



FEATURES



Auto-Ranging Input Voltage

24 - 600 VAC, 45 - 65 Hz

AC Output

10 - 160 Amps

Internal Class-T Fusing

Blown Fuse Indicator

Analog Interface (Two Analog Inputs)

Standard setpoint ranges: 0 - 5 Vdc, 4 - 20 mA
Field Scalable 0 - 10 Vdc, 0 - 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 (Phase Angle only)
Missing Cycle Detection
TRANS-GUARD™, SYNC-GUARD™

Alarms

Overtemp / Phase Loss / Over Current Trip /
Shorted SCR**
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



BRANCH-RATED FUSING: SAVE \$\$\$ - DON'T FUSE TWICE!

Compact FUSION utilizes integrated Class-T, Branch-rated fusing. It's fast enough to protect your SCR from dead shorts, reduces nuisance fuse-blowing, and meets UL 508A branch fusing requirements. Integrated fusing gives you fewer pieces to manage and lowers installation costs and footprint size.

DESCRIPTION

The Compact FUSION series controller is a modular digital controller capable of single phase or three phase operation. The modular design allows up to four independent zones of control within one footprint-saving package.

Compact FUSION is nearly identical to its predecessor FUSION, (see sidebar) but with a narrower footprint, onboard branch-rated protection fusing (Class T), and a blown fuse indicator for each line. Optional pass through fusing allows a line to pass through the single phase controller to fuse the return leg of the load.



Loads can be controlled in phase-angle, zero-cross, or burst modes for operation of resistive or transformer connected loads. Output is controlled linearly with respect to command signal and can be set to the average or RMS value of the voltage or current, as well as true instantaneous power or external feedback.

Compact FUSION controllers are available in current ratings from 10 - 160 amps AC. 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. 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.

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 “Utilizing Remote Control,” below)

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), DeviceNet™, PROFINET (Ethernet), PROFIBUS, or EtherNet/IP. These interface options 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.

THE VISION BEHIND COMPACT FUSION

In 2009, Control Concepts released FUSION: a single controller designed to meet customer requirements and built for use around the world. FUSION series controllers accommodate international supply voltages and meet global safety and environmental standards.

Compact FUSION is our latest controller built on this same vision. The slim design reduces total installed cost and further improves economic impact, and you can expect reliable performance backed by exceptional customer service.



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.

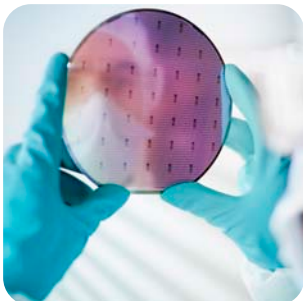
For a complete description and ordering information, see Page 6.



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

POWER

Line Voltage (auto ranging)	24 - 600 Vac (Nominal) +10% / -15% *
Line Frequency (auto switching)	45 - 65 Hz
Frame Current Ratings (Amps) Fusing (Amps)	I Continuous RMS 10 25 50 80 100 125 160 Fused at 15 30 60 100 125 150 200
Current Rating- Peak Surge	20X continuous rating
Minimum Hold/Latch Current	1 A RMS
SCR Rating (PIV)	1600 V peak forward & reverse
Fusing	Internal; Branch-Rated Class T
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

RELIABILITY

Mean Time Between Failure (MTBF)	Designed for 50,000 Hours
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ENCLOSURE PROTECTIVE RATING

International	IP 20
Removable Display	IP 65, UL Type 1 & 12

ENVIRONMENTAL

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 (only non-conductive pollution occurs)
Storage Temperature	- 4 to 176°F [- 20 to 80°C]

ISOLATION

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

CF - - - - - -

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

	Single Phase						Three Phase		
# of Zones	1 Zone	1 Zone	2 Zones	2 Zones	3 Zones	4 Zones	1 Zone 2 Leg	1 Zone 2 Leg	1 Zone 3 Leg
Lines Fused	L1	L1, L2	L1, L2	L1, L2, L3, L4	L1, L2, L3	L1, L2, L3, L4	L1, L2	L1, L2, L3	L1, L2, L3
Current Size	10 Amps	1000	1F00	1100	1F1F	1110	1100	1F10	1110
	25 Amps	2000	2F00	2200	2F2F	2220	2200	2F20	2220
	50 Amps	3000	3F00	3300	3F3F	3330	3300	3F30	3330
	80 Amps	4000	4F00	4400	4F4F	4440	4400	4F40	4440
	100 Amps	5000	5F00	5500	5F5F	5550	5500	5F50	5550
	125 Amps	6000	6F00	6600	6F6F	6660	6600	6F60	6660
	160 Amps	7000	7F00	7700	7F7F	7770	7700	7F70	7770

NOTE: F = Pass-Through Fuse

Multi-Zone Note: When combining current sizes, the first two and last two numbers must be identical. (Examples: 3311, 6655) Higher numbers precede lower numbers.

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

XXXX - Custom configuration data such as load configurations, firing modes, feedback, limits, setpoints ramp rates, etc., assigned by factory.

