

## Three-Phase, Phase-Angle, 6 SCR Power Controller

### Features

- 6 SCR Phase-Angle Control
- Linear control of RMS Voltage with respect to command signal, or other parameters represented by a 0/5Vdc signal
- Adjustable True RMS Current Limit
- User Adjustable Over Current Trip
- Shorted SCR Detection
- Soft Start with Missing Cycle Detection
- In-Line, Inside-Delta and 3 or 4 Wire WYE Control
- Digital Timing & 50/60 Hz Operation
- Multiple Tap Operating Voltages
- Plug-In & Interchangeable Circuit Card
- 8 Diagnostic/Status LEDs
- Optical Coupled Gatedrives
- Over Temp Protection
- High Surge Current Rating
- Auto-Phase rotation detection



### Description

The Model 3629C is a three phase, six SCR, phase-angle power controller. The controller linearly controls, with respect to a command signal, either the RMS value of the load voltage or the average value of the load voltage. When configured to accept an external feedback signal, the 3629C linearly controls other parameters such as load current or load power. The controller can be configured to accept most standard industrial command signals, as well as non-standard commands.

The Model 3629C is available with current ratings from 50 to 1000 amperes, and voltage ratings from 208 to 575Vac. The controller will operate without adjustment or modification on 50 or 60 Hertz, and can be connected for in-line, inside-delta or 4-wire wye operation.

The Model 3629C is intended for controlling transformer coupled loads, fast responding loads, and non-linear loads in which the resistance changes with time or age. Examples include Scott-T transformers, step-up transformers used in high frequency induction heating, fast responding lamps, and non-linear loads such as tungsten, silicon carbide, and molybdenum disilicide.

### Applications

- Variable Resistance Loads
  - Silicon Carbide
  - Molybdenum Disilicide
  - Graphite
- Vacuum Furnaces
- Transformer Coupled Loads
- Fast Responding Loads
- T-3 Lamps
- High Frequency Induction Heating

### Certification:

CERTIFIED  
BY UL TO  
CANADIAN  
NATIONAL  
STANDARDS



LISTED 3L32  
INDUSTRIAL  
CONTROL  
EQUIPMENT  
E136219

# 3629C Description

## Adjustable Current Limiting.

Current limit provides a means by which the user can prevent the load current from exceeding a preset value. This feature prevents surge currents when controlling loads that have a low resistance when cold. Metering of this setting is possible from the command connector. Remote set capability is available, contact factory for information.

## Over Current Trip.

The over current trip provides an adjustable means to remove power when a load fault occurs. The over current trip feature, in the event of excessive current, prevents the SCRs from being turned ON and energizes a relay with form "C" contacts rated for 250V @ 5A. The relay contacts can be used to activate an alarm or remove system power. The over current trip is preset at 175% of the current rating of the controller. The relay and operation of the controller are reset by momentary closure of a remote contact or by momentarily removing power from the controller. Metering of this setting is possible from the command connector.

## Shorted SCR Detection.

A relay with form "C" contacts rated for 250V @ 5A is energized in the event an SCR fails in the ON state.

## Soft Start.

Soft start sets the output to zero on start up, or after a momentary power interruption, and then ramps the output to the desired level at a predetermined rate.

## Diagnostic LEDs.

The diagnostic/status indicating LEDs provide a convenient and safe method of analyzing the operation of the controller.

## Line OK LED.

Indicates that three phase power is present. The controller is ready to run.

## Command LED.

Varies intensity with the level of the applied command signal.

## Line Current LEDs (3).

Varies intensity with the level of load current in each of the three phases.

## Over Current Trip LED.

Indicates that the over current trip relay is activated.

## Shorted SCR LED.

Indicates that an SCR has failed in the ON state.

## Current Limit LED.

Indicates that the controller is operating in current limit state.

## Automatic Phase Detection.

The Model 3629C is not phase rotation sensitive.

