



Hi-Temp Power Supply
Ultra-high efficiency 1U size



Hi-Temp



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
- Up to 600W at 70degC
- 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

The XH family of high temperature power supplies provides up to 600W in an extremely compact 1U x 260mm x 127mm package. Designed as a configurable power supply, the XH family employs the innovative plug and play architecture that allows users to instantly configure a custom power solution in less than 5 minutes.

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 90%.

The XH family consists of 2 *powerPac* models ranging in power levels from 400W to 600W. 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. UL60950 and EN60950 2nd edition and carry the CE Mark.

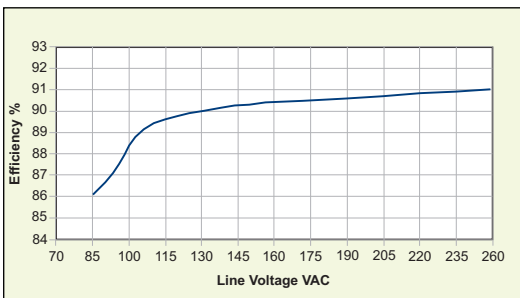
powerMods

| MODEL | Vmin | Vnom | Vmax | Imax | Watts |
|--------|-------|------|------|------|----------|
| | Vtrim | Vpot | | | |
| Xg1 | 1.0 | 1.5 | 2.5 | 3.6 | 26A 65W |
| Xg2 | 1.5 | 3.2 | 5.0 | 6.0 | 25A 100W |
| Xg3 | 4.0 | 6.0 | 12.0 | 15.0 | 10A 120W |
| Xg4 | 8.0 | 12.0 | 24.0 | 30.0 | 5A 120W |
| Xg5 | 8.0 | 24.0 | 48.0 | 58.0 | 3A 144W |
| Xg7 | | 5.0 | 24.0 | 28.0 | 2.5A 60W |
| Xg8 v1 | | 5.0 | 24.0 | 28.0 | 1.5A 36W |
| v2 | | 5.0 | 24.0 | 28.0 | 1.5A 36W |

powerPacs

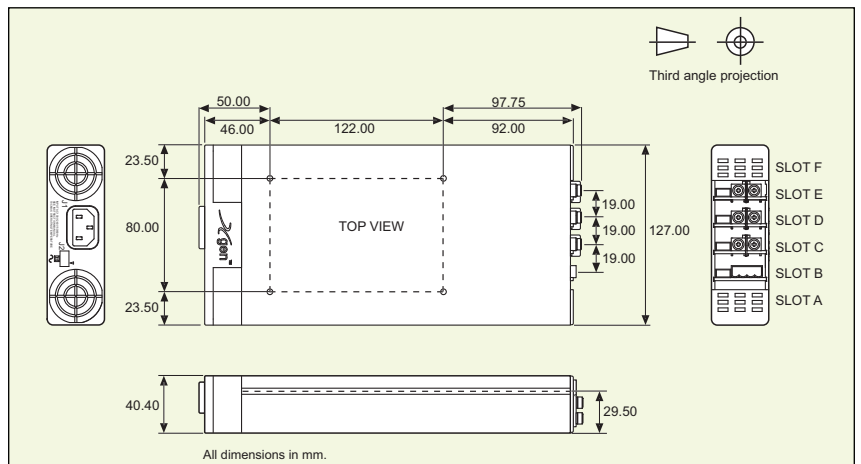
| | MODEL | Watts |
|----|-------|-------|
| HX | XHA | 400W |
| | XHB | 600W |

EFFICIENCY (typical)



