# *DIN-A-MITE*® Style A

## Solid-State Power Controller

# User's Manual



1241 Bundy Boulevard, Winona, Minnesota USA 55987
Phone: +1 (507) 454-5300, Fax: +1 (507) 452-4507 http://www.watlow.com

Please consult this user manual when you place your new DIN-A-MITE in service. It contains all the necessary information to mount and wire the product into the application. This manual also contains all the user-pertinent specifications and semiconductor fusing recommendations. Please refer to national and local electrical code safety guidelines whenever you install electrical equipment.

This DIN-A-MITE product is capable of switching up to 18 A single phase at 600V~ (ac), depending on the model selected at 50°C. (See the output rating curve in the specifications section.) The DIN-A-MITE is electrically touch-safe, and includes DIN (Deutsche Industrial Norm) rail or standard back panel mounting. UL® 508-listed, C-UL®, and CE-approved (see Declaration of Conformity [filter required]).

## Warranty

The DIN-A-MITE is warranted to be free of defects in material and workmanship for 36 months after delivery to the first purchaser for use, providing that the units have not been misapplied. Since Watlow has no control over their use, and sometimes misuse, we cannot guarantee against failure. Watlow's obligations hereunder, at Watlow's option, are limited to replacement, repair, or refund of purchase price, and parts which upon examination prove to be defective within the warranty period specified. This warranty does not apply to damage resulting from transportation, alteration, misuse, abuse, or improper fusing.

## Returns

- Call Customer Service: (507) 454-5300, or fax: (507) 452-4507, for a Return Material Authorization (RMA) number before returning any item for repair.
- Make sure the RMA number is on the outside of the carton, and on all paperwork returned. Ship on a freight prepaid basis.
- A restocking charge of 20% of the net price applies for all returned stock controls and accessories in like new condition and within 120 days after shipment. Non-stock and modified stock items are not returnable.
- If the unit is unrepairable, it will be returned to you with a letter of explanation. Repair costs will not exceed 50% of the original cost.

## Technical Assistance

If you encounter a problem with your Watlow controller, review your configuration information to verify that your selections are consistent with your application: inputs; outputs; alarms; limits; etc. If the problem persists after checking the configuration of the controller, you can get technical assistance from your local Watlow representative, or in the U.S., dial +1 (507) 494-5656. For technical support, ask for for an Applications Engineer.

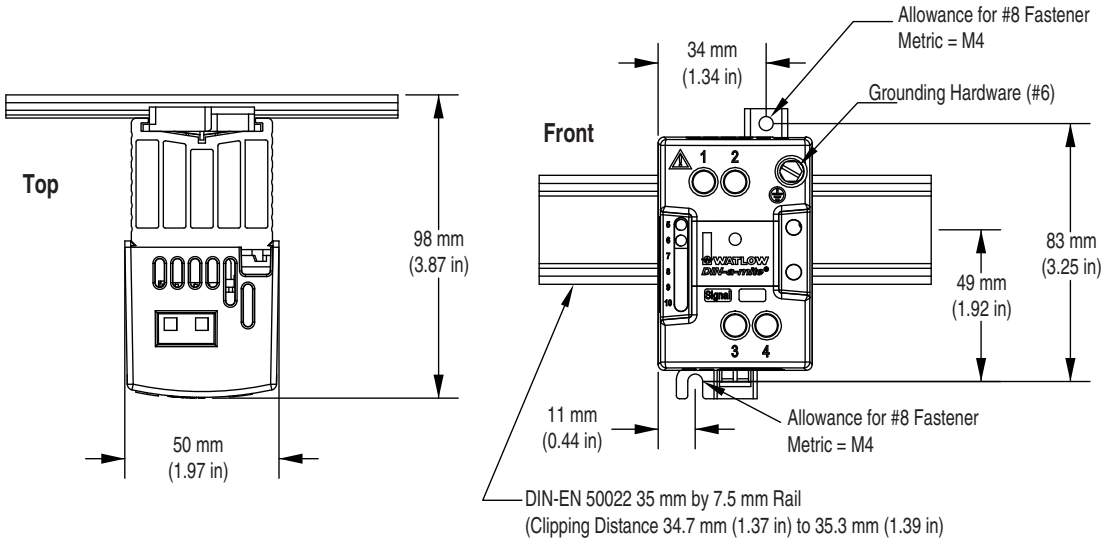
Please have the following information available when calling:

