

# Controls

## C4 Advanced Multi-Loop SCR Power Controller

- DIN Rail or Panel Mount
- 30, 60, and 80KW Solid State Relays (Higher Amperages Possible With C4X)
- 4 Main Universal Inputs
- 4 Heat/Cool Independent PID Loops
- 4 Main Outputs Internally Wired to SSR
- 4 Configurable Output Options Including Relay, Logic, TRIAC, Continuous
- Current Transformers on Each Loop
- 2 Configurable Relay Alarm Output
- 2 Digital Inputs
- Zero Cross Firing
- Load Connections in Single Phase, Dualphase, and Three Phase
- Standard ModBus RTU Communication
- 8 Optional Fieldbus Communications Including Modbus RTU, Modbus/TCP, Profibus, Profinet, Ethernet IP, DeviceNet, EtherCat, and CANopen Available
- Powerful C-PWR Configuration Software
- Optional Fuse Holder With Fast Acting Fuses For 30KW and 60KW models
- Compact Footprint
- UL, cUL, CE Marking



### Description

The C4 Series Multiple Zone SCR Power Controller manages both single phase and 3-phase industrial heating load applications which require zero cross firing modes. Load options include up to 4 independently controlled single phase loads or two 3-phase/2-Leg load or one 3-phase/3-leg load (with or without an additional single phase load).

The controller features four universal main process inputs, two digital inputs, and two configurable alarm outputs as standard to accommodate a variety of process needs. When more flexibility is required, the C4 controller can be customized with four analog inputs, and up to four configurable outputs.

Despite the four independent zones, the C4 still boasts a compact footprint, with options for either DIN rail mounting or direct panel mount.

### Communications

Modbus RTU/RS485 communications are outfitted by default, but with PLC's and integrated networks being commonplace, the C4 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 C4 to any host network.

### Complete Process Control Package

While the C4 includes diverse process control capability, it also features efficient thermal and electrical monitoring, allowing 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.

The C4 also features the powerful and detailed C-PWR configuration software, which allows you to run trends, save historical data and read or write device parameters quickly and easily. Configurations may be saved locally for later retrieval or sent across a network for cloning of other units. This significantly reduces mistakes and system setup time.



### Applications

- Packaging
  - Extrusion
  - Thermoforming
  - Injection molding
  - Heat treatment
  - Mold & dye heating/cooling
  - HVAC
  - Chemical Processing
  - Textile production
  - Multizone Furnaces
- And many more...

CONTROL  
PRODUCTS

# Controls

## C4

### Advanced Multi-Loop SCR Power Controller *(cont'd.)*

#### C4-OP Local Programming Interface

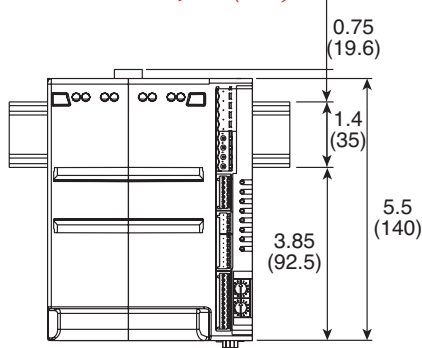
The C4-OP local interface display is a great tool to use when remote programming or monitoring isn't enough. It is comprised of a Lexan membrane, IP65 display, including three 4-digit displays, and a 2-digit display. A total of 6 function keys allow navigation through the C4-OP software menus and adjustment of process parameters on the spot.



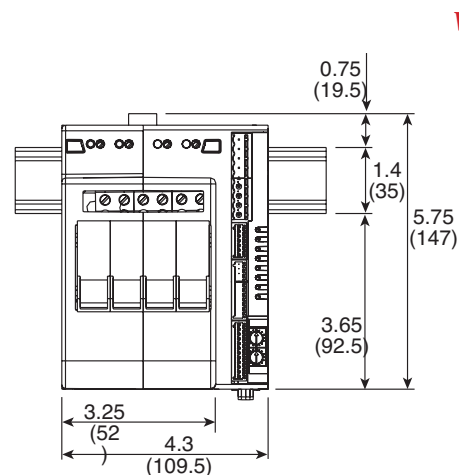
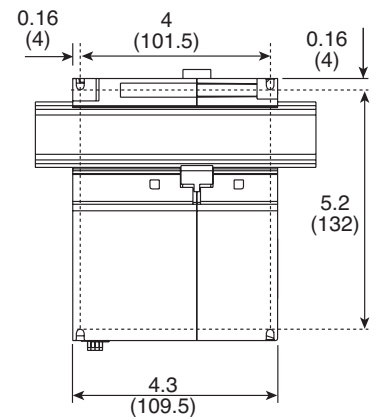
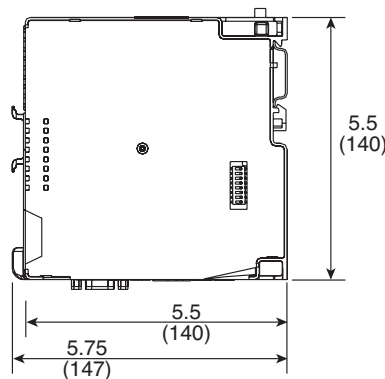
Its built-in memory gives users the ability to save complete configurations for up to ten C4 family devices, which can then be uploaded to a PC for seamless integration with the C-PWR software. The opposite is also true if users prefer to download C-PWR settings on to the C4-OP, making this controller an ideal addition for routine plant maintenance where local programming and monitoring is necessary.