MECHANICAL SPECIFICATIONS

Note: See diagrams on pages 34-37



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 47-63Hz. Contact factory for 440Hz operation | 85 120 | | 264 380 | VAC VDC |
| Power Rating | XHA:400W, XHB:600W See Section 4.11 for line voltage deratings | | | | |
| Input Current XHA XHB | 85VAC in 400W out 85VAC in 600W out | | 6.5 7.5 | | A A |
| Inrush Current | 230VAC @ 25°C | | | 25 | A |
| Undervoltage Lockout | Shutdown | 65 | | 74 | VAC |
| Fusing XHA XHB | 250V 250V | | F10A HRC 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 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 Settling Time | | | 10 250 | % µs |
| Ripple and Noise | 20MHz 100mV or 1.0% pk-pk | | | | |
| Overvoltage Protection | 1st level: Vset Tracking. 2nd level: Vmax (Latching) | 110 | | 125 | % |
| Overcurrent Protection | Straight line with hiccup activation at <30% of Vnom See Section 4.6 | 110 | | 120 | % |
| Remote Sense | Max. line drop compensation. (except Xg7, Xg8) | | | 0.5 | VDC |
| Overshoot | | | | 2 | % |
| Turn-on Delay | From AC In / Enable signal | | | 600 / 30 | 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 Input to Chassis | 3000 1500 | | | VAC VAC |
| Efficiency | 230VAC, 600W @ 24V | | 90 | | % |
| Safety Agency Approvals | EN60950, UL60950, CSA22.2 No.950 UL File No. E181875 | | | | |
| Leakage Current | 250VAC, 60Hz, 25°C | | 300 | | mA |
| Signals | See Section 4.9 | | | | |
| Bias Supply | Always on. Current 250mA. 500mA option available | 4.8 | 5.0 | 5.2 | VDC |
| Reliability | Failures per million hours at 25°C and full load <i>powerMod</i> See Section 4.12. <i>powerPac</i> excludes fans <i>powerPac</i> | | | 0.98 0.92 | fpmh fpmh |

| EMC | | | | | |
|----------------------------------|-----------------------|--|-----------|--|-------|
| Parameter | Standard | | Level | | Units |
| Emissions | | | | | |
| Conducted | EN55011, EN55022, FCC | | Level B | | |
| Radiated | EN55011, EN55022, FCC | | Level 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 | | Compliant | | |

| ENVIRONMENTAL | | | | | |
|------------------------------|---|-----|-----|-----|-------|
| Parameter | Conditions/Description | Min | Nom | Max | Units |
| Operating Temperature | Full Load | -20 | | +70 | °C |
| Storage Temperature | | -40 | | +85 | °C |
| Derating | See Section 4.11 for full temperature deratings | | | | |
| Relative Humidity | Non-condensing | 5 | | 95 | %RH |
| Shock | 3000 Bumps, 10G (16ms) half sine | | | | |
| Vibration | 1.5G | 10 | | 200 | Hz |

- 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 3.1 and 4.10 for details.
 6. For section references above go to the Xgen Designers Manual.

Xgen Flexibility and Signals

For detailed information please refer to the Xgen Designers' Manual which is available on-line or contact Excelsys.

Voltage Adjustment

Output voltage can be adjusted in a number of ways:

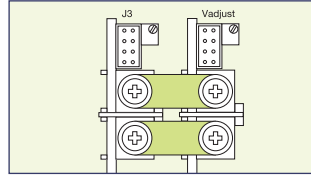
1. On board multi turn potentiometer
2. Remote resistive programming (via Vtrim pin)
3. Remote voltage programming (via Vtrim pin)

Current Limit Adjustment

Output current limit can be Straight line or Foldback and can be adjusted via Itrim pin.

Parallel Connection

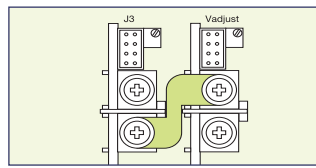
To achieve increased current capacity, simply parallel outputs using the standard parallel links.



Parallel Links available to order.
Part Number XP1

Series Connection

To achieve increased output voltages, simply series outputs using standard series links, paying attention to the requirements to maintain SELV levels if required in your system.



Series Links available. Part Number XS1

Remote Sensing

When the load is remote from the power supply, the remote sense pins may be used to compensate for drops in the power leads. Where the power cabling contributes significant dynamic impedance, see Xgen series Designers' Manual.

Bias Voltage

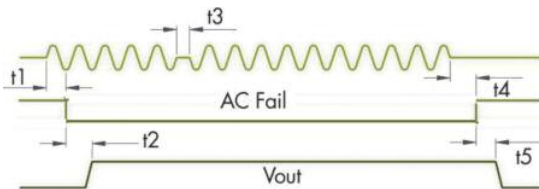
A SELV isolated bias (always on) voltage of 5V @ 250mA (30mA on XCE and XVE models) is provided on J2 pin 2 relative to J2 pin 1 (common) and may be used for miscellaneous control functions. 5V @ 500mA available on request.

