

## **F Series**

**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. EMC characterisation, Shock and Vibration and Thermal Stress reports are available.

For further details please contact [support@excelsys.com](mailto:support@excelsys.com).

#### powerPacs

	PowerPac	Power	PowerMod Slots	Operating Temperature	MIL-STD-461F	MIL-STD-810G	Conformal Coating
Hi-Rel COTS	XFA	400W	6	-55 to 70°C	Yes	Yes	Yes
	XFB	700W	6	-55 to 70°C	Yes	Yes	Yes
	XFC	1000W	6	-55 to 70°C	Yes	Yes	Yes
	XFN	1000W	6	-40 to 70°C	Yes	Yes	Yes

#### powerMods

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	I <sub>max</sub> (A)	Power (W)	Remote Sense	Power Good
XgA	12.0	10.8-15.6	-	12.5	150	-	-
XgB	24.0	19.2-26.4	-	8.3	200	-	-
XgC	36.0	28.8-39.6	-	5.6	200	-	-
XgD	48.0	38.5-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	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

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

See our new Wide Trim *powerMods* on page 40 and Reactive Load *powerMods* on page 42 of the Excelsys Product Catalogue.



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

INPUT						
Parameter		Conditions/Decription	Min	Nom	Max	Units
Input Voltage Range		Input Frequency: 47 - 63Hz.	85		264	VAC
		Input Frequency: 47 - 440Hz.	90		120	VAC
			120		380	VDC
Power Rating		XFA			400	W
		XFB			700	W
		XFC			1000	W
		XFN			1000	W
Input Current	XFA	85VAC in 400W out		7.5		A
	XFB	85VAC in 700W out		9.5		A
	XFC	85VAC in 765W out		11.5		A
	XFN	85VAC in 765W 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	XFA	250V		F8A HRC		
	XFB	250V		F10A HRC		
	XFC	250V		F12A HRC		
	XFN	250V		F12AHRC		
OUTPUT						
Parameter		Conditions/Description	Min	Nom	Max	Units
powerMod Power		As per powerMod table				
Output Adjustment Range		Manual or Electronic				
		As per powerMod Table				
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			10	%
		Voltage Deviation Settling Time			250	µs
Ripple and Noise		20MHz Bandwidth100mv or 1.0% pk-pk				
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 2)			0.5	VDC
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			VDC
GENERAL						
Parameter		Conditions/Description	Min	Nom	Max	Units
Isolation 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
Weight		PowerPac		1.2		kg
		Typical powerMod		0.1		kg
Reliability		Telcordia SR-332 at 25°C and full load			1020	kh
		Telcordia SR-332 at 25°C and full load			1057	kh
		MIL-STD-217F at 25°C and full load			86	kh
		MIL-STD-217F at 25°C and full load			77	kh
EMC						
Parameter		Standard	Level		Units	
Emissions						
Conducted		EN55011, EN55022, FCC: Class B		Compliant		
Radiated		EN55011, EN55022, FCC: Class B		Compliant		
Harmonic Distortion		EN61000-3-2 Class A & MIL-STD-1399 SECTION 300A		Compliant		
Flicker and Fluctuation		EN61000-3-3		Compliant		
Immunity						
Electrostatic Discharge		EN61000-4-2: Level 2		Compliant		
Radiated RFI		EN61000-4-4: Level 3 & MIL-STD-461F. See note 6.		Compliant		
Fast Transients - burst		EN61000-4-4: Level 3		Compliant		
Input Line Surges		EN61000-4-5: Level 3 & MIL-STD-1399		Compliant		
Conducted RFI		EN61000-4-6: Level 3 & MIL-STD-461F. See note 6.		Compliant		
Voltage Dips		EN61000-4-11 & MIL-STD-70, SEMI F47 compliant <sup>(7)</sup>		Compliant		
ENVIRONMENTAL						
Parameter		Conditions/Description	Min	Nom	Max	Units
Operating Temperature		XFA, XFB, XFC	-55		+70	°C
		XFN operates to specification below -20°C after 10 min warm-up	-40		+70	°C
Storage Temperature			-55		+75	°C
Derating		See page 20 for full temperature derating				
Acoustic Noise		Measured from distance of 1m; See Page 58 of catalogue		56.5		dBA
Relative Humidity		Non-condensing	5		95	%RH
Shock		3000 Bumps, 10G (16ms) half sine				
Vibration		1.5G : MIL-STD-810G	10		500	Hz
Altitude		Operational: 2000m, Storage: 8000m				

#### NOTES

- All specifications at nominal input, full load, 25°C unless otherwise stated.
- 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.
- Derating required below -40 °C.
- 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.
- 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.
- 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.

