

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 one-phase, three-phase, two leg and three-phase, three leg.

A variety of transformers from 120 to 575VAC 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) or phase-angle 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) or phase-angle fired mode

- Meets most application requirements

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



ISO 9001



WIN-QPAC-0613

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
 - Phase-angle fire control
 - Phase-angle control with soft start and current limiting
- Plug-in transformers (50/60Hz)
- 120, 208, 240, 380, 415, 480, 575VAC operation

Power bases

- 1-phase (Q01), 1 pair of SCRs
- 3-phase (Q32), 2 leg control, 2 pair SCRs
 - Resistive load only, burst firing only
- 3-phase (Q33), 3 pair hybrid SCRs/diodes
 - Recommended for phase-angle only with balanced load

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 Q01 and 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

(AF) Phase-angle control

- Process input factory set @ 4-20mA DC
- Input impedance 250Ω (clip resistor for 5kΩ impedance voltage input), or manual control input
- Soft start approximately 6 seconds upon power-up, 1 second upon set point change

(AL) Phase-angle control with current limit

- Process input factory set @ 4-20mA DC
- Input impedance 250Ω (clip resistor for 5kΩ impedance voltage input), or manual control input
- Soft start approximately 10 seconds upon power-up, 1 to 2 seconds upon set point change
- Current transformer included

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

- 120 through 575VAC
- 1, 2 or 3 pole
- 150 to 1000A per pole
- SCCR, 200KA with original equipment specified semiconductor fusing

Line Voltage / Power

- 50/60Hz ac line frequency, Q32 and Q33 models are 50/60Hz calibration dependent
- Voltage: ±10%, 120, 208, 240, 277, 380, 415, 480, 575VAC

Line Voltage Compensation

- 10% Δ in line, 2% Δ in load in the 30 to 70% power region (AF, AL and BV)

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.
- MOV^① and 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

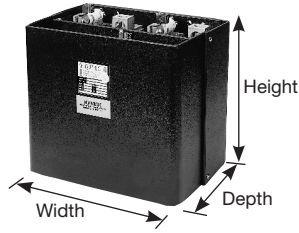
- Manual Control Kit for process input cards (1kΩ potentiometer) #08-5362
- 240VAC and 120VAC cooling fans

^① MOV comes only on Q33 (3-phase, 3 leg).

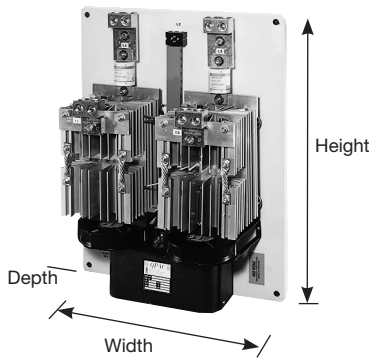
QPAC Weight Chart

Amps	Phase			
	1Ø/Q01 lb (kg)	3Ø, 2-leg/Q32 lb (kg)	3Ø, 3-wire/Q33 lb (kg)	
150	15 (6.8)	36 (16.3)	50 (22.7)	
200	15 (6.8)	36 (16.3)	50 (22.7)	
300	15 (6.8)	36 (16.3)	50 (22.7)	
400-600	44 (20.0)	85 (38.5)	100 (45.4)	
800-1000	49 (22.2)	120 (54.4)	135 (61.2)	

Case Styles



Style C



Style E

QPAC Dimensions

Q01				
Style	Amps	Height (H) in. (mm)	Width (W) in. (mm)	Depth (D) in. (mm)
C	150	13 (330)	6.9 (175)	10.25 (260)
C	200	13 (330)	6.9 (175)	10.25 (260)
C	300	13 (330)	6.9 (175)	10.25 (260)
E	400-600	27 (685)	17 (430)	11.7 (300)
E	800-1K	27 (685)	17 (430)	13.3 (340)

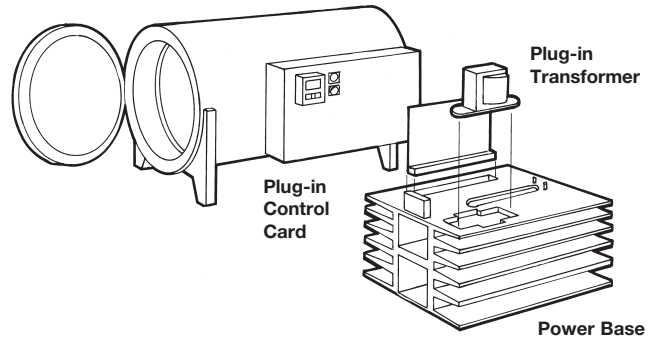
Q32				
Style	Amps	Height (H) in. (mm)	Width (W) in. (mm)	Depth (D) in. (mm)
C	150	13 (330)	13.7 (350)	10.25 (260)
C	200	13 (330)	13.7 (350)	10.25 (260)
C	300	13 (330)	13.7 (350)	10.25 (260)
E	400-600	27 (685)	21 (535)	11.7 (300)
E	800-1K	33 (840)	21 (535)	13.3 (340)

