



Modular and Scalable Power Controllers Enable Increased Throughput and Yield While Reducing System Complexity

The ASPYRE[®] AT is a family of flexible, compact and scalable smart SCR power controllers. It features multiple advanced firing and control mode algorithms combined with sophisticated diagnostics. The ASPYRE AT integrates easily with EZ-ZONE[®] RM, PM PLUS[®] and RMA PLUS[™] controllers as part of a Watlow[®] ecosystem solution.

Features and Benefits

Key component of a Watlow ecosystem solution

- Integrates with EZ-ZONE[®] RM, RMA PLUS[™] and PM PLUS[®] controllers for a complete solution including Modbus[®] TCP, EtherNet/IP[™], or EtherCAT[®] communication
- Eliminates discrete wiring between temperature controllers and power controllers for each heater through the high-speed backplane interface with Watlow controllers
- Enables data collection and diagnostics from the power controllers
- Customizes for your application with programmable function blocks including logic, math, compare and more

High accuracy current and voltage measurement

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

Integrated, scalable solution

- Allows connection from the temperature control system at one point communicating with up to 16 power controllers
- Offers greater than 60% reduction in wiring footprint and costs compared to other multi-zone systems
- Eliminates need for current transformer and associated wiring with integrated current measurement

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

- Shortens project schedules, agency testing and expenses

Closed-loop control on: Voltage, current or power

- Compensates for line voltage variations and thermal component 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 with electronics 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

- Integrates DIN-rail mountable heat sink option for simplifying implementation
- Offers base plate option for flexibility in removing heat from the electrical box

Specifications

Power Bases

- Single-phase, 1 controlled leg

Load Amp Range

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

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
- I²T for fuse selection for all ASPYRE AT models: 9,100 A²s

Line and Load Voltage Range

- 100 to 480V

Voltage Frequency

- Automatically compensates for 47 to 63Hz

Controller Operating Supply Voltage

- 24VDC, 6W 6VA per ASPYRE AT unit
- Maximum 10 units powered via terminal screw and backplane connector
- Use split-rail configuration when more units are required

Voltage and Current Measurement Accuracy

- Zero cross and burst firing (all models): $\pm 2\%$ of range
- Phase angle firing (12A and 48A models): $\pm 2\%$ of range
- Phase angle firing (24A models):
 - $\pm 2\%$ of range (output power $\geq 15\%$ of nominal)
 - $\pm 2.5\%$ of range ($7.5\% \leq$ output power $< 15\%$ of nominal)
 - $\pm 6\%$ of range (output power $< 7.5\%$ of nominal)

Control Modes

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

Output Control Firing Types

- Fixed time-base zero crossing
- Variable time-base zero crossing (burst firing)
- Phase angle

Digital Inputs and Outputs

- Independently user-configurable as input or output
- Update rate: 10Hz
- Input type: User-selectable, dc voltage or dry contact
- Input logic: On ≥ 4 VDC, off ≤ 1 VDC, 30VDC max
- Output type: User-selectable, switched dc or open collector
- Output voltage: 24V (based on the supply voltage)
- Switched DC: Source or sink up to 250 mA per output
- Open collector: Sink up to 250 mA per output, 30 VDC max.

Analog Input

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

Analog Output

- 0 to 20mADC $\pm 120\mu$ A or 4 to 20mADC into 500 Ω max. load with 30 μ A nominal resolution
- 0 to 10VDC ± 60 mV 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

Connectivity

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

Diagnostics

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

Operator Interface

- 4 discrete LED indicators for status monitoring

COMPOSER[®] PC Configuration Software

- Connects via USB port
- Easy-to-use test drive screen
- Function block diagram programming

Cooling Options

- DIN-rail heat sink for convection cooling
- Base plate for use with customer supplied heat sink

Control Terminals

- Terminal blocks are touch safe, removable, 22 to 12 AWG, 5 in.-lb. (0.6 Nm) torque, 1/8 in. (3.5 mm) flat blade screw driver

Line and Load Terminals

- Compatible with crimp lug terminals or bare wire, 12 to 6 AWG, 24 in.-lb. (2.7 Nm) torque, 1/8 in. hex driver

Ground Terminal

- Recommended 14 to 10 AWG with UL[®] Listed (ZMVV) #8 ring or spade crimp lug, 15 to 17 in.-lb (1.7 to 1.9 Nm) torque, 1/4 in. (6.5 mm) flat blade screw driver

