



# 400W/600W/1000W Configurable Medically Approved Switch Mode Power Supplies

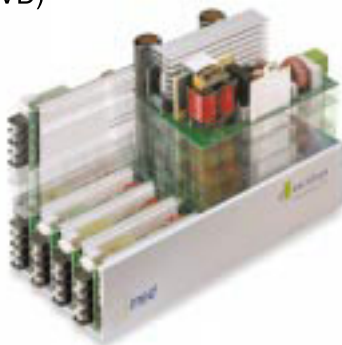
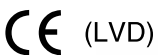
4 slot and 6 slot package sizes

## STANDARD FEATURES

- EN60601-1, UL2601-1, IEC601-1 approved
- 12mm Creepage
- Class B Conducted Emissions
- Low Leakage Current <300uA
- Ultra low leakage current <150uA (3M4E)
- Dual Fused versions available (3M4E)
- Stackable for up to 2000W output power
- 1 to 12 isolated outputs with full user configurability
- Individual control signals on each module
- 1.45V to 28V standard output voltages
- Isolated Bias Supply Voltage 5V @ 50mA
- 400, 600 and 1000 Watts of output power
- Series and parallel capability
- Zero load operation
- EN61000-3-2 compliant
- Universal input
- Modular construction
- 3 Year warranty

## APPLICATIONS INCLUDE

- Medical and Dental Equipment
- Test and Measurement
- Chemical Analysis Equipment
- Drug Infusion Equipment
- Peripherals



3med provides an instant, no compromise power solution for Medical power requirements where a unique set of voltage and current requirements is needed. The Excelsys 3med modular platform provides a *pre-approved* power solution that reduces costly safety agency approval and dramatically reduces system design cycles shortening your Time-To-Market. Boasting Class B Conducted emissions performance, whilst meeting the rigorous Earth leakage requirements, the 3med provides an unparalleled solution for system designers.

Excelsys has coupled a 2 transistor forward converter front end with proprietary planar magnetic main transformer technology and modular magnetic amplifier output stages to provide a fast turn-around, production line built power solution that can be matched to meet your exact requirements for Volts and Amps. Configured units are shipped within 1 week to your exact set point requirements complete with CE and UL approval and fully compliant to EN61000-3-2.

Designed as a cost-effective solution for single piece or volume production runs, the 3med series provide up to 1000W in a rugged extruded aluminium chassis, suitable for a wide range of Medical, laboratory and dental applications, such as drug infusion and chemical analysis equipment. Power connections are made using quality screw terminal connections and primary and secondary controls enable power channels to be individually margined, enabled, paralleled or stacked to provide literally millions of power solutions to match your needs.

Enhanced leakage current versions are available with Earth leakage of less than 150uA. Design resources available from our web site [www.coolpowersolutions.fi](http://www.coolpowersolutions.fi) include safety certification, CAD profile drawings, handbooks and configuration software tools.

SINGLE OUTPUT MODULES		NOMINAL	RANGE	I <sub>max</sub>
Module 1	1 Slot	5V	(3 to 5.6V)	30A
Module 2	1 Slot	12V	(5 to 13V)	20A
Module 3	1 Slot	18V	(8 to 20V)	15A
Module 4	1 Slot	24V	(12 to 28V)	12A
Module 70	2 Slots	5V	(1.45 to 5.6V)	80A
DUAL OUTPUT MODULE		NOMINAL	RANGE	I <sub>max</sub>
Module 5	1 Slot	24V	(10 to 28V)	3A
		24V	(10 to 28V)	3A
Module 6	1 Slot	5V	(3 to 5.6V)	10A
		24V	(10 to 28V)	3A

## PACKAGE SELECTION GUIDE All 3med units are 270mm (L) x 65mm (H)

PACKAGE	POWER (WATTS)	SLOTS	LEAKAGE CURRENT	EN55011	WIDTH (W)
3M4B	400W	4	<300µA	A	127mm
3M4C	600W	4	<300µA	A	127mm
3M4E	600W	4	<150µA	B	187mm
3M6C	600W	6	<300µA	B	187mm
3M6D	1000W	6	<300µA	B	187mm

