GEFRAN
BEYOND TECHNOLOGY

Solid State Relays

Solid State Relays GQ and GRSH Series

GQ-25-24-D-1-3

GRSH-25-60-A-5-0

GRSH-120-60-A-5-61

Overview

A solid state relay is a relay with an isolated input and output, whose functions are achieved by using electronic components without the use of moving parts (vs. electromechanical relays).

Operation

Solid state relays (SSR) are similar to electromechanical relays, in that both use a control circuit and a separate circuit for switching the load. When voltage is applied to the input of the SSR, the relay is energized by a light-emitting diode. The light from the diode is beamed into a light sensitive semiconductor which, in the case of zero voltage crossover relays, signals the control circuit to turn on the output of the solid state switch at the next zero voltage crossover.

Features GQ Series

- Alternating current solid state relay
- Zero crossing switching
- In 15, 25, 50, 75, and 90 Arms contact ratings
- Nominal voltage up to 600VAC
- SCCR 100kA
- Isolation (input-output) 4000 Vrms
- Green LED drive active signal
- Thermal pad included
- IP20 finger-safe protection rating

Main Applications

- Packaging machinery
- Thermoforming
- Plastic extrusion lines
- Industrial ovens and furnaces
- Control application with high switching speed

Features GRSH Series

- In 15A to 120A contact ratings
- DIN rail and panel mounting
- Zero crossing switching
- Input command from DC/AC logic signal with push-in connectors; signaling LEDs
- Cage clamps for power cables
- Load voltage 480VAC, 600VAC
- SCCR 100kA
- Thermal alarm option with led and alarm output
- Interrupted load option with led and alarm output
- Internal overvoltage protection
- P20 finger-safe protection rating

Main Applications

- Extrusion, injection, blow molding, thermoforming of plastics
- Vulcanization of rubber
- Synthetic fiber production and polymerization
- Packing and packaging
- Dryers for ceramics and building elements
- Industrial electric ovens
- Food processing plants
- Chemical and pharmaceutical industry

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Solid State Relays GQ Series 15-90A Models

Solid State Relays Selection Table GQ Series 15-90A Models							
Part Number	*Price*	*Contact Rating*	*Load Voltage*	*Input Voltage*	*Connector*	*Weight (lb)*	*Drawing Link*
GQ-15-24-D-1-3	$21.75	15A	24-230 VAC	3-32 VDC	Screw terminal(s)	0.17	PDF
GQ-15-24-A-1-3	$30.00	15A	24-230 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-15-24-D-1-4	$21.75	15A	24-230 VAC	3-32 VDC	Push-in spring		PDF
GQ-15-24-A-1-4	$30.00	15A	24-230 VAC	20-260 VAC	Push-in spring		PDF
GQ-15-60-D-1-3	$23.00	15A	48-600 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-15-60-A-1-3	$31.00	15A	48-600 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-15-60-D-1-4	$23.00	15A	48-600 VAC	3-32 VDC	Push-in spring		PDF
GQ-15-60-A-1-4	$31.00	15A	48-600 VAC	20-260 VAC	Push-in spring		PDF
GQ-25-24-D-1-3	$22.50	25A	24-230 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-25-24-A-1-3	$32.00	25A	24-230 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-25-24-D-1-4	$22.50	25A	24-230 VAC	3-32 VDC	Push-in spring		PDF
GQ-25-24-A-1-4	$32.00	25A	24-230 VAC	20-260 VAC	Push-in spring		PDF
GQ-25-60-D-1-3	$25.00	25A	48-600 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-25-60-A-1-3	$33.00	25A	48-600 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-25-60-D-1-4	$25.00	25A	48-600 VAC	3-32 VDC	Push-in spring		PDF
GQ-25-60-A-1-4	$33.00	25A	48-600 VAC	20-260 VAC	Push-in spring		PDF
GQ-50-24-D-1-3	$32.00	50A	24-230 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-50-24-A-1-3	$38.00	50A	24-230 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-50-24-D-1-4	$32.00	50A	24-230 VAC	3-32 VDC	Push-in spring		PDF
GQ-50-24-A-1-4	$38.00	50A	24-230 VAC	20-260 VAC	Push-in spring		PDF
GQ-50-60-D-1-3	$35.00	50A	48-600 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-50-60-A-1-3	$39.00	50A	48-600 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-50-60-D-1-4	$35.00	50A	48-600 VAC	3-32 VDC	Push-in spring		PDF
GQ-50-60-A-1-4	$39.00	50A	48-600 VAC	20-260 VAC	Push-in spring		PDF
GQ-75-24-D-1-3	$45.00	75A	24-230 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-75-24-A-1-3	$50.00	75A	24-230 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-75-24-D-1-4	$45.00	75A	24-230 VAC	3-32 VDC	Push-in spring		PDF
GQ-75-24-A-1-4	$50.00	75A	24-230 VAC	20-260 VAC	Push-in spring		PDF
GQ-75-60-D-1-3	$47.00	75A	48-600 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-75-60-A-1-3	$51.00	75A	48-600 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-75-60-D-1-4	$47.00	75A	48-600 VAC	3-32 VDC	Push-in spring		PDF
GQ-75-60-A-1-4	$51.00	75A	48-600 VAC	20-260 VAC	Push-in spring		PDF
GQ-90-24-D-1-3	$51.00	90A	24-230 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-90-24-A-1-3	$55.00	90A	24-230 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-90-24-D-1-4	$51.00	90A	24-230 VAC	3-32 VDC	Push-in spring		PDF
GQ-90-24-A-1-4	$55.00	90A	24-230 VAC	20-260 VAC	Push-in spring		PDF
GQ-90-60-D-1-3	$53.00	90A	48-600 VAC	3-32 VDC	Screw terminal(s)		PDF
GQ-90-60-A-1-3	$56.00	90A	48-600 VAC	20-260 VAC	Screw terminal(s)		PDF
GQ-90-60-D-1-4	$53.00	90A	48-600 VAC	3-32 VDC	Push-in spring		PDF
GQ-90-60-A-1-4	$56.00	90A	48-600 VAC	20-260 VAC	Push-in spring		PDF

