

1 PRODUCT OVERVIEW

The AERL COOLPRO CATHODIC CONVERTER™ is an efficient, high current DC-DC converter for impressed current cathodic protection.



2 PRODUCT FEATURES

- Robust thermal design with no cooling fans and efficiencies of up to 98%
- Designed to operate in harsh conditions and in ambient temperatures between -20 and +50°C
- Rugged and reliable design including a durable weatherproof enclosure
- Compact and lightweight compared to competing brands
- High speed ON/OFF control eliminates need for expensive external current interrupters for measurement of instantaneous off potential
- Low device current consumption
- Onboard surge protection with optional supplementary 'Surge Buster' for lightning prone locations
- Can drive in parallel to provide any desired level of anti-corrosion protection. (Except for structure potential control mode)
- On-board LCD display showing output voltage and current



**PRODUCT DATASHEET
CATHODIC CONVERTER™ RANGE**

COOLPRO SERIES
Australian Energy Research Labs
AER04.006 – G1 v2
28 February 2016

3 PRODUCT MODELS AND OPTIONS

Model	Maximum Anti-Corrosion Current
CP15	15A
CP30	30A
Options	Function
Surge Buster	Lightning surge arrester.
Structure/Ref Cell Potential Control	Accurate corrosion protection for structures where overprotection is harmful.

4 PRODUCT SPECIFICATIONS

Parameter	Typical
Weight	1.5kg
Dimensions (L x W x H)	240 x 160 x 90 mm
Input/output power cable size	25m ²

4.1 MODEL CP15

Absolute Maximum Ratings		
Symbol	Parameter	Max
T _{amb}	Maximum ambient air temperature	50°C
I _{batt}	Maximum output current	15A
V _{MIN}	Minimum battery input voltage	11V
V _{MAX}	Maximum battery input voltage	60V
Electrical Characteristics		
Description	Value	
V _{OUT} - Output Voltage (adjustable)	0 - V _{IN}	
I _q – Standby current consumption	35mA	
η – Efficiency @ 10V, 30A, 25°C Amb	97.00%	
Output current variation with load	< ±0.50%	
Output current variation with temperature	< ±0.50%	
Current interruption fall time	1-2 ms (typ)	

4.2 MODEL CP30

Absolute Maximum Ratings		
Symbol	Parameter	Max
T_{amb}	Maximum ambient air temperature	50°C
I_{batt}	Maximum output current	30A
V_{MIN}	Minimum battery input voltage	11V
V_{MAX}	Maximum battery input voltage	60V
Electrical Characteristics		
Description	Value	
V_{OUT} - Output Voltage (adjustable)	0 - V_{IN}	
I_q – Standby current consumption	35mA	
η – Efficiency @ 10V, 30A, 25°C Amb	97.00%	
Output current variation with load	< $\pm 0.50\%$	
Output current variation with temperature	< $\pm 0.50\%$	
Current interruption fall time	1-2 ms (typ)	

5 OPTIONAL EXTRAS

5.1 SURGE BUSTER

(Please Note: To validate AERL’s COOLPRO CATHODIC CONVERTER™ product Warranty in lightning prone applications (ie. all pipelines and structures longer than 100 meters or higher than 10 meters), this 50KA/500 Joule “Surge Buster” lightning protection buffer module must be used to supplement the on-board surge protection in the CATHODIC CONVERTER™).

The lightning protection module with a total of 110,000 Amps of MOV surge protection provides common mode and differential surge protection for all Inputs, Outputs, local cabinet earth and Interrupt Control connections to the COOLPRO CATHODIC CONVERTER™. It also contains the optically isolated ON/OFF control and a surge protected opto-coupler for buffered/isolated ON/OFF interrupt control if permanently connecting an interrupt sequencer.



Electrical Characteristics	
Description	Value
Output current rating (non repetitive 8/20us rating)	50 000A
Output energy absorption (non repetitive 8/20us rating)	500 Joules
Output energy absorption (non repetitive 10/1000us rating)	230 Joules

5.2 CONSTANT STRUCTURE POTENTIAL CONTROL MODE

In some situations, overprotection of a structure may be harmful. Examples of such situations include protection of structures with painted coatings, and structures under mechanical stress (such as tanks, pressure vessels).

In these circumstances, precise control of corrosion potential can be achieved using a reference cell placed in the ground near the structure to be protected.

Electrical Characteristics	
Description	Value
Minimum controllable structure/ref cell potential	-2400mV
Minimum controllable structure/ref cell potential	2400mV

6 APPLICATION NOTES & FEATURES

6.1 CONSTANT CURRENT OUTPUT MODE

AERL COOLPRO CATHODIC CONVERTER™ control units are generally operated in constant current output mode. The output current is set using the 'A' trimpot located on the control module.

6.2 CONSTANT VOLTAGE OUTPUT MODE

The voltage limit overrides the current control mode in situations where the ground bed resistance increases due to periods of low ground moisture content.

This effectively limits the power that can be drawn from the batteries, protecting the batteries from heavy cycling.

The voltage limit is set using the 'V' trimpot located on the control module.

6.3 LOW BATTERY CUTOUT

AERL COOLPRO control units are fitted with an automatic low battery cutout feature to protect lead acid batteries from over-discharge.

The system will cut out when the battery voltage is below the cut-out voltage, and will wait until the battery has been recharged to the cut-in voltage before resuming normal operation.

The battery can be forced to cut-in at any time above the cut-out voltage by pressing the 'battery cut-out reset' pushbutton.



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Nominal Battery Voltage	Cut-out	Cut-in
12	11V	13V
24	22V	26V
36	33V	39V
48	44V	52V

6.4 INPUT REVERSE POLARITY PROTECTION

The power semiconductors are protected from input reverse polarity by an internal fuse.

6.5 OUTPUT SHORT CIRCUIT PROTECTION

The high speed current control limit effectively prevents high currents due to the event of output short circuit.

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