40 °C...104 °F)	76 kh	79 kh	94 kh	89 kh	81 kh	71 kh
Temperature, operating	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating (3)	5 W/°C	2W/°C	2W/°C	3 W/ °C	5W/°C	6 W/ °C
Connection Terminals	Spring	Spring	Spring	Spring	Spring	Spring
Dimensions W x H x D	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	40 x 124 x 117 mm (1.57 x 4.88 x 4.61 in.)	40 x 124 x 117 mm (1.57 x 4.88 x 4.61 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)
Weight	930 g (2.05 lb)	440 g (0.97 lb)	620 g (1.37 lb)	620 g (1.37 lb)	900 g (1.98 lb)	900 g (1.98 lb)
DC OK Relay Contact	Yes	–	Yes	Yes	Yes	Yes
Special Features	–	–	DeviceNet approved	ATEX Approved (1606-XLS120EA)	DeviceNet approved	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

100....240V AC/DC, Continued

Catalog Number	1606-XLS480E 1606-XLS480EA 1606-XLS480EC	1606-XLS480EE	1606-XLS960E	1606-XLS960EE	1606-XLS240K
Output Voltage, Nom	24V	24V	24V	24V	28V
Output Current, Nom	20 A	20 A	40 A	40 A	8.6 A
Adjustment Range	24...28V	24...28V	24...28V	24...28V	28...32V
Output Current Range	20...17A	20...17A	40...34.3A	40...34.3A	8.6...7.5A
Output Power	480 W	480 W	960 W	960 W	240 W
Power Reserves	50%	50%	50%	50%	50%
Ripple and Noise, Max [mVPP]	100 mV	100 mV	100 mV	100 mV	50 mV
AC Input Voltage	AC 100...240V	AC 200...240V	AC 100...240V	AC 200...240V	AC 100...240V
DC Input Voltage	DC 110...150V	–	–	–	DC 110...150V
Power Factor, Typ	0.90	0.50	0.99	0.96	0.92
Input Inrush Current Limiter	Active	Active	Active	Active	Active
Input Inrush Current(1)	9 A/7 A	40 A	17 A/11 A	14 A	4 A/7 A
External Input Fuse, Min	B-10 A or C-10 A	B-10 A or C-6 A	B-16 A or C-16 A	B-10 A or C-8 A	B-6 A or C-4 A
Efficiency, Typ	93.9%	94.5%	94.6%	94.6%	93.5%
Power Losses, Typ	31.4 W	28.3 W	54.8 W	54.8 W	16.7 W
MTBF(2)	469 kh	577 kh	300 kh	366 kh	581 kh
Lifetime, Min (+40 °C)	71 kh	62 kh	84 kh	59 kh	71 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating(3)	12 W/ °C	12 W/ °C	24 W/ °C	24 W/ °C	6 W/ °C
Connection Terminals	Spring	Spring	Screw	Screw	Spring
Dimensions W x H x D	82 x 124 x 127 mm (3.23 x 4.88 x 5 in.)	70 x 124 x 127 mm (2.76 x 4.88 x 5 in.)	125 x 124 x 127 mm (3.23 x 4.88 x 5 in.)	125 x 124 x 127 mm (4.92 x 4.88 x 5 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.6 in.)
Weight	1200 g (2.65 lb)	880 g (1.94 lb)	1900 g (4.19 lb)	1800 g (3.97 lb)	900 g (1.98 lb)
DC OK Relay Contact	Yes	Yes	Yes	Yes	Yes

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

100....240V AC/DC, Continued

Catalog Number	1606-XLS480G	1606-XLS240F 1606-XLS240F-D	1606-XLS480F	1606-XLS960F	1606-XLS960FE
Output Voltage, Nom	36V	48V	48V	48V	48V
Output Current, Nom	13.3 A	5 A	10 A	20 A	20 A
Adjustment Range	36...42V	48...56V	48...55V	48...54V	48...54V
Output Current Range	13.3...11.4 A	5...4.3 A	10...8.7 A	20...17.8 A	20...17.8 A
Output Power	480 W	240 W	480 W	960 W	960 W
Power Reserves	50%	50%	50%	50%	50%
Ripple and Noise, Max [mVPP]	100 mV	100 mV	100 mV	150 mV	150 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 200...240V
DC Input Voltage	DC 110...150V	DC 110...150V (-XLS240F) DC110...300V (-XLS240F-D)	DC 110...150V	–	–
Power Factor, Typ	0.90	0.92	0.90	0.99	0.96
Input Inrush Current(1)	9 A/7 A	4 A/7 A	9A/7A	17A/11A	14 A
Recommended External Input Fuse, Min	B-10 A or C-10 A	B-6 A or C-4 A	B-10 A or C-10 A	B-16 A or C-16 A	B-10 A or C-8 A
Efficiency, Typ	94.0%	92.0%	94.3%	95.0%	95.0%
Power Losses, Typ	30.6 W	20.9 W	29.0 W	50.5 W	50.5 W
MTBF(2)	469 kh	606 kh	469 kh	300 kh	392 kh
Lifetime, Min (+40 °C)	84 kh	81 kh	92 kh	90 kh	65 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating(3)	12 W / °C	6 W / °C	12 W/°C	24 W/°C	24 W/°C
Connection Terminals	Spring	Spring	Spring	Screw	Screw
Dimensions W x H x D	82 x 124 x 127 mm (3.23 x 4.88 x 5 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	82 x 124 x 127 mm (3.23 x 4.88 x 5 in.)	125 x 124 x 127 mm (4.92 x 4.88 x 5 in.)	125 x 124 x 127 mm (4.92 x 4.88 x 5 in.)
Weight	1200 g (2.65 lb)	900 g (1.98 lb)	1200 g (2.65 lb)	1900 g (4.19 lb)	1800 g (3.97 lb)
DC-OK Relay Contact	Yes	Yes	Yes	Yes	Yes

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

380...480V AC/DC

Catalog Number	1606-XLS480E-3 1606-XLS480E-3C	1606-XLS960E-3	1606-XLS480G-3	1606-XLS480F-3	1606-XLS960F-3
Output Voltage, Nom	24V	24V	36V	48V	48V
Output Current, Nom	20 A	40 A	13.3...11.4 A	10 A	20 A
Adjustment Range	24...28V	24...28V	36...42V	48...55V	48...54V
Output Current Range	20...17.5 A	40...34.3 A	13.3...11.4 A	10...8.7A	20...17.8A
Output Power	480 W	960 W	480 W	480 W	960 W
Power Reserves	50%	50%	50%	50%	50%
Ripple and Noise, Max [mVPP]	100 mV	100 mV	100 mV	100 mV	150 mV
AC Input Voltage	3 AC 380...480V	3 AC 380...480V	3 AC 380...480V	3 AC 380...480V	3 AC 380...480V
Power Factor, Typ	0.94	0.88	0.94	0.94	0.92
Input Inrush Current Limiter	Active	Active	Active	Active	Active
Input Inrush Current[1]	3 A/3 A	4.5 A/4.5 A	3 A/3 A	3 A/3 A	4.5 A/4.5 A
External Input Fuse, Min	B-6 A or C-3 A	B-6 A or C-6 A	B-6 A or C-3 A	B-6 A or C-3 A	B-6 A or C-6 A
Efficiency, Typ	95.0%	95.3%	94.8%	95.4%	95.4%
Power Losses, Typ	25.3 W	47.3 W	26.3 W	23.1 W	46.3 W
MTBF[2]	690 kh	375 kh	690 kh	690 kh	375 kh
Lifetime, Min (+40 °C)	105 kh	69 kh	51 kh	51 kh	68 kh
Temperature, operating	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating[3]	12 W/ °C	24 W/ °C	12 W/ °C	12 W/ °C	24W/ °C
Connection Terminals	Spring	Screw	Spring	Spring	Screw
Dimensions W x H x D	65 x 124 x 127 mm (2.56 x 4.88 x 5 in.)	110 x 124 x 127 mm (4.33 x 4.88 x 5 in.)	65 x 124 x 127 mm (2.56 x 4.88 x 5 in.)	65 x 124 x 127 mm (2.56 x 4.88 x 5 in.)	110 x 124 x 127 mm (4.33 x 4.88 x 5 in.)
Weight	870 g (1.91 lb)	1500 g (3.31 lb)	870 g (1.92 lb)	870 g (1.92 lb)	1500 g (3.31 lb)
DC OK Relay Contact	Yes	Yes	Yes	yes	Yes
Special Features	Conformal Coated (1606-XLS480E-3C)	–	–	–	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

