



ASPYRE[®] AT

WIRING SAFETY GUIDE



10-51914 2266-7027



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

August 2022, Part Number 2266-7027, Rev. -

WATLOW INFO

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 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.

Warranty

The ASPYPE AT power controller is warranted by Watlow in accordance with the terms and conditions set forth on Watlow's website at www.watlow.com/terms.

Registered Trademarks

Watlow®, ASPYPE® and COMPOSER® are registered trademarks of Watlow Electric Manufacturing Company.

UL® is a registered trademark of Underwriter's Laboratories, Inc.

Modbus® is a registered trademark of Schneider Automation Incorporated.

Document Number: 10-51914, Rev. -, August 2022

For assistance contact Watlow: www.watlow.com
1-800-WATLOW2 (1-800-928-5692)
wintechsupport@watlow.com

SAFETY

Safety Information

Symbol	Explanation
"NOTE"	An important detail or recommendation.
	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.

WARNING! To avoid damage to property or 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, and troubleshooting 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 service controller without first disconnecting and preventing power from being restored while servicing the power controller.

WARNING! Do not use in aerospace or nuclear applications.

WARNING! The power controller's protection rating is IP20. It must be installed in an enclosure that provides all the necessary additional protections appropriate for the environment and application.

WARNING! Ground the power controller via the provided protective earth grounding terminal. Verify ground is within impedance specifications of UL 508A 0.1 ohm. This should be verified periodically.

WARNING! The installation must be protected by electromagnetic circuit breakers or by fuses.

WARNING! When making live voltage or current measurements, use proper personal protective equipment for the voltages and arc-flash potentials involved.

WARNING! Verify the voltage and current ratings of the power controller are correct for the application.

CAUTION: To avoid compromising the insulation, do not bend wire or other components beyond their bend radius specifications.

CAUTION: Protect the power controller from high temperature, humidity and vibrations.

NOTE! Use only copper cables and wires rated for use at 90°C or greater, unless otherwise noted.

Safety Information

CAUTION: Install an appropriately sized RC filter across contactor coils, relays and other inductive loads.

NOTE! Provide a local disconnect to isolate the power controller for servicing.

NOTE! The nominal current is specified for ambient temperatures at or below 40° 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.

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! Lorsqu'il est utilisé, le contrôleur de puissance est connecté à des tensions dangereuses. Ne réparez pas le contrôleur sans d'abord déconnecter et empêcher le rétablissement de l'alimentation lors de l'entretien du contrôleur de puissance.

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! Ne pas utiliser pour les applications aérospatiales ou nucléaires.

AVERTISSEMENT! L'indice de protection du régulateur de puissance est de IP20 lorsque les couvercles sont installés et fermés. L'appareil doit être installé dans une enceinte qui assure toute la protection supplémentaire nécessaire pour l'environnement et l'application.

AVERTISSEMENT! Mise à la terre du régulateur de puissance par le biais de la borne de prise de terre de protection fournie. Vérifier que la prise de terre est conforme aux spécifications de l'impédance UL 508A 0.1 ohm. Cela doit être vérifié périodiquement.

AVERTISSEMENT! L'installation doit être protégée par des disjoncteurs électromagnétiques ou des fusibles.

AVERTISSEMENT! Au moment de relever des mesures de tension ou de courant en direct, utiliser un équipement de protection individuelle approprié pour les tensions et les potentiels d'arc électrique concernés.

AVERTISSEMENT! Vérifier que les valeurs de tension et de courant du régulateur de puissance sont correctes pour l'application.

ATTENTION: Pour éviter de compromettre l'isolation, ne pas plier le fil ou tout autre composant au-delà de ses spécifications en matière de rayon de courbure.

ATTENTION: Protéger le régulateur de puissance contre les températures élevées, l'humidité et les vibrations.

ATTENTION: Installer un filtre RC de dimensions appropriées sur les bobines du contacteur, les relais et autres charges par induction.

REMARQUE: Fournir une déconnexion locale afin d'isoler le régulateur de puissance pour l'entretien.

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.

REMARQUE: N'utiliser que des câbles et des fils en cuivre pour l'utilisation à 90 °C ou plus, sauf indication contraire.