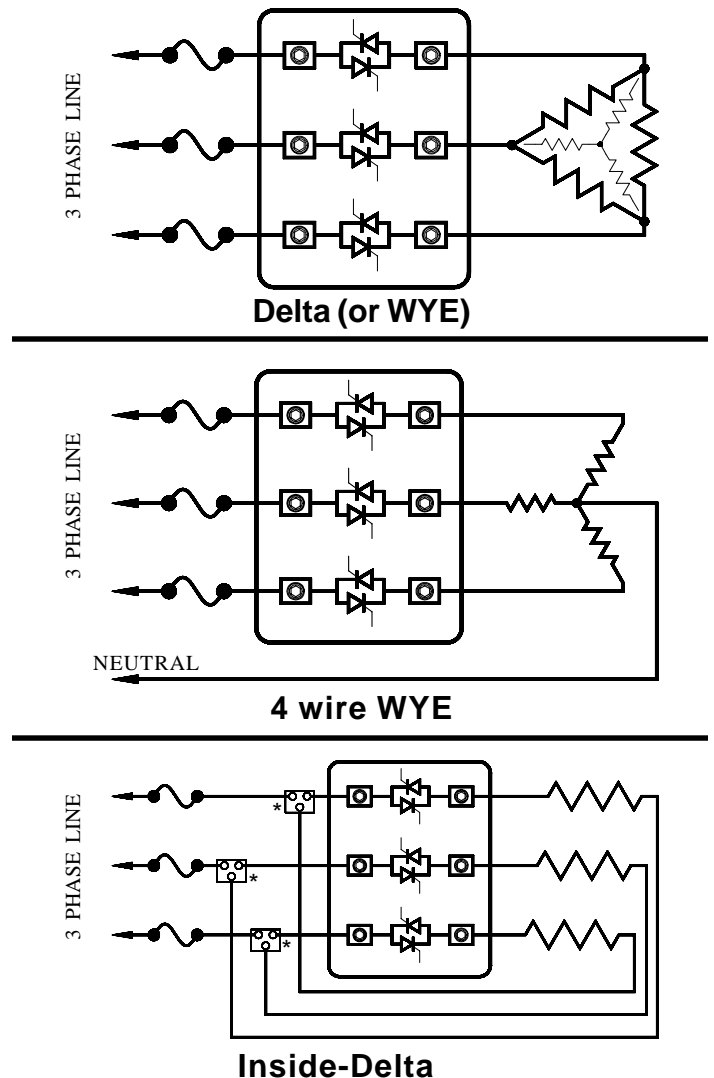
## Digital Phase Locked Loop (PLL) Timing.

PLL timing ensures a stable, transient immune, accurate timing method that automatically synchronizes to the supply frequency and digitally determines when each SCR is to be turned on. The unique timing circuitry allows the controller to operate at 50 or 60 Hertz without adjustment or modification.

## Optically Coupled SCR Gate Drives.

Optically coupled SCR gate drives provide superior transient immunity and electrical isolation than conventional techniques using pulse transformers. This technique virtually eliminates false operation and prevents SCR failure that can result when SCRs are not properly gated into the ON state.

