



Excelsys Product Catalogue

The Power Solutions of Choice for Mission Critical Applications

Highest Efficiency
Highest Reliability
Highest Power Density





Iti od

The Ultimate Range of Modular Power Supplies for Industrial, Medical and Communications Applications -Hi-Rel Modular Power Supplies for Harsh Industrial and MIL-COTS Applications





Ultra Compact, Convection and Fan Cooled Single Output Power supplies for Industrial, Medical, MIL-COTS and Communications



∕⁄gen

Modular Power Supplies for Industrial, Medical, Communications and Acoustic Sensitive Applications



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Section 1.1 About Excelsys

Your Global Partner for Mission Critical Power Supplies

Excelsys Technologies brings over 20 years experience of leading edge power supply development and applications support to market with our revolutionary UltiMod, Xsolo and Xgen series of products. Our products deliver unrivalled levels of efficiency, flexibility, performance and reliability, all backed by a market leading 5 Year Warranty. We serve original equipment manufacturers globally from our head office in Ireland, our additional sales offices in the USA and China and our network of qualified and experienced manufacturer representatives and distributors in over 30 countries worldwide. Together we have established Excelsys as the brand of choice for customers seeking the highest performing, most reliable and most cost efficient power solutions.

Serving Your Markets, Delivering Your Solutions:

Whatever your application, our dedicated teams of Sales and Applications Engineers are ready to assist you in defining and implementing the optimum power solution to meet your requirements. Some of the markets where Excelsys has demonstrated success include:



MEDICAL

Medical power supply design and manufacturing demands the highest safety and quality standards including UL/EN60601-1 3rd edition, 2 MOPP and 4kVAC Isolation. The medically certified solutions in the UltiMod, Xsolo and Xgen Platforms are the solutions of choice for a variety of applications including:

Clinical Diagnostic Equipment • Medical Lasers • X-ray Machines • CT-Scanners • MRI Scanners • Dialysis Equipment • Skin Treatment and Regeneration • Cryotherapy Equipment • Cancer Treatment Equipment



INDUSTRIAL

Excelsys Technologies designs and manufactures power supplies that meet the rigorous demands of the industrial sector and its standards including EN60950 2nd edition and SEMI F47. Our products are ideal for a variety of industrial, automation and test & measurement applications including:

Industrial Lasers • Optical Inspection Equipment • Electronic Microscopes • Printer & Binder Equipment • Wafer Fabrication • Camera Equipment •3D Printing • Industrial Cutting Equipment



COMMUNICATIONS

The UltiMod, Xsolo, XF and Xgen range of power supplies meet the high reliability and stringent space requirements (1U) and standards including EN60950 2nd edition of the communications electronics sector and are used across a wide number of applications including:

Wireless Telephony Equipment • Bulk Power System • Base Stations • Data Communications



HI-REL COTS

Excelsys designs and manufactures MIL-COTS (Commercial Off The Shelf) power supplies that meet the high reliability and often harsh operating environments of the military electronics industry. Excelsys Hi Rel MIL-COTS products are characterised to MIL-STD-461F, CE101 & CE102 conducted emissions, MIL-STD 810G, Integrity Test for Shock and Vibration and are ideal for use in a variety of applications including:

Radar Systems • Data Acquisition (Ground Based and Mobile) • Communications Equipment • Test & Measurement Equipment

Excelsys: Our commitment to you...

As a global supplier of modular power supplies, Excelsys combines the latest technology, management methods and a total customer service philosophy to provide the best performing and highest reliability solutions for your business.

Working closely with both our customers and channel partners we are committed to ensuring our products provide the lowest total cost of power supply ownership over the life of your system.





excelsvs









The UltiMod series from Excelsys - the Ultimate range of Modular Configurable Power Supplies

- Unique in Flexibility
 Unrivalled in Performance
- Ultra Cost Competitive

UltiMod





Unique in Flexibility, Unrivalled in Performance, Ultra Cost Competitive

FEATURES & OPTIONS

- Dual Safety Approvals
 - UL/EN60950 2nd edition
 - UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- Highest Efficiency up to 91%
- User & Field Configurable
- Standard Medical Features
- Leakage Current <300µA (<150µA optional)
 2 MOPP
- 4KV Isolation
- Lowest Acoustic Noise
- -40°C Startup Temperature
- Extra Ruggedised Optional
 Shock: >60G's
- Vibration: MIL STD-810G
- No Minimum Load
- Extra low profile <1U height
- All outputs fully floating
- Series / Parallel of multiple outputs
- 5V Isolated standby voltage
- Active PFC (Power Factor Correction)
- Product Options: Conformal Coating, Low Leakage Current, Connector, Cabling & Mounting options and Reverse Fans Additional Ruggedisation

TYPICAL APPLICATIONS

- Medical; Clinical diagnostic equipment, Medical lasers, Dialysis equipment, Radiological Imaging, Clinical Chemistry
- Industrial; Test and Measurement, Industrial Machines, Automation equipment, Printing, Telecommunications, Audio equipment





The UltiMod Series from Excelsys - the *Ultimate* range of Modular Configurable Power Supplies provides up to 1200W output power in a compact 1U form factor. The series is designed for *highest efficiencies* and consists of two Input AC front ends (*powerPacs*), UX4 and UX6 and a wide range of DC output modules (XgA-XgQ & Xg1-Xg8).

Both *powerPacs* carry *dual safety certification*, EN60950 for Industrial Applications and EN60601-1 3rd Edition for Medical Applications. The UX4 delivers up to 600W and can be populated with up to 4 *powerMods*, the UX6 delivers up to 1200W and can be populated with up to 6 *powerMods* providing up to 12 fully isolated DC outputs ranging from 1.0V to 58V. Users can select the modules most suitable for their application based on power level and/or desired control feature set. Customers can configure any combination of *powerMods* in series/parallel.

UltiMod powerPacs

	Model	Slots	Power	er Medical Approval Industrial Appr UL/EN60601-1 3rd edition UL/EN60950 2nd	
\times	UX4	4	600W	Yes	Yes
Ň	UX6	6	1200W	Yes	Yes

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim	lmax (A)	Power	Remote Sense	Power Good
XgA	12.0	10.8-15.6	Range (V)	12.5	(W) 150		
0			-			-	-
XgB	24.0	19.2-26.4	-	8.3	200	-	-
XgC	36.0	28.8-39.6	-	5.6	200	-	-
XgD	48.0	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(4)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(4)	6.0	288	Yes	Yes
Reactive	Load Mc	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



INPUT Perometer	Conditions/Description	Min	Nom	Mox	Linite
Parameter	Conditions/Decription	Min 85	Nom	Max	Units
nput Voltage Range	Universal Input 47-440Hz	85 120		264 380	VAC VDC
Power Rating	UX4: See derating curves	120	600	300	W
ower Rating	UX6: See derating curves		1200		Ŵ
Input Current UX4	85VAC in 400W out		7.5		A
UX6	85VAC in 850W out		11.5		
Inrush Current	230VAC @ 25°C UX6/UX4			25/50	Α
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing UX4	250V		F8A HRC		
UX6	250V		F12A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
	Dynamic: As per <i>powerMod</i> table		0		•
Minimum Load Load & Cross Regulation	For 25% to 75% load change		0	±0.2	A %
Transient Response	For 25% to 75% load change: Voltage Deviation; XgA-XgD			±0.2 2.5	%
mansient Response	Settling Time: XgA-XgD			2.3 500	μs
	Voltage Deviation: XgE-XgQ, Xg1-Xg8			10	μs %
	Settling Time: XgE-XgQ			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk (except 150mV XgA) See note 4				- <u>-</u>
Overvoltage Protection	Latching	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom.	105		170	%
Line Regulation	For ±10% change from nominal line			±0.1	%
Remote Sense	Max. line drop compensation (except XgA, B, C, D, E, F)			0.5	VDC
Overshoot				2	%
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	ms
Output Isolation	Output to Output/Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output	4000			VAC
isolation voltage	Input to Chassis	1500			VAC
Efficiency	230VAC, 1200W @ 24V	1300	90	91	%
Safety Agency Approvals	EN60601-1 3rd Edition, UL60601-1, CSA601, UL File No. E230761		50	51	70
	EN60950 2nd Edition, CSA C22.2 No. 60950-1, UL File No.E181875				
Leakage Current	250VAC, 60Hz, 25°C			300	μA
	250VAC, 60Hz, 25°C (Option 04)			150	μA
Weight	See weight calculators on Excelsys website				
Signals	See section 4.9				
Bias Supply	Always on, current 500mA	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod			0.958	fpmh
	See Section 7.1 . powerPac excludes fans powerPac			0.92	fpmh
MTBF	UX4 with two XgA's @ full load.Telecordia SR-332 , Issue 1 May 2001,	670			kHours
	ground benign, ambient temperature of 40°C				
ЕМС					
Parameter	Standard		Level		Units
Emissions					
Conducted	EN55011, EN55022, FCC		Class B*		
Radiated	EN55011, EN55022, FCC		Class B*		
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		Compliant		
ENVIRONMENTAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Operating Temperature	Operates to specification below -20°C after 10 min warm-up	-40		+70	°C
Storage Temperature		-40		+85	°C
<u> </u>	See Page 8 for full temperature deratings				
Derating	Non-condensing	5		95	%RH
Derating Relative Humidity					
Relative Humidity			39.8/42 7		dBA
Relative Humidity Acoustic Noise	Measured from distance of 1m; UX4/UX6. See Page 58 for full table	60	39.8/42.7		dBA G
Relative Humidity		60	39.8/42.7		

NOTES 1. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

2. Visit www.excelsys.com for configuration and ordering and contact information.

3. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.

XgP & XgQ- Output ripple and noise are load dependent. Contact Excelsys or support@excelsys.com for details.
 * See section 7.3 of the Excelsys Modular Designers Manual and Product Catalogue for more information on Class B compliance.



Output Connectors

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:







Type B: powerMod

XgF/Xg8

Output Signals and Power Connector Pinout

*remote sense not present on XgR and XgT powerMods

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*	not used	not used	-pg (V2)	-Vout	-V2
2	Common	-Sense*	-Vtrim	not used	+pg (V2)	+Vout	+V2
3	not used	Vtrim	+Vtrim	not used	Inhibit V2)		-V1
4	not used	Itrim	Itrim	Common	Common (V2)	+V1
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 (√1)	

J3: Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal: Molex p/n 50394. Or Molex 51110-0856, includes Locking Tab &

Polarization Keying,

J4 (Type A): M4 Screw (8mm)

J4 (Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Input Connectors

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.

J1 & J2 Connectors UX4







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

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 & 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 300mm 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, Excelsys 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

Derating Curves







Output Mating Connectors





Jen Series Ultra Quiet

The Modular Power Solution of Choice for Acoustic Sensitive Applications

- High Efficiency
- High Reliability
 - High Power Density

200W-800W Ultra Quiet Power Supply

Ultra-high efficiency 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Low Acoustic noise 37.3dBA
- Ultra high efficiency, up to 89%
- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- Extra low profile: 1U height (40mm) compliant
- Plug & Play Power allows fast custom configuration
- · Individual output control signals
- All outputs fully floating
- · Series / Parallel of multiple outputs
- · Few electrolytic capacitors (all long life)
- Visual LED indicators
- 5V bias standby voltage provided
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- Audio Equipment
- Test and measurement
- Telecommunications
- Medical/Scientific



The Ultra-Quiet series from Excelsys delivers the lowest acoustic noise solutions in the market, providing up to 800W of output power in an extremely compact 1U package. Application specific solutions are available in either a 4 slot or 6-slot form factor which employ a unique plug and play architecture allowing users to configure a custom power supply in less than 5 minutes.

genSeries

All configurations carry full safety agency approvals, UL60950/EN60950/UL60601-1/EN60601-1 and are CE marked.

powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽⁹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0 ⁽⁹⁾	6.0	288	Yes	Yes
Reactive	Load Mo	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes

powerPacs

	MODEL	Slots	Power	Medical Approval UL/EN60601-1 3 rd Edition	(Industrial) UL/EN60950 ^{2nd} Edition
	XTA	4	200W	No	Yes
	XTB	4	400W	No	Yes
لي.	XNA	4	200W	Yes	No
Jie	XNB	4	400W	Yes	No
Quiet	XBA	6	400W	No	Yes
ល	XBB	6	600W	No	Yes
Ultra	XBC	6	800W	No	Yes
	XWA	6	400W	Yes	No
	XWB	6	600W	Yes	No
	XWC	6	800W	Yes	No



200W-800W

SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

nput Voltage Range Universal input 47-440µz 65 120 284 V Power Rating See power/Bra table on page 10. - <td< th=""><th>INPUT Parameter</th><th></th><th>Conditions/Description</th><th>Min</th><th>Nom</th><th>Max</th><th>Units</th></td<>	INPUT Parameter		Conditions/Description	Min	Nom	Max	Units
See powe/Ret table on page 10. 120 380 V1 nput Current XTAXVA See Section 2.2 for the voltage denting. 4.6 A nput Current XTAXVA See Section 2.2 for the voltage denting. 4.6 A NERNOVA XEXXVA See Section 2.2 for the voltage denting. 5.6 A NERNOVA See Section 2.2 for the voltage denting. 5.6 A NERNOVA See Section 2.2 for the voltage denting. 5.6 A NERNOVA See Section 2.2 for the voltage denting. 5.6 A NernovA See Section 2.2 for the voltage denting. 5.6 A NernovA See Section 2.2 for the voltage denting. 5.6 A Values State Section 2.2 for the voltage denting. 5.6 A Values XTAXNA 2.00 V FE 2.4 HEC FE 2.4 HEC Values XTAXNA 2.00 V FE 2.4 HEC FE 2.4 HEC Values XTAXNA 2.00 V FE 2.4 HEC FE 2.4 HEC Values XTAXNA See Section 2.4 Section 2.4 Section 2.4 Sect		ae					VAC
See Sector 3.2 for line vollage deratings	input voltage Ran	ge					VDC
nput Current XTAXXAN BSVAC in 2000 kut 4.5 A NEADAW BSVAC in 2000 kut 7.5 A NEADAW BSVAC in 2000 kut 7.5 A NeadAWAW BSVAC in 2000 kut 7.5 A NeadAWAW BSVAC in 2000 kut 11.5 50.25 A NeadAWAW Statution 65 7.4 V/V NeadAW Statution 65 7.4 V/V Name Control NeadAWA Statution 65 7.4 V/V Name To VAC (p ELLoad 0.8 0.9 0.9 P.1 V/V V/V <td>Power Rating</td> <td></td> <td>1 0</td> <td></td> <td></td> <td></td> <td></td>	Power Rating		1 0				
XTRX/NR BSVAC In 2339 Aut 5.0 A XRX/NR BSVAC In 4000 volt 9.5 A A DSE Autor 95.0 A A SEBX/NR BSVAC In 4000 volt 9.5 A A SEBX/NR BSVAC In 2000 volt 9.5 A A SEBX/NR SEX/NR SEX SEX Power Factor 1010 V/c6 (Full Louid 0.8 0.98 Fe A HPC Sessing XTAXXA 250V Fe A HPC Fe A HPC Sex NUM 250V Fe A HPC Fe A HPC Fe A HPC Sex NUM 250V Fe A HPC Fe A HPC Fe A HPC Sex NUM 250V Fe A HPC Fe A HPC Fe A HPC Sex NUM 250V Fe A HPC Fe A HPC Fe A HPC Sex NUM 250V Fe A HPC Fe A HPC Fe A HPC Sex NUM A pe powerMode Table In 1 Fe A HPC Fe A HPC <td></td> <td></td> <td></td> <td></td> <td>4.5</td> <td></td> <td>•</td>					4.5		•
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			Operational: 2000m, Storage: 8000m				
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		is product is no					

tage 6. Visit www.excelsys.com for configuration and ordering and contact information.

7. Conformal Coating option: See Sections 3.4 and 4.10 for details.

Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details
 XgP & XgQ- Output ripple and noise are load dependent. Contact Excelsys or support@excelsys.com for details.

200W-800W

J2

Global Inhibit

Output Connectors

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:







Type B: powerMod

XgF/Xg8

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*	not used	not used	-pg (V2)	-Vout	-V2
2	Common	-Sense*	-Vtrim	not used	+pg (V2)	+Vout	+V2
3	not used	Vtrim	+Vtrim	not used	Inhibit V2)		-V1
4	not used	Itrim	Itrim	Common	Common (V2)	+V1
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	1)	
8	not used	-pg	-pg	Common	Common (V1)	

Pin

8

J1

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 & Polarization Keying

J4 (Type A): M4 Screw (8mm)

J4 (Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Input Connectors

Excelsys modular power supplies have a variety of input connector options to ease system integration. These include IEC, Input cables (3-wire) and IEC to Screw Terminal Adaptor.

J1 & J2 Connectors 4-slot



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 & Polarization

Keying Input Cable (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm 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 Excelsys modular power supplies. For such applications, Excelsys can offer the XE1, the IEC to Screw terminal adaptor accessory plug. This is a press fit connector that plugs securely into the powerPac and provides the system integrator with screw terminals for mains connection (not available on XCE, XVE, XMD, XLD, XF). Recommended IEC to Faston/Terminal Lugs Schurter P/N 4788.8000







gen Series High Power

The Modular Power Solution of Choice for Mission Critical Applications

- High Efficiency
- High Reliability
 - High Power Density

Xgen High Power AC/DC Power Supply

Ultra-high efficiency 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Ultra high efficiency, up to 90%
- Extra low profile < 1U height
- Plug & Play Power allows fast custom configuration
- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- 4KV isolation (medical)
- SEMI F47 compliant
- -40C start up temperature
- · All outputs fully floating
- Series/Parallel of outputs
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Confromal Coating, Low Leakage Current, Extra Ruggedisation, Connector, Cabling and Mounting options, Reverse Fans.

APPLICATIONS INCLUDE

- Medical: Clinical diagnostic equipment, Medical lasers, Dialysis, Radiological Imaging equipment, Clinical Chemistry
- Industrial: Test & Measurement, Industrial Machines, Automation equipment, Printing,

Telecommunications, Audio equipment



The Xgen High Power family of industrial and medically approved power supplies provide up to an incredible 1340W in an extremely compact 1U package. Providing up to 12 isolated DC outputs, the Xgen High Power family employs innovative plug & play architecture allowing users to instantly configure a custom power solution in less than 5 minutes!

