EXCELSYS ULTIMOD SERIES

UNIQUE IN FLEXIBILITY, UNRIVALLED IN PERFORMANCE, ULTRA-COST COMPETITIVE

Advanced Energy's UltiMod series, part of our Excelsys product line, brings modular power supplies to a new paradigm, combining technical excellence with logistics simplicity to exceed the most demanding requirements from any industry. The UltiMod range of power supplies offers unrivalled performance and demonstrates our global leadership in product reliability, efficiency and cost competitiveness. The UX4 delivers up to 600 W and can be populated with up to four powerMods, and the UX6 delivers up to 1200 W and can be populated with up to six powerMods.

PRODUCT HIGHLIGHTS

- Highest efficiency — up to 91%
- User and field configurable
- Standard medical features
  - Leakage current < 300 µA (< 150 µA optional)
  - 2 MOPP
  - 4 KV Isolation
- Lowest acoustic noise
- -40°C startup temperature
- Extra ruggedized optional
  - Vibration: MIL-STD-810G
- No minimum load
- Extra-low profile < 1U height
- All outputs fully floating
- Series/parallel of multiple outputs
- 5 V isolated standby voltage
- Active PFC (Power Factor Correction)
- Product options: Conformal coating, low leakage current, connector, cabling and mounting options, and reverse fans additional ruggedization

TYPICAL APPLICATIONS

Medical

- Clinical diagnostic and dialysis equipment, medical lasers, radiological imaging, clinical chemistry

Industrial

- Test and measurement, industrial machines, automation and audio equipment, printing, telecommunications

AT A GLANCE

	UX4	UX6
Power		
	600 W	1200 W
Slots		
	4	6

Certifications

Medical

- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition (EMC)

Industrial

- UL/EN60950 2nd edition
- IEC62368-1 2nd edition

ELECTRICAL SPECIFICATIONS

powerMods							
Model	Vnom (V)	Set Point Adjust Range	Dynamic Vtrim Range (v)	Imax (A)	Power (W)	Remote Sense	Power Good
XgA	12.0	10.8-15.6	—	12.5	150	—	—
XgB	24.0	19.2-26.4	—	8.3	200	—	—
XgC	36.0	28.8-39.6	—	5.6	200	—	—
XgD	48.0	38.5-50.4	—	4.2	200	—	—
XgE/Xg7	24.0	5.0-28.0	—	5.0	120	—	—
XgF/Xg8	24.0	5.0-28.0	—	3.0	72	—	Yes
	24.0	5.0-28.0	—	3.0	72	—	Yes
XgG	2.5	1.5-3.6	1.15-3.6	40.0	100	Yes	Yes
XgH	5.0	3.2-6.0	1.5-6.0	36.0	180	Yes	Yes
XgJ	12.0	6.0-15.0	4.0-15.0	18.3	220	Yes	Yes
XgK	24.0	12.0-30.0	8.0-30.0	9.2	220	Yes	Yes
XgL	48.0	28.0-58.0	8.0-58.0	5.0	240	Yes	Yes
Xg1	2.5	1.5-3.6	1.15-3.6	50.0	125	Yes	Yes
Xg2	5.0	3.2-6.0	1.5-6.0	40.0	200	Yes	Yes
Xg3	12.0	6.0-15.0	4.0-15.0	20.0	240	Yes	Yes
Xg4	24.0	12.0-30.0	8.0-30.0	10.0	240	Yes	Yes
Xg5	48.0	28.0-58.0	8.0-58.0	6.0	288	Yes	Yes
XgM	5.0	3.2-6.0	1.0 -6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 - 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0-30.0[1]	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0[2]	6.0	288	Yes	Yes
XgR	24.0	12.0-30.0	8.0-30.0	10.0	240	—	Yes
XgT	48.0	28.0-58.0	8.0-58.0	6.0	288	—	Yes

Input						
Parameter	Conditions/Description	Min	Nom	Max	Units
Input Voltage Range	Universal Input 47-440 Hz	85	—	264	VAC
		120	—	380	VDC
Power Rating	UX4: See derating curves	—	600	—	W
	UX6: See derating curves	—	1200	—	W
Input Current UX4	85 VAC in 400 W out	—	7.5	—	A
UX6	85 VAC in 850 W out	—	11.5	—	—
Inrush Current	230 VAC @ 25°C UX6/UX4	—	—	25/50	A
Undervoltage Lockout	Shutdown	65	—	74	VAC
Power Factor	110 VAC @ full load	0.98	0.99	—	—
Fusing UX4	250 V	—	F8A HRC	—	—
UX6	250 V	—	F12A HRC	—	—

