



ASPYRE® AT

Watlow's ASPYRE® AT power controller family is flexible and scalable, and available with a variety of options allowing one platform to be re-used across a wide range of applications, which can help save time and money. ASPYRE AT models available include sizes from 12 to 48 amps.

This smart power controller features multiple advanced firing and control mode algorithms.

Features and Benefits

RM connectivity

- High speed backplane interface with Watlow RM family of controllers eliminates discrete wiring between temperature controllers and power controllers for each heater
- Enables data collection and diagnostics from the power controllers

High accuracy current and voltage measurement

- Characterizes process performance
- Supports comparing (fingerprinting) equipment operation

Wide range of communication protocols (future option)

- Modbus® RTU, Modbus® TCP, EtherNet/IP™, USB device, ProfiNet, EtherCAT® (configuration and data file transfers)

Industry-leading design and serviceability

- Offers a robust SCR design to meet a rugged industrial environment's high quality and reliability needs
- Enables fast troubleshooting by providing helpful thermal system diagnostics

100KA short circuit current rating (SCCR)

- Enables greater protection in the event of a short circuit

c-UL® 508 Listed (pending)

- Shortens project schedules, agency testing and expenses

Control modes: Contactor, voltage, current, power or energy

- Compensates for component thermal tolerances (e.g. heater wattage, insulation variation etc.)

Load firing modes: Zero-cross, burst fire, phase angle, soft start

- Handles a wide range of load types
- Protects and extends the life of connected loads



Open heater and shorted SCR indication

- Minimizes production downtime with easy to understand, intelligent, troubleshooting diagnostics

Integrated USB for configuration

- Easily and safely program configuration settings as the user interface can be powered through USB connection
- Eliminates a user from having to work in a high voltage hazardous environment. High voltage to controller or system panel can be turned off while setting controller configuration

Heater bakeout

- Protects heater on startup
- Eliminates labor and time associated with checking for wet heaters

Cooling options

- Integrated DIN-rail mountable heat sink option simplifies implementation
- Base plate option for flexibility in removing heat from the electrical box



ASPYPE AT

Specifications

Power Bases

- Single-phase, 1 controlled leg (2 SCRs)

Load Amp Range

- 12A to 48A @ 40°C ambient
- De-rate 10% per 10°C up to 60°C (pending testing)

SCR and Amperage Rating

- SCCR rating 100,000A up to 480VAC with coordinated fusing

Line and Load Voltage Range

- 100 to 480V

Voltage frequency

- Automatically compensates for 47 to 63Hz

Controller Operating Supply Voltage

- 24VDC

Voltage and Current Measurement Accuracy

- $\pm 2\%$ of range (standard)
- $\pm 0.5\%$ of range (optional)

Control Modes and Load Types

- Voltage, voltage squared, current, current squared, power, energy

Output Control Firing Types

- Zero crossing
- Burst firing
- Phase angle

Digital Inputs and Outputs

- Independently user-configurable as input or output
- On ≥ 4 VDC, off ≤ 1 VDC, 30VDC max

Analog Input

- Voltage: 0-10VDC, 15k Ω impedance
- Current: 4 to 20mA, 0 to 20mADC, 100 Ω impedance

Analog Output

- 0 to 20mADC or 4 to 20mADC into 500 Ω max. load with 30 μ A nominal resolution
- 0 to 10VDC into a 500 Ω min. load with 15mV nominal resolution

Electromechanical Relay Output

- Form C, 5A resistive load
- 100,000 cycles at 24VDC, 120/240 VAC
- 125VA pilot duty 120/240VAC
- 25VA 24VAC/DC

Diagnostics

- Open load circuit (including heater break), SCR short circuit, current limit, thermal alarm, line voltage loss

Operator Interface

- 4 discrete LED indicators for status monitoring

Connectivity

- EIA 485, Modbus[®] RTU (future option)
- USB Device
- EtherCAT[®] ETG (future option)
- Modbus[®] TCP (future option)
- EtherNet/IP[™] (future option)
- ProfiNet (future option)

Configuration

- PC software tool via USB port

Cooling Mode

- Convection with option for cooling plate

Control Terminals

- Terminals are touch safe, removable, 22 to 12 AWG, 5 in.-lb. torque

Line and Load Terminals

- Compatible with crimp lug terminals or bare wire, 12 to 6 AWG, 24 in.-lb. torque

Ground Terminal

- Recommended 14 to 10 AWG with UL[®] Listed (ZMVV) #8 ring or spade crimp lug, 15 to 17 in.-lb torque

Mounting

- Panel mounting with screws or DIN rail

Environment

- 0 to 40°C without derating
- 5 to 90% RH (relative humidity), non-condensing

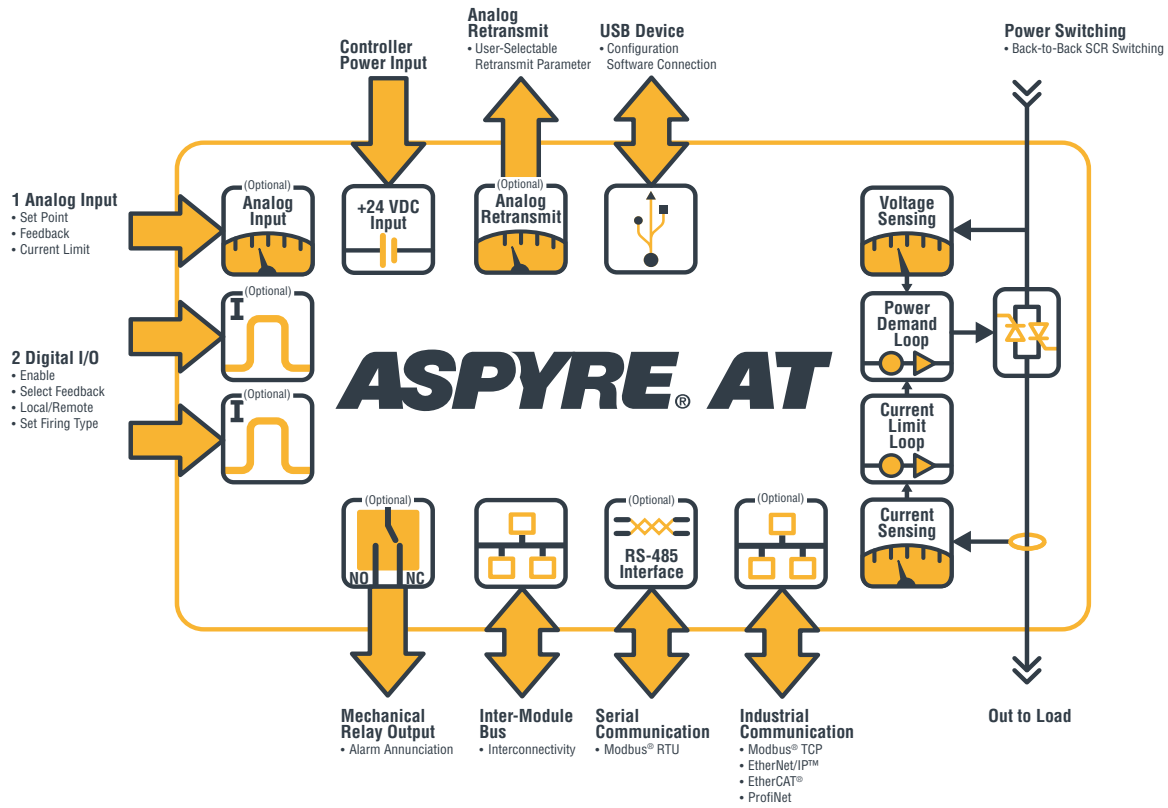
Agency Approval and Regulatory

- UL[®] 508 Listed (pending)
- c-UL[®] Listed (pending)
- CE EMC Directive Class A Emissions
- CE Safety Directive EN 60947-4-3
- IP20
- RoHS 2015-863-EU
- W.E.E.E 2012-19-EU
- Enclosure Flammability Rating: UL[®] 94-V0 (pending)



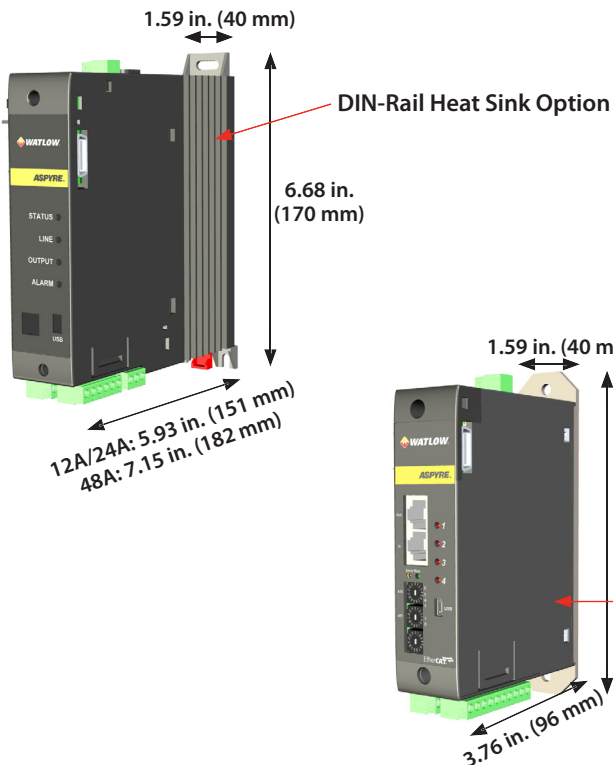
ASPYRE AT

I/O Functional Block Diagram

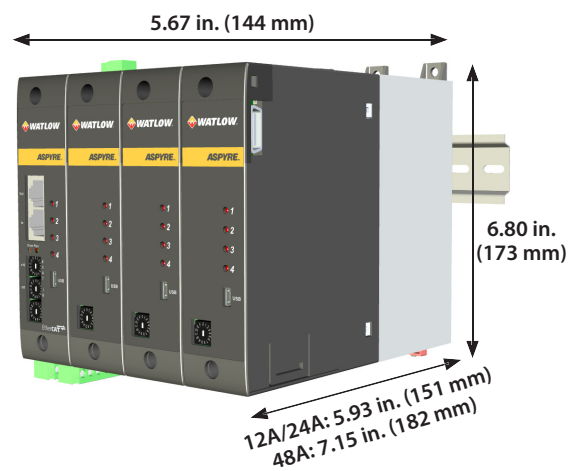


Dimensions

One Zone



Four Zones - Example





ASPYRE AT

Ordering Information

Instructions: Choose one option for each feature.

