

CFW Advanced Modular SCR Power Controller

- 40A—600A Models Available
- 480Vac, 600Vac, and 690Vac Options
- 1P, 3P 2-Leg, or 3P 3-Leg
- 100KA SCCR Rating
- Zero Cross (Fixed Cycle, Burst Fire, Half Single Cycle) and Phase Angle Firing Capability
- Current Limiting
- Multiple Analog Input Options Including 0-5V, 0-10V, 0-20mA, 4-20mA, PWM and Potentiometer
- Analog Retransmit
- V, V2, I, I2, P Feedback Monitoring
- Built In Fusing
- Total and Partial Interrupted Load Alarm
- Default Modbus RS-485 Communications
- Communication Expansion Slot Capable of Profibus, Modbus TCP/RTU, Realtime Ethernet IP, EtherCat, CanOpen, ProfiNet
- Add On Keyboard For Programming and Monitoring
- Optional Built In PID Control
- C-PWR PC Configuration Software
- SCR Overtemperature and Shorted SCR Alarm
- UL, cUL, CE Marking



Description

The CFW Series Advanced SCR Power Controller offers modular single phase, three phase 2-Leg, or three phase 3-Leg power control from 40A to 600A. All models feature Zero Cross and Phase Angle firing capability making the CFW extremely versatile in the industry. Multiple input options are featured, including 0-5V, 0-10V, 0-20mA, 4-20mA, PWM, and 1Kohm to 10Kohm potentiometer signal. Programmable analog outputs are included to allow retransmission of critical process details.

Communications

Modbus RTU/RS485 communications are outfitted by default, but with PLC's and integrated networks being commonplace, the CFW can host a number of additional fieldbus communications including Modbus TCP, Profibus, ProfiNet, Ethernet IP, DeviceNet, EtherCat, and CANopen. Each of these fieldbus cards can be installed at time of order or outfitted at a later date. This makes it extremely easy to adapt the CFW to any host network.

Complete Process Control Package

In addition to the integration of PID control and power control, the CFW offers a full suite of diagnostic and monitoring capabilities to make this the most versatile controller Chromalox has to offer. Full thermal and electrical monitoring allows users to anticipate failures and malfunctions so corrective steps can be taken in a timely manner.

With each zone outfitted with an independent current transformer, full diagnostics can be performed from loop break alarm, heater break, SSR short circuit, input opening or short circuit, and even over temperature alarm

Applications

- Packaging
 - Thermoforming
 - Heat treatment
 - Mold & dye heating/cooling
 - HVAC
 - Chemical Processing
 - Textile production
 - Multizone Furnaces
 - Dryers
 - Industrial Ovens
- And many more...



CFW

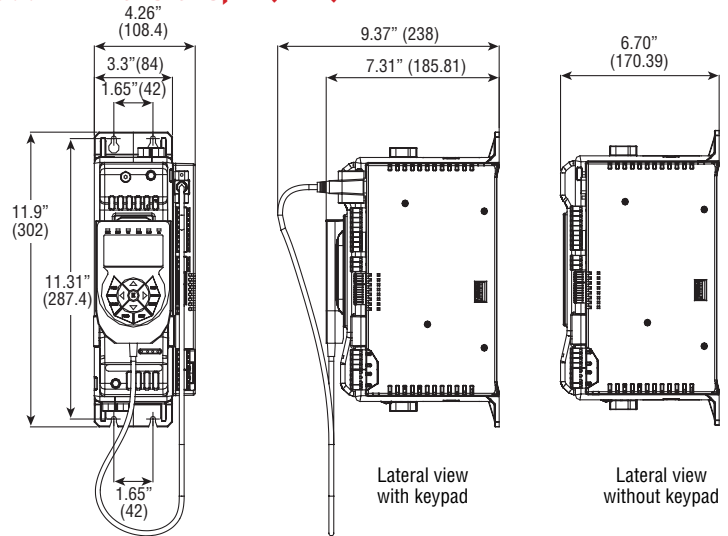
Advanced Modular SCR Power Controller *(cont'd.)*

