

MiniMax™ 3

Three Phase, Six-SCR Power Pak

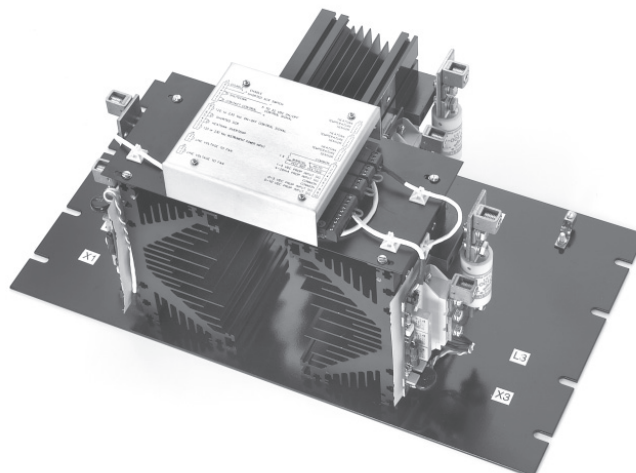
Features:

- 120-575 Vac @ 30-75 Amp
- Zero Cross-Over Firing
- Isolated Control Circuit
 - On/Off Control Inputs:
120 Vac, 240 Vac, 5-32Vdc
Dry Contact Closure
 - Proportional (DOT firing)
Inputs:
4-20mA, 0-5Vdc, 1-5Vdc,
0-10Vdc
- 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
- dv/dt Transient Voltage
Protection
- MOV Protection
- Six SCR Full Converter
- 3-Phase Delta, 3-Wire Wye or
4-Wire Wye Connected Loads
- Dot-Fired with Single or Three
Cycle Resolution (Jumper
selectable)



ISO9001
APPROVED • CERT. NO. A3164

Chromalox®
PRECISION HEAT AND CONTROL



Description

The MiniMax Series is specifically designed for the OEM market. The plug-in options, flexible I/O power wiring, space saving footprint and universal approvals make it an excellent candidate for your product.

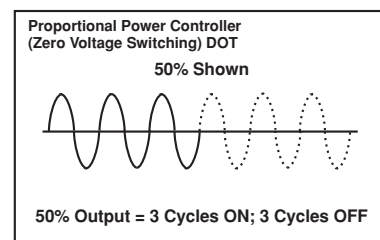
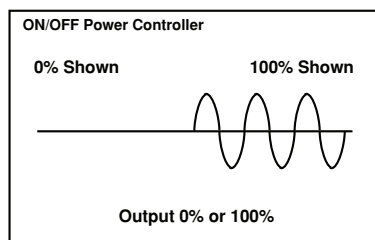
Typical Applications:

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

The Chromalox Model MiniMax 3 is a solid state, highly versatile power pak with optional plug-in proportional firing and shorted SCR detection boards. Firing techniques 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 three electrical cycles on and three cycles off. At 51% the output continues with three cycles on / three cycles off and gradually integrates three extra "on" cycles 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

