



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

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

- $\pm 2\%$ of range

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 switched DC output
- Update rate: 10Hz
- Input type: User-selectable, dc voltage or dry contact
- Input logic: On \geq 4VDC, off \leq 1VDC, 30VDC max
- Output voltage: 24V (based on the supply voltage)
- Output: 100mADC max. per channel

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

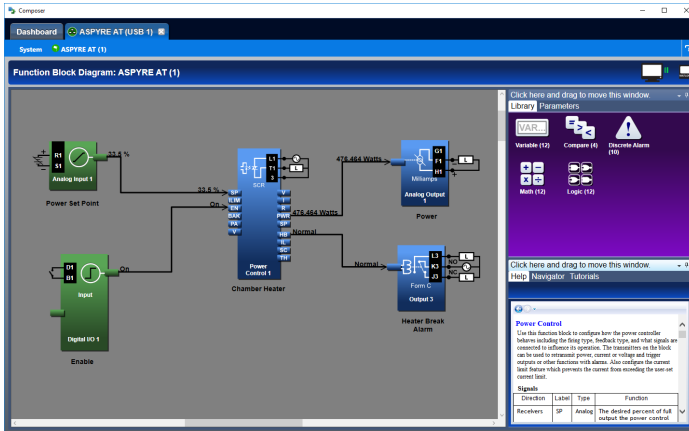
- Panel mounting with screws or DIN rail
- No. 8 (M4) fastener
- DIN rail: 35mm x 7.5mm

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

Test: ASPYRE AT (1)

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

Average Output Power: 720.226 Watts

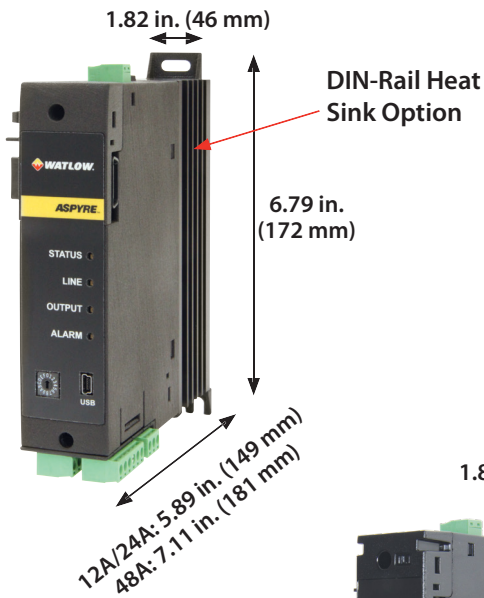
Alarms and Statuses

- 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

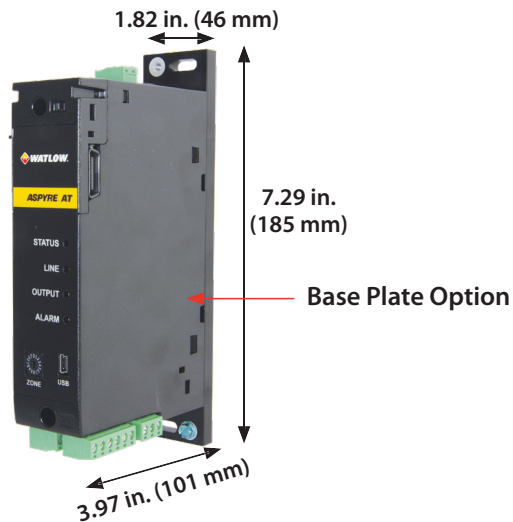
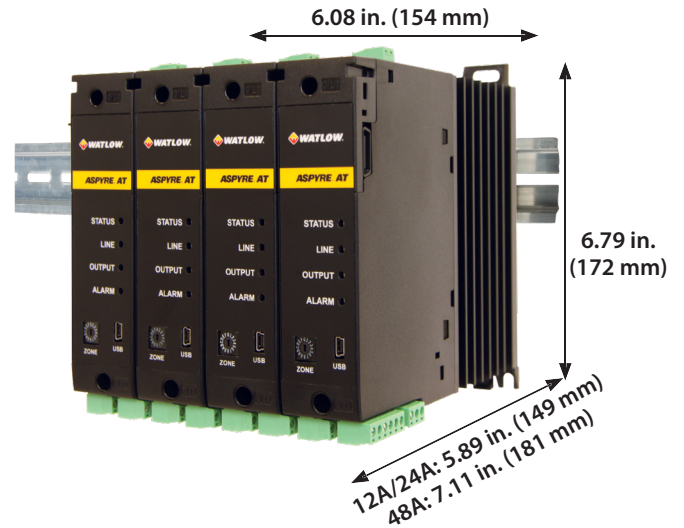
Use the Test view to set up the power controller and run it through its paces

Dimensions

One Zone



Four Zones - Example

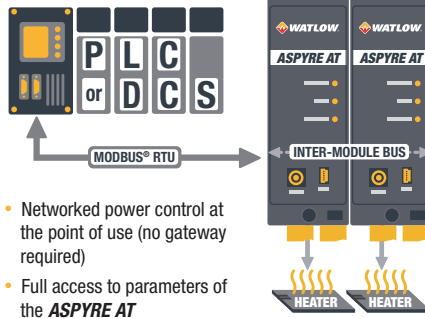


I/O Functional Block Diagram

Compatible with any way you want to integrate into your system

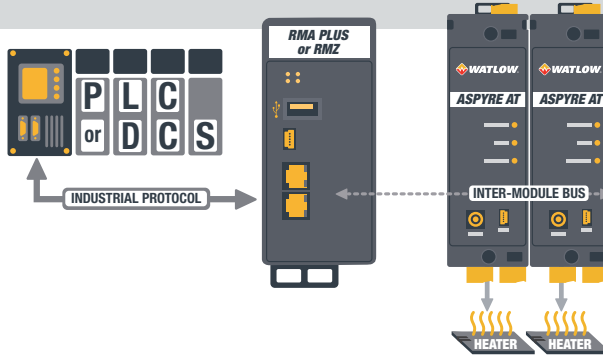
- Simplify wiring and reduce cost with all-communication interface between temperature control and power control
- More data-rich solution: measure load voltage, current, heater resistance and more
- From PLC or DCS via EtherCAT®, EtherNet/IP, Modbus RTU or Modbus TCP
- Can be configured for compatibility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

