

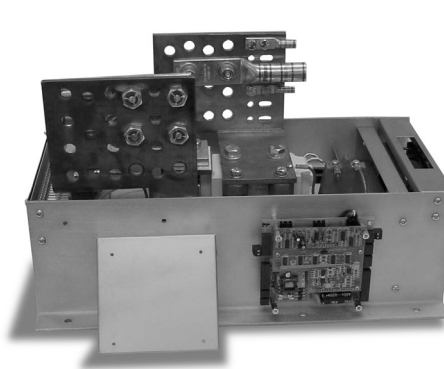
## Single Phase SCR Power Pak

### Features:

- 120-575 Vac @ 100-1200 Amp
- Zero Cross-Over Firing
- Isolated Control Circuit
  - On/Off Control Inputs:  
120 Vac, 240 Vac, 5-32 Vdc  
Dry Contact Closure
  - Proportional (DOT firing)  
Inputs:  
4-20 mA, 0-5 Vdc, 1-5 Vdc,  
0-10 Vdc  
Remote Manual Adjust,  
Remote Auto Manual  
Switch
- Flexible I/O Power Wiring
- Shorted SCR Detection (option)
- Easy Customer Interface
- Remote Shutdown
- Electronically protected with  
temperature warning and  
shutdown system
- Compact Size and Construction
- Touch-Safe (option on  
100 to 650 Amp models)
- dv/dt Transient Voltage  
Protection
- MOV Protection
- Single or Three Cycle Resolution  
(Jumper selectable)

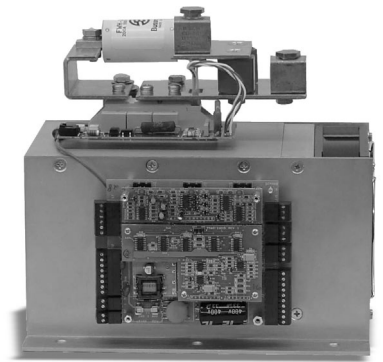


**Chromalox®**  
PRECISION HEAT AND CONTROL



**Touch Safe Design**

\*Shown without cover



**Open Design**

### Description

The MaxPac Series is specifically designed for the OEM market. The plug-in options, flexible I/O power wiring, space saving footprint, optional lug kits, I<sup>2</sup>t fusing and universal approvals make it an excellent candidate for your product.

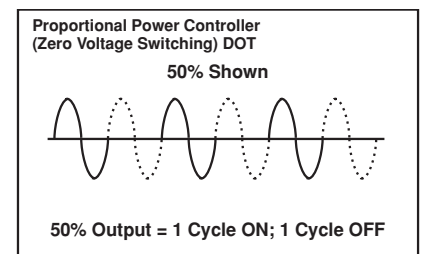
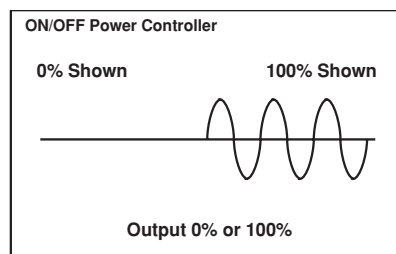
#### Typical Applications:

- Resistive Heaters
- Electric Ovens
- Furnaces
- Kilns
- Environmental Chambers

The Chromalox Model MaxPac I Single Phase Solid State SCR Power Controller is a highly versatile power pak with optional plug-in proportional Firing and Shorted SCR Detection Boards. Firing modes include: "ON/OFF Power Control" (Contactor) and "Proportional Power Control" (Zero Voltage Switching, DOT fire).

Chromalox's exclusive DOT (Demand Oriented Transfer) firing switches the fewest number of cycles to provide the most precise zero crossover control. At 50% output the unit's output alternates between one electrical cycle on and one cycle off. At 51% the output continues with one cycle on / one cycle off and gradually integrates one extra "on" cycle for the additional one percent. With the exception of phase angle firing, DOT firing is the most precise method of SCR control. DOT firing is preferred in many applications because phase angle firing creates unwanted RFI. DOT is excellent for applications where consistent heater/process temperature control is critical.