Note: Thermal mounting pad included.

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Solid State Relays GQ Series 15-90A Models

Solid State Relays Specifications GQ Series 15-90A Models					
Part Number Series	***GQ-15***	***GQ-25***	***GQ-50***	***GQ-75***	***GQ-90***
Control Voltage Range	GQ-xx-xx-D-x-x models: 3–32 VDC GQ-xx-xx-A-x-x models: 20–260 VAC				
Turn-On Voltage	GQ-xx-xx-D-x-x models: ≥ 2.7 VCC GQ-xx-xx-A-x-x models: ≥ 15VAC				
Turn-Off Voltage	GQ-xx-xx-D-x-x models: ≤ 1VAC GQ-xx-xx-A-x-x models: ≤ 6VAC				
Consumption	GQ-xx-xx-D-x-x models: ≤ 8mA @ 260VAC GQ-xx-xx-A-x-x models: ≤ 13mA @ 32V				
Nominal Current (IEC 60947-4-3)	15 Arms	25 Arms	50 Arms	75 Arms	90 Arms
Nominal Current (IEC 60947-4-2)	3 Arms	5 Arms	15 Arms	18 Arms	20 Arms
Min. Load Current	0.1 Arms	0.3 Arms		0.5 Arms	
Repetitive Overcurrent	t = 1s: ≤ 35 Arms	t = 1s: ≤ 60 Arms	t = 1s: ≤ 125 Arms	t = 1s: ≤ 150 Arms	
Non-Repetitive Overcurrent	t = 20ms: 200 Ap	t = 20ms: 300 Ap	t = 20ms: 600 Ap	t = 20ms: 1,600 Ap	
Current Drop at Nominal Voltage	≤ 8m Arms			≤10m Arms	
I^2t for Fusing	t = 1-10ms: ≤ 200A^2s	t = 1-10ms: ≤ 450A^2s	t = 1-10ms: ≤ 1,800A^2s	t = 1-10ms: ≤ 12,800A^2s	
Critical dI/dt	≥ 100A/µs				
Voltage Drop at Nominal Current	≤1.45 Vrms		≤1.35 Vrms	≤1.3 Vrms	
Critical dV/dt Off-State	≥ 1000 V/µs				
Dielectric Strength (Input-to-Output Isolation)	4000 Vrms				
Relay Configuration	SPST				
Output Type	(1) N.O. SCR				
Switching Type	Zero Cross				
Heatsink/Thermal Resistance *	R_{th} ≤ 2.8 kW	R_{th} ≤ 0.83 kW		R_{th} ≤ 0.56 kW	
Operating Temperature Range	-25 to 80°C [-13 to 176°F]				
Storage Temperature Range	-55 to 100°C [-67 to 212°F]				
Max. Relative Humidity	90% at 40°C				
Protection Level	IP20				
Pollution Level	2				
Frequency	45–65 Hz				
Input Indication	Green LED				
Tightening Torque Command Terminals	0.5 – 0.6 N·m 7 [4.4 – 5.3 lb·in]				
Tightening Torque Power Terminals	2 – 2.4 N·m [18 – 21.3 lb·in]				
Mount Type	Panel mount				
Agency Approvals **	CE, cURus File E243386				

