







Wiring Safety Guide

DIN-A-MITE® Power Controllers

Document Number:
2271-5649, 10-52315 Rev-

Safety Information

	CAUTION – Warning or Hazard that needs further explanation than the label on unit can provide. Consult User's Guide for further information.
	Electrical Shock Hazard - Symbol (a lightning bolt in a triangle) precedes an electric shock hazard CAUTION or WARNING safety statement.
	ESD Sensitive product , use proper grounding and handling techniques when installing or servicing product.
	Do not throw in trash, use proper recycling techniques or consult manufacturer for proper disposal.
	Unit is a Listed device per Underwriters Laboratories. It has been investigated to ANSI/UL® 508 standards for Industrial Control Switches and equivalent to CSA C22.2 #14. For more detail search for File E73741 on www.ul.com.
	Unit is compliant with European Union directives. See Declaration of Conformity for further details on Directives and Standards used for Compliance.

Safety Notes

WARNING! To avoid damage to property and equipment, injury and loss of life, adhere to applicable electrical codes and standard wiring practices when installing and operating this product. Failure to do so could result in damage, injury and death.

WARNING! All service including inspection, installation, wiring, maintenance, troubleshooting, fuse or other user-serviceable component replacement must be performed only by properly qualified personnel. Service personnel must read this manual before proceeding with work. While service is being performed, other, unqualified personnel should not work on the unit or be allowed in the immediate vicinity.

WARNING! When in use, the power controller is connected to dangerous voltages. Do not remove the protective covers without first disconnecting and preventing power from being restored while servicing the unit.

WARNING! Electric Shock Hazard: when the power controller has been energized, after shutting off the power, wait at least one minute for internal capacitors to discharge before commencing work that brings you in to contact with power connections or internal components.

WARNING: The installation must be protected by fuses. Semiconductor fuses are classified for UL® as supplementary protection for semiconductor devices. They are not approved for branch circuit protection.

NOTE! The nominal current is specified for ambient temperatures at or below 50°C. Ensure the application design allows for adequate cooling of each power controller. The power controller must be mounted vertically. The cooling design must prevent air heated by one power controller from causing power controllers mounted above to exceed the ambient operating temperature limit. When power controllers are mounted side by side allow a minimum spacing of 15mm between them.

NOTE! Use only copper cables and wires rated for use at 75°C or greater.

AVERTISSEMENT! Pour éviter d'endommager la propriété et l'équipement, les blessures et la perte de vie, respecter les codes électriques en vigueur et les pratiques de câblage standard au moment de l'installation et de l'utilisation de ce produit. Dans le cas contraire, cela peut entraîner la mort, des blessures graves ou des dommages.

AVERTISSEMENT! Tous les services, y compris l'inspection, l'installation, le câblage, l'entretien, le dépannage, le remplacement de fusibles ou d'autres composants pouvant être réparés par l'utilisateur, doivent être effectués uniquement par un personnel dûment qualifié. Le personnel de service doit lire ce manuel avant d'effectuer tout travail. Pendant que l'entretien est exécuté, tout personnel non qualifié ne doit effectuer de travail sur l'appareil ni se trouver à proximité.

AVERTISSEMENT! Au moment de l'utilisation, le régulateur de puissance est connecté à des tensions dangereuses. Ne retirer aucun couvercle de protection sans d'abord débrancher l'appareil et ainsi empêcher l'alimentation d'être rétablie pendant l'entretien.

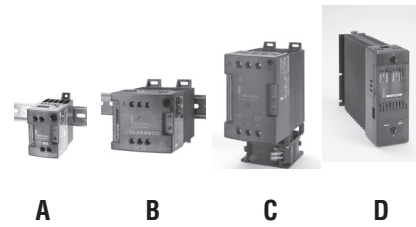
AVERTISSEMENT! Risque de décharges électriques : lorsque le régulateur de puissance est mis sous tension, après avoir été éteint, attendre au moins une minute pour que les condensateurs internes se déchargent avant de commencer tout travail incluant le contact avec les connexions électriques ou les composants internes.