Cost Effective Multi-Zone Controllers



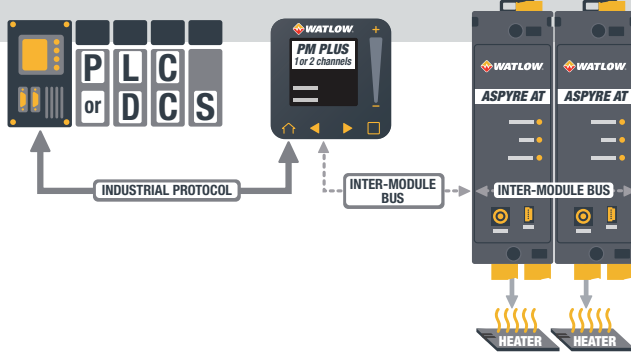
- Networked power control at the point of use (no gateway required)
- Full access to parameters of the **ASPYRE AT**

Flexible Solutions with Fieldbus



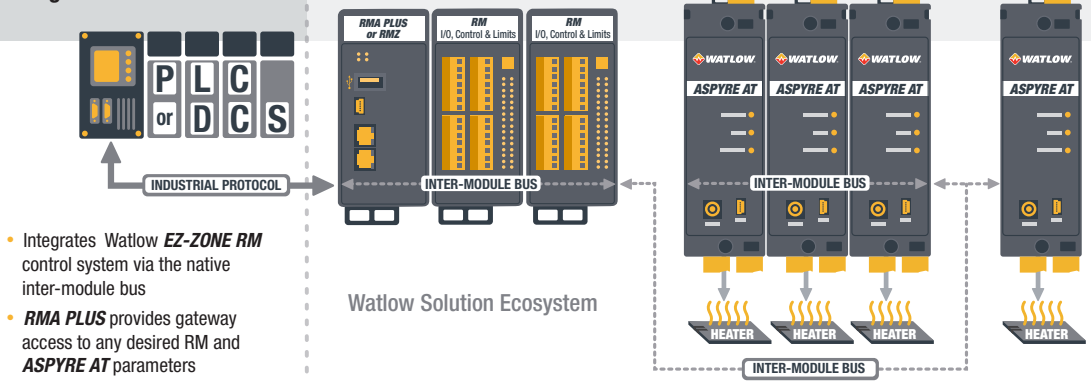
- Build cost-effective multizone solutions
- Full access to parameters of the **ASPYRE AT**
- Up to 16 zones

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

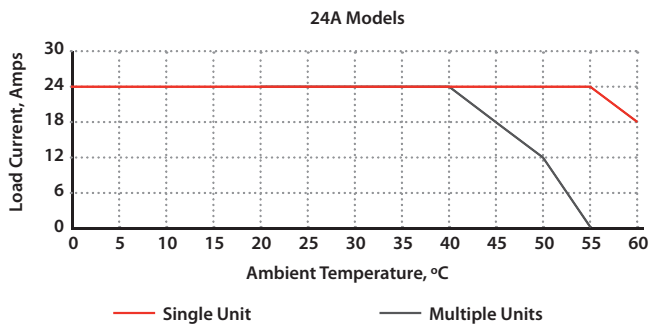
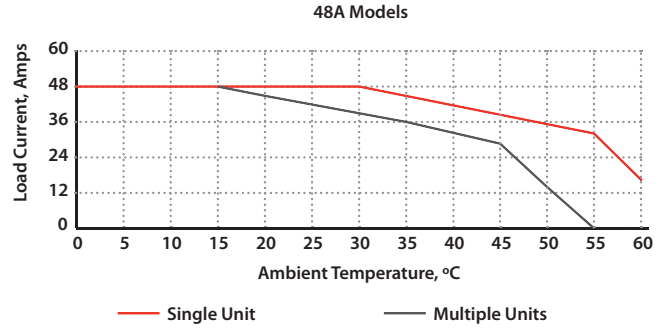
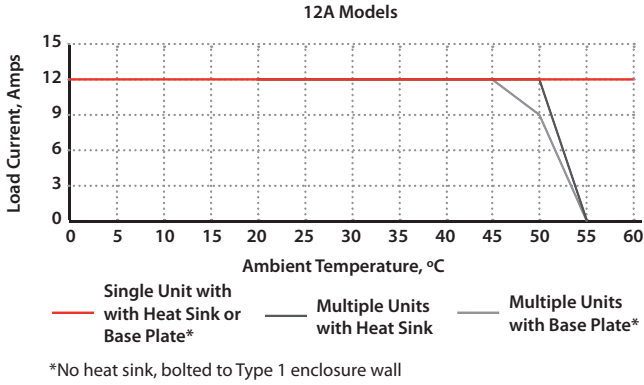
- Watlow power supply (p/n 0847-0299-0000) UL® Class 2, 90-263VAC input, 24VDC output, 1.30A, 31W

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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