

Multi-Channel Constant Current Controller

Operating Instructions

INTRODUCTION

Your multi-channel current controller is a compact, precision, continuous duty electronic instrument for the independent control of a series of constant currents derived from a single, non-stabilized rectifier. It can be used in conjunction with almost any appropriately rated source of direct current. Every output of the controller is continuously and independently adjustable from zero to the maximum rated DC value. The current is stabilized, filtered and virtually ripple-free.

INSTALLATION and WIRING

Install the current controller in a well ventilated area. Do not block the vent slots at the bottom and top of the instrument. Avoid placing the controller in an area where corrosive fumes and spills could directly affect it.

The instrument allows to independently and simultaneously regulate currents in several parallel cathodic circuits. The

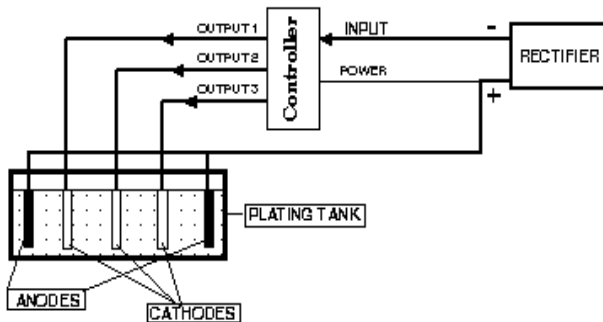


Figure 1

cathodes can be processed in the same or different plating tanks. Fig. 1 depicts the wiring of the

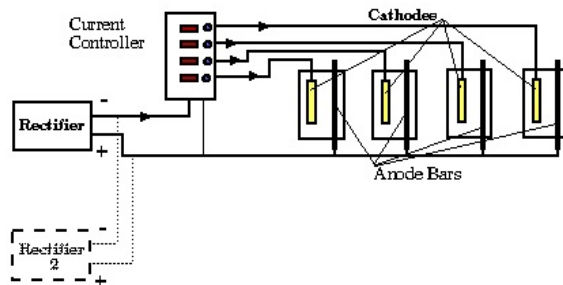


Figure 2

current controller for a single-tank operation.

For a multiple-tank operation, all tanks have to be connected to a common anodic circuit as shown in Fig. 2.

Connect the negative input of the instrument to the negative output pole of the power source (rectifier). **Use a wire of sufficient cross-section, rated at the total**

amperage for all independent outputs. Using a smaller (16 gauge min.) wire, connect the positive input of the controller to the positive output of the rectifier or directly to the anode bus-bar. Using wires of appropriate current-carrying capacity (10 gauge wire for up to 25 A, 12 gauge for 10 A), connect each independent output of the instrument to the corresponding cathode. Do not plate independently controlled cathodes on a common conductive cathode bar in the plating tank - parts have to be electrically isolated for individual current adjustments.

Note: Two or more small-capacity rectifiers can be used in parallel (see Fig. 2) to power the current controller. Under such conditions, maintain the output currents of the rectifiers connected in parallel within 10-20% of each other.

OPERATION

Set the DC voltage supplied to the instrument at 1-2 V higher than is needed for the plating process, but no less than 6 V DC. Turn on the switch located on front panel. The LED displays will light up. Immerse the cathodes in the plating tank and adjust each load current to the desired value using control knobs located next to the corresponding current meters. If a knob reaches its limit before the current achieves its maximum rated value, the input voltage is insufficient - increase it



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until current attains the desired value. If necessary, further adjust the currents after the voltage had been increased. Once set, the currents will remain unchanged indefinitely, regardless of the variations in the size and condition of your anodes, bath temperature or pH, input voltage fluctuations and ripple etc.

To plate at a current, higher than the maximum rated per output value, connect two or more outputs to the same cathode. Add readings of the corresponding meters to obtain the actual output current.