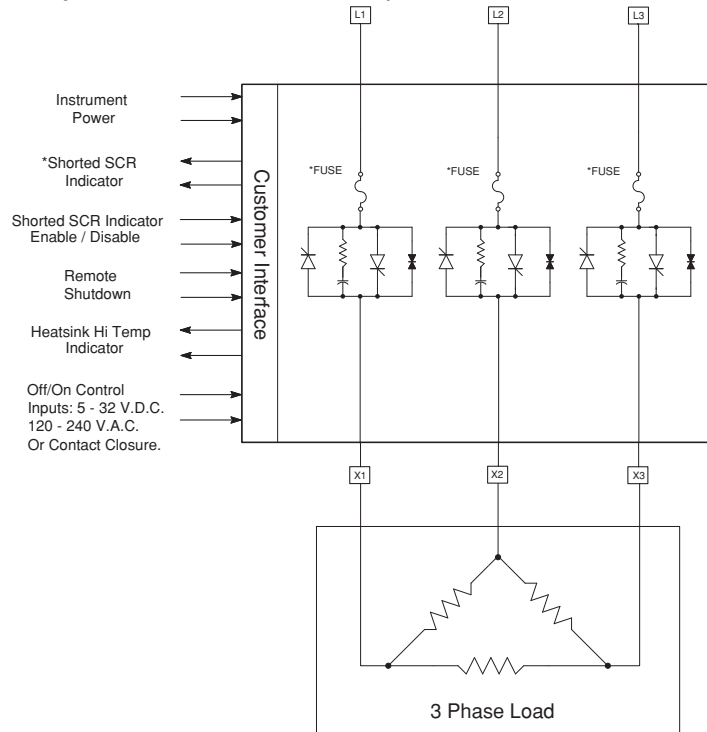


MiniMax 3 Power Pak

Solid State Six SCR Power Controls for Two Types of Applications

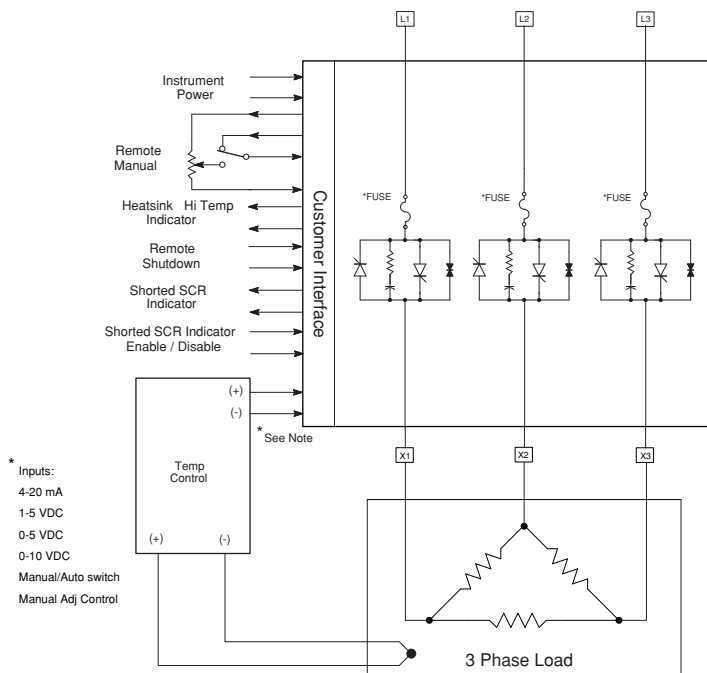
ON/OFF Control (Solid State Contactor)

Capable of directly replacing a three-phase mechanical contactor for maintenance-free operation. With true zero voltage switching RFI (Radio Frequency Interference) is virtually eliminated. The MiniMax 3 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. 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.



MiniMax 3 Power Pak

Specifications

Control Inputs

Accepts all of the following as standard:

On/Off Control

Signal Input

120 Vac $\pm 10\%$

230 Vac $\pm 10\%$

5-32Vdc

Contact Closures

Proportional Control

Signal Input

Input Impedance

4-20mA.....250 Ohms

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

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

0-10Vdc.....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 30, 50, 75 Amp

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

High Temperature.....MOSFET Switch

Indicator Output 100mA @ instrument power

Shorted SCR MOSFET Switch

Indicator Output 100mA @ instrument power

Mechanical Features

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

Electrical Features

- PIV 1200V Min at 480 Vac
PIV 1400V Min at 575 Vac
- Isolated Semiconductor Power Blocks are used on all Current Ratings
- I²T Fusing

Safety Features

Personnel Safety

- Ground Potential Heat Sink
- SCR to Heat Sink Isolation

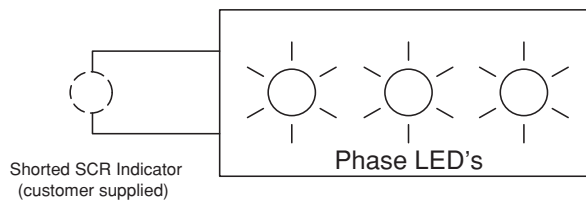
Equipment/Process Safety

- Input to Output Isolation
- Transient Overvoltage Protection, (dv/dt)
- I²t Fusing for SCR Protection
- Remote Shutdown
- Shorted SCR Detection (optional)

MiniMax 3 Power Pak

Shorted SCR Detection Option

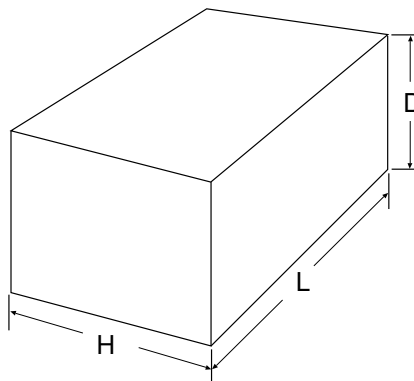
The MiniMax 3, with the shorted SCR detection circuit, will monitor the output of the SCRs. If one fails shorted, the output will be activated and the LED on the circuit board will light. The LED indicates which phase has the shorted SCR.



Mounting Dimensions

MiniMax 3 Open

	Height	Length	Depth
Amps	H	L	D
30	10	14	7.75
50	10	14	7.75
75	10	14	9.5



Ordering Information

Model **SCR Power Pack**

Mmax3 **3 Phase Six SCR Power Controller Complete with Lugs and I²T Fusing**

Code Control Configuration

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

Code Current at 50°C (104°F) Ambient

- 01** 30 Amp
- 02** 50 Amp
- 03** 75 Amp

Code Line Voltage

- 1** 120 - 480 Vac
- 2** 575 Vac²

Code Instrument Power

- 1** 120 to 240 Vac 50/60Hz

Code Remote Manual Adjust/Auto Manual Switch

- 0** None
- 1** Pot with 0-100% dial and local/Remote Switch, Single Turn 1K ohm Potentiometer (Proportional control only)

Mmax3- **3** **01** **1** **1** **0** **Typical Model Number**

- 1) SCR fusing is for semiconductor protection only, not wire protection.
- 2) Fuses are supplied loose for 575 Vac applications.
- 3) Potentiometer supplied loose for customer mounting.

Chromalox Part Numbers

- 0005-60056 – Line filter, three phase, 440VAC
- 0005-60057 – Line filter, 120-230VAC

CE application requires filter.

Note:

Storage Temperature 14°F to 158°F (-10°C to 70°C).
CE Application requires filters.

Mmax 3 PDS
November 2004