ELECTRICAL SPECIFICATIONS (CONTINUED)

Output

Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per powerMod table	—	—	—	—
Output Adjustment Range	Manual: Multi-turn potentiometer. As per powerMod table. Dynamic: As per powerMod table	—	—	—	—
Minimum Load		—	0	—	A
Load and Cross Regulation	For 25% to 75% load change	—	—	±0.2	%
Transient Response	For 25% to 75% load change: Voltage deviation; XgA-XgD	—	—	2.5	µs
	Settling time: XgA-XgD	—	—	500	%
	Voltage deviation: XgE-XgL, Xg1-Xg8	—	—	10	µs
	Settling time: XgE-XgL	—	—	250	—
Ripple and Noise	20 MHz 100 mV or 1.0% pk-pk (except 150 mV XgA)	—	—	—	%
Over-Voltage Protection	Latching	105	—	170	%
Over-Current Protection	Straight line with hiccup activation at < 30% of Vnom.	105	—	170	%
Line Regulation	For ±10% change from nominal line	—	—	±0.1	VDC
Remote Sense	Max. line drop compensation (except XgA, B, C, D, E, F)	—	—	0.5	%
Overshoot		—	—	2	ms
Rise Time	Monotonic	—	15	—	ms
Turn-On Delay	From AC in and global enable	—	700	—	ms
	powerMod enable	—	2	—	ms
Hold-Up Time	For nominal output voltages at full load	15		20	VDC
Output Isolation	Output to output/output to chassis	500/500	—	—	—

General

Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to output; contact Advanced Energy for Hi-Pot instructions	4000	—	—	VAC
	Input to chassis	1500	—	—	VAC
Efficiency	230 VAC, 1200 W @ 24 V	—	90	91	%
Safety Agency Approvals	EN60601-1 3rd Edition, UL60601-1, CSA601, UL File No. E230761	—	—	—	—
	EN60950 2nd Edition, CSA C22.2 No. 60950-1, UL File No.E181875	—	—	—	—
	IE62368-1 2nd Edition	—	—	—	—
Leakage Current	250 VAC, 60 Hz, 25°C	—	—	300	µA
	250 VAC, 60 Hz, 25°C (Option 04)	—	—	150	µA
Weight	See weight calculators on Advanced Energy website	—	—	—	—
Signals	See section 4.9 of catalog	—	—	—	—
Bias Supply	Always on, current 500 mA	4.8	5	5.2	VDC
Reliability	Telcordia SR-332 at 40°C and full load powerMod	—	—	0.959	fpmh
	Telcordia SR-332 at 40°C and full load powerPac (excludes Fans)	—	—	0.95	fpmh
MTBF	UX4 with two XgA's @ full load.Telecordia SR-332 , Issue 1 May 2001, ground benign, ambient temperature of 40°C	670	—	—	kHours

ELECTRICAL SPECIFICATIONS (CONTINUED)

EMC					
Parameter	**Conditions/Description**	**Criteria**			
Emissions					
Conducted	EN55011, EN55022, FCC	Class B[4]			
Radiated	EN55011, EN55022, FCC	Class B[4]			
Harmonic Distortion	EN61000-3-2 Class A	Compliant			
Flicker & Fluctuation	EN61000-3-3	Compliant			
Immunity					
Electrostatic Discharge	EN61000-4-2	Level 2			
Radiated Immunity	EN61000-4-3	Level 3			
Fast Transients-Burst	EN61000-4-4	—	Level 3	—	—
Input Line Surges	EN61000-4-5	—	Level 3	—	—
Conducted Immunity	EN61000-4-6	—	Level 3	—	—
Voltage Dips	EN61000-4-11, SEMI F47 compliant[1]	—	Compliant	—	—

Environmental					
Parameter	**Conditions/Description**	**Min**	**Nom**	**Max**	**Units**
Operating Temperature	Operates to specification below -20°C after 10 min warmup	-40	—	70	°C
Storage Temperature		-40	—	85	°C
Derating	See page 6 and 7 for full temperature deratings	—	—	—	—
Relative Humidity	Non-condensing	5		95	%RH
Acoustic Noise	Measured from distance of 1m; UX4/UX6. See catalog	—	39.8/42.7	—	dBA
Shock		60	—	—	G
Vibration	MIL-STD 810G	—	—	—	—
Altitude	Operational: 2000 m, Storage: 8000 m	—	—	—	—

[1] SEMI F47 compliant at input voltages > 160 VAC. Consult Advanced Energy for details.