***R_{th} = (90°C - T. amb. max) (max air temperature inside the electrical cabinet) / Pd (dissipated power)**
****To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.**

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Power Terminals		
Wiring Type	***Rigid / Flexible / Ferrule Conductor***	***Fork Or Eyelet Cable***
Nominal Current of the Load	15-25-50-75-90	
Contact Area (WxD) Screw Type	13 x 11mm M5	
Stripping Length	11mm	–
Minimum Allowed Section 1 Conductor / 2 Conductors	1 x 1.5 mm^2 / 2 x 1.5 mm^2 1 x 15 AWG / 2 x 15 AWG	1 x 1.5 mm^2 1 x 15 AWG
Maximum Allowed Section 1 Conductor / 2 Conductors	1 x 6mm^2 / 2 x 6mm^2 1 x 10 AWG / 2 x 10 AWG	1 x 25 mm^2 1 x 3 AWG
Tightening Torque	2 – 2.4 N•m [18 – 21.3 lb•in]	

Note: Use 75°C (167°F) copper (CU), multi-stranded conductors.

Control Signal Terminals		
Connector	***Extractable (MORS3)***	***Integrated (MORS4)***
Wire Locking Type	Screw M3	Push-in
Minimum Allowed Section 1 Conductor / 2 Conductors	1 x 0.25 mm^2 / 2 x 0.25 mm^2 1 x 23 AWG / 2 x 23 AWG	1 x 0.5 mm^2 / 2 x 0.5 mm^2 1 x 20 AWG / 2 x 20 AWG
Maximum Allowed Section 1 Conductor / 2 Conductors	1 x 2.5 mm^2 / 2 x 1mm^2 1 x 13 AWG / 2 x 17 AWG	1 x 1.5 mm^2 / 2 x 0.5 mm^2 1 x 15 AWG / 2 x 20 AWG
Stripping Length / Cable Lug	7mm	6mm

Note: Use 75°C (167°F) copper (CU), multi-stranded conductors.