AVERTISSEMENT! L'installation doit être protégée par des disjoncteurs électromagnétiques ou des fusibles. Les fusibles pour semi-conducteurs situés à l'intérieur du régulateur de puissance sont classés UL® comme protection supplémentaire pour les dispositifs pour semi-conducteurs. Ils ne sont pas approuvés pour la protection des circuits de dérivation.

REMARQUE : Le courant nominal est précisé pour des températures ambiantes égales ou inférieures à 40°C. S'assurer que la conception de l'application permette le refroidissement adéquat de chaque régulateur de puissance. Le régulateur de puissance doit être monté verticalement. La conception de refroidissement doit empêcher l'air chauffé par le régulateur de puissance de dépasser la limite de température de fonctionnement ambiante de la part des régulateurs de puissance montés au-dessus. Lorsque les régulateurs de puissance sont montés côte à côte, il faut conserver un espacement minimal de 15 mm entre les deux.

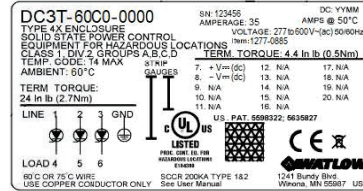
REMARQUE : N'utiliser que des câbles et des fils en cuivre pour l'utilisation à 75°C ou plus.

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Identifying the Products

The product identification label includes not only the part number, but also the voltage and current ratings.



Environment

- Ambient operating temperature: 0 to 50°C. See User Manual for de-rating.
- Ambient temperature maximum varies depending on unit
- Mount power controllers vertically
- 5 to 90% RH (relative humidity), non-condensing
- Up to 6560 feet (2000m) above sea level maximum
- Storage temperature: -40 to 85°C maximum
- Pollution degree: Installation Category III, Pollution degree 2
- Install away from direct sun light, conductive dust, corrosive gas, vibration, water and corrosive salts.

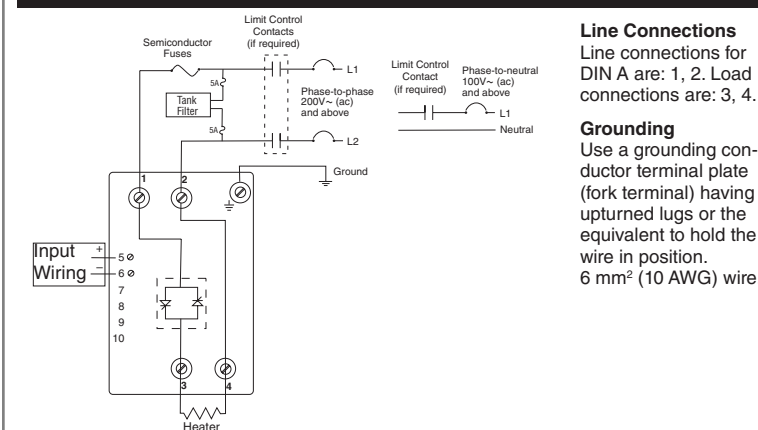
SCCR Rating

- SCCR Rating 200,000A up to 480 VAC

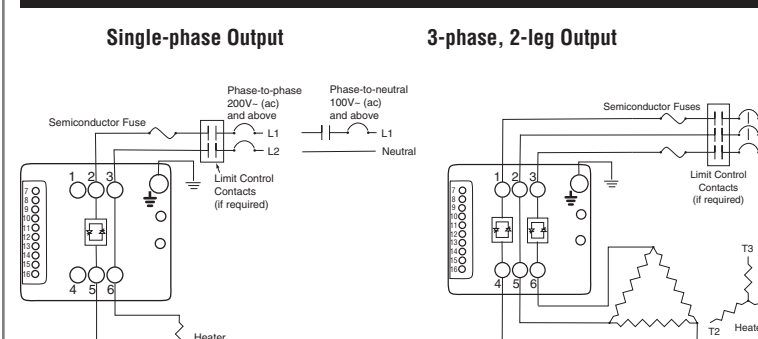
Terminal Identification

The following illustrations show the locations for line power, load, earth ground and signal connections.

