



# FUSION

## SCR POWER CONTROLLERS





## FEATURES

### Auto-Ranging Input Voltage

24 - 600 VAC, 45 - 65 Hz

### AC or DC Output

AC Models: 50 - 1200 Amps

DC Models: 45 - 1400 Amps

### Analog Interface (Two Analog Inputs)

Standard setpoint ranges: 0 - 5 Vdc, 4 - 20 mA

Field Scalable 0 - 10 Vdc , 0/4 - 20 mA , or POT\*

### Optional Fieldbus Interface

Modbus TCP (Ethernet)

Modbus RTU (RS-485)

ODVA-Certified DeviceNet™

PROFINET

PROFIBUS

EtherNet/IP

### Integrated or Remote Display

Displays Setpoints, Line / Load Voltage,

Load Current, Load Power, Alarms

\* Other scaling options available via control panel software. Contact factory for information.

\*\* User selectable. Feature may be disabled in case of nuisance shorted SCR warnings

### Control Features

Digital Controller / Phase Lock Loop Timing

Zero-Cross / Phase Angle / Burst Mode

Soft Start

Output Limits: Voltage, Current, Power

Missing Cycle Detection

TRANS-GUARD™, SYNC-GUARD™

### Alarms

Overtemp / Shorted SCR\*\* / Phase Loss /

Over Current Trip

Two form C relay outputs for alarms

### Optional Auxiliary I/O Card

Up to two retransmit channels of voltage, current, or power

### Easy Setup via Plug-n-Play USB

Load / Save Configurations

Diagnostics with Chart and Log Operations

## CERTIFICATIONS



## DESCRIPTION

FUSION Series power controller is a modular digital power controller capable of single or three phase operation with either AC or DC loads. Loads can be controlled by either phase angle, zero-cross, or burst modes for operation of resistive or transformer-connected loads. Output to the command signal is controlled linearly and can be set to the average or RMS value of the voltage and current, as well as true instantaneous power or external feedback.

FUSION Series power controllers are available in current ratings from 50 - 1200 amps AC or 45 - 1400 amps DC. Auto-ranging voltage circuitry enables mains supply voltage from 24-600 VAC, (45-65 Hz) eliminating the need for hardware jumpers or stocking multiple controllers for international voltages. A separate power source supplies the control electronics and maintains critical communications to your control system when the mains are absent.

An integrated display and on-board diagnostics make operation and trouble shooting simple. Limits, set-points, and alarm conditions can be easily viewed and customized.

## DESCRIPTION, CONTINUED

A plug-n-play USB interface and free FUSION Control Panel software for the PC further simplifies installing and configuring the controller to your application. OEMs, for example, can duplicate controller settings by simply loading a configuration file saved from a previous unit.

Setpoints can be controlled through the standard analog or optional Fieldbus interface. The factory-configured analog setpoint signal ranges are 0 - 5 Vdc and 4 - 20 mA, both of which are field scalable from 0 - 10 Vdc or 0 - 20 mA.

The Fieldbus interface options include Modbus RTU (RS-485), Modbus TCP (Ethernet), PROFINET, PROFIBUS, EtherNet/IP or DeviceNet™. These can be used to communicate with a PLC or factory control system. For multi zone controllers consisting of 3 or 4 zones, a Fieldbus interface is required.

Parameters can be easily viewed and controlled through the onboard display. For additional convenience, the display can also be remotely mounted on an electrical enclosure door. (See below.)

## UTILIZING REMOTE CONTROL

A remote display kit is available from Control Concepts, Inc, allowing you to mount the display on the outside of an electrical enclosure and eliminating costly Amp meters, switches, and associated wiring and labor.

The display is rated IP 65 and UL type 1 and 12 to withstand water or dust in demanding factory conditions.

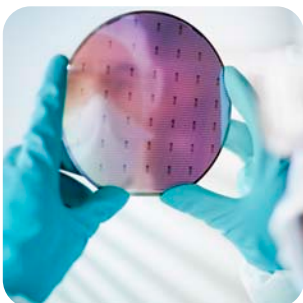
For a complete description and ordering information, see Page 6.