For assistance contact Watlow: www.watlow.com
1-800-WATLOW2 (1-800-928-5692)
wintechsupport@watlow.com

CE DECLARATION

Declaration of Conformity
CE ASPYPE Series AT

WATLOW Electric Manufacturing Company,
1241 Bundy Blvd.
Winona, MN 55987 USA

Declares that the following ASPYPE Series AT
Classification: Electric Power Control, Utilization Categories AC-51, AC-55b, AC-56a
Installation Category III, Pollution degree 2

Auxiliary Supply: AUX power 24 Vdc + 10, -15%
Load Voltage and Frequency: 100 to 480 Vac ± 10%³
50/60 Hz
Power Consumption: Auxiliary Power 4 Watts maximum
Load current 12, 24 or 48 Amps maximum, see derating curves.
Environmental Rating: IP20 with covers installed.

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

2014/30/EU Electromagnetic Compatibility Directive
Low Voltage Switchgear and Controlgear: Part 1 General Rules.

EN 60947-1 2007:A1 2011, A2 2014
EN 60947-4-3 2014
EN 55011 2016:A1 2017
Part 4-3: Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads
Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Class A Emissions. Group 1 Equipment.

CAUTION: This equipment not intended for use in residential environments and may not provide adequate protection to radio reception in such environments. For use in Class B environments, additional filtering on power lines required. For use with Phase Angle control, additional filtering required to pass Class A conducted Emissions.

EN 61000-3-2:2014¹
EN 61000-3-3:2013¹
Electromagnetic compatibility (EMC) — Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
Electromagnetic compatibility (EMC) — Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

EN 61000-4-2:2009
EN 61000-4-3:2006
+A1:2008, A2:2010
EN 61000-4-4:2012
EN 61000-4-5:2014
+A1:2017
EN 61000-4-6:2014 +
Corrigendum 2015
IEC 61000-4-11:2020
Electrostatic discharge immunity
Radiated, radio-frequency electromagnetic field immunity, 10 V/m 80 MHz to 1 GHz
3 V/m 1.4 to 2 GHz, 1 V/m from 2 to 2.7 GHz.
Electrical fast-transient / burst immunity
Surge immunity²

Immunity to conducted disturbances induced by radio-frequency fields 10 Vrms.
Voltage dips, short interruptions and voltage variations immunity

¹Harmonics and Flicker for models ≤ 16 Amps only, above this and for industrial uses this is not applicable. Flicker requires extended cycle times to comply. Up to 175 second cycle time at 16 Amps.
²AUX tested on primary side of Lambda DSP series 24 Vdc power supply.
³SCCR rating of 100,000 Amps Type 2 protection when using Eaton DFJ or Special purpose FWP fuse up to 60 Amps, or Class J, CC, CF, T, fuse up to 30 amp rating. Type 1 protection if using Class J, CF, T fuse up to 60 amps or 10,000A rating with Eaton FAZ-NA circuit breaker at 240 Vac 30 Amps.

2014/35/EU Low-Voltage Directive
Low Voltage Switchgear and Controlgear: Part 1 General Rules.

EN 60947-1 2007:A1 2011, A2 2014
EN 60947-4-3 2014
Part 4-3: Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads

Compliant with 2015/863/EU RoHS Directive

Per 2012/19/EU W.E.E Directive Please Recycle Properly

Jeff Harrington
Name of Authorized Representative Winona, Minnesota, USA
Place of Issue

Director of Operations
Title of Authorized Representative April 2022
Date of Issue

Signature of Authorized Representative

SPECIFICATIONS

Power Bases

- Single-phase, 1 controlled leg

Load Amp Range

- 12A, 24A and 48A options
(see derating curves in User Guide)

SCR and Amperage Rating

- SCCR rating 100,000A up to 480VAC with coordinated fusing
- SCCR rating 10,000A up to 240VAC with recommended circuit breaker

- Power dissipation: Approximately 1 to 1.2 watts per amp

- Leakage current: 1mA at 25°C

Environment

- 0 to 60 °C (single unit) or 55 °C (multiple units) see derating curves
- 5 to 90% RH (relative humidity), non-condensing

Agency Approval and Regulatory

- UL® 508 Listing
- c-UL® Listed
- 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: 94-V0

User Guide: www.watlow.com/kb/ASPYPEAT
has complete specifications list.

MOUNTING INSTRUCTIONS

Mounting Dimensions

The power controller may be mounted on a DIN rail or with screws. See the tables and illustrations on the page for the product dimensions, spacing, weight and mounting locations.