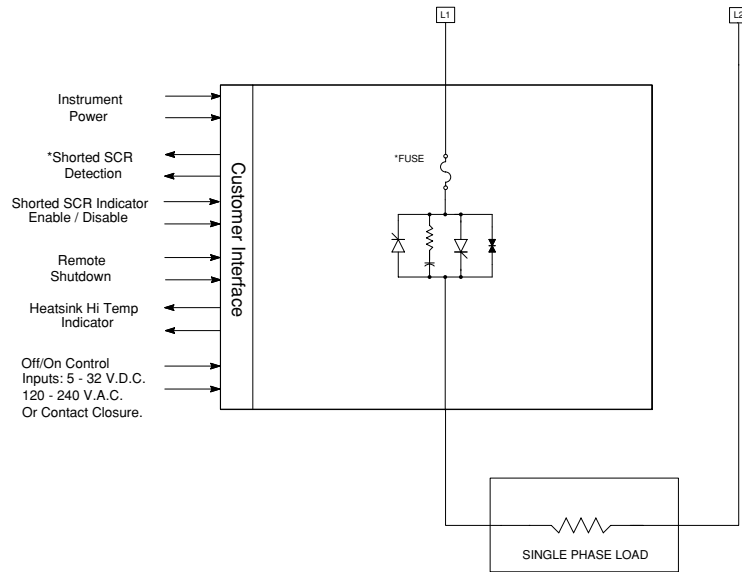
### Wave Form Cycle Rate



## Solid State SCR Power Controls for Two Types of Applications

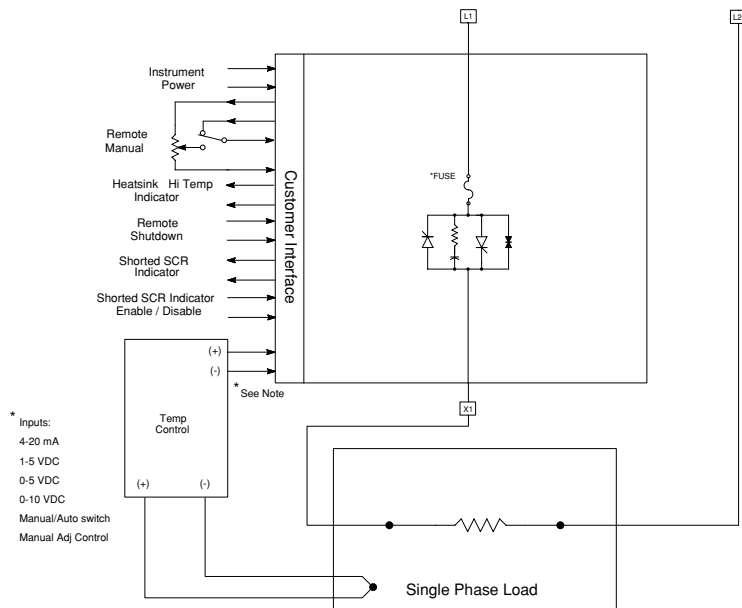
### ON/OFF Control (Solid State Contactor)

Capable of directly replacing a single-phase mechanical contactor for maintenance-free operation or can be used in conjunction with PID control. With true zero voltage switching RFI (Radio Frequency Interference) is virtually eliminated. The MaxPac I provides LED's for visual indication of the controller operation.



### Proportional Power Controller

This proportional power controller utilizes the "Zero Voltage Switching" technique to modulate power for a wide range of resistive loads. The unit accepts a Remote Auto/Manual Switch and Potentiometer Control Kit (optional). Output power modulation is accomplished by Chromalox's exclusive Demand Oriented Transfer (DOT) system which virtually eliminates RFI. Thermal cycling and heater degradation are minimized with the system's fast response time.