Mounting

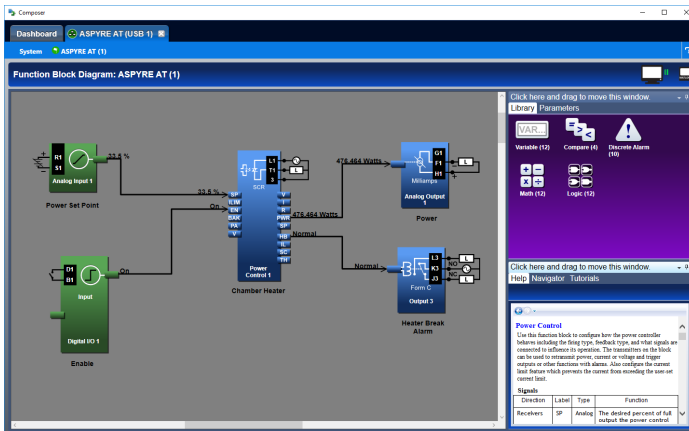
- Panel mounting with screws or DIN rail
- No. 8 (M4) fastener
- DIN rail: 35mm x 7.5mm

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 Listed
- 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



Use the Function Block Diagram to customize the system for your application

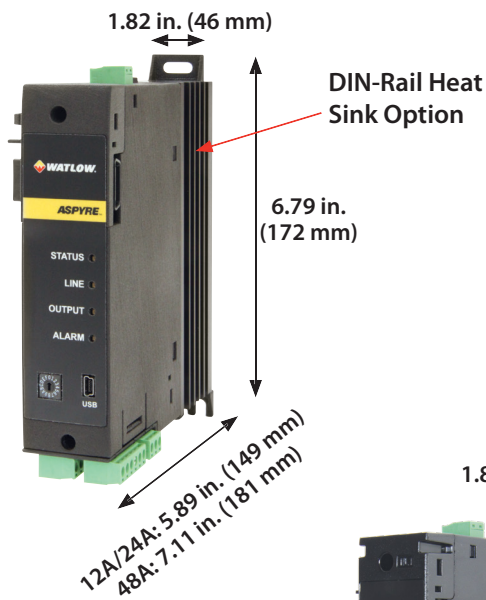
The Test view displays the following configuration parameters:

- Set These First:** Nominal Voltage (120.0 Volts), Nominal Current (12.0 Amps), Output Scaling (100.0 %), Firing Type (Phase Angle), Cycle Time (1.50 Seconds), Number of Burst Fire Cycles (4), Soft Start Time (0.00 Seconds), Feedback Type (Power Feedback).
- Power Set Point:** 50.0 %
- Set Point in Feedback Units:** 720.0 Watts
- Set Point Source:** Communication
- Load Resistance:** 10.212
- RMS Output Voltage:** 85.759 Volts
- RMS Output Current:** 8.396 Amps
- Current Limit Set Point:** 24.0 Amps
- Average Output Power:** 720.226 Watts
- Alarms and Statuses:** Unit Enable Status (On), Bakeout Status (Off), Current Limit Status (Off), Open Load Circuit Status (Normal), SCR Short Circuit Status (Normal), Heat Sink Over-Temperature Alarm (Off), Line Voltage Alarm (Line Voltage Normal), 24V Power Supply Alarm (Off), Safe State Reason (None).

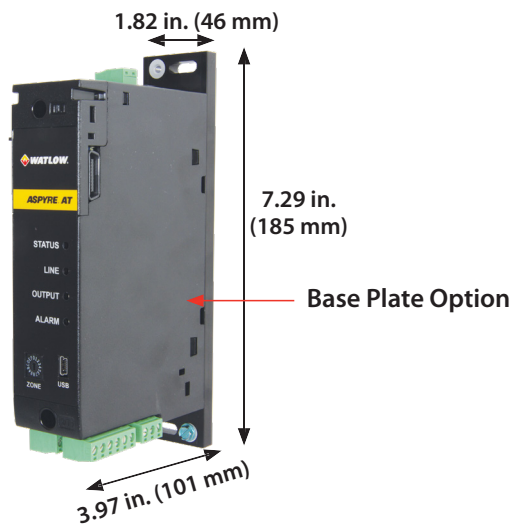
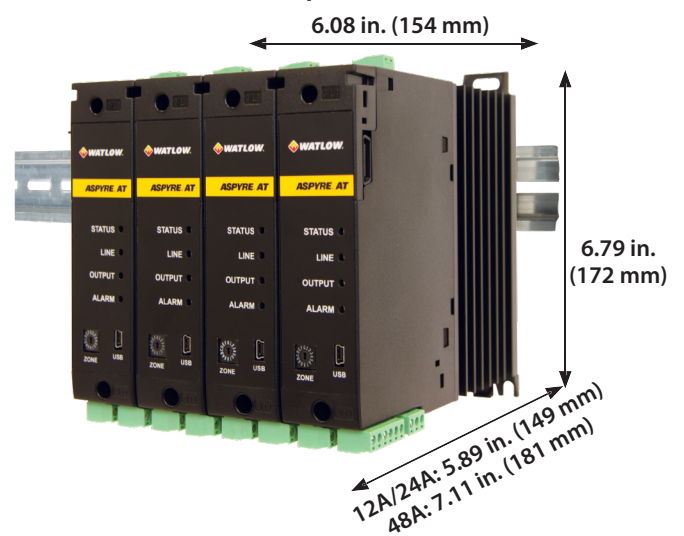
Use the Test view to set up the power controller and run it through its paces