DC/DC Converter

Catalog Number	1606-XLS480E-D
Input Voltage, Nom	DC 600V
Output Voltage Range	24...28V
DC Input Voltage	DC 600V
Output Current Range	20...17.5 A
Output Power	480 W
Power Reserves	25%
Ripple and Noise, Max [mVPP]	100 mV
Efficiency, Typ	95.0%
Power Losses, Typ	25.5 W
MTBF(1)	446 kh
Lifetime, Min (+40 °C)	42 kh
Temperature, Operating	-25...+70°C (-13...+158 °F)
Derating(2)	12 W/°C
Connection Terminals	Spring
Dimensions W x H x D	65 x 124 x 127 mm (2.56 x 4.88 x 5 in.)
Weight	890 g (1.96 lb)
DC OK Relay Contact	Yes
Special Features	Intermediate DC-bus

(1) +40 °C (104 °F), SN29500
(2) From 60...70 °C (140...158 °F).

Redundancy Modules

Catalog Number	1606-XLSRED	1606-XLSRED40HE	1606-XLSRED40	1606-XLSREDS40HE	1606-XLSRED80	1606-XLSRED80HE	1606-XLSRED40HF
Voltage, Nom	DC 12...48V	DC 12...28V	DC 12...28V	DC 12...28V	DC 12...28V	DC 12...28V	DC 24...56V
Input/output	2x 10 A / 20 A	2x 20 A / 40 A	2x 20 A / 40 A	1x 40 A / 40 A	2x 40 A / 80 A	2x 40 A / 80 A	2x 20 A / 40 A
Input Voltage Range	DC 9...60V	DC 8.4...36.4 V	DC 8.4...36.4V	DC 8.4...36.4V	DC 8.4...36.4V	DC 8.4...36.4V	DC 20.4...64.4V
Current, Nom per Input[1]	10 A	20 A	20 A	40 A	40 A	40 A	20 A
Output Current Nom Current Short Circuit	20 A 25 A max	40 A 26 A max	40 A 65 A max	40 A 22 A max	80 A 130 A max	80 A 44 A max	40 A 45 A max
Voltage Drop In-/ Output	800 mV	72 mV	72 mV	80 mV (at 1x20 A) 150 mV (at 40 A)	49 mV	65 mV	60 mV
Decoupling	Diode	MOSFET	MOSFET	MOSFET	MOSFET	MOSFET	MOSFET
Power Losses No Load Load Nom[2]	0 W 17.0 W	0.2 W 1.7 W	0.7 W 2.2 W	0.1 W 1.8 W (at 1x20A) 6.2 W (at 40 A)	0.7 W 2.7 W	0.2 W 2.9 W	0.62 W 1.8 W
MTBF[3]	47 Mio. h	4.5 Mio. h	2.7 Mio. h	6.4 Mio. h	2.1 Mio. h	2.5 Mio. h	4.1 Mio. h
Lifetime Min (+40	218 kh	255 kh	246 kh	134 kh	143 kh	85 kh	222 kh
Temperature, Operating	-40...+70°C (-40...+158 °F)	-40...+70°C (-40...+158 °F)	-40...+ 70 °C (-40...+ 158 °F)	-40...+ 70 °C (-40...+ 158 °F)	-40...+ 70 °C (-40...+ 158 °F)	-40...+ 70 °C (-40...+ 158 °F)	-40...+ 70 °C (-40...+ 158 °F)
Derating[4]	12 W/°C	1 W/°C	Not required	1 A/°C	Not required	2 W/°C	1 W/°C
Dimensions W x H x D	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	36 x 124 x 127 mm (1.42 x 4.88 x 5 in.)	36 x 124 x 127 mm (1.42 x 4.88 x 5 in.)	46 x 124 x 127 mm (1.81 x 4.88 x 5 in.)	46 x 124 x 127 mm (1.81 x 4.88 x 5 in.)	46 x 124 x 127 mm (1.81 x 4.88 x 5 in.)	46 x 124 x 127 mm (1.81 x 4.88 x 5 in.)
Weight	290 g (0.64 lb)	280 g (0.62 lb)	340 g (0.75 lb)	340 g (0.75 lb)	440 g (0.97 lb)	370 g (0.82 lb)	360 g (0.79 lb)
Connection Terminals	Spring	Screw	Screw	Screw, plug connection	Screw	Screw	Screw

(1) 50% higher currents are allowed up to 55 s
(2) 1+1-redundancy (= 50% of the nominal current) and symmetrical input currents
(3) +40 °C (104 °F), SN29500
(4) From 60...70 °C (140...158 °F).

24V DC-UPS with Batteries

Catalog Number	1606-XLS240-UPS	1606-XLS240-UPSE	1606-XLS240-UPSD	1606-XLS480-UPS	1606-XLS240-UPSC
Current, Nom	10 A	10 A	10 A	20 A	10 A
Voltage, Nom	DC 24V	DC 24V	DC 24V	DC 24V	DC 24V
Storage Element	External battery	External battery	External battery	External battery	Built-in battery
Allowed Battery Size	12V, 3.9…40Ah	12V, 17…130Ah	12V, 3.9…40Ah	24V, 3.9…150Ah	12V, 5 Ah
Output 1 in Normal-mode	15 A	15 A	15 A	25 A	15 A
Buffer-mode 1	10 A/15 A	10 A/15 A	10 A/15A	20 A/30 A	10 A/15 A
Output 2 in Normal-mode	–	–	12V 5 A	–	–
Buffer-mode	–	–	12V 5 A	–	–
Output Power in Normal-mode	360 W	360 W	360 W	600 W	360 W
Output Power in Buffer-mode	240/360 W	240/360 W	240/360 W	480 W/720 W	240 W/360 W
Output Voltage in Normal-mode	Smaller than input voltage	Smaller than input voltage	Smaller than input voltage	Smaller than input voltage	Smaller than input voltage
Output Voltage in Buffer-mode	Regulated to 22.5V	Regulated to 22.5V	Regulated to 22.5V and 12.0V	Selectable: 22.5V/24V/25V/26V	Regulated to 22.5V
Temperature Tracking of the End-of-Charge Voltage	Manual select	Manual select/automatically	Manual select	Automatically with temperature sensor	Automatically with temperature sensor
Int. Current Consumption (incl. Charging Current)	1.3 A	2.2 A	1.3 A	1.8 A/3.5 A	1.3 A
MTBF[1]	886 kh	886 kh	788 kh	649 kh	886 kh
Lifetime Min (+40 °C)	137.4 kh	137.4 kh min	114 kh min	122 kh	137.4 kh min
Temperature Range, Operating	-25…+70 °C (-13…+158 °F)	-25…+50 °C (-13…+122 °F)	-25…+70 °C (-13…+158 °F)	-40… +70 °C (-40…+158 °F)	0… +40 °C (32…104 °F)
Derating[2]	>60 °C 0.25 A/°C	–	>60 °C 0.25 A/°C	>12W/°C 0.5A/°C	–
Dimensions W x H x D	49 x 124 x 117 mm (1.93 x 4.88 x 4.61 in.)	49 x 124 x 117 mm (1.93 x 4.88 x 4.61 in.)	49 x 124 x 117 mm (1.93 x 4.88 x 4.61 in.)	46 x 124 x 127 mm (1.81 x 4.88 x 4.99 in.)	123 x 124 x 119 mm (4.84 x 4.88 x 4.69 in.)
Weight	530 g (1.16 lb)	545 g (1.20 lb)	650 g (1.43 lb)	700 g (1.65 lb)	2.85 kg (6.28 lb)
Connection Terminals	Spring	Spring	Spring	Screw	Spring
Signals	Ready, buffering, inhibit, replace battery	Ready, buffering, inhibit, replace battery	Ready, buffering, inhibit, replace battery	Ready, buffering, inhibit, replace battery	Ready, buffering, inhibit, replace battery

(1) +40 °C (104 °F), SN29500
(2) From 60…70 °C (140…158 °F).