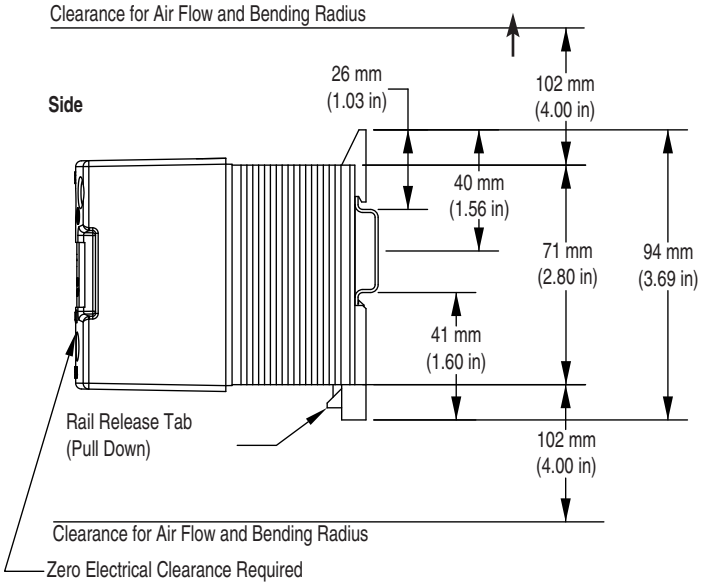
- Complete model number
- All configuration information
- User's Manual

The DIN-A-MITE Style A User's Manual is copyrighted by Watlow, Inc., © September 2013, with all rights reserved.

**0600-0025-0001 Rev K**
September 2013

## Unit Dimensions




**Mount the cooling fins vertically. Failure to do so may cause premature unit failure.**

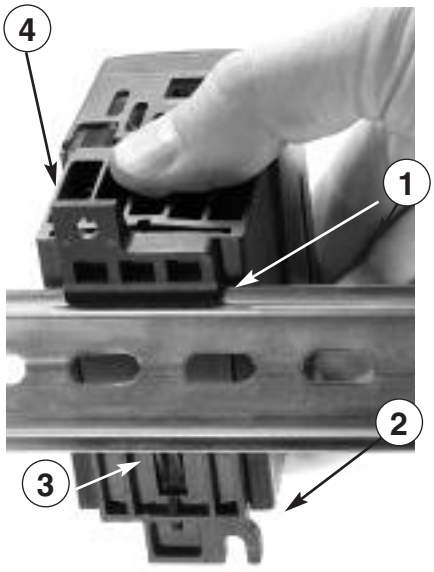
3

4

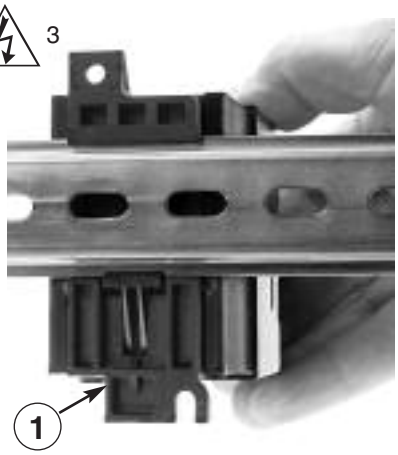
## Mounting and Dismounting

### To mount:

1. Push the unit in and down to catch the rail hook on top of the rail.
2. Rotate the bottom of the unit in toward the rail.
3. The rail clasp will audibly "snap" into place. If the DIN-A-MITE does not snap into place, check to see if the rail is bent.
4. Mount the cooling fins vertically.