XLD and XCE parts are approved to EN60950 2nd edition and are ideal for wide range of industrial applications. XMD and XVE parts carry full medical safety agency approvals including UL/ENEN60601-1 2nd and 3rd Edition, 2MOPP and 4kVAC, CSA as well as carrying the CE mark.

powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽¹¹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0 ⁽¹¹⁾	6.0	288	Yes	Yes
Reactive	Load Mc	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes

powerPacs

	MODEL	Slots	Power	Medical Approval UL/EN60601-1 3 rd Edition	(Industrial) UL/EN60950 ^{2nd} Edition
<u>ب</u>	XLD	4	750W	No	Yes
ligh ower	XMD	4	750W	Yes	No
Ξ Ó	XCE	6	1340W	No	Yes
	XVE	6	1340W	Yes	No



SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

Ipper Voltage Range Universal Input 47-40Hz 85 120 224 VM Power Raling XLDXAD 750W XCEXVE: 1340W 120 120 20 20 Input Corrent XLDXMD (Seg section 3.2 dentify and section 3.2	Parameter	Conditions/Decription	Min	Nom	Max	Units
Nome Number of the second						VAC
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Diput Current NUM BSWAC in 222W out 7.5 A Ansrah Current 220WAC (b) 220 VAL (b) 4XMD/XCE 4 XVE 14.5 50/25 A Inderroltage Lockout Shutdown 0.5 60/25 A Structurent 220WAC (b) 220 VAL (b) 4XMD/XCE 4 XVE 0.5 60/27 A Training Conditions/Description 0.5 60/27 A VAL Yearing XLDXMD 220VAC (b) 220VAC	Power Rating	XLD/XMD: 750W. XCE/XVE: 1340W				
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Shock 3000 Bumps, 10G (16ms) half sine			5	50.0/50.5	95	%RH
Vibration MIL-STD810G				52.8/56.5		dBA
Altitude Operational: 2000m, Storage: 8000m	Inition					

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. XLD/XMD: 800W peak for 1s; Duty Cycle 7% powerMod output power must not exceed normal ratings

5. XCE/XVE: 1450W peak for 10s; Duty Cycle 8%. powerMod output power must not exceed normal ratings

6. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

7. Conformal Coating option: See Sections 3.4 and 4.10 for details.

8. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

9. Visit www.excelsys.com for configuration and ordering and contact information.

10. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



Output Connectors

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:

Type A: powerMods XgA to XgE XgG to XgT Xg1 to Xg7





Type B: powerMod

XgF/Xg8

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*	not used	not used	-pg (V2)	-Vout	-V2
2	Common	-Sense*	-Vtrim	not used	+pg (V2)	+Vout	+V2
3	not used	Vtrim	+Vtrim	not used	Inhibit V2)		-V1
4	not used	Itrim	Itrim	Common	Common (\	/2)	+V1
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 (\	/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 & Polarization Keying

J4: M4 Screw

J4 (Type A): M4 Screw (8mm)

J4 (Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Input Connectors

Excelsys Modular power supplies have a variety of input connector options to ease system integration. These include IEC, Input cables (3-wire) and IEC to Screw Terminal Adaptor.

J1 & J2 Connectors 4-slot



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 & Polarization Keying

Input Cable (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm in length and come supplied with Faston connectors.

XCE and XVE PowerPac considerations

- 1. XCE and XVE can deliver 1450W for a duration of 10s with an 8% duty cycle.
- 2. When 6 powerMods are operated in parallel, the XCE output power must be derated to 1280W.
- 3. At operation above 40°C, it is necessary to apply minimum load to the outputs. See table for minimum load requirements.

T ambient (°C)	Min Load (W)
40	0
50	100
60	175
70	250

XVC/XVE minimum load requirements









The Modular Power Solution of Choice for Hi Rel & Mil-COTS Applications.

· Highest Reliability, Efficiency, Power Density

- MIL810G & MIL461
- -55 °C to 70 °C Operating temperature
- 47-440Hz Input Frequency



Ruggedised COTS AC/DC Power Supply

Ultra-high efficiency 1U size

PLUG & PLAY POWER

next generation power source

FEATURES

- MIL-STD-810G: Shock & Vibration
- MIL-STD-461F (CE101 & CE102) : EMC
- Conformal Coated & Ruggedised as standard
- Operating temperature range of -55/-40 to 70°C
- 47-440Hz input frequency
- Anti-Vibration Compound
- 1.15V to 58V standard output voltages
- All outputs fully floating
- Extra low profile: 1U height (40mm)
- Ultra high efficiency, up to 90%
- Plug & Play Power
 allows fast custom configuration
 Outputs completely field configurable with option to factory fix
- Series / Parallel outputs for higher voltages and currents
- Parallel powerpacs for higher power
- OVP, OTP, OCP as standard
- 5V/250mA bias standby voltage provided
- Individual output control
- 5 Year Warranty
- SEMI F47 Compliant
- Active PFC (Power Factor Correction)

APPLICATIONS INCLUDE

- Harsh Industrial Electronics
- Radar (Naval, Ground Based)
- Communications
- Test & Measurement





The XF family of power supplies provides up to an incredible 1000W in an extremely compact 1U x 268 x 127mm package. Employing an innovative plug & play architecture the XF family brings unprecedented flexibility that allows users to instantly configure a custom power solution in less than 5 minutes.

Designed for use in harsh operating environments, the XF family is conformal coated and ruggedised to withstand extremes in shock and vibration as well as operation over a wide temperature range of -55 to 70°C. Applications include Harsh Industrial, Test and Measurement, Communications, Fixed and Mobile Radar and Military Electronics which require COTS solutions.

All configurations carry full safety agency approvals, including UL60950 and EN60950 and are fully characterised for EMC according to MIL-STD-461F. All configurations meet the MIL-STD-810G standard for shock and vibration.

powerPacs

		PowerPac	Power	PowerMod Slots	Operating Temperature		MIL-STD-810G	Conformal Coating
		XFA	400W	6	-55 to 70°C	Yes	Yes	Yes
Re	TS	XFB	700W	6	-55 to 70°C	Yes	Yes	Yes
늪	ဗ္ဗ	XFC	1000W	6	-55 to 70°C	Yes	Yes	Yes
		XFN	1000W	6	-40 to 70°C	Yes	Yes	Yes

powerMods

powerwo	us							
Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-	
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes	
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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	
Wide Trin	n Module	es						
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes	
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes	_
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes	
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes	_
Reactive	Load Mc	odules						
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes	_
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes	

*When ordering individual *powerMods* for use with the XF Series add the suffix C for conformal coating.



SPECIFICATION applies to configured units consisting of powerMods modules plugged into the appropriate powerPac

Parameter	Conditions/Decription	Min	Nom	Max	Units
nput Voltage Range	Input Frequency: 47 - 63Hz.	85		264	VAC
	Input Frequency: 47 - 440Hz.	90		120	VAC
Betin a		120		380	VDC
ower Rating	XFA			400	W
	XFB			700	W
	XFC			1000	W
	XFN		7.5	1000	W
nput Current XFA	85VAC in 400W out		7.5		A
XFB XFC	85VAC in 700W out 85VAC in 765W out		9.5 11.5		A
XFC	85VAC in 765W out		11.5		A
nrush Current	230VAC @ 25°C		11.5	25	A
Jndervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99	74	VAC
Fusing XFA	250V	0.90	F8A HRC		
XFB	250V		F10A HRC		
XFC	250V		F12A HRC		
XFN	250V 250V		F12A HRC		
	2500		FIZARIKU		
DUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Unit
oowerMod Power	As per powerMod table				
Dutput Adjustment Range	Manual or Electronic				
	As per <i>powerMod</i> Table				
Minimum Load			0		Α
ine Regulation	For ±10% change from nominal line			±0.1	%
_oad & Cross Regulation	For 25% to 75% load change			±0.2	%
Fransient Response	For 25% to 75% load change Voltage Deviation			10	%
	Settling Time			250	μs
Ripple and Noise	20MHz Bandwidth100mv or 1.0% pk-pk. See note 10.				
Overvoltage Protection	Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
Remote Sense	Max. line drop compensation. (See powerMod table on page 18)			0.5	VDO
Overshoot				2	%
Turn-on Delay	From AC In / powerMod Enable signal			1000 /6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load.	20			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDO
GENERAL					
	Conditions/Description	Mire	Nom	Mox	l les it
Parameter	Conditions/Description	Min	Nom	Max	Unit
solation Voltage	Primary to Secondary	3000			VAC
	Input to Chassis	1500			VAC
Efficiency	230VAC, 1000W @ 24V		90		%
Safety Agency Approvals	EN60950, UL60950, CSA22.2 No.950 UL File No. E181875				
Earth Leakage Current	230VAC, 50Hz, 25°C			1.5	mA
Bias Supply	Always ON. Current 250mA	4.8	5.0	5.5	VDC
Veight	PowerPac		1.2		kg
	Typical PowerMod		0.1		kg
Reliability	Telcordia SR-332 at 25°C and full load powerMod			1020	kh
	Telcordia SR-332 at 25°C and full load powerPac (excludes fans)			1057	kh
	MIL-STD-217F at 25°C and full load powerMod			86	kh
	MIL-STD-217F at 25°C and full load powerPac (excludes fans)			77	kh
ЕМС					
Parameter	Standard		Level		Units
missions					
Conducted	EN55011, EN55022, FCC: Class B		Compliant		
Radiated	EN55011, EN55022, FCC: Class B EN55011, EN55022, FCC: Class B		Compliant		-
larmonic Distortion	EN61000-3-2 Class A & MIL-STD-1399 SECTION 300A		Compliant		-
Flicker and Fluctuation	EN61000-3-2 Class A & MIL-31D-1399 SECTION 300A		Compliant		-
mmunity			Compliant		-
Electrostatic Discharge	EN61000-4-2: Level 2		Compliant		
Radiated RFI	EN61000-4-2: Level 2 EN61000-4-4: Level 3 & MIL-STD-461F. See note 6.		Compliant		-
Fast Transients - burst	EN61000-4-4: Level 3 & Mil-STD-46TF. See Hole 6.		Compliant		-
nput Line Surges	EN61000-4-4. Level 3 EN61000-4-5: Level 3 & MIL-STD-1399		Compliant		
Conducted RFI	EN61000-4-6: Level 3 & MIL-STD-461F. See note 6.		Compliant		
/oltage Dips	EN61000-4-0. Level 3 & MIL-STD-46 IP. See Note 6. EN61000-4-11 & MIL-STD-70, SEMI F47 compliant ⁽⁷⁾		Compliant		
			Compliant		
ENVIRONMENTAL					
Parameter	Conditions/Description	Min	Nom	Max	Unit
Operating Temperature	XFA, XFB, XFC	-55		+70	°C
sporating remperature	XFN operates to specification below -20°C after 10 min warm-up	-40		+70	°C
Storage Temporature	A re operates to specification below -20 C after 10 min warm-up	-40		+70	0°
Storage Temperature	See page 20 for full temporature deroting	-00		CIT	U
Derating	See page 20 for full temperature derating Measured from distance of 1m: See Page 58 for full table		56 5		4DV
Acoustic Noise	Measured from distance of 1m; See Page 58 for full table	E	56.5	05	dBA
Relative Humidity	Non-condensing	5		95	%RH
Shock	3000 Bumps, 10G (16ms) half sine	10		500	
/ibration	1.5G : MIL-STD-810G	10		500	Hz
Altitude	Operational: 2000m, Storage: 8000m				1

3. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

4. Derating required below -40 °C.

5. With certain configurations when powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.- consult Excelsys for further detail.

6. An external filter may be required to meet certain conducted and radiated emissions requirements for MIL-STD-461F. For further details contact support@excelsys.com.

7. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

Consult Excelsys for module derating at temperatures from -40°C to -55°C.
 Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



Output Connectors

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:

Type A: powerMods XgA to XgE XgG to XgT Xg1 to Xg7



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*	not used	not used	-pg (V2)	-Vout	-V2
2	Common	-Sense*	-Vtrim	not used	+pg (V2)	+Vout	+V2
3	not used	Vtrim	+Vtrim	not used	Inhibit V2)		-V1
4	not used	Itrim	Itrim	Common	Common ((V2)	+V1
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 (V	1)	
8	not used	-pg	-pg	Common	Common (V1)	

Output Mating Connectors

*remote sense not present on XaR and XaT powerMods.

J3: Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal: Molex p/n 50394: Or Molex 51110-0856, includes Locking Tab & Polarization Keying

J4 (Type A): M4 Screw (8mm)

J4 (Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Input Connectors

Excelsys Modular power supplies have a variety of input connector options to ease system integration. These include IEC, Input cables (3-wire) and IEC to Screw Terminal Adaptor.



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

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 & Polarization Keying

Input Cable (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm in length and come supplied with Faston connectors.

XF Series Derating Curves

Temperature Derating Curve for XF Models

XF Series Derating Curves



Line Derating Curve for XF Models (@ 60°C)







Zgen Series

The World's Most Popular Modular Power Supply

- High Efficiency
- High Reliability
 - High Power Density



Slimline Power Supply

User Configurable 1U Size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Ultra high efficiency, up to 89%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast
- custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputs
 Few electrolytic capacitors (all long life)
- Visual LED indicators
- 5V bias standby voltage provided
- SEMI F47 Compliant
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- · Industrial machines
- · Test and measurement
- Automation equipment
- Printing
- Telecommunications

powerPacs				
	MODEL	Watts		
	XLA	200W		
	XLB	400W		
\times	XLC	600W		
	XLD	750W		



The XL family of power supplies provides up to 750W in a slimline 1U package. Providing up to 8 isolated outputs, the XL family is the most flexible power supply in its class and brings affordable configurable power to the 200-750W market.

The XL family consists of 4 *powerPac* models in 200W, 400W, 600W and 750W power levels. Each *powerPac* model may be populated with up to 4 *powerMods* selected from the table of *powerMods* shown below.

All configurations carry full safety agency approvals, UL60950, EN60950 and are CE marked.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
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
Wide Trin	n Module	es					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽¹¹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(11)	6.0	288	Yes	Yes
Reactive	Load Mc	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



SPECIFICATION applies to configured units consisting of powerMods inserted into the appropriate powerPac

NPUT Parameter	Conditions/Description	Min	Nom	Max	Units
nput Voltage Range	Universal Input 47-440Hz	85		264	VAC
		120		380	VDC
Power Rating	XLA:200W, XLB:400W, XLC:600W, XLD:750W				
	See Section 3.2 for line voltage deratings				
nput Current XLA	85VAC in 200W out		4.0		A
XLB	85VAC in 400W out		6.0		A
XLC	85VAC in 400W out		7.5		A
XLD	85VAC in 525W out		7.5		A
nrush Current	230VAC, 25°C			50	Α
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XLA	250V 5 x 20mm		F5A HRC		
XLB	250V 5 x 20mm		F6.3A HRC		
XLC, XLD	250V 5 x 20mm		F8A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Unit
and Rowar	As par newark/ad table				
powerMod Power	As per powerMod table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
	Electronic: See Section 4.6				-
Minimum Load			0	10.1	A
Line Regulation	For ±10% change from nominal line			±0.1	%
Load Regulation	For 25% to 75% load change			±0.2	%
Cross Regulation				±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 11.				
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				
Remote Sense	Max. line drop compensation.(except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC In and Global Enable / powerMod Enable XLA, XLB, XLC			700 / 6	ms
iani on bolay	From AC In and Global Enable / powerMod Enable XLA, XLB, XLC			1000/6	ms
Rise Time	Monotonic			5	ms
		20/15		5	
Hold-up Time	For nominal output voltages at full load XLA, XLB, XLC/XLD	500 / 500			ms VDC
Output Isolation	Output to Output / Output to Chassis	5007500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Unit
Isolation Voltage	Input to Output	3000			VAC
solution voltage	Input to Chassis	1500			VAC
Efficiency	230VAC, 750W @ 24V	1500	89		%
Safety Agency Approvals	EN60950, UL60950, CSA22.2 No.950 UL File No. E181875		09		/0
				1.5	
Leakage Current	250VAC, 60Hz, 25°C			1.5	mA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA.	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod			0.958	fpmh
	See Section 7.1 . <i>powerPac</i> excludes fans <i>powerPac</i>			0.92	fpmh
EMC					
Parameter	Standard		Level		Unit
Emissions					
Conducted	EN55011, EN55022, FCC		Class B		
Radiated	EN55011, EN55022, FCC		Class B		
Harmonic Distortion	EN61000-3-2 Class A		Compliant		
Flicker & Fluctuation	EN61000-3-2 Class A EN61000-3-3		Compliant		
mmunity			Compliant		
	EN61000 4 2				
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		
/oltage Dips	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾		Compliant		
ENVIRONMENTAL					
Parameter	Conditions/Description	Min	Nom	Мах	Unit
Operating Temperature		-20		+70	°C
Storage Temperature		-40		+85	°C
Derating	See Section 3.2 for full temperature deratings	_			
Relative Humidity	Non-condensing	5		95	%R⊦
Acoustic Noise	Measured from distance of 1m; See Page 58 for full table		45.8		dBA
Shock	3000 Bumps, 10G (16ms) half sine				
				200	Hz
Vibration	1.5G	10		200	ΠZ

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. XLD: 800W peak for 1s; Duty cycle 7%. powerMod output power must not exceed normal ratings.

5. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

6. Conformal Coating option: See Sections 3.4 and 4.10 for details.

7. For section references above go to the Designers Manual.

8. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

9. Visit www.excelsys.com for configuration and ordering and contact information.

10. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details







Medical Power Supply

User Configurable 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- Less than 300µA leakage current
- 150µA option available
- 4000VAC isolation
- Ultra high efficiency, up to 89%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- Individual output control signals
 All outputs fully floating
- All outputs fully floating
- Series / Parallel of multiple outputs
- Few electrolytic capacitors (all long life)
- 5V bias standby voltage provided
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- Radiological imaging
- Clinical diagnostics
- Medical lasers
- Clinical chemistry

powerPacs

	MODEL	Watts
	XMA	200W
Σ	XMB	400W
\mathbf{X}	XMC	600W
	XMD	750W

The XM family of medically approved power supplies provides up to 750W in a slimline 1U package. The XM family carries the latest safety agency approvals to EN60601-1 and UL60601-1 3rd Edition, meeting the stringent creepage and clearance requirements in this compact package. Providing up to 8 isolated outputs, the XM family is the most flexible power supply in its class and brings affordable configurable power to the 200-750W medical market.

den Series

This slimline product boasts unrivalled power density, providing significant system space savings. Combined with ultra-high efficiencies, the XM family provides system designers with flexible instant solutions that significantly shorten system design-in time.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	es					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽⁹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to $58.0^{(9)}$	6.0	288	Yes	Yes
Reactive	Load Mc	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



SPECIFICATION applies to configured units consisting of nowerMods plugged into the appropriate nowerPac

INPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
Input Voltage Range	Universal Input 47-440Hz	85		264	VAC
		120		380	VDC
Power Rating	XMA:200W, XMB:400W, XMC:600W, XMD:750W				-
-	See Section 3.2 for line voltage deratings				
nput Current XMA	85VAC in 200W out		4.0		А
. XMB	85VAC in 400W out		6.0		A
XMC	85VAC in 400W out		7.5		Α
XMD	85VAC in 525W out		7.5		A
nrush Current	230VAC, 25°C			50	Α
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XMA	250V 5 x 20mm	0.00	F5A HRC		
XMB	250V 5 x 20mm		F6.3A HRC		
XMC, XMD	250V 5 x 20mm		F8A HRC		
OUTPUT			10/11/10		
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per powerMod table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per powerMod table				
	Electronic: See Section 4.6				
Minimum Load			0		A
_ine Regulation	For ±10% change from nominal line		-	±0.1	%
Load Regulation	For 25% to 75% load change			±0.1	%
Cross Regulation				±0.2	%
Fransient Response	For 25% to 75% load change Voltage Deviation			10.2	%
	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 9.			200	μο
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6	100		110	70
Remote Sense	Max. line drop compensation.(except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Remote Sense Overshoot				0.5	%
	From AC in and Clobal Enable / neurorMed Enable XMA, XMB, XMC			700 / 6	
Turn-on Delay	From AC in and Global Enable / powerMod Enable XMA, XMB, XMC				ms
	From AC in and Global Enable / powerMod Enable XMD			1000 / 6	ms
Rise Time	Monotonic	00/45		5	ms
Hold-up Time	For nominal output voltages at full load XMA,XMB, XMC/XMD	20/15			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
solation Voltage	Input to Output	4000			VAC
solution voltage	Input to Chassis	1500			VAC
Efficiency	230VAC, 750W @ 24V	1500	89		%
Safety Agency Approvals	EN60601-1, UL60601-1 3rd Edition, CSA601-1 UL File no. E230761		09		/0
Leakage Current	250VAC, 60Hz, 25°C			300	μA
Leakage Guilent	250VAC, 60Hz, 25°C Option 04			150	
Naiaht	, , , ,	_		150	μA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9	4.0	5.0	5.0	1/2.0
Bias Supply	Always on. Current 500mA.	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod			0.958	fpmh
	See Section 7.1 . <i>powerPac</i> excludes fans <i>powerPac</i>			0.92	fpmh
ЕМС					
			Level		Units
Parameter	Standard				Grints
	Standard		Level		
Emissions					
Emissions Conducted	EN55011, EN55022, FCC		Class B		
Emissions Conducted Radiated	EN55011, EN55022, FCC EN55011, EN55022, FCC		Class B Class B		
Emissions Conducted Radiated Harmonic Distortion	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A		Class B Class B Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	EN55011, EN55022, FCC EN55011, EN55022, FCC		Class B Class B		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A		Class B Class B Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2		Class B Class B Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3		Class B Class B Compliant Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2		Class B Class B Compliant Compliant Level 2		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3		Class B Class B Compliant Compliant Level 2 Level 3		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4		Class B Class B Compliant Compliant Level 2 Level 3 Level 3		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-5 EN61000-4-6		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity Voltage Dips	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity Voltage Dips	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-5 EN61000-4-6		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-5 EN61000-4-6	Min	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3	Max	Units
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾	-20	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70	°C
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Decrating	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant		
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	⊃°C ⊃°
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing	-20	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70	°C °C %RH
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation munity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Storage Temperature Derating Relative Humidity Acoustic Noise	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	⊃°C ⊃°
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Dperating Temperature Derating Relative Humidity Acoustic Noise Shock	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table 3000 Bumps, 10G (16ms) half sine	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	°C °C %RH
Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst nput Line Surges Conducted Immunity /oltage Dips ENVIRONMENTAL Parameter Dperating Temperature Storage Temperature Derating Relative Humidity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	°C °C %RH

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice. 3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. XMD: 800W peak for 1s; Duty cycle 7%. powerMod output power must not exceed normal ratings.

5. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

For section references above go to the Modular Power Supplies Designers Manual.
 SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

8. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.





Slimline Power Supply

User Configurable 1U size



The XK family of low acoustic noise power supplies provides up to 600W in a slimline 1U x 260mm x 89mm package.

Ideal for acoustic sensitive applications, the XK boasts unrivalled power density saving valuable system space. Combine with ultra high efficiencies, the XK family provides system designers with flexible instant solutions that significantly shorten and simplify system design-in time.

All configurations carry full safety agency approvals, UL60950, EN60950 and are CE marked.

powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	- -	Yes 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
Wide Trin	n Module	es					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes
Reactive	Load Mo	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes

PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Low Acoustic noise 39.8dBA
- Ultra high efficiency, up to 89%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputs
- Few electrolytic capacitors (all long life)
- Visual LED indicators
- 5V bias standby voltage provided
- SEMI F47 Compliant
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- · Audio Equipment
- Test and measurement
- Telecommunications

powerPacs

	MODEL	Watts
	ХКА	200W
X	XKB	400W
	XKC	600W



SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

INPUT Parameter	Conditions/Description	Min	Nom	Max	Units
			Nom	Max	
nput Voltage Range	Universal Input 47-440Hz	85		264	VAC
		120		380	VDC
Power Rating	XKA:200W, XKB:400W, XKC:600W				
	See Section 3.2 for line voltage deratings		4.5		۸
Input Current XKA	85VAC in 200W out		4.5		A
XKB	85VAC in 400W out		5.5		A
XKC	85VAC in 400W out		7.5	50	A
Inrush Current	230VAC, 25°C	05		50	A
Undervoltage Lockout	Shutdown	65	0.00	74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XKA	250V 5 x 20mm		F5A HRC		
XKB	250V 5 x 20mm		F6.3A HRC		
XKC	250V 5 x 20mm		F8A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
output / lajuotinent runge	Electronic: See Section 4.6				
Minimum Load			0		A
Line Regulation	For ±10% change from nominal line			±0.1	%
Load Regulation	For 25% to 75% load change			±0.1	%
Cross Regulation				±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10.2	%
	Settling Time			250	µs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. see note 10.			200	μə
Overvoltage Protection	Two-level. 1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6	105		110	/0
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot	max. The drop compensation. (except Ay_i , Ay_0 , Ay_{E} , Ay_{F} , Ay_{K} , Ay_{I})	-		2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable			700/6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load	20		5	ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
•		3007300			VDC
GENERAL					
GENERAL Parameter	Conditions/Description	Min	Nom	Max	Units
Parameter			Nom	Max	
	Input to Output	3000	Nom	Мах	VAC
Parameter Isolation Voltage	Input to Output Input to Chassis			Max	VAC VAC
Parameter Isolation Voltage Efficiency	Input to Output Input to Chassis 230VAC, 600W @ 24V	3000	Nom 89	Max	VAC
Parameter Isolation Voltage Efficiency Safety Agency Approvals	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875	3000			VAC VAC %
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C	3000		Max 	VAC VAC
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website	3000			VAC VAC %
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9	3000 1500	89	1.5	VAC VAC % mA
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA.	3000		1.5	VAC VAC % mA VDC
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod	3000 1500	89	1.5 5.2 0.958	VAC VAC % mA VDC fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA.	3000 1500	89	1.5	VAC VAC % mA VDC fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac	3000 1500	89 5.0	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod	3000 1500	89	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac	3000 1500	89 5.0	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC	3000 1500	89 5.0	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC	3000 1500	89 5.0 Level	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac	3000 1500	89 5.0 Level	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC	3000 1500	89 5.0 Level Class B Class B Compliant	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A	3000 1500	89 5.0 Level Class B Class B	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3	3000 1500	89 5.0 Level Class B Class B Compliant Compliant	1.5 5.2 0.958	VAC VAC MA MA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2	3000 1500	89 5.0 Class B Class B Compliant Compliant Level 2	1.5 5.2 0.958	VAC VAC MA MA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-4	3000 1500	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-5	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-5	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % mA VDC fpmh fpmh
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6	3000 1500	89 5.0 Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3	1.5 5.2 0.958	VAC VAC % MA VDC fpmh fpmh Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾	3000 1500 4.8 4.8	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % MA VDC fpmh fpmh Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾	3000 1500 4.8 4.8	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % MA VDC fpmh fpmh Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾	3000 1500 4.8 4.8	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % MA VDC fpmh fpmh Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings	3000 1500 4.8 4.8 	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % mA fpmh Units Units
Parameter solation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing	3000 1500 4.8 4.8	89 5.0 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % mA fpmh fpmh Units Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Derating Relative Humidity Acoustic Noise	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m. See Page 58 for full table	3000 1500 4.8 4.8 	89 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC % mA VDC fpmh fpmh Units
Parameter solation Voltage Efficiency Safety Agency Approvals Leakage Current Weight Signals Bias Supply Reliability EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation mmunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	Input to Output Input to Chassis 230VAC, 600W @ 24V EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 250VAC, 60Hz, 25°C See weight calculators on Excelsys website See Section 4.9 Always on. Current 500mA. Failures per million hours at 40°C and full load powerMod See Section 7.1 . powerPac excludes fans powerPac Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁷⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing	3000 1500 4.8 4.8 	89 5.0 5.0 Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Level 3 Compliant	1.5 5.2 0.958 0.92	VAC VAC % mA fpmh Units Units

NOTES 1. This product is not intended for use as a stand alone unit and must be installed by qualified personnel.

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

5. Conformal Coating option: See Sections 3.4 and 4.10 for details.

6. For section references above go to the Modular Power Supplies Designers Manual.

7. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

8. Visit www.excelsys.com for configuration and ordering and contact information.

9. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



Medical Power Supply Low Acoustic Noise 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Low Acoustic noise 39.8dBA
- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- Less than 300µA leakage current
- 150µA option available
- 4000VAC isolation
- Ultra high efficiency, up to 89%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- · Individual output control signals
- · All outputs fully floating
- Series / Parallel of multiple outputs
- Few electrolytic capacitors (all long life)
- 5V bias standby voltage provided
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- Radiological imaging
- Clinical diagnostics
- Medical lasers
- Clinical chemistry

powerPacs

	MODEL	Watts
	XRA	200W
К К	XRB	400W
×	XRC	600W

The XR family of low acoustic noise medically approved power supplies provides up to 600W in a slimline 1u x 260mm x 89mm package. Ideal for acoustic sensitive medical equipment, the XR family carries full safety agency approvals to EN60601-1 and UL60601-1 3rd Edition.

The XR family consists of 3 *powerPac* models in 200W, 400W and 600W power levels. Each *powerPac* model may be populated with up to 4 *powerMods* selected from the table of *powerMods* shown below. Simply select your appropriate *powerPac* and *powerMods* to get your instant custom power solution.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽⁹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0 ⁽⁹⁾	6.0	288	Yes	Yes
Reactive	Load Mc	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

INPUT Parameter	Conditions/Description	Min	Nom	Max	Units
		85	Nom	мах 264	VAC
nput Voltage Range	Universal Input 47-440Hz	120		264 380	VAC
Power Rating	XRA:200W, XRB:400W, XRC:600W	120		300	VDC
Power Rating	See Section 3.2 for line voltage deratings				
Input Current XRA	85VAC in 200W out		4.5		A
XRB	85VAC in 400W out		5.5		A
XRC	85VAC in 400W out		7.5		A
Inrush Current	230VAC, 25°C		7.5	50	A
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99	74	VAC
Fusing XRA	250V 5 x 20mm	0.90	F5A HRC		
XRB	250V 5 x 20mm		F6.3A HRC		
XRC					
	250V 5 x 20mm		F8A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				_
output Aguotinont Rungo	Electronic: See Section 4.6				
Minimum Load			0		Α
Line Regulation	For ±10% change from nominal line		U	±0.1	×
Load Regulation	For 25% to 75% load change			±0.1 ±0.2	%
	r or 25 % to 75% toau change			±0.2 ±0.2	_
Cross Regulation	Ear 25% to 75% load abarran Maltara Davistism				%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
Divide and M. 1	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 9.	10-		1	
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable			700 / 6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load	20			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output	4000			VAC
-	Input to Chassis	1500			VAC
Efficiency	230VAC, 600W @ 24V		89		%
Safety Agency Approvals	EN60601-1, UL60601-1 3rd Edition, CSA601-1 UL File no. E230761				
Leakage Current	250VAC, 60Hz, 25°C			300	μA
	250VAC, 60Hz, 25°C Option 04			150	μΑ
Weight	See weight calculators on Excelsys website			100	μ
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA.	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod	4.0	5.0	0.958	fpmh
Reliability				0.958	
	See Section 7.1. powerPac excludes fans powerPac			0.32	fpmh
EMC					
Parameter	Standard		Level		Unit
Emissions					
Emissions Conducted			Class D		-
Conducted	EN55011, EN55022, FCC		Class B		
Radiated	EN55011, EN55022, FCC		Class B		_
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 (6)		Compliant		
ENVIRONMENTAL					
	Canditiona/Decovirtien	DAL.	N	Marrie	
Parameter	Conditions/Description	Min	Nom	Max	Units
		-20		+70	°C
Operating Temperature		-40		+85	°C
		10			
Storage Temperature	See Section 3.2 for full temperature deratings			05	%RF
Storage Temperature Derating	See Section 3.2 for full temperature deratings	5			70 5
Storage Temperature Derating Relative Humidity	Non-condensing	5	30.0	95	_
Storage Temperature Derating Relative Humidity Acoustic Noise	Non-condensing Measured from distance of 1m. See Page 58 for full table	5	39.8	95	dBA
Storage Temperature Derating Relative Humidity Acoustic Noise Shock	Non-condensing Measured from distance of 1m. See Page 58 for full table 3000 Bumps, 10G (16ms) half sine		39.8		dBA
Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise Shock Vibration Altitude	Non-condensing Measured from distance of 1m. See Page 58 for full table	5 10	39.8	200	_

NOTES 1. This product is not intended for use as a stand alone unit and must be installed by qualified personnel.

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

5. For section references above go to the Modular Power Supplies Designers Manual.

6. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

7. Visit www.excelsys.com for configuration and ordering and contact information.

8. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



AC/DC Power Supply Ultra-high efficiency 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Ultra high efficiency, up to 90%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast
- custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputs
 Few electrolytic capacitors (all long)
- life)
- Visual LED indicators
- 5V bias standby voltage provided
- SEMI F47 Compliant
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- · Industrial machines
- · Test and measurement
- Automation equipment
- Printing
- · MIL-COTS applications

powerPacs							
	MODEL	Watts					
	XCA	400W					
	XCB	700W					
V	XCC	1000W					
	XCD	1200W					
	XCE	1340W					

www.excelsys.com

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The XC family of power supplies provides up to 1340W in a slimline 1U package. Providing up to 12 isolated outputs, the XC family is the most flexible power supply in its class and brings affordable configurable power to the 400-1340W market.

genSeries

The XC family consists of 5 *powerPac* models in 400W, 700W, 1000W, 1200W and 1340W power levels. Each *powerPac* model may be populated with up to 6 *powerMods* selected from the table of *powerMods* shown below.

All configurations carry full safety agency approvals, UL60950, EN60950 and are CE marked.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	- -	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes
Reactive	Load Mo	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

INPUT					
Parameter	Conditions/Decription	Min	Nom	Мах	Units
Input Voltage Range	Universal Input 47-440Hz	85		264	VAC
		120		380	VDC
Power Rating	XCA:400W, XCB:700W, XCC:1000W, XCD:1200W, XCE:1340W				
Innut Current XCA	See Section 3.2 for line voltage deratings		7.5		Δ
Input Current XCA XCB	85VAC in 400W out 85VAC in 700W out		7.5 9.5		A
XCC, XCD	85VAC in 850W out		11.5		A
XCE	85VAC in 1000W out		14.0	05	A
Inrush Current	230VAC @ 25°C	05		25	A
Undervoltage Lockout	Shutdown	65	0.00	74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XCA	250V		F8A HRC		
XCB	250V		F10A HRC		
XCC, XCD	250V		F12A HRC		
XCE	250V		F15A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Unit
powerMod Power					
	As per powerMod table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
Minimum Laad	Electronic: See Section 4.6		0	<u> </u>	•
Minimum Load	For 110% change from constrained line		0	10.4	A
Line Regulation	For ±10% change from nominal line			±0.1	%
Load & Cross Regulation	For 25% to 75% load change			±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 10.				
Overvoltage Protection	Two-level. 1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable XCA, XCB, XCC, XCD			700 / 6	ms
	From AC in and Global Enable / powermod Enable XCE			1000 / 6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load. XCA, XCB, XCC / XCD, XCE	20 / 15			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Unit
Farameter	Conditions/Description	IVIIII	NOM	WidX	Unit
Isolation Voltage	Input to Output	3000			VAC
	Input to Chassis	1500			VAC
Efficiency	230VAC, 1340W @ 24V		90		%
Safety Agency Approvals	EN60950, UL60950, CSA22.2 No.950 UL File No. E181875				
Earth Leakage Current	250VAC, 60Hz, 25°C			1.5	mA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA (250mA for XCE)	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod	-		0.958	fpmł
	See Section 7.1 . powerPac excludes fans powerPac			0.946	fpmh
EMC					
Parameter	Standard		Level		Unit
Emissions					
Conducted	EN55011, EN55022, FCC	-	Class B		
Radiated	EN55011, EN55022, FCC		Class B		
Harmonic Distortion	EN61000-3-2 Class A		Compliant	<u> </u>	1
Flicker & Fluctuation	EN61000-3-3		Compliant	<u> </u>	-
Immunity			Compliant		
	EN61000 4 2		Level 2		
Electrostatic Discharge	EN61000-4-2				
Radiated Immunity Fast Transients-Burst	EN61000-4-3		Level 3		
	EN61000-4-4		Level 3	1	
Input Line Current	EN61000-4-5		Level 3	<u> </u>	
_	EN61000 4 6		Level 3		
Conducted Immunity	EN61000-4-6				
Conducted Immunity Voltage Dips	EN61000-4-6 EN61000-4-11, SEMI F47 compliant ⁽⁶⁾		Compliant		
Conducted Immunity Voltage Dips			Compliant		
Conducted Immunity Voltage Dips ENVIRONMENTAL		Min	Nom	Max	Unit
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	EN61000-4-11, SEMI F47 compliant ⁽⁶⁾				
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	EN61000-4-11, SEMI F47 compliant ⁽⁶⁾	-20		+70	°C
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description				
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description See Section 3.2 for full temperature deratings	-20 -40		+70 +85	°C °C
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing	-20	Nom	+70	°C °C %RH
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40		+70 +85	°C °C
Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise Shock	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table 3000 Bumps, 10G (16ms) half sine	-20 -40 5	Nom	+70 +85 95	°C %R⊢ dBA
Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise	EN61000-4-11, SEMI F47 compliant ⁽⁸⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Nom	+70 +85	°C °C

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. XCE: 1450W peak for 10s; Duty cycle 8%. powerMod output power must not exceed normal ratings.

5. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

6. Conformal Coating option: See Sections 3.4 and 4.10 for details.

7. For section references above go to the Modular Power Supplies Designers Manual.

8. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

9. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



Medically Approved Ultra-high efficiency 1U size

PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- Less than 300µA leakage current
- 150µA option available
- 4000VAC isolation
- \bullet Ultra high efficiency, up to 90%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputs
 Few electrolytic capacitors (all long life)
- 5V bias standby voltage provided
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- · Clinical diagnostic equipment
- Medical lasers
- · Dialysis equipment

powerPacs

	MODEL	Watts
	XVA	400W
	XVB	700W
\geq	XVC	1000W
	XVD	1200W
	XVE	1340W

The XV family of medically approved power supplies provides up to an incredible 1340W in an extremely compact 1U package.

enSeries

The XV family consists of 5 *powerPacs* ranging in power levels from 400W to 1450W peak and 6 *powerMod* DC output modules. Simply select the appropriate *powerPac* and up to 6 *powerMods* from the tables below to complete your custom power supply.

All configurations carry full safety agency approvals including UL60601-1, EN60601-1 3rd Edition and are CE marked.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0 ⁽⁹⁾	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0 ⁽⁹⁾	6.0	288	Yes	Yes
Reactive	Load Mc	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



SPECIFICATION applies to configured units consisting of *powerMods* plugged into the appropriate *powerPac*

400W-1340W

Parameter	Conditions/Decription	Min	Nom	Max	Units
nput Voltage Range	Universal Input 47-440Hz	85		264	VAC
nput voltage range		120		380	VDC
Power Rating	XVA:400W, XVB:700W, XVC:1000W, XVD:1200W, XVE:1340W				
_	See Section 3.2 for line voltage deratings				
Input Current XVA	85VAC in 400W out		7.5		Α
XVB	85VAC in 700W out		9.5		A
XVC, XVD	85VAC in 850W out		11.5		A
XVE	85VAC in 1000W out		14.0		A
Inrush Current	230VAC @ 25°C			25	A
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XVA	250V		F8A HRC		
XVB	250V		F10A HRC		
XVC, XVD XVE	250V 250V		F12A HRC		
	2307		F15A HRC		
DUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table Electronic: See Section 4.6				
Minimum Load			0		A
Line Regulation	For ±10% change from nominal line		-	±0.1	%
Load & Cross Regulation	For 25% to 75% load change			±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
-	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 9.				
Overvoltage Protection	Two-level. 1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable XVA,XVB,XVC,XVD			700/6	ms
D . T .	From AC in and Global Enable / powerMod Enable XVE			1000/6	ms
Rise Time	Monotonic	20./45		5	ms
Hold-up Time	For nominal output voltages at full load. XVA,XVB,XVC / XVD,XVE	20 / 15			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output	4000			VAC
	Input to Chassis	1500			VAC
Efficiency	230VAC, 1340W @ 24V		90		%
Safety Agency Approvals	EN60601-1, UL2601-1, CSA601-1 UL File No. E230761				
Leakage Current	250VAC, 60Hz, 25°C			300	μA
	250VAC, 60Hz, 25°C Option 04			150	μA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9				_
Bias Supply	Always on. Current 500mA. (250mA for XVE)	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod			0.958	fpmh
	See Section 7.1 . powerPac excludes fans powerPac			0.946	fpmh
EMC					
	Standard				Linder
Parameter	Standard		Level		Units
Parameter Emissions					Units
Parameter Emissions Conducted	EN55011, EN55022, FCC		Class B		Units
Parameter <mark>Emissions</mark> Conducted Radiated	EN55011, EN55022, FCC EN55011, EN55022, FCC		Class B Class B		Units
Parameter Emissions Conducted Radiated Harmonic Distortion	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A		Class B Class B Compliant		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	EN55011, EN55022, FCC EN55011, EN55022, FCC		Class B Class B		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3		Class B Class B Compliant Compliant		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2		Class B Class B Compliant Compliant Level 2		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3		Class B Class B Compliant Compliant Level 2 Level 3		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4		Class B Class B Compliant Compliant Level 2 Level 3 Level 3		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant		
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6	Min	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3	Max	Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾	-20	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70	Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾		Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant		Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾ Conditions/Description	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	Units °C °C
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾	-20	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70	Units
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Derating Relative Humidity Acoustic Noise	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾ Conditions/Description See Section 3.2 for full temperature deratings Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	Units °C °C
Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁶⁾	-20 -40	Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3 Level 3 Compliant	+70 +85	Units °C °C

This product is not intended for use as a stand alone unit and must be installed by qualified personnel.
 The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. XVE: 1450W peak for 10s; Duty cycle 8%. powerMod output power must not exceed normal ratings.

5. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

6. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

7. Visit www.excelsys.com for configuration and ordering and contact information.

8. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.

400W-1200W



Low Acoustic Noise Power Supply

Ultra-high efficiency 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Low Acoustic noise 42.7dBA
- Ultra high efficiency, up to 90%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputsFew electrolytic capacitors (all long
- life)
 Visual LED indicators
- 5V bias standby voltage provided
- SEMI F47 Compliant
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- Audio Equipment
- Test and measurement
- Telecommunications

powerPacs

	MODEL	Watts
_	XQA	400W
Q Q	XQB	900W
	XQC	1200W

The XQ family of low acoustic noise power supplies provides up to 1200W in an extremely compact 1U x 260mm x 127mm package.

*Gen*Series

Ideal for acoustic sensitive applications such as audio applications, the XQ family provides unmatched efficiency and high power density, made possible through the combination of low loss technologies and the best field-proven technologies in planar magnetics and surface mount electronics.

All configurations carry full safety agency approvals, UL60950, EN60950 and are CE marked.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	s					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes
Reactive	Load Mo	dules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



400W-1200W

SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

Parameter	Conditions/Description	Min	Nom	Max	Units
Parameter Input Voltage Range	Conditions/Description Universal Input 47-440Hz	85	Nom	264	VAC
input voltage Range		120		264 380	VAC
Power Rating	XQA:600W, XQB:900W, XQC:1200W	120		000	VDC
lower reating	See Section 3.2 for line voltage deratings				
Input Current XQA	85VAC in 400W out		7.5		Α
XQB	85VAC in 850W out		11.5		A
XQC	85VACin 850W out		11.5		A
Inrush Current	230VAC @ 25°C			25	A
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XQA	250V	0.00	F8A HRC		
XQB	250V		F12A HRC		
XQC	250V		F12A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table		Nom	INIAA	Units
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
Output Aujustinent Kange	Electronic: See Section 4.6				
Minimum Load			0		A
Line Regulation	For ±10% change from nominal line		<u> </u>	±0.1	~ %
Load & Cross Regulation	For 25% to 75% load change			±0.1 ±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10.2	%
manoient Neoponoe	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 10.			200	μο
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	Straight line with niccup activation at <30% of vhom See Section 4.6	105		170	70
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable			2 700 / 6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load. XQA, XQB/XQC	20 / 15		5	ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
		5007500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output	3000		Incox	VAC
isolation voltage	Input to Chassis	1500			VAC
Efficiency	230VAC, 1200W @ 24V	1300	90		%
Safety Agency Approvals	EN60950, UL60950, CSA22.2 No.950 UL File No. E181875		30		/0
Leakage Current	250VAC, 60Hz, 25°C			1.5	mA
Weight	See weight calculators on Excelsys website			1.5	IIIA
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA.	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod	4.0	5.0	0.958	fpmh
Reliability	See Section 7.1 . powerPac excludes fans powerPac			0.936	fpmh
				0.340	ipinin
EMC					
Parameter	Standard		Level		Units
Emissions					
Conducted	EN55011, EN55022, FCC		Class B		-
Radiated	EN55011, EN55022, FCC		Class B		
Harmonic Distortion	EN61000-3-2 Class A		Compliant		
Flicker & Fluctuation	EN61000-3-3		Compliant		
Immunity			Compilant		
Electrostatic Discharge	EN61000-4-2		Level 2		
Radiated Immunity	EN61000-4-2		Level 2		
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	EN61000-4-0		Compliant		
<u> </u>			Sompliant		
ENVIRONMENTAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
		-20		+70	°C
Operating Temperature				-	0°C
Storage Temperature	See Section 2.2 for full townships downting -	-40		+85	· U
Derating	See Section 3.2 for full temperature deratings	5		05	0/ 5/ 1
Relative Humidity	Non-condensing	5	40.7	95	%RH
Acoustic Noise	Measured from distance of 1m. See Page 58 for full table		42.7		dBA
Shock	3000 Bumps, 10G (16ms) half sine	40		000	
Vibration Altitude	1.5G	10		200	Hz
	Operational: 2000m, Storage: 8000m	1	1		- I.

This product is not intended for use as a stand alone unit and must be installed by qualified personnel.
 The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

5. Conformal Coating option: See Sections 3.4 and 4.10 for details.

6. For section references above go to the Modular Power Supplies Designers Manual.

7. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

8. Visit www.excelsys.com for configuration and ordering and contact information.

9. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.



400W-1200W



Medical Power Supply

Low Acoustic Noise 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- UL/EN60950 2nd edition
- UL/EN60601-1 3rd edition
- UL/EN60601-1-2 4th edition EMC compliant
- EN60601-1 3rd edition Approved
- Less than 300µA leakage current
- 150µA option available
- 4000VAC isolation
- Ultra high efficiency, up to 90%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputsFew electrolytic capacitors (all long
- life)

 5V bias standby voltage provided
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- · Clinical diagnostic equipment
- Medical lasers

powerPacs



The XZ family of low acoustic noise medically approved power supplies provides up to 1200W in an extremely compact 1U x 260mm x 127mm package.

The XZ family consists of 3 *powerPac* models ranging in power levels from 400W to 1200W. Each model may be populated with up to 6 *powerMods* selected from the table of *powerMods* shown below.

All configurations carry full safety agency approvals, UL60601-1, EN60601-1 3rd Edition and are CE marked.

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	- -	Yes 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
Wide Trin	n Module	es					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes
Reactive	Load Mo	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes


400W-1200W

SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

INPUT Parameter	Conditions/Description	Min	Nom	Max	Units
Input Voltage Range	Universal Input 47-440Hz.	85		264	VAC
input voltage Range		120		380	VDC
Power Rating	XZA:600W, XZB:900W, XZC:1200W				
-	See Section 3.2 for line voltage deratings				
Input Current XZA	85VAC in 400W out		7.5		A
XZB	85VAC in 850W out		11.5		A
XZC	85VAC in 850W out		11.5		A
Inrush Current	230VAC @ 25°C			25	Α
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XZA	250V		F8A HRC		
XZB	250V		F12A HRC		
XZC	250V		F12A HRC		
Ουτρυτ					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per <i>powerMod</i> table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per powerMod table				
	Electronic: See Section 4.6				
Minimum Load			0		Α
Line Regulation	For ±10% change from nominal line		-	±0.1	%
Load & Cross Regulation	For 25% to 75% load change			±0.1	%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 10.				
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				,5
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable			700/6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load. XZA, XXB/XZC	20 / 15			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
-					
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output	4000			VAC
	Input to Chassis	1500			VAC
Efficiency	230VAC, 1200W @ 24V		90		%
Safety Agency Approvals	EN60601-1, UL60601-1 3rd Edition, CSA601-1 UL File no. E230761				
Leakage Current	250VAC, 60Hz, 25°C			300	μA
	250VAC, 60Hz, 25°C Option 04			150	μA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod			0.958	fpmh
	See Section 7.1 . powerPac excludes fans powerPac			0.946	fpmh
ЕМС					
					Units
Parameter	Standard		Level		Units
Emissions					
Conducted	EN55011, EN55022, FCC		Class B		
Radiated	EN55011, EN55022, FCC		Class B		
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 ⁽⁷⁾		Compliant		
ENVIRONMENTAL		<u> </u>	<u> </u>		
Parameter	Conditions/Description	Mix	Nom	Max	1 Junit
	Conditions/Description	Min	Nom	Max	Units
Operating Temperature		-20		+70	°C
· · ·		-40		+85	°C
Storage Temperature	See Section 3.2 for full temperature deratings				
Storage Temperature Derating		5		95	%RH
Storage Temperature Derating Relative Humidity	Non-condensing				dBA
Storage Temperature Derating Relative Humidity Acoustic Noise	Measured from distance of 1m. See Page 58 for full table		42.7		UDA
Storage Temperature Derating Relative Humidity Acoustic Noise Shock	V		42.7		UDA
Storage Temperature Derating Relative Humidity	Measured from distance of 1m. See Page 58 for full table	10	42.7	200	Hz

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. See Modular Power Supplies Designers Manual for detailed power ratings.

5. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

6. For section references above go to the Modular Power Supplies Designers Manual.

7. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

Schult Friedericht der input vollages Fredericht Schladt Excelsion ertaut.
 Visit www.excelsys.com for configuration and ordering and contact information.
 Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsion for details.

10. XgP & XgQ- Output ripple and noise are load dependent. Contact Excelsys or support@excelsys.com for details.

400W-600W



Hi-Temp Power Supply

Ultra-high efficiency 1U size



PLUG & PLAY POWER next generation power solution

FEATURES & OPTIONS

- Ultra high efficiency, up to 89%
- Extra low profile: 1U height (40mm)
- Plug & Play Power allows fast
- custom configuration
- Individual output control signals
- All outputs fully floating
- Series / Parallel of multiple outputs
 Few electrolytic capacitors (all long life)
- Visual LED indicators
- 5V bias standby voltage provided
- SEMI F47 Compliant
- Up to 600W at 70°C
- Active PFC (Power Factor Correction)
- Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans. See Section 4.10 for more information

APPLICATIONS INCLUDE

- Industrial equipment
- Telecommunications
- · Outdoor display systems

powerF	acs	
	MODEL	Watts
I	XHA	400W
×	XHB	600W

The XH family of high temperature power supplies provides up to 600W in an extremely compact 1U x 260mm x 127mm package.

GenSeries

The XH family is ideal for use in harsh environments where there can be high ambient temperatures and wide temperature fluctuations. Operation at higher temperatures is made possible through employment of leading edge technologies and cooling techniques, making it possible for the XH to achieve unprecedented efficiencies of up to 89%. All configurations carry full safety agency approvals. UL60950 and EN60950 2nd edition and carry the CE Mark.

powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (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	38.4-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0 24.0	5.0-28.0 5.0-28.0	-	3.0 3.0	72 72	-	Yes 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
Wide Trin	n Module	es					
XgM	5.0	3.2-6.0	1.0 to 6.0	40.0	200	Yes	Yes
XgN	12.0	6.0-15.0	1.0 to 15.0	20.0	240	Yes	Yes
XgP	24.0	12.0-30.0	1.0 to 30.0(10)	10.0	240	Yes	Yes
XgQ	48.0	24.0-58.0	1.0 to 58.0(10)	6.0	288	Yes	Yes
Reactive	Load Mo	odules					
XgR	24.0	12.0-30.0	8.0 to 30.0	10.0	240	No	Yes
XgT	48.0	28.0-58.0	8.0 to 58.0	6.0	288	No	Yes



400W-600W

SPECIFICATION applies to configured units consisting of powerMods plugged into the appropriate powerPac

INPUT Parameter	Conditions/Description	Min	Nom	Max	Unit
			Nom		
nput Voltage Range	Universal Input 47-440Hz	85		264	VAC
		120		380	VDC
Power Rating	XHA:400W, XHB:600W				
	See Section 3.2 for line voltage deratings				
Input Current XHA	85VAC in 400W out		6.5		A
XHB	85VAC in 600W out		7.5		A
Inrush Current	230VAC @ 25°C			25	A
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing XHA	250V		F10A HRC		
XHB	250V		F12A HRC		
Ουτρυτ					
Parameter	Conditions/Description	Min	Nom	Max	Unit
powerMod Power	As per <i>powerMod</i> table			Indix	
Output Adjustment Range	Manual: Multi-turn potentiometer. As per <i>powerMod</i> table				
	Electronic: See Section 4.6				
Minimum Load			0		A
Line Regulation	For ±10% change from nominal line			±0.1	%
Load & Cross Regulation	For 25% to 75% load change			±0.2	%
Transient Response	For 25% to 75% load change Voltage Deviation			10	%
	Settling Time			250	μs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk. See note 10.				
Overvoltage Protection	1st level: Vset Tracking. 2nd level: Vmax (Latching)	105		170	%
Overcurrent Protection					%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom	105		170	%
	See Section 4.6				
Remote Sense	Max. line drop compensation. (except Xg7, Xg8, XgE, XgF, XgR, XgT)			0.5	VDC
Overshoot				2	%
Turn-on Delay	From AC in and Global Enable / powerMod Enable			700 / 6	ms
Rise Time	Monotonic			5	ms
Hold-up Time	For nominal output voltages at full load.	20			ms
Output Isolation	Output to Output / Output to Chassis	500 / 500			VDC
•					
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Unit
Isolation Voltage	Input to Output	3000			VAC
	Input to Chassis	1500			VAC
Efficiency	230VAC, 600W @ 24V		89		%
Safety Agency Approvals	EN60950, UL60950, CSA22.2 No.950 UL File No. E181875				
Leakage Current	250VAC, 60Hz, 25°C		300		mA
Weight	See weight calculators on Excelsys website				
Signals	See Section 4.9				
Bias Supply	Always on. Current 500mA	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load powerMod		0.0	0.958	fpmh
Reliability				0.936	
	See Section 7.12 powerPac excludes fans powerPac			0.946	fpmł
EMC					
	Standard		Level		Unit
Parameter	Stanual u		Level		Unit
Emissions					
Conducted	EN55011, EN55022, FCC		Class B		
Radiated	EN55011, EN55022, FCC		Class B		
Harmonic Distortion	EN61000-3-2 Class A		Compliant		
Flicker & Fluctuation	EN61000-3-3		Compliant		
Immunity					
			Level 2		
	EN61000-4-2				
Electrostatic Discharge	EN61000-4-2 EN61000-4-3				
Electrostatic Discharge Radiated Immunity	EN61000-4-3		Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst	EN61000-4-3 EN61000-4-4		Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges	EN61000-4-3 EN61000-4-4 EN61000-4-5		Level 3 Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6		Level 3 Level 3 Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	EN61000-4-3 EN61000-4-4 EN61000-4-5		Level 3 Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6		Level 3 Level 3 Level 3		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾		Level 3 Level 3 Level 3 Compliant		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6	Min	Level 3 Level 3 Level 3	Max	Unit
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description		Level 3 Level 3 Level 3 Compliant		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾	-20	Level 3 Level 3 Level 3 Compliant	+70	°C
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load		Level 3 Level 3 Level 3 Compliant		
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load No derating 0 to 70°C	-20 -40	Level 3 Level 3 Level 3 Compliant	+70 +85	°C ℃
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load No derating 0 to 70°C Non-condensing	-20	Level 3 Level 3 Level 3 Compliant	+70	°C ℃
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load No derating 0 to 70°C Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Level 3 Level 3 Level 3 Compliant	+70 +85	°C ℃
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise Shock	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load No derating 0 to 70°C Non-condensing Measured from distance of 1m; See Page 58 for full table 3000 Bumps, 10G (16ms) half sine	-20 -40 5	Level 3 Level 3 Level 3 Compliant	+70 +85 95	
Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity Acoustic Noise	EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant ⁽⁷⁾ Conditions/Description Full Load No derating 0 to 70°C Non-condensing Measured from distance of 1m; See Page 58 for full table	-20 -40	Level 3 Level 3 Level 3 Compliant	+70 +85	°C ℃

2. The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.

3. All specifications at nominal input, full load, 25°C unless otherwise stated.

4. When powering inductive or capacitive loads, it is recommended to use a blocking diode on the output.

5. Conformal Coating option: See Sections 3.4 and 4.10 for details.

6. For section references above go to the Modular Power Supplies Designers Manual.

7. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.

8. Visit www.excelsys.com for configuration and ordering and contact information.

9. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.

10. XgP & XgQ- Output ripple and noise are load dependent. Contact Excelsys or support@excelsys.com for details.



Section 3 Connectors, Derating, Mechanical Drawings and Configuration Section 3.1 Connectors for Xgen Series

Output Connectors

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 power/Mod. The power and signal connectors are as follows:



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 & Polarization Keying

J4 (Type A): M4 Screw (8mm)

J4 (Type B) Connector(s): Camden CTB9200/4A or Wurth Elektronik 691 352 710 004

Input Connectors

Excelsys modular power supplies have a variety of input connector options to ease system integration. These include IEC, Input cables (3-wire) and IEC to Screw Terminal Adaptor.

J1 & J2 Connectors (4-slot)

J1 & J2 Connectors (6-slot)



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 & Polarization Keying

Input Cable (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm 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 Excelsys modular power supplies. For such applications, Excelsys can offer the XE1, the IEC to Screw terminal adaptor accessory plug. This is a press fit connector that plugs securely into the powerPac and provides the system integrator with screw terminals for mains connection (not available on XCE, XVE, XMD, XLD, XF). Recommended IEC to Faston/Terminal Lugs Schurter P/N 4788.8000

Modular Power Supply Mounting Options

1. Base Plate Mounting

The unit can be mounted in the system via the mounting holes present on the UltiMod and Xgen base. See mechanical drawings for mounting hole positions. Use M4 mounting screws. Ensure that maximum screw penetration from base does not exceed 6mm.

2. Fleximount System A

Using the side mounting clips accessory shown, the clip can be positioned at the user defined position along the slide rail on the side of the UltiMod/Xgen. The clip is then mounted to the system base plate. Use M4 mounting screws to fix mounting clip to system base. Excelsys part number Z165.

3. Fleximount System B

Using the slide rail on side of the UltiMod/Xgen, self clenching studs can be placed at a user defined position. Recommend: PEM FH-M4-X or FH-832-X or equivalent.





Section 3.2 Deratings Curves for Xgen Series



XLA/XLB/XLC/XLD and XMA/XMB/XMC/XMD @ 220VAC Derating



XLA/XLB/XLC/XLD and XMA/XMB/XMC/XMD @ 110VAC Derating









XBA/XBB/XBC and XWA/XWB/XWC @ 110VAC Derating



Deratings Curves for Xgen Series



@ 220VAC Derating







XQC, XZC @ 220VAC*



XHB @ 110VAC

XHA @ 110VAC

600

500

400

Output Power 300

W









Section 3.3

Modular Power Supplies Mechanical Drawings

All 3D/CAD Drawings available at http://www.excelsys.com/technical-support/3d-files-and-cad-drawings/



TOLERANCES unless otherwise stated, according to DIN 2768-1/-2 CLASS M ALL DIMENSIONS in mm. See http://www.excelsys.com/technical-support/ for DIN table.