Weights Lbs (kg)

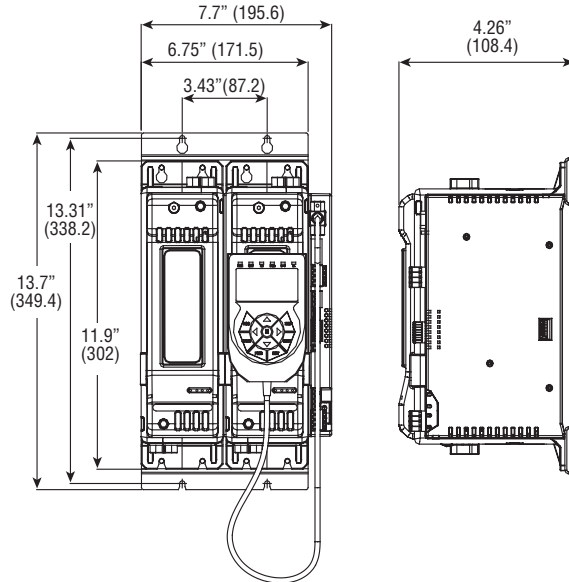
Model	Amps	Weight Lbs (kg.)
CFW1	40/60/100	4.85 (2.2kg)
CFW2	40/60/100	9.25 (4.2kg)
CFW3	40/60/100	13.67 (6.2kg)
CFW1	150/200/250/300	5.73 (2.6kg)
CFW2	150/200/250/300	11.0 (5.0kg)
CFW3	150/200/250/300	16.3 (7.4kg)

CFW 40A—300A Dimensions, In (mm)

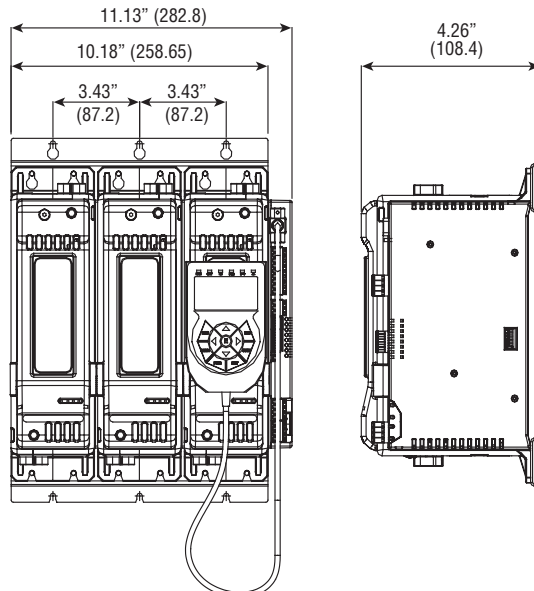
CFW1



CFW2



CFW3



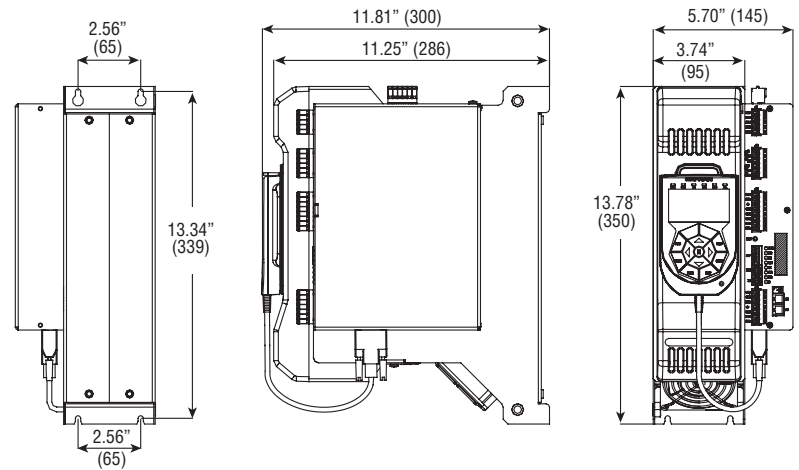
CFW Advanced Modular SCR Power Controller *(cont'd.)*