## APPLICATIONS

**Constant Resistive Loads**  
(Nickel Chromium)

**Variable Resistive Loads**  
Silicon Carbide  
Molybdenum Disilicide  
Graphite  
Tungsten Lamps



**Transformer Coupled Loads**

**Inductive**  
(Not Intended for Motor Applications)

**Gas Discharge**  
Ultra Violet



**Electron Beam**

**Crystal Growing and Processing**



# PERFORMANCE SPECIFICATIONS

<b>POWER</b>	
Line Voltage (Auto Ranging)	24 - 600 Vac (Nominal) +10% / -15% *
Line Frequency (Auto Ranging)	45 - 65 Hz
Frame Current Ratings (Amps)	I Continuous RMS (AC)    50   80   100   130   160   200   240 320   400   500   650   800   1000   1200 I Continuous DC (1Ø)    45   90   145   220   360   720   1080 I Continuous DC (3Ø)    60   120   195   290   490   975   1400
Current Rating- Peak Surge	20X continuous rating
Minimum Hold/Latch Current	1 A RMS
SCR Rating (PIV)	1600 V peak forward & reverse
Fusing	External Required, compliant with UL, CE or Local Authority
Thermal	Integrated heat sink thermal sensor
Current Limit	20% – 105% of continuous rating of Frame Amp Rating
Current Trip	50% - 450% of continuous rating
Power Dissipation	1.3 Watt per amp of load current per phase
Control Power / Operates Internal Control Electronics	100 - 240 Vac 50/60 Hz

<b>RELIABILITY</b>	
Mean Time Between Failure (MTBF)	Designed for 50,000 Hours

<b>ENCLOSURE PROTECTIVE RATING</b>	
International	IP 20
Removable Display	IP 65, UL Type 1 & 12

<b>ENVIRONMENTAL</b>	
Surrounding Air Operating Temperature	32°F [0°C] - 122°F [50°C]
Humidity	20% to 90% RH Non-Condensing
Rated Operating Altitude	Up to 6000 ft [1750m] at full rated current
Contaminates	ROHS Compliant CE Pollution Degree 2
Storage Temperature	- 4 to 176°F [- 20 to 80°C]

<b>ISOLATION</b>	
Signal to Line/Load	3750 Vac minimum
Line/Load to Ground	2500 Vac minimum
Signal to Ground	1500 Vac minimum
Line to Load	1400 Vac minimum
Network	1500 Vac minimum
USB	2500 Vac minimum
Signal to Processor	1500 Vac minimum
Remote Display	2500 Vac minimum

\* Contact factory for other options

# MODEL NUMBER IDENTIFICATION

FUSION -   -  -     -  -     -

**Type of Controller** \_\_\_\_\_

- ZC - Zero Cross
- PA - Phase Angle
- DC - Direct Current

**Number of Legs of Control** \_\_\_\_\_

- 1 - 1 Leg
- 2 - 2 Leg (ZC only)
- 3 - 3 Leg

**Module Amperage Selections** \_\_\_\_\_

AC Frame Size			
Current Size (Amps)	1Ø	3Ø - 2 Leg	3Ø - 3 Leg
50	1000	1100	1110
80	2000	2200	2220
100	3000	3300	3330
130	4000	4400	4440
160	5000	5500	5550
200	6000	6600	6660
240	7000	7700	7770
320	8000	8800	8880
400	9000	9900	9990
500	A000	AA00	AAA0
650	B000	BB00	BBB0
800	C000	CC00	CCC0
1000	D000	DD00	DDD0
1200	E000	EE00	EEE0

DC Frame Size		
Current Size (Amps)	1Ø DC	3Ø DC
45	1000	-
60	-	1110
90	3000	-
120	-	3330
145	5000	-
195	-	5550
220	7000	-
290	-	7770
360	9000	-
490	-	9990
720	C000	-
975	-	CCC0
1080	E000	-
1400	-	EEE0

**Factory Industrial Communications\*** \_\_\_\_\_

- 0 - None
- D - DeviceNet
- I - Ethernet/IP
- E - Modbus TCP (Ethernet)
- S - Modbus RTU (RS-485)
- N - PROFINET
- P - PROFIBUS

\*This is in addition to USB, which comes standard on all controllers.

**Configuration Data (supplied by Control Concepts, Inc.)** \_\_\_\_\_

Includes configuration data such as load configurations, firing modes, feedback, limits, setpoints, ramp rates, etc.