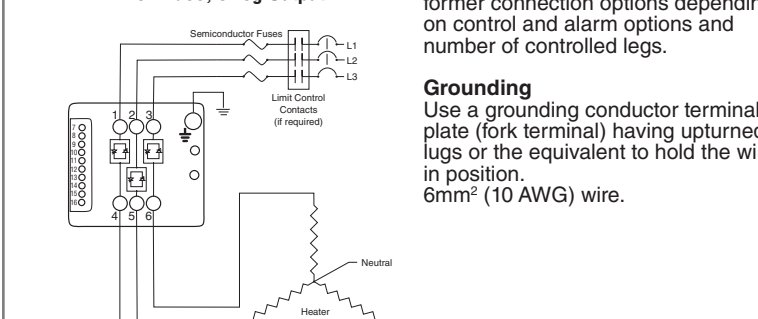
Connection Locations DIN-A-MITE Style A



Connection Locations DIN-A-MITE Style B



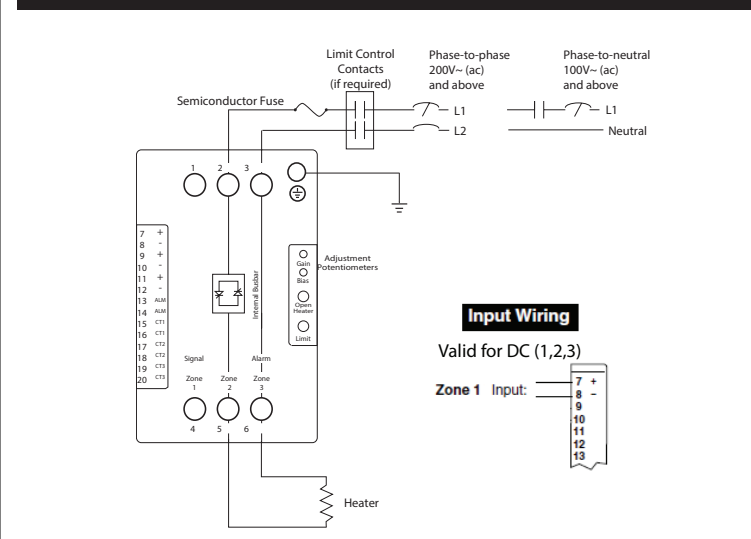
3 Phase, 3-leg Output



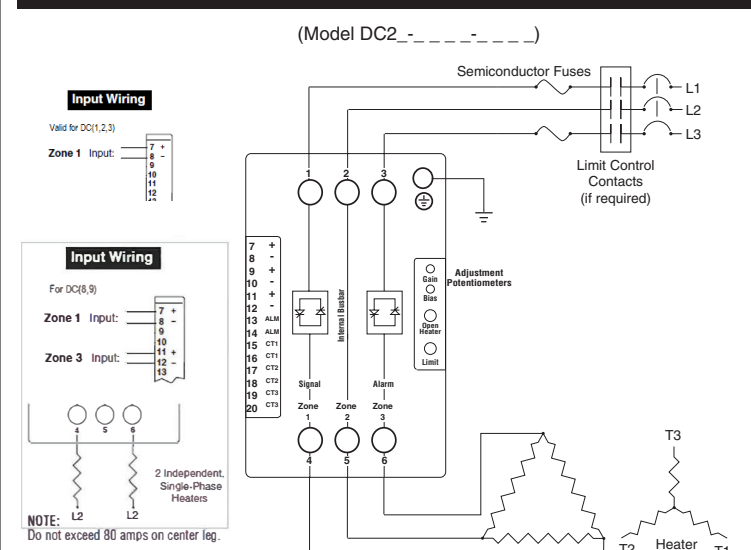
See user manual for current transformer connection options depending on control and alarm options and number of controlled legs.