Cool Power Solutions Oy

Keskustie 6  
FIN-01900 Nurmijärvi

Tel: +358-9-2906 1990  
Fax: +358-9-2906 1991

Email: [info@coolpowersolutions.fi](mailto:info@coolpowersolutions.fi)  
Web: [www.coolpowersolutions.fi](http://www.coolpowersolutions.fi)



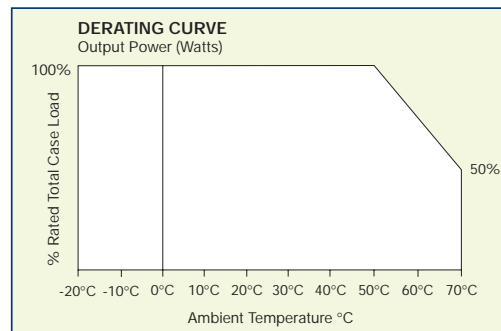
**SPECIFICATION** All specifications are typical at nominal input, full load at 25°C unless otherwise stated

OUTPUT SPECIFICATIONS		
Maximum power	Input module B Input module C Input module D (Note 1) Input module E	400W 600W 1000W 600W
Output adjustment	(Note 2)	Multi-turn potentiometer
Line regulation		±0.1%
Load regulation	50% load change	±0.2%
Cross regulation		±0.2% typ.
Transient response	(Note 3)	<10%, <0.5ms
Temperature coefficient		±0.02%/°C
Ripple and noise	(Note 4)	1.0% or 100mV pk-pk
Overvoltage protection		Standard on all outputs
Overcurrent protection	(Note 5)	Individual current limit
Thermal protection		Standard
Mains failure signal	Option 03, 05, 06 or 07	5ms warning
Output isolation	(Note 6)	Each single and dual output fully floating
Margin	See AN105 for individual module margin capabilities	
Minimum load	(Note 7)	Zero
Turn-on delay		500ms
Remote sense	Single outputs only	0.5V drop
INPUT SPECIFICATIONS		
Input voltage range	Universal input	88 to 264VAC 125 to 370VDC
Input frequency range	(Note 8)	47Hz to 63Hz
Inrush current	230VAC @ 25°C	50A max.
Harmonic distortion	(Power factor)	EN61000-3-2

## NOTES

- For module 3M6D, 1000W peak power for 10 seconds (800W average power) for input voltages <180VAC.
- Outputs are user adjustable or factory set to your requested voltage.
- 25% to 75% load change.
- Whichever is greater. 20MHz bandwidth. (See AN105 for specification below 0°C).
- Straight line on all outputs. On Module 70 current limit adjustable from 50% to 110%. Optional foldback on Module 70. See AN105 or contact Cool Power Solutions Oy for details.
- 100V isolation between each output and 500V to chassis.
- All outputs except Module 70, which has 5.0% minimum load for full specification.
- Contact factory for 400Hz operation.
- For nominal output voltages and full load.
- The specifications contained in this data sheet are believed to be correct at time of publication. Specifications are subject to change without notice.
- This product is not intended for use as a stand alone unit and must be installed by authorised personnel in order to maintain approvals.