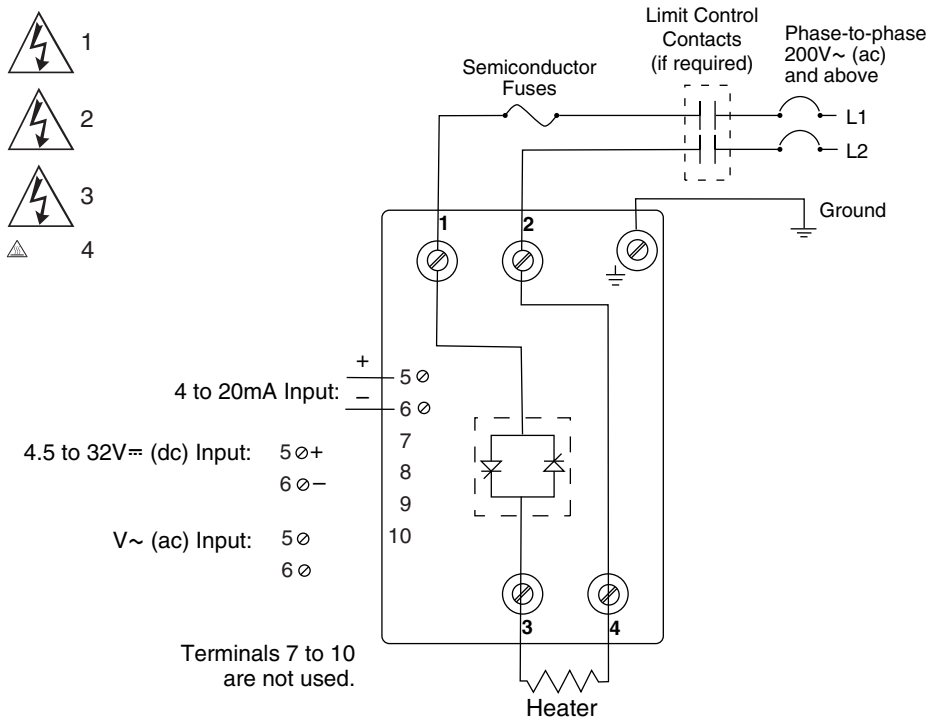

3

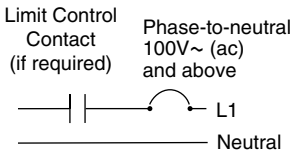



### To dismount:

1. Press down on the release tab while rotating the unit up and away from the rail.

## Single-phase Output and Input Wiring




**NOTE:**

**Grounding**

- Use a grounding conductor terminal plate (fork terminal) having upturned lugs or the equivalent to hold the wire in position. Maximum 6 mm² (10 AWG) wire.

**Fusing**

- Recommended fusing options (see page 6) to meet 200KA SCCR, type 1 and 2 approved. All other fuse and SCR combinations are defaulted to 5KA SCCR per UL508A and NEC guidelines.

**Torque Guidelines**

- Properly torque line and load terminals to 1.4 Nm (12 in-lb).
- Retorque after 48 hours to minimize wire cold flow.
- Retorque line and load terminals every 3 to 6 months.