Buffer Modules / DC-UPS with Capacitor Storage

Catalog Number	1606-XLSCAP24-6	1606-XLSCAP24-12	1606-XLSBUFFER24	1606-XLS960BUFFER	1606-XLSBUFFER48
Voltage, Nom	DC 24V	DC 24V	DC 24V	DC 24V	DC 48V
Storage Element	Electrochemical Double Layer Capacitors	Electrochemical Double Layer Capacitors	Electrolytic Capacitors	Electrolytic Capacitors	Electrolytic Capacitors
Integrated Storage Element	6 kWs	12 kWs	0.2 kWs	0.32 kWs	0.2 kWs
Current, Nom	15 A	15 A	–	–	–
Buffer Current Max	15 A	15 A	20 A	40 A	20 A
Voltage in Buffer-mode	22.5V	22.5V	22.5V	22.5V	48V
Separation of Input and Output	Yes	Yes	No	No	No
Charging Time	16 minutes	32 minutes	18 seconds	34 seconds	22 seconds
Buffer Time	typ 16.5 s at 10 A typ 9 s at 15 A	typ 33 s at 10 A typ 18 s at 15 A	310 ms at 20 A	250 ms at 40 A 500 ms at 20 A	150 ms at 20 A
Power Losses, Typ	4.6 W at 10 A	4.6 W at 10 A	1.9 W in stand-by	1.9 W in stand-by	1.9 W in stand-by
MTBF[(1)]	954 kh	850 kh	2327 kh	2114 kh	2348 kh
Lifetime (Min at +40 °C)	96 kh	96 kh	166 kh	189 kh	161 kh
Temperature, Operating	-40…+60 °C (-40…+140°F)	-40…+60 °C (-40…+140°F)	-25…+70 °C (-13…+158 °F)	-25…+70 °C (-13…+158 °F)	-25…+70 °C (-13…+158 °F)
Connection Terminals	Spring	Spring	Spring	Screw	Spring
Dimensions, W x H x D	126 x 124 x 117 mm (4.96 x 4.88 x 4.61 in.)	198 x 124 x 117 mm (7.80 x 4.88 x 4.61 in.)	64 x 124 x 102 mm (2.51 x 4.88 x 4.02 in.)	64 x 124 x 142 mm (2.51 x 4.88 x 5.59 in.)	64 x 124 x 102 mm (2.51 x 4.88 x 4.02 in.)
Weight	1150 g (2.54 lb)	1720 g (3.79 lb)	740 g (1.63 lb)	1040 g (2.29 lb)	740 g (1.63 lb)
Signals	Ready, buffering, inhibit, PC-mode	Ready, buffering, inhibit, PC-mode	Ready, buffering, inhibit	Ready, buffering, inhibit	Ready, buffering, inhibit

(1) +40 °C (104 °F), SN29500

1606-XLE Essential Power Supplies

100....240V AC/DC

Catalog Number	1606-XLE120B	1606-XLE192BM 1606-XLE192BDM	1606-XLE80E	1606-XLE120E 1606-XLE120EC 1606-XLE120EL 1606-XLE120EH 1606-XLE120ED	1606-XLE120EN	1606-XLE120EE
Output Voltage, Nom	12V	12V	24V	24V	24V	24V
Output Current, Nom	10 A	16 A	3.3 A	5 A	5 A	5 A
Adjustment Range	12...15V	12...15V	24...28V	24...28V	24...28V	24...28V
Output Current Range	10...8 A	16...12.8 A	3.3...2.7 A	5...4.3 A	5...4.3 A	5...4.3 A
Output Power	120 W	192 W	80 W	120 W	120 W	120 W
Power Reserves	20%	20%	–	20%	20%	20%
Ripple and Noise Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...120V	AC 200...240V
DC Input Voltage	DC 110...150V	DC 110...150V (-XLE192BM) DC 110...300V (-XLE192BDM)	DC 110...300V	– (-XLE120E, -XLE120EC) DC 110...150V (-XLE120EL, -XLE120EH) DC 110...300 V (-XLE120ED	–	–
Power Factor, Typ	0.91	0.96	0.56	0.91	0.59	0.50
Input Inrush Current Limiter	Active	Active	NTC	Active	NTC	NTC
Input Inrush Current(1)	4 A/4 A	6 A/9 A	23A/45 A	4 A/4 A	45 A	30 A
External Input Fuse, Min	B-6 A or C-6 A	B-6 A or C-6 A	B-10 A or C-6 A	B-6A/C-6A	B-16 A or C-10 A	B-16 A or C-10 A
Efficiency, Typ	94%	94.3%	89.8%	94.3%	90.0%	90.2%
Power Losses, Typ	7.7 W	11.6 W	9.1 W	7.3 W	13.5 W	13.2 W
MTBF(2)	732 kh	690 kh	2243 kh	867kh	740 kh	940 kh
Lifetime Min (+40 °C)	110 kh	97 kh	77 kh	166kh	58 kh	72 kh
Temperature Range, Operating	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-10...+70°C (-14...+158 °F)	-10...+70°C (-14...+158 °F)
Derating(3)	3 W/°C	4.8 W/°C	1.8W/°C	3 W/ °C	3 W/ °C	3 W/ °C
Connection Terminals	Screw	Screw	Screw	Screw (-XLE120E, -XLE120EC, -XLE120ED) Spring (-XLE120EL) Push-in Clamps (-XLE120EH)	Screw	Screw
Dimensions W x H x D	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	39 x 124 x 117 mm (1.54 x 4.88 x 4.61 in.)	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)
Weight	440 g (0.97 lb)	600 g (1.32 lb)	430 g (0.95 lb)	440 g (0.97 lb)	500 g (1.10 lb)	500 g (1.10 lb)
DC OK Relay Contact	Yes	Yes	–	– (-XLE120E, -XLE120EC) Yes (-XLE120EL, -XLE120EH, -XLE120ED)	–	–

(1) Output transient current
(2) +40 °C, SN29500
(3) From 60...70 °C (140...158 °F).

100...240V AC/DC, Continued

Catalog Number	1606-XLE240E 1606-XLE240EP 1606-XLE240EC 1606-XLE240EL 1606-XLE240EH	1606-XLE240EN	1606-XLE240EE	1606-XLE480EP 1606-XLE480EPC 1606-XLE480EL 1606-XLE480EH 1606-XLE480EM	1606-XLE480EP-D
Output Voltage, Nom	24V	24V	24V	24V	24V
Output Current, Nom	10 A	10 A	10 A	20 A	20 A
Adjustment Range	24...28V	24...28V	24...28V	24...28V	24...28V
Output Current Range	10...8.6A	10...8.6A	10...8.6A	20...17.1 A	20...17.1 A
Output Power	240 W	240 W	240 W	480 W	480 W
Power Reserves	20%	20%	20%	20%	20%
Ripple and Noise, Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...120V	AC 200...240V	AC 100...240V	
DC Input Voltage	(XLE240E, -XLE240EP) 110...150V (-XLE2400EC, -XLE240EL, -XLE240EH)	–	–	DC 110...150V	DC 110...300V
Power Factor, Typ	0.51 (-XLE240E) 0.57 (-XLE240EP) 0.97 (-XLE240EC, -XLE240EL, -XLE240EH)	0.57	0.52	0.98	0.98
Input Inrush Current Limiter	Active	NTC	NTC	Active	Active
Input Inrush Current[1]	6 A/9 A	85 A	48 A	10 A/4.5 A	6 A/4 A
External Input Fuse Recommendation, Min	B-6 A/C-6 A	B-16 A or C-10 A	B-10 A or C-6 A	B-10 A or C-10 A	B-10 A or C-10 A
Efficiency, Typ	91.6% (-XLE240E) 91.2% (-XLE240EP) 95.2% (-XLE240EC, -XLE240EL, -XLE240EH)	91.3%	91.3%	95.6%	94.6%
Power Losses, Typ	12.1 W	23.4 W	23.4 W	22.1 W	27.4 W
MTBF[2]	661 kh (XLE240E) 667 kh (XLE240EP) 667 kh (XLE240EC) 667 kh (XLE240EL) 661 kh (XLE240EH)	710 kh	910 kh	590 kh	537 kh
Lifetime, Min (+40 °C)	120 kh	50 kh	75 kh	94 kh	98 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	0...70°C (32...158 °F)	0...70°C (32...158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating[3]	6W/°C	6W/°C	6W/°C	12 W/ °C	12 W/ °C
Connection Terminals	Screw (XLE-240E, -XLE240EP, XLE240EC) Spring (-XLE240EL) Push-in (-XLE240EH)	Screw	Screw	Screw (-XLE480EP, -XLE480EPC, -XLE480EM) Spring (-XLE480480EL) Push-in (-XLE480EH)	Screw
Dimensions W x H x D	39 x 124 x 117 mm	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	48x 124 x 127 mm	65 x 124 x 127 mm
Weight	600 g	700 g (1.54 lb)	700 g (1.54 lb)	830 g	940 g (2.07 lb)
DC OK Relay Contact	– (-XLE240E, -XLE240EP) Yes (-XLE240EC, -XLE240EL, -XLE240EH)	–	–	Yes	Yes
Special Features	–	–	–	–	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