[2] Visit www.advancedenergy.com for configuration, ordering and contact information.

[3] Product is not UL/EN certified for 120-380VDC input operation. Consult Advanced Energy for details.

[4] See designer's manual and product catalog for more information on Class B compliance.

INTERFACE

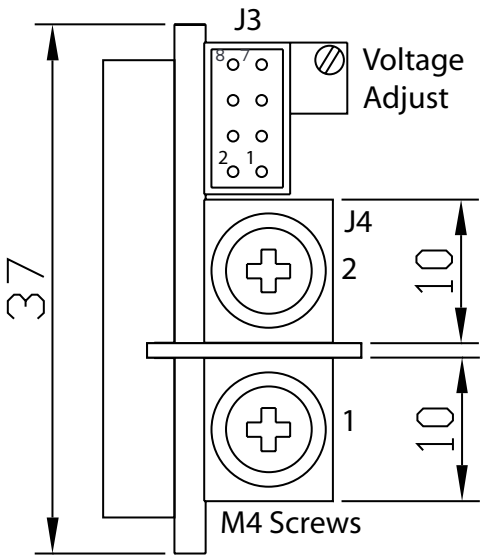
The output powerMods connection details are shown below. Type A connectors are for single output powerMods XgA-XgT and Xg1-Xg7. The Type B connector is for the dual output XgF/Xg8 powerMod. The power and signal connectors are as follows:

Output Signals and Power Connector Pinout							
Pin	**J3**	**J3**	**J3**	**J3**	**J3**	**J4**	**J4**
Module	(XgA to XgD)	(XgG-XgQ)	(XgR-XgT)	(XgE)	(XgF)	(Type A)	(Type B)
		(Xg1-Xg5)		(Xg7)	(Xg8)	—	—
1	not used	+Sense[1]	not used	not used	-pg (V2)	-Vout	-Vout 2
2	Common	-Sense[1]	-Vtrim	not used	+pg (V2)	+Vout	+Vout 2
3	not used	Vtrim	+Vtrim	not used	Inhibit V2)	—	-Vout 1
4	not used	Itrim	Itrim	Common	Common (V2)	—	-Vout 2
5	+Inhibit	+Inhibit/enable	+Inhibit/enable	-pg	-pg (V1)	—	—
6	-Inhibit	-Inhibit/enable	-Inhibit/enable	+pg	+pg (V1)	—	—
7	not used	+pg	+pg	Inhibit	Inhibit (V1)	—	—
8	not used	-pg	-pg	Common	Common (V1)	—	—

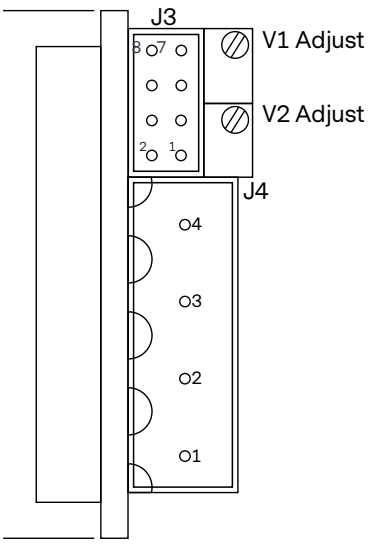
[1] remote sense not present on XgR and XgT powerMods

Output Mating Connectors	
J3	Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal: Molex p/n 50394. Or Molex 51110-0856, includes locking tab and polarization keying
J4 (Type A)	M4 screw (8 mm) Max Torque 0.74 Nm
J4	(Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Type A



Type B



Type A : powerMods	Type B: powerMod
XgA to XgE	XgF/Xg8
XgG to XgT	—
Xg1 to Xg7	—

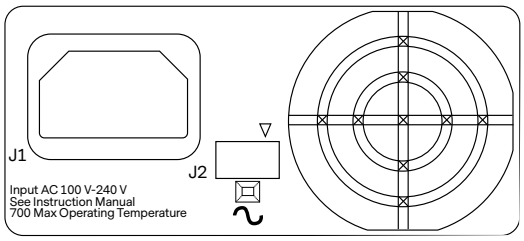
INTERFACE (CONTINUED)

The UltiMod series has a variety of input connector options to ease system integration. These include IEC, input cables (3-wire) and IEC to screw terminal adaptor.

