

## CX10 Instruction Manual

**PLEASE READ THIS INSTRUCTION MANUAL CAREFULLY BEFORE INSTALLATION OR USE OF THIS PRODUCT, AND KEEP IT IN A SAFE PLACE FOR FUTURE REFERENCE. FOLLOW ALL WARNINGS AND INSTRUCTIONS MARKED ON THE PRODUCT.**

### HIGH VOLTAGE WARNING!

Dangerous voltages are present within these power supplies. These products should only be worked on by qualified personnel.

#### coolPacs

<b>CX10S</b>	<b>Standard</b>	<b>1000W</b>
<b>CX10M</b>	<b>Medical</b>	<b>1000W</b>

CX10 products are comprised of:

**coolPac Chassis Converters** intended for use in CoolX series ONLY. These must NOT be used for any other purpose.

and

**coolMod Plug-In Modules** intended for use in CoolX series ONLY. These must NOT be used for any other purpose.

#### coolMods

<b>CmA</b>	<b>5V</b>
<b>CmB</b>	<b>12V</b>
<b>CmC</b>	<b>24V</b>
<b>CmD</b>	<b>48V</b>
<b>CmE*</b>	<b>24V</b>
<b>CmF*</b>	<b>48V</b>
<b>CmG**</b>	<b>24V/24V</b>
<b>CmH***</b>	<b>5V/24V</b>

CX10 products are designed for use within other equipment or enclosures, which restrict access to **authorised competent personnel only**. This equipment is only intended for use in a **restricted access area**. The unit covers are designed only to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since, under full load conditions, part or parts of the unit may reach temperatures in excess of those considered safe for operator access. This equipment is not suitable for use in locations where children are likely to be present.

### IMPORTANT CONSIDERATIONS

The coolPac should be supplied only by a power source of the type indicated on its label. A socket outlet shall be installed near the equipment and shall be easily accessible. The unit should only be used with a suitably rated cable and appropriate IEC320 type connector, sourced by the end user, and in accordance with the requirements of Table G.5 of EN62368-1 (latest edition). If in doubt, contact Excelsys Engineering Department for assistance. Double pole / neutral fusing is used. If the installation is not completely disconnected from power, parts may remain live even if one of the two mains fuses has blown.

When adding or removing coolMods from the coolPac, care must be taken to handle the coolMods by the output terminals ONLY, ensuring that all other surface mount components are not unduly damaged.

When securing the product, do not use screws which infringe the maximum penetration depth of 1.50mm. Customer fixings are provided on the base of the unit in addition to the side mounting which allows the unit to be mounted on either side of the coolPac chassis. Maintain a 50mm minimum clearance all around the power supply to allow for adequate natural convection cooling to take place.

PARTS OF THE UNIT WILL BECOME HOT DURING OPERATION; ALLOW TIME TO COOL BEFORE HANDLING.  
AFTER DISCONNECTING THE AC SOURCE, ALLOW 4 MINUTES BEFORE DISASSEMBLY TO ALLOW CAPACITORS WITHIN THE UNIT TO DISCHARGE.

### INPUT SPECIFICATIONS (coolPac only)

Input Voltage Range	100 to 240Volts AC
Input Frequency	50/60 Hz
Earth Leakage Current	300µA - Standard Options 150µA - Low Leakage Options

### INPUT FUSING

#### WARNING!

There are no serviceable parts in this product  
Return to Excelsys for repair.

Line	Reference	Fuse	Type	Voltage	Size
Live	FS1	10A	T	500VAC	5 X 20mm
Neutral	FS2	10A	T	500VAC	5 X 20mm

### OUTPUT SPECIFICATIONS (coolMod only)

See coolMod table below, with more detail in Designers' Manual. Each module may be adjusted over the full voltage range shown in the table **subject to not exceeding the maximum rated Voltage and Power shown in the table.**

### SAFETY

The CX10 when correctly installed in a limited access environment is designed to comply with the following requirements

CX10S: UL60950-1, CAN/CSA C22.2 No. 60950-1-07, IEC60950-1, IEC62368-1, EN60950-1  
CX10M: ANSI/AAMI ES60601-1, CAN/CSA C22.2 No. 60601-1, IEC 60601-1, EN60601-1.

For current approval status, please contact Excelsys Sales. Equipment manufacturers must protect service personnel against inadvertent contact with the module output terminals.