# MAXPAC™ I Power Pak

## Specifications

### Control Inputs

Accepts all of the following as standard:

#### On/Off Control

Signal Input

120 Vac  $\pm$  10%

230 Vac  $\pm$  10%

5-32 Vdc

Contact Closures

#### Proportional Control

Signal Input

Input Impedance

4-20 mA ..... 250 Ohms

1-5 Vdc ..... 10k Ohms or greater

0-5 Vdc ..... 10k Ohms or greater

0-10 Vdc ..... 10k Ohms or greater

Optional Remote Manual Adjust

Auto/Manual Switch

**Instrument Power** ..... 120 or 230 VAC  
50/60 Hz

**Output Voltage** ..... 0-99% RMS line voltage  
( $E_o = V_{supply} - 1.5V$  SCR forward drop)

**Resolution (Prop.)** ..... Better than 0.1%

**Line Voltage** ..... 120-575 Vac

**Load Current Rating** ..... 100, 150, 200, 300, 400, 550,  
650, 800, 1000, 1200A

**Ambient Temperature** ..... 0-50°C (32-122°F)

**SCR Capability** ..... Dielectric withstand  
capability 1500V RMS min.

**Surge Rating** ..... Typically fifteen (15) times  
nominal RMS rating for  
8.3 milliseconds

**Isolation** ..... SCR's isolation 2500V  
Input-output isolation 1500V

**Heatsink** ..... Ground potential up to  
650 amps

**High Temperature Indicator Output** ..... MOSFET Output  
100 mA @ supply voltage

**Shorted SCR Indicator Output** ..... MOSFET Output  
100 mA @ supply voltage

## Mechanical Features

- LED Indication of Firing
- Customer Control Connections are made on a Plug-In Screw Type Terminal Block
- Optional Remote Manual Adjust and Auto/Manual Switch
- Heatsink Mounted Temperature Sensor
- Built-In Power Distribution

## Electrical Features

- SCRs PIV 1200V Minimum (1400 Volts on 575 Volt model)
- Isolated Semiconductor Power Blocks are used on all Current Ratings up to 650 Amps

## Safety Features

### Personnel Safety

- Ground Potential Heat Sink up to 650 Amps
- SCR to Heat Sink Isolation up to 650 Amps
- Touch-Safe Option

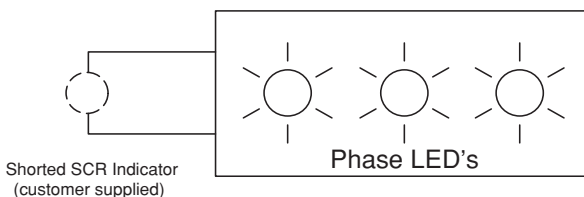
### Equipment/Process Safety

- Input to Output Isolation
- dv/dt Transient Voltage Protection
- Optional I<sup>2</sup>t Fusing
- Remote Shutdown
- Optional Shorted SCR Detection
- MOV

# MAXPAC I Power Pak

## Shorted SCR Detection Option

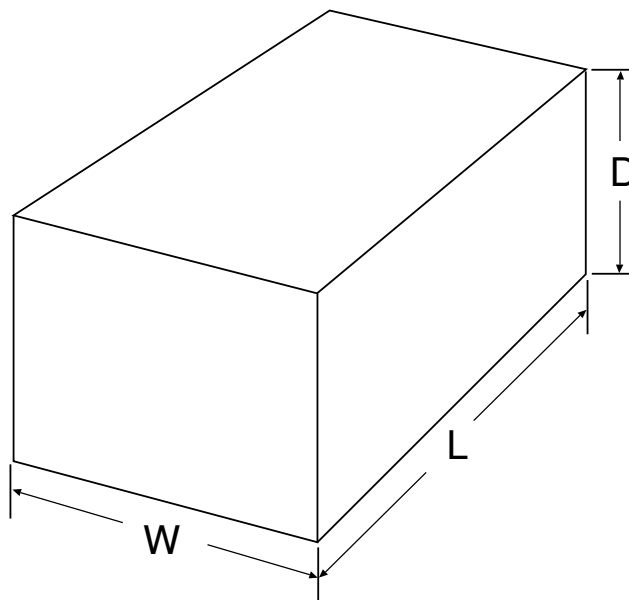
The MaxPac I, with the shorted SCR detection circuit, will monitor the output of the SCR. If it fails shorted, the output will be activated and the LED on the circuit board will light.