TOLERANCES unless otherwise stated, according to DIN 2768-1/-2 CLASS M ALL DIMENSIONS in mm. See http://www.excelsys.com/technical-support/ for DIN table.







TOLERANCES unless otherwise stated, according to DIN 2768-1/-2 CLASS M ALL DIMENSIONS in mm. See http://www.excelsys.com/technical-support/ for DIN table.



4 slot Input Cable Version (Option D)



Standard cable length 300 mm. Please contact factory for alternative lengths.

6 slot Input Cable Version (Option D)



Standard cable length 300 mm. Please contact factory for alternative lengths.



Section 3.4 Configuring your Modular Power Supply

The Xgen and UltiMod series of user configurable power supplies combine feature rich AC input front-ends (*power-Pacs*) with slide-in DC output modules (*powerMods*). The plug and play architecture allows system designers to define and build 'instant' custom power solutions with industry leading 17W/in³ power density and up to 92% efficiency.

Configured units may be specified and ordered using the part numbering system shown above.

OPTION CODES EXPLAINED

CONFIGURATION OPTIONS

- "-" Standard. No additional configuration Nominal output voltages and no options
- "C" Conformal Coating
- "P" Preset. Voltage Adjustments, Series, Parallel Outputs
- "R" Extra Ruggedisation for Shock and Vibration
- "S" Conformal Coating and Extra Ruggedisation for Shock and Vibration

INPUT CONNECTOR CONFIGURATOR OPTIONS

- "0" Standard IEC Input Connector
- "D" Input Cable Option

REVERSE FAN AND LEAKAGE CURRENT OPTIONS

- "0" Standard Thermal Signals + Fan Fail Signal Included
- "1" Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- "2" Reverse Fan (Includes "0")
- "3" Reverse Fan, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- "4" 150uA Leakage Current*(medical models only, Includes"0")
- "5" 150uA Leakage Current*, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- "6" 150uA* + Reverse Fan (medical versions only, Includes"0")
- "7" 150uA Leakage Current*, Reverse Fan, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)

Specifying & Ordering Configured Power Supplies

Configured Units may be specified and ordered using the part numbering system shown opposite. At our configuration centre we will assemble the Power Supply as specified by you accounting for slot preferences and also for preferred settings (Voltage/Series/Parallel etc), and also incorporating any Options required.

Configuration example for UltiMod: part number UX4CGD0-D4 specifies the following product;

- UX4 powerPac 600W (Medical & Industrial)
- Slot A: XgC: 36V/5.6A powerMod
- Slot B: XgG: 2.5V/40A powerMod
- Slot C: XgD: 48V/4.2A powerMod
- Slot D: empty
- Option D (input cable) & Option 4 (150uA Leakage current)

Configuration example for XF: part number XFC2DK4BHS01 specifies the following product;

- XFCS01 powerPac 1000W (includes options S & 1 as standard)
- Slot A: Xg2C 5V/40A powerMod
- Slot B: XgDC 48V/4.2A powerMod
- Slot C: XgKC 24V/9.2A powerMod
- Slot D: Xg4C 24V/10A powerMod
- Slot E: XgBC 24V/8.3A powerMod
- Slot F: XgHC 5V/36A powerMod

Configuration example for Xgen: part number XVD2345F0-D4 specifies the following product;

- XVD powerPac 1200W (Medical)
- Slot A: Xg2:5V/40A powerMod
- Slot B: Xg3:12V/20A powerMod
- Slot C: Xg4:24V/10A powerMod
- Slot D: Xg5:48V/6A powerMod
- Slot E: XgF:24V/3A, 24V/3A powerMod
- Slot F: empty
- Option D (input cable) & Option 4 (150uA Leakage current)

*UltiMod comes with Thermal and Fan Fail signals as standard

*With 150uA Leakage Current (Option 4) some external filtering may in certain cases be needed to meet system level EMC specifications. Consult Excelsys for support.



Section 3.5

Accessories

Input Cable (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm 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 Excelsys modular power supplies. For such applications, Excelsys can offer the XE1, the IEC to Screw terminal adaptor accessory plug. This is a press fit connector that plugs securely into the powerPac and provides the system integrator with screw terminals for mains connection (not available on XCE, XVE, XMD, XLD, XF).

IEC to Faston Adaptor

For application that require Faston connectors on the AC input, Excelsys recommends IEC to Faston/Terminal Lugs Schurter P/N 4788.8000.

Modular Power Supply Mounting Options

1. Base Plate Mounting

The unit can be mounted in the system via the mounting holes present on the UltiMod and Xgen base. See mechanical drawings for mounting hole positions. Use M3 mounting screws. Ensure that maximum screw penetration from base does not exceed 6mm.

2. Fleximount System A

Using the side mounting clips accessory shown, the clip can be positioned at the user defined position along the slide rail on the side of the UltiMod/Xgen. The clip is then mounted to the system base plate. Use M3 mounting screws to fix mounting clip to system base. Excelsys part number Z165.

3. Fleximount System B

Using the slide rail on side of the UltiMod/Xgen, self-clenching studs can be placed at a user defined position. Excelsys recommends:PEM<FH-M4-X or FH-832-X or equivalent.

LK1 for Current Share on powerMods XgA to XgD

To implement current share on powerMods XgA to XgD, The Excelsys LK1 connector must be inserted. Excelsys recommends the use of Harwin M7567-05 (Jumper Socket, Black 2.54mm 2 way connector). See picture below for details on where to inset LK1.

XS1 & XP1 Bus Bars

Parallel and Series Links

XP1 Parallel bus bar. When connecting powerMods in parallel for higher current outputs, the XP1 bus bar can be used. This can also be used to create common grounds between outputs. Please follow the procedure for parallel connection of powerMods in Section 4.6

XS1 Series bus bar. When connecting powerMods in series for higher voltage outputs, the XS1 bus bar can be used. This can also be used to create common grounds between outputs. Please follow the procedure for series connection of powerMods in Section 4.6

Full mechanical details of all drawings available on request.

















Section 4.0 MODULAR POWER SUPPLIES

This Modular Power Supply Designers' Manual has been prepared by Excelsys experts to assist qualified engineers and technicians in understanding the correct system design practices necessary to achieve maximum versatility and performance from any of the Ultimod and Xgen range of Modular Configurable power supplies.



Section 4.1 Overview of UltiMod and Xgen

The UltiMod and Xgen series allows users to instantly configure high efficiency, off-line power supplies. Although very small in size, the Excelsys range of modular power supplies provide up to 1340W of simultaneous output power.

A complete power supply is configured by selecting and inserting up to six DC output modules called *powerMods* into a *powerPac* to build a power supply. This offers the advantages of a custom supply, but is assembled from standard and modular building blocks continuing the Excelsys tradition of industry leading configurable power supplies.

Manufactured in world class power supply production facilities, the UltiMod and Xgen are completely user configurable. If output requirements change, i.e. more power or a different output voltage is needed, upgrading is easy: simply unlock a single screw and replace the slide-in *powerMod* assembly with the preferred alternative. Allowing additional flexibility, *powerMods* can be connected in parallel to increase output power, or in series for higher voltages (subject to staying within isolation ratings and giving due consideration to any SELV requirements).

A user-friendly interface on connector J3 of each *powerMod* provides control and output sequencing capability, in addition to useful status indicators.

The plug-together architecture facilitates 'instant' custom power solutions with industry leading $17W/in^3$ power density and up to 92% conversion efficiency.

Section 4.2 Installation Considerations

The UltiMod and Xgen series models may be mounted on any of three surfaces using standard M4 screws. The chassis comes with four mounting points on the base. Maximum allowable torque is 2Nm. The maximum penetration depth is 6mm. Additionally, the fleximountTM system on both side walls of the *powerPac* chassis facilitates flexible mounting.

When selecting a mounting location and orientation, the unit should be positioned so air flow is not restricted. Maintain a 50mm minimum clearance at both ends of the power supply and route all cables so airflow is not obstructed. The standard unit draws air in on the input side and exhausts air out the load side. If airflow ducting is used, avoid sharp turns that could create back pressure.

Avoid excessive bending of output power cables after they are connected to the *powerMods*. For high current outputs, use cable-ties to support heavy cables and minimise mechanical stress on output studs. Be careful not to short-out to neighboring output studs. *PowerMods* are supplied with spring washers on all output screws. These (or equivalents) should be used and thread locking compounds are not required. The maximum torque recommended on output connectors is 2Nm. Avoid applications in which the unit is exposed to excessive shock or vibration levels that exceed the specified levels. In such applications, a shock absorption mounting design is required.

Section 4.3 Mounting Considerations

- Always fill all output slots of the UltiMod or Xgen. If a slot is not filled with a *powerMod*, it should be filled with an Empty Slot Cover (part numbers XB1, XB2 or XB3). Empty Slot covers are plastic assemblies whose main function is to fill up an empty slot. Excessive airflow escape from an empty slot may degrade thermal performance and result in overheating and damage to the UltiMod unit. Refer to Section 4.11 for optimal positioning of *powerMods* to equalize airflow and prevent foreign objects from entering *powerPac*
- Do not unplug *powerMods* while input power is applied to the *power-Pac*. The UltiMod and Xgen are not designed for hot-plug applications.
- Do not restrict airflow to the unit. The cooling fan draws air into the unit and forces it out at the output terminals.
- Always ensure that output screws are properly torqued to maximum 2Nm before applying power to the *powerPac*.
- Secure modules in powerPac chassis to a torque value of maximum 2Nm
- Positive and negative power cables should be arranged as a twisted pair to minimise inductance.
- Wait 4 minutes after shutting off power before inserting or removing *powerMods*.
- UltiMod and Xgen assemblies do not have user serviceable components. They must be returned to the factory for repairs. Contact Customer Service for a RMA number before returning the unit. Do not attempt to repair or modify the power supply in any manner other than the exchange of *powerMods* as described in this Designers' Manual.
- Use proper size wires to avoid overheating and excessive voltage drop.

Section 4.4 Theory of Operation

The Xgen and UltiMod platforms are comprised of an appropriate *powerPac* and a selection of *powerMod* DC output modules selected to deliver the exact volts and amps requirements of the the system designer. See Operational Block Diagram.

The *powerPac* consists of a fan-cooled semi-enclosed chassis containing circuitry for an off-line single phase AC front end, EMI filter, cooling fan, customer interface and associated housekeeping circuits. Input AC mains voltage (L1/N, L2 and GND) is applied to an IEC320 type input connector and then through an EMI filter designed to meet EN 55022 Class B (for Industrial models).





Operational Block Diagram

For medical applications, the EMI filter also ensures the power supply meets the low earth leakage current requirements of EN60601-1 3rd Edition (Medical supplies only).

This stage is then followed by a high frequency switching input current shaping boost converter feeding the ZVS (Zero Voltage Switching) resonant switching stage. The ZVS stage supplies power to a variety of *powerMod* assemblies that provide the desired low voltage, regulated outputs. Conversion in the output assemblies is achieved by the most advanced high efficiency converters resulting in reduced size for magnetics and capacitors; excellent line and load regulation; wide adjustment range for output and low EMI/RFI emission.

At initial power-up, the outputs are disabled to eliminate inrush current and a low-power flyback converter operating with PWM current mode control converts the high voltage DC bus into regulated low voltage to power the internal housekeeping circuits and cooling fans. Once the bus potential is within operating parameters, the AC Fail signal is deactivated indicating that the input power is ok, and allows the installed *powerMod* outputs to come up. An auxiliary isolated bias supply of 5 VDC is provided for peripheral use on interface connector J2. In the case of medically approved supplies, this bias supply has medical isolation (4000VAC).

Section 4.5

Configuration (and Reconfiguration) See Online Configuration tool: http://www.excelsys.com/xgen_configurator/configure.html

powerMods may be easily added, replaced, or moved by sliding the assemblies in or out of the *powerPac* chassis.

Prior to removing or installing a *powerMod*, remove power from the *powerPac* and wait 4 minutes. Failure to do so can result in personal injury and/or damage to the supply. Take standard ESD precautions when handling *powerMods*.

Configuring the UltiMod and Xgen is as easy as 1,2,3!

- 1. Select the appropriate *powerMods* for your application.
- 2. Calculate your power requirements.
- 3. Select your appropriate *powerPac* for power and application from the wide range of *powerPacs*.

Removing powerMods

powerMods may be removed by removing the screw on the top surface. Once this screw has been removed the *powerMod* will

slide out of the chassis. Once a *powerMod* has been removed, the empty slot MUST be filled with either another *powerMod* or an empty slot cover. If the slot is left empty, it will provide an air-flow escape and may cause inadvertent thermal shutdown of the unit to equalize airflow and prevent foreign objects from entering the powerPac.

Installing powerMods

powerMods may be installed in empty slots by simply sliding in the new *powerMod*, pushing the *powerPac* 'home' until the mounting bracket lines up with the hole in the Top Panel, then securing the module with the M3 x 6 countersunk screw provided tighten to 2Nm max. Power and interface connections can be made after the *powerMod* has been installed.

powerMods may be paralleled for more power using bus bars (Paralleling Links) across the positive and negative output terminals. They can be series connected for applications requiring higher voltages.

Section 4.6 powerMod Operation

The UltiMod and Xgen series of products have been designed to allow maximum flexibility in meeting the unique requirements of system designers. The inherent flexibility resulting from modular concepts allows users to configure solutions with multiple outputs that can be individually controlled.

Voltage Adjustment

The UltiMod and Xgen series outputs boast very wide adjustment ranges on the powerMod: Voltage setting and dynamic voltage adjustment can achieved via the on board potentiometer and the J3 signals connector.

Type A: *powerMods* XgA to XgE XgG to XgT Xg1 to Xg7



Type B: *powerMod* XgF/Xg8





Voltage adjustment may be achieved by

- 1. Front Panel potentiometer adjustment allowing users to set the output voltage to their required level.
- 2. Remote voltage adjustment using external resistor or potentiometer for modules XgG-XgT and Xg1-Xg5.
- 3. Remote voltage adjustment using an external voltage source for modules XgG-XgT and Xg1-Xg5.



Remote Output Voltage Adjustment of powerMods

Excelsys have developed calculators that assist our customers in defining the external resistor values and external control voltages to allow users to set and control the output voltages. These are available to download from:

http://www.excelsys.com/technical-support/

Important: When using an external voltage source to set or adjust the output voltage, the control voltage must not exceed 2.5 VDC, and the slew rate of a dynamic control voltage must not exceed 2 V/ms..



Go to the support section of our website to download calculators and module specific K values: http://www.oxedsus.com/toohnical.cupport/

http://www.excelsys.com/technical-support/

Modules XgM-XgQ can be dynamically trimmed to 1V. Contact Excelsys for applications support.

Current Limit Adjustment

A number of over current protection methods can be implemented on the UltiMod and Xgen platforms. *powerMods* Xg1 to Xg5 and XgG to XgT can have the default Straight-Line current limit, a reduced user defined Straight-Line current or a user defined Foldback current limit. (See *powerMod* Summary Specifications table for the default Straight-Line current limit values)

The following simple external application circuits can be used to set user defined Foldback and Straight-Line current limit for reduced power or constant current applications.

Programming Current Limit

The current limit can be programmed to your requirements (in both Straight line and Foldback modes).



Straight line Current Limit

The onset of current limit can be programmed using an external voltage source resistor/potentiometer. Connection between the Itrim pin (J3 pin4) and the -Vout (J4) terminal will set the current limit to the desired level.



Current Limit Programming

Easy to use calculators have been developed to help users define the external resistor values and external control voltages to allow users to set and control the output current limit. These are available to download from http://www.excelsys.com/technical-support/

Important: when using an external voltage source for set/adjust the output current, the control voltage must not exceed 2.5VDC.

Foldback current Limit Programming

Foldback Current Limit can be achieved using the circuit below



Foldback Current Limit

Calculators have been developed to help users define the external resistor values and to allow users to set and control the foldback current limit. These are available to download from the support section of our website;

http://www.excelsys.com/technical-support/



Model	Vnom (V)	Set Point Adjust Range (V)	Current Limit Foldback	Dynamic Vtrim Range (V)	lmax (A)	Power (W)	OVP 1 Tracking % of Vset	Remote Sense (V)	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	38.4-50.4	-	-	4.2	200	-	-	-
XgE	24.0	5.0-28.0	No	-	5.0	120	No	-	Yes
XgF _{V1} XgFV2	24.0 24.0	5.0-28.0 5.0-28.0	No No	-	3.0 3.0	72 72	No No	-	Yes Yes
XgG	2.5	1.5-3.6	Yes	1.15-3.6	40.0	100	105-170%	0.5	Yes
XgH	5.0	3.2-6.0	Yes	1.5-6.0	36.0	180	105-170%	0.5	Yes
XgJ	12.0	6.0-15.0	Yes	4.0-15.0	18.3	220	105-170%	0.5	Yes
XgK	24.0	12.0-30.0	Yes	8.0-30.0	9.2	220	105-170%	0.5	Yes
XgL	48.0	28.0-58.0	Yes	8.0-58.0	5.0	240	105-170%	0.5	Yes
XgM	5.0	3.2-6.0	Yes	1.0-6.0	40.0	200	105-170%	0.5	Yes
XgN	12.0	6.0-15.0	Yes	1.0-15.0	20.0	240	105-170%	0.5	Yes
XgP	24.0	12.0-30.0	Yes	1.0-30.0	10.0	240	105-170%	0.5	Yes
XgQ	48.0	24.0-58.0	Yes	1.0-58.0	6.0	288	105-170%	0.5	Yes
XgR	24.0	12.0-30.0	Yes	8.0-30.0	10.0	240	105-170%	-	Yes
XgT	48.0	28.0-58.0	Yes	8.0-58.0	6.0	288	105-170%	-	Yes
Xg1	2.5	1.5-3.6	Yes	1.15-3.6	50.0	125	105-170%	0.5	Yes
Xg2	5.0	3.2-6.0	Yes	1.5-6.0	40.0	200	105-170%	0.5	Yes
Xg3	12.0	6.0-15.0	Yes	4.0-15.0	20.0	240	105-170%	0.5	Yes
Xg4	24.0	12.0-30.0	Yes	8.0-30.0	10.0	240	105-170%	0.5	Yes
Xg5	48.0	28.0-58.0	Yes	8.0-58.0	6.0	288	105-170%	0.5	Yes
Xg7	24.0	5.0-28.0	No	-	5.0	120	No	-	Yes
Xg8 _{V1}	24.0	5.0-28.0	No	-	3.0	72	No	-	Yes
Xg8 _{V2}	24.0	5.0-28.0	No	-	3.0	72	No	-	Yes

Over Voltage Protection (OVP)

PowerMod Summary Specifications

Over-voltage protection is implemented on each powerMod output. OVP level is fixed relative to Vmax (105-170%). OVP is latching and it may be reset by removing and reinstating AC power from the powerPac input.

Power Limit

Each *powerMod* has a number of levels of protection in order to ensure that UltiMod or Xgen is not damaged if used in overload conditions.Refer to Output *powerMod* Power Limit graph



Output powerMod Power Limit

When Vset is less than or equal to Vnom, current limit is employed at the current limit set point. However if Vset is greater than Vnom, the power limit is employed to ensure that the powerMods does not exceed its power rating.

e.g. XgK is adjustable between 12V and 30V. Imax is 9.2A. Power rating is 220W.

At 24V the powerMod can deliver 9.2A continuously, i.e 220W. At 30V, the powerMod can still deliver 220W, however this equates to 7.33A continuous current.

Remote Sense (powerMods XgG-XgQ and Xg1-Xg5 only)

To compensate for voltage drops in the output leads, use remote sensing. Remote sensing is available on XgG, XgQ and Xg1-Xg5 modules only.