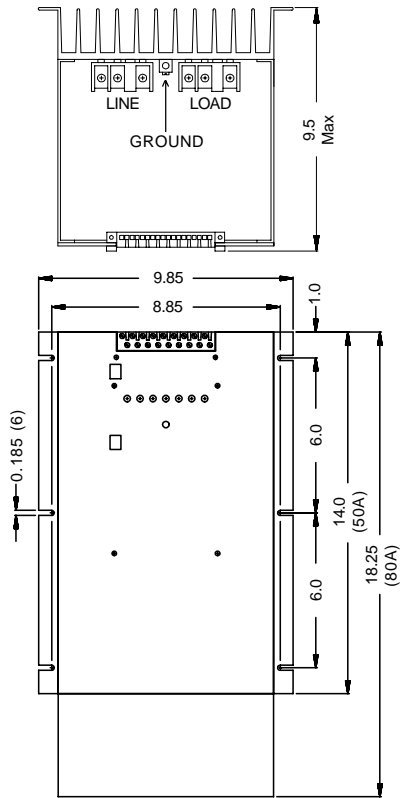
## Wiring Examples



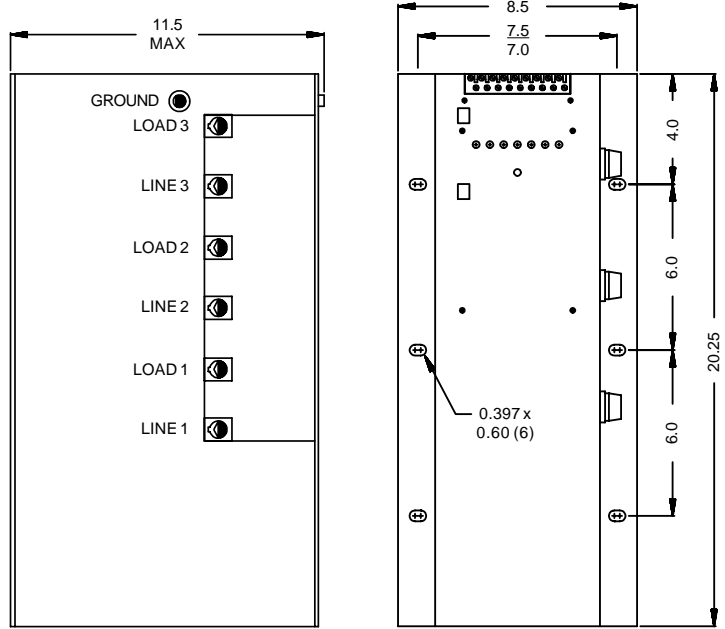
\*External Power Distribution Blocks Must be Supplied By Customer

**MODEL 3629C NOT SUITABLE FOR  
WYE-WYE TRANSFORMER COUPLED LOADS**

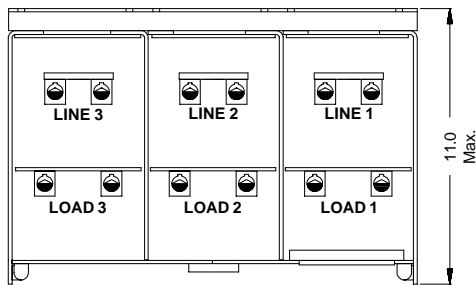
# 3629C Dimensions



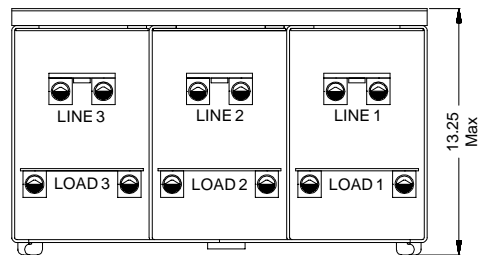
**50 & 80 Amp**



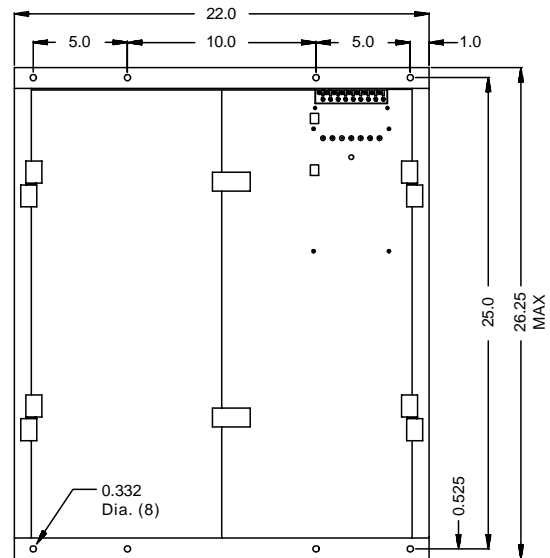
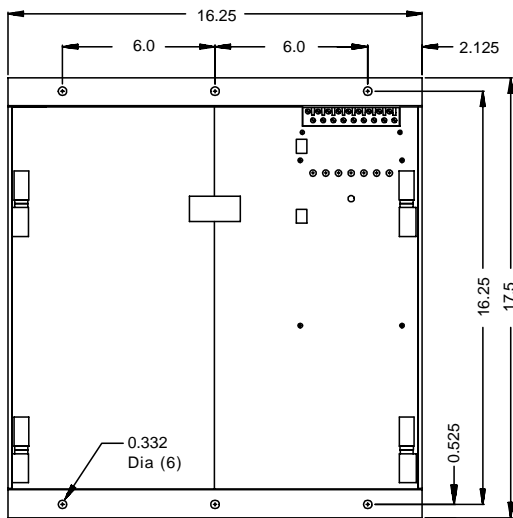
**120 & 160 Amp**