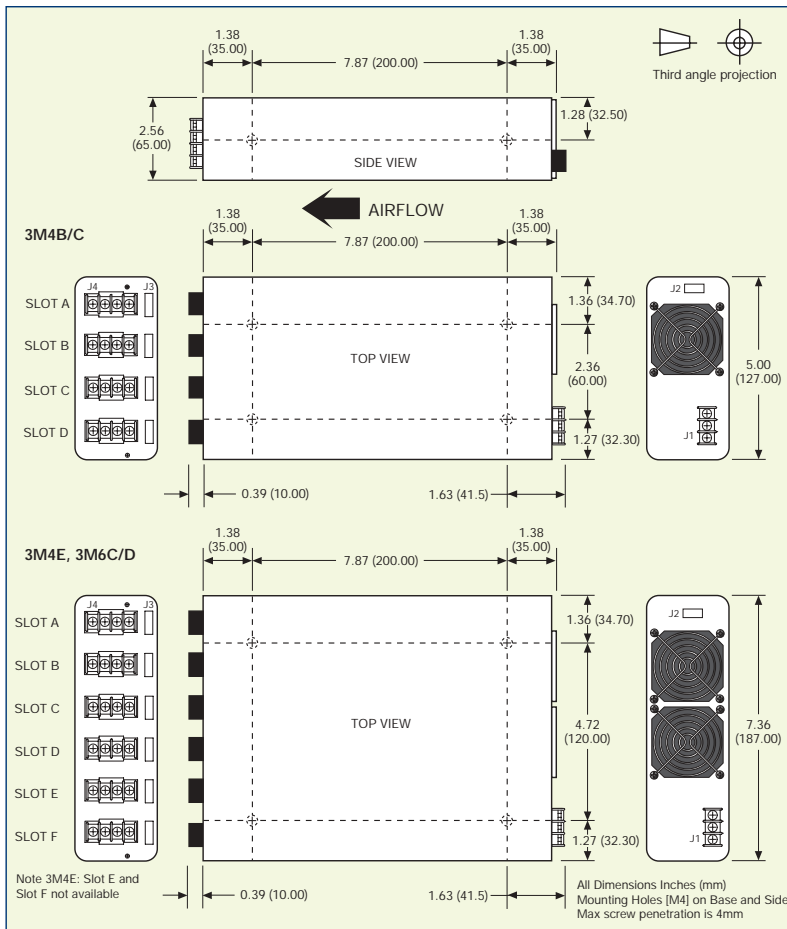
EMC CHARACTERISTICS		
<b>Emissions:</b>		
Conducted	EN55011, FCC	See table
<b>Immunity:</b>		
Electrostatic discharge	EN61000-4-2	Level 4
Radiated RFI	EN61000-4-3	Level 3
Fast transients - burst	EN61000-4-4	Level 3
Input line surges	EN61000-4-5	Class 3
Conducted RFI	EN61000-4-6	Level 3
Voltage dips	EN61000-4-11	Compliant
GENERAL SPECIFICATIONS		
Hold-up time	(Note 9)	20ms typ after loss of AC power
Efficiency		82% typ.
Isolation voltage	Input/output Input/chassis	4000VAC 1500VAC
Switching frequency		200kHz
Approvals and standards		IEC601-1, EN60601-1, UL2601-1, CSA601.1
Leakage current	3M4B, 3M4C, 3M6C, 3M6D 3M4E Version	<300uA, 250VAC, 60Hz <150uA, 250VAC, 60Hz
Weight	3M4B, 3M4C 3M6C, 3M6D, 3M4E	2.5kg 3.5kg
Size (LxWxH)		See mechanical specifications
MTBF	See AN105	400,000 hours
ENVIRONMENTAL SPECIFICATION		
Operating temperature (See derating curve)	See AN105	-20°C to +50°C Derate 2.5% per °C up to +70°C
Storage temperature		-40°C to +85°C
Relative humidity	Non-condensing	5% to 95% RH
Shock		3000 bumps, 10G (16ms) half sine
Vibration		10-200Hz, 1.5G



## ELECTROMAGNETIC COMPATIBILITY

See documents 40001 and 40018, **3gen and 3med Application Handbook (AN105)** and **3med EMC File** for details on the EMC performance of Excelsys 3med series. Both documents are available on [www.coolpowersolutions.fi](http://www.coolpowersolutions.fi).