- 0000 - Standard
- 0001 - 3 Phase Controller with a Inside Delta Load
- 0002 - 3 Phase Controller with a 4 Wire Wye Load

**Option Card** \_\_\_\_\_

- 0000 - No option card
- 1000 - Auxiliary I/O expansion card [Details found in Installation & Maintenance Manual]

Examples of Controllers	
FUSION - PA - 3 - 6660 - 0 - 0000 - 0000 Three Phase, Three Leg, Phase Angle, 200 Amps	FUSION - DC - 3 - EEE0 - 0 - 0000 - 0000 Three Phase Full Wave Bridge, 1400 Amps DC
FUSION - PA - 1 - A000 - S - 0000 - 0000 Single Phase, Phase Angle, 500 Amps, Modbus RTU	FUSION - ZC - 2 - 1100 - 0 - 0000 - 1000 Three Phase, Two Leg, Zero Cross, 50 Amps, Aux I/O Card with a standard configuration

**Custom configurations are available.** Contact factory with special requirements and for availability.

This may require a "SP " to be appended to the model number which would be supplied by Control Concepts, Inc.



# DIMENSIONS

**DIMENSIONS ARE IN INCHES [mm], LISTED HEIGHT x WIDTH x DEPTH**

	45-495 Amp*	500-1400 Amp**
Single Phase AC	14.03 [356.5] x 5.96 [151.4] x 9.57 [243.0]	20.49 [520.3] x 9.22 [134.1] x 11.21 [284.7]
Single Phase DC	14.03 [356.5] x 12.87 [326.9] x 9.57 [243.0]	20.49 [520.3] x 20.02 [508.5] x 11.21 [284.7]
Three Phase 2 Leg	14.03 [356.5] x 9.61 [244.1] x 9.57 [243.0]	20.49 [520.3] x 16.12 [409.5] x 11.21 [284.7]
Three Phase 3 Leg	14.03 [356.5] x 13.27 [337.1] x 9.57 [243.0]	20.49 [520.3] x 23.03 [585.0] x 11.21 [284.7]
Three Phase DC	14.03 [356.5] x 20.18 [512.6] x 9.57 [243.0]	20.49 [520.3] x 33.83 [859.3] x 11.21 [284.7]

\*DeviceNet depth = 9.82 [249.4] See Manual for panel layout.

\*\* DeviceNet depth = 11.46 [291.1] See Manual for panel layout.



## ACCESSORIES

### AUXILIARY I/O CARD

#### Retransmit

- 2 Analog output channels
- Scalable 0-10V dc or 0-20mA with up to 15 Vdc compliance voltage
- Each channel may be assigned either the RMS or AVG value of the load voltage, load current, or true instantaneous load power

#### Digital I/O

- 2 Digital inputs (TTL compatible, pull up to 5V through a 10KΩ resistor)
- 2 Digital Outputs (Relay driver transistor based, Open collector that sinks up to 48 Vdc at 150 mA)

### FIELD BUS INTERFACE

MODBUS RTU (RS-485), MODBUS TCP (Ethernet), DeviceNet, or EtherNet/IP, or PROFINET. Simplify your cabling, eliminate A/D conversion error, and gain access to monitor information.

In the model number, use:

- S for Modbus RTU (RS-485)
- D for DeviceNet
- I for EtherNet/IP
- E for Modbus TCP (Ethernet)
- N for PROFINET

### REMOTE DISPLAY

- Controller display is mountable in a 1/4 DIN cutout
- UL-type 1 & 12 ratings, IP65
- Outside Dimensions: 4.156 [105.6] x 4.156 [105.6]
- Display Mounting Kit includes: Gasket, display retainer with screws, shielded cable, ferrite, and empty replacement display with CCI logo
- Sizes: 25 ft [7.62m] (CCI P/N: SMAFUSION-RD25)  
5 ft [1.52m] (CCI P/N: SMAFUSION-RD5)

### USB CABLE

- 15 ft [4.92m] USB Cable (CCI P/N: 0058004-0000-15)

### FUSES AND OTHER ACCESSORIES

- A wide range of fuses and fuse blocks are available.
- Please contact factory for fuse sizing and any other accessory needs and we would be happy to accommodate you.

## CONTACT/ORDERING INFORMATION

TEL: (952) 474-6200 | (800) 765-2799  
FAX: (952) 474-6070 | [www.cci-power.com](http://www.cci-power.com)  
18760 Lake Drive East, Chanhassen, MN 55317, USA