100...240V AC/DC, Continued

Catalog Number	1606-XLE120F	1606-XLE240F	1606-XLE260F	1606-XLE480FP	1606-XLE480FP-D
Output Voltage, Nom	48V	48V	48V	48V	48V
Output Current, Nom	2.5 A	5 A	5.4 A	10 A	10 A
Adjustment Range	48...56V	48...52V	48...56V	48...56V	48...56V
Output Current Range	2.5...2.1 A	5...4.6 A	5.4...4.6 A	10...8.6 A	10...8.6 A
Output Power	120 W	240 W	260 W	480 W	480 W
Power Reserves	20%	20%	20%	20%	20%
Ripple and Noise, Max [mVPP]	50 mV	100 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...120V/ 200...240V auto-select	AC 100...240V	AC 100...240V	–
DC Input Voltage	DC 110...150V	–	DC 110...150V	DC 110...150V	DC 110...300V
Power Factor, Typ	0.91	0.51	0.98	0.98	0.95
Input Inrush Current[1]	4A/4A	3 A/3 A	6 A/9 A	4.5 A/5.5 A	6 A/4 A
External Input Fuse, Min	B-6A or C-6 A	B-10 A or C-6 A	B-6 A or C-6 A	B-10 A or C-10 A	B-10 A or C-10 A
Efficiency, Typ	93.5%	91.6%	95.5%	96.3%	94.6%
Power Losses, Typ	8.4 W	22.0 W	12.3 W	18.4 W	27.4 W
MTBF[2]	836 kh	830 kh	699 kh	540 kh	537 kh
Lifetime, Min (+40 °C)	71 kh	96 kh	120 kh	87 kh	110 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating[3]	1.6 W / °C	6 W / °C	6.5 W / °C	12 W/°C	12 W/°C
Connection Terminals	Screw	Screw	Screw	Screw	Screw
Dimensions W x H x D	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	60 x 124 x 117 mm (2.36 x 4.88 x 4.61 in.)	39 x 124 x 117 mm (1.54 x 4.88 x 4.61 in.)	48 x 124 x 127 mm (2.56 x 4.88 x 5 in.)	65 x 124 x 127 mm (2.56 x 4.88 x 5 in.)
Weight	440 g (0.97 lb)	700 g (1.54 lb)	600 g (1.32 lb)	830 g (2.20 lb)	940 g (2.07 lb)
DC-OK Relay Contact	Yes	–	Yes	Yes	Yes

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

380...480V AC/DC

Catalog Number	1606-XLE96B-2	1606-XLE120E-2	1606-XLE240E-3	1606-XLE960DX-3N	1606-XLE240F-3	1606-XLE960MX-3N
Output Voltage, Nom	12V	24V	24V	24V	48V	48V
Output Current, Nom	8 A	5 A	10 A	40 A	5 A	20 A
Adjustment Range	12...15V	24...28V	24...28V	24V	48...56V	48V
Output Current Range	8...6.4 A	5...4.3 A	10...8.6 A	40 A	5...4.3A	20 A
Output Power	96 W	120 W	240 W	960 W	240 W	960 W
Power Reserves	–	20%	20%	25%	20%	25%
Ripple and Noise, Max [mVPP]	100 mV	50 mV	50 mV	1500 mV	100 mV	2500 mV
AC Input Voltage	2 AC 380...480V	2 AC 380...480V	3 AC 380...480V	3 AC 400V 3 AC 480V	3 AC 380...480V	3 AC 400V 3 AC 480V
Power Factor, Typ	0.44	0.45	0.53	0.93	0.53	0.93
Input Inrush Current Limiter	Active	Active	Active	Active	Active	Active
Input Inrush Current[1]	4 A/4 A	4 A/4 A	4 A/4 A	2 A	4 A/4 A	2 A
External Input Fuse, Min	B-6 A or C-3 A	B-6 A or C-3 A	B-6 A or C-3 A	B-6 A or C-3 A	B-6 A or C-3 A	B-6 A or C-3 A
Efficiency, Typ	85.4%	90.4%	92.8%	95.5%	92.8%	96.0%
Power Losses, Typ	16.4 W	12.7 W	18.6 W	45.2 W	18.6 W	40.0 W
MTBF[2]	983 kh	1173 kh	975 kh	529 kh	1051 kh	541 kh
Lifetime, Min (+40 °C)	51 kh	92 kh	54 kh	51 kh	114 kh	77 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70 °C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating[3]	2.5 W/ °C	3 W/ °C	6 W/ °C	24 W/ °C	6 W/ °C	24W/ °C
Connection Terminals	Screw	Screw	Screw	Screw	Screw	Screw
Dimensions W x H x D	40 x 124 x 117 mm (1.57 x 4.88 x 4.61 in.)	40 x 124 x 117 mm (1.57 x 4.88 x 4.61 in.)	62 x 124 x 117 mm (2.44 x 4.88 x 4.61 in.)	96 x 124 x 159 mm (3.78 x 4.88 x 6.26 in.)	62 x 124 x 117 mm (2.44 x 4.88 x 4.61 in.)	96 x 124 x 159 mm (3.78 x 4.88 x 6.26 in.)
Weight	500 g (1.10 lb)	500 g (1.10 lb)	750 g (1.65 lb)	1400 g (3.07 lb)	750 g (1.65 lb)	1400 g (3.07 lb)
DC OK Relay Contact	–	–	–	–	–	–
Special Features	–	–	–	Semi-regulated	–	Semi-regulated

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

Power Supplies with Integrated Decoupling Function

Catalog Number	1606-XLE240ERL	1606-XLE240ERZ 1606-XLE240ECRZ	1606-XLE240EDRZ	1606-XLE480ERL	1606-XLE480ERZ 1606-XLE480ECRZ	1606-XLE480EDRZ
Output Voltage, Nom	24V	24V	24V	24V	24V	24V
Output Current, Nom	10 A	10 A	10 A	20 A	20 A	20 A
Adjustment Range	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Output Power	240 W	240 W	240 W	480 W	480 W	480 W
Power Reserves	20%	20%	20%	20%	20%	20%
Ripple and Noise Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
Power Factor, Typ	0.97	0.97	0.97	0.95	0.95	0.95
Input Inrush Current Limiter	Active	Active	Active	Active	Active	Active
Input Inrush Current(1)	6 A/9 A	6 A/9 A	6 A/9 A	10 A/4.5 A	10 A/4.5 A	10 A/4.5 A
Ext. Input Fuse Recommendation	B - 6 A or C - 6 A	B - 6 A or C - 6 A	B - 6 A or C - 6 A	B - 10 A or C - 10 A	B - 10 A or C - 10 A	B - 10 A or C - 10 A
DC Input Voltage	DC 110...150V	DC 110...150V	DC 110...300V	DC 110...150V	DC 110...150V	DC 110...300V
Efficiency, Typ	94.7%	94.7%	95.2%	95.2%	95.2%	95.2%
Power Losses, Typ	13.4 W	13.4 W	12.1 W	24.2 W	24.2 W	24.2 W
MTBF(2)	641 kh	641 kh	667 kh	543 kh	543 kh	543 kh
Lifetime Min (+40 °C)	109 kh	109 kh	109 kh	90 kh	90 kh	90 kh
Temperature, Operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-40...+70°C (-40...+158 °F)	-40...+70°C (-40...+158 °F)	-40...+70°C (-40...+158 °F)
Derating(3)	6W/°C	6W/°C	6W/°C	12W/°C	12W/°C	12W/°C
Dimensions W x H x D	39 x 124 x 117 mm (1.54 x 4.88 x 4.61 in.)	39 x 124 x 117 mm (1.54 x 4.88 x 4.61 in.)	39 x 124 x 117 mm (1.54 x 4.88 x 4.61 in.)	48 x 124 x 127 mm (1.89 x 4.88 x 5 in.)	48 x 124 x 127 mm (1.89 x 4.88 x 5 in.)	48 x 124 x 127 mm (1.89 x 4.88 x 5 in.)
Weight	600 g (1.32 lb)	600 g (1.32 lb)	600 g (1.32 lb)	830 g (1.83 lb)	850 g (1.87 lb)	850 g (1.87 lb)
DC-OK Relay Contact	Yes	Yes	Yes	Yes	Yes	Yes
Connection Terminals	Spring	Plug	Screw	Spring	Plug	Plug
Hot-Swap	No	Yes	Yes	No	Yes	No