The user should connect to the screw barrier terminal input connector version using wiring terminated with grip sleeve insulated, fork/spade tongue terminals for stud Size 6 (M3.5).

The power supply FG terminal of Terminal Block is connected to printed wiring board trace directly; the Limited Short-Circuit Test in CSA C22.2 No. 0.4, Bonding of Electrical Equipment not conducted due to building-in type component. The evaluation shall be considered in end-product.

### ENVIRONMENTAL PARAMETERS

The products are designed for the following parameters:

- Pollution Degree 2
- Installation Category 2
- Class I - Equipment achieves electric shock protection through basic insulation and protective earth grounding.
- For use as part of another piece of equipment such that unit is accessible to service engineers only

#### Environmental Conditions for Normal Operations

- Altitude: -155 metres to +5000 metres from sea level
- Relative Humidity: 5% to 95% non-condensing
- Temperature Range: -25°C to +85°C

#### Environmental Conditions for Transport & Storage

- Altitude: -155 metres to +15200 metres from sea level
- Relative Humidity: 5% to 95% non-condensing
- Temperature Range: -40°C to +85°C

### ENVIRONMENTAL PARAMETERS (Continued)

- Derate at 1.67% per °C above 40°C and up to 85°C (NOTE: IEC input terminal option limits maximum operating temperature to 50°C)
- Derating of 10% across all line voltages applies when lid is used on product.
- Derating applies to both coolPacs and coolMods

### Approval Limitations

Use In North America

When this product is used on 180 to 253 Volts AC mains with no neutral, connect one live wire to L (live) terminal and the other live wire to N (neutral) terminal on the input connector.

The attachment plug shall be rated to a current not less than 125% of the rated current of the equipment.

### LEVELS OF INSULATION

Subject to the limitations above.

- Primary mains circuits to earth: 4mm spacing
- Primary mains circuits to secondary: 8mm spacing
- Dielectric strength testing is carried out as follows:
  - Primary mains circuits to chassis: 1850V AC
  - Secondary to chassis: 1850V AC
  - Primary mains circuits to secondary: 4243VAC or 6000VDC.

### EARTH TERMINAL IMPORTANT

The protective earth must be considered in the end system. The input terminal block guarantees Functional Ground (FG) only on pin 2, the protective earth only provided by connecting directly to chassis. The power supply is only a component of the system and therefore must not be relied upon to provide protective earth for the end application. The IEC inlet input provides a protective earth connection. For further information, please contact Excelsys Technologies.

### HEALTH AND SAFETY AT WORK ACT (UK ONLY)

To protect service personnel and users and to comply with section 6 of the Health And Safety Acts, a clearly visible label should be fitted warning that surfaces of these units may be hot and must not be touched when the units are in operation.

### RECEIPT AND UNPACKING

On receipt a unit should be unpacked carefully and checked for transit damage. If the unit is damaged, do not apply power or install the unit. SEEK SPECIALIST ADVICE!

### WARRANTY

Warranty conditions are contained in our standard terms and conditions. Contact your authorised outlet for repair.

### coolMods

coolMod maximum power ratings must not be exceeded

Model	CX06/CX10 Ratings				CX18 Ratings	
	Vmin	Vnom	Vmax	Imax	Watts	Imax
CmA	2.5	5.0	6.0	21.0	105	30.0
CmB	6.0	12.0	15.0	15.0	180	23.3
CmC	15.0	24.0	28.0	8.33	200	12.5
CmD	28.0	48.0	58.0	4.17	200	6.25
CmE*	22.8	24.0	25.2	2.57	600	37.5
CmF*	45.6	48.0	50.4	12.5	600	18.75
CmG**	3.0	24.0	30.0	3.0	90	4.0
	3.0	24.0	30.0	3.0	90	4.0
CmH***	3.0	5.0	6.0	6.0	36	10.0
	3.0	24.0	30.0	3.0	90	4.0
CmA-W01	1.0	5.0	6.0	21.0	105	30.0
CmB-W01	1.0	12.0	15.0	15.0	180	23.3
CmC-W01	2.0	24.0	28.0	8.33	200	12.5
CmD-W01	3.0	48.0	58.0	4.17	200	6.25

### Permitted Power Ratings for Reliable Operation.

coolPacs and coolMods are operating within their power ratings as listed above, taking care to factor in the appropriate derating if the ambient temperature exceeds 40°C.