Dimensions

One Zone



Four Zones - Example

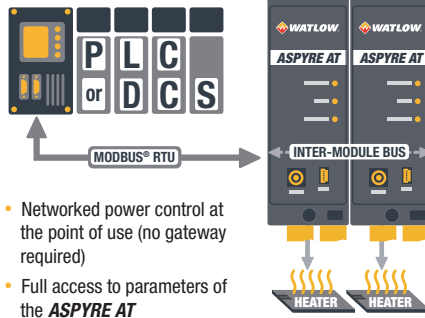


I/O Functional Block Diagram

Compatible with any way you want to integrate into your system

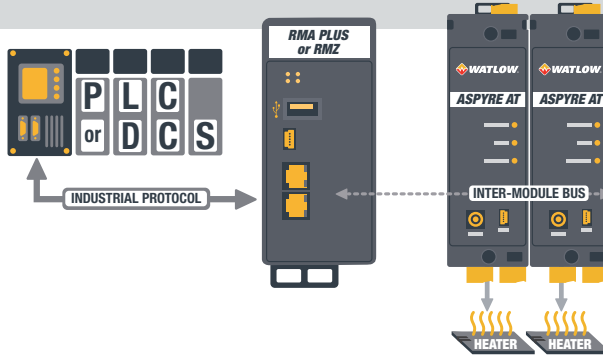
- Simplify wiring and reduce cost with all-communication interface between temperature control and power control
- More data-rich solution: measure load voltage, current, heater resistance and more
- From PLC or DCS via EtherCAT®, EtherNet/IP, Modbus RTU or Modbus TCP
- Can be configured for compatibility with legacy analog interface design

Cost Effective Multi-Zone Controllers



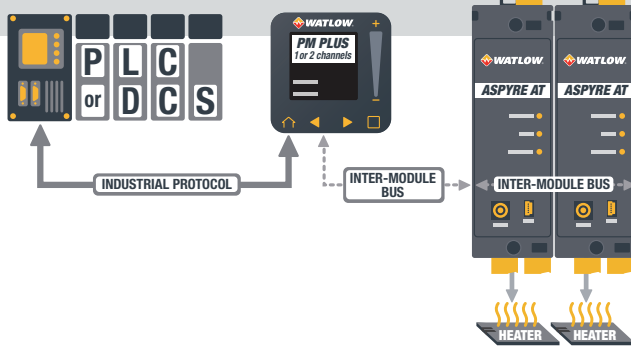
- Networked power control at the point of use (no gateway required)
- Full access to parameters of the **ASPYRE AT**

Flexible Solutions with Fieldbus



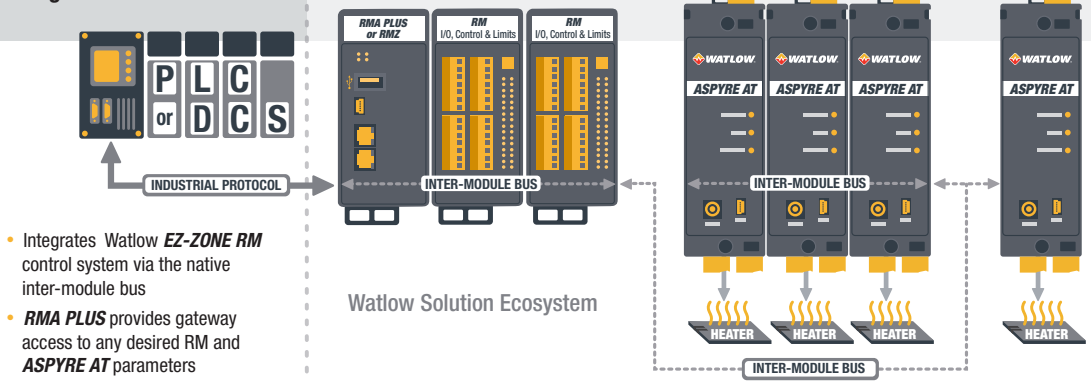
- Build cost-effective multizone solutions
- Full access to parameters of the **ASPYRE AT**
- Up to 16 zones