Warning: Avoid using the current controller at an input voltage significantly higher (over 5-7 V) than is necessary for the desired current, as this might lead to overheating and failure of power elements

Caution: The sides and top of the current controller could reach a temperature of 120-160°F during normal operation. Do not touch these surfaces during operation or shortly thereafter



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POTENTIAL PROBLEMS and SOLUTIONS

PROBLEM	CAUSE/ACTION
Current readings fluctuate	<p>1. <u>Cause:</u> Insufficient input voltage <u>Action:</u> Increase input voltage in 0.5-1.0 V increments until current stabilizes</p> <p>2. <u>Cause:</u> High ripple of the DC current source. <u>Action:</u> Repair rectifier</p>
Output Current is not '0' when the control knob is turned to a full stop counterclockwise	<p><u>Cause:</u> The corresponding channel is defective and needs to be repaired. Other channels can be used in the meantime</p> <p>Note: A reading of 0.4 mA may be observed on high resolution controllers reflecting the internal rectifier's offset current. This is not a malfunction and does not affect the accuracy of the instrument under load.</p>
LED displays do not light up	<p><u>Cause:</u> Input voltage less than specified minimum <u>Action:</u> Increase input voltage</p>
Current Controller sides and top too hot (>200 Deg. F)	<p><u>Cause:</u> Input voltage exceeds necessary tank voltage by more than 5 VDC. <u>Action:</u> Reduce input voltage (see warning on p.3)</p>



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LIMITED WARRANTY

NiCoForm Inc., 72 Cascade Dr. Rochester, NY 14614, (877)278-0098 (ph), (585)454-5167 (fx) warrants this current controller to the original purchaser for six months from the date of purchase against defective material or workmanship. It is the obligation of the purchaser to forward the unit to the authorised service and repair representative for warranty repairs.

This limited warranty is void if the product is misused, subjected to careless handling, or repaired by anyone other than the manufacturer or its authorized representative.

Authorized Service and Repair Representative:

ATA Access, 179 Fern Rd., East Brunswick, NJ 08816

732- 690-6080 (ph); 732-651-9725 (fx)

ataaccess@aol.com



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Specifications

Model	CC3*15/6F	Number of Outputs	3 Independent Channels
Display Type	3 1/2-digit LED	Current per Channel	0.02 A Min., 15 A Max.
Display Resolution	10 mA	Mode of Operation	Constant Current
Accuracy	0.5 %	Noise & Ripple	0.3% Max.
Duty	Continuous	Input	4.5 V DC Min., 45 A Max
Footprint	8.25"x 5"	Serial No	

Model	CC4*10/6F	Number of Outputs	4 Independent Channels
Display Type	3 1/2-digit LED	Current per Channel	0.02 A Min., 12.5 A Max.
Display Resolution	10 mA	Mode of Operation	Constant Current
Accuracy	0.5 %	Noise & Ripple	0.3% Max.
Duty	Continuous	Input	4.5 V DC Min., 50 A Max
Footprint	8.25"x 5"	Serial No	

Model	CC4*2/6F	Number of Outputs	4 Independent Channels
Display Type	3 1/2-digit LED	Current per Channel	1 mA Min., 1.999 A Max.
Display Resolution	1 mA	Mode of Operation	Constant Current
Accuracy	0.5 %	Noise & Ripple	0.3% Max.
Duty	Continuous	Input	4.5 V DC Min., 8 A Max.
Footprint	8.25"x 5"	Serial No	



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Model	CC4*0.2/6F	Number of Outputs	4 Independent Channels
Display Type	3 1/2-digit LED	Current per Channel	.1 mA Min., 199 mA Max.
Display Resolution	0.1 mA	Mode of Operation	Constant Current
Accuracy	0.5 %	Noise & Ripple	0.3% Max.
Duty	Continuous	Input	4.5 V DC Min., 0.8 A Max.
Footprint	8.25"x 5"	Serial No	

Model	CC6*2/6F	Number of Outputs	6 Independent Channels
Display Type	3 1/2-digit LED	Current per Channel	1 mA Min., 1.999 A Max.
Display Resolution	1 mA	Mode of Operation	Constant Current
Accuracy	0.5 %	Noise & Ripple	0.3% Max.
Duty	Continuous	Input	4.5 V DC Min., 12 A Max.
Footprint	8.25"x 5"	Serial No	