Note: Power Ratings Evaluated whilst unit was attached to a 1.7 mm by 612 mm by 612 mm conductive surface

Model	Watts	L x H x W (mm)
CX10S - Standard	1000W	265.29 x 40.60 x 164.00
CX10M - Medical	1000W	265.29 x 40.60 x 164.00

Derate linearly from 1000W at 180Vac to 800W at 120Vac and from 800W at 120V to 680W at 100Vac nom.

Notes:

A French translation of this Instruction Manual is also available, document number 40127. Contact sales.support@ael.com for a copy of this.

\* = CoolMod variants CmE & CmF are a 3 slot wide module which plugs into slot F only. When a CoolX 1000 is populated with a CmE or CmF the power supply part number will show the CmE or CmF in slot F and have slots D and E marked as unavailable by using the # symbol.

\*\* = For CoolMod variant CmG the maximum output power of each channel is 90W, while the output power of both channels must not exceed 120W.

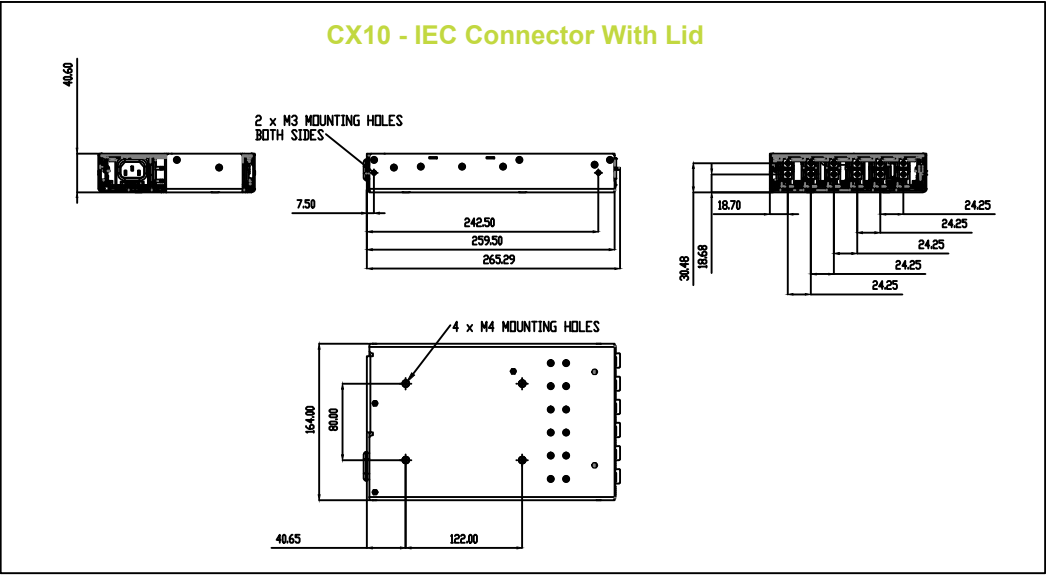
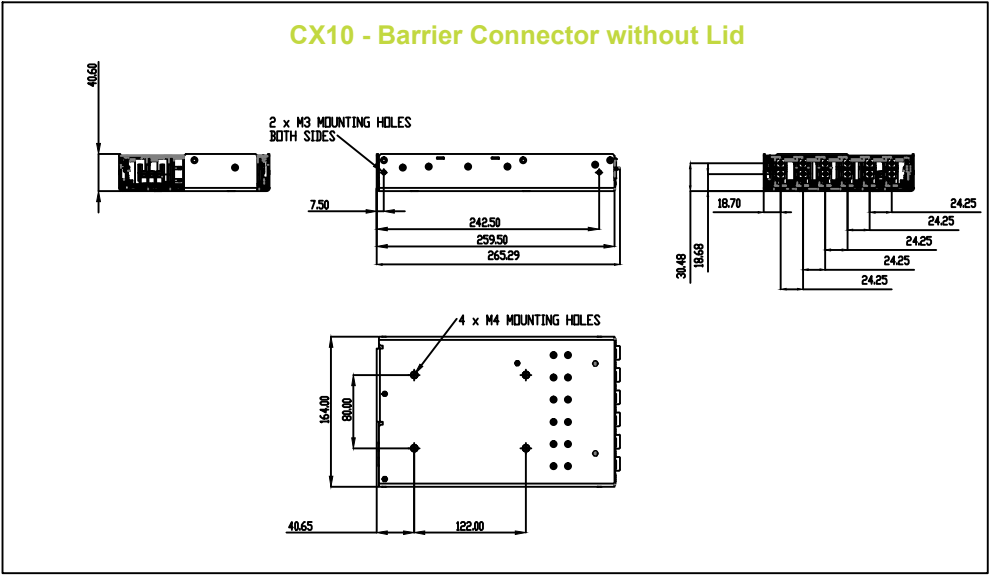
\*\*\* = For CoolMod variant CmH the maximum output power of channel 1 is 36W and channel 2 is 90W, while the output power of both channels must not exceed 100W.