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

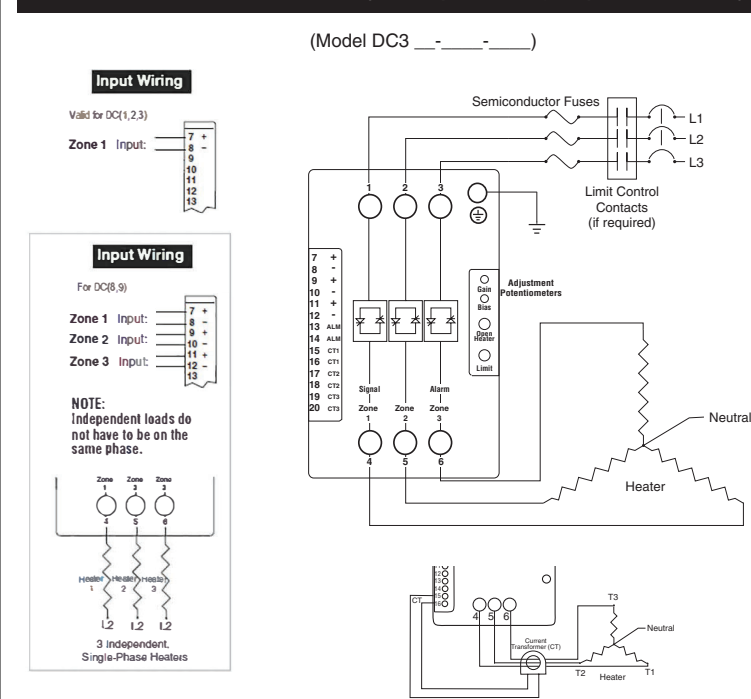
Connection Locations DIN-A-MITE Style C: Single phase, Output



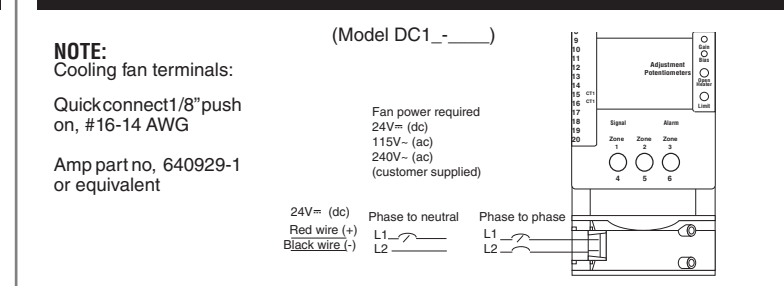
Connection Locations DIN-A-MITE Style C: 3-phase, 2-leg Output



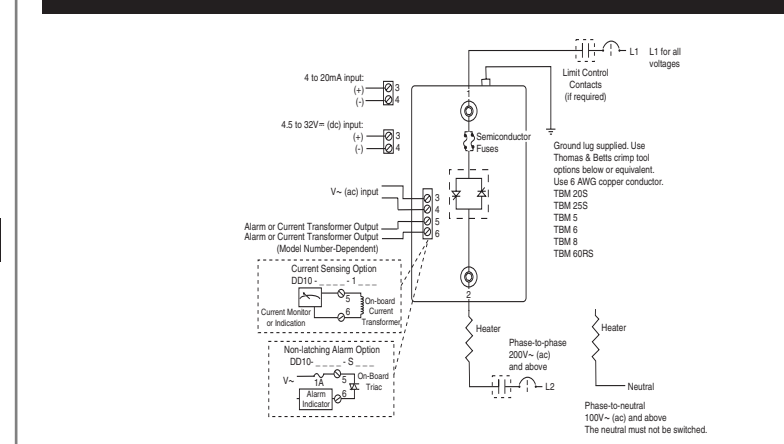
Connection Locations DIN-A-MITE Style C: 3-phase, 3-leg Output, Four Wire Wye