✓	Switched Legs
	Single-phase
✓	Maximum Load Current
	12A
	24A
	48A
✓	Cooling
	Base plate (customer supplied heatsink)
	Convection cooled, DIN-rail mounted heatsink
✓	Control and Measurement
	Standard precision closed-loop power control with current limit
	High precision closed-loop power control with current limit
✓	Analog Input
	None
	1 process input (volts and milliamps)

✓	Digital Inputs/Outputs
	None
	2 digital I/O points
✓	Mechanical Relay Output
	None
	Mechanical relay 5A, Form C
✓	Universal Process/Retransmit Output
	None
	1 universal process output
✓	Locked Revision
	Standard (current revision)
	Rev - copy exact
✓	Defaults
	Standard
	Custom - consult factory

Accessories

COMPOSER® Configuration Software

- Download at: <https://www.watlow.com/products/controllers/software/composer-software>

USB Cable

- 5 ft USB 2.0 type A to mini device cable (p/n 0219-0382-0000), PC to ASPYRE AT for COMPOSER PC software

24VDC Power Supply

- Watlow power supply (p/n 0847-0299-0000) UL® Class 2, 90-263VAC input, 24VDC output, 1.30A, 31W



ASPYRE® DT

Watlow's ASPYRE® DT power controller family is flexible and scalable, and available with a variety of options allowing one platform to be re-used across a wide range of applications, which can help save time and money. ASPYRE DT models available include sizes from 35 to 2100 amps.

This power controller family features multiple advanced microprocessor-based firing and control mode algorithms. Combined with diagnostics and several communications options the product enables equipment and factory automation.

Controller firing modes include zero cross, burst firing, single cycle, delayed triggering and phase angle. These smart algorithms enable the product to easily control a wide base of heater loads including nichrome, moly, silicon carbide, tungsten quartz and infrared lamps and transformer-coupled loads.

ASPYRE DT offers a comprehensive list of modular options that deliver space and labor savings including controlled legs (1, 2 or 3), semiconductor fusing, load current measurement, amperage size and user interface.

Features and Benefits

Heater bakeout

- Protects heater on start up
- Eliminates labor and time associated with checking for wet heaters

Integrated semiconductor fusing, current transformer and user interface

- Saves installation time and eases setup and commissioning
- Delivers a user-friendly, intuitive interface

Industry-leading design and serviceability

- Offers a robust SCR design to meet a rugged industrial environment's high quality and reliability needs
- Provides quick and easy access to maintain and service fuses and individual legs in minimal time
- Enables fast troubleshooting by providing helpful thermal system diagnostics

Comprehensive power controller range

- Provides wide range of options from simple single-phase to complex three-phase loads to 690V

100KA short circuit current rating (SCCR)

- Minimizes damage in the event of a short circuit



c-UL® 508 Listed

- Shortens project schedules, agency testing and expenses

Control modes: Contactor, voltage, current or power

- Satisfies a wide range of demanding thermal applications

Load firing modes: Zero-cross, burst fire, phase angle, soft start, half-cycle, single-cycle, delayed triggering

- Handles a wide range of load types including nichrome, medium and long waveform infrared lamps, moly (Kanthal® Super), transformers, silicon carbide, UV lamps and tungsten
- Protects and extends the life of connected loads

Wide range of communication protocols

- Enable factory and process automation with connectivity access to process and equipment data using Modbus® RTU, Modbus® TCP, EtherNet/IP™, Wi-Fi, Profibus, Profinet, USB device (configuration and data file transfers)

Open heater and shorted SCR indication

- Minimizes production downtime with easy to understand, intelligent, troubleshooting diagnostics

Integrated USB and user interface for configuration

- Easily and safely program configuration settings as the user interface can be powered through USB connection
- Eliminates need to work in a hazardous environment near high voltage when configuring the controller. High voltage to the controller and panel can be turned off while setting controller configuration



ASPYRE DT

Typical Applications

- Furnaces and ovens
- Autoclaves
- Kilns
- Heat treatment
- Glass industry
- Semiconductor
- Power generation
- Oil and gas
- HVAC
- Textiles
- Plastics
- Packaging
- Petrochemical
- Dryers and curing

Specifications

Power Bases

- 1-phase, 1 controlled leg (2 SCRs)
- 3-phase, 2 controlled legs (4 SCRs)
- 3-phase, 3 controlled legs (6 SCRs)

Load Amp Range

- 35A to 2100A @ 40°C ambient
- Amperage derating curve for other ambient temperatures

SCR Ratings

- Latching current 1A min.
- Power dissipation: Approximate 1.25 to 1.5 watts per amp per controlled leg
- Leakage current: (35A to 800A models): 15mA
- Leakage current: (1100A to 2100A models): 300mA
- Short Circuit Current Rating (SCCR): 100,000A up to 600VAC

Line and Load Voltage Range

- 24 to 480V ±10% min./max.
- 24 to 600V ±10% min./max.
- 24 to 690V ±10% min./max.
690VAC only available for 60A and greater models
- Isolation voltage 2500V

Voltage frequency

- 50 to 60Hz

Feedback Types

- Voltage, voltage squared, current, current squared, power, open loop and external
- All feedback types available with any firing type combination

Load Types

- Normal resistive loads: Nichrome, infrared lamps (medium and long waveform)
- Others: Moly (Kanthal® Super), transformers, silicon carbide, UV lamps, short wave infrared lamps (such as tungsten)

Current Limiting and Heater Bakeout

- Available on 1-phase models and 3-phase, 3-leg models 60A to 2100A

Firing Type Combinations	Single-Phase	3-Phase, 2-Leg	3-Phase, 3-Leg
Zero Crossing	X	X	X
Zero Crossing + Start Ramp	X		X*
Zero Crossing + Start Ramp + Soft Start	X		X*
Zero Crossing + Soft Start	X	X	X
Burst Firing	X	X	X
Burst Firing + Soft Start	X	X	X
Burst Firing + Start Ramp	X		X*
Burst Firing + Start Ramp + Soft Start	X		X*
Single Cycle	X		
Single Cycle + Soft Start	X		
Phase Angle	X		X*
Phase Angle + Soft Start	X		X*
Half Cycle	X		
Half Cycle + Soft Start	X		
Burst Firing + Delayed Triggering	X		X*
Burst Firing + Delayed Triggering + Soft Start	X		X*
Burst Firing + Delayed Triggering + Safety Ramp	X		X*
Burst Firing + Delayed Triggering + Safety Ramp + Soft Start	X		X*
Half Cycle + Safety Ramp	X		
Half Cycle + Safety Ramp + Peak Current Limit	X		

*60A to 2100A models

Digital Inputs 1 and 2

- On ≥4VDC, off <1VDC
- 4 to 30VDC @ 5mA max.
- Optically isolated
- Digital input functions: Enable, SSR, alarm reset, change to voltage feedback, local/remote set point enable, change firing to phase angle, select analog input 1 or 2 for set point, enable data logging, enable heater bakeout
- A switched DC control output can be connected to the digital input as an open loop control mode command signal

Analog Inputs 1 and 2

- Voltage: 0 to 10VDC, 15KΩ impedance
- Current: 0 to 20mA or 4 to 20mA, 100Ω impedance
- Potentiometer: 10KΩ min.
- Analog Input 1 Function: Set point reference
- Analog Input 2 Functions: Current limit, feedback or set point reference



ASPYPE DT

Agency Approval and Regulatory

- 35A to 700A models: cULus 508 Listed File E73741
- 35A to 700A models: cUL® Listed to C22.2 No. 14
- 800A to 2100A models: UL® 508 Listed File E73741
- CE EMC Directive 2014-30-EU, EN 60947-4-3 Class A Emissions
- CE Safety Directive 2014-35-EU, EN 60947-4-1, 4-3
- IP20 with all covers in place
- RoHS 2011-65-EU
- W.E.E.E. 2012-19-EU
- 690VAC units not covered by UL®

Accessories

- Free Watlow ASPYPE configuration software on the Watlow website at <http://www.watlow.com/en/resources-and-support/Technical-Library/Software-and-Demos>
- 6 ft USB 2.0 to micro USB device cable (p/n 0219-0480-0000)
- External power supply UL® Class 2, 90-263VAC input, 24VDC output, 1.30A, 31W (p/n 0847-0299-0000)
- Fuses - see table in next column

Fuses

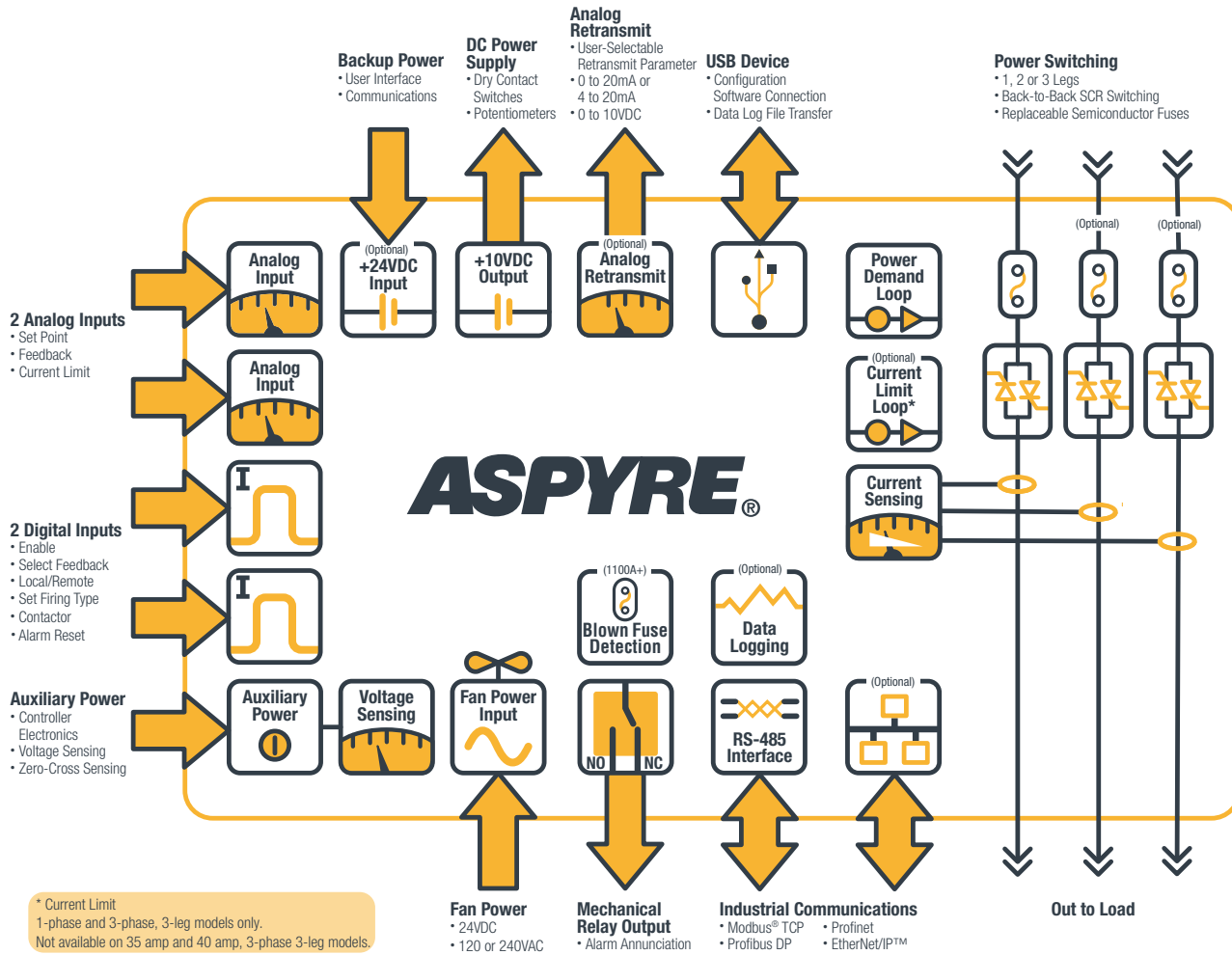
ASPYPE Model Number	Qty. Used Per Unit	Watlow Fuse Part Number	
		480V and 600V	690V
DT___ - 035 ...	1/leg	17-8050	N/A
DT___ - 040 ...			
DT___ - 060 ...		0808-0363-0160	2048-2760
DT___ - 090 ...		0808-0363-0180	
DT___ - 120 ...		0808-0363-0200	2048-4405
DT___ - 150 ...		0808-0363-0250	2048-4418
DT___ - 180 ...		0808-0363-0315	2048-4426
DT___ - 210 ...			
DT1__ - 300 ...	1	0808-0362-0000	N/A
DT1__ - 400 ...	1	0808-0358-0000	0808-0358-0000
DT1__ - 500 ...	1	0808-0359-0000	0808-0359-0000
DT1__ - 600 ...	4	0808-0363-0250	808-0363-0250
DT1__ - 700 ...	4		
DT2__ - 300 ...	3	0808-0357-0000	2055-5072
DT2__ - 400 ...	3	0808-0358-0000	0808-0358-0000
DT2__ - 450 ...	6	0808-0360-0000	0808-0360-0000
DT2__ - 500 ...	6		
DT2__ - 600 ...	4	0808-0357-0000	0808-0357-0000
DT2__ - 700 ...	4		
DT3__ - 300 ...	3	0808-0357-0000	2055-5072
DT3__ - 350 ...	3	0808-0358-0000	0808-0358-0000
DT3__ - 400 ...	3		
DT3__ - 450 ...	3	0808-0359-0000	0808-0359-0000
DT3__ - 500 ...	3		
DT___ - 800 ...	4/leg	0808-0363-0250	0808-0363-0250
DT___ - 1K1 ...	2/leg	2078-4948	2078-5301
DT___ - 1K4 ...		2078-5257	2078-5358
DT___ - 1K6 ...		2078-5261	2078-5413
DT___ - 1K8 ...			
DT___ - 2K1 ...			