### OPTIONS

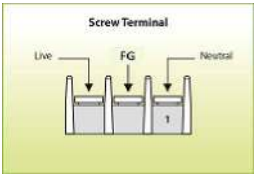
Conformal Coating and Ruggedisation  
IEC Input Terminal  
Lower Leakage Current  
12V or 5V Auxiliary Supply  
Lid available

Contact Excelsys Technologies Ltd. in relation to all options listed above.

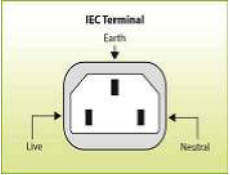
CX10 Mechanical Drawings



CX10 Input Connectors

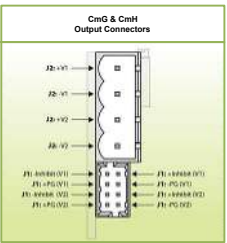
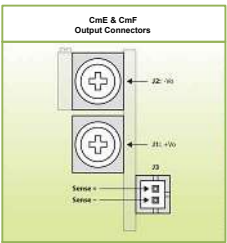
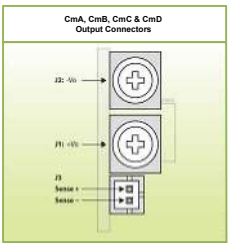
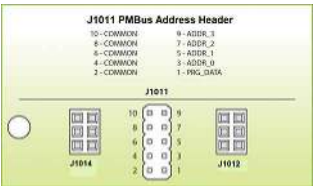
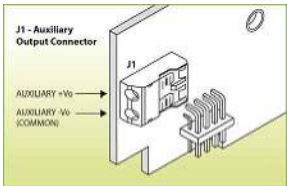
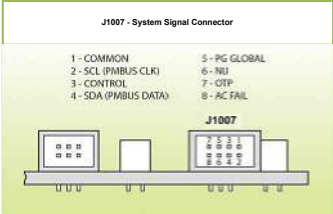
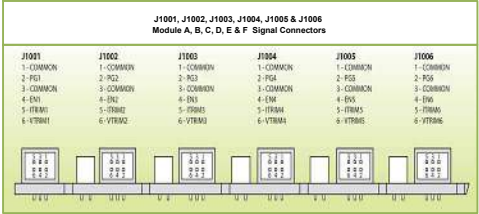


**J2**  
Barrier Terminal Block  
TE/Tyco: 2-1437667-5; Dinkle:  
DT-31-B01W-03



**J11**  
IEC Input Option  
Schurter GSP2.9103.13; Rong Feng  
701W-G40111

CX10 Output Connectors



J1001-J1006 Mating Connector J1001-J1006 6-way Molex 87833-0631 Locking Molex 51110-0660; Non Locking Molex 51110-0650 Crimp Terminal Molex p/n 50394 or Molex 51110-0656 which includes Locking Tab and Polarization Key

J1007 System Signal Connector Mating Connector J1007 8-way Molex 87833-0831 Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal Molex p/n 50394 or Molex 51110-0856 which includes Locking Tab and Polarization Keying

J1 Auxiliary Output Connector Molex 104188-0210 (solid wire should be used)

J1011 PMBus Address Header Mating Connector J1011 10-way Molex 87758-1016 Harwin M22-1900005

Each CmA, B, C, D, E & F CoolMod DC output has Power Terminals (J1 and J2) and Sense Connector (J3)

J1 & J2 DC Output Terminals M4 Screws JST-S2BPH-K-S (LF) (SN) JST PHR-2, Crimp: JST BPH-002T-P0.5S or SPH-002T-P0.5S

J3 Sense Connector JST BPH-002T-P0.5S or SPH-002T-P0.5S

J3 Mating Connector

Each CmG & CmH CoolMod DC output has Power Terminal (J2) and Signal Connector (J1)