Weights Lbs (kg)

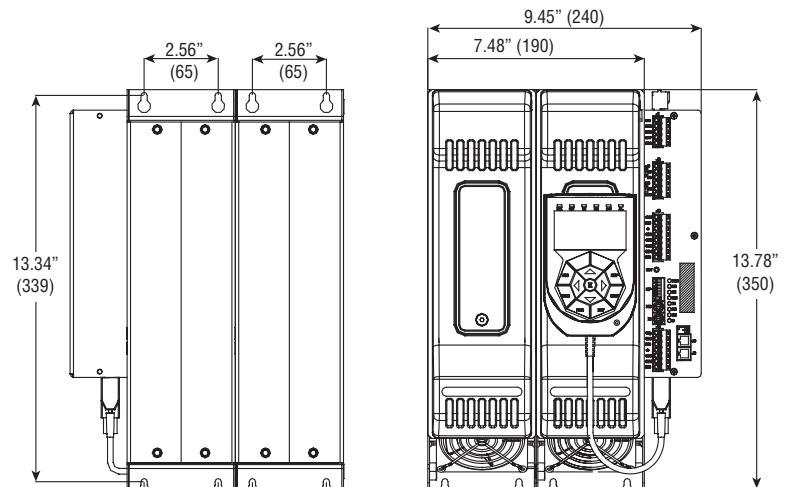
Model	Amps	Weight Lbs (kg.)
CFW1	400	17.63 (8 Kg)
CFW2	400	34.17 (15.5 Kg)
CFW3	400	49.60 (22.5 Kg)
CFW1	500/600	24.25 (11kg)
CFW2	500/600	46.30 (21kg)
CFW3	500/600	68.34 (31kg)

CFW 400A—600A Dimensions, In (mm)