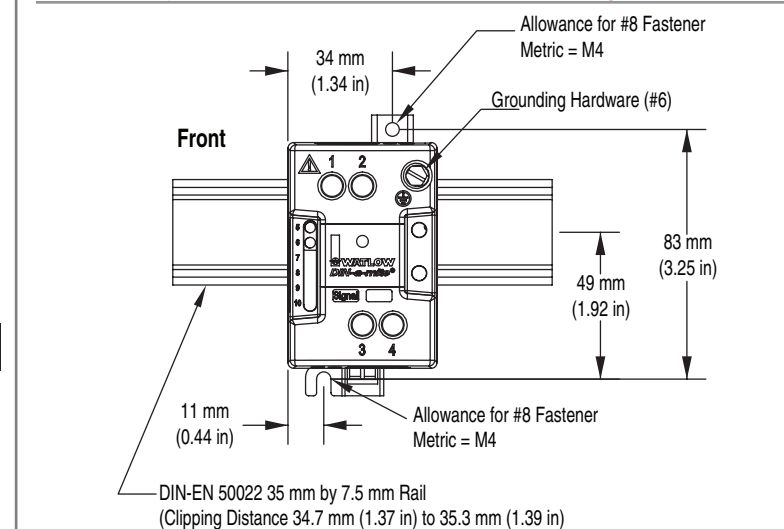
Connection Locations DIN-A-MITE Style C: Fan Cooled



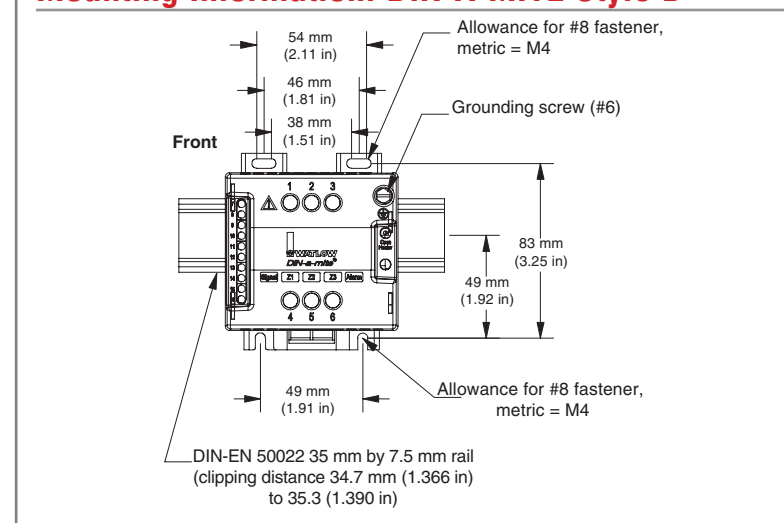
Connection Locations DIN-A-MITE Style D: Single Phase, Output and Input Wiring



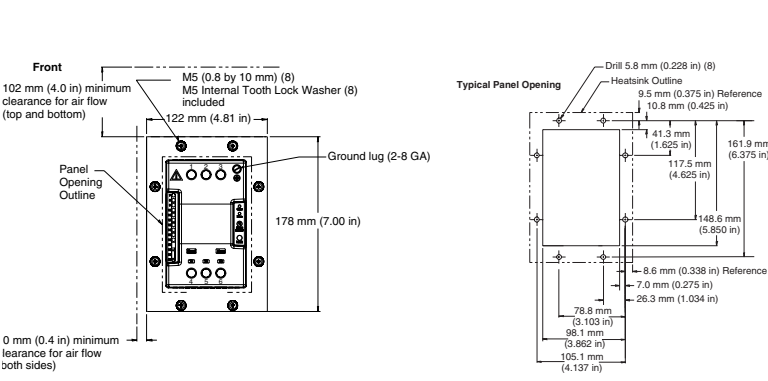
Mounting Information: DIN-A-MITE Style A



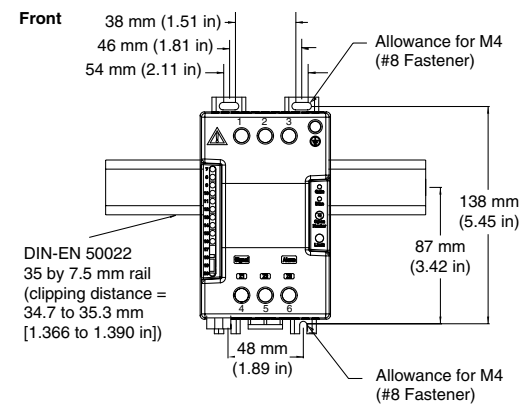
Mounting Information: DIN-A-MITE Style B



