

Modular SCR Power Controller for Custom Tailoring to the Application



The QPAC SERIES from Watlow® is a modular Silicon Controlled Rectifier (SCR) power controller with plug-in features for flexibility. Bases are rated from 150 to 1000 amperes in a three-phase, two leg configuration.

A variety of transformers up to 480VAC along with 50/60Hz operation enable the QPAC to operate in applications anywhere. Plug-in control cards set the QPAC's SCR firing modes; solid state contactor, burst firing (zero cross) models are available with a wide variety of options. This power controller includes 200KA short circuit current rating (SCCR) and high speed fuses to minimize damage in the event of a short circuit.

Typical Applications

- Furnace and ovens
- Petrochemical
- Heat treating
- Duct heating
- Environmental chambers
- Kilns

Features and Benefits

200KA short circuit current rating (SCCR)

- Minimizes damage in the event of a short circuit

Modular power controller

- Unit base can be fitted with a variety of plug-in transformers and control cards

Available in 150 to 1000 ampere ratings

- Handles large or small loads

Available in solid state contactor, burst firing (zero cross)

- Meets most application requirements for resistive heating

Rugged design for 122°F (50°C) ambient operation

- Full rating of the power controller can be used in industrial applications

Semiconductor fuses and snubber protection included

- Protects the SCR from voltage or current surges or spikes

Open heater or shorted SCR detector option

- Diagnostic capabilities

UL® 508 listed and C-UL® up to 1000 amperes

- For applications requiring agency approvals

Specifications

Operation

Modular controller base with plug-in card and transformer

- Plug-in control cards
 - Solid state contactor, dc input
 - Burst fire control, fixed or variable time base
- Plug-in transformers (50/60Hz)
- 208, 240, 380, 415, 480VAC operation

Power bases

- 3-phase (Q32), 2 leg control, 2 pair SCRs
- Resistive load only, burst firing only

Agency Approvals

- UL® 508 and C-UL® listed, 150 to 300A all configurations, File #E73741
- UL® 508 and C-UL® listed, 400 to 1,000A on Q32, up to 480VAC

Control Card Inputs

(CD) Solid state contactor, dc input

- On, 4-32VDC; off, 0.5VDC
- Built-in noise reduction network

(BF) Burst firing control fixed time base

- Process input factory set @ 4-20mA DC
- Input impedance 250Ω (clip resistor for 5kΩ impedance voltage input), or manual control input
- Time base 4 seconds (clip resistor for 1 sec)

(BV) Burst firing control, variable time base

- Process input factory set @ 4-20mA DC
- Input impedance 250Ω (clip resistor for 5kΩ impedance voltage input), or manual control input. Requires an accessory bias and gain card to calibrate for 0-5VDC input

Open Heater/Shorted SCR Detector

- Zero cross/burst fire models only
- Triac output
- 24 to 240VAC, 300mA @ 77°F (25°C), 125mA @ 176°F (80°C)
- Energizes on alarm
- Holding current 200μA min.
- Latching current 5mA typical

Outputs

- 208 through 480VAC
- 150 to 1000A per leg
- SCCR, 200KA with original equipment specified semiconductor fusing

Line Voltage / Power

- 50/60Hz ac line frequency, Q32 models are 50/60Hz calibration dependent
- Voltage: ±10%, 208, 240, 277, 380, 415, 480VAC

Line Voltage Compensation

- 10% Δ in line, 2% Δ in load in the 30 to 70% power region (BV models only)

Power Dissipation (Watts)

- 1.5 W/A per controlled leg

Isolation

- Command signal to load 1250VAC min.

Linearity

- 2%, 30 to 70% power region (All units except CD)

Off-State Leakage Current

- 20mA @ 480VAC

SCR Protection

- Semiconductor fuses provided dv/dt 200V/μsec min.
- RC snubber network standard
- (Q32) 3rd leg fuse kit may be used, but not required, with 3-phase, 2 leg models

Mounting

- Heat sink fins must be mounted in vertical orientation

Operating Environment

- 32 to 122°F (0 to 50°C)
- 0 to 90% RH, non-condensing
- 2,000 meters altitude

Storage Temperature

- -40 to 185°F (-40 to 85°C)

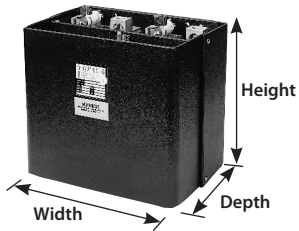
Options

- 240VAC and 120VAC cooling fans

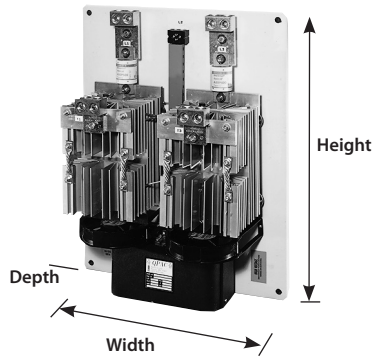
QPAC Weight Chart

| Amps | Phase | |
|----------|---------------|--------|
| | 3Ø, 2-leg/Q32 | |
| | lb | (kg) |
| 150 | 36 | (16.3) |
| 200 | 36 | (16.3) |
| 300 | 36 | (16.3) |
| 400-600 | 85 | (38.5) |
| 800-1000 | 120 | (54.4) |

