



**TOTAL  
CUSTOMER  
SATISFACTION**  
3 Year Warranty

## SCR Power Controller Delivers Up To 80 Amps in a Compact Package

### Features and Benefits

#### DIN rail and standard panel mount thru-wall mounting

- Versatile, quick and low-cost installation

#### Compact size

- Reduced panel space; less cost

#### Touch-safe terminals

- Increased safety for installer/user

#### One-and three-phase power

- Can be used in a variety of applications

#### Open heater/shorted output alarm

- Notifies you in case of an open heater or shorted output

#### No mercury

- Environmentally safe

#### Faster switching with solid state

- Saves energy and extends heater life

#### UL® 508 listed, C-UL® and CE with filter

- Meets applications requiring agency approval

#### System solution component

- Provides single source thermal loop

#### Back-to-back SCR design

- Rugged design

The Watlow DIN-A-MITE® Style C SCR power controller provides you with a low cost, compact and versatile solid state option for controlling electric heat. You also get all the quality you expect from a Watlow designed and manufactured product. DIN rail and standard panel mounting plus a cabinet thru-wall mount version is available.

Basic features include single-phase, three-phase/two leg, and three-phase/three leg, 24-600V~(ac) operation. Current switching capabilities range from 30 to 80A depending on the model ordered.

Variable time base, linear voltage and current process control or V~(ac/dc) input contactor versions are available. Also single phase, phase angle firing and current limiting are available. All configurations are model number dependent and factory selectable.

The DIN-A-MITE power controller is made in the USA.



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**ISO 9001**



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## Specifications

### Operator Interface

- Command signal input and indication light
- Alarm output and indication light
- Current limit indication LED

### Amperage Rating

- See output rating curves on page 3
- Maximum surge current for 16.6 milliseconds, 1,350A peak
- Maximum I<sup>2</sup>t for fusing is 9100A<sup>2</sup>s
- Latching current: 200mA minimum
- Holding current: 100mA minimum
- Fan current: 0.14A for 24V $\approx$ (dc); 0.12A for 120V $\sim$ (ac); 0.06A for 240V $\sim$ (ac)
- Off-state leakage 1mA at 25°C (77°F) maximum
- Power dissipation: 1 watt per amp per leg switched

### Line Voltage

- 24 to 48V $\sim$ (ac) units: 20.4V $\sim$ (ac) minimum to 53V $\sim$ (ac) maximum
- 100 to 240V $\sim$ (ac) units: 48V $\sim$ (ac) minimum to 265V $\sim$ (ac) maximum
- 277 to 600V $\sim$ (ac) units: 85V $\sim$ (ac) minimum to 660V $\sim$ (ac) maximum
- 100 to 120V $\sim$ (ac), 200 to 208V $\sim$ (ac), 230 to 240V $\sim$ (ac), 277V $\sim$ (ac), 400V $\sim$ (ac), 480V $\sim$ (ac), 600V $\sim$ (ac), +10/-15 percent, 50 to 60Hz independent  $\pm$ 5 percent (Input Control Signal Type L, P and S)

### Alarms (zero cross models only)

#### Shorted SCR Alarm Option (Input Control Signal Type S only)

- Alarm state when the input command signal is off and a 10A or more load current is detected by the current transformer (two turns required for 5A or three turns for 2.5A)


#### Open Heater Alarm Option

- Alarm state when the input command signal is on and the load current detected by the current transformer is less than 5A $\sim$ (ac)

#### Alarm output

- Energizes on alarm, non-latching
- Triac 24 to 240V $\sim$ (ac), external supply with a current rating of 300mA @ 25°C (77°F), 200mA @ 50°C (122°F), 100mA @ 80°C (176°F) and a holding current of 200  $\mu$ A with a latching current of 5mA typical

### Agency Approvals

- CE with proper filter:  
89/336/EEC Electromagnetic Compatibility Directive  
EN 61326: Industrial Immunity Class A emissions not suitable for Class B environments  
73/23/EEC Low Voltage Directive EN 50178 Safety Requirements Installation category III, Pollution degree 2  
Phase angle and phase angle with current limit Input Control Signal Types (P and L) are not CE approved
- UL® 50 Type 4X Enclosure and UL® 1604 File E184390 (Thru-wall heatsink mounting only)
-  UL® 508 listed and C-UL® File E73741

### Input Terminals

- Compression: will accept 0.2 to 1.5 mm<sup>2</sup> (24 to 16 AWG) wire
- Torque to 0.5 Nm (4.4 in. lb) maximum with a 3.5 mm ( $\frac{1}{8}$  in.) blade screwdriver