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

Redundancy Modules

Catalog Number	1606-XLERED	1606-XLERED20	1606-XLERED20Y
Voltage, Nom	DC 24…48V	DC 12…28V	DC 24…28V
Input/output	2x 10 A / 20 A	2x 10 A / 20 A	2x 10 A / 20 A
Input Voltage Range	DC 18…60V	DC 8.4…36.4 V	DC 18…35 V
Current, Nom per Input	10 A	10 A	10 A
Output Current Nom Current Short Circuit	20 A 25 A max	20 A 26 A max	20 A 26 A max
Voltage Drop/ Output	800 mV	60 mV	110 mV
Decoupling	Diode	MOSFET	MOSFET
Power Losses No Load Load Nom	1 W 9.0 W	0.2 W 0.6 W	1.7 W 2.6 W
MTBF(1)	9.1 Mio. h	7.9 Mio. h	2 Mio. h
Lifetime Min (+40 °C)	218 kh	355 kh	182 kh
Temperature, Operating	-40…+70°C (-40…+158 °F)	-40…+70°C (-40…+158 °F)	-40…+ 70 °C (-40…+ 158 °F)
Derating(2)	0.5 W/°C	1 A/°C	Not required
Dimensions W x H x D	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)
Weight	350 g (0.77 lb)	250 g (0.55 lb)	310 g (0.68 lb)
Connection Terminals	Screw	Screw	Screw

(1) +40 °C (104 °F), SN29500
(2) From 60…70 °C (140…158 °F).

DC-DC Converters

Catalog Number	1606-XLDC92D	1606-XLDD240E	1606-XLDF120E	1606-XLDF240F
Input Voltage, Nom	DC 24V	DC 24V	DC 24V	DC 48V
Output Voltage Range	24V	24...28V	24...28V	48...56V
DC Input Voltage	DC 24V	DC 24V	DC 48V	DC 48V
Output Current Range	3.8 A	10...8.6 A	5...4.3 A	5...4.3 A
Output Power	92 W	240 W	120 W	240 W
Power Reserves	–	20%	20%	20%
Ripple and Noise, Max [mVPP]	50 mV	50 mV	50 mV	100 mV
Efficiency, Typ	90.5%	94.2%	90.3%	95.1%
Power Losses, Typ	9.7 W	14.8 W	12.9 W	12.4 W
MTBF(1)	1178 kh	731 kh	951 kh	853 kh
Lifetime, Min (+40 °C)	63 kh	103 kh	64 kh	160 kh
Temperature, Operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating(2)	–	6 W/°C	3 W/°C	6 W/°C
Connection Terminals	Spring	Screw	Screw	Screw
Dimensions W x H x D	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	42 x 124 x 117 mm (1.65 x 4.88 x 4.61 in.)	32 x 124 x 102 mm (1.26 x 4.88 x 4.02 in.)	42 x 124 x 117 mm (1.65 x 4.88 x 4.61 in.)
Weight	425 g (0.94 lb)	500 g (1.10 lb)	425 g (0.94 lb)	500 g (1.10 lb)
Special Features	–	–	–	–

(1) +40 °C (104 °F), SN29500
(2) From 60...70 °C (140...158 °F).

1606-XLP Compact Power Supplies

100....240V AC/DC

Catalog Number/ Attribute	1606-XLP15A	1606-XLP25A	1606-XLP15B	1606-XLP30B	1606-XLP50B	1606-XLP60BQ	1606-XLP60BQT
Output Voltage, Nom	5V	5V	12V	12V	12V	12V	12V
Output Current, Nom	3 A	5 A	1.3 A	3.0 A	4.2 A	4.5 A	4.5 A
Adjustment Range	5...5.5V	5...5.5V	12...15V	10...12V	12...15V	12...15V	12...15V
Output Current Range	3.0 A	5.0 A	1.3...1.0 A	3...2.5 A	4.2...3.4 A	4.5...3.6 A	4.5...3.6 A
Output Power	15 W	25 W	15 W	30 W	50 W	54 W	54 W
Power Reserves	–	–	–	–	–	–	–
Ripple and Noise Max [mV_{PP}]	50 mV	50 mV	75 mV	10 mV	100 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
DC Input Voltage	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V
Power Factor, Typ	0.44	0.44	0.44	0.53	0.52	0.5	0.44
Input Inrush Current Limiter	NTC	NTC	NTC	NTC	NTC	NTC	Active
Input Inrush Current[1]	16 A/31 A	17 A/35 A	16 A/31 A	17 A/35 A	17 A/35 A	16 A/32 A	6 A
External Input Fuse, Min	B - 6 A or C - 3 A	B - 10 A or C - 6 A	B - 6 A or C - 3 A	B - 10 A or C - 6 A	B - 10 A or C - 6 A	B - 10 A or C - 6 A	B - 6 A
Efficiency, Typ	77.2%	80.0%	82.5%	84.0%	90.0%	87.2%	87.6%
Power Losses, Typ	4.5 W	6.3 W	3.2 W	5.8 W	6.0 W	7.9 W	7.6 W
MTBF[2]	2686 kh	1963 kh	3811 kh	650 kh	600 kh	1690 kh	1571 kh
Lifetime Min (+40 °C)	93 kh	–	125 kh	–	–	56 kh	56 kh
Temperature Range, operating	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)	-40...+70°C (-40...+158 °F)
Derating[3]	0.4 W/°C	0.5 W/°C	0.4 W/°C	0.8 W/°C	1.3 W/°C	1.4 W/°C	1.4 W/°C
Connection Terminals	Screw	Spring	Screw	Spring	Spring	Screw	Screw
Dimensions, W x H x D	22.5 x 75 x 91 mm (0.86 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	22.5 x 75 x 91 mm (0.86 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)
Weight	130 g (0.29 lb)	240 g (0.53 lb)	130 g (0.29 lb)	250 g (0.55 lb)	260 g (0.57 lb)	250 g (0.55 lb)	250 g (0.55 lb)
Special Features	–	–	–	–	–	–	-40 °C operation

(1) Output transient current
(2) +40 °C, SN29500
(3) From 60...70 °C (140...158 °F).