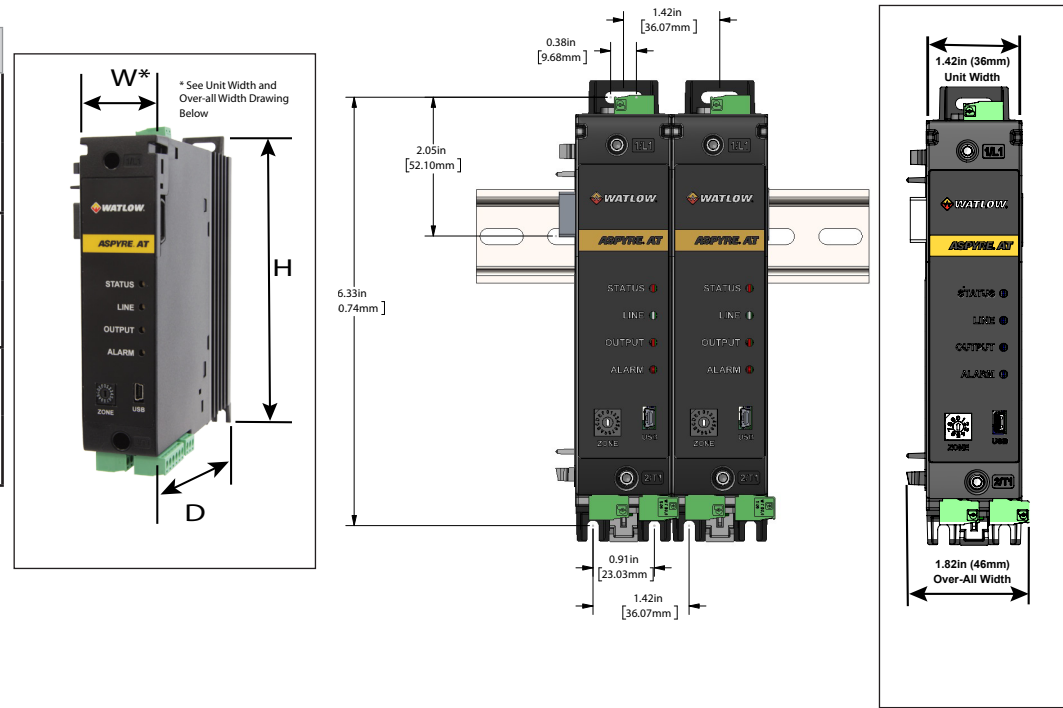
Model	W	H	D	Weight
12A/24A DIN-Rail w/Heat Sink Option	Unit Width 36mm (1.42in)	6.79 in. (172 mm)	12A/24A: 5.88 in. (149 mm)	1.61 lb. (0.73 kg)
	Over-all Width 1.82 in. (46mm)			
48A DIN-Rail w/Heat Sink Option	Unit Width 36mm (1.42in)	6.79 in. (172 mm)	48A: 7.07 in. (180 mm)	1.89 lb. (0.86 kg)
	Over-all Width 1.82 in. (46mm)			
One Zone Cooling Plate Option	Unit Width 36mm (1.42in)	7.29 in. (185 mm)	3.97 in. (101 mm)	1.15 lb. (.52 kg)
	Over-all Width 1.82 in. (46mm)			