**WARNINGS:**

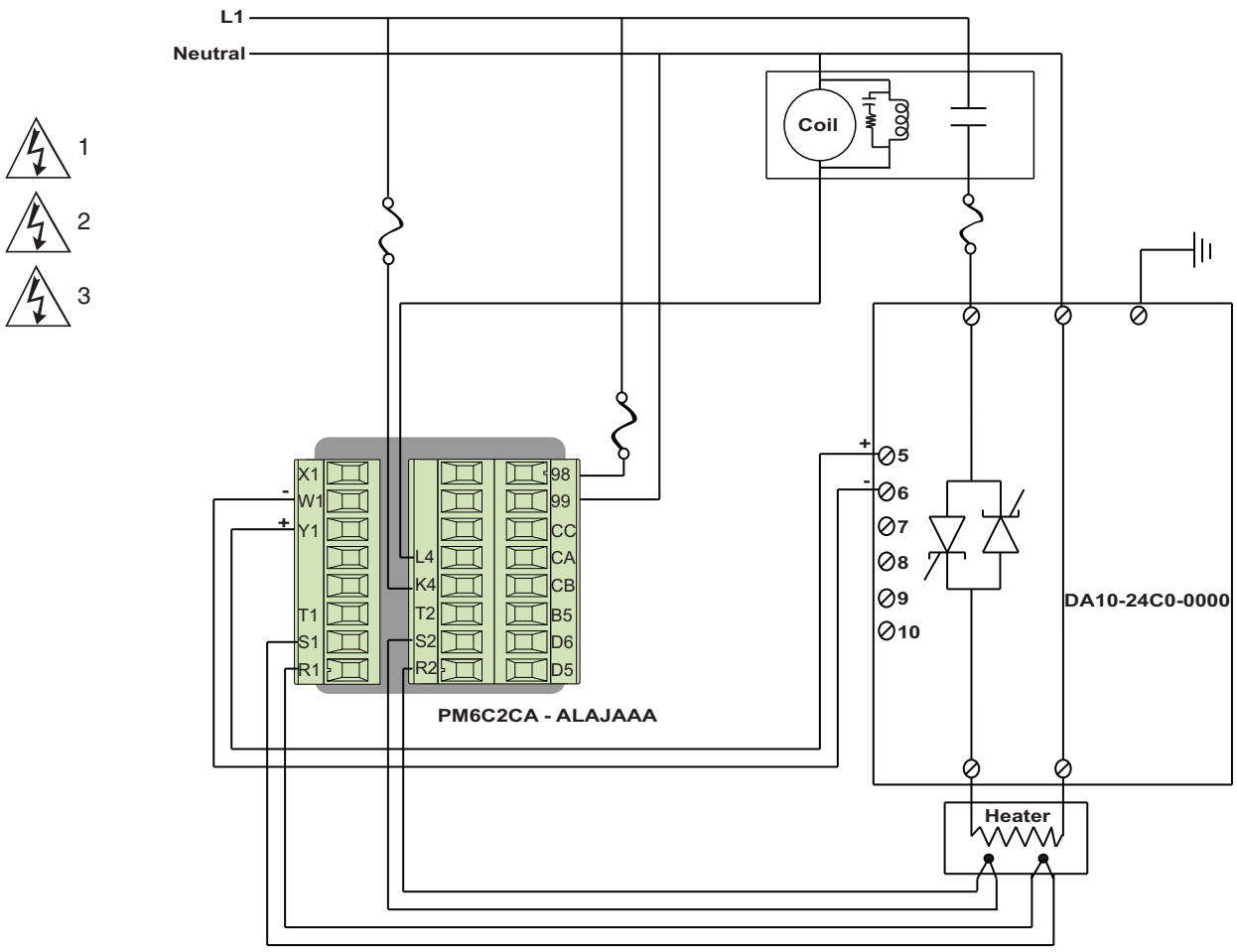
**1 WARNING: Use National Electric (NEC) or other country-specific standard wiring practices to install and operate the DIN-A-MITE. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.**

**2 WARNING: Wiring examples show L2 in phase-to-phase, 200 V~ (ac) and above configuration. In phase-to-neutral, 100 V~ (ac) and above applications, L2 is neutral and must not be fused or switched. Failure to follow this guideline could result in personal injury or death.**

**3 WARNING: Only authorized and qualified personnel should be allowed to install and perform preventive and corrective maintenance on this unit. Failure to do so could result in damage to equipment, and personal injury or death.**

**4 WARNING: Hot surface, do not touch the heat sink. Failure to follow this guideline could result in personal injury.**

## System Wiring Example



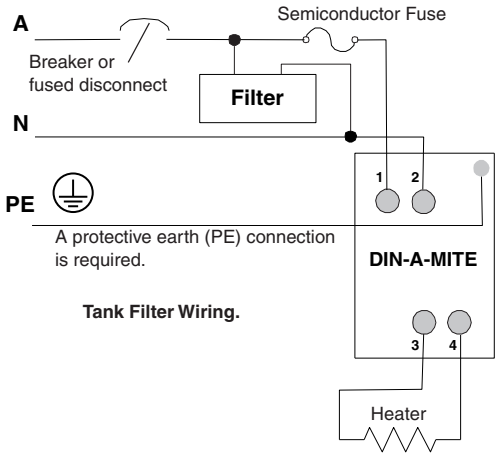
## Required External EMI Filters for DIN-A-MITE with More than 6 A Loads

An external EMI filter must be used in conjunction with the DIN-A-MITE for loads in excess of six amperes (6A) at 150 to 250 kHz. Without a filter applied, the DIN-A-MITE does not comply with the conducted emissions standard for loads above 6A at 150 to 250 KHz.

Watlow has verified that two types of filters will suppress electromagnetic interference (EMI) created by the DIN-A-MITE power controller to within the CE requirements.

A tank filter supplied by Crydom or Watlow, installed across the power lines, suppresses EMI on the power lines. See figure below.

See Table 1 for the correct filter.