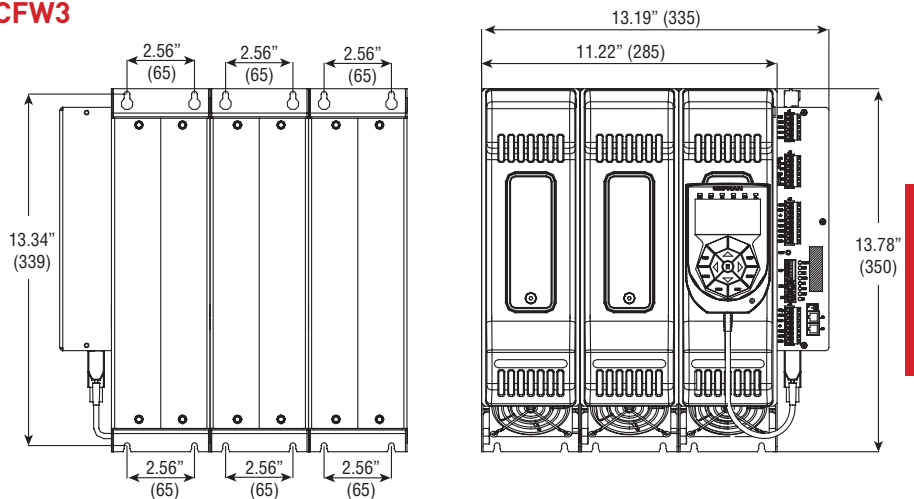
CFW1



CFW2



CFW3



CFW

Advanced Modular SCR Power Controller *(cont'd.)*

Technical Data

Voltage	
Nominal Voltage	480Vac (max range 90-530Vac), 600Vac (max range 90-660Vac), 690Vac (max range 90-760Vac)
Frequency	Nominal 50-60Hz
Non-repetitive Voltage	1200 Vpk (480V models) / 1600 Vpk (600 & 690 Vac)
Control Analog Inputs	
Voltage	0-5 Vdc, 0-10Vdc (impedance > 100 kohm)
Current	0-20mA, 4-20mA (impedance 125 ohm)
Potentiometer	1-10 Kohm (auto-fed by 5V from CFW)
Digital Inputs	
Range	5-30V max 7mA
PWM Input Control	0.03 – 100Hz
PID Inputs	
Sampling Time	60msec
Accuracy	0.2% FS +/- Scale points 25°C
Thermal Drift	< 100ppm/C scale points.
Thermocouples	Type J, K, S, R, T, custom
RTD	PT100 / Max Resistance 20ohm
Selectable Temperature	°C/°F
Voltage	0-60mV, 12-60mV, Ri > 1Mohm / 0-1V, 0.2-1V, Ri > 1Mohm custom linearization at 32 sections
Current	0-20mA, 4-20mA, Ri = 50ohm custom linearization at 32 sections
TC AUX Inputs	
Sampling Time	480msec
Accuracy	1% F.S. +/- scale point 25°C
Thermocouples	Type J, K, S, R, T, custom
Voltage	0-60mV, 12-60mV, Ri > 1Mohm
Voltage Line Range	
Range	90V Nominal Product
Frequency	50/60Hz
Accuracy	1% F.S. with neutral connected / 2% F.S. without neutral connected
Voltage Load Range	
Accuracy	1% F.S. with load voltage measurement option (VLOAD option) / 2% F.S. without option VLOAD
Current Load Range	
Accuracy	2% F.S. at room temperature of 25°C
Sampling Time	0.25msec
Measurement Of External Current Transformer (400-600A Models Only)	
Input F.S.	5A rms
Input Impedance	16mohm
Accuracy	2% F.S. at room temperature of 25°C
Sampling Time	0.25msec

CFW Advanced Modular SCR Power Controller *(cont'd.)*

RS485 Serial (PORT 1)	
Connector	Double RJ10
Protocol	Modbus RTU RS485
Baud Rate	Configurable from 1200 Baud to 115000 Baud
Node Address	Pair of rotary-switches
Dip Switch	For insertion of line termination resistance. Isolation 1500V
Fieldbus (PORT 2)	
Modbus RTU	115Kbps
CANopen	10K-1Mbps
Profibus DP	9.6-12Mbps
Ethernet IP/Modbus TCP	10/100Mbps
EtherCAT	10/100Mbps
PROFINET	10/100Mbps
Isolation HV Output	
Rated Isolation Voltage	Input/Output 4000Vac
CFW 40	
Nominal Current	40Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 1,400A
I ² T For Blowout	10,000 A ² s
dV/dt Critical	1,000 V/us
CFW 60	
Nominal Current	60Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 1,500A
I ² T For Blowout	12,000 A ² s
dV/dt Critical	1,000 V/us
CFW 100	
Nominal Current	40Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 1,900A
I ² T For Blowout	18,000 A ² s
dV/dt Critical	1,000 V/us
CFW 150	
Nominal Current	150Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 5,000A
I ² T For Blowout	125,000 A ² s
dV/dt Critical	1,000 V/us
CFW 200	
Nominal Current	200Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 8,000A
I ² T For Blowout	320,000 A ² s
dV/dt Critical	1,000 V/us
CFW 250	
Nominal Current	250Arms @ 40°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 8,000A
I ² T For Blowout	320,000 A ² s
dV/dt Critical	1,000 V/us