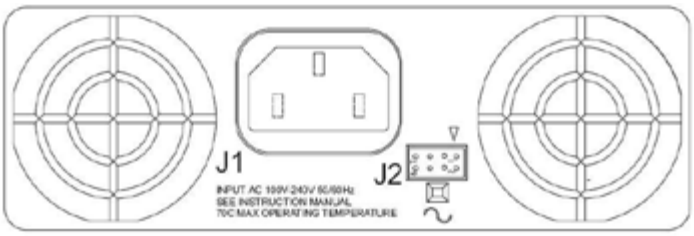
Input Mating Connectors	
J1	IEC320 type female plug rated 13, locking IEC cable and connector: Schaffner EMC part number IL13-US1-SVT-3100-183.
J2	Locking Molex 51110-0860; non locking 51110-0850; Crimp Terminal: Molex p/n 50394: Or Molex 51110-0856, includes locking tab and polarization keying

Input Cable (Option D)
The UltiMod series is also available with an input cable connection option allowing greater flexibility when mounting the UltiMod in the system. Individually insulated input cables are 300 mm in length and come supplied with Faston connectors.

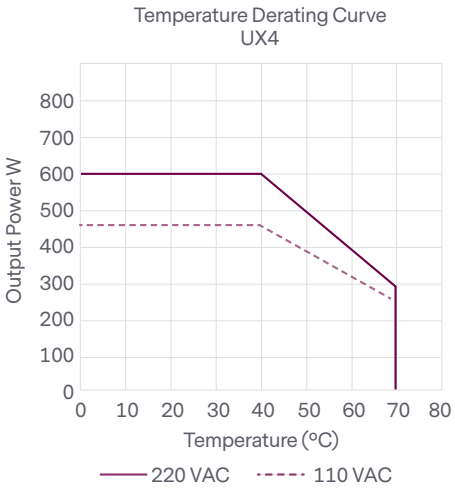
IEC to Screw Terminal Adaptor
Some applications may require a screw terminal input rather than the standard IEC320 connector provided with the UltiMod. For such applications, Advanced Energy can offer the XE1, the IEC to Screw terminal adaptor accessory plug.
This is a press fit connector that plugs securely into the UltiMod powerPac and provides the system integrator with screw terminals for mains connection. Recommended IEC to Faston/Terminal Lugs Schurter P/N 4788.8000.