## Mounting Dimensions

### MaxPac I Open

	Width	Length	Depth
Amps	W	L	D
100	7.75	9.75	10
150	7.75	9.75	10
200	7.75	9.75	10
300	7.75	9.75	10
400	9.5	14.75	11
550	11	17.75	11
650	11	17.75	11
800	17	27	17
1000	17	27	17
1200	17	27	17



### MaxPac I Closed

	Width	Length	Depth
Amps	W	L	D
100	9.5	14.75	11.8
150	9.5	14.75	11.8
200	9.5	14.75	11.8
300	9.5	14.75	11.8
400	9.5	14.75	11.8
550	11	17.75	11.8
650	11	17.75	11.8

## Enclosure Options

The MaxPac I can be installed in an enclosure by itself (see Model 4131) or as part of a complete custom control system. Chromalox's UL panel shop and engineering staff can design, document and build a system to meet your power control requirements.

## Ordering Information

Model      SCR Power Pack

### MXPC I      Single Phase SCR Power Pack

#### Code      Control Configuration

- |   |   |
|---|---|
| 1 | On/Off Standard (Accepts: 120Vac, 240Vac, 5-32Vdc, Dry Contact Closure)         |
| 2 | On/Off Control with Shorted SCR Detection                                       |
| 3 | Proportional Control, DOT Firing (Accepts: 4-20 mA, 1-5 Vdc, 0-5 Vdc, 0-10 Vdc) |
| 4 | Proportional Control, DOT Firing with Shorted SCR Detection                     |

#### Code      Current at 50°C (122°F)

- |    |          |                   |
|----|----------|-------------------|
| 01 | 100 Amp  | Open Design       |
| 02 | 100 Amp  | Touch Safe Design |
| 03 | 150 Amp  | Open Design       |
| 04 | 150 Amp  | Touch Safe Design |
| 05 | 200 Amp  | Open Design       |
| 06 | 200 Amp  | Touch Safe Design |
| 07 | 300 Amp  | Open Design       |
| 08 | 300 Amp  | Touch Safe Design |
| 09 | 400 Amp  | Open Design       |
| 10 | 400 Amp  | Touch Safe Design |
| 11 | 550 Amp  | Open Design       |
| 12 | 550 Amp  | Touch Safe Design |
| 13 | 650 Amp  | Open Design       |
| 14 | 650 Amp  | Touch Safe Design |
| 15 | 800 Amp  | Open Design       |
| 16 | 1000 Amp | Open Design       |
| 17 | 1200 Amp | Open Design       |

#### Code      Line Voltage

- |   |                  |
|---|------------------|
| 1 | 120 Vac - 480Vac |
| 2 | 575 Vac          |

#### Code      Instrument Power

- |   |                  |
|---|------------------|
| 1 | 120 Vac 50/60 Hz |
| 2 | 230 Vac 50/60 Hz |

#### Code      Compression Lug Kits (Open Design up to 300 Amps)

For Other Ranges See Crimp Lug Chart

- |    |  |
|----|--|
| L0 | None   |
| L1 | 100 - 150 Amp PAK 1(#2 - 4/0)/connection     |
| L2 | 200 - 300 Amp PAK 1(1/0 - 500mcm)/connection |

MXPC I -      2      03      1      1      L1      (Continued on next page)