100....240V AC/DC, Continued

Catalog Number	1606-XLP90B	1606-XLP36C	1606-XLP15E	1606-XLP30E	1606-XLP30EQ
Output Voltage, Nom	12V	12V	24V	24V	24V
Output Current, Nom	7.5 A	2.5 A	0.63 A	1.3 A	1.3 A
Adjustment Range	12...15V	12...15V	24...28V	24...28V	24...28V
Output Current Range	7.5...6 A	2.5 A (1)	0.63...0.54 A	1.3...1.1 A	1.3...1.1 A
Output Power	90 W	36 W	15 W	30 W	30 W
Power Reserves	–	–	–	–	–
Ripple and Noise Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...120V/ 220...240V auto-select	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
DC Input Voltage	DC 290V	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V
Power Factor, Typ	0.55	0.53	0.44	0.53	0.49
Input Inrush Current Limiter	NTC	NTC	NTC	NTC	NTC
Input Inrush Current(2)	22 A/37 A	17 A/35 A	16 A/31 A	17 A/35 A	18 A/35 A
External Input Fuse, Min	B-10 A or C-6 A	B-10 A or C-6 A	B - 6 A or C - 3 A	B - 10 A or C - 6 A	B - 6 A or C - 3 A
Efficiency, Typ	88.5%	86.0%	85.1%	87.5%	89.4%
Power Losses, Typ	11.7 W	5.9 W	2.7 W	4.5 W	3.7 W
MTBF(3)	500 kh	600 kh	4369 kh	650 kh	2405 kh
Lifetime Min (+40 °C)	–	–	196 kh	–	174 kh
Temperature Range, Operating	-10...+70 °C (-14...+158 °F)	-10...+70 °C (-14...+158 °F)	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)
Derating(4)	2.5 W/°C	1 W/°C	0.4 W/°C	0.8 W/°C	0.8 W/°C
Connection Terminals	Spring	Spring	Screw	Spring	Screw
Dimensions W x H x D	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	23 x 75 x 91 mm (0.91 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	23 x 75 x 91 mm (0.91 x 2.95 x 3.58 in.)
Weight	360 g (0.79 lb)	240 g (0.53 lb)	130 g (0.29 lb)	230 g (0.51 lb)	140 g (0.31 lb)
DC OK Relay Contact	–	–	–	–	–

(1) Both outputs can flexibly be loaded up to this current as long as the output power remains less than 36 W. The current at the output with the lower load can be at least 5% of the output with the higher load.
(2) Output transient current
(3) +40 °C, SN29500
(4) From 60...70 °C (140...158 °F).

100...240V AC/DC, Continued

Catalog Number	1606-XLP50E	1606-XLP50EZ	1606-XLP60EQ	1606-XLP60EQT	1606-XLP72E
Output Voltage, Nom	24V	24V	24V	24V	24V
Output Current, Nom	2.1 A	2.1 A	2.5 A	2.5 A	3 A
Adjustment Range	24...28V	24...28V	24...28V	24...28V	24...28V
Output Current Range	2.1...1.8 A	2.1...1.8 A	2.5...2.1 A	2.5...2.1 A	3...2.6 A
Output Power	50 W	50 W	60 W	60 W	72 W
Power Reserves	–	–	–	–	–
Ripple and Noise, Max [mVPP]	50 mV	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...120V 220...240V manual select
DC Input Voltage	DC 110...300V	DC 110...300V	DC 110...300V	DC 110...300V	DC 290V
Power Factor, Typ	0.52	0.56/0.52	0.5	0.44	0.54
Input Inrush Current Limiter	NTC	NTC	NTC	Active	NTC
Input Inrush Current[1]	17 A/35 A	17 A/35 A	16/32 A	6 A/6 A	26 A/30 A
External Input Fuse, Min	B - 10 A or C - 6 A	B - 10 A or C - 6 A	B-10 A or C-6A	B-6A or C-3A	B-10 A or C-6A
Efficiency, Typ	89.0%	88.5%	89.7%	90.4%	89.0%
Power Losses, Typ	6.2 W	6.8 W	6.9 W	7.8 W/6.4 W	8.7 W
MTBF[2]	2613 kh	2613 kh	1916 kh	1866 kh	600 kh
Lifetime Min (+40 °C)	54 kh	–	128 kh	90 kh	–
Temperature Range, operating	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)	-40...+70°C (-40...+158 °F)	-10...+70 °C (14...158°F)
Derating[3]	1.3 W/°C	1.3 W/°C	1.5W/°C	1.5W/°C	1.8W/°C
Connection Terminals	Spring	Plug	Screw	Screw	Spring
Dimension W x H x D	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 98 mm (1.77 x 2.95 x 3.86 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)
Weight	240 g (0.53 lb)	240 g (0.53 lb)	250 g (0.55 lb)	250 g (0.55 lb)	260 g (0.57 lb)
DC-OK Relay Contact	Yes	Yes	–	–	–
Special Features	–	Parallel Operation	–	-40 °C operation	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F)

100...240V AC/DC, Continued

Catalog Number	1606-XLP95E	1606-XLP100E	1606-XLP50F	1606-XLP100F
Output Voltage, Nom	24V	24V	48V	48V
Output Current, Nom	4 A	4.2 A	1.1 A	2.1 A
Adjustment Range	24...28V	24...28V	48...56V	48...56V
Output Current Range	4...3.4 A	4.2...3.6 A	1.1 A	2.1...1.8 A
Output Power	95 W	100 W	50 W	100 W
Power Reserves	–	–	–	–
Ripple and Noise, Max [mVPP]	50 mV	50 mV	50 mV	50 mV
AC Input Voltage	AC 100...120V/ 220...240V auto-select	AC 100...120V/ 220...240V auto-select	AC 100...240V	AC 100...120V/ 220...240V auto-select
DC Input Voltage	DC 290V	DC 290V	DC 110...300V	DC 290V
Power Factor, Typ	0.55	0.55	0.52	0.55
Input Inrush Current Limiter	NTC	NTC	NTC	NTC
Input Inrush Current(1)	22A/37 A	22 A/37 A	17 A/35 A	22 A/37 A
External Input Fuse, Min	B-10 A or C-6 A	B-10 A or C-6 A	B-10 A or C-6 A	B-10 A or C-6 A
Efficiency, Typ	90.0%	90.0%	90.0%	91.0%
Power Losses, Typ	10.5 W	11.4 W	6.0 W	10.0 W
MTBF(2)	500 kh	500 kh	600 kh	500 kh
Lifetime, Min (+40 °C)	–	–	–	–
Temperature, Operating	-10...+70°C (-14...+158 °F)	-10...+70°C (-14...+158 °F)	-10...+70°C (14...158 °F)	-10...+70°C (14...158 °F)
Derating(3)	2 W/ °C	2.5 W/ °C	1.3 W / °C	2.5 W / °C
Connection Terminals	Spring	Spring	Spring	Spring
Dimensions W x H x D	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)
Weight	360 g (0.79 lb)	360 g (0.79 lb)	240 g (0.53 lb)	360 g (0.79 lb)
DC OK Relay Contact	–	–	–	–
Special Features	NEC Class 2	–	–	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

380...480V AC/DC

Catalog Number	1606-XLP90E-2	1606-XLP100E-2
Output Voltage, Nom	24V	24V
Output Current, Nom	3.75 A	4.2 A
Adjustment Range	24...28V	24...28V
Output Current Range	3.75 ...3.2 A	4.2...3.6 A
Output Power	90 W	100 W
Power Reserves	–	–
Ripple and Noise, Max [mVPP]	50 mV	50 mV
AC Input Voltage	2 AC 380...480V	2 AC 380...480V
Power Factor, Typ	0.60	0.60
Input Inrush Current Limiter	NTC	NTC
Input Inrush Current(1)	30A/36 A	30A/36 A
External Input Fuse, Min	B- 10 A or C-6 A	B- 10 A or C-6 A
Efficiency, Typ	89.5%	89.5%
Power Losses, Typ	10.5 W	11.7 W
MTBF(2)	1594 kh	1594 kh
Lifetime, Min (+40 °C)	–	–
Temperature, operating	-10...+70 °C (14...158 °F)	-10...+70 °C (14...158 °F)
Derating(3)	2 W/ °C	2.5 W/ °C
Connection Terminals	Spring	Spring
Dimensions W x H x D	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)	73 x 75 x 103 mm (2.87 x 2.95 x 4.06 in.)
Weight	360 g (0.79 lb)	360 g (0.79 lb)
DC OK Relay Contact	–	–
Special Features	NEC Class 2	–

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

Redundancy Modules

Catalog Number	1606-XLPRED
Voltage, Nom	DC 12…48V
Input/output	2x 5 A / 10 A
Input Voltage Range	DC 9…60V
Current, Nom per Input	5 A
Output Current Nom Current Short Circuit	10 A 16 A max
Voltage Drop/ Output	800 mV
Decoupling	Diode
Power Losses No Load Load Nom	0 W 4.0 W
MTBF(1)	85 Mio. h
Lifetime Min (+40 °C)	218 kh
Temperature, Operating	-40…+70°C (-40…+158 °F)
Derating(2)	0.25 A/°C
Dimensions W x H x D	45 x 75 x 91 mm (1.77 x 2.95 x 3.58 in.)
Weight	140 g (0.31 lb)
Connection Terminals	Spring

(1) +40 °C (104 °F), SN29500
(2) From 60…70 °C (140…158 °F).