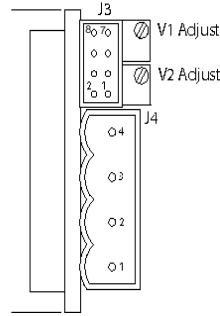
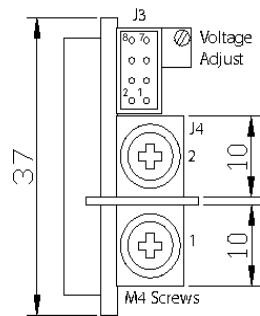


## Output Connectors

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

**Type B: *powerMod***  
XgF/Xg8



## Output Signals and Power Connector Pinout

Pin	J3 Module (XgA to XgD)	J3 (XgG-XgQ) (Xg1-Xg5)	J3 (XgR-XgT)	J3 (XgE) (Xg7)	J3 (XgF) (Xg8)	J4 (Type A)	J4 (Type B)
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 (V1)		

\*remote sense not present on XgR and XgT *powerMods*.

## Output Mating Connectors

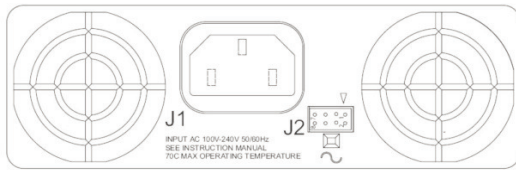
J3: Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal: Molex p/n 50394: Or Molex 51110-0856, includes Locking Tab & Polarization Keying

J4 (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.

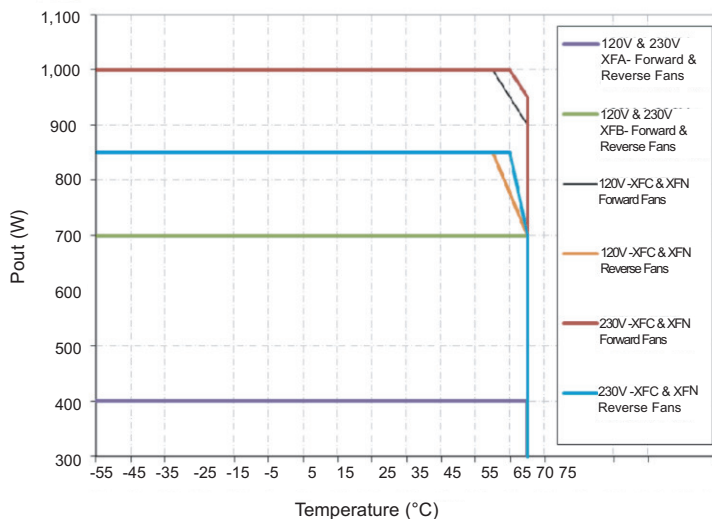
J2: Locking Molex 51110-0860; Non Locking 51110-0850; Crimp Terminal: Molex p/n 50394: Or Molex 51110-0856, includes Locking Tab & Polarization Keying

## 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

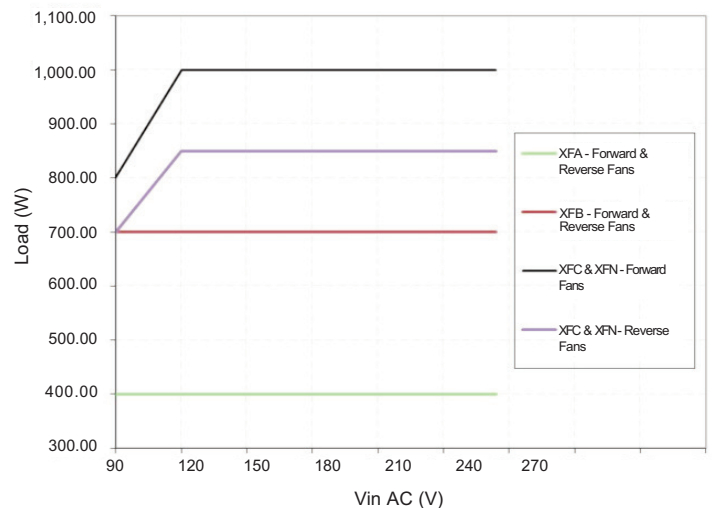
Temperature Derating Curve for XF Models



\*XFN Operation from -40°C to 70°C

## XF Series Derating Curves

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



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