Case Styles



Style C



Style E

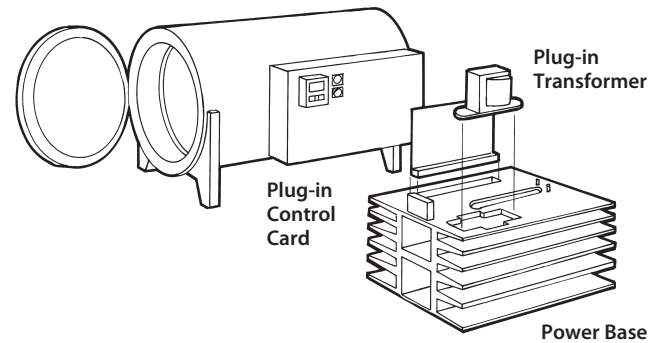
QPAC Dimensions

| Q32 | | | | | |
|-------|---------|------------------------|-----------------------|-----------------------|--|
| Style | Amps | Height (H) in. (mm) | Width (W) in. (mm) | Depth (D) in. (mm) | |
| C | 150 | 13 (330) | 13.7 (350) | 10.25 (260) | |
| C | 200 | 13 (330) | 13.7 (350) | 10.25 (260) | |
| C | 300 | 13 (330) | 13.7 (350) | 10.25 (260) | |
| E | 400-600 | 27 (685) | 21 (535) | 11.7 (300) | |
| E | 800-1K | 33 (840) | 21 (535) | 13.3 (340) | |

Applications Sketch

In heat treating applications, the QPAC offers modular flexibility. Different heater elements require different control firing modes: nichrome elements use burst (zero cross) firing, fixed or variable time base.

Shipping the furnace to different countries could require different voltage sources (and thus transformers): i.e., U.S. 240 or 480 volt, Australia 415 volt; Europe 380 or 400 volt. By simply changing plug-in transformers, the OEM can ship anywhere in the world.



Ordering Information

QPAC - Modular power controller; zero cross only, fuse(s) and holder(s) included.

Part Number

| | | | | | | |
|---|-------------|----------------------------|---------------------|-----------------------|--------------------|----------------------------------|
| ① | ② ③ | ④ ⑤ | ⑥ | ⑦ ⑧ ⑨ | ⑩ ⑪ | ⑫ |
| Q | Phase 32 | Operating & Output Voltage | Cooling Fan Voltage | Output Current (Amps) | Input Control Card | Open Heater/Shorted SCR Detector |

| ② ③ Phase |
|---|
| 32 = 3-phase, 2-leg (Optional 3rd leg fuse kit extra) |

| ④ ⑤ Operating and Output Voltage |
|----------------------------------|
| 20 = 208VAC |
| 24 = 240VAC |
| 27 = 277VAC |
| 38 = 380VAC |
| 41 = 415VAC |
| 48 = 480VAC |

| ⑥ Cooling Fan Voltage |
|--|
| 1 = 120VAC; required on all 3-phase models |
| 2 = 240VAC; required on all 3-phase models |

Notes:

- Customer to supply wiring and hook-up.
- All cooling fans rated at 20 W each, must be wired by customer.

| ⑦ ⑧ ⑨ Output Current (Amps) |
|-----------------------------|
| 150 = 150A |
| 200 = 200A |
| 300 = 300A |
| 400 = 400A |
| 500 = 500A |
| 600 = 600A |
| 800 = 800A |
| 01k = 1000A |

| ⑩ ⑪ Input Control Card |
|--|
| CD = Zero cross dc input (08-5286) contactor 4-32VDC |
| BF = Zero cross, fixed time base (08-5289) 4-20mA dc |
| BV = Zero cross, variable time base (RPC-5342) 4-20mA dc |

| ⑫ Open Heater/Shorted SCR Detector |
|------------------------------------|
| 0 = None |
| 2 = 3-phase operation |

Notes:

- The open heater/shorted SCR detector is for burst fire operation only.
- Includes two current transformers for 3-phase and one interstate transformer.

Accessories

| | | | | |
|--------|---|------|------------------------|----------------|
| 150A | : | 5A | Current Transformer | 16-0008 |
| 200A | : | 5A | Current Transformer | 16-0045 |
| 300A | : | 5A | Current Transformer | 16-0073 |
| 400A | : | 5A | Current Transformer | 0004-0286-0400 |
| 500A | : | 5A | Current Transformer | 0004-0286-0500 |
| 600A | : | 5A | Current Transformer | 0004-0286-0600 |
| 800A | : | 5A | Current Transformer | 0004-0286-0800 |
| 1,000A | : | 5A | Current Transformer | 0004-0288-1000 |
| 5A | : | 20mA | Interstage Transformer | 16-0176 |

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