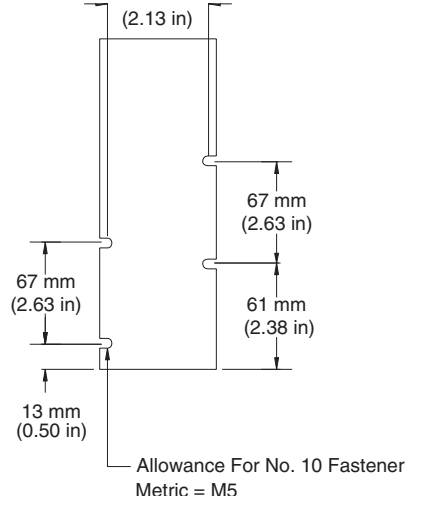
Mounting Information: DIN-A-MITE Style C -DCxT



Mounting Information: DIN-A-MITE Style C -DCx(0,1,2,3)



Mounting Information: DIN-A-MITE Style D



Wiring Instructions

Choose line and load wire size based on National Electric Code NFPA 70 or local electric codes for the current to be carried. When using 90°C wire, choose wire gauge based on 75°C table. See the table below for ground wire size recommendations.

Branch Circuit Protection Rating	Ground Wire Size
15 Amps	14 AWG
20 Amps	12 AWG
30 - 60 Amps	10 AWG
100 Amps	8 AWG
100 - 125 Amps	6 AWG

Wiring Instructions (Continued)

Line and Load Torquing Guidelines

- Properly torque line and load terminals, hold torque for 30 seconds
- Re-torque after 48 hours to minimize wire cold flow
- Re-torque line and load terminals every three to six months

Control Signal Torque

- 4.4 in.-lb. (0.5 Nm)

Line Power, Load and Earth Ground Torque		
Model Line/Load Driver	Line, Load & Earth Ground	Earth Ground Driver
DIN A 1/4 in. Flat blade	12 in.-lbs. (1.4 Nm)	1/4 in. Flat blade or hex
DIN B Pozi drive #2	12 in.-lbs. (1.4 Nm)	1/4 in. Flat blade or hex
DIN C Pozi drive #2	24 in.-lbs. (2.7 Nm)	1/4 in. Flat blade
DIN D 3/16 in. Hex	85 in.-lbs. (9.6 Nm)	3/8 in. Hex

Terminal Descriptions

NOTE: Use recommended fusing to meet 200KA SCCR, type 1 and 2 approved. Other fusing limits SCCR to 5KA per UL508A and NEC guidelines.

DIN-A-MITE Style A Terminals

Terminal	Function	Notes
1	Line 1 power	Switched by SCR
2	Line 2 power / neutral	Internal bus-bar to terminal 4
3	T1 Load power	Output from SCR
4	T2 Load power	Internal bus-bar to terminal 2
5	DC+ / AC command signal	DA10-xx(C,F)x-xxxx takes DC DA10-xxKx-xxxx takes AC
6	DC- / AC command signal	DA10-xxKx-xxxx takes AC
7, 8, 9, 10	Not used / no connection	

DIN-A-MITE Style B, Style C Terminals

Terminal	Function	Notes
1	Not used / no connection	
2	Line 1 power	Switched by SCR
3	Line 2 power / neutral	Internal bus-bar to terminal 6
4	Not used / no connection	
5	T1 Load power	Output from SCR
6	T2 Load power	Internal bus-bar to terminal 3

Power and Load Connections D(B or C)2x-xxxx-xxxx or D(B or C)8x-xxxx-xxx

Terminal	Function	Notes
1	Line 1 power	Switched by SCR 1
2	Line 2 power / neutral	Internal bus-bar to terminal 5
3	Line 3 power	Switched by SCR 2
4	T1 Load power	Output from SCR 1
5	T2 Load power	Internal bus-bar to terminal 2
6	T3 Load power	Output from SCR 2

Power and Load Connections D(B or C)3x-xxxx-xxxx or D(B or C)9x-xxxx-xxxx

Terminal	Function	Notes
1	Line 1 power	Switched by SCR 1
2	Line 2 power	Switched by SCR 2
3	Line 3 power	Switched by SCR 3
4	T1 Load power	Output from SCR 1
5	T2 Load power	Output from SCR 2
6	T3 Load power	Output from SCR 3

NOTE: For D(B or C)(8 or 9) models. All zones can be on same phase input or multi-phase input. Each zone is controlled independent of other zones.