N/A - Not available



ASPYRE DT

I/O Functional Block Diagram



ASPYPE DT

Dimensions and Shipping Weight

Current and Voltages	1-Phase, 1 Controlled Leg	3-Phase, 2 Controlled Legs	3-Phase, 3 Controlled Legs
35 and 40A 480 and 600VAC	 <p>4.77 in. H x 2.84 in. W x 7.28 in. D - 2.6 lbs</p>	 <p>4.77 in. H x 4.25 in. W x 7.28 in. D - 4 lbs</p>	 <p>4.77 in. H x 5.67 in. W x 7.28 in. D - 5.5 lbs</p>
60, 90, 120, 150, 180 and 210A 480 and 600VAC	 <p>10.6 in. (60A) or 10.79 in. (90-210A) H x 3.66 in. W x 6.7 in. D - 9 lbs</p>	 <p>10.6 in. (60A) or 10.79 in. (90-210A) H x 7.36 in. W x 6.7 in. D - 18 lbs</p>	 <p>10.6 in. (60A) or 10.79 in. (90-210A) H x 11.1 in. W x 6.7 in. D - 27 lbs</p>
60, 90, 120, 150, 180 and 210A 690VAC	 <p>17.33 in. H x 5.40 in. W x 10.63 in. D - 23 lbs</p>	  <p>60-90A = 17.33 in. H x 5.40 in. W x 10.63 in. D - 23 lbs 120-210A = 17.33 in. H x 10.32 in. W x 10.63 in. D - 40 lbs</p>	
1 and 2 leg: 300, 400, 500, 600 and 700A 3 leg: 300, 350, 400, 450 and 500A 480, 600 and 690VAC	 <p>20.47 in. H x 5.4 in. W x 10.63 in. D - 33 lbs</p>		 <p>20.47 in. H x 10.32 in. W x 10.63 in. D - 63 lbs</p>



ASPYRE DT

Dimensions and Shipping Weight (cont.)

Current and Voltages	1-Phase, 1 Controlled Leg	3-Phase, 2 Controlled Legs	3-Phase, 3 Controlled Legs
800A 480, 600, 690VAC	 <p>22.1 in. H x 5.4 in. W x 10.7 in. D - 23.2 lbs</p>	 <p>22.1 in. H x 10.9 in. W x 10.7 in. D - 46.3 lbs</p>	 <p>22.1 in. H x 16.2 in. W x 10.7 in. D - 69.5 lbs</p>
1100A 480, 600, 690VAC	 <p>21.7 in. H x 13 in. W x 13.7 in. D - 59.5 lbs</p>	 <p>21.7 in. H x 20.6 in. W x 13.7 in. D - 108 lbs</p>	 <p>21.7 in. H x 28.3 in. W x 13.7 in. D - 158.7 lbs</p>
1400, 1600, 1800, 2100A 480, 600, 690VAC	 <p>28.8 in. H x 13 in. W x 13.7 in. D - 74.9 lbs</p>	 <p>28.8 in. H x 20.6 in. W x 13.7 in. D - 143.3 lbs</p>	 <p>28.8 in. H x 28.3 in. W x 13.7 in. D - 216.1 lbs</p>



ASPYRE DT

Ordering Information

Base model includes: Power control loop for open loop, voltage, current or power control, 2 analog inputs (0-10VDC, 4-20mA selectable), 2 digital inputs, semiconductor fusing and current transformers for each leg, mechanical relay heater break alarm, RS-485 Modbus® communications, pixel OLED user interface and keypad, 10VDC auxiliary power supply

Part Number

① ②	③	④ ⑤	⑥ ⑦ ⑧	⑨	⑩	⑪	⑫	⑬	⑭ ⑮
Model	Phase	Max. Line & Load Voltage	Amperage	Auxiliary Power	Current Limit Loop/Analog Retransmit Output	Cooling Fan Voltage	Add'l Wired Comms.	Data Logging	Custom Options - Firmware Overlay, Preset Parameters and Locked Code
DT									

③ Phase	
1 =	1-phase, 1 controlled leg
2 =	3-phase, 2 controlled leg
3 =	3-phase, 3 controlled leg

④ ⑤ Maximum Line and Load Voltage	
48=	480VAC
60=	600VAC
69=	690VAC - Only available for 60A and greater models

⑥ ⑦ ⑧ Amperage	
035 =	35A
040 =	40A
060 =	60A
090 =	90A
120 =	120A
150 =	150A
180 =	180A
210 =	210A
300 =	300A
350 =	350A - Not available for 1-phase, 1 leg or 3-phase, 2 leg models
400 =	400A
450 =	450A - Not available for 1-phase, 1 leg models
500 =	500A
600 =	600A - Not available for 3-phase, 3 controlled leg models
700 =	700A - Not available for 3-phase, 3 controlled leg models
800 =	800A
1K1 =	1100A
1K4 =	1400A
1K6 =	1600A
1K8 =	1800A
2K1 =	2100A

⑨ Auxiliary Power				
		35 to 40A	60 to 800A	1100 to 2100A
1 =	100 or 120VAC	OK	OK	OK
2 =	200, 208, 220, 230 or 240VAC	OK	OK	OK
3 =	277VAC	OK	OK	N/A
4 =	380, 400, 415, 440 or 480VAC	OK	OK	N/A
5 =	600VAC	OK	OK	N/A
6 =	690VAC	N/A	OK	N/A

Note: For 35A to 800A models you *must* choose the nominal, switched line voltage. For 1100A to 2100A models the auxiliary power is independent of the switched voltage.

⑩ Current Limit Loop/Analog Retransmit Output							
		35A to 40A			60A to 2100A		
		DT1	DT2	DT3	DT1	DT2	DT3
A =	Both	OK	N/A	N/A	OK	N/A	OK
B =	Neither	OK	OK	OK	OK	OK	OK
C =	Current limit	OK	N/A	N/A	OK	N/A	OK
D =	Retransmit	OK	OK	OK	OK	OK	OK

Note: If using both Analog Retransmit (digit 10, options A or D) and Additional Wired Communication (digit 12, options 1-5) an external power supply is required. See Accessories.
OK = Available for these models.
N/A = Not available for these models.

⑪ Cooling Fan Voltage						
		35A to 40A	60A to 480/600V	60A to 690V	90A to 800A	1100A to 2100A
0 =	No fan	OK	OK	N/A	N/A	N/A
1 =	120VAC	N/A	N/A	OK	OK	OK
2 =	240VAC	N/A	N/A	OK	OK	OK
3 =	24VDC	N/A	N/A	OK	OK	N/A

OK = Available for these models.
N/A = Not available for these models.

⑫ Additional Wired Communication (Modbus® RTU-485 Comes Standard in all Models)	
0 =	No additional communications option
1 =	Modbus® TCP
3 =	Profibus DP
4 =	Profinet
5 =	EtherNet/IP™

Note 1: If using both Analog Retransmit (digit 10, options A or D) and Additional Wired Communication (digit 12, options 1-5) an external power supply is required. See Accessories.

⑬ Data Logging	
A =	No data logging
C =	Data logging with battery backup and real time clock

Note: 35A and 40A models do not include battery backup or real time clock.

⑭ ⑮ Custom Options - Firmware Overlay, Preset Parameters and Locked Code	
AA=	Standard
NC=	No IP20 covers on 1100A and greater models
XX=	Contact factory - custom firmware, preset parameters, locked code



DIN-A-MITE® A

The DIN-A-MITE® A power controller provides a low-cost, highly compact and versatile solid state option for controlling electric heat. This controller is designed and manufactured with the quality features expected from Watlow. DIN-rail and panel mounting is standard on every controller. There is no need to worry about mercury, the DIN-A-MITE controller is mercury free.

Features include single-phase zero cross switching up to 25 amperes at 600VAC (see rating curve). A unique integrated design removes the guesswork associated with selecting a proper heat sink and adequate terminations for the application.

Variable time-base, 4-20mA process control and VAC/VDC input contactor versions are available. All options are model number dependent and factory configurable. This power controller also includes 200KA short circuit current rating (SCCR) tested up to 480VAC to minimize damage in the event of a short circuit when used with required fusing.

Watlow's DIN-A-MITE A is available through Watlow **SELECT**®, a program that enables you to quickly identify, configure and receive your thermal products faster and easier than ever before. With **SELECT**, you use a variety of tools to guide your decision, configure products for an exact fit and quickly receive your order.