Mounting Hole Size

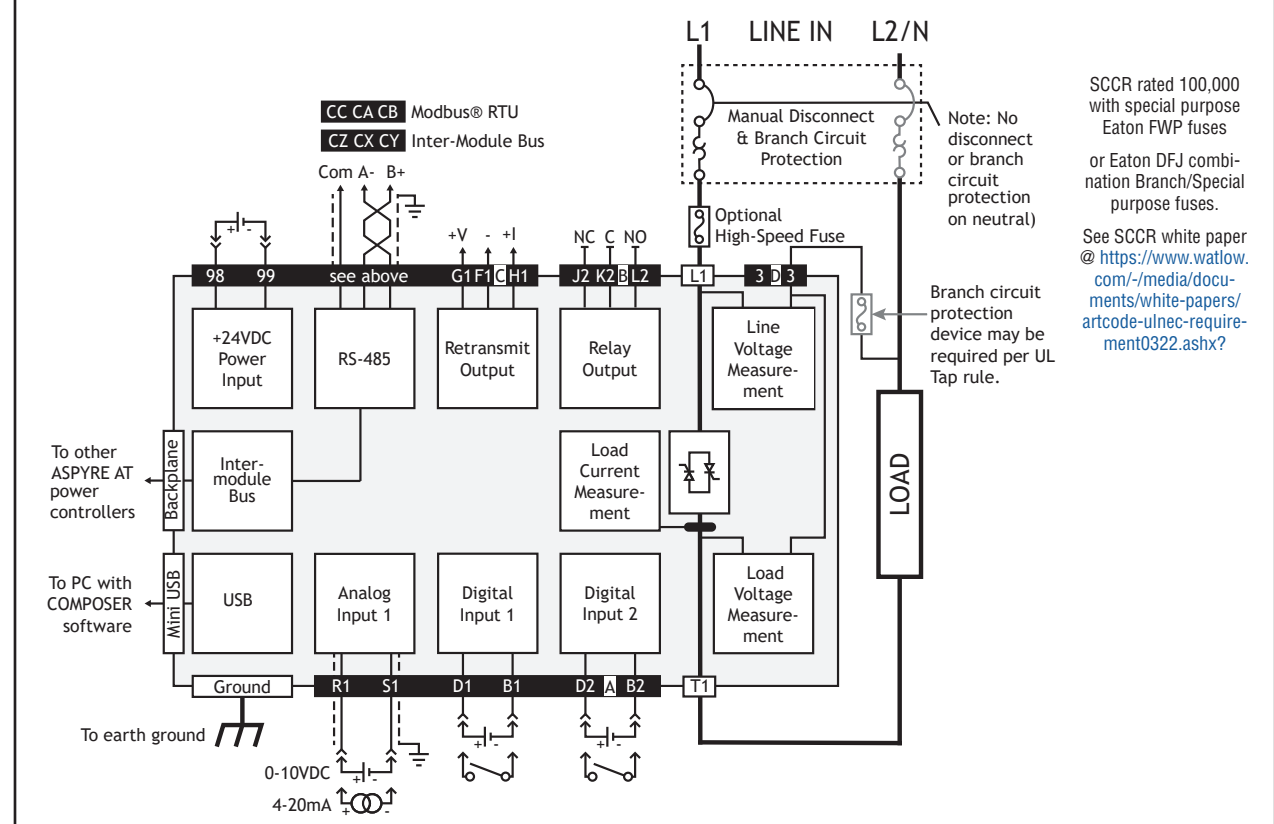
Mounting hole diameter	0.177 in. (4.50 mm)
------------------------	---------------------

Note! The maximum thickness for the DIN rail is 1mm.

Recommended fastener: No 8-32 (M5)



WIRING SCHEMATIC



SCCR rated 100,000 with special purpose Eaton FWP fuses or Eaton DFJ combination Branch/Special purpose fuses. See SCCR white paper @ <https://www.watlow.com/-/media/documents/white-papers/artcode-ulnec-requirement0322.ashx?>

WIRE SELECTION

Wire Selection, Prep and Torque

This section lists the recommended wire sizes for line power, load, earth ground and control signal connections. There are also recommendations for insulation stripping and termination torque.

Stranded Wire Size	Wire Termination	Temperature Rating
14 to 10 AWG solid (1.5 to 6 mm ²)	Wire compression clamp	90°C or greater
14 to 6 AWG Stranded (1.5 to 16 mm ²)	Wire compression clamp	90°C or greater

Wire Size	Wire Termination	Temperature Rating
10 AWG (6 mm ²)	UL Listed (ZMVV) ring or spade crimp lug	75°C or greater

Control and Signal Wire Size
Range: 22 to 14 AWG (0.50 to 1.5 mm²) Recommended: 18 AWG (0.75 mm²)
Temperature Rating: 75°C or greater

Insulation Stripping and Torque	
Load & Line Power	Bare wire connection: 0.59 in. (15 mm) Connection with crimp lug: per lug manufacturer
Ground	Per crimp lug requirements
Control and Signal	0.24 in. (6mm)

Control Signal and Ground Torque	
Control & Signal	5 in.-lbs. (0.56 Nm)
Ground Screw	15 to 17 in.-lbs. (1.7 to 1.9 Nm)

Line Power and Load Torque	
Recommended Tool	Proper Torque
1/8 in. Hex Driver	24 in.-lbs. (2.7 Nm)

WIRE CONNECTIONS

Note: Not all options identified below are on all units. See unit label for options present.