Inhibit/Enable

Inhibiting may be implemented either globally or on a per module basis (*powerPac* or *powerMod* inhibiting). Reverse logic (enabling) may also be implemented.

AC Fail

Open collector signal indicating that the input voltage has failed or is less than 80Vac. This signal changes state giving 5ms of warning before loss of output regulation.



Power Good

Opto-isolated output signal indicates that the *powerMod* is operating correctly and output voltage is within normal band.



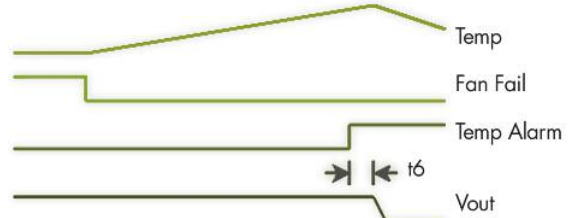
powerPac Options

Temperature Alarm (Option 01)

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 (Option 01)

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.



Reverse Fan (Option 02)

The Xgen series is available with reverse air flow direction. Contact Excelsys for derating details.

Ultra Low Leakage current (Option 04)

The Xgen is available with the option of Ultra Low Earth Leakage Current of <math><150\mu\text{A}</math> and is approved to EN60601-1 and UL60601-1 2nd and 3rd Editions.

Conformal Coating (Option C)

Xgen is available with conformal coating for harsh environments and MIL-COTs applications.

Ruggedised Option (Option R)

Xgen is available with extra ruggedisation for applications that are subject to extremes in shock and vibration.

Input cable Option (Option D)

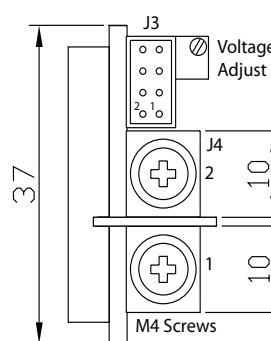
3 Wire input mains cable. Input cables are 300mm in length and come supplied with fast on connectors.

Signal Connector Pinout

| Pin | J2 (<i>powerPac</i>) | J3 (<i>powerMod</i>) Type A | J3 (<i>powerMod</i>) Type B |
|-----|------------------------|-------------------------------|-------------------------------|
| 1 | common | +sense | +pg (V2) |
| 2 | +5V bias | -sense | -pg (V2) |
| 3 | | V trim | inhibit (V2) |
| 4 | ac fail | I trim | common (V2) |
| 5 | fan fail* | +inhibit/enable | +pg (V1) |
| 6 | global enable | -inhibit/enable | -pg (V1) |
| 7 | temp alarm* | +power good | inhibit (V1) |
| 8 | global inhibit | -power good | common (V1) |

*Option 01 only

TYPE A Xg1-Xg7



J4 Connector : M4 Screw

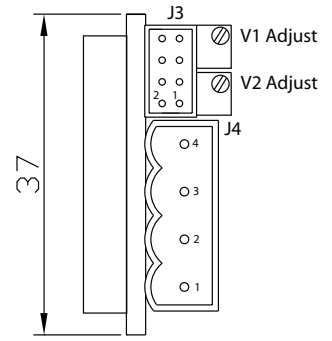
J3 Connector Mating Connector

Housing: Locking Molex 51110-0860

Non Locking Molex 51110-0850

Crimp Terminal: Molex p/n 50394

TYPE B : Xg8



J4Connector : Camden 9200/4A

J3 Connector Mating Connector

Housing: Locking Molex 51110-0860

Non Locking Molex 51110-0850

Crimp Terminal: Molex p/n 50394

Xgen Product Selector

The Xgen series of user configurable power supplies with its unique 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 90% efficiency.