Features and Benefits

200KA SCCR with proper fusing

- Minimizes damage in the event of a short circuit

DIN-rail and panel mounting

- Provides versatility and quick, low-cost installation

Compact size

- Reduces panel space and cost

Touch-safe terminals

- Increases safety for installer and user

Mercury free

- Assures environmental safety

Faster switching with solid state

- Saves energy and extends heater life

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

- Meets applications requiring agency approval
- Reduces end product documentation cost

Back-to-back SCR design

- Ensures a rugged design



DIN-A-MITE A

Specifications

Operator Interface

- Control input
- Input indication LED

Amperage

- 1-phase, see the output rating curve
- Max. I²t for fusing: 4000A² sec
- Latching current: 400mA max.
- Holding current: 200mA max.
- Power dissipation is 1.2 watts per ampere switched
- 200KA SCCR, Type 1 and 2 approved with the recommended fusing; see user manual

Line Voltage

- 24 to 660VAC model number dependent; see ordering information
- Off-state leakage: 1mA at 77°F (25°C) max.
- 50/60Hz independent


Control Mode, Zero Cross

- Control option C: VDC input, contactor output
- Control option K: VAC input, contactor output
- To increase service life on contactor models, the cycle time should be less than three seconds
- Control option F: 4 to 20mA DC input, variable time-base control output (3 cycles on, 3 cycles off at 50% power)

Control Input

- AC contactor: 24VAC ±10%, 120VAC +10/-25%, 240VAC +10/-25% @ 25mA max.
- DC contactor: 4.5 to 32VDC: max. current @ 4.5VDC is 8mA
- Loop powered linear current 4 to 20mA DC: loop-powered, control option F0 only (requires current source with 8.0VDC available, no more than two DIN-A-MITE inputs can be connected in series)

Agency Approvals

- CE with proper filter:
204/108/EC Electromagnetic Compatibility Directive
EN 61326-1: Industrial Immunity Class A Emissions
- 2006/95/EC Low Voltage Directive
EN 50178 Safety Requirements
- Installation category III, pollution degree 2
-  UL[®] 508 listed and C-UL[®] File E73741
- 2011/65/EU RoHS 2

Control Input Terminals

- Compression: Will accept 24 to 16 AWG (0.2 to 1.5 mm²) wire

Line and Load Terminals

- Compression: Will accept 18 to 8 AWG (0.8 to 8.4 mm²) wire

Operating Environment

- -4 to 176°F (-20 to 80°C); see the output rating curve chart for your application
- 0 to 90% RH (relative humidity), non-condensing
- Insulation tested to 3,000 meters
- Units are suitable for "Pollution degree 2"

Mounting

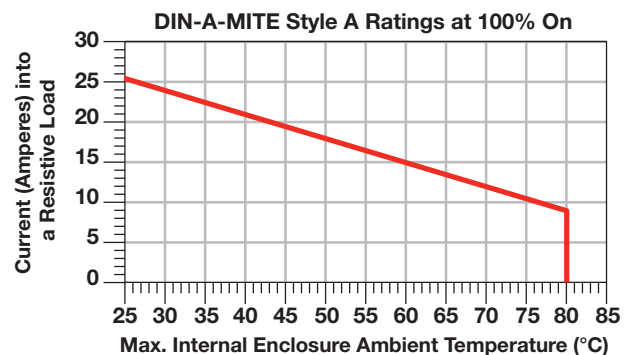
- Options include DIN-rail or standard back panel mounting
- DIN EN 50022, 35 mm by 7.5 mm
- Mount cooling fins vertically

Dimensions

- 3.7 in. (94 mm) high x 2.0 in. (50 mm) wide x 3.9 in. (98 mm) deep
- Weight: 0.71 lb (0.32kg)

Specifications are subject to change without notice.

Output Rating Curve





DIN-A-MITE A

Ordering Information

Part Number

①	②	③	④	⑤ ⑥	⑦ ⑧	⑨	⑩	⑪ ⑫
D	A	Phase	Cooling & Current Rating	Line & Load Voltage	Control	0	User Manual	Custom Options
		1	0					

③ Phase	
1 =	1-phase, 1 controlled leg

④ Cooling and Current Rating (See rating curve)	
0 =	Natural convection current rating 18A @ 50°C

⑤ ⑥ Line and Load Voltage	
02 =	24 to 48VAC
24 =	120 to 240VAC
60 =	277 to 600VAC

⑦ ⑧ Control	
C0 =	4.5 to 32VDC input, contactor output
F0 =	4 to 20mA DC input, variable time-base output
K1 =	22 to 26VAC input, contactor output
K2 =	100 to 120VAC input, contactor output
K3 =	200 to 240VAC input, contactor output

⑩ User Manual	
0 =	English
1 =	German
2 =	Spanish
3 =	French

⑪ ⑫ Custom Options	
00 =	Standard part
XX =	Any letter or number, custom options

Recommended Fuses and Fuse Holders

Semiconductor Fuses and Holders

Part Number	Description
17-8025	25A fuse
17-5110	10-25A holder

DFJ Combination Fuses and Holders

Part Number	Description
0808-0325-0020	20A fuse
0808-0325-0030	30A fuse
0808-0326-1530	15-30A holder



DIN-A-MITE® B

The DIN-A-MITE® B power controller provides a low-cost, highly compact and versatile solid state option for controlling electric heat. This controller is designed and manufactured with the quality features expected from Watlow. DIN-rail and panel mounting are standard on every control. There is no need to worry about mercury, the DIN-A-MITE controller is mercury free.

Features include single-phase and three-phase zero cross switching up to 40 and 22 amperes, respectively, at 600VAC (see rating curve). A unique, integrated design removes the guesswork associated with selecting a proper heat sink and adequate terminations for the application.

Variable time-base, 4-20mA process control and VAC/VDC input contactor versions are available. A shorted output alarm option is also available. All options are model number dependent and factory configurable. This power controller includes 200KA short circuit current rating (SCCR) tested up to 480VAC to minimize damage in the event of a short circuit when used with required fusing.

Watlow's DIN-A-MITE B is available through Watlow **SELECT**®, a program that enables you to quickly identify, configure and receive your thermal products faster and easier than ever before. With **SELECT**, you use a variety of tools to guide your decision, configure products for an exact fit and quickly receive your order.



Features and Benefits

200KA SCCR with proper fusing

- Minimizes damage in the event of a short circuit

DIN-rail and panel mounting

- Provides versatility and quick, low-cost installation

Compact size

- Reduces panel space and cost

Touch-safe terminals

- Increases safety for installer and user

Single- and three-phase power

- Permits use in a variety of applications

Mercury free

- Assures environmental safety

Faster switching with solid state

- Saves energy and extends heater life

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

- Meets applications requiring agency approval
- Reduces end product documentation cost

Back-to-back SCR design

- Ensures a rugged design

Shorted output alarm (optional)

- Simplifies troubleshooting and reduces downtime



DIN-A-MITE B

Specifications

Operator Interface

- Control input and indication light
- Alarm output and indication light

Amperage Rating

- See the output rating curve
- Max. surge current for 16.6ms, 380A peak
- Max. I²t for fusing is 4,000A²s
- Latching current: 400mA max.
- Holding current: 200mA max.
- Off-state leakage 1mA at 77°F (25°C) max.
- Power dissipation = 1.2 watts per ampere per leg switched
- 200KA SCCR, Type 1 and 2 approved with the recommended fusing; see user manual

Line Voltage

- 24 to 660VAC model number dependent; see ordering information

Control Mode, Zero Cross

- Control option C: VDC input, contactor output
- Control option K: VAC input, contactor output
- To increase service life on contactor models, the cycle time should be less than 3 seconds
- Control option F: 4 to 20mA DC input, variable time-base control output

Control Input

- AC contactor: 24VAC ±10%, 120VAC +10/-25%, 240VAC +10/-25% @ 25mA max. per controlled leg
- DC contactor: 4.5 to 32VDC: max. current @ 4.5VDC is 6mA per leg. Add 2mA per LED used to the total current
- Loop powered linear current: 4 to 20mA DC: loop-powered, control option F0 only (requires current source with 8.0VDC available, no more than 2 DIN-A-MITE inputs connected in series)

Alarm

Shorted SCR Alarm Option

- Alarm state when the input command signal off and a 10A or more load current is detected by the current transformer (2 turns required for 5A and 3 turns for 2.5A)

Alarm Output

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

Agency Approvals

- CE with proper filter:
 - 204/108/EC Electromagnetic Compatibility Directive
 - EN 61326-1: Industrial Immunity Class A Emissions
- 2006/95/EC Low Voltage Directive
 - EN 50178 Safety Requirements
 - Installation category III, pollution degree 2
- cUL^{us}UL[®] 508 listed and C-UL[®] File E73741
- 2011/65/EU RoHS 2

Control Input Terminals

- Compression: Will accept 24 to 16 AWG (0.2 to 1.5 mm²) wire

Line and Load Terminals

- Compression: Will accept 18 to 8 AWG (0.8 to 8.4 mm²) wire

Operating Environment

- See the output rating curve
- 0 to 90% RH (relative humidity), non-condensing
- Storage temperature: -40 to 185°F (-40 to 85°C)
- Operating temperature: -4 to 176°F (-20 to 80°C)
- Insulation tested to 3,000 meters

DIN-rail Mount

- DIN EN 50022, 35 mm by 7.5 mm

Back-Panel Mount

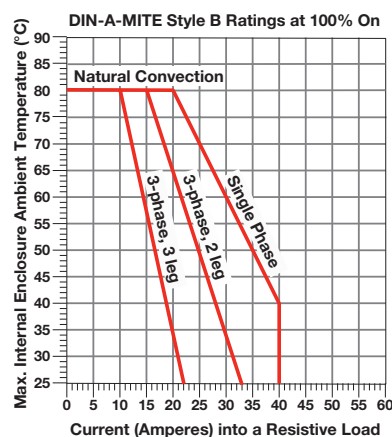
- 4 mounting holes No. 6 to No. 8 (M3 to M4) fastener

Dimensions

- 3.7 in. (94 mm) high x 3.3 in. (83 mm) wide x 4.9 in. (124 mm) deep
- Weight: 1.5 lb (0.68kg)

Specifications are subject to change without notice.