J2 DC Output Terminal Camden - CTB9350/4A Camden - CTB9200/4A or Würth Elektronik - 691 352 710 004

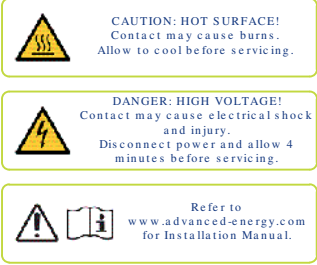
J2 Mating Connector Molex - 87833-0831 Housing: Molex - 51110; Crimp Terminals: Molex - 50394

Note: Cables must be rated 105°C minimum.

Labeling and Model Numbers

**coolMod**  
coolMod labels contain:  
..Minimum, Nominal & Maximum voltage adjustment range  
..Maximum current (Imax)  
..Maximum power (Watts)  
..Model number

**coolPac**  
coolPac labels contain:  
..Input Freq  
..Input Voltage  
..Fuse rating  
..Serial Number  
..Maximum combined power rating of inserted coolMods  
..Maximum Line current under rated conditions  
..Model Number in the format CX10M-000000-N-A as an example of standard medical product part number with no options  
..The following warning and information symbols:

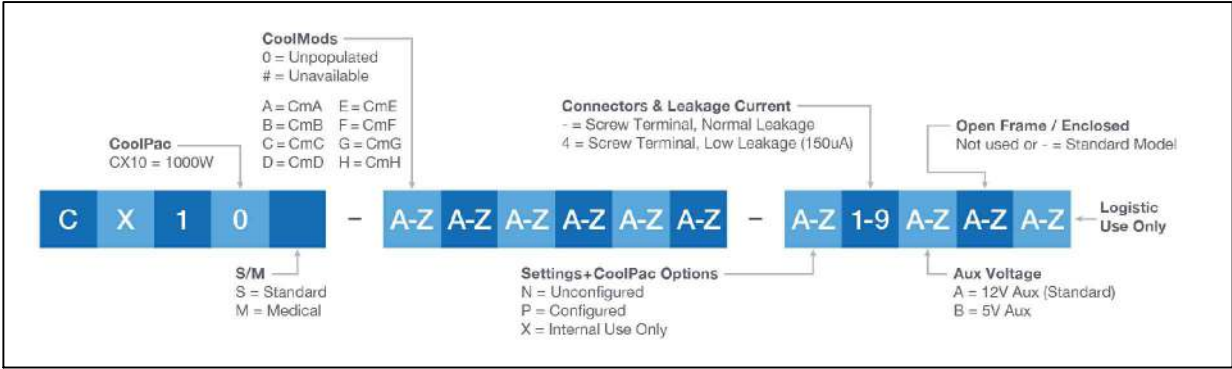


Configuration Considerations

1. When parallel connecting outputs, refer to Designers' Manual for set-up, including Vtrim adjust and I-Share header.
  2. When connecting outputs in series to achieve voltages in excess of 60VDC (SELV), ensure that appropriate safety precautions are taken in the system.
  3. Before removing and replacing output modules, remove input power for 4 minutes.
  4. For proper connection to Inhibit, Enable, Fan Fail, Over Temp alarm, and Output Signals Power Good refer to Designers' Manual.
  5. For power derating, refer to Designers' Manual.
  6. For motor loads, high inductance, and high capacitance: blocking diode may be needed. Contact Excelsys for support.
- Refer to the Designers' Manual and Product Series Catalogue for information on all the above and additional information regarding the set, installation and operation of the CoolX Series.

Excelsys Technologies Ltd. reserves the right to alter or improve the specification, internal design or manufacturing process without notice. Please check with your Excelsys representative or visit [www.advanced-energy.com](http://www.advanced-energy.com) to ensure that you have the current and complete specification for your product before use. For information and instructions on use, please consult the Designers Manuals for these products at [www.advanced-energy.com](http://www.advanced-energy.com).

CX10 Part Numbering System



When the coolPac has no coolMods inserted, its Model number is simply CX10M-000000-N-A.

When the coolPac has one or more coolMods inserted, its model number may be easily read to be CX10M-AAAAAB-N-A as an example, where coolMods CmA, CmA, CmA, CmA, CmA, CmA are inserted in Slots A, B, C, D, E and F respectively.