Option Card

0000 - No option card

1000 - Auxiliary I/O expansion card [Details found in Installation & Maintenance Manual]

Model Number	Controller Description
CF - PA - 1 - 7000 - 0 - 0000 - 1000	Single Phase, Phase Angle, 160 Amps, Aux I/O Card
CF - PA - 1 - 3330 - E - 0000 - 0000	(3x) Single Phase, Phase Angle, 50 Amps, Modbus TCP
CF - ZC - 2 - 3311 - 0 - 0000 - 0000	(2x) Three Phase, Two Leg, Zero Cross, 50 Amps in Zone 1, 10 Amps in Zone 2
CF - PA - 1 - 7F5F - 0 - 0000 - 0000	(2x) Single Phase, Phase Angle, 160 Amps with Pass-Through Fusing, 100 Amps with Pass-Through Fusing

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	
14.03 [356.5] x 5.96 [151.4] x 9.57 [243.0]	14.03 [356.5] x 9.61 [244.1] x 9.57 [243.0]
Single Phase	(2x) Single Phase with Pass Through
Single Phase with Pass Through	(3x) Single Phase
(2x) Single Phase	(4x) Single Phase
Three Phase Two Leg	3 Phase Two Leg with Pass Through
	Three Phase Three Leg

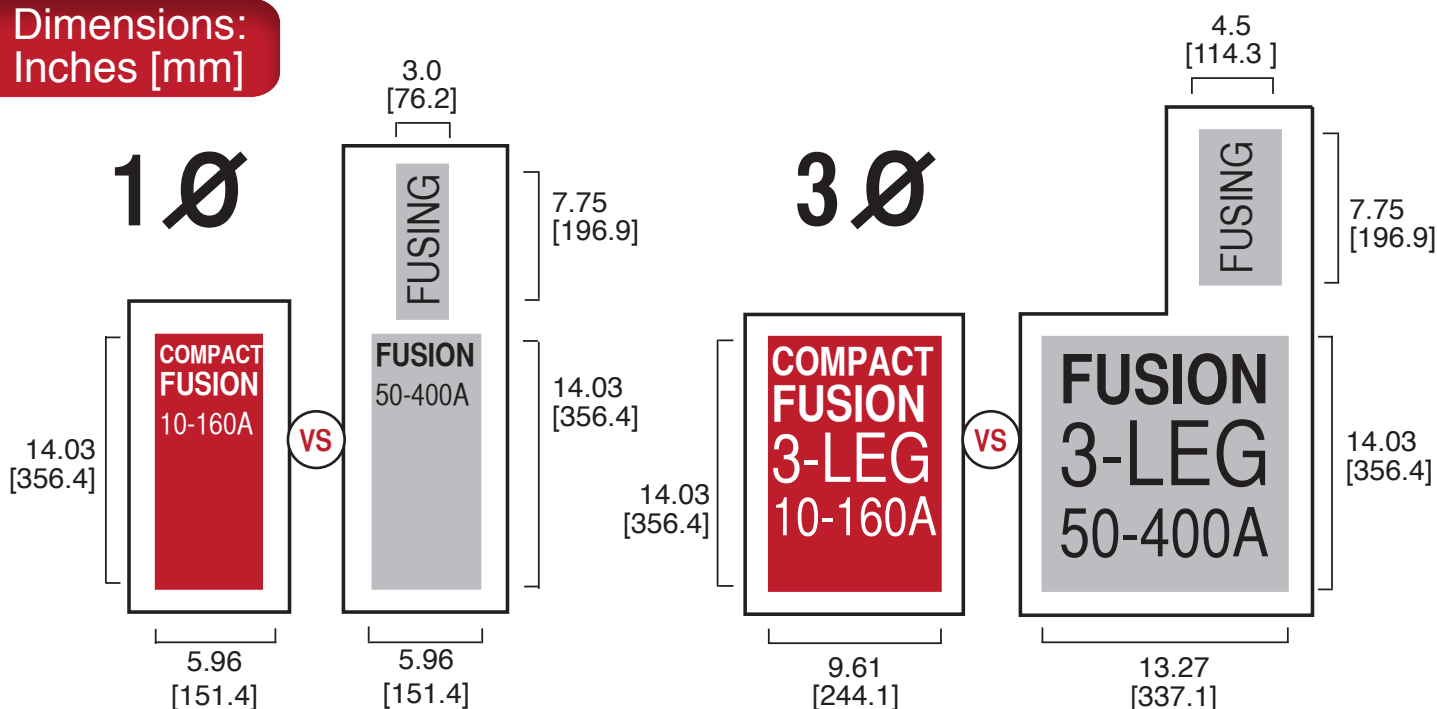
*DeviceNet depth = 9.82 [249.4]
See Manual for panel layout.

HOW COMPACT IS THE FOOTPRINT?

Internal fusing reduces power control-related panel space requirements significantly. Three-phase models are also built almost four inches slimmer than their equivalents in the original Fusion series.

Compare panel space requirements between Compact Fusion and the original Fusion model to see how slimmer dimensions translate into big savings.

Dimensions:
Inches [mm]



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)

FIELDBUS 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 | - P for PROFIBUS |

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)

USER MANUAL & CONTROL PANEL CD

CCI P/N: SMA-CD

CONTACT/ORDERING INFORMATION

TEL: (952) 474-6200 | (800) 765-2799
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8077 Century Blvd, Chanhassen, MN 55317, USA