Output Rating Curve



Current Rating Table

Phase	Cooling	Current at 122°F (50°C)
1	0	35A
2, 8	0	25A
3, 9	0	17A



DIN-A-MITE B

Ordering Information

Part Number

①	②	③	④	⑤ ⑥	⑦ ⑧	⑨	⑩	⑪ ⑫
D	B	Phase	Cooling & Current Rating	Line & Load Voltage	Control	Alarm	User Manual	Custom Options
				-		-		

③ Phase	
1 =	1-phase, 1 controlled leg
2 =	3-phase, 2 controlled legs
3 =	3-phase, 3 controlled legs
8 =	2 independent zones (control options C or K)
9 =	3 independent zones (control options C or K)

④ Cooling and Current Rating (See rating curve)	
0 =	Natural convection

⑤ ⑥ Line and Load Voltage	
02 =	24 to 48VAC
24 =	120 to 240VAC
60 =	277 to 600VAC

⑦ ⑧ Control	
C0 =	4.5 to 32VDC input, contactor output
F0 =	4 to 20mA DC input, variable time-base output
K1 =	22 to 26VAC input, contactor output
K2 =	100 to 120VAC input, contactor output
K3 =	200 to 240VAC input, contactor output

⑨ Alarm	
0 =	No alarm
S =	Shorted SCR alarm

⑩ User Manual	
0 =	English
1 =	German
2 =	Spanish
3 =	French

⑪ ⑫ Custom Options	
00 =	Standard part
XX =	Any letter or number, custom options

Recommended DIN-rail Mount Fuses and Fuse Holders

Semiconductor Fuses and Holders

Part Number	Description
17-8020	20A fuse
17-8025	25A fuse
17-8030	32A fuse
17-8040	40A fuse
17-8050	50A fuse
17-5110	10-25A holder
17-5114	32-50A holder

DFJ Combination Fuses and Holders

Part Number	Description
0808-0325-0020	20A fuse
0808-0325-0030	30A fuse
0808-0325-0040	40A fuse
0808-0325-0050	50A fuse
0808-0326-1530	15-30A holder
0808-0326-3560	35-60A holder



DIN-A-MITE® C

The DIN-A-MITE® C silicon controlled rectifier (SCR) power controller provides a low cost, compact and versatile solid state option for controlling electric heat. This controller is designed and manufactured with the quality features expected from Watlow. DIN-rail/panel mount and through-wall mount versions are available.

Features include single-phase, three-phase/two leg, and three-phase/three leg, 24-600VAC operation. Current switching capabilities range from 30 to 80A depending on the model ordered.

Variable time-base, linear voltage and current process control or VAC/VDC input contactor versions are available. Single-phase, phase angle firing and current limiting are also available. All options are model number dependent and factory configurable. This power controller includes 200KA short circuit current rating (SCCR) tested up to 480VAC to minimize damage in the event of a short circuit when used with required fusing.

Watlow's DIN-A-MITE C is available through Watlow **SELECT**®, a program that enables you to quickly identify, configure and receive your thermal products faster and easier than ever before. With **SELECT**, you use a variety of tools to guide your decision, configure products for an exact fit and quickly receive your order.



Features and Benefits

200KA SCCR with proper fusing

- Minimizes damage in the event of a short circuit

DIN-rail, panel and thru-wall mounting

- Provides versatility and quick, low-cost installation

Compact size

- Reduces panel space and cost

Touch-safe terminals

- Increases safety for installer and user

One- and three-phase power

- Can be used in a variety of applications

Open heater/shorted output alarm

- Notifies the user in case of an open heater or shorted output

Mercury free

- Assures environmental safety

Faster switching with solid state

- Saves energy and extends heater life

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

- Meets applications requiring agency approval
- Reduces end product documentation cost

System solution component

- Provides single source thermal loop

Back-to-back SCR design

- Ensures a rugged design



DIN-A-MITE C

Specifications

Operator Interface

- Control input and indication light
- Alarm output and indication light
- Current limit indication LED

Amperage Rating

- See output rating curves on the next page
- Max. surge current for 16.6ms, 1,350A peak
- Max. I^2t for fusing is 9100A²s
- Latching current: 500mA max.
- Holding current: 200mA max.
- Fan current: 0.14A for 24VDC; 0.12A for 120VAC; 0.06A for 240VAC
- Off-state leakage 1mA at 77°F (25°C) max.
- Power dissipation: 1.2 watts per ampere per leg switched
- 200KA SCCR, Type 1 and 2 approved with the recommended fusing; see user manual

Line Voltage

- 24 to 48VAC units: 20.4VAC min. to 53VAC max.
- 100 to 240VAC units: 48VAC min. to 265VAC max.
- 277 to 600VAC units: 85VAC min. to 660VAC max.
- 100 to 120VAC, 200 to 208VAC, 230 to 240VAC, 277VAC, 400VAC, 480VAC, 600VAC, +10/-15%, 50 to 60Hz independent $\pm 5\%$ (control options L, P and S)

Alarms (Zero Cross Models Only)

Shorted SCR Alarm Option

- Alarm state when the input command signal is off and a 10A or more load current is detected by the current transformer (2 turns required for 5A and 3 turns for 2.5A)


Open Heater Alarm Option (Control Option S Only)

- Alarm state when the input command signal is on and the load current detected by the current transformer is 20% less than customer adjusted set point

Alarm Output

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

Agency Approvals

- CE with proper filter:
204/108/EC electromagnetic compatibility directive
EN 61326-1: Industrial immunity Class A emissions not suitable for Class B environments
Phase angle and phase angle with current limit (control options P and L) are not CE approved for conducted or radiated emissions
2006/95/EC low voltage directive EN 50178 safety requirements installation category III, pollution degree 2
- UL[®] 50 Type 4X enclosure, Class 1, Div. 2 per ANSI/ISA 12.12.01. Through-wall heat sink models T4 File 184390
-  UL[®] 508 listed and C-UL[®] File E73741
- Shock and vibration tested to IEC 60068-2-32
- Vibration tested to IEC 60068-2-6
- 2011/65/EU RoHS 2

Control Input Terminals

- Compression: Will accept 24 to 16 AWG (0.2 to 1.5 mm²) wire
- Torque to 4.4 in. lb (0.5 Nm) max. with a 1/8 in. (3.5 mm) blade screwdriver

Line and Load Terminals

- Compression: Will accept 14 to 3 AWG (2.5 to 25 mm²) wire
- Torque to 24 in. lb (2.7 Nm) max. with a 1/4 in. (6.4 mm) blade screwdriver, or a type 1A, #2 Pozi driver

Operating Environment

- See the output rating curve chart on next page
- 0 to 90% RH (relative humidity), non-condensing
- Storage temperature: -40 to 185°F (-40 to 85°C)
- Operating temperature: -29 to 176°F (-34 to 80°C)
- Insulation tested to 3,000 meters

DIN-Rail Mount

- DIN EN 50022, 35 mm by 7.5 mm

Back-Panel Mount

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

Through-Wall Mount

- See page 100 for through-wall panel cutout
(**Note:** Mount cooling fins vertically.)

Additional Specifications for Contactors and Proportional Controllers

Control Mode, Zero-Cross

- Control option C: VDC input, contactor output
- Control option K: VAC input, contactor output
- To increase service life on contactor models, the cycle time should be less than 3 seconds
- Control option F: 4 to 20mA DC input, variable time-base control output



DIN-A-MITE C

Specifications (Continued)

Control Input

- AC contactor: 24VAC $\pm 10\%$, 120VAC $+10/-25\%$, 240VAC $+10/-25\%$ @ 25mA max. per controlled leg
- DC contactor: 4.5 to 32VDC: max. current @ 4.5VDC is 6mA per leg, add 2mA per LED used to the total current
- Loop powered linear current: 4 to 20mA DC: loop-powered, control option F0 only (requires current source with 8.0VDC available, no more than 2 DIN-A-MITE inputs connected in series)

Additional Specifications for Phase Angle, Phase Angle Current Limit and Single-Cycle Variable Time-Base

Operation

- With control option S (single-cycle, variable time-base) the output is not on for more than 1 consecutive AC cycle below 50% power and not off for more than 1 consecutive AC cycle above 50% power
- Phase angle control, 1-phase only

Control Input

- 0 to 20mA, 4 to 20mA, 0 to 5VDC, 1 to 5VDC and 0 to 10VDC
- Input impedance 250 Ω for 4mA to 20mA, 5k Ω for linear voltage input

Output Voltage

- 100 to 120VAC, 200 to 208VAC, 230 to 240VAC, 277VAC, 400VAC, 480VAC and 600VAC, $\pm 10\%$

Linearity (Control Option S)

- $\pm 5\%$ input to output power over 0 to 100% of span between calibration points

Linearity (Control Options P and L)

- $\pm 5\%$ input to output power, as referenced to a sinusoidal power curve, between calibration points

Resolution

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

Soft Start (Control Options P and L)

Typically:

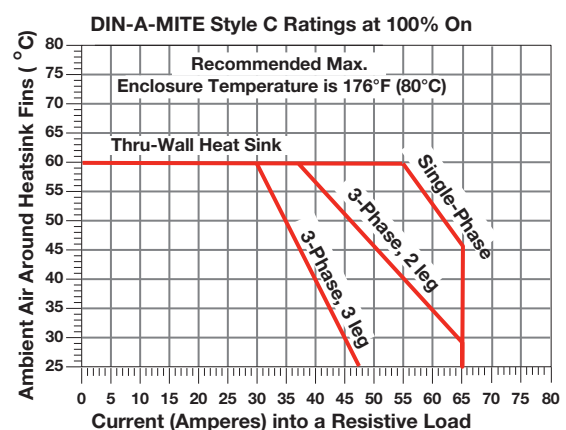
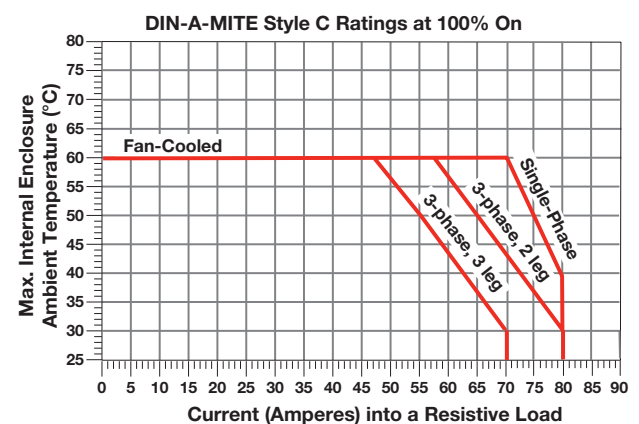
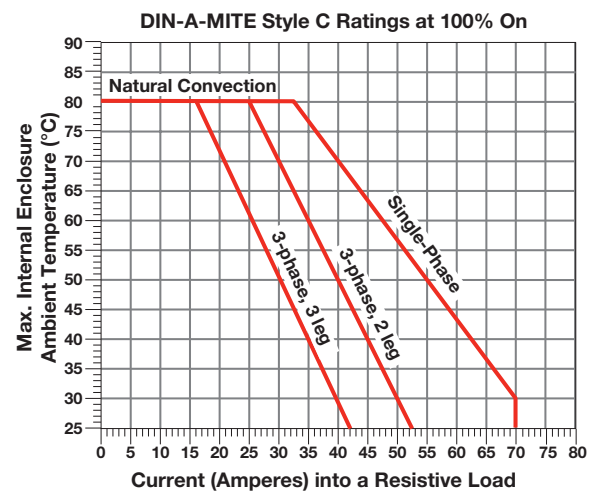
- 5 seconds soft start on power up
- Soft start on thermostat overtemperature
- Soft start on $1/2$ cycle drop out detection
- 1 second soft start on set point change

Options

- Alarm option is not available on control options P or L

Specifications are subject to change without notice.