**Tank Filter Wiring.**

| Description | Crydom Filter | Watlow Filter |
|---|---|---|
| Single-phase, 230V~ (ac) | 1F25 | 14-0019 |

**Table 1— DIN-A-MITE EMI Filters.**

**WARNING:**

**The tank filters specified may suppress desirable communications carried on power lines in the 150 to 250 kHz region. The filters may suppress carrier current such as that used for infant monitors and medical alert systems. Verify that suppressed carrier current or other desirable communications on power lines creates no hazard to people or property. Failure to observe this warning could result in damage to property, and injury or death for personnel.**

**WARNING:**

**All filter installation and wiring must be performed by qualified personnel, and conform to local and national electrical codes. Failure to observe this warning could result in damage to property, and injury or death for personnel.**

## Specifications

**Operator Interface**
- Command signal input
- Input indicator LED

**Amperage**
- Single-phase, 18 A output maximum at 50°C (122°F) into a resistive load. See the output rating curve.
- Maximum $I^2t$ for fusing: 4,000 $A^2sec$
- Holding current: 100 mA minimum
- Latching current: 200 mA minimum
- Power dissipation: 1.2 watts per amp switched
- 200KA SCCR with recommended fusing

**Line Voltage**
- 24 to 48V~ (ac) units: 20V~ (ac) minimum to 53V~ (ac) maximum
- 120 to 240V~ (ac) units: 48V~ (ac) minimum to 265 V~ (ac) maximum
- 277 to 600V~ (ac) units: 85V~ (ac) minimum to 660V~ (ac) maximum
- Off-state leakage: 1 mA at 25°C (77°F) maximum
- 50/60 Hz. independent

**Control Mode, Zero Cross**
- Input Control Signal Type C: V⎓ (dc) input contactor. To increase service life, the cycle time should be less than 3 seconds.
- Input Control Signal Type K: V~ (ac) input contactor. To increase service life, the cycle time should be less than 3 seconds.
- Input Control Signal Type F: 4 to 20 mA⎓ (dc) proportional variable time base control.

**Input Command Signal**
- **AC contactor**
  24 V~ ±10%, 120V~ +10%/-25%, 240V~ (ac) +10%/-25% @ 25 mA maximum per controlled leg
- Do not use the DIN-A-MITE Vac-input models with a temperature controller that includes an RC snubber circuit across its output. Remove the RC snubber circuit before placing the DIN-A-MITE into service.
- **DC Contactor**
  4.5 to 32V⎓ (dc): maximum current @ 4.5V⎓ (dc) is 8 mA per leg.
- **Loop powered linear current**
  4 to 20 mA⎓ (dc): loop-powered. Input Type F0 option only. (Requires current source with 6.2V⎓ (dc) available. No more than three DIN-A-MITE inputs can be connected in series.)

**Agency Approvals**
- UL® 508-listed and C-UL® File E73741
- CE with proper filter:
  EN 61326 Industrial Immunity Class A Emissions
  EN 50178 Safety requirements

**Input Terminals**
- Compression: Will accept 0.2 to 1.5 $mm^2$ (24 to 16 AWG) wire
- Torque to 0.5 Nm (4.4 in-lb) maximum with a 3.5 mm (1/8 in) blade screwdriver
- Strip 5.5 mm (0.22 in)

**Line and Load Terminals**
- Compression: Will accept 0.75 to 10 $mm^2$ (18 to 8 AWG) wire
- Torque to 1.4 Nm (12 in-lb) with a 6.4 mm (1/4 in) blade screwdriver, or Type 1A #2 Pozi driver .
- Retorque after 48 hours to minimize wire cold flow.
- Retorque line and load terminals every 3 to 6 months.
- Strip 6.4 mm (0.25 in)

**Operating Environment**
- Up to 80°C. See the output rating curve chart for your application.
- 0 to 90% RH (relative humidity), non-condensing

## Ordering Information

**DIN-A-MITE Style A**, solid-state power controller
Part Number **D A 1 0** - _ _ _ - 0

**Phase**
1 = 1-phase, 1 controlled leg

**Cooling & Current Rating**
0 = Natural convection current rating 18A @ 50°C
Note: See derating curve for current rating at other temperatures.