Remote sensing may be implemented by connecting the Positive Sense pin (J3 pin1) to the positive side of the remote load and the Negative Sense pin (J3 pin2) to the negative side of the remote load. The maximum line drop, which can be compensated for by remote sensing, is 0.5V, subject to not exceeding the maximum module voltage at the output terminals.

Observe the following precautions when remote sensing:

- 1. Use separate twisted pairs for power and sense wiring.
- 2. Route the sensing leads to prevent pick up, which may appear as ripple on the output.
- 3. Never disconnect the output power rail with the sensing still connected to the load.



Remote Sense of Output Voltage



In certain applications where there is a high dynamic impedance along the power leads to the sensing point, remote sensing may cause system instability. This system problem can be overcome by using resistors in the sense leads (Positive sense lead: R1 = 100ohm, Negative sense lead: R2=10ohm), together with local AC sensing, by using 22uF capacitors between the remote sense pins and the output terminals. The resistance of the power cables must be so that the voltage drop across the cables is less than (Rcable) 0.5V (to ensure remote sensing operates correctly).

e.g. for an XgH, 5V/36A. The $\mathsf{R}_{\mathsf{cable}}$ must be less than 13.9mohms.

Measurement of Ripple & Noise

As with all switched mode power supplies, it is important to ensure that the correct method is used to measure ripple & noise. Care should be taken to ensure that a loop antenna is not formed by the tip and ground lead of the oscilloscope probe as this would lead to erroneous readings consisting mainly of pickup from remnant radiation in the vicinity of the output connectors. Excelsys recommends the use of an x1 probe with the ground sheath of the probe tip used for ground connection.

In some applications, further erroneous readings may result from CM currents. These can be reduced by looping a few turns of the scope lead through a suitable high permeability ferrite ring.

As most loads powered by a power supply will have at least small values of differential capacitors located near the load, Excelsys also recommends the use of small value of capacitance (approx 1uF) positioned at the point of measurement.

Minimising System Noise

There are a number of causes of poor system noise performance. Some of the more common causes are listed below.

- a. Insufficient de-coupling on the PCB or load.
- b. Faulty wiring connection or poor cable terminations.

c. Poor system earthing, system level grounding and shielding issues

There are some simple steps to eliminate, reduce or identify the causes of high frequency noise;

- a. Is the noise conducted or radiated? If changing the position of the power supply or screening improves performance, the noise is likely to be radiated. See Section 7.3 (EMC Characteristics).
- b. Twist all pairs of power and sense cables separately.
- c. Ground connections (zero Volt) should be made with the shortest possible wiring via a capacitor to the nearest point on the chassis. See Excelsys Application Note: AN1105 on website: http://www.excelsys.com/wp-content/uploads/2011/09/ ApplicationNoteAN1105-RippleandNoise1.pdf

Series Connection of powerMod outputs

It is possible to connect modules in series to increase output voltage. Outputs are rated SELV (Safety Extra Low Voltage), that is, that output voltages are guaranteed to be less than 60V, if putting modules in series please take appropriate precautions.



Series Links available. Part Number XS1 It is good practice to stack modules with similar output current limits, so that in case of short

circuit the outputs collapse together.

If remote sensing is required, the exterior sense connections should connect to the load at point of use, and the interior connections to the local sense. Special links for series connection modules (part number XS1) to reduce wiring complexity can be specified and fitted by the installer or added at the factory.

Parallel Connection for PowerMods

To achieve increased current capacity, simply parallel outputs using the standard parallel links. Excelsys 'wireless' sharing ensures that current hogging is not possible.



Parallel Links available to orde Part Number XP1

To parallel connect outputs: XgG-Xgt and Xg1-Xg5

- 1. Switch on IShare switch to ON.
- 2. Connect Negative Parallel Link.
- 3. Adjust output voltages of *powerMods* to within 5mV of each other using differential techniques. For XgR & XgT Apply a load of 100mA or higher during this step.
- 4. Connect Positive Parallel Link.



DIP Switch for Current Share & Inhibit/Enable for powerMods XgG to XgL and Xg1 to Xg5

To parallel connect outputs: XgA-XgD

- 1. Add jumper to current share header LK1 for *powerMods* XgA-XgD.
- 2. Connect Negative Parallel Link.
- 3. Adjust output voltages of *powerMods* to within 5mV of each other using differential techniques.
- 4. Connect Positive Parallel Link
- LK1 for Current Share on powerMods XgA to XgD



Recommended Jumper for LK1: HARWIN M7567-05 (Jumper Socket, Black, 2.54mm, 2-way)

powerMod Start-Up and Shutdown

powerMods are designed such that when input power is applied, all outputs rise to their set point voltage simultaneously. Likewise, when input power is removed all outputs commence to drop simultaneously and reach Zero potential simultaneously.

Outputs can be sequenced using the enable function in order to allow controlled start up if required. See plots for start-up and





Section 4.7 PowerMod Signals

PowerMod Enable/Inhibit

Each powerMod may be enabled/inhibited by means of an appropriate signal applied to an opto-isolated input. (see figure alongside & table below)

Xg1-Xg5 and XgG-XgT

Apply a signal to the opto-isolated input on J3 pin 5 (positive) and J3 pin 6 (negative). The signal voltage must be between 3V and 12V with a minimum signal current of 1.7mA

XgA-XgD

Inhibit is available by applying an appropriate signal to an optoisolated input on J3 pin 5(positive) and J3 pin 6 (negative). The signal voltage must be between 4V and 17V with a minimum signal current of 1.7mA

XgE and Xg7

Direct access to the output buck controller is given to the user via J3 pin 7 and J3 Pin 8. Reducing the voltage to less than 0.8V between J3 pin 7 and J3 pin 8 will inhibit the module.

XgF and Xg8

Direct access to the output buck controller is given to the user via J3 pin 3 and J3 Pin 4 for OP1 and J3 pin 7 and J3 pin 8 for OP2 Reducing the voltage to less than 0.8V between these pins will inhibit the corresponding module output.

When inhibited the output voltage of the powerMod will be fully inhibited to 0V. Turn-on delay from AC in and Global Enable is typically 2ms but is load dependant.

	XgA to XgD	XgG to XgT	XgE/Xg7, XgF/Xg8
Maximum signal input voltage	17V	12V	0.8V
Minimum signal input voltage	4V	3V	0V

Minimum current required is 1.7mA 1.7mA









XgG-XgT and Xg1-Xg5

PowerMods can be configured to be normally ON or normally OFF the by appropriate setting of the DIP switch on the *power-Mod*(default mode is normally ON as in figure below). The *powerMod* will deliver output voltage when mains is applied (and the powerPac is enabled). The *powerMod* requires an external current >1.7mA (between +IN/EN and -IN/EN) to disable the output pins. This may be reversed (normally OFF and requiring a signal to turn ON) by setting of the Inhibit dip switch to the OFF position



DIP Switch for Current Share & Inhibit/Enable for powerMods XgG to XgT

PowerMod Power Good Signal (XgE-XgT and Xg1-Xg8)

Each *powerMod* contains an internal comparator which monitors the output voltage and determines whether this voltage is within normal operation limits. When the output voltage is within normal limits, the Power Good signal is activated (see below for signal descriptions).

For XgG-XgQ and Xg1-Xg5

The open collector of an opto-isolator is available on J3 pin 7 and the emmiter on J3 pin 8. (opto-transistor ON= Power-Good).

For XgE and Xg7

The open collector of an opto-isolator is available on J3 pin 6 and the emmiter on J3 pin 5. (opto-transistor ON= Power-Good).



For XgF and Xg8

The open collector of an opto-isolater is available on J3 pin 6 and J3 pin 5 for OP1 and J3 Pin 2 and J3 Pin 1 for OP2 (opto-transistor ON= Power Good).

Maximum collector current is 2mA. Maximum Collector voltage is 30V. t7 < 30ms t8 < 30ms



Output powerMod Signals

(In this figure the Power Good open collector has been pulled up to a 5V signal with a 4k resistor).

Function	XgA-XgD	XgG-XgT/Xg1-Xg5	XgE/Xg7,	XgF/Xg8
	No pg			
+pg		Pin7	Pin 5	
-pg		Pin 8	Pin 6	
+pg V1				Pin 5
-pg V1				Pin 6
+pg V2				Pin 1
-pgV2				Pin 2

powerMod LED Indicator

The LED indicator on each *powerMod* module gives a visual indication of the information contained in the Power Good signal above.

Combining Power Good signals from multiple powerMods

The Power Good signals for each output can be combined to give a give a single Power Good Signal using the diagrams below.





Section 4.8 powerPac Operation

The *powerPac* provides the front end input power to the *power-Mods*. This is available in two package sizes and a number of power ratings. See Section 4.11, Power Ratings for more detail.

Bias Voltage

A SELV isolated bias (always on) voltage of 5V nominal @ 500mA (250mA on XF, XCE and XVE models) is provided on J2 pin 2 relative to J2 pin 1 (common) and may be used for miscellaneous control functions. For medical applications, this bias supply voltage has 4000VAC isolation.

Section 4.9 powerPac (Global) Signals

AC Fail

AC Mains Fail signal is implemented by an open collector of an opto-isolater with a maximum sink current of 4mA. During normal operation the transistor is ON. When the input voltage is lost or goes below 80Vac, the opto-transistor is turned OFF at least 5mS before loss of output regulation (at nominal *powerMod* voltage or below)

In this figure the AC Fail open collector has been pulled up to a 5V signal with a 4k resistor.





80 ms < t1 < 600 ms 80 ms < t2 < 100 ms t3 = 10 ms t4 > 10 ms t5 > 2 ms

Global Inhibit

A global inhibit function may be implemented via simple contact closure as shown. This function inhibits ALL *powerMod* outputs except the auxiliary bias voltage. Global inhibit also shuts down the *powerPac* fans. When current flows through the internal opto-isolator the *powePac* is turned off.



Global Inhibit Using Bias Supply Voltage

Global Enable

A global enable function may be implemented via simple contact closure as shown in the diagram.Ensure that J2 pin 8 and J2 pin 1 are connected prior to contact closure, this mode by-passes the opto-isolator. This function enables ALL *powerMod* outputs and the *powerPac* fans when the switch is closed.



Global Enable Using Bias Supply Voltage



Global Enable Using an External Signal



Global Inhibit Using an External Signal

Section 4.10 powerPac Options

Temperature Alarm

Open collector signal indicating that excessive temperature has been reached due to fan failure or operation beyond ratings. This signal is activated at least 10ms prior to system shutdown. (In this figure the Fan Fail and temperature alarms open collector have been pulled up to a 5V signal with a 4k resistor).



Over-temperature and Fan Fail

Fan Fail

Open collector signal indicating that at least one of the *powerPac* fans has failed. This does not cause power supply shutdown. The power supply will continue to operate until 10ms after the temperature alarm signal is generated. The signal is low during normal fan operation, going open on failure.

Reverse Fan (Option 02)

UltiMod and Xgen are available with reverse air flow direction. This is ideal to expel air from the system and works particularly well with the internal fan cooling built into the overall system. Contact factory for details (standard airflow is from input connections to output connections).

Ultra Low Leakage Current (Option 04)

The UltiMod and Xgen is available with the option of Ultra Low Earth Leakage Current of <150 μ A. This is ideal for Medical applications using two power supplies or containing additional parts that contribute to the system Earth Leakage Current, ensuring system Earth Leakage current does not exceed levels defined in EN60601-1 and UL60601-1 2nd and 3rd Editions. Consult Excelsys for possible filter recommendations which may be needed to meet system level EMC specifications.

Conformal Coating (Option C)

UltiMod and Xgen is available with conformal coating for harsh environments and MIL-COTs applications. It is IP50 rated against dust and protected against vertical falling drops of water and non condensing moisture, e.g. UX6ABDDL0C0 is a conformal coated 1000W configured UltiMod. Conformal coating material is Humiseal 1A33: (polyurethane based and military qualified)

excelsys

Designer Manual Ruggedised (Option R)

UltiMod and Xgen are available with extra ruggedisation as standard for applications that are subject to extremes in shock and vibration. These parts have been tested on 3 axes, for a total of 300hours at 1.67g's rms and have been tested versus MIL-STD 810G., e.g. UX6ABDDL0R00 is a ruggedised 1000W configured UltiMod.

Conformal Coated and Ruggedised Option (Option S)

UX6ABDDL0S00 is a ruggedised and conformal coated 1000W configured UltiMod.

Input Cable Option (Option D)

Excelsys modular power supplies are also available with an input cable connection option allowing greater flexibility when mounting the power supply in the system. Individually insulated input cables are 300mm in length and come supplied with Faston connectors.

Section 4.11 Power Ratings

When specifying an UltiMod or Xgen power supply in an application it is necessary to ensure that powerPacs and powerMods are operating within their power output capabilities, taking into account the Temperature Derating and Input Voltage Derating. The maximum permissible output power that may be drawn from any powerMod is given in the powerMod specification table in Section 4.6. Refer to derating Curves on Individual Datasheets for Line and Temperature derating for UltiMod and Xgen.

Refer to derating Curves on individual datasheets or on page 45 and 46 for Line and Temperature deratings for UltiMod and Xgen.

PowerMod Positioning

PowerMod performance can vary depending on slot position. Please use our online configurator to determine the optimal configuration for your system. This is particularly important when paralleling modules. Visit our configurator here

http://www.excelsys.com/xgen_configurator/configure.html

Section 4.12

Acoustic Noise

UltiMod and Xgen power supplies can be used in a wide variety of applications. Certain applications are more sensitive to acoustic noise than others. The table below sets out the measured acoustic noise of the various versions of UltiMod and Xgen. All acoustic noise measurements have been conducted in an anechoic chamber at a distance of 1m.

Acoustic Noise measurements of powerPacs

4-Slot powerPac	[dBA]	amb [dBA]
XL, XM	45.8	27.4
UX4, XK, XR	39.8	27.5
Ultra Quiet, XT, XN	37.3	27.3
XLD, XMD	52.8	27.3
6-Slot <i>powerPac</i>	[dBA]	amb [dBA]
XC, XV, XH	49.5	27.3
UX6, XQ, XZ,	42.7	27.5
Ultra Quiet, XB, XW	38.3	27.4









Ultra compact 500W and 1000W single output power supplies

- High Efficiency
- Convection Cooled
- Digital Communications

Single Output Power Supply 500W - 1000W





Ultra-high efficiency 1U size

FEATURES

• Single output: 24V, 36V or 48V

- IEC60950 2nd Edition, IEC60601-1 2nd & 3rd Edition & IEC60601-1-2 4th Edition EMC compliant
- Ultra high efficiency, >92%
- Low profile: 1U height (40mm)
- Convection Cooled 500W
- Fan Cooled 1000W (variable speed fan)
 12V/300mA bias standby voltage
- T2V/300mA bias star provided
- Remote ON/OFF Signal
- Power Good Signal
- MIL810G
- 2 MOPP
- SEMI F47 Compliant
- Suitable for Type B and BF rated applications
- Optional I²C PMBus™Communications
- Optional OR-ing Function
- 5 Year Warranty
- Adjustable output voltage
- 5000m altitude for EN60950 applications
- All models feature active power factor correction as standard
- Product Options: Conformal Coating, Low Leakage Current and Ruggedised

APPLICATIONS INCLUDE

- Industrial
- Test & Measurement
- Medical
- Hi-Rel COTS

The Xsolo family of single output power supplies provides up to an incredible 1008W in an extremely compact package.

Available in two package types, the high efficiency Xsolo delivers an incredible *convection cooled 504W* in an open-frame U-channel form factor and up to *1008W in an enclosed, fan cooled chassis.*

The Xsolo platform comes with a host of features including: variable speed fan, 12V/300mA isolated bias supply, remote ON/OFF, output voltage control and parallel operation for higher power applications. Nominal output voltages are 24, 36V and 48V with wide adjustment ranges and user defined set-points. Xsolo carries *dual safety certification*, *EN60950 2nd Edition* for Industrial Applications and *EN60601-1 2nd and 3rd Edition* for Medical

Applications, meeting the stringent creepage and clearance requirements, 4KVAC isolation and <300uA leakage current. Xsolo is designed to meet *MIL810G* and is also compliant with *SEMI F47* for voltage dips and interruptions as well as being compliant with all relevant EMC emission and immunity standards.

Optional features include I²C digital communications and OR-ing Function for N+1 redundancy. The product can also be conformal coated and ruggedised for use in harsh environments. With convection cooled power capability of over 500W, the Xsolo is ideal for use in a wide range of applications: industrial, Hi-Rel MIL-COTS applications, as well as acoustically sensitive laboratory and medical environments.



XS Models

	Model	Power (W)	Output Voltage	Output Current (A)	Medical Approval UL/EN60601-1 3rd edition	Industrial Approval UL/EN60950 2nd edition
	XS500-24	504	24	21.0	Yes	Yes
	XS1000-24	1008	24	42.0	Yes	Yes
S	XS500-36*	504	36	14.0	Yes	Yes
XS	XS1000-36*	1008	36	28.0	Yes	Yes
	XS500-48	504	48	10.5	Yes	Yes
	XS1000-48	1008	48	21.0	Yes	Yes

	Model	Vnom (V)	Power (W)	Description	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	lmax (A)	Remote Sense	Power Good
	XS500-24	24	504	Convection Cooled U-Channel	19-28	14-28	21.0	Yes	Yes
	XS1000-24	24	1008	Enclosed Fan Cooled	19-28	14-28	42.0	Yes	Yes
S	XS500-36*	36	504	Convection Cooled U-Channel	26-40	20-40	14.0	Yes	Yes
\times	XS1000-36*	36	1008	Enclosed Fan Cooled	26-40	20-40	28.0	Yes	Yes
	XS500-48	48	504	Convection Cooled U-Channel	36-58	29-58	10.5	Yes	Yes
	XS1000-48	48	1008	Enclosed Fan Cooled	36-58	29-58	21.0	Yes	Yes

*Contact Excelsys for availability of 36V models

Full part numbering information including product options and ordering information on page 65.