Output Rating Curves

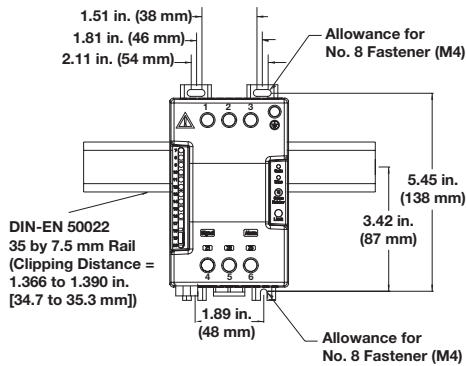




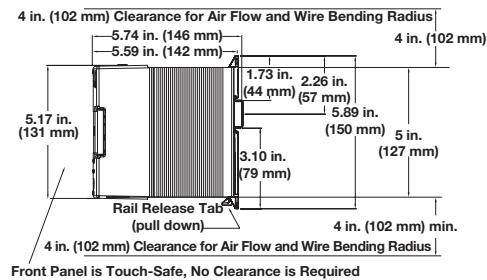
DIN-A-MITE C

Dimensions—Natural Convection, DIN-rail/Panel Mount

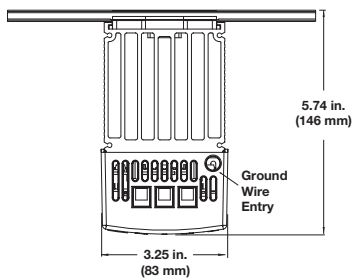
Front



Side

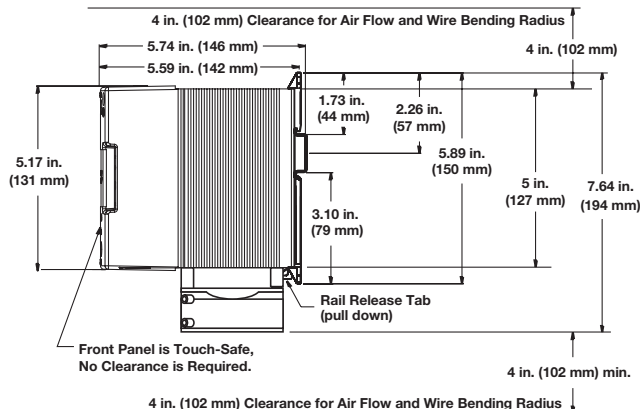


Top



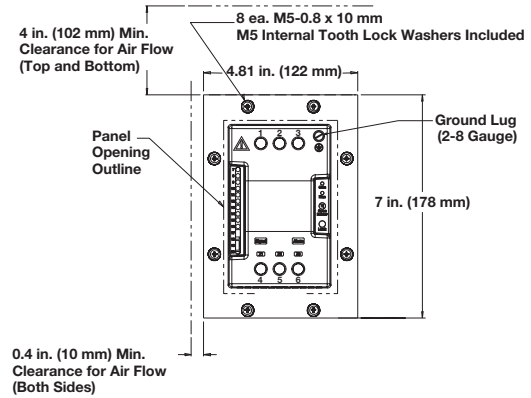
Dimensions—Fan Cooled, DIN-rail/Panel Mount

Side

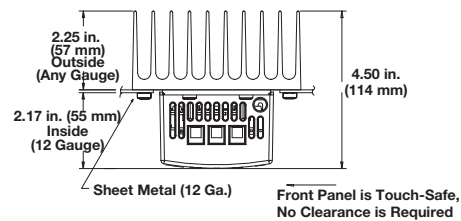


Dimensions—Natural Convection, Through-Wall Mount^①

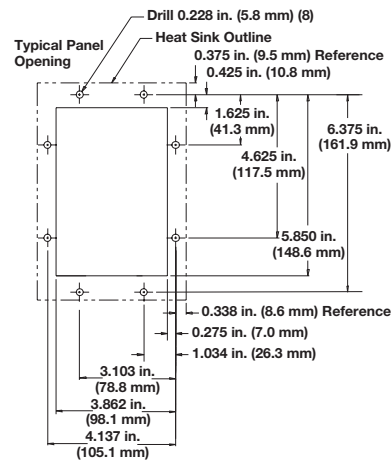
Front



Top



Panel Cutout



^① With the potential for high through-wall heat sink temperatures, application may require a touch-safe shield.



DIN-A-MITE C

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 the command signal. Accelerated life testing shows 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. This saves money on heaters, downtime and maintenance.

Loop-Powered or Transformer Powered Loop-Powered

By using a temperature controller's 4-20mA process output signal as the power supply for the DIN-A-MITE input, the cost of the power controller can be reduced. With control option F0 the 4-20mA control signal simultaneously powers the DIN-A-MITE's internal electronics and provides the input command signal.

Transformer-Powered

DIN-A-MITE controllers with single-cycle, variable time-base or phase angle outputs (control options L, P and S) detect the power line zero cross with a transformer that also powers their internal electronics. These units can be controlled manually with a potentiometer or automatically with a temperature controller using any of the control options: 4-20mA, linear voltage (0-5, 1-5 and 0-10VDC).

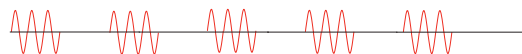
Loop-Powered, Variable Time-Base Output

Models: DC__ - __F0 - ____

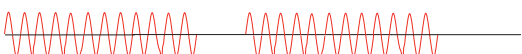
20% Power Output: 3 AC cycles on, 12 cycles off



50% Power Output: 3 AC cycles on, 3 cycles off



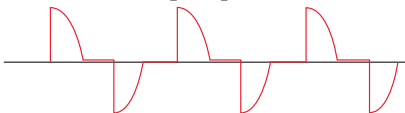
80% Power Output: 12 AC cycles on, 3 cycles off



With loop-powered, variable time-base control, the minimum on or off time is three cycles.

Phase Angle Output

Models: DC1_ - __ [L, P] - 0_ ____

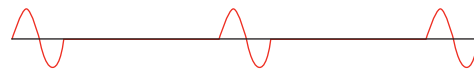


Phase angle control (control options L and P) is infinitely variable over the period of the AC sine wave. It provides a variable voltage and/or current output. The phase angle circuitry is transformer powered and accepts a linear voltage, current or potentiometer input.

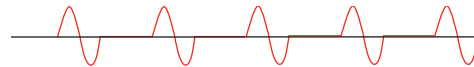
Single-Cycle, Variable Time-Base Output

Models: DC__ - __S_ - ____

25% Power Output: 1 AC cycle on, 3 cycles off



50% Power Output: 1 AC cycle on, 1 cycle off



With single-cycle, variable time-base control, at 50 percent power, the output is on for one cycle and off for one cycle. At 25 percent, it is on for one cycle and off for three cycles. Under 50 percent, the output is not on for more than one consecutive cycle; over 50 percent the output is not off for more than one consecutive cycle.

Semiconductor Fuses for Applications through 600VAC

Fuse Part Number		
Fuse Rating	Watlow	Cooper Bussman®
40A	17-8040	FWP-40A14F
50A	17-8050	FWP-50A14F
63A	17-8063	FWP-63A22F
80A	17-8080	FWP-80A22F
100A	17-8100	FWP-100A22F

Fuse Holder Part Number		
Fuse Rating	Watlow	Ferraz Shawmut
40A	17-5114	US1411
50A	17-5114	US1411
63A	17-5122	US2211
80A	17-5122	US2211
100A	17-5122	US2211

Combined Branch Protection and Semiconductor Fuses for Applications through 480VAC

Fuse Part Number		
Fuse Rating 125% of Load	Watlow	Cooper Bussman®
20A	0808-0325-0020	DFJ-20
30A	0808-0325-0030	DFJ-30
40A	0808-0325-0040	DFJ-40
50A	0808-0325-0050	DFJ-50
63A	0808-0325-0060	DFJ-60
80A	0808-0325-0080	DFJ-80
100A	0808-0325-0100	DFJ-100

Fuse Holder Part Number		
Fuse Rating	Watlow	Cooper Bussman®
20 and 30A	0808-0326-1530	CH30J1i
40 to 63A	0808-0326-3560	CH60J1i
80 and 100A	0808-0326-7010	J601001CR



DIN-A-MITE C

Ordering Information

Part Number

①	②	③	④	⑤ ⑥	⑦ ⑧	⑨	⑩	⑪ ⑫
D	C	Phase	Cooling & Current Rating/Leg	Line & Load Voltage	Control	Alarm	User Manual	Custom Options
D	C			-		-		

③	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 (control options C, K)
9 =	3 independent zones (control options C, K)

④	Cooling and Current Rating Per Leg (See chart below)
0 =	Natural convection standard DIN-rail or panel heat sink
1 =	Fan cooled 120VAC standard DIN-rail or panel heat sink
2 =	Fan cooled 240VAC standard DIN-rail or panel heat sink
3 =	Fan cooled 24VDC standard DIN-rail or panel heat sink
T =	Natural convection through-wall or cabinet heat sink (NEMA 4X)

⑤ ⑥	Line and Load Voltage
02 =	24 to 48VAC (control options C, F, K)
12 =	100 to 120VAC (control options L, P, S)
20 =	200 to 208VAC (control options L, P, S)
24 =	100 to 240VAC (control options C, F, K); 230 to 240VAC (control options L, P, S)
27 =	277VAC (control options L, P, S)
40 =	400VAC (control options L, P, S)
48 =	480VAC (control options L, P, S)
60 =	277 to 600VAC (control options C, F, K); 600VAC (control options L, P, S)

⑦ ⑧	Control
C0 =	4.5 to 32VDC input, contactor output
F0 =	4 to 20mA DC input, variable time-base output
K1 =	22 to 26VAC input, contactor output
K2 =	100 to 120VAC input, contactor output
K3 =	200 to 240VAC input, contactor output
L (0 to 5) =	Phase angle output with current limiting* (single-phase only)
P (0 to 5) =	Phase angle output* (single-phase only)
S (0 to 5) =	Single-cycle variable time-base output
	0 = 4 to 20mA input
	1 = 12 to 20mA input (option S only)
	2 = 0 to 20mA input
	3 = 0 to 5VDC input
	4 = 1 to 5VDC input
	5 = 0 to 10VDC input

* Not CE approved for conducted or radiated emissions.

⑨	Alarm
0 =	No alarm
S =	Shorted SCR alarm (not available with control options L or P)
H =	Open-heater and shorted-SCR alarm (control option S only)

⑩	User Manual
0 =	English
1 =	German
2 =	Spanish
3 =	French

⑪ ⑫	Custom Options
00 =	Standard part
1X =	1-second soft start (control options P, L)
XX =	Any letter or number, custom options, labeling, etc.

DIN-A-MITE C Current Rating Table

Phase	Cooling	Current at 122°F (50°C)
1	0	55A
1	T	60A
1	1, 2, 3	75A
2, 8	0	40A
2, 8	T	46A
2, 8	1, 2, 3	65A
3, 9	0	30A
3, 9	T	35A
3, 9	1, 2, 3	55A



DIN-A-MITE® D

The DIN-A-MITE® D silicon controlled rectifier (SCR) power controller provides an inexpensive, versatile product for controlling heat in an efficient package. This controller is designed and manufactured with the quality features expected from Watlow. The mounting footprint matches that of the industry standard mercury displacement relay (MDR), but there is no need to worry about mercury, the DIN-A-MITE controller is mercury free.