1606-XLB Basic Power Supplies

100....240V AC/DC

Catalog Number	1606-XLB60BH	1606-XLB36EH	1606-XLB60EH 1606-XLB60E	1606-XLB90EH 1606-XLB90E 1606-XLB90EQ
Output Voltage, Nom	12V	24V	24V	24V
Output Current, Nom	5 A	1.5 A	2.5 A	3.8 A
Adjustment Range	12...15V	24...28V	24...28V	24...28V
Output Current Range	5.0...4.0 A	1.5...1.2 A	2.5...2.1 A	3.8...3.2 A
Output Power	60 W	36 W	60 W	90 W
Power Reserves	–	–	-	-
Ripple and Noise Max [mVPP]	100 mV	50 mV	100 mV	100 mV
AC Input Voltage	AC 100...240V	AC 100...240V	AC 100...240V	AC 100...240V
DC Input Voltage	–	–	–	–
Power Factor, Typ	0.47	0.46	0.47	0.45
Input Inrush Current Limiter	NTC	NTC	NTC	NTC
Input Inrush Current(1)	15 A/36 A	14 A/40 A	15 A/36 A	18A/40A (-XLB90EH, -XLB90E) 40 A (-XLB90EQ)
External Input Fuse, Min	B-6 A or C-4 A	B - 6 A or C - 4 A	B-6A or C-4A	B-6A/C-4A
Efficiency, Typ	90.7%	> 90.6%	91.8%	93.8%
Power Losses, Typ	6.2 W	3.7 W	6.2/5.4 W	7.9/6.0 W
MTBF(2)	1673 kh	2081 kh	1982 kh	1507 kh (-XLB90EH, -XLB90E) 1446 kh (-XLB90EQ)
Lifetime Min (+40 °C)	119 kh	161 kh	148 kh	102 kh
Temperature Range, Operating	-10...+70 °C (-14...+158 °F)	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)	-10...+70 °C (14...158°F)
Derating(3)	1.44W/°C	0.96W/°C	0.06W/°C	2.4W/°C
Connection Terminals	Push-in	Push-in	Push-in (-XLB60EH) Screw (-XLB60E)	Push-in (-XLB90EH) Screw (-XLB90E, -XLB90EQ)
Dimensions W x H x D	36 x 90 x 91 mm (1.42 x 3.54 x 3.58 in.)	22.5 x 90 x 91 mm (0.89 x 3.54 x 3.58 in.)	36 x 90 x 91 mm (1.42 x 3.54 x 3.58 in.)	36 x 90 x 91 mm (1.42 x 3.54 x 3.58 in.)
Weight	225 g (0.50 lb)	140 g (0.31 lb)	220 g (0.49 lb)	270 g (0.60 lb)
DC OK Relay Contact	–	–	–	–

(1) Output transient current
(2) +40 °C, SN29500
(3) From 60...70 °C (140...158 °F).

100...240V AC/DC, Continued

Catalog Number	1606-XLB120E	1606-XLB240E	1606-XLB480E
Output Voltage, Nom	24V	24V	24V
Output Current, Nom	5 A	10 A	20 A
Adjustment Range	24...28V	24...28V	24...28V
Output Current Range	5...4.3 A	10...8.6 A	20 A
Output Power	120 W	240 W	480 W
Power Reserves	–	–	–
Ripple and Noise, Max [mVPP]	100 mV	100 mV	100 mV
AC Input Voltage	AC 100...120V/ 200...240V auto-select	AC 100...240V	AC 100...240V
DC Input Voltage	–	–	–
Power Factor, Typ	0.54	0.93	0.97
Input Inrush Current Limiter	NTC	Active	Active
Input Inrush Current(1)	22 A/33 A	14 A/26 A	15 A/35 A
External Input Fuse, Min	B-10 A or C-6 A	B-10 A or C-6 A	B-10 A or C-6 A
Efficiency, Typ	92.3%	95.2%	95.3%
Power Losses, Typ	10.0 W	12.1 W	25.3 W
MTBF(2)	1379 kh	822 kh	704 kh
Lifetime, Min (+40 °C)	83 kh	74 kh	102 kh
Temperature, operating	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)	-25...+70°C (-13...+158 °F)
Derating(3)	3 W/ °C	6 W/ °C	12 W/ °C
Connection Terminals	Screw	Screw	Screw
Dimensions W x H x D	39 x 124 x 124 mm (1.54 x 4.88 x 4.88 in.)	49 x 124 x 124 mm (1.93 x 4.88 x 4.88 in.)	59 x 124 x 127 mm (2.32 x 4.88 x 5 in.)
Weight	370 g (0.82 lb)	540 g (1.19 lb)	810 g (1.79 lb)
DC OK Relay Contact	Yes	Yes	Yes

(1) Output transient current
(2) +40 °C (104 °F), SN29500
(3) From 60...70 °C (140...158 °F).

Redundancy Modules

Catalog Number	1606-XLBRED20
Voltage, Nominal	DC 12…28V
Input/output	2x 10 A / 20 A
Input Voltage Range	DC 9…35V
Current, Nominal per Input	10 A
Output Current Nominal Current Short Circuit	20 A 26 A max
Voltage Drop/ Output	460 mV
Decoupling	Diode
Power Losses No Load Load Nominal	210 mV 2.0 W
MTBF(1)	2.0 Mio. h
Lifetime Min (+40 °C)	113 kh
Temperature, Operating	-40…+70°C (-40…+158 °F)
Derating(2)	0.5 W/°C
Dimensions W x H x D	39 x 124 x 124 mm (1.54 x 4.88 x 4.88)
Weight	280 g (0.62 lb)
Connection Terminals	Screw

(1) +40 °C (104 °F), SN29500
(2) From 60…70 °C (140…158 °F).

Standards Compliance and Certifications

Catalog Number	CE	UL 61010-2-201	IECEx	ATEX	Class I Div. 2 HazLoc	DNV GL Marine	EAC Registration	NEC Class 2
1606-XLS Performance Power Supplies								
1606-XLS80E	✓	✓			✓	✓	✓	
1606-XLS120E	✓	✓			✓	✓	✓	
1606-XLS120EA	✓	✓	✓	✓	✓	✓	✓	
1606-XLSDNET4	✓	✓			✓	✓	✓	✓
1606-XLS180B	✓	✓			✓	✓	✓	
1606-XLS240E	✓	✓			✓	✓	✓	
1606-XLS240EA	✓	✓	✓	✓	✓	✓	✓	
1606-XLS240EC	✓	✓			✓	✓	✓	
1606-XLS240E-D	✓	✓					✓	
1606-XLS240K	✓	✓			✓	✓	✓	
1606-XLS240F	✓	✓			✓	✓	✓	
1606-XLS240F-D	✓	✓					✓	
1606-XLSDNET8	✓	✓			✓	✓	✓	
1606-XLS480E	✓	✓			✓	✓	✓	
1606-XLS480EA	✓	✓	✓	✓		✓	✓	
1606-XLS480EC	✓	✓			✓		✓	
1606-XLS480EE	✓	✓			✓	✓	✓	
1606-XLS480G	✓	✓			✓	✓	✓	
1606-XLS480F	✓	✓			✓	✓	✓	
1606-XLS960E	✓	✓	✓	✓	✓	✓	✓	
1606-XLS960EE	✓	✓			✓	✓	✓	
1606-XLS960F	✓	✓	✓	✓	✓	✓	✓	
1606-XLS960FE	✓	✓			✓	✓	✓	
1606-XLS480E-3	✓	✓			✓	✓	✓	
1606-XLS480E-3C	✓	✓			✓	✓	✓	
1606-XLS480G-3	✓	✓			✓	✓	✓	
1606-XLS480F-3	✓	✓			✓	✓	✓	
1606-XLS960E-3	✓	✓				✓	✓	
1606-XLS960F-3	✓	✓				✓	✓	
1606-XLS480E-D	✓	✓					✓	
1606-XLS240-UPS	✓	✓			✓	✓	✓	
1606-XLS240-UPSE	✓	✓			✓	✓	✓	
1606-XLS240-UPSD	✓	✓			✓		✓	
1606-XLS480-UPS	✓	✓			✓	✓	✓	
1606-XLS240-UPSC	✓	✓			✓	✓	✓	
1606-XLSCAP24-6	✓	✓			✓		✓	
1606-XLSCAP24-12	✓	✓			✓		✓	
1606-XLSBUFFER24	✓	✓					✓	
1606-XLSBUFFER48	✓						✓	
1606-XLS960BUFFER	✓	✓					✓	