### Line and Load Terminals

- Compression: Will accept 2.5 to 27 mm<sup>2</sup> (14 to 4 AWG) wire
- Torque to 2.7 Nm (24 in. lb) maximum with a 6.4 mm ( $\frac{1}{4}$  in.) blade screwdriver, or a No. 2 Phillips screwdriver

### Operating Environment

- See the output rating curve chart on page 3
- 0 to 90 percent RH (relative humidity), non-condensing
- Storage temperature: -40 to +85°C (-40 to 185°F)
- Insulation only tested to 3,000 meters

### DIN Rail Mount

- DIN EN 50022, 35 mm by 7.5 mm

### Back Panel Mount

- Four mounting holes M3 to M4 (No. 6 to No. 8) fastener

### Through-Wall Mount

- See page 4 for thru-wall cutout

## Additional Specifications for Contactors and Proportional Controllers

### Control Mode, Zero-Cross

- Input Control Signal Type C: V $\approx$ (dc) input contactor
- Input Control Signal Type K: V $\sim$ (ac) input contactor
- To increase service life on contactor input models the cycle time should be less than three seconds
- Input Control Signal Type F: 4 to 20mA $\approx$ (dc) proportional variable time base control

### Input Command Signal

- AC contactor  
24V $\sim$ (ac)  $\pm$ 10 percent, 120V $\sim$ (ac) +10/-25 percent, 240V $\sim$ (ac) +10/-25 percent @ 25mA maximum per controlled leg
- DC Contactor  
4.5 to 32V $\approx$ (dc): maximum current @ 4.5V $\approx$ (dc) is 6mA per leg. Add 2mA per LED used to the total current
- Loop powered linear current  
4 to 20mA $\approx$ (dc): loop-powered. Input Type F0 option only.  
No more than three inputs connected in series

**Additional Specifications: Phase Angle, Phase Angle Current Limit, and Single Cycle VTB**

**Operation**

- Burst firing (zero-cross) control, single-cycle variable time base, Type S single phase and 3 phase. Unit is not on for more than one full cycle under 50 percent power and not off for more than one full cycle above 50 percent power
- Phase angle control, single-phase only

**Input Command Signal**

- 0 to 20mA, 4 to 20mA, 0 to 5V<sub>dc</sub>, 1 to 5V<sub>dc</sub> and 0 to 10V<sub>dc</sub>
- Input impedance 250Ω for 4mA to 20mA, 5kΩ for linear voltage input

**Output Voltage**

- 100 to 120V<sub>ac</sub>, 200 to 208V<sub>ac</sub>, 230 to 240V<sub>ac</sub>, 277V<sub>ac</sub>, 400V<sub>ac</sub>, 480V<sub>ac</sub> and 600V<sub>ac</sub>, ±10 percent

**Linearity (Input Control Signal Type S)**

- ±5 percent input to output power over 0 to 100 percent of span between calibration points

**Linearity (Phase Angle Input Control Type P and L)**

- ±5 percent input to output power, as referenced to a sinusoidal power curve, between calibration points

**Resolution**

- Better than 0.1 percent of input span with respect to output change

**Soft Start**

**(Phase Angle Input Control Signal Type P and L)**

Typically:

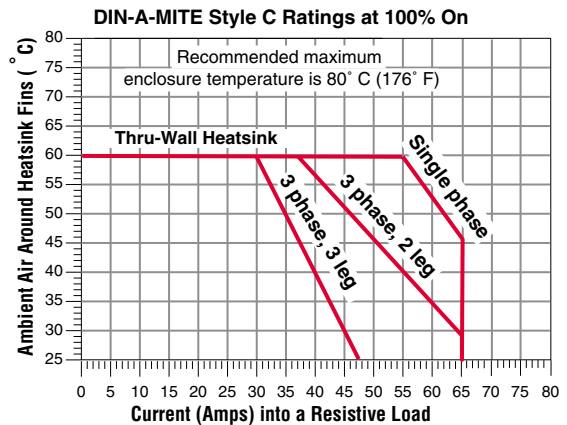
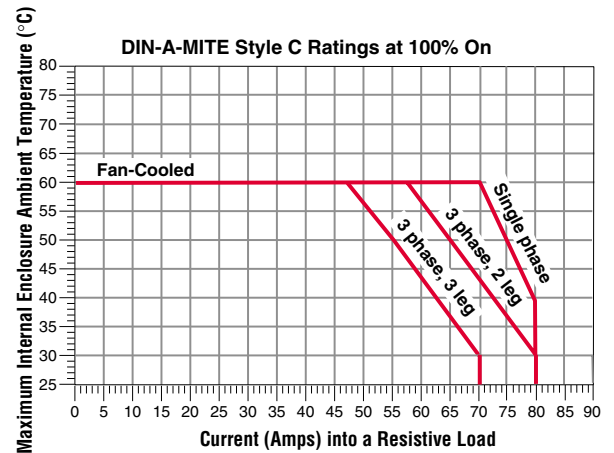
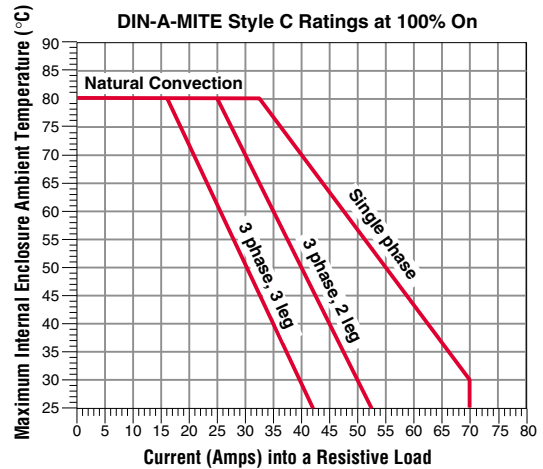
- 5 seconds soft start on power up
- Soft start on thermostat overtemperature
- Soft start on ½ cycle drop out detection
- 1 second soft start on set point change

**Options**

- Manual Control Kit (1kΩ potentiometer) 08-5362
- Alarm option is **not** available on phase angle Input Control Signal Type P or L

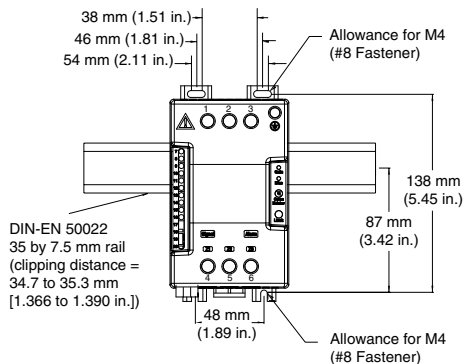
Specifications are subject to change without notice.