Integration with PM PLUS



- Networked power control at the point of use
- **PM PLUS** provides access to operation parameters
- Configuration performed via USB connection on **ASPYRE AT**

Integration with EZ-ZONE RM



- Integrates Watlow **EZ-ZONE RM** control system via the native inter-module bus
- **RMA PLUS** provides gateway access to any desired RM and **ASPYRE AT** parameters

Watlow Solution Ecosystem

Ordering Information

Instructions: Choose one option for each feature.

✓	Switched Legs
	Single-phase

✓	Maximum Load Current
	12A
	24A
	48A

✓	Cooling
	Base plate (customer supplied heat sink)
	Up to 24A convection cooled, DIN-rail mounted heat sink
	Up to 48A convection cooled, DIN-rail mounted heat sink

✓	Control and Measurement
	Standard precision closed-loop power control with current limit

✓	Serial Communications
	High-speed inter-module bus via backplane and screw terminal connection
	Modbus® RTU via screw terminal connection, high-speed inter-module bus via backplane only

✓	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

✓	Firmware
	Standard (current revision)
	Locked revisions

✓	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

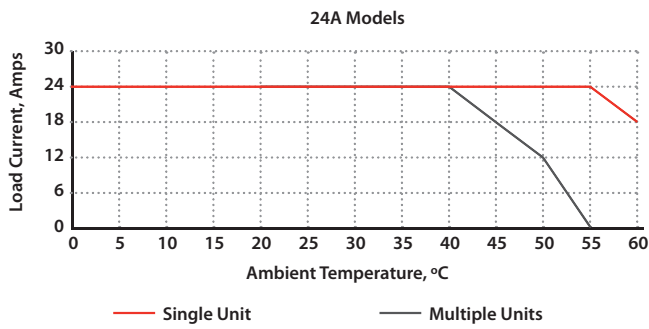
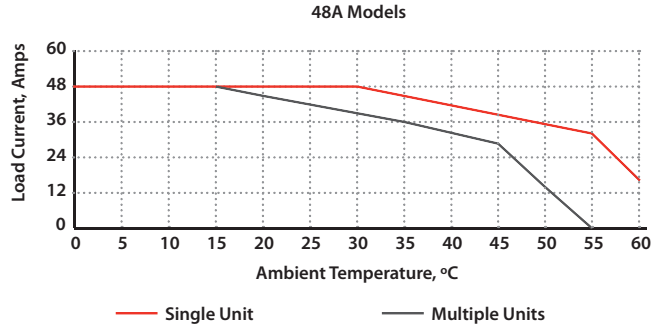
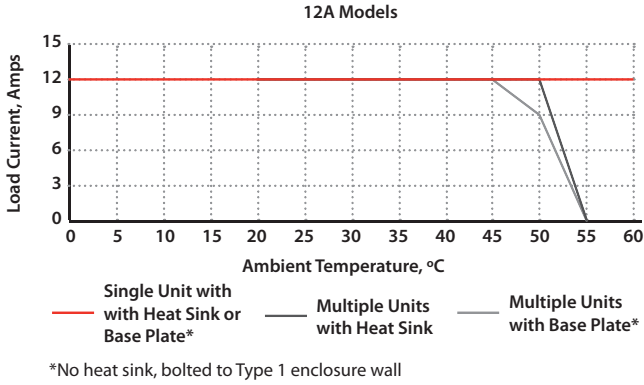
- Watlow power supply (p/n 0847-0299-0000) UL® Class 2, 90-263VAC input, 24VDC output, 1.30A, 31W

Combination Branch Circuit Protection and Semiconductor Fuses and Fuse Holders

- 15A Fuse: 1471-8116, Fuse Holder: 0808-0326-1530
- 30A Fuse: 0808-0325-0030, Fuse Holder: 0808-0326-1530
- 60A Fuse: 0808-0325-0060, Fuse Holder: 0808-0326-3560

For other fuse options search for "SCCR" on www.watlow.com

Ambient Temperature Derating



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