Terminal Descriptions (Continued)

Command Signal Inputs DIN-A-MITE Style B and Style C

Terminal	Models	Command Signal Input
7	Dx(1,2,3)x-xx(C,F)x-xxxx	DC+
	Dx(1,2,3)x-xxKx-xxxx	AC
	DC1x-xx(L,P)x-xxxx or DC(1,2,3)x-xxSx-xxxx	DC+ or Potentiometer wiper
	Dx(8,9)x-xxCx-xxxx	Zone 1 DC+
8	Dx(8,9)x-xxKx-xxxx	Zone 1 AC
	Dx(1,2,3)x-xx(C,F)x-xxxx	DC-
	Dx(1,2,3)x-xxKx-xxxx	AC
	Dx(8,9)x-xxCx-xxxx	Zone 1 DC-
9	Dx(8,9)x-xxKx-xxxx	Zone 1 AC
	DC1x-xx(L,P)x-xxxx or DC(1,2,3)x-xxSx-xxxx	DC- or Potentiometer CCW
	Dx(1,2,3)x-xxxx-xxxx	Not used / no connection
	Dx9x-xxCx-xxxx	Zone 2 DC+
10	Dx9x-xxKx-xxxx	Zone 2 AC
	DX1x-xx(L,P)x-xxxx or DC(1,2,3)x-xxSx-xxxx	Potentiometer CW
	Dx(1,2,3)x-xxxx-xxxx	Not used / no connection
	Dx9x-xxCx-xxxx	Zone 2 DC-
11	Dx9x-xxKx-xxxx	Zone 2 AC
	Dx(1,2,3)x-xxxx-xxxx	Not used / no connection
	Dx8x-xxCx-xxxx	Zone 2 DC+
	Dx8x-xxKx-xxxx	Zone 2 AC
12	Dx9x-xxCx-xxxx	Zone 3 DC+
	Dx9x-xxKx-xxxx	Zone 3 AC
	Dx(1,2,3)x-xxxx-xxxx	Not used / no connection
	Dx8x-xxCx-xxxx	Zone 2 DC-
13	Dx8x-xxKx-xxxx	Zone 2 AC
	Dx9x-xxCx-xxxx	Zone 3 DC-
	Dx9x-xxKx-xxxx	Zone 3 AC
	Dx(1,2,3)x-xxxx-xxxx	Not used / no connection

Alarm Output and Current Transformer Input

Terminal	Models	Function
13	Dxxx-xxxx-(H,S)xxx	Alarm 100-240AC 300mA max.
	Dxxx-xxxx-0xxx	Not used / no connection
14	Dxxx-xxxx-(H,S)xxx	Alarm 100-240AC 300mA max.
	Dxxx-xxxx-0xxx	Not used / no connection
15	DC1x-xxLx-xxxx or Dxxx-xxxx-(H,S)xxx	Current transformer
	All other models	Not used / no connection
16	DC1x-xxLx-xxxx or Dxxx-xxxx-(H,S)xxx	Current transformer input
	All other models	Not used / no connection
17,18,19,20	DCxx-xxxx-xxxx	Not used / no connections

DIN-A-MITE Style D Terminals

Terminal	Function	Notes / Model
1	Line 1 power	Switched by SCR
2	T1 Load power	Output from SCR
3	DC+ / AC command signal	DD10-xx(C,F)x-xxxx takes DC, DD10-xxKx-xxxx takes AC
4	DC- / AC command signal	DD10-xxKx-xxxx takes AC
5	Not used / no connection	DD10-xxxx-0xxx
	Current transformer output	DD10-xxxx-1xxx
	Alarm 100-240 AC 300mA max.	DD10-xxxx-Sxxx
6	Not used / no connection	DD10-xxxx-0xxx
	Current transformer output	DD10-xxxx-1xxx
	Alarm 100-240 AC 300mA max.	DD10-xxxx-Sxxx

200kA Fusing

Use recommended fusing to meet 200KA SCCR, type 1 and 2 approved. Other fusing limits SCCR to 5KA per UL508A and NEC guidelines. See "UL" and NEC Requirements for Electrical Panel Assemblies Marked with Fault Current or SCCR" on the Watlow website for more information.