**Output Rating Curves**

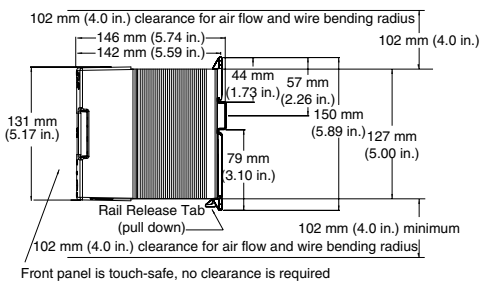


# Style C Dimensions Without Cooling Fan

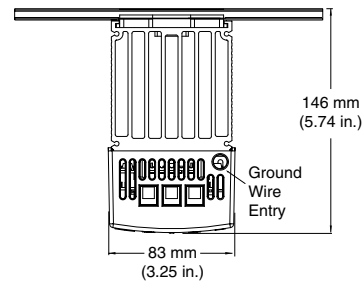
**Front**



**Side**

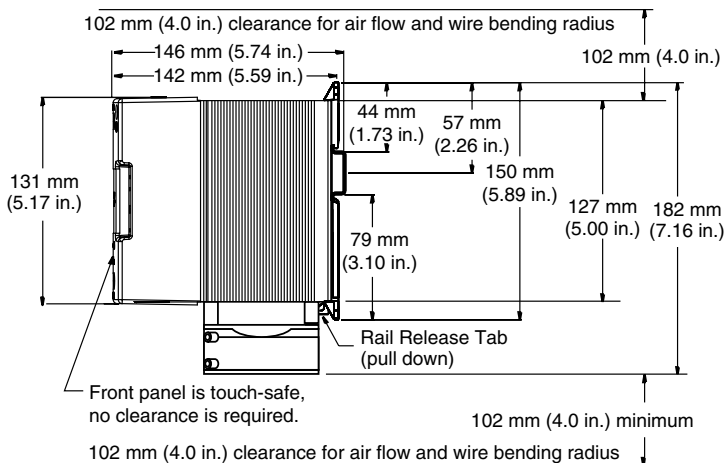


**Top**



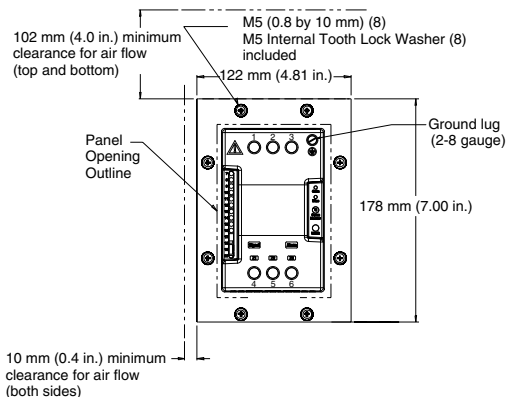
# With Cooling Fan

**Side**

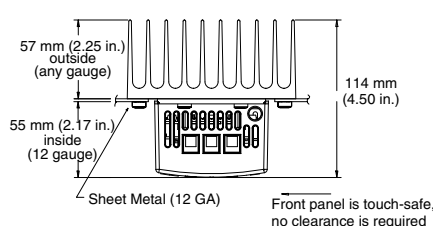


# Thru-Wall Style C<sup>①</sup>

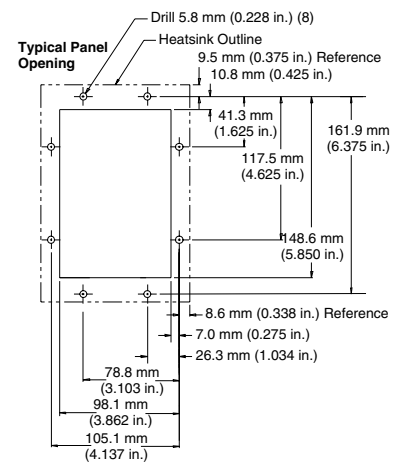
**Front**



**Top**



**Panel Cutout**



<sup>①</sup> With the potential for high thru-wall heatsink temperatures, application may require a touch-safe shield.

## Extended Heater And Power Controller Life With Variable Time Base

With variable time base control, the power controller automatically adjusts the time base and output power with respect to process input. Accelerated life testing verified that variable time base control significantly reduces expansion and contraction of the heater element. This extends heater and power controller life while improving process temperature control. You save money on heaters, downtime and maintenance.

## Loop Powered or Transformer Powered

### Loop Powered

By using a temperature control 4-20mA process output signal as the power supply for the DIN-A-MITE input the cost of the power control can be reduced. With zero cross (burst fired) the 4-20mA input signal simultaneously performs the tasks of providing a power supply and an input command signal. The DIN-A-MITE "V" output type is a loop powered option and will work as single phase or three phase. It works only with a 4-20mA input.

### Transformer Powered

Some DIN-A-MITE models require that an on board power supply be used to power the internal electronics. Phase angle options require that we detect the zero cross of the AC sine wave and thus a transformer is required also. The DIN-A-MITE input control signal types "L", "P" and "S" are transformer powered and can be controlled manually (open loop) with a potentiometer input or in the auto mode (close loop) with a temperature control using any of the 4-20mA, linear voltage (0-5, 1-5 and 0-10V=(dc)) input types.

## Loop Powered 4-20mA Variable Time Base

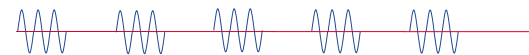
Models: DC\_\_-[02, 24, 60] [F0]-\_\_\_\_\_

### 20 Percent Power Output



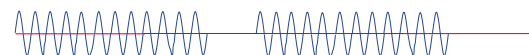
3~ cycles on, 12~ cycles off

### 50 Percent Power Output



3~ cycles on, 3~ cycles off

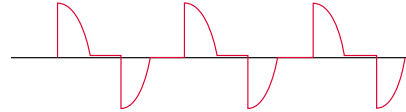
### 80 Percent Power Output



12~ cycles on, 3~ cycles off

## Phase Angle

Models: DC1\_ - \_ \_ [L, P] 0 - 0\_ \_ \_



Phase Angle (input control type "P") Phase control is infinitely variable inside the sine wave. This provides a variable voltage and/or current output. This option includes soft start and line voltage compensation. This is transformer powered and therefore will work with a linear voltage, current input, or a potentiometer input. This is single-phase only.