**Line & Load Voltage**
02 = 24 to 48V~ (ac)
24 = 120 to 240V~ (ac)
60 = 277 to 600V~ (ac)

**Input Type**
C0 = 4.5 to 32V⎓ (dc) contactor
K1 = 24 to 48V~ (ac) contactor
K2 = 100 to 120V~ (ac) contactor
K3 = 200 to 240V~ (ac) contactor
F0 = 4 to 20 mA⎓ (dc) proportional

**Manual Language**
0 = English
1 = German
2 = Spanish
3 = French

**Custom Parts Designation**
00 = Standard parts

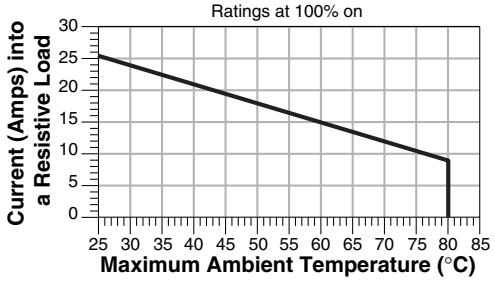
### Recommended Fuse and Fuse Holder

| Fuse | Watlow Semiconductor | Bussmann Semiconductor | Watlow Combination | Bussmann Combination |
|---|---|---|---|---|
| 20A | 17-8020 | FWC20A10F | 0808-0325-0020 | DFJ20 |
| 25A | 17-8025 | FWC25A14F | 0808-0325-0025 | DFJ25 |
| 32A | 17-8030 | FWP32A14F | 0808-0325-0030 | DFJ30 |
| 40A | 17-8040 | FWP40A14F | 0808-0325-0040 | DFJ40 |

### Holders (single)

| Fuse | Watlow | Bussmann | Ferraz | Bussmann Combination |
|---|---|---|---|---|
| 20A | 17-5110 | - - - - | USM1i | - - - - |
| 25A | 17-5110 | - - - - | USM1i | - - - - |
| 32A | 17-5114 | - - - - | USM141i | - - - - |
| 40A | 17-5114 | - - - - | USM141i | - - - - |
| 15 to 30A | 0808-0326-1530 | - - - - | - - - - | CH30J1i |
| 35 to 60 A | 0808-0326-3560 | - - - - | - - - - | CH60J1i |

## Output Rating Curve




- Installation only tested to 3,000 meters
- Units are suitable for “Pollution degree 2”
- Contactor V≂ (ac/dc) To increase service life, the cycle time should be less than three seconds

**Mounting**
Options include DIN rail or standard back panel mounting.
- The DIN rail specification is: DIN EN 50022, 35 mm by 7.5 mm
- Minimum clipping distance: 34.8 mm (1.37 in)
- Maximum clipping distance: 35.3 mm (1.39 in)
- Mount the cooling fins vertically

**Weight**
- 323 grams (11.40 oz)

# DIN-A-MITE® “A” Power Controller

CE

WATLOW
1241 Bundy Blvd.
Winona, MN 55987 USA

an ISO 9001approved facility since 1996.

Declares that the following products:

| | |
|---|---|
| Designation: | DIN-A-MITE® “A” Power Control |
| Model Numbers: | DA10 – (02, 24 or 60)(C0, C1, C2, K1, K2, K3, F0 or F1) – 0 (followed by any 3 numbers or letters.) |
| Classification: | Power Control, Installation Category III, Pollution degree 2, IP20 |
| Rated Voltage: | 24 to 600 V~ (ac), 50 or 60 Hz |

Meets the essential requirements of the following European Union Directives by using the relevant standards show below to indicate compliance.

## 2004/108/EC Electromagnetic Compatibility Directive

| | |
|---|---|
| **EN 61326-1: 2005** | **Electrical equipment for measurement, control and laboratory use – EMC requirements (Industrial Immunity, Class A[1,2,4] Emissions) Not for use in a Class B environment without additional filtering.** |
| EN 61000-4-2:2008 | Electrostatic Discharge Immunity |
| EN 61000-4-3:2006 | Radiated Field Immunity 10V/m 80 MHz- 1GHz, 3V/m 1.4GHz-2.7GHz |
| EN 61000-4-4:2011 | Electrical Fast-Transient / Burst Immunity |
| EN 61000-4-5:2006 | Surge Immunity |
| EN 61000-4-6:2008 | Conducted Immunity |
| EN 61000-4-11:2004 | Voltage Dips, Short Interruptions and Voltage Variations |
| EN 61000-3-2:2005 | Harmonic Current Emissions |
| EN 61000-3-3:2005 | Voltage Fluctuations and Flicker[3] |

**Notes**

[1]Use of an external filter is required to comply with conducted emissions limits. See note 4 below.