With no external power requirements, the C4-OP is powered directly from the C4 host device and can either be DIN rail mounted, or installed directly on the front panel of the enclosure where permanent installations are required. With its minimal footprint, the C4-OP continues the compact trend of the C4 family.

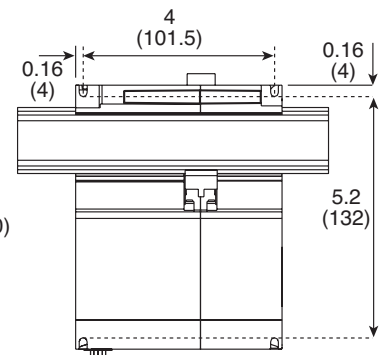
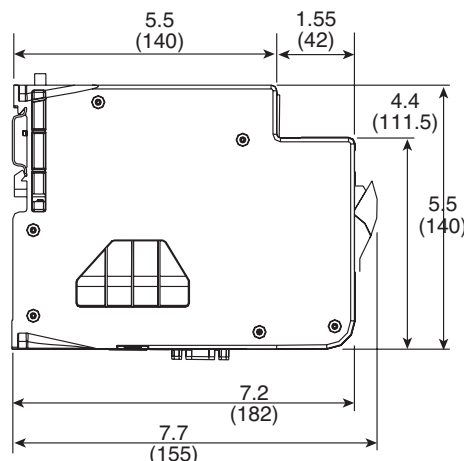
#### C4 Dimensions, In. (mm)



#### Without Fuse Holder



#### With Fuse Holder



# Controls

## C4

### Advanced Multi-Loop SCR Power Controller *(cont'd.)*

#### Electrical Specifications

| Size         | Current (Amp)   | Voltage (Vac) |         |         | Power |                |
|--------------|-----------------|---------------|---------|---------|-------|----------------|
|              | Max Per Channel | Range         | Nominal | Working | Total | Single Channel |
| 30 (4 x 16A) | 16              | 24...530      | 480     | 110     | 7.0   | 1.7            |
|              |                 |               |         | 230     | 14.7  | 3.6            |
|              |                 |               |         | 400     | 25.6  | 6.4            |
|              |                 |               |         | 480     | 30.7  | 7.6            |
| 60 (4 x 30A) | 30              | 24...530      | 480     | 110     | 13.2  | 3.3            |
|              |                 |               |         | 230     | 27.6  | 6.9            |
|              |                 |               |         | 400     | 48.0  | 12.0           |
|              |                 |               |         | 480     | 57.6  | 14.4           |
| 80 (4 x 40A) | 40              | 24...530      | 480     | 110     | 17.6  | 4.4            |
|              |                 |               |         | 230     | 36.8  | 9.2            |
|              |                 |               |         | 400     | 64.0  | 16.0           |
|              |                 |               |         | 480     | 76.8  | 19.2           |