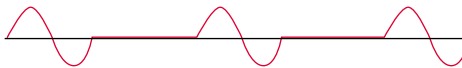
## Single Cycle Variable Time Base

Models: DC\_ \_ - \_ \_ S\_ - \_ \_ \_ \_

40 percent Variable Time Base, 2~ Line Cycles On, 3 Cycles Off



50 percent Variable time Base, 1~ Line Cycle On, 1 Cycle Off



**Variable Time Base** (Input Control Type "S") single cycle variable. At 50 percent power, it is on one cycle and off one cycle. At 40 percent it is on for two cycles and off for three. This is transformer powered and therefore will work with a linear voltage, current input or a potentiometer input.

## Recommended Semiconductor Fuse for Applications Through 600V~(ac):

Fuse Rating	Fuse Part Number		
	Wattlow	Bussman	Ferraz
40A	17-8040	FWP-40A14F	A093909
50A	17-8050	FWP-50A14F	B093910
63A	17-8063	FWP-63A22F	T094823
80A	17-8080	FWP-80A22F	A094829
100A	17-8100	FWP-100A22F	Y094827

Fuse Rating	Fuse Holder Part Number	
	Wattlow	Ferraz
40A	17-5114	J081221 or ST-14
50A	17-5114	J081221 or ST-14
63A	17-5122	F0220368 or ST-22
80A	17-5122	F0220368 or ST-22
100A	17-5122	F0220368 or ST-22

## Ordering Information

To order, complete the code number on the right with the information below:

**Style C** = Solid-State Power Controller

**D C** - - - - -

### Phase

- 1 = 1 phase, 1 controlled leg
- 2 = 3 phase, 2 controlled legs
- 3 = 3 phase, 3 controlled legs, (use with four wire wye)
- 8 = 2 independent zones (Input Type C, K)
- 9 = 3 independent zones (Input Type C, K)

### Cooling and Current Rating Per Leg\* (see chart below)

- 0 = Natural convection standard DIN rail or panel heatsink
- 1 = Fan cooled 120V~(ac) standard DIN rail or panel heatsink
- 2 = Fan cooled 240V~(ac) standard DIN rail or panel heatsink.
- 3 = Fan cooled 24V=(dc) standard DIN rail or panel heatsink
- T = Natural convection through wall or cabinet heatsink (NEMA 4X)

### Line and Load Voltage

- 02 = 24 to 48V~(ac) (Control C, F, K)
- 12 = 100 to 120V~(ac) (Control L, P, S)
- 20 = 200 to 208V~(ac) (Control L, P, S)
- 24 = 100 to 240V~(ac) (Control C, F, K): 230 to 240V~(ac) (Control L, P, S)
- 27 = 277V~(ac) (Control L, P, S)
- 40 = 400V~(ac) (Control L, P, S)
- 48 = 480V~(ac) (Control L, P, S)
- 60 = 277 to 600V~(ac) (Control C, F, K): 600V~(ac) (Control L, P, S)

### Input Control Signal

- C0 = 4.5 to 32V=(dc) contactor
- F0 = 4 to 20mA=(dc) proportional
- K1 = 22 to 26V~(ac) contactor
- K2 = 100 to 120V~(ac) contactor
- K3 = 200 to 240V~(ac) contactor
- L (0 to 5) = Phase angle with current limiting<sup>①</sup> (single phase only)
- P (0 to 5) = Phase angle<sup>①</sup> (single phase only)
- S (0 to 5) = Single cycle variable time base
  - 0 = 4 to 20mA
  - 2 = 0 to 20mA
  - 3 = 0 to 5V=(dc) proportional
  - 4 = 1 to 5V=(dc) proportional
  - 5 = 0 to 10V=(dc) proportional

### Alarm

- 0 = No alarm
- S = Shorted SCR alarm
- H = Open-heater and shorted-SCR alarm (for Input Control Signal Option S)

### Language

- 0 = English
- 1 = German
- 2 = Spanish
- 3 = French

### Custom Part Numbers

- 00 = Standard part
- 1X = 1-second soft start (control option P, L)
- XX = Any letter or number, custom options, labeling, etc.

<sup>①</sup> Not CE Approved

### \*DIN-A-MITE C Current Rating Table

Phase	Cooling	Current at 50°C (122°F)
1	0	55A
1	T	60A
1	(1, 2, 3)	75A
2, 8	0	40A
2, 8	T	45A
2, 8	(1, 2, 3)	65A
3, 9	0	30A
3, 9	T	35A
3, 9	(1, 2, 3)	55A

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