[2]A Line Impedance Stabilization Network (LISN) was used for conducted emissions measurements.

[3]To comply with flicker requirements, command signal models F0 and F1 will require a reduced source impedance. Cycle time on ON/OFF models C0, C1, C2 and K1, K2, K3 may need to be up to 175 seconds at 16A.

2006/95/EC Low-Voltage Directive
EN 50178:1997 Electronic equipment for use in power installations.

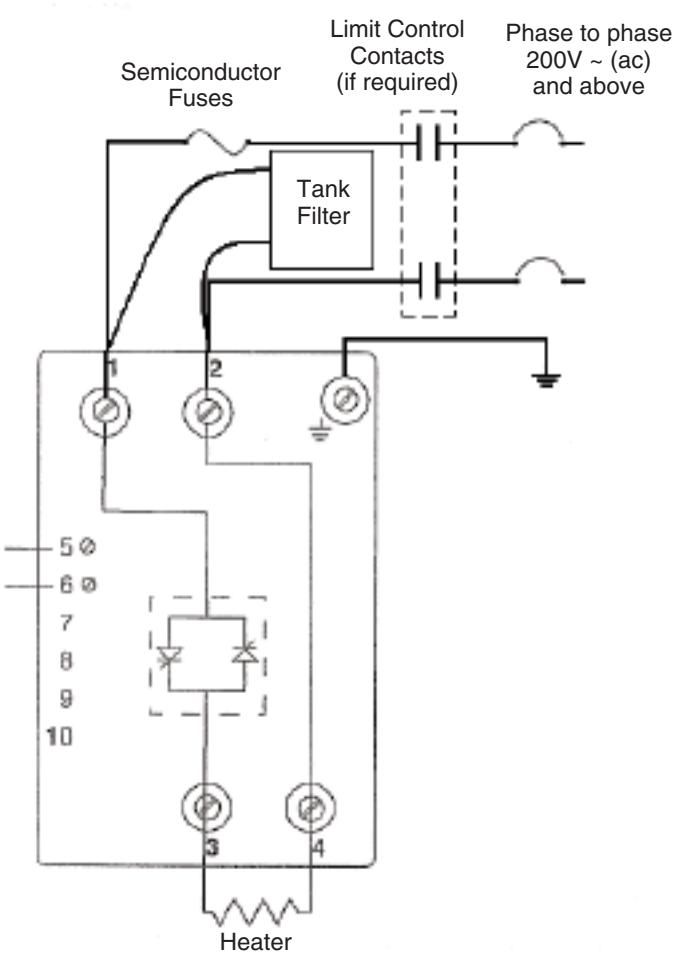
**Per 2002/96/EC W.E.E.E Directive**  **Please Recycle Properly.**

**These devices contain lead solder and are not RoHS compliant.**
**They are a Control Devices and fall outside the scope of 2002/95/EC Directive.**

**[4]Required External EMI Filters for DIN-A-MITE with More Than 6 Amp Loads**

An external ElectroMagnetic Interference (EMI) filter must be used in conjunction with the DIN-A-MITE for loads in excess of six amperes (6A) at 150 to 250 KHz.

Watlow has verified that a tank filter will suppress EMI created by SCR power controllers to comply with the conducted emissions limits.




| Description | Crydom Filter | Watlow Filter |
|---|---|---|
| Single phase 230 v~(ac) | 1F25 | 14-0019 |

WARNING

Tank filters may suppress desirable communications carried on power lines in the 150 to 250 KHz region. The filters may suppress carrier current such as that used for infant monitors and medical alert systems. Verify that suppressed carrier current or other desirable communications on power lines creates no hazard to people or property. Failure to observe this warning could result in damage to property, and or injury to death for personnel.

WARNING

All filter installation and wiring must be performed by qualified personnel and conform to local and national electrical codes

In-line power filters have been shown to properly suppress EMI; however, these filters must be rated for the entire load current and are generally more expensive than the tank filter specified. An In-line filter may be required if carrier current communications are used on site.