**200 thru 425 Amp**



**500 thru 1000 Amps**



All Dimensions In Inches

# 3629C Specifications

<b>Control Mode(s)</b>	Three-phase in line or inside delta 6 SCR phase angle control of the RMS or average load voltage. External feedback control available.	<b>Line/Load Wire Size</b>	50 & 80Amp: 14ga to 2 ga wire. 120Amp & up: 4ga to 500mcm										
		<b>Load Current</b>	50, 80, 120, 160, 200, 250, 300, 380, 425, 500, 600, 750, 1000A.										
<b>Command Signal</b>	<table border="0"> <tr> <td><b>Signal</b></td> <td><b>Impedance</b></td> </tr> <tr> <td>0/5Vdc</td> <td>200K Ohms</td> </tr> <tr> <td>0/10Vdc</td> <td>200K Ohms</td> </tr> <tr> <td>Potentiometer</td> <td>200K Ohms</td> </tr> <tr> <td>4/20mA</td> <td>300 Ohms</td> </tr> </table>	<b>Signal</b>	<b>Impedance</b>	0/5Vdc	200K Ohms	0/10Vdc	200K Ohms	Potentiometer	200K Ohms	4/20mA	300 Ohms	<b>dv/dt and Transient Voltage</b>	200 Volts/microsecond minimum. Uses a dv/dt snubber and a metal oxide varistor (MOV).
		<b>Signal</b>	<b>Impedance</b>										
0/5Vdc	200K Ohms												
0/10Vdc	200K Ohms												
Potentiometer	200K Ohms												
4/20mA	300 Ohms												
<b>Control Range</b>	0 to 98% of line voltage.	<b>Cooling</b>	Convection cooling on 50A unit. Forced air fan cooling on all others.										
<b>Linearity</b>	Output is linear within 2% of span over entire range of control.	<b>Weight</b>	50A: 25 pounds, 80A, 33 pounds, 120A and 160A: 40 pounds, 200A thru 425A: 62 pounds, 500A thru 1000A: 82 pounds.										
<b>Zero and Span</b>	Factory preset. Multi-turn potentiometers allow zero and span adjustments of $\pm 25\%$ of span.												
<b>Current Limit</b>	User adjustable over a range from 20% to 125% of rated current.	<b>Temperature</b>	Operating: 0 to 55°C (32 to 131°F) Storage: -40 to 80°C (-40 to 176°F) 87°C Thermostat on heatsink										
<b>Over Current trip</b>	User adjustable over a range from 50% to 300% of rated current.	<b>Overtemp protection</b>	Output is interrupted in the event that adequate cooling does not occur.										
<b>Isolation</b>	Dielectric strength, input/output and load voltage/heatsink: 2500V(RMS)	<b>Heat Dissipation</b>	1.5 Watts per amp of controlled current per phase.										
<b>Mounting</b>	Convection cooled: HS fins vertical. Forced air cooled: any orientation.	<b>Load &amp; Line Fusing</b>	Class T fuses are recommended for up to 600 Amp frames. Semiconductor fuses are recommended for larger frames. Control transformer is protected by fast acting fuses.										
<b>Line Voltage</b>	208, 240, 380, 415, 440, 480, and 575 Vac, 3 phase, +10%, -15%, 50/60 Hz.												
		<b>SCR Ratings</b>	Peak forward and reverse rating: 1600 Volts minimum.										

## Ordering Information:

3629C - X - XXX - XXX - XX/XX - ILXXX

Basic Model Number \_\_\_\_\_

Feedback: **V** = RMS Voltage; **A** = Average Voltage; **E** = External \_\_\_\_\_

Voltage: **208V, 240V, 380V, 415V, 480V, or 575V.** \_\_\_\_\_

Current Rating: **50, 80, 120, 160, 200, 250, 300, 380, 425, 500, 600, 750 or 1000** Amps. 1000 Amp not UL listed \_\_\_\_\_

Command Signal: **0/5Vdc, 0/10Vdc, 4/20mA or Potentiometer.** \_\_\_\_\_

Current Limit: Specify only if a value other than 105% is desired. \_\_\_\_\_

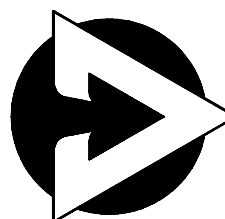
## Complementary products:

Control Concepts, Inc., with a full range of standard and custom SCR power controllers and signal conditioners, has the expertise to meet your specific industrial power control needs.

All of Control Concepts products are covered by a limited two year warranty.

Call for answers and delivery schedules that work for you.

## Manufactured by:



**CONTROL  
CONCEPTS**

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