## MECHANICAL SPECIFICATIONS



### Connectors:

- J1** Line Input Connector
- J2** Options  
See AN105 for Pin-out
- J3** Output Signals  
See AN105 for Pin-out
- J4** Output Connector

### Accessories:

- 61069 Parallel Link
- 61070 Series Link
- 362D010 "U" Link
- OPCONN4 Mating Connector for options + Module 1-6 signals
- OPCONN6 Mating Connector for Module 70 signals

## 3med STANDARD OPTIONS

- 03** Mains Power Fail + Global Enable
- 05** Mains Power Fail + Global Inhibit
- 06** Mains Power Fail + Global Enable + Bias Supply Voltage
- 07** Mains Power Fail + Global Inhibit + Bias Supply Voltage

Options: Mutually exclusive

## OUTPUT SIGNALS

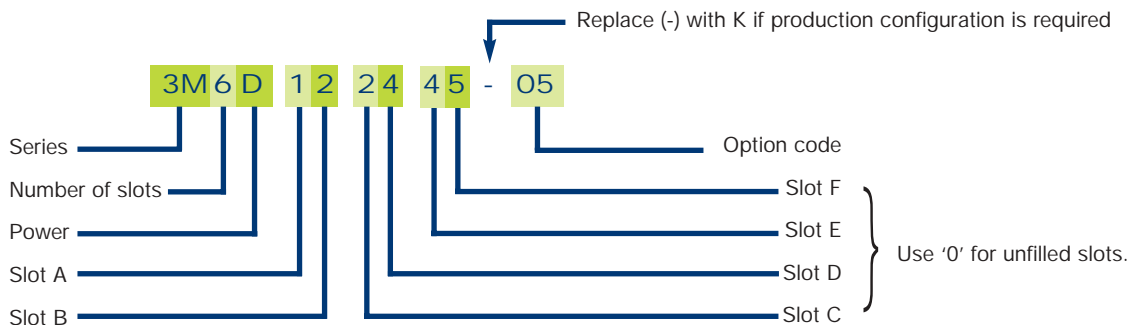
Output control signals are available on all output modules.

- | Modules 1 to 6           | Module 70 Additional Features (See AN105)    |
|--------------------------|--|
| • Power good signal      | • Adjustable Current Limit                   |
| • Output inhibit signal  | • Foldback or Straight Line Current limiting |
| • Remote adjust (margin) | • Bias Voltage                               |
|                          | • Output Inhibit or Enable                   |

(Dual output modules: output signals available on first [top] output only).

## HOW TO ORDER

**Note:** Calculate power requirements by summing output powers calculated at NOMINAL output voltages.



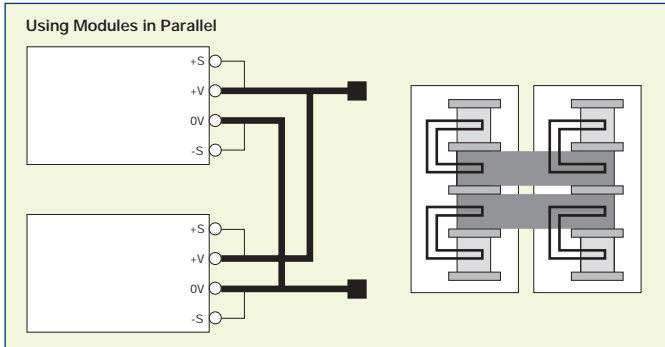
### Specification of power supply detailed above:

- 6 slot Medical series
- Maximum output power: 1000W
- 5V @ 30A; 12V @ 20A; 12V @ 20A; 24V @ 12A; 24V @ 12A; 24V @ 3A; 24V @ 3A
- Mains Power Fail Signal + Logic Inhibit