Xsolo

Single Output Power Supply 500W - 1000W

Developmenter	ConditionalDestintion			Mana	1 Justice
Parameter	Conditions/Decription	Min	Nom	Max	Units
Input Voltage Range	Universal Input 47-440Hz	85 120		264 380	VAC VDC
Power Rating	XS500	120	504	360	W
i ower raung	XS1000		1008		Ŵ
Input Current	X\$500		5		A
• • • • • • •	XS1000		10		А
Inrush Current	230VAC @ 25°C			25	А
Undervoltage Lockout	Shutdown	65		74	VAC
Fusing	XS500 250VAC		F8A HRC		
	XS1000 250VAC		F12A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
Output Voltage Range	XS500/1000-24: Multi-turn potentiometer	19		28	VDC
	XS500/1000-24: Dynamic Vtrim range	14		28	VDC
	XS500/1000-36: Multi-turn potentiometer	26		40	VDC
	XS500/1000-36: Dynamic Vtrim range	20		40	VDC
	XS500/1000-48: Multi-turn potentiometer	36		58	VDC
<u> </u>	XS500/1000-48: Dynamic Vtrim range	29		58	VDC
Output Current Range	XS500-24 XS1000-24			21	A
	XS1000-24 XS500-36			42 14	A A
	XS100-36 XS1000-36			28	A
	XS500-48			20 10.5	A
	XS1000-48			21	A
Load & Cross Regulation	For 25% to 75% load change			±0.2	%
	ORing Option			±0.4	%
Transient Response	For 25% to 75% load change Voltage Deviation			2.5	%
•	Settling Time			500	μs
Ripple and Noise	XS500/1000-24: 20MHz		240		mV pk-p
	XS500/1000-36: 20MHz		360		mV pk-p
	XS500/1000-48: 20MHz		480		mV pk-p
Overvoltage Protection	XS500/1000-24: Latching	33	34	37	VDC
	XS500/1000-36: Latching	44	47	52	VDC
	XS500/1000-48: Latching	61	63	69	VDC
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom.	105	115	130	%
Line Regulation	For ±10% change from nominal line		±0.5		%
Remote Sense				0.5	VDC
Overshoot	Monotonic		3	2 5	%
Rise Time	From AC in		3 500	5 800	ms
Turn-on Delay	From Remote On/Off		10	800	ms ms
Hold-up Time	For nominal output voltages at full load.	17	10		ms
•	i of hormital output voltagoo at fail load.				mo
OFNED AL					
GENERAL					
Parameter	Conditions/Description	Min	Nom	Мах	Units
	Input to Output	4000	Nom	Max	VAC
Parameter	Input to Output Input to Chassis	4000 1500	Nom	Мах	VAC VAC
Parameter Isolation Voltage	Input to Output Input to Chassis Output to Chassis	4000		Мах	VAC VAC VAC
Parameter Isolation Voltage Efficiency	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V	4000 1500	Nom >92	Max	VAC VAC
Parameter Isolation Voltage	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1	4000 1500		Max	VAC VAC VAC
Parameter Isolation Voltage Efficiency Safety Agency Approvals	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950	4000 1500			VAC VAC VAC %
Parameter Isolation Voltage Efficiency	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1	4000 1500		Max 300 150	VAC VAC VAC
Parameter Isolation Voltage Efficiency Safety Agency Approvals	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C	4000 1500		300	VAC VAC %
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4)	4000 1500		300	VAC VAC %
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500	4000 1500	>92	300	VAC VAC VAC % µA µA VDC Kg
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000	4000 1500	>92	300 150	VAC VAC WAC WAC WA VAC Kg Kg
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500	4000 1500	>92	300	VAC VAC VAC % µA µA VDC Kg
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000	4000 1500	>92	300 150	VAC VAC VAC M M M M VDC Kg Kg
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count.	4000 1500	>92 12.0 1.1 1.3	300 150	VAC VAC VAC WAC WA µA VDC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000	4000 1500	>92	300 150	VAC VAC VAC M M M M VDC Kg Kg
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count.	4000 1500	>92 12.0 1.1 1.3 Level	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC	4000 1500	>92 12.0 1.1 1.3 Level Class B	300 150	VAC VAC VAC WAC WA µA VDC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count.	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B	300 150	VAC VAC VAC WAC WA µA VDC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC	4000 1500	>92 12.0 1.1 1.3 Level Class B	300 150	VAC VAC VAC WAC WA µA VDC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Class B	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Class B	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-3-3	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-4	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Class B Compliant Compliant Compliant Level 2 Level 3 Level 3	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-2 EN61000-4-5 EN61000-4-5 EN61000-4-6	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Compliant Level 3 Level 3 Level 3 Level 3	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN61000-3-2 Class A EN61000-4-2 EN61000-4-2 EN61000-4-3 EN61000-4-5	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Class B Compliant Compliant Level 2 Level 3 Level 3 Level 3	300 150	VAC VAC VAC WAC VAC VAC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMIC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-2 EN61000-4-5 EN61000-4-5 EN61000-4-6	4000 1500	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Compliant Level 3 Level 3 Level 3 Level 3	300 150	VAC VAC VAC M M M M VDC Kg Kg Hours
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant.®		>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000	VAC VAC VAC % % VDC Kg Kg Hours Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-2 EN61000-4-5 EN61000-4-5 EN61000-4-6	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Compliant Level 3 Level 3 Level 3 Level 3	300 150 550,000	VAC VAC VAC % Units Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant.®	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000 550,000	VAC VAC VAC % Units Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-2 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant.®	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000	VAC VAC VAC % µA µA VDC Kg Kg Hours Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant. ⁽¹⁾ Conditions/Description See Page 62 for full temperature deratings	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000 550,000	VAC VAC VAC VAC % VDC Kg Kg Hours Units Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating Relative Humidity	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN60601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-5 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant.® Conditions/Description See Page 62 for full temperature deratings Non-condensing	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000 550,000	VAC VAC VAC VAC % UDC Kg Kg Hours Units Units
Parameter Isolation Voltage Efficiency Safety Agency Approvals Leakage Current Signals Bias Supply Weight MTBF EMC Parameter Emissions Conducted Radiated Harmonic Distortion Flicker & Fluctuation Immunity Electrostatic Discharge Radiated Immunity Fast Transients-Burst Input Line Surges Conducted Immunity Voltage Dips ENVIRONMENTAL Parameter Operating Temperature Storage Temperature Derating	Input to Output Input to Chassis Output to Chassis 230VAC, 1008W @ 24V/36V/48V EN609601-1 2nd and 3rd Edition, cTUVus 60601-1 EN60950 2nd Edition, cTUVus 60950 264VAC, 60Hz, 25°C 264VAC, 60Hz, 25°C (Option 4) See Page 3 Always on, current 300mA, 50mA XS500 XS500 XS1000 Telecordia SR-332, 40°C ground benign, parts count. Standard EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN55011, EN55022, FCC EN61000-3-3 EN61000-4-2 EN61000-4-3 EN61000-4-5 EN61000-4-5 EN61000-4-6 EN61000-4-11, SEMI F47 Compliant. ⁽¹⁾ Conditions/Description See Page 62 for full temperature deratings	4000 1500 1500 	>92 12.0 1.1 1.3 Level Class B Class B Compliant Compliant Level 2 Level 3 Level 3	300 150 550,000 550,000	VAC VAC VAC VAC % VDC Kg Kg Hours Units Units



Section 5.2

Xsolo Derating Curves

The line voltage and temperatures derating curves for the XS500 and XS1000 are shown below.

The XS500 is a 500W convection cooled part. The graphs below show the output power ratings with no system air flow and with 10CFM of system air flow applied to the product.

Contact support@excelsys.com for further information on the XS500 and XS1000 performance with system air flow applied to the product.











Section 5.3 Xsolo Connectors

Input Connector J7

Connector, Barrier Terminal Block, Vertical, 3 position, Pitch:0.375in Molex - 38720-7503

O/P Connector J10 and J12

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Connector, Barrier STRIP DL 3CIRC .325 Tyco - 2-1437667-5 *Note maximum current per screw terminal is 20Amps

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Output Signal Connector J5

Connector, Header 14POS 2MM Pitch T/H Molex - 87831-1420

J5 Mating Connectors

Locking Molex 51110-1451; Non Locking 51110-1450; Crimp Terminal: Molex p/n 50394

I²C Interface (Option)

The I²C PM Bus compatible interface can be used for monitoring the output voltage and current. It can also be used to manage real time data for the PSU.

For full details on PM Bus please contact sales@excelsys.com.

PMBus Connector:

PL1: Molex - 87833-0831

PL1 Mating Connector:

Locking Molex 51110-0860; Non Locking 51110-0850; Crimp Terminal: Molex p/n 50394

AC Fail Signal



80ms < t1 < 700ms 10ms < t2 < 100ms t3 = 10ms t4 > 15ms t5 > 2ms

AC Fail

AC Mains Fail signal is implemented by an an open collector of an opto-isolater with a maximum sink current of 4mA. During normal operation the transistor is ON. When the input voltage is lost or goes below 80VAC, the opto-transistor is turned OFF at least 10mS before loss of output regulation (at nominal voltage or below).

Temperature Alarm

Open collector signal indicating that excessive temperature has been reached due to fan failure or operation beyond ratings. This signal is activated at least 10mS prior to system shutdown.



Fan Fail

Open collector signal indicating that at least one of the fans has failed. This does not cause power supply shutdown. The power supply will continue to operate until 10ms after the temperature alarm signal is generated.

*Fan Fail, Temperature Fail and AC Fail signal figures above assume use of a pull up resistor to a signal voltage

Paralleling Xsolo's

To achieve increased currents Xsolo products can be paralleled. To connect in parallel the outputs must be trimmed to within 5mV of each other and then the current share header J20 must be added to each Xsolo product.

Recommended Jumper for J20: HARWIN M7567-05 (Jumper Socket, Black, 2.54mm, 2-way)



J20 (Attach jumper here)

Output Signal Connector J5



Pin	Input	Output	Signal	PMBus Connector
1	L	+Vo	EN-	Not Used
2	Ν	+Vo	EN+	SDA
3	PE	+Vo	PG+	SCL
4		-Vo	PG-	Not Used
5		-Vo	12V	Not Used
6		-Vo	ACFail	Not Used
7			OTP	Not Used
8			Common	GND
9			Vtrim	
10			-Sns	
11			+Sns	
12			FanFail	
13			Itrim	
14			Common	



Section 5.4 **Xsolo Mechanical Drawings**

All 3D/CAD Models available for download : http://www.excelsys.com/technical-support/3d-files-and-cad-drawings/

XS500 Mechanical Specifications (All dimensions in mm)

XS1000 Mechanical Specifications (All dimensions in mm)











Mounting Holes

4 M3 threaded PEMS on Base. Max Screw Penetration is 6mm from Base 2 M3 threaded PEMs on each Side. Max Screw Penetration is 2mm from Side. **Mounting Holes**

4 M3 threaded PEMS on Base. Max Screw Penetration is 6mm from Base 2 M3 threaded PEMs on each Side. Max Screw Penetration is 2mm from Side.

NOTES

- Note 1. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.
- Note 2. Consult Excelsys for HALT report (enhanced ruggedisation available as an option).
- System design with low leakage capacitors requires particular attention to EMI. Please consult Excelsys for application details. Note 3.
- Note 4 Contact sales@excelsys.com for details including MOQs on alternative preset output voltages
- The specifications contained herein are believed to be correct at time of publication and are subject to change without notice. Note 5.
- All specifications at nominal input, full load, 25°C unless otherwise stated. Note 6. Compliance with MIL-STD-461 (CE101 & CE102) achieved with the addition of an external line filter from LCR p/n F19374. Note 7
- Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details Note 8.
- Above 2000m altitude, ambient operating temperature decreases by 1 °C per 305m (1000 ft) altitude increase Note 9.



Section 5.5 Configuring your Xsolo



Example 1: XS1000-24N-000 = Xsolo 1000W, 24V output with no options Example 2: XS1000-24N-003 = Xsolo 1000W, 24V output with I²C/PMBus and OR-Ing function.





Ultra-high efficiency 1U size

Section 6.1 Overview of Xsolo

The Xsolo family of single output power supplies provides up to an incredible 1008W in an extremely compact package. Available in two package types, the high efficiency Xsolo delivers an incredible convection cooled 504W in an open-frame U-channel form factor and up to 1008W in an enclosed, fan cooled chassis.

The Xsolo platform comes with a host of features including: variable speed fan, 12V/300mA isolated bias supply, remote ON/OFF, output voltage control and parallel operation for higher power applications. Nominal output voltages are 24V, 36V and 48V with wide adjustment ranges and user defined set-points. Xsolo carries dual safety certification, EN60950 2nd Edition for Industrial Applications and EN60601-1 2nd and 3rd Edition for Medical Applications, meeting the stringent creepage and clearance requirements, 4KVAC isolation and <300uA leakage current. Xsolo is designed to meet MIL810G and is also compliant with SEMI F47 for voltage dips and interruptions as well as being compliant with all relevant EMC emission and immunity standards.

Optional features include I2C digital communications and OR-ing Function for N+1 redundancy. The product can also be conformal coated and ruggedised for use in harsh environments. With convection cooled power capability of over 500W, the Xsolo is ideal for use in a wide range of applications: industrial, Hi-Rel MIL-COTS applications, as well as acoustically sensitive laboratory and medical environments.

Section 6.2 Xsolo Features

- EN60950 2nd Edition & EN60601-1 2nd and 3rd Edition
- MIL810G
- 2 MOPP
- SEMI F47 Compliant
- Ultra high efficiency, >92%
- Low profile: 1U height (40mm)
- Convection Cooled 500W/Fan Cooled 1000W (variable speed fan)
- 12V/300mA bias standby voltage provided
- Remote ON/OFF Signal, Power Good Signal
- 5 Year Warranty
- · Suitable for Type B and BF rated applications
- Adjustable output voltage
- 5000m altitude for EN60950 applications
- Product Options: Conformal Coating, Low Leakage Current, Ruggedised, PMBus, & OR-ing function

APPLICATIONS INCLUDE

- Industrial
- Test & Measurement
- Medical
- Hi-Rel/MIL-COTS
- Communication







Section 6.3

Installation Considerations

The Xsolo models may be mounted on any of three surfaces using standard M3 screws. The chassis comes with four mounting points on the base. Maximum allowable torque is 2Nm. The maximum penetration depth is 6mm. Maintain a 50mm minimum clearance at both ends of the Xsolo power supply and route all cables so airflow is not obstructed. The XS1000 unit draws air in on the input side and exhausts air out the load side. If airflow ducting is used, avoid sharp turns that could create back pressure. XS500 units are convection cooled. See Excelsys Application Note: AN1504 on website.

Avoid excessive bending of output power cables after they are connected to the Xsolo *powerMods*. For high current outputs, use cable-ties to support heavy cables and minimise mechanical stress on output studs. Be careful not to short-out to neighbouring output studs.

The maximum torque recommended on output connectors is 3Nm. Avoid applications in which the unit is exposed to excessive shock or vibration that exceed the specified levels. In such applications, a shock absorption mounting design is required.

Section 6.4 Xsolo Control and Signals (Analog)

Voltage Adjustment

The Xsolo has been designed with maximum user flexibility as a key objective. The output voltage can be adjusted over a wide range by a number of methods.

Voltage adjustment and setting may be achieved by:

1. Voltage Setting via the on board potentiometer.

 Remote voltage programming by applying a control voltage (Vcontrol) between J5 Pin 9 (Vtrim) and J5 Pin 10 (-Sense)
 Remote voltage programming by applying a resistor between J5 Pin 9 (Vtrim) and J5 Pin 10 (-Sense).

An Excel spreadsheet has been developed to help users calculate output voltage and control values. These are available to download from the support section of our website; http://www.excelsys.com/technical-support/

XS500-24 and XS1000-24

By applying a control voltage (Vcontrol) between J5 Pin 9 (Vtrim) and J5 Pin 10 (-Sense) the output voltage of XS1000-24 and XS500-24 may be adjusted over a wide range. Vcontrol can be read from the graph below or calculated with the formula:

Voutput = 12.59 x Vcontrol

Important: Vcontrol must not exceed 2.5V

Example. Setting the output voltage to 20VDC via the Vtrim Pin Voutput/12.59 = Vcontrol 20V/12.59 = 1.59V. Vcontrol = 1.59V

See Graph for full range.



XS500-48 and XS1000-48

Using an external Voltage source (Vcontrol), the output voltage of the XS1000-48 and XS500-48 may be adjusted over a wide range.

By applying a control voltage (Vcontrol) between J5 Pin 9 (Vtrim) and J5 Pin 10 (-Sense) the output voltage of XS1000-48 and XS500-48 may be adjusted over a wide range. Vcontrol can be read from the graph below or calculated with the formula

Voutput = 24.75 x Vcontrol

Important: Vcontrol must not exceed 2.5V

Example.

Setting the output voltage to 40VDC via the Vtrim Pin Voutput/24.75 = Vcontrol 40V/24.75 = 1.62V. Vcontrol = 1.62V

See Graph below for full range.



Remote voltage programming by an external resistor/potentiometer can also be implemented on the Xsolo. Simply apply the appropriate resistor value between J5 Pin 9 (Vtrim) and J5 Pin 10 (-Sense).An Excel spreadsheet has been developed to help users calculate output voltage and resistor values. These are

available to download from the support section of our website; http://www.excelsys.com/technical-support/

Current Limit Adjustment (Voltage)

The Xsolo has been designed to allow users to adjust the onset of Current Limit for reduced power or constant current applications. By applying a voltage (Vcontrol) between the Itrim pin, (J5 Pin 13), and -Vout, current limit of the Xsolo can be adjusted from 0 A to the max rated current of the supply.

An Excel spreadsheet has been developed to help users calculate output current and control voltage values. These are available to download from the support section of our website; http://www.excelsys.com/technical-support/



Current Limit Adjustment on XS500-24

By applying a control voltage (Vcontrol) between Itrim (J5, Pin 13) and -Vout, current limit can be adjusted from 0-21A. Vcontrol can be read from the graph below or calculated with the formula

loutput = 15.27 x Vcontrol

Important: Vcontrol should not exceed 1.5V for XS500-24

Example. Setting the output current limit of the XS500-24 to 15A via the Itrim Pin Ioutput/15.267=Vcontrol 15A/15.267 = 0.98V. Vcontrol = 0.98VDC

Current Limit Adjustment on XS1000-24

By applying a control voltage (Vcontrol) between Itrim (J5, Pin 13) and -Vout, current limit can be adjusted from 0-42A. Vcontrol can be read from the graph below or calculated with the formula loutput = 15.267 x Vcontrol

Important: Vcontrol should not exceed 3.0V for XS1000-24

Example. Setting the output current limit of the XS1000-24 to 30A via the Itrim Pin Ioutput/15.267=Vcontrol 30A/15.267 = 1.96VDC.

Vcontrol = 1.96VDC

See Graph for full range.



Current Limit Adjustment on XS500-48

By applying a control voltage (Vcontrol) between Itrim (J5, Pin 13) and -Vout, current limit can be adjusted from 0-10.5A. Vcontrol can be read from the graph below or calculated with the formula

loutput = 8.06 x Vcontrol

Important: Vcontrol should not exceed 1.5V for XS500-48

Example.

Setting the output current limit of the XS500-48 to 7.5A via the Itrim Pin Ioutput/8.06 = Vcontrol

Toutput/8.06 = Vcontrol 7.5A/8.06 = 0.93V. Vcontrol = 0.93VDC

Current Limit Adjustment on XS1000-48

By applying a control voltage (Vcontrol) between Itrim (J5, Pin 13) and -Vout, current limit can be adjusted from 0-21A. Vcontrol can be read from the graph below or calculated with the formula

loutput = 8.06 x Vcontrol

Important: Vcontrol should not exceed 3.0V for XS1000-48

Example.

Setting the output current limit of the XS1000-48 to 15A via the Itrim Pin

Ioutput/8.06 = Vcontrol 15A/8.06 = 1.86VDC. Vcontrol = 1.86VDC See Graph for full range.



Current Limit Adjustment via Resistor/Potentiometer

The Xsolo has been designed to allow users to adjust the onset of Current Limit by applying a resistor between the Itrim pin, (J5 Pin 13), and -Vout. An Excel spreadsheet has been developed to help users calculate the appropriate resistor values to set output current. These are available to download from the support section of our website;

http://www.excelsys.com/technical-support/

Current Limit Programming (Foldback)

The Current Limit characteristics of the Xsolo can be programmed to be either Straight Line or Foldback. The previous sections refer to setting the Straight Line Current Limit of the Xsolo. To implement Foldback Current Limit, an Excel spreadsheet has been developed to help users calculate the appropriate resistor values to define the onset and final current limit points of the foldback current curve These are available to download from the support section of our website;

http://www.excelsys.com/technical-support/

Remote ON/OFF

The Xsolo may be inhibited by means of an appropriate signal applied to an opto-isolated input (diode of an opto-isolater) on pins J5 connector Pin 2 (positive) and Pin 1 (negative). The delay from Inhibit to output turning OFF is typically <1ms.

Maximum current source allowed is 6.5mA. Maximum applied voltage allowed is 13V.

Fan Fail

Fan Fail is an Open collector signal indicating that at least one of the Xsolo fans has failed. This does not cause power supply shutdown. The power supply will continue to operate for 10ms after the temperature alarm signal is generated.



The Fan Fail signal is accessed via J5 connector Pin 12. There is an on-board series current limit resistor of 2k connecting Pin 12 to the collector of an NPN transistor opto-coupler output. The emitter is connected to J5 Pin 8 – or Pin 14 (Common). When a fan-fail condition is detected this transistor turns off.