Joe Millanes
Name of Authorized Representative

Director of Operations
Title of Authorized Representative

Winona, Minnesota, USA
Place of Issue

August 2013
Date of Issue

Signature of Authorized Representative

# How to Reach Us

## Corporate Headquarters

Watlow Electric Manufacturing Company
12001 Lackland Road
St. Louis, MO 63146
Sales: 1-800-WATLOW2
Manufacturing Support: 1-800-4WATLOW
Email: info@watlow.com
Website: www.watlow.com
From outside the USA and Canada:
Tel: +1 (314) 878-4600
Fax: +1 (314) 878-6814

## Latin America

Watlow de México S.A. de C.V.
Av. Fundición No. 5
Col. Parques Industriales
Querétaro, Qro. CP-76130
Mexico
Tel: +52 442 217-6235
Fax: +52 442 217-6403

## Europe

Watlow France
Tour d'Asnières.
4 Avenue Laurent Cély
92600 Asnières sur Seine
France
Tél: + 33 (0)1 41 32 79 70
Télécopie: + 33(0)1 47 33 36 57
Email: info@watlow.fr
Website: www.watlow.fr

Watlow GmbH
Postfach 11 65, Lauchwasenstr. 1
D-76709 Kronau
Germany
Tel: +49 (0) 7253 9400-0
Fax: +49 (0) 7253 9400-900
Email: info@watlow.de
Website: www.watlow.de

Watlow Italy S.r.l.
Viale Italia 52/54
20094 Corsico MI
Italy
Tel: +39 024588841
Fax: +39 0245869954
Email: italyinfo@watlow.com
Website: www.watlow.it

Watlow Ibérica, S.L.U.
C/Marte 12, Posterior, Local 9
E-28850 Torrejón de Ardoz
Madrid - Spain
T. +34 91 675 12 92
F. +34 91 648 73 80
Email: info@watlow.es
Website: www.watlow.es

Watlow UK Ltd.
Linby Industrial Estate
Linby, Nottingham, NG15 8AA
United Kingdom
Telephone: (0) 115 964 0777
Fax: (0) 115 964 0071
Email: info@watlow.co.uk
Website: www.watlow.co.uk
From outside The United Kingdom:
Tel: +44 115 964 0777
Fax: +44 115 964 0071

## Asia and Pacific

Watlow Singapore Pte Ltd.
16 Ayer Rajah Crescent,
#06-03/04,
Singapore 139965
Tel: +65 6773 9488 Fax: +65 6778 0323
Email: info@watlow.com.sg Website: www.watlow.com.sg

Watlow Australia Pty., Ltd.
4/57 Sharps Road
Tullamarine, VIC 3043
Australia
Tel: +61 3 9335 6449
Fax: +61 3 9330 3566
Website: www.watlow.com

Watlow Electric Manufacturing (Shanghai) Company
1118 Fangyuan Road, Anting Industrial Park, Jiading, Shanghai,
PRC 201203
People's Republic of China
Tel: +86 21 39509510
Fax: +86 21 5080-0906
Email: info@watlow.cn
Website: www.watlow.cn

ワトロー・ジャパン株式会社
〒101-0047 東京都千代田区内神田1-14-4
四国ビル別館9階
Tel: 03-3518-6630 Fax: 03-3518-6632
Email: infoj@watlow.com Website: www.watlow.co.jp

Watlow Japan Ltd.
1-14-4 Uchikanda, Chiyoda-Ku
Tokyo 101-0047
Japan
Tel: +81-3-3518-6630 Fax: +81-3-3518-6632
Email: infoj@watlow.com Website: www.watlow.co.jp

Watlow Korea Co., Ltd.
#1406, E&C Dream Tower, 46, Yangpyeongdong-3ga
Yeongdeungpo-gu, Seoul 150-103
Republic of Korea
Tel: +82 (2) 2628-5770 Fax: +82 (2) 2628-5771
Website: www.watlow.co.kr

Watlow Malaysia Sdn Bhd
No. 14-3 Jalan 2/114
Kuchai Business Centre
Jalan Kuchai Lama
58200 Kuala Lumpur
Malaysia
Tel: +60 3 7980 7741 Fax: +60 3 7980 7739

瓦特龍電機股份有限公司
80143 高雄市前金區七賢二路189號 10樓之一
電話: 07-2885168 傳真: 07-2885568

Watlow Electric Taiwan Corporation
10F-1 No.189 Chi-Shen 2nd Road Kaohsiung 80143
Taiwan
Tel: +886-7-2885168 Fax: +886-7-2885568

**Your Authorized Watlow Distributor**