The DIN-A-MITE Style D is capable of zero cross switching up to 100 amperes single-phase, at 600VAC at 86°F (30°C), depending on the model selected. Combining the input of two or three controllers allows control of three-phase loads. The controller is completely touch-safe and includes on-board, front-accessible, semiconductor fuses. Options include a current transformer for load current monitoring and a shorted output alarm. The controller is UL® 508, C-UL® and CE approved making it ideal for panels and cabinets that require agency approvals.

Variable time-base, 4-20mA process control and VAC/VDC input contactor options are available. All options are model number dependent and factory configurable. This power controller also includes 200KA short circuit current rating (SCCR) tested up to 480VAC to minimize damage in the event of a short circuit when used with required fusing.

Watlow's DIN-A-MITE D is available through Watlow **SELECT**®, a program that enables you to quickly identify, configure and receive your thermal products faster and easier than ever before. With **SELECT**, you use a variety of tools to guide your decision, configure products for an exact fit and quickly receive your order.



Features and Benefits

200KA SCCR with proper fusing

- Minimizes damage in the event of a short circuit

Standard panel mount

- Provides same mount as industry standard 100A MDR

Compact size

- Reduces panel space and cost

Touch-safe terminals

- Increases safety for installer and user

Mercury free

- Assures environmental safety

Faster switching with solid state

- Saves energy and extends heater life

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

- Meets applications requiring agency approval
- Reduces end product documentation

Back-to-back SCR design

- Ensures a rugged design

On-board semiconductor fusing

- Provides quick access with no extra mounting necessary



DIN-A-MITE D

Specifications

Amperage

- See the Output Rating Curve below
- Max. surge current for 16.6ms, 1,800A peak
- Latching current: 500mA min.
- Holding current: 200mA min.
- Power dissipation is 1.4 watts per ampere switched including on-board fusing
- 200KA SCCR, Type 1 and 2 approved with the recommended fusing; see user manual

Line Voltage

- 24 to 48VAC units: 20VAC min. to 53VAC max.
- 100 to 240VAC units: 48VAC min. to 265VAC max.
- 277 to 480VAC units: 85VAC min. to 528VAC max.
- 277 to 600VAC units: 85VAC min. to 660VAC max.
- 50/60Hz independent $\pm 5\%$

Control Mode, Zero Cross

- Control option C: VDC input, contactor output
- Control option K: VAC input, contactor output
- To increase service life, the cycle time should be less than 3 seconds
- Control option F: 4 to 20mA DC input, variable time-base control output

Control Input

- AC contactor: 24VAC $\pm 10\%$, 120VAC $+10/-25\%$, 240VAC $+10/-25\%$ @ 25 mA max. per controlled leg
- DC contactor: 4.5 to 32VDC: max. current @ 4.5VDC is 8mA per leg
- Loop powered linear current: 4 to 20mA DC: Loop-powered, control option F0 only (requires current source with 8.0VDC available, no more than 2 DIN-A-MITE inputs connected in series)

Shorted SCR Alarm Option

- Alarm state when the input command signal off and a 15A or more load current is detected by the current transformer


Alarm Output

- Energizes on alarm, non-latching
- Triac 24 to 240VAC external supply with a current rating of 300mA @ 77°F (25°C)

Current Sensing

- On-board current transformer (CT), typically 0.2VAC output signal per ampere sensed into 1,000 Ω load

Agency Approvals

- CE with proper filter:
 - 204/108/EC Electromagnetic Compatibility Directive
 - EN 61326-1: Industrial Immunity Class A Emissions
 - Not suitable for Class B emissions environment
 - 2006/95/EC Low Voltage Directive
 - EN 50178 Safety Requirements
-  UL[®] 508-listed and C-UL[®] File E73741

Control Input Terminals

- Compression: Will accept 26 to 12 AWG (0.13 to 3.3 mm²) wire

Line and Load Terminals

- Compression: Will accept 6 to 2 AWG (13.3 to 33.6 mm²) wire

Operating Environment

- Operating temperature range: -4 to 176°F (-20 to 80°C)
- 0 to 90% RH (relative humidity), non-condensing
- Vibration: 2 g, 10Hz to 150Hz, applied in any 1 of 3 axes
- Storage temperature: -40 to 185°F (-40 to 85°C)
- Insulation tested to 3,000 meters
- Installation Category III, pollution degree 2

Mounting

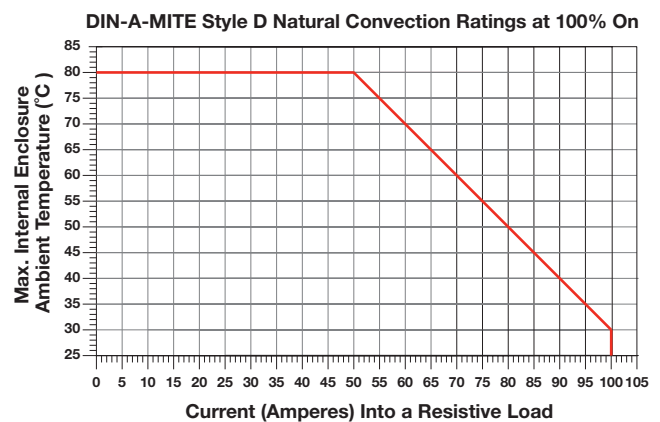
- Back-panel mounting; fits the same mounting pattern as a 100A, single-phase mercury displacement relay
- On-board semiconductor fusing

Dimensions

- 7.3 in. (185 mm) high x 2.6 in. (66 mm) wide x 9.4 in. (239 mm) deep
- Weight: 6.5 lb (2.95kg)

Specifications are subject to change without notice.

Output Rating Curve





DIN-A-MITE D

Ordering Information

Part Number

1	2	3	4	5 6	7 8	9	10	11 12
		Phase	Cooling & Current Rating	Line & Load Voltage	Control	Current Sensing or Alarm	User Manual	Custom Options
D	D	1	0	-		-		

3 Phase	
1 =	1-phase, 1 controlled leg

4 Cooling and Current Rating (See rating curve)	
0 =	Natural convection

5 6 Line and Load Voltage	
02 =	24 to 48VAC
24 =	120 to 240VAC
48 =	277 to 480VAC
60 =	277 to 600VAC

7 8 Control	
C0 =	4.5 to 32VDC input, contactor output
F0 =	4 to 20mA DC input, variable time-base output
K1 =	22 to 26VAC input, contactor output
K2 =	100 to 120VAC input, contactor output
K3 =	200 to 240VAC input, contactor output

9 Current Sensing or Alarm	
0 =	No alarm
1 =	Load current transformer
S =	Shorted SCR alarm

10 User Manual	
0 =	English
1 =	German
2 =	Spanish
3 =	French

11 12 Custom Options	
00 =	Standard part

Replacement Semiconductor Fuse

Watlow Part Number	Cooper Bussmann® Part Number
0808-0096-0000	170N3437



Solid State Relays (SSR)

Watlow solid state relays (SSR) offer many of the advantages of solid state power controllers, yet at a lower cost. Watlow's extensive knowledge in power controller design has led to the development of a special fast cycle input card that enables a SSR to operate from a standard 4-20mA instrumentation command signal. Test results have shown that a zero cross SSR in combination with the fast cycle card promotes better temperature control and longer heater life than slow cycle relays. Through a time proportional cycle rate of one tenth of a second heater life will be extended.

Both low and high voltage models are available from 24 up to 530VAC. All ac output models include back-to-back Silicon Controlled Rectifiers (SCRs) for a more rugged design than the traditional triac based SSR. The internal design allows it to handle high currents and the harsh electrical environments of heavy industry. Watlow also offers a switched VDC model for dc heating applications.

Watlow can provide all the components necessary for trouble-free operation. This includes two standard convenience items: A thermal foil to ensure proper thermal transfer from the relay to the heat sink and belville washers that ensure the relay is mounted with sufficient pressure for good heat transfer. Matched semiconductor fuses and heat sinks are available to complete the power switching package.



Features and Benefits

Fast cycle card

- Increases heater life
- Optimizes temperature control
- Allows for higher watt density heaters

Zero cross firing

- Results in minimal electrical noise

Back-to-back SCR design

- Withstands harsh or hostile industrial environments

UL® recognized File #E151484 and #E73741
CSA certified up to 600VAC, File #LR700195
VDE 60950 License #40021401, File #1995500
up to 480VAC, CE - EN 60950 and RoHS

- Meets applications requiring agency approval

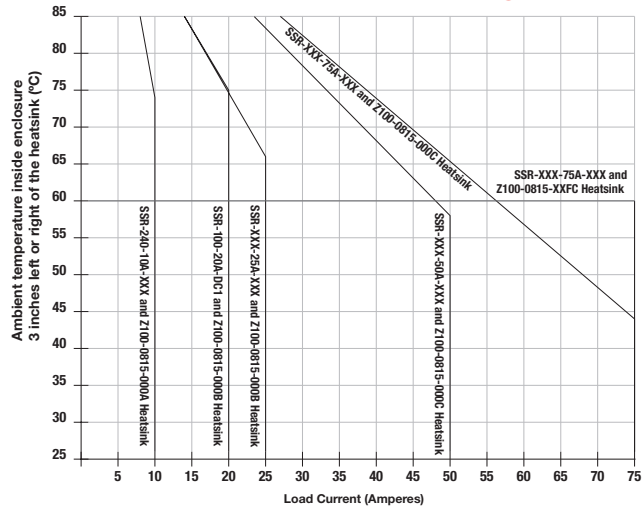


Solid State Relays (SSR)

Specifications

Specifications Standard To All SSRs:	
Dielectric Strength (Volts)	4000 RMS
Input, DC Control	
Voltage range	3-32VDC
Typical input current	3.4 to 20mA
Turn on voltage (max.)	3VDC
Turn off voltage (min.)	1VDC
Input, AC Control	
Voltage range	90-280VAC
Typical input current	2mA (typical) @ 120VAC 4mA (typical) @ 240VAC
Turn on voltage (max.)	90VAC
Turn off voltage (min.)	10VAC
AC Output (Max.)	
Forward voltage drop	1.5VAC and 2.1VDC
Min. holding current (mA)	50mA
Turn on-off time (ms)	up to 10ms (max.)
Frequency range	47 to 63Hz

Ambient Temperature Operating Curve



120/240VAC						
Model Number	SSR-240-10A-DC1	SSR-240-25A-DC1	SSR-240-50A-DC1	SSR-240-10A-AC1	SSR-240-25A-AC1	SSR-240-50A-AC1
Current output	10A	25A	50A	10A	25A	50A
Nominal voltage	120/240VAC	120/240VAC	120/240VAC	120/240VAC	120/240VAC	120/240VAC
One cycle surge current	120A	250A	625A	120A	250A	625A
Max. I ² t for fusing	60A ² seconds	260A ² seconds	1,620A ² seconds	60A ² seconds	260A ² seconds	1,620A ² seconds
Thermal resistance	1.48° C/W	1.05° C/W	0.63° C/W	1.48° C/W	1.05° C/W	0.31° C/W
Ambient operating temperature	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)
Output (Max.)						
Voltage range	48-280VAC	48-280VAC	48-280VAC	48-280VAC	48-280VAC	48-280VAC
Over voltage rating	600V (peak)	600V (peak)	600V (peak)	600V (peak)	600V (peak)	600V (peak)
Off state leakage	10mA	10mA	10mA	10mA	10mA	10mA