Recommended Fuse and Fuse Holder				
Fuse	Watlow Semiconductor	Eaton® Semiconductor	Watlow Combination	Eaton® Combination
20A	17-8020	FWC20A10F	0808-0325-0020	DFJ20
25A	17-8025	FWC25A10F	0808-0325-0025	DFJ25
32A	17-8030	FWP32A14F	0808-0325-0030	DFJ30
40A	17-8040	FWP40A14F	0808-0325-0040	DFJ40
50A	17-8050	FWP50A14F	0808-0325-0050	DFJ50

Holders (single)			
Fuse	Watlow	Mersen® (formerly Ferraz)®	Eaton® 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 60A	0808-0326-3560	-----	CH60J1i

DIN-A-MITE Style C Recommended Fuses				
Semiconductor Fuses for Applications Through 600V - (ac):				
Semiconductor Fuse Rating	Watlow Fuse P/N	Eaton® Fuse P/N	Watlow Holder P/N	Mersen® Holder P/N
30A	17-8030	FWP30A14F	17-5114	USM141i
40A	17-8040	FWP40A14F	17-5114	USM141i
50A	17-8050	FWP50A14F	17-5114	USM141i
63A	17-8063	FWP63A22F	17-5122	US22i
80A	17-8080	FWP80A22F	17-5122	US22i
100A	17-4100	FWP100A22F	17-5122	US22i

Combination Fuses for Applications Through 600V - (ac):				
Semiconductor use Rating	Watlow Fuse P/N	Eaton® Fuse P/N	Watlow Holder P/N	Mersen® Holder P/N
30A	0808-0325-0030	DFJ30	0808-0326-1530	CH30J1i
40A	0808-0325-0040	DFJ40	0808-0326-3560	CH60J1i
50A	0808-0325-0050	DFJ50	0808-3026-3560	CH60J1i
63A	0808-0325-0060	DFJ60	0808-3026-3560	CH60J1i
80A	0808-0325-0080	DFJ80	0808-0326-7010	J60100-1CR
100A	0808-0325-0100	DFJ100	0808-0326-7010	J60100-1CR

DIN-A-MITE Style D Replacement Fuses
 Watlow 0808-0096-0000 Eaton 170N3437
 Torque for Replacement Fuses 40 in.-lbs (4.52 Nm)

EMC Filters

Filters for EMC conducted emissions compliance.

Description	Crydom® Filter	Watlow Filter
Single-phase, 230V- (ac)	1F25	14-0019
Three-phase, 440V- (ac)	3F20	14-0020

Agency Approval and Regulatory

- cULus® 508 Listed File E73741
- cULus® Listed to C22.2 No. 14
- IP 20 with all covers in place
- Utilization Category: AC-51, AC-55b, AC-56a
- SCCR rating 200,000A up to 480 VAC
- DCxT models
 - UL® 50 Type 4x approved
 - Class 1 Division 2 Groups A, B, C, D Temperature Code T4 Hazardous Locations
 - cULus® ANSI/ISA 12.12.01 Listed file E 184390
- CE and UKCA declarations available upon request

User Manuals

Complete user manuals are available at
 User manuals: www.watlow.com/kb/DINA; www.watlow.com/kb/DINB;
www.watlow.com/kb/DINC; www.watlow.com/kb/DIND

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, you can get technical assistance from your local Watlow representative (see back cover), by e-mailing your questions to wintechsupport@watlow.com or by dialing +1 (507) 494-5656 between 7 a.m. and 5 p.m. Central Time USA & Canada. Ask for an Applications Engineer. Please have the complete model number available when calling.

How to Reach Us

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
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