Xgen powerPacs

The application specific 4 slot and 6 slot *powerPacs* provide up to 12 isolated DC outputs from 200W up to 1340W. The table below summarises the *powerPacs* by application and power level. Please refer to the specific product datasheets for full specifications.

| Application | Slots | 200W | 400W | 600W | 700W | 750W | 800W | 900W | 1000W | 1200W | 1340W |
|----------------------|--------|------|------|------|------|------|------|------|-------|-------|-------|
| Standard | 4 Slot | XLA | XLB | XLC | | XLD | | | | | |
| | 6 Slot | | XCA | | XCB | | | | XCC | XCD | XCE |
| Medical | 4 Slot | XMA | XMB | XMC | | XMD | | | | | |
| | 6 Slot | | XVA | | XVB | | | | XVC | XVD | XVE |
| Low Noise Standard | 4 Slot | XKA | XKB | XKC | | | | | | | |
| | 6 Slot | | | XQA | | | | XQB | | XQC | |
| Low Noise Medical | 4 Slot | XRA | XRB | XRC | | | | | | | |
| | 6 Slot | | | XZA | | | | XZB | | XZC | |
| Ultra Quiet Standard | 4 Slot | XTA | XTB | | | | | | | | |
| | 6 Slot | | XBA | XBB | | | XBC | | | | |
| Ultra Quiet Medical | 4 Slot | XNA | XNB | | | | | | | | |
| | 6 Slot | | XWA | XWB | | | XWC | | | | |
| Hi-Temp | 6 Slot | | XHA | XHB | | | | | | | |

Xgen powerMods

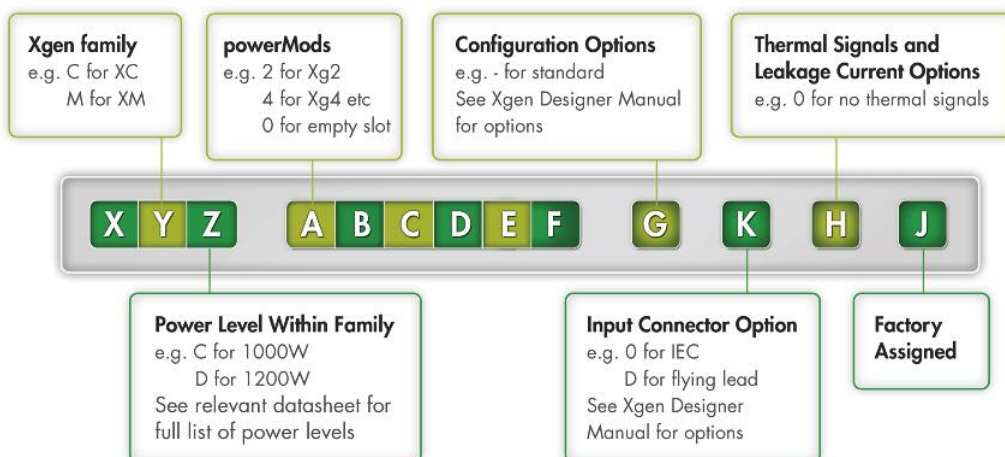
High Efficiency Plug and Play DC output modules to provide a wide range of DC output voltages from 1.0V up to 58.0V.

| MODEL | Vmin Vtrim | Vnom Vpot | Vmax | I _{max} | Watts |
|--------|---------------|--------------|------|------------------|----------|
| Xg1 | 1.0 | 1.5 | 2.5 | 3.6 | 50A 125W |
| Xg2 | 1.5 | 3.2 | 5.0 | 6.0 | 40A 200W |
| Xg3 | 4.0 | 6.0 | 12.0 | 15.0 | 20A 240W |
| Xg4 | 8.0 | 12.0 | 24.0 | 30.0 | 10A 240W |
| Xg5 | 8.0 | 24.0 | 48.0 | 58.0 | 6A 288W |
| Xg7 | | 5.0 | 24.0 | 28.0 | 5A 120W |
| Xg8 v1 | | 5.0 | 24.0 | 28.0 | 3A 72W |
| v2 | | 5.0 | 24.0 | 28.0 | 3A 72W |

Standard Xgen product options include: Conformal Coating, Low Acoustic Noise, Low Leakage Current, Extra Ruggedisation, Connector, Cabling & Mounting options, Thermal Signals and Reverse Fans.



Configuring your Xgen



Example:

XVD234580-D4A contains

XVD *powerPac*:

1200W medically approved

Powermods

- Xg2:5V/40A,
- Xg3:12V/20A,
- Xg4:24V/10A,
- Xg5:48V/6A,
- Xg8:24V/3A, 24V/3A

Option D : Input cable option

Option 4: 150µA leakage current option

A: Factory assigned unique identifier