120/240VAC		Random Fired Models				100VDC
Model Number	SSR-240-75A-DC1	SSR-240-75A-AC1	SSR-480-50A-RND	SSR-480-75A-RND	SSR-240-10A-RND	SSR-100-20A-DC1
Current output	75A	75A	50A	75A	10A	20A
Nominal voltage	120/240VAC	120/240VAC	480VAC	480VAC	120/240VAC	100VDC
One cycle surge current	1000A	1000A	625A	1000A	120A	42A (10ms)
Max. I ² t for fusing	6000A ² seconds	6000A ² seconds	1,620A ² seconds	6000A ² seconds	60A ² seconds	N/A
Thermal resistance	0.31° C/W	0.31° C/W	0.63° C/W	0.31° C/W	1.48° C/W	1.06° C/W
Ambient operating temperature	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-4 to 176°F (-20 to 80°C)
Output (Max.)						
Voltage range	48-280VAC	48-280VAC	80-530VAC	80-530VAC	48-280VAC	0-100VDC
Over voltage rating	600V (peak)	600V (peak)	1200V (peak)	1200V (peak)	600V (peak)	N/A
Off state leakage	10mA	10mA	10mA	10mA	10mA	0.3mA VDC

480 VAC						
Model Number	SSR-480-25A-DC1	SSR-480-50A-DC1	SSR-480-75A-DC1	SSR-480-25A-AC1	SSR-480-50A-AC1	SSR-480-75A-AC1
Current output	25A	50A	75A	25A	50A	75A
Nominal voltage	480VAC	480VAC	480VAC	480VAC	480VAC	480VAC
One cycle surge current	250A	625A	1000A	250A	625A	1000A
Max. I ² t for fusing	260A ² seconds	1,620A ² seconds	6,000A ² seconds	260A ² seconds	1,620A ² seconds	6,000A ² seconds
Thermal resistance	1.02° C/W	0.63° C/W	0.31° C/W	1.02° C/W	0.63° C/W	0.31° C/W
Ambient operating temperature	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)	-40 to 176°F (-40 to 80°C)
Output (Max.)						
Voltage range	48-530VAC	48-530VAC	48-530VAC	48-530VAC	48-530VAC	48-530VAC
Over voltage rating	1200V (peak)	1200V (peak)	1200V (peak)	1200V (peak)	1200V (peak)	1200V (peak)
Off state leakage	10mA	10mA	10mA	10mA	10mA	10mA



Solid State Relays (SSR)

Heater Life

Watlow has extensively tested electric heating elements with a variety of power switching devices. Results prove that the life of an electric element dramatically increases when the on-off cycle time that is used to time-proportion the heater is kept at less than one second. This reduces the thermal expansion and contraction of the element and improves heater life as much as 20 times. This very fast cycle time controls temperature much more accurately and allows the use of higher watt density heating elements.

Fast Cycle Card

In order to obtain the very rapid cycling time required for longer heater life, accurate temperature control and higher watt densities, Watlow has developed a loop-powered firing card for SSRs. This card operates from a standard instrumentation signal of 4 to 20mA and controls solid state relays with a time proportional cycle rate of less than one second (4VAC cycles on and 4VAC cycles off at 50 percent power).

Thermal Transfer

A thermal foil is provided with each solid state relay for mounting on the base of the relay to improve heat transfer. In addition, two belville washers are supplied to provide the proper pressure for this transfer of heat. Use two #8-32 screws 0.625 in. (16 mm) long to secure the relay to the heat sink.

Replacing Contactors or Mercury Displacement Relays (MDRs)

Improvements in heater life and control accuracy can be achieved with SSRs operated with rapid cycle times as compared to slower operating electromechanical relays or even MDRs. When replacing these types of relays with the SSR, it is important to consider two aspects:

1. Heat

Solid state devices require a small voltage to turn on, which is consumed as heat (approx. 1.5 volts x amps = watts). This heat must be removed from the device and is usually accomplished by mounting the relay on a heat sink.

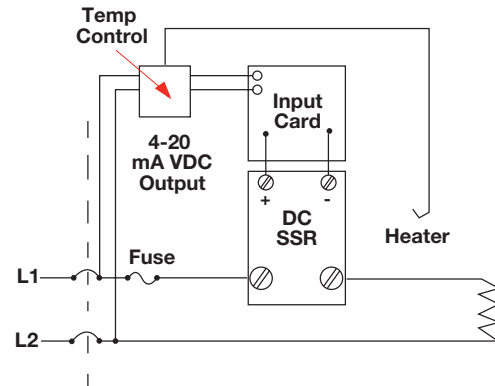
2. Failure Mode

Solid state devices should last for many years when properly protected with voltage snubbers, mounted on appropriate heat sinks and when fused with semiconductor fuses against the high currents caused by electrical shorts. Watlow's SSRs include an internal voltage snubber. However, if the unit fails, the most probable condition will be a short. Mechanical relays also have a good probability of failing short. In all

cases where uncontrolled full power can cause damage, it is recommended that a high limit temperature controller and contactor be used for protection.

Wiring Diagrams

Single-Phase Fast Cycle Input Card



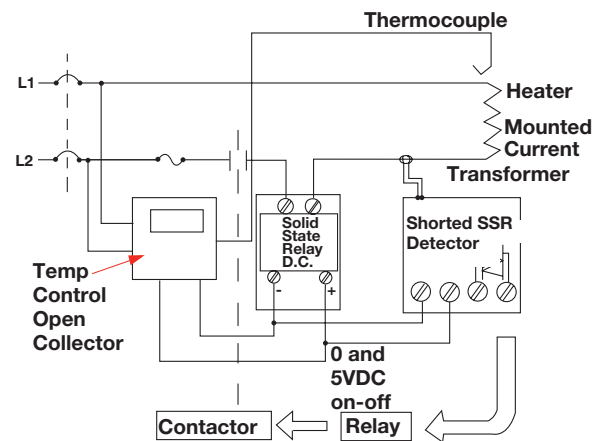
Shorted SSR Alarm

The most prevalent concern when using solid state relays is the possibility of a relay failing in a shorted condition. With this in mind, Watlow has designed a cost effective "Shorted SSR Alarm."

The device monitors the output (current through the heater) and activates a triac (alarm) if there is no command signal from the temperature controller. The triac can be wired to a bell, or to a normally closed latching relay to remove power to the heater.

The shorted SSR alarm is not a substitute for an agency-approved high-temperature limit device.

Single-Phase Shorted SSR Detector

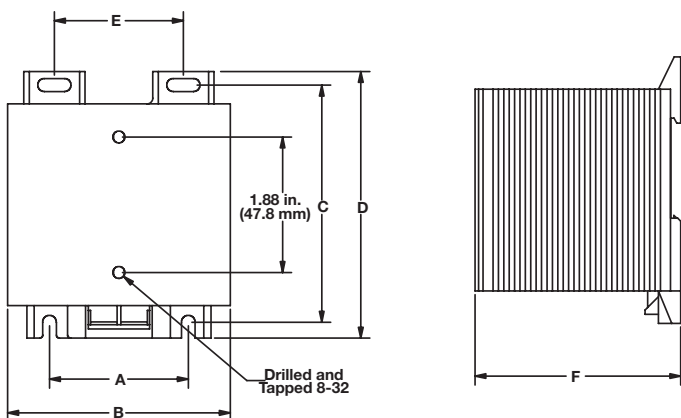


Note: Semiconductor power switching devices are not legal for over temperature limit or safety devices. For limit and safety devices you must have a positive mechanical break of all electrically hot legs simultaneously.

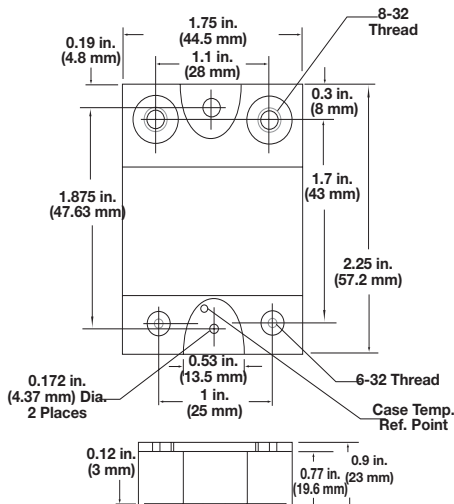


Solid State Relays (SSR)

Dimensions - Heat Sink



Dimensions - Solid State Relay



Heat Sink Dimensions by Part Number

Part Number	Descriptor	Dimensions					
		A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)
Z100-0815-000A	18A	N/A	1.8 (46)	3.25 (82.6)	3.7 (94)	N/A	1.9 (48)
Z100-0815-000B	35A	1.91 (48.5)	3.2 (81)	3.25 (82.6)	3.7 (94)	1.81 (46)	2.9 (74)
Z100-0815-000C	55A	1.89 (48)	3.2 (81)	5.45 (138.4)	5.89 (149.6)	1.81 (46)	3.6 (91)
Z100-0815-XXFC*	75A	1.89 (48)	3.2 (81)	5.45 (138.4)	7.16 (181.9)	1.81 (46)	3.6 (91)

*Fan cooled

Ordering Information

Part Number

① ② ③	④ ⑤ ⑥	⑦ ⑧	⑨	⑩ ⑪ ⑫
	Voltage	Current		Control Voltage
SSR	-	-	A	-

④ ⑤ ⑥	Voltage
100 =	0 to 100VDC (20A model only)
240 =	48 to 240VAC
480 =	48 to 530VAC

⑦ ⑧	Current
10 =	10A
20 =	20A (100VDC model only)
25 =	25A
40 =	40A
50 =	50A
75 =	75A

⑩ ⑪ ⑫	Control Voltage
DC1 =	3 to 32VDC (see specifications)
AC1 =	90 to 280VAC
RND =	3 to 32VDC (10, 50 and 75A models only)

Note: Relay will also include thermal foil, 2 belville washers and #8-32 screws for mounting to a heat sink.

Heat Sinks (sold separately)	
Z100-0815-000A =	18A or 2.2°C/watt
Z100-0815-000B =	35A or 1.1°C/watt
Z100-0815-000C =	55A or 0.6°C/watt
Z100-0815-12FC =	75A or 0.16°C/watt (120VAC fan)
Z100-0815-24FC =	75A or 0.16°C/watt (240VAC fan)

Fast Cycle Input Card and Shorted SSR Alarm Card	
For direct mounting on zero cross dc input solid state relay.	
RPC-5399-42-000 =	Fast cycle input card, 4 to 20mA input
RPC-5386-0000 =	Shorted SSR alarm card

Sub Cycle Fuses - I ² T (sold separately)	
Recommended and available with holders.	