1) For amperages in excess of 40A, refer to C4X

#### Specifications

| Power                    |   |
|--------------------------|---|
| Thermocouple             | J, K, R, S, T   |
| RTD                      | 3 Wire PT100  |
| DC Linear                | 0 to 20mA, 4 to 20mA, 0 to 60mV, 12 to 60mV, 0 to 1V, 0.2 to 1V   |
| Accuracy                 | Thermocouple $\pm 0.2\%$ of full range $\pm 1$ LSD. PT100 $\pm 0.2\%$ of full range, $\pm 1$ LSD, Linear $\pm 0.2\%$ of full range, $\pm 1$ LSD |
| Sampling                 | 120msec the four inputs   |
| Impedance                | $> 1M\Omega$ resistive, except DC mA (50 $\Omega$ ) and Thermoresistance (20 $\Omega$ )   |
| Selectable Range         | $^{\circ}C/^{\circ}F$   |
| Digital Input            | PNP, 24VDC, 8mA (isol. 3500V)   |
| CT Input                 | 50mAac, 50/60Hz, 10 $\Omega$  |
| CT Sampling              | 60msec, 1% of full range $\pm 1$ LSD  |
| Outputs 1-4              |   |
| Function                 | Default heating control. Outputs connected to solid state relay   |
| Outputs 5-8              |   |
| Connector                | J1  |
| Relay                    | NO, max 3A, 250V/30VDC, $\cos\phi = 1$ , resistive load   |
| Logic                    | 24Vdc, 35mA   |
| Voltage                  | 0 to 10V, 2 to 10V, max 25mA Short Circuit Protection   |
| Current                  | 0 to 20mA, 4 to 20mA, 500 $\Omega$ max  |
| Insulation               | 3500V   |
| TRIAC                    | 230V/4A AC51, 1A for four, 2A for two   |
| Outputs 9-10             |   |
| Connector                | J1  |
| Relay                    | NO, max 5A, 30 Vdc, $\cos\phi = 1$ ,  |
| Operating Conditions     |   |
| Protection               | IP20  |
| Work/Storage Temperature | 32 - 122 $^{\circ}F$ (0 - 50 $^{\circ}C$ ) / -4 - 158 $^{\circ}F$ (-20 - 70 $^{\circ}C$ )   |
| Ambient Conditions       | 20-85% UR not condensing  |
| Installation             | DIN EN50022 RAIL / Panel Mount with Screws  |
| Weight                   | Without Fuses = 1200g / With Fuses = 1600g  |

CONTROL PRODUCTS

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## C4

### Advanced Multi-Loop SCR Power Controller *(cont'd.)*

#### Ordering Information

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

| Model      | C4 SCR Power Controller  |  |           |          |           |                             |
|------------|--|--|-----------|----------|-----------|-----------------------------|
| C4         | <b>Code Current Per Loop @ 40°C (104°F) Ambient, continuous service (110 Vac to 480 Vac)<sup>3</sup></b> |  |           |          |           |                             |
|            | 164  | 16 Amps/Loop   |           |          |           |                             |
|            | 304  | 30 Amps/Loop   |           |          |           |                             |
|            | 404  | 40 Amps/Loop   |           |          |           |                             |
|            | <b>Code</b>  | <b>Auxiliary Outputs</b>                                 |           |          |           |                             |
|            | O  | None   |           |          |           |                             |
|            | R  | Relay  |           |          |           |                             |
|            | D  | Logic  |           |          |           |                             |
|            | A  | Analog   |           |          |           |                             |
|            | T  | Triac  |           |          |           |                             |
|            | <b>Code</b>  | <b>Auxiliary Inputs</b>                                  |           |          |           |                             |
|            | 2  | 4 Current Transformers                                   |           |          |           |                             |
|            | 4  | 4 Current Transformers plus 4 Linear Inputs <sup>1</sup> |           |          |           |                             |
|            | <b>Code</b>  | <b>Fusing</b>  |           |          |           |                             |
|            | O  | None   |           |          |           |                             |
|            | F  | Fuse Holder & Extra rapid fuses <sup>2</sup>             |           |          |           |                             |
|            | <b>Code</b>  | <b>Second Fieldbus Option</b>                            |           |          |           |                             |
|            | OO   | None   |           |          |           |                             |
|            | MR   | Modbus RTU (RS485)                                       |           |          |           |                             |
|            | ET   | Modbus TCP/Ethernet                                      |           |          |           |                             |
|            | ER   | Ethernet IP, Real Time <sup>1</sup>                      |           |          |           |                             |
|            | PB   | Profibus DP  |           |          |           |                             |
|            | PN   | ProfiNET <sup>1</sup>                                    |           |          |           |                             |
|            | EC   | EtherCAT <sup>1</sup>                                    |           |          |           |                             |
|            | CN   | CANopen  |           |          |           |                             |
|            | DN   | DeviceNet  |           |          |           |                             |
|            | EM   | Euromap 66   |           |          |           |                             |
| <b>C4-</b> | <b>304</b>   | <b>D</b>   | <b>4-</b> | <b>F</b> | <b>OO</b> | <b>Typical Model Number</b> |

<sup>1</sup>Not available with EC, PN & ER Fieldbus Codes.

<sup>2</sup>Not available with 404 Current Code

<sup>3</sup>For higher amperages, refer to C4X

#### Accessories

| Description                       | PCN    |
|-----------------------------------|--------|
| Communication Cable, USB to TTL   | 309171 |
| Communication Cable, USB to RS485 | 309180 |