Catalog Number	CE	UL 61010-2-201	IECEx	ATEX	Class I Div. 2 HazLoc	DNV GL Marine	EAC Registration	NEC Class 2
1606-XLSBAT5						✓	✓	
1606-XLSBAT1							✓	
1606-XLSBAT2							✓	
1606-XLSBATASSY1	✓					✓	✓	
1606-XLSBATASSY1W	✓	✓					✓	
1606-XLSBATASSY2	✓	✓				✓	✓	
1606-XLSBATASSY3	✓	✓					✓	
1606-XLSBATASSY4	✓	✓					✓	
1606-XLSBATBR1	✓					✓	✓	
1606-XLSBATBR1W	✓	✓					✓	
1606-XLSBATBR2	✓						✓	
1606-XLSBATBR3	✓	✓					✓	
1606-XLSBATBR4	✓						✓	
1606-XLSBATSEN	✓	✓			✓		✓	
1606-XLSRED	✓	✓	✓	✓	✓	✓	✓	
1606-XLSRED40	✓	✓	✓	✓	✓	✓	✓	
1606-XLSRED40HE	✓	✓	✓	✓	✓	✓	✓	
1606-XLSREDS40HE	✓	✓	✓	✓	✓	✓	✓	
1606-XLSRED40HF	✓	✓	✓	✓	✓	✓	✓	
1606-XLSRED80	✓	✓	✓	✓	✓	✓	✓	
1606-XLSRED80HE	✓	✓	✓	✓	✓	✓	✓	
1606-XLE Essential Power Supplies								
1606-XLERED20	✓	✓	✓	✓	✓		✓	
1606-XLERED20Y	✓	✓	✓	✓	✓		✓	
1606-XLE120B	✓	✓	✓	✓	✓		✓	
1606-XLE120E	✓	✓	✓	✓	✓	✓	✓	
1606-XLE120EC	✓	✓	✓	✓	✓		✓	
1606-XLE120EL	✓	✓	✓	✓	✓		✓	
1606-XLE120EH	✓	✓	✓	✓	✓		✓	
1606-XLE120ED	✓	✓					✓	
1606-XLE120F	✓	✓	✓	✓	✓		✓	
1606-XLE192BM	✓	✓	✓	✓		✓	✓	
1606-XLE192BDM	✓	✓					✓	
1606-XLE240E	✓	✓	✓	✓	✓	✓	✓	
1606-XLE240EC	✓	✓	✓	✓	✓	✓	✓	
1606-XLE240ERL	✓	✓	✓	✓	✓		✓	
1606-XLE240ERZ	✓	✓	✓	✓	✓		✓	
1606-XLE240ECRZ	✓	✓	✓	✓	✓		✓	
1606-XLE240EL	✓	✓	✓	✓	✓	✓	✓	
1606-XLE240EH	✓	✓	✓	✓	✓		✓	
1606-XLE240EP	✓	✓			✓	✓	✓	
1606-XLE240EDRZ	✓	✓					✓	
1606-XLE260F	✓	✓	✓	✓	✓	✓	✓	

Catalog Number	CE	UL 61010-2-201	IECEx	ATEX	Class I Div. 2 HazLoc	DNV GL Marine	EAC Registration	NEC Class 2
1606-XLE480EP	✓	✓	✓	✓	✓	✓	✓	
1606-XLE480EPC	✓	✓	✓	✓	✓	✓	✓	
1606-XLE480ERL	✓	✓	✓	✓	✓		✓	
1606-XLE480ERZ	✓	✓	✓	✓	✓		✓	
1606-XLE480ECRZ	✓	✓	✓	✓	✓		✓	
1606-XLE480EL	✓	✓	✓	✓	✓		✓	
1606-XLE480EH	✓	✓	✓	✓	✓		✓	
1606-XLE480EM	✓	✓	✓	✓			✓	
1606-XLE480EP-D	✓	✓					✓	
1606-XLE480EDRZ	✓	✓					✓	
1606-XLE480FP	✓	✓	✓	✓	✓	✓	✓	
1606-XLE480FP-D	✓	✓		✓	✓		✓	
1606-XLE96B-2	✓	✓			✓	✓	✓	
1606-XLE120E-2	✓	✓				✓	✓	
1606-XLE240E-3	✓	✓			✓	✓	✓	
1606-XLE240F-3	✓	✓			✓	✓	✓	
1606-XLE960DX-3N	✓	✓					✓	
1606-XLE960MX-3N	✓	✓					✓	
1606-XLERED	✓	✓	✓	✓	✓	✓	✓	
1606-XLD DC-DC Power Supplies								
1606-XLDC92D	✓	✓	✓	✓	✓	✓	✓	✓
1606-XLDF120E	✓	✓	✓	✓	✓	✓	✓	
1606-XLDD240E	✓	✓					✓	
1606-XLDF240F	✓	✓					✓	
1606-XLP Compact Power Supplies								
1606-XLP15A	✓	✓	✓		✓	✓	✓	✓
1606-XLP15B	✓	✓			✓	✓	✓	✓
1606-XLP15E	✓				✓	✓	✓	✓
1606-XLP30E	✓	✓			✓	✓	✓	✓
1606-XLP25A	✓	✓			✓	✓	✓	✓
1606-XLP30B	✓	✓			✓		✓	✓
1606-XLP36C	✓	✓				✓	✓	✓
1606-XLP30EQ	✓	✓			✓	✓	✓	✓
1606-XLP50E	✓	✓✓			✓	✓	✓	✓
1606-XLP50B	✓	✓			✓		✓	✓
1606-XLP50F	✓	✓					✓	✓
1606-XLP50EZ	✓	✓			✓	✓	✓	✓
1606-XLP60BQ	✓	✓			✓	✓	✓	✓
1606-XLP60BQT	✓	✓			✓	✓	✓	✓
1606-XLP60EQ	✓	✓			✓	✓	✓	✓
1606-XLP60EQT	✓	✓			✓	✓	✓	✓
1606-XLP72E	✓	✓			✓	✓	✓	✓
1606-XLP90E-2	✓	✓				✓	✓	✓

Catalog Number	CE	UL 61010-2-201	IECEx	ATEX	Class I Div. 2 HazLoc	DNV GL Marine	EAC Registration	NEC Class 2
1606-XLP95E	✓	✓			✓		✓	✓
1606-XLP100E	✓	✓			✓	✓	✓	
1606-XLP90B	✓	✓			✓	✓	✓	
1606-XLP100F	✓	✓				✓	✓	
1606-XLP100E-2	✓	✓				✓	✓	
1606-XLPRED	✓	✓	✓	✓		✓	✓	
1606-XLB - Basic Power Supplies								
1606-XLB480E	✓	✓					✓	
1606-XLB36EH	✓	✓					✓	✓
1606-XLB60BH	✓	✓					✓	✓
1606-XLB60EH	✓	✓					✓	✓
1606-XLB60E	✓	✓					✓	✓
1606-XLB90EH	✓	✓					✓	
1606-XLB90E	✓	✓					✓	
1606-XLB90EQ	✓	✓					✓	✓
1606-XLB120E	✓	✓					✓	
1606-XLB240E	✓	✓					✓	
1606-XLBRED20	✓	✓	✓	✓	✓		✓	

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
Power Supply Reference Manuals, publication 1606-RM___	Provides detailed specifications on specific power supply or accessory.
Power Supply Installation Instructions, publication 1606-IN___	Provides product description, installation instructions, functional descriptions and wiring diagrams.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications.	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

Connect with us.

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846
UNITED KINGDOM: Rockwell Automation Ltd. Pitfield, Kiln Farm Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917