Terminal Block A		
Position	Name	Description
R1	Analog In	0-10V or 4-20mA analog input referenced to pin S1. Can be configured as 0-10V or 4-20mA via the software interface.
S1	Analog In Reference	
D1	Digital I/O 1	Digital I/O 1 referenced to pin B1. Can be configured as a 24V input, output, or dry contact input via the software interface.
B1	Digital I/O 1 Reference	
D2	Digital I/O 2	Digital I/O 2 referenced to pin B2. Can be configured as a 24V Input, output, or dry contact input via the software interface.
B2	Digital I/O 2 Reference	

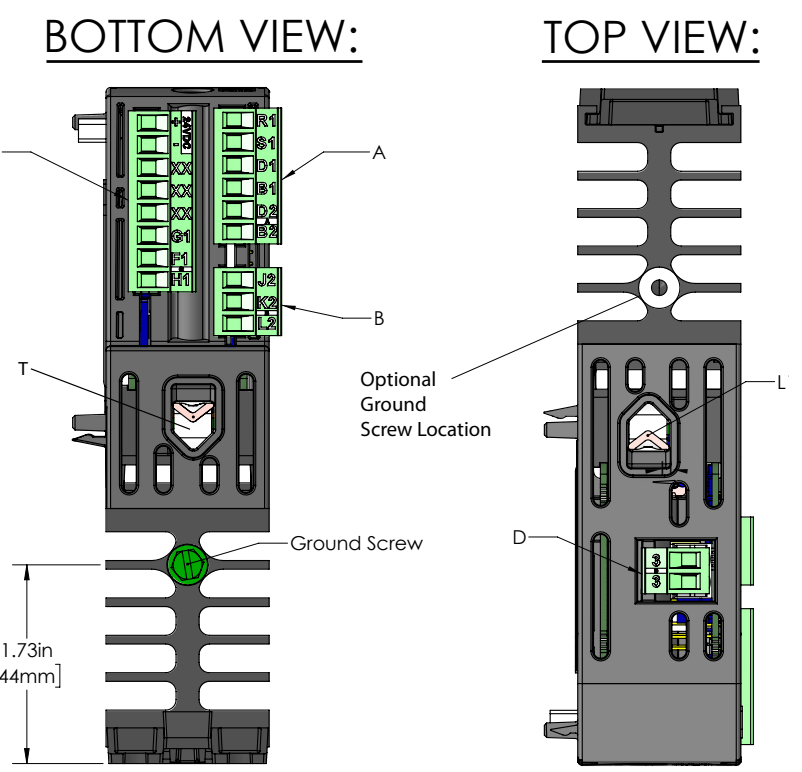
Terminal Block B		
Position	Name	Description
J2	Relay NC	Normally closed relay contact.
K2	Relay Com	Relay connections rated for 240VAC at 5A maximum.
L2	Relay NO	Normally open relay contact.

Power and Ground Connections		
Position	Name	Description
L1	Line Connection	Line power connection Torque= 24 (in.-lbs.)
T1	Switched Leg	Switched power connection Torque = 24 (in.-lbs.)
Ground Screw	Earth Ground	#8-32 Screw head diameter: 0.341" Torque = 15-17 (in.-lbs.)

Terminal Block C		
Position	Name	Description
+	24VIN	24VDC power to the controller.
-	GND	24VDC power reference to the controller.
CC/CZ	Modbus® Common or Inter-module bus common	MODBUS/WATBUS isolated bus common. Configured per product part number.
CA/CX	Modbus® A(-) or Inter-module bus	MODBUS/WATBUS isolated bus A signal. Configured per product part number.
CB/CY	Modbus® B(+) Inter-module bus	MODBUS/WATBUS isolated bus B signal. Configured per product part number.
G1	Retransmit 0-10V	0-10V retransmit output referenced to pin F1.
F1	Retransmit Reference	Retransmit ground reference.
H1	Retransmit 4-20mA	4-20mA retransmit output referenced to pin F1.

Terminal Block D		
Position	Name	Description
3	Reference	Connect to the unswitched phase of the heater.
3	Reference	Connect to the unswitched phase of the heater.

For assistance contact Watlow: www.watlow.com
1-800-WATLOW2 (1-800-928-5692)
wintechsupport@watlow.com



Line/Load Voltage 100 to 480 Vac 50/60 Hz
See terminal D for Line Sync connection.