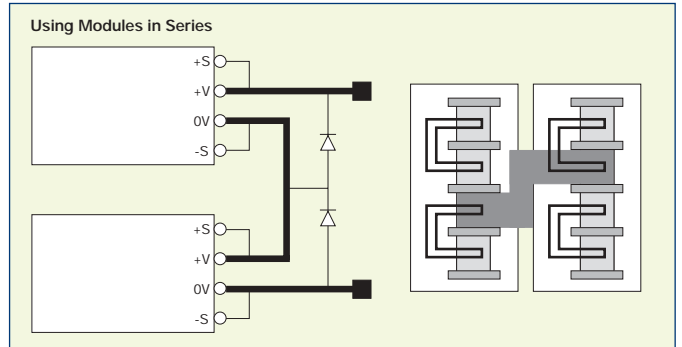
### Production configuration:

Units are shipped with nominal output voltages unless production configuration is specified. Excelsys can configure to your exact requirements, through use of appropriate parallel and series busbars and through voltage adjustment to specific set points. Please refer to configuration sheet for details (MD-3GCONFIG-05/00) and for part number assignment to our website at [www.coolpowersolutions.fi](http://www.coolpowersolutions.fi).

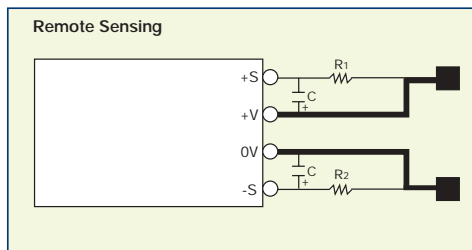
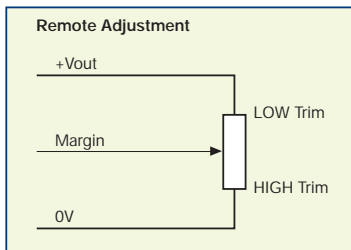
3med FLEXIBILITY



**Notes:**  
 Maximum current =  $(I_1 + I_2) \times .9$   
 Use two parallel links (P/N 61069)

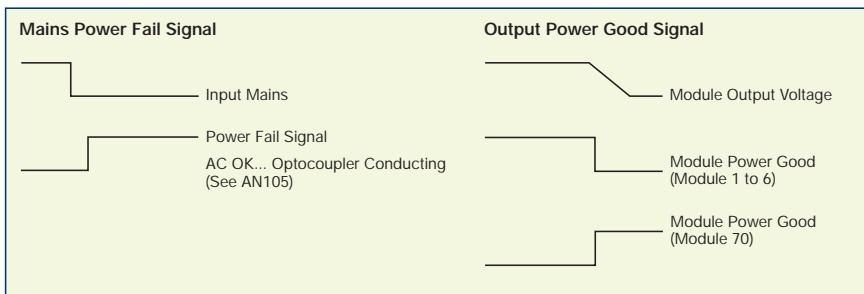


**Notes:**  
 Maximum voltage to chassis is 500V  
 Use series link (P/N 61070)  
 Reverse bias diodes may be required for certain applications, eg. large capacitive loads

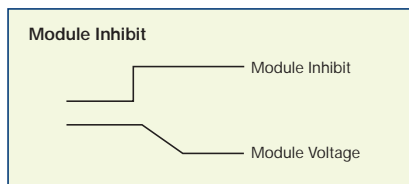
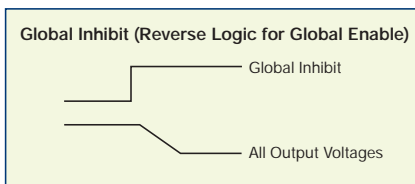


**Notes:**  
 Where the sensing point is remote from the output of the power supply, to avoid spurious noise pick-up it may be necessary to:

- 1 Use twisted pair sense wires.
- 2 Use R C as shown ( $R_1 = 100\Omega$ ) ( $R_2 = 10\Omega$ ) ( $C = 22\mu F$ ).



**Notes:**  
 See Application Note AN105, or visit our website [www.coolpowersolutions.fi](http://www.coolpowersolutions.fi) for full details.



4 PRINCIPLE OF OPERATION