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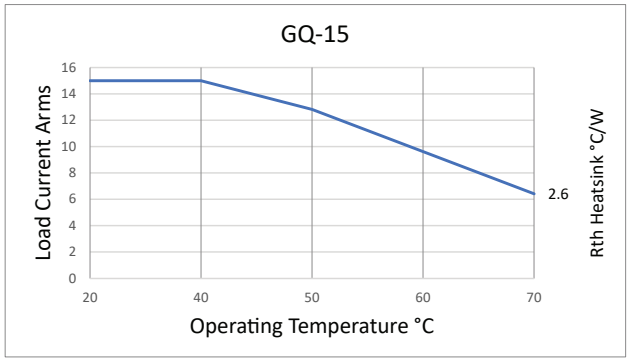
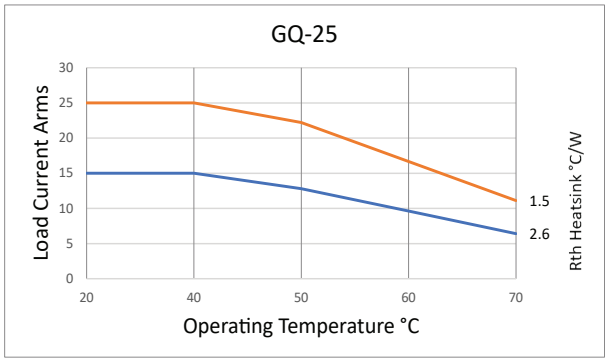
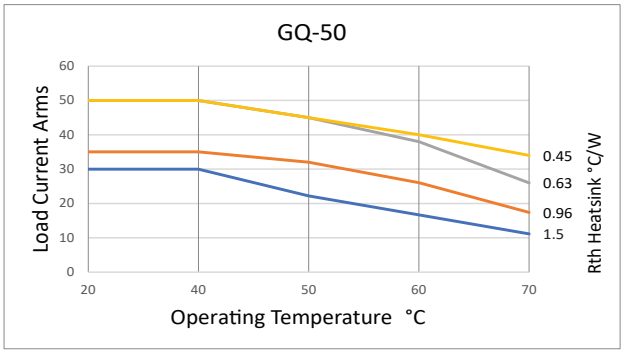
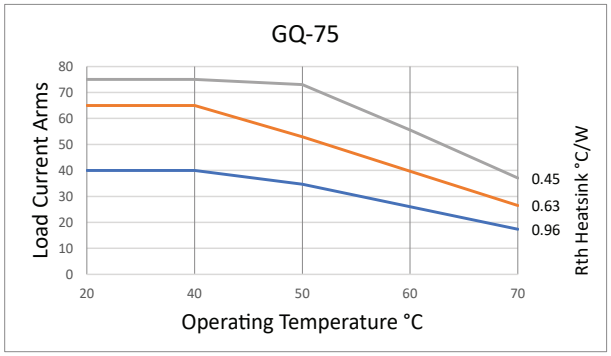
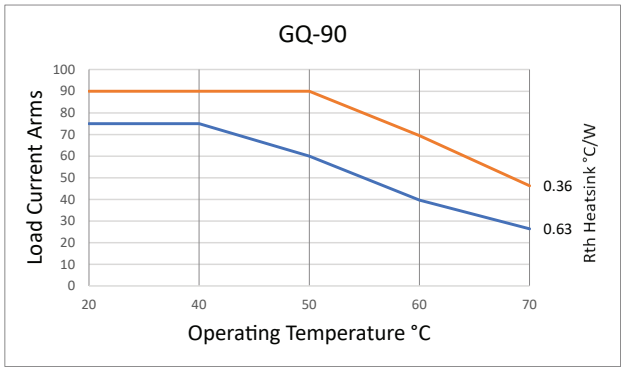
Solid State Relays GQ Series Derating Curves











Solid State Relays

Solid State Relays Accessories GQ Series

Terminal Block Replacement

Part Number	Price	Description	Weight (lb)	Drawing Link
MORS3	$5.00	Gefran terminal block, replacement. For use with all Gefran GQ-xx-xx-x-x-3 solid state relays.	0.01	N/A


MORS3

Thermal Mounting Pad Replacement

Part Number	Price	Description	Weight (lb)	Drawing Link
10-PAD-GQ	$36.00	Gefran thermal mounting pad, replacement. Package of 10. For use with all Gefran GQ series solid state relays.	0.01	N/A

10-PAD-GQ

Heatsink

Part Number	Price	Description	Weight (lb)	Drawing Link
HS-60-10	$21.00	Gefran heatsink, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 25A. Mounting hardware included.	0.45	PDF
HS-52-50	$32.00	Gefran heatsink, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 50A. Mounting hardware included.	0.80	PDF
HS-70-67	$32.00	Gefran heatsink, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 75A. Mounting hardware included.	1.15	PDF
HS-52-50-FAN *	$40.00	Gefran heatsink with fan, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 75A. Mounting hardware included.	0.80	PDF
DIS-90G-KIT	$58.00	Gefran heatsink, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 90A. Mounting hardware included.	2.70	PDF
HS-70-67-FAN **	$41.00	Gefran heatsink with fan, 35mm DIN rail mount. For use with Gefran GQ series solid state relays up to 90A. Mounting hardware included.	1.30	PDF


HS-60-10


HS-70-67-FAN

* HS-52-50-FAN 24VDC 0.05 A
** HS-70-67-FAN 24VDC 0.11 A

Heatsink Performance Data

Part Number	Recommended Max Relay Load [A]	Rth Heatsink [°C/W