CFW Advanced Modular SCR Power Controller *(cont'd.)*

CFW 300	
Nominal current	300 Arms @ 40°C in continuous service.
Non-repetitive overcurrent	t=10ms: 8000 A
I ² t for blowout	320000 A ² s
dV/dt critical	1000V/μs
CFW 400	
Nominal Current	400Arms @ 50°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 15,000A
I ² T For Blowout	1,125,000 A ² s
dV/dt Critical	1,000 V/us
CFW 500	
Nominal current	500 Arms @ 50°C n continuous service.
Non-repetitive overcurrent	t=10ms: 15.000 A
I ² t for blowout	1.125.000 A ² s
dV/dt critical	1000V/μs
CFW 600	
Nominal Current	600Arms @ 50°C in continuous service
Non-repetitive Overcurrent	t = 10ms: 15,000A
I ² T For Blowout	1,125,000 A ² s
dV/dt Critical	1,000 V/us
Thermal Dissipation	
Pdissipation (W)	I_Load_Arms*1.3V (For models with integrated fuse, refer to fuse table for additional dissipation)
LED	
Quantity	8 LED Indicators (All are configurable via software. Default configuration as follows)
Run (Green)	RUN state of the CPU ERROR (Red) error
DI1 (Yellow)	DI1 Digital Input State
DI2 (Yellow)	DI2 Digital Input State
O1 (Yellow)	Out 1 Main Input State
O2 (Yellow)	Out 2 Main Input State
O3 (Yellow)	Out 3 Main Input State
Button (Yellow)	State Key Heater Break
Power Supply (40-300A Models)	
CPU Power Supply	24Vdc +/- 10%, Max 10VA
Cooling Fan Power Supply	24Vdc +/- 10% (For each module), Input @ 24Vdc Max 500mA
Power Supply (400-600A Models)	
CFW1 Power Supply	24Vdc +/- 10%, Max 38W
CFW2 Power Supply	24Vdc +/- 10%, Max 66W
CFW3 Power Supply	24Vdc +/- 10%, Max 94W
Ambient Conditions	
Working Temperature	0-50°C (reference derating curve)
Storage Temperature	-20°C to 85°C
Max Relative Humidity	85+ UR Non-condensing
Max Altitude	2000m above sea level
Installation Requirements	Installation Category 2, Pollution Level 2, Double Isolation
Installation	Panel with screws

CFW Advanced Modular SCR Power Controller *(cont'd.)*

Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model CFW Advanced Modular SCR Power Controller										
CFW1	Single Phase									
CFW2	Three Phase, 2-leg									
CFW3	Three Phase, 3-leg									
Code Current @ 104°F (40°C) Ambient, continuous service										
040	40 Amps	200	200 Amps	500	500 Amps					
060	60 Amps	250	250 Amps	600	600 Amps					
100	100 Amps	300	300 Amps							
150	150 Amps	400	400 Amps							
Code Nominal Voltage										
48	480 Vac ¹									
60	600 Vac ¹									
69	690 Vac									
Code Input 1: Analog Process Input + PID										
0	None									
1	TC/RTD/Linear input (60mV) ¹									
Code Inputs 2 - 5: Auxiliary Analog Inputs										
0	None									
1	4 TC/Linear input (60mV) ¹									
Code Control Options										
0	None									
1	Current limit									
2	Current limit and feedback V,I,P									
3	Current limit and feedback V,I,P + V Load input									
4	Current limit and feedback V,I,P+ Vload input; CT external inputs ²									
Code Auxiliary Output										
0	None	A	4 Direct analog outputs ¹							
R	4 Relays		T	4 Triac outputs ¹						
D	4 Digital outputs		W	3 Analog outputs 12 bit 0-10V, 4-20mA ²						
Code Diagnostic/Alarm option										
0	None									
1	Partial or total load failure alarm (HB)									
Code Fusing										
0	None									
1	Internal (for current sizes > 150A)									
Code Communications										
00	None		EP	Ethernet IP						
MR	Modbus RTU/RS485		ET	Modbus TCP/IP						
PB	Profibus DP		PS	Profinet w/ Stack Protocol 3.12.0.5						
CN	CANopen		ES	EtherCAT w/ Stack Protocol 4.7.0.3						
CFW1-	040	48-	0	0	2	R	0-	0	MR	Typical Model Number

¹Not available on models with rated current >=400A

²Not available on models with rated current <=250A

Accessories

Description	PCN
Communication Cable, USB to RS485	309180