## Ordering Information (Continued)

MXPC I					
					<p><b>Fusing Option <sup>(1)</sup></b></p> <p><i>For &lt; 500Vac Applications, Select One</i></p> <p><b>F00</b> None</p> <p><b>F01</b> 100 -150 Amp PAK (200 Amp Fuse)</p> <p><b>F02</b> 200 Amp PAK (250 Amp Fuse)</p> <p><b>F03</b> 300 Amp PAK (400 Amp Fuse)</p> <p><b>F04</b> 400 Amp PAK (500 Amp Fuse)</p> <p><b>F05</b> 550 Amp PAK (700 Amp Fuse)</p> <p><b>F06</b> 650 Amp PAK (800 Amp Fuse)</p> <p><b>F07</b> 800 Amp PAK (1000 Amp Fuse)</p> <p><b>F08</b> 1000 Amp PAK (1200 Amp Fuses)</p> <p><b>F09</b> 1200 Amp PAK (Two 1000 Amp Fuses)</p> <p><i>For 575Vac Applications, Select One<sup>(2)</sup></i></p> <p><b>F10</b> 100 Amp PAK (125 Amp Fuse)</p> <p><b>F11</b> 150 Amp PAK (175 Amp Fuse)</p> <p><b>F12</b> 200 Amp PAK (250 Amp Fuse)</p> <p><b>F13</b> 300 Amp PAK (400 Amp Fuse)</p> <p><b>F14</b> 400 Amp PAK (500 Amp Fuse)</p> <p><b>F15</b> 550 Amp PAK (700 Amp Fuse)</p> <p><b>F16</b> 650 Amp PAK (800 Amp Fuse)</p> <p><b>F17</b> 800 Amp PAK (1000 Amp Fuse)</p> <p><b>F18</b> 1000 Amp PAK (1200 Amp Fuse)</p> <p><b>F19</b> 1200 Amp PAK (Two 1000 Amp Fuses)</p> <p><b>Remote Manual Adjust/Auto Manual Switch</b></p> <p><b>0</b> None</p> <p><b>1</b> Pot with 0 - 100% dial and Local/Remote Switch<sup>(2)</sup> Single Turn 1K<math>\Omega</math> Potentiometer</p>
<b>MXPC I</b>	<b>-</b>	<b>2</b>	<b>03</b>	<b>1</b>	<b>1</b>
				<b>L1</b>	<b>F01</b>
					<b>1</b>
					<b>Typical Model Number</b>

- 1) SCR Fusing is for semiconductor protection only, not wire protection.
- 2) Supplied Loose for Customer Mounting.

**Note:**  
Storage Temperature 14°F to 158°F (-10°C to 70°C).  
CE application requires filters.

**Chromalox Part Numbers**  
0005-60055 – Line filter, single phase, 230VAC  
0005-60057 – Line filter, 120-230VAC

Crimp Lug Chart		
Chromalox #	Panduit #	Conductor Size
0135-10002	LCD8-14A-L	#8 AWG
0135-10003	LCD6-14A-L	#6 AWG or #6 Weld
0135-10004	LCD4-14A-L	#4 AWG or #4 Weld
0135-10005	LCD2-56B-Q	#2 AWG
0135-10006	LCD1-56C-E	#1 AWG or #2 Weld
0135-10007	LCD1/0-12-X	#1/0 AWG or #1 Weld
0135-10008	LCD2/0-12-X	#2/0 AWG or #1/0 Weld
0135-10009	LCD3/0-12-X	#3/0 AWG or #2/0 Weld
0135-10010	LCD4/0-12-X	#4/0 AWG or #3/0 Weld
0135-10011	LCD250-12-X	250 MCM or #4/0 Weld
0135-10012	LCD300-12-X	300 MCM
0135-10013	LCD350-12-6	350 MCM
0135-10014	LCD400-12-6	400 MCM
0135-10015	LCD500-12-6	500 MCM

**Note:** NEMA standard two hole copper crimp lugs only.