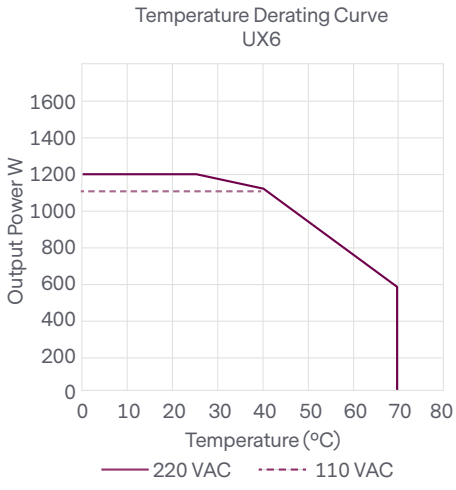


J1 and J2 Connectors UX4



J1 and J2 Connectors UX6

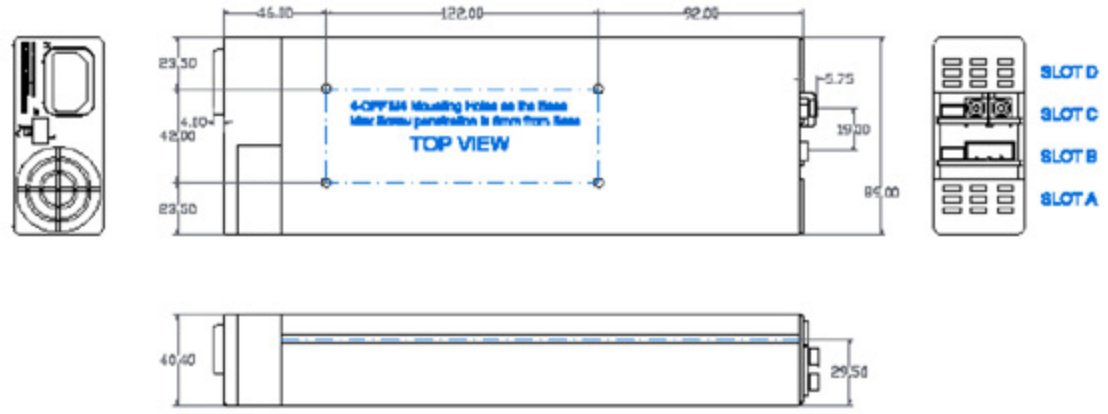




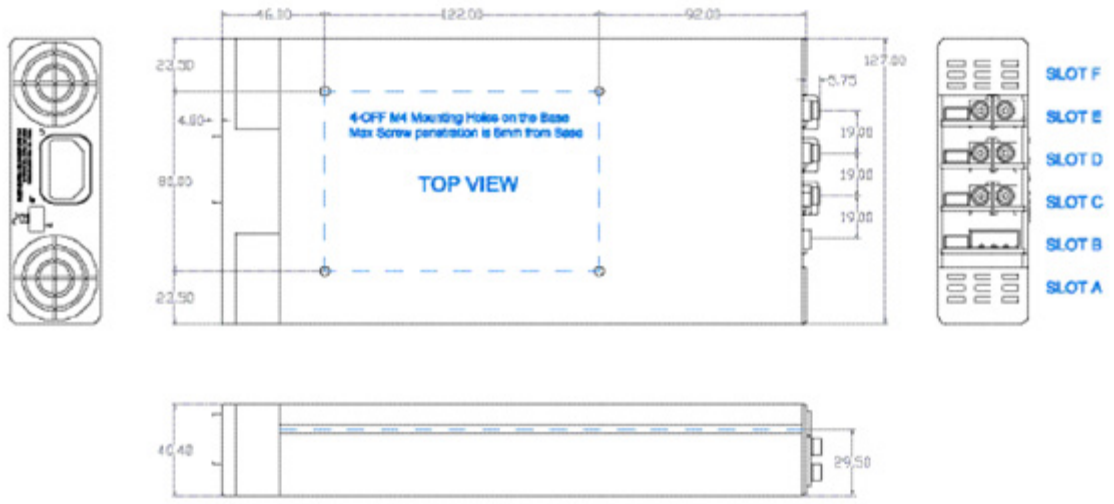
Pin	J1	J2
1	Line	Common
2	Neutral	+5V bias
3	Earth	not used
4	—	AC fail
5	—	Fan fail
6	—	Global enable
7	—	Temp alarm
8	—	Global inhibit

MECHANICAL DRAWINGS

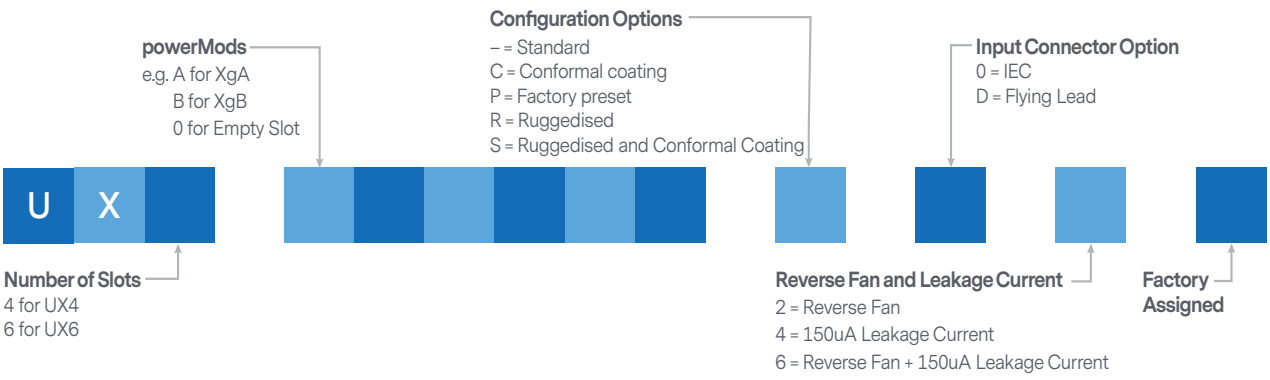
UX4



UX6



CONFIGURATION



ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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Advanced Energy

For international contact information, visit advancedenergy.com

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