Q33				
Style	Amps	Height (H) in. (mm)	Width (W) in. (mm)	Depth (D) in. (mm)
C	150	13 (330)	20.7 (525)	10.25 (260)
C	200	13 (330)	20.7 (525)	10.25 (260)
C	300	13 (330)	20.7 (525)	10.25 (260)
E	400-600	33 (840)	27 (685)	11.7 (300)
E	800-1K	33 (840)	27 (685)	13.3 (340)

Applications Sketch

In heat treating applications, the QPAC offers modular flexibility. Different heater elements require different control firing modes: i.e., tungsten elements need phase-angle firing, while Nichrome® elements use burst (zero cross) firing.

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; phase, burst or solid state contactor, fuse(s) and holder(s) included.

Part Number

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

② ③ Phase	
01=	1-phase
32=	3-phase, 2-leg (Optional 3rd leg fuse kit extra)
33=	3-phase, 3-leg

④ ⑤ Operating and Output Voltage	
12=	120VAC
20=	208VAC
24=	240VAC
27=	277VAC
38=	380VAC
41=	415VAC
48=	480VAC
57=	575VAC

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 Control (Amps)	
150 =	150A
200 =	200A
300 =	300A
400 =	400A
500 =	500A
600 =	600A
800 =	800A
01k =	1000A

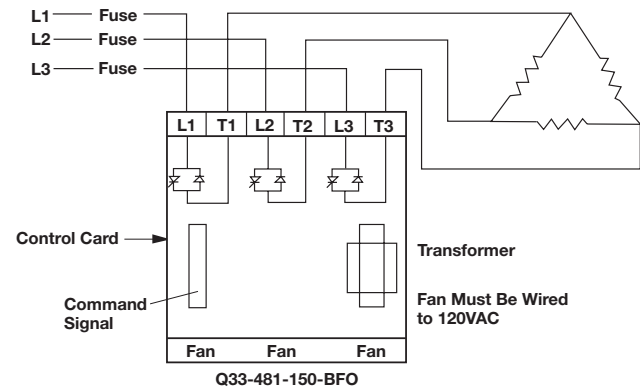
⑩ ⑪ Input Control Card	
CD =	Solid state dc input (08-5286) contactor 4-32VDC
BF =	Burst fired, fixed time base (08-5289) 4-20mA dc
BV =	Burst fired, variable time base (08-5342) 4-20mA dc
AF =	Phase-angle fired, not available on Q32 (08-5288) 4-20mA dc
AL =	Phase-angle fired w/current limit (08-5411) 4-20mA, not available on Q32. AL option includes one current transformer. Add second CT for 3-phase, 3-leg

⑫ Open Heater/Shorted SCR Detector	
0 =	None
1 =	1-phase operation
2 =	3-phase operation

Notes:

- The open heater/shorted SCR detector is for burst fire operation only.
- Includes one current transformer for 1-phase and two current transformers for 3-phase.

Wiring Example



Accessories

Manual Control Kit		08-5362
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

Watlow® and DIN-A-MITE® are registered trademarks of Watlow Electric Manufacturing Company.

UL® and C-UL® are registered trademarks of the Underwriter's Laboratories, Inc.

Nichrome® is a registered trademark of Driver-Harris Company.

To be automatically connected to the nearest North American Technical Sales Office:

1-800-WATLOW2 • www.watlow.com • inquiry@watlow.com

International Technical Sales Offices: Australia, +61 3 9335 6449 • China, +86 21 3532 8532 • France, +33 1 41 32 79 70
 Germany, +49 (0) 72 53 / 94 00-0 • India, +91 40 6661 2700 • Italy, +39 024588841 • Japan, +81 3 3518 6630 • Korea, +82 2 2628 5770
 Malaysia, +60 3 8076 8745 • Mexico, +52 442 217 6235 • Singapore, +65 6773 9488 • Spain, +34 91 675 12 92
 Taiwan, +886 7 288 5168 • United Kingdom, +44 (0) 115 964 0777

Buy: www.ValinOnline.com | Phone: 844-385-3099 | Email: CustomerService@valin.com