Maximum current source allowed is 6.5mA. Maximum applied voltage allowed is 13V.

AC Mains Fail



AC Mains fail signal is accessed through J5 connector Pin 6. There is an on-board series current limit resistor of 2kohm connecting Pin 6 to the collector of an NPN transistor optocoupler output. The emitter is connected to J5 Pin 8 or Pin 14 (Common).During normal operation the transistor is ON. When input voltage is lost or goes below 80VAC the opto-transistor is turned OFF at least 2 ms before loss of output regulation. (The output voltage waveform above assumes a pull-up resistor to a maximum voltage of +13V)

Maximum current source allowed is 6.5mA. Maximum applied voltage allowed is 13V.

Over-Temperature Protection (OTP)

This is an opto-isolated open collector transistor signal indicating that excessive temperature has been reached due to fan failure or operation beyond ratings. This signal is activated at least 10ms prior to system shutdown. The OTP signal is accessed via J5 connector Pin 7. There is an on-board series connect limit resistor of 2Kohm connecting Pin 7 to the collector of an NPN transistor opto-coupler output. The emmitter is connected to J5 Pin 8 or Pin 14 (Common).



The Fan Fail and Temp Alarm signal waveforms in the diagram assume connection via a pull-up resistor to the 12 V bias source or an external voltage.

Remote Sense

Remote sensing can be used to compensate for voltage drops in the output loads.

Remote sensing may be implemented by connecting the Positive Sense pin (J5 pin 11) to the positive side of the remote load and the Negative Sense pin (J5 pin 10) to the negative side of the remote load. The maximum line drop, which can be compensated for by remote sensing, is 0.5V, subject to not exceeding the maximum module voltage at the output terminals.

Power Good Signal

The Xsolo contains an internal comparator which monitors the output voltage and determines whether this voltage is within normal operation limits. When the output voltage is within normal limits, the PowerGood signal is activated. The signal is implemented by an open collector of an opto-isolater which is available on J5 Pin 3 (collector) and J5 Pin 4 (emitter) (transistor ON = Power Good).



Section 6.5 Parallel Connection and N+1 Redundant operation

How to Connect in Parallel

To achieve increased current capacity, 2 or more Xsolo power supplies may be connected in parallel. To connect in parallel the current share header J20 must be added to each Xsolo product, all -Vo pins must be connected together and then the outputs must be trimmed to within 5mV of each other using the on-board potentiometer. Only then can the positive parallel connectors be attached, and the parallel supplies connected to the load.



For optimal current sharing with OR-ing option a 10% min load is recommended. If paralleling 3 or more Xsolos consult Excelsys for applications support.

Recommended Jumper for J20: HARWIN M7567-05 (Jumper Socket, Black, 2.54mm, 2-way)



How to implement N+1 Redundancy

Xsolo can be utilised in systems that require N+1 redundant operation. The OR-ing option must be selected. Then simply connect the required number of Xsolo power supplies in parallel using the procedure for Parallel Connection of Xsolo.



Section 6.6 Options

Environmental Conformal Coating (Option C)

Xsolo is available with conformal coating for harsh environments and MIL-COTs applications. It is IP50 rated against dust and protected against vertical falling drops of water and non condensing moisture. Conformal coating material is polyurethane based and military qualified.

Ruggedised Option (Option R)

Xsolo is available with extra ruggedisation for applications that are subject to extremes in shock and vibration. These parts have been tested on 3 axes, for a total of 300hours at 1.67g's rms.

Conformally Coated and Ruggedised (Option S)

Features Options

00 = no options 01 = I2C/PMBus 02 = OR-ing Function 03 = 2C/PMBus + OR-ing Function 04 = Low Leakage 05 = I2C/PMBus + Low Leakage 06 = OR-ing Function + Low Leakage 07 = I2C/PMBus + OR-ing Function + Low Leakage

Section 6.7 Xsolo Efficiency

The Xsolo series offer unrivalled efficiency with a maximum efficiency of over 92%. It is often the case that power supplies are operating at lower levels than their maximum ratings. Most power supplies have optimised efficiency at a higher load ratings (close to full rating) but perform significantly worse at light or lower loads.

The Xsolo design and component selection ensures that conversion losses are kept to a minimum over a wide range of output loads. For example, in the graph below, The XS1000 is still over 90% efficient at 30% of rated output (300W).



The XS500 is over 90% efficient at loads of 250W or higher.

The XS500 provides up to 504W with no fan cooling and is therefore a silent power supply. The XS1000 has a temperature controlled fan that only operates if and when the output load and internal component temperatures require.

Please refer to the Acoustic Noise vs Output Power XS1000 graph below. At loads below 500W the fan is not required and the XS1000 is silent.

The XS500 can also be cooled using system air flow. Please refer to XS500 derating curves get detailed line and temperature derating of the XS500.



Section 6.8 Xsolo Acoustic Noise

The XS500 provides up to 504W with no fan cooling and is therefore a silent power supply. The XS1000 has an integral temperature controlled fan that only operates if and when the output load and internal component temperatures require. Please refer to the Acoustic Noise vs Output Power XS1000 graph below.

At loads below 500W the fan is not required and the XS1000 is silent.





Section 7 Reliability, Safety, EMI and Technical Resources

Section 7.1 Reliabilty



The 'bath-tub' curve shows how the failure rate of a power supply develops over time. It is made up of three separate stages. Immediately after production, some units fail due to defective components or production errors. To ensure that these early failures do not happen while in the possession of the user, Excelsys carries out a burn-in on each unit, designed to ensure that all these early failures are detected at Excelsys. After this period, the power supplies fail very rarely, and the failure rate during this period is fairly constant. The reciprocal of this failure rate is the MTBF (Mean Time Between Failures).

At some time, as the unit approaches its end of life, the first signs of wear appear and failures become more frequent. Generally 'lifetime' is defined as that time where the failure rate increases to five times the statistical rate from the flat portion of the curve.

In summary, the MTBF is a measurement of how many devices fail in a period of time (i.e. a measure of reliability), before signs of wear set in. On the other hand, the lifetime is the time after which the units fail due to wear appearing.

The MTBF may be calculated mathematically as follows:

MTBF = Total x t / Failure , where

Total is the total number of power supplies operated simultaneously.

Failure is the number of failures.

t is the observation period.

MTBF may be established in two ways, by actual statistics on the hours of operation of a large population of units, or by calculation from a known standard such as Telecordia SR-332 and MIL-HDBK-217 and its revisions.

Determining MTBF by Calculation

MTBF, when calculated in accordance with Telecordia, MIL-HDBK-217 and other reliability tables involves the summation of the failure rates of each individual component at its operating temperature. The failure rate of each component is determined by multiplying a base failure rate for that component by its operating stress level.

The result is FPMH, the failure rate per million operating hours for that component.

Then FPMH for an assembly is simply the sum of the individual component FPMH.

Total FPMH = FPMH1 + FPMH2 + +FPMHn

 $\begin{array}{l} \text{MTBF (hours)} = \frac{1,000,000}{\text{FPMH}} \\ \text{In this manner, MTBF can be calculated at any temperature.} \end{array}$

powerMod 0.958 failures per million hours 4slot *powerPac* 0.92 failures per million hours 6slot *powerPac* 0.946 failures per million hours

The figures for the *powerPac* excludes fans.

Example: What is the MTBF of UX4DD00 UX4 FPMH = 0.92 XgD FPMH = 0.286 Total FPMH = 1.49 MTBF = 670,000 hours at 40°C

Xsolo MTBF

Xsolo has an MTBF of 550,000 hours at 40°C and full load based on the Telecordia SR-332 (fans excluded).

MTBF and Temperature

Reliability and MTBF are highly dependent on operating temperature. The figures above are given at 40°C. For each 10°C decrease, the MTBF increases by a factor of approximately 2. Conversely, however, for each 10°C increase, the MTBF reduces by a similar factor. Therefore, when comparing manufacturer's quoted MTBF figures, look at the temperature information provided. Contact Excelsys for detailed analysis of MTBF for your specific application conditions.

Section 7.2 Safety Approvals

UltiMod and Xsolo carry *dual safety certification, UL/EN60950* 2nd Edition for Industrial Applications and *UL/EN60601-1 2nd* and 3rd Edition for Medical Applications, meeting the stringent creepage and clearance requirements, 4KVAC isolation and <300uA leakage current. The Xgen series also carries full safety approvals. Refer to individual Xgen Datasheets for the relevant safety approvals carried by each model.

UltiMod, Xsolo and Xgen are designed to meet *MIL810G* and are also compliant with *SEMI F47* for voltage dips and interruptions as well as being compliant with all relevant EMC emission and immunity standards (See individual datasheets for details).

Safety Approvals

Low Voltage Directive (LVD) 2006/95/EC

The LVD applies to equipment with an AC input voltage of between 50V and 1000V or a DC input voltage between 75V and 1500V. The XSolo series is CE marked to show compliance with the LVD.The relevant European standard for UltiMod, Xsolo and Xgen models is EN60950 (Information technology). The 2nd Edition of this standard in now published and all relevant Excelsys power supplies are certified to the latest edition as well as the 1st Edition.

The relevant European standard for UltiMod, Xsolo and Xgen models is EN60601-1 (Medical Devices Directive). The 3rd Edition of this standard is published and all Excelsys medically approved power supplies are certified to this latest edition as well as the 2nd Edition. With appropriate packaging, the UltiMod, Xsolo and Xgen models can also meet the requirements of EN61010-1 for industrial scientific measuring equipment and process control.

UltiMod, Xsolo and Xgen models are certified to comply with the requirements of IEC950, EN60950, UL60950 (1st and 2nd Editions), and CSA 22.2 no. 234 and IEC1010, when correctly installed in a limited access environment.

The UltiMod, Xsolo and Xgen series are certified to comply with the requirements of IEC601-1, EN60601-1, UL60601-1 (2nd and 3rd Editions) and CSA601-1, for non-patient connect applications.



PowerMods are capable of providing hazardous energy levels (>240 VA). Equipment manufacturers must provide adequate protection to service personnel.

Environmental Parameters

The UltiMod, Xsolo and Xgen series are designed for the following parameters

Material Group IIIb, Pollution Degree 2 Installation Category 2 Class I Indoor use (installed, accessible to Service Engineers only). Altitude: -155 metres to +3000 metres from sea level. Humidity: 5 to 95% non-condensing. Operating temperature -20°C to 70°C

Derate to 70°C. See *powerPac* Derating for details.

Approval Limitations

Use in North America

When these products are used on 180 to 253 Volts AC mains with no neutral, connect the two live wires to L (live) and N (neutral) terminals on the input connector.

Standard

Creepage Distances XL, XC, XK, XQ, XT, XB, XH models Primary mains circuits to earth: 2.5mm spacing Primary mains circuits to secondary: 5mm spacing

Dielectric strength XL, XC, XK, XQ, XT, XB, XH models Primary mains circuits to chassis: 1500VAC Primary mains circuits to secondary: 3000VAC

Medical

Creepage Distances UltiMod, Xsolo, XM, XV, XR, XZ, XN, XW models

> Primary mains circuits to earth: 4mm spacing Primary mains circuits to secondary: 8mm spacing

Dielectric strength UltiMod, Xsolo, XM, XV, XR, XZ, XN, XW models

> Primary mains circuits to chassis: 1500VAC Primary mains circuits to secondary: 4000VAC

The primary to secondary test is not possible with modules fitted to the unit, as damage to the EMI capacitors will occur.

Output Isolation

Output to Chassis isolation is 1500VAC. Xsolo :

Output to Output Isolation is 500VDC UltiMod, Xgen: Output to Chassis Isolation is 500VDC

Section 7.3 **EMC Characteristics**

EMC Directive 2004/108/EC

Component Power Supplies such as the UltiMod, Xsolo and Xgen series are not covered by the EMC directive. It is not possible for any power supply manufacturer to guarantee conformity of the final product to the EMC directive, since performance is critically dependent on the final system configuration. System compliance with the EMC directive is facilitated by Excelsys products compliance with several of the requirements as outlined in the following paragraphs. Although the UltiMod, Xsolo and Xgen series meet these requirements, the CE mark does not cover this area.

EMISSIONS

Power Factor (Harmonic) Correction

The UltiMod, Xsolo and Xgen series incorporates active power factor correction and therefore meets the requirements of EN61000-3-2. Power factor: 0.98.

EN61000-3-3 **Flicker & Voltage Fluctuation Limits**

UltiMod, Xsolo and Xgen power supplies meet the requirements of the limits on voltage fluctuations and flicker in low voltage supply systems.

EN55022 **Class B Conducted Emissions**

For system compliance to EN55022, Level B, additional filtering may be required, for technical support, contact our Applications Engineering team.

IMMUNITY

The UltiMod, Xsolo and Xgen series has been designed to meet, and tested to, the immunity specifications outlined below:

EN61000-4-2 **Electrostatic Discharge Immunity** 8kV Air discharge applied to Enclosure

6kV Contact with Enclosure

EN61000-4-3 **Radiated Electromagnetic Field** 10Volts/metre 80MHz to 2.5GHz applied to Enclosure EN61000-4-4 **Fast Transients-Burst Immunity** +/-2kV

EN61000-4-5 **Input Surge Immunity** Xsolo:

+/-4kV Common Mode 1.2/50 S (Voltage); 8/20uS (Current) +/-2kV Differential Mode 1.2/50 S (Voltage) 8/20 S (Current)

UltiMod and Xgen:

+/-2kV Common Mode 1.2/50 S (Voltage); 8/20uS (Current) +/-1kV Differential Mode 1.2/50 S (Voltage) 8/20 S (Current) EN61000-4-6 **Conducted Immunity** 10 V/m 150KHz to 80MHz EN61000-4-11 **Voltage Dips** 0% 1s Criteria B 40% 100ms Criteria B 70% 10ms Criteria A

Further details on all tests are available from Excelsys.

Guidelines for Optimum EMC Performance

All Excelsys products are designed to comply with European Normative limits (EN) for conducted and radiated emissions and Immunity, when correctly installed in a system. However, power supply compliance with these limits is not a guarantee of system compliance and system EMC performance can be impacted by a number of items.

Cabling arrangements and PCB tracking layouts are the greatest contributing factors to system EMC performance. All cables and PCB tracks should be treated as radiation sources and antenna. Every effort should be made to minimise current carrying loops that can radiate, and to minimise loops that could have noise currents induced into them.

- a. Keep all cable lengths as short as possible.
- b. Minimise the area of power carrying loops to minimise radiation, by using twisted pairs of power cables with the maximum twist possible.
- c. Run PCB power tracks back to back.
- d. Minimise noise current induced in signal carrying lines, by twisted pairs for sense cables with the maximum twist possible.
- e. Do not combine power and sense cables in the same harness
- f. Ensure good system grounding. System Earth should be a "starpoint". Input earth of the equipment should be directed to the "starpoint" as soon as possible. The power supply earth should be connected directly t

*Radiated emissions are extremely applications dependent - with steps outlined above, it may still be possible in a system to generate some high frequency conducted noise through the power & load cables. These may be broadcasted and picked up by an antenna during a radiated test. For issues with resolving these issues we would encourage you to talk to our applications engineering team who have extensive knowledge in this field and can make some recommendations on attenuating specific frequencies should these occur during your system testing



EMI for XF

The XF series of Hi-Rel/MIL-COTS Modular power supplies have been designed for used in harsh environments including military applications. Please contact Excelsys for information relating to MIL461F, CE101 and CE102 EMI characterisation. Contact our applications team for support on external filter recommendations.



TECHNICAL RESOURCES



CONSULT AN ENGINEER

Our experienced applications engineering team is ready to provide design consultancy support including product recommendations to deliver optimal systems performance, and most importantly reduced time to market. We are committed to providing you with the highest performing, most reliable power solution ensuring the lowest total cost of ownership for you.

To contact one of our team please e-mail support@excelsys.com or telephone:

North America and Canada: +1 972 771 4544

Europe and Asia: +353 21 4354716

ONLINE RESOURCES



Our website www.excelsys.com hosts a wide range of easily accessible resources to support your power supply decision making. This includes:

- Application Notes: Supporting system designers in the integration of the Excelsys power supplies into their system.
- Safety and Environmental Certification: All our power supplies carry full international safety agency approvals including UL and EN for information technology and medical power supplies. To ease the system safety approvals we have provided our UL and CB certificates and we have also included our declarations of conformity. All Excelsys power supplies are REACH and RoHS compliant. Visit our Safety and Environmental section online where you can download our UL and CB safety certifications, and declarations of conformity to simplify system compliance.
- EMI Characterisation: Excelsys power supplies are component power supplies and as such are not subject to the EMC directive for EMI, however in order to ease system integration, Excelsys Technlogies has carried out extensive EMI characterization of our products against the relevant standards.
- HALT (Highly Accelerated Life Testing): Poor reliability, low MTBF, frequent field returns, high in-warranty costs and customer dissatisfaction are often the result of design and/or process weaknesses, even if a product has successfully

passed qualification tests and burn-in. Excelsys Technologies subjects all our products to the HALT (Highly Accelerated Life Testing) process to uncover design and/or process weaknesses. During the HALT process, the product is subjected to progressively higher stress levels brought on by thermal dwells, vibration, rapid temperature transitions and combined environments.

- White Papers: Excelsys team of experienced power supply designers have an extensive knowledge of power supplies, technology and the challenges facing system designers. In conjunction with the UltiMod, Xsolo and Xgen Designers' Manual, and Application Notes, we also prepare White Papers on topics that are relevant to system designers.
- Designers' Manual: Excelsys has created Designers' Manual for our UltiMod, Xsolo and Xgen series of power supplies. These have been prepared to assist engineers and technicians in understanding correct design practices necessary to achieve the maximum versatility and performance from any of the UltiMod products. Whatever your application, be it industrial electronics, medical equipment, automation equipment etc., these Designers' Manuals provide the system designer with easy to implement integration instructions. The various Designers' Manuals can be downloaded from the Excelsys website.
- **Datasheets:** All Excelsys product datasheets are available to download online.
- 3D files and CAD drawings: 3D CAD files in a number of formats (STEP, DXF and DWG formats) are available to download from our website. These files can easily imported by system designers to simplify the mechanical engineering design of systems. Download 3D files & CAD drawings from http://www.excelsys.com/technical-support/3d-files-and-caddrawings/.
- Online Configurator: Whatever your power supply needs, Excelsys has a solution for you. Design your power supply using our Online Configurator. Simply input your volts and amps, and the configurator will generate a power supply solution to meet your exact power requirement. Visit the Excelsys Online Configurator at http://www.excelsys.com/xgen_configurator/configure.html
- Online Calculators: Excelsys have developed a range of online calculators to assist system developers in utilising the wide feature set of our products. Voltage adjustment and control, Current limit adjustment and weight calculators are available online and to download. These are available to download http://www.excelsys.com/technical-support/

The specifications contained herein are believed to be correct at time of publication and are subject to change without notice.









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The Ultimate Range of Modular Power Supplies for Industrial, Medical and Communications Applications Hi-Rel Modular Power Supplies for Harsh Industrial and MIL-COTS Applications





Ultra Compact, Convection and Fan Cooled Single Output Power supplies for Industrial, Medical, MIL-COTS and Communications



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Modular Power Supplies for Industrial, Medical, Communications and Acoustic Sensitive Applications

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Excelsys supports customers and distributors worldwide. With experienced Applications Teams based in the US and in Europe, this allows Excelsys to offer immediate support and service to our customers.

Whatever your application, our dedicated team is ready to assist you in defining and implementation of the optimum power supply solution. Check out our *"Contact Us"* page on our website **www.excelsys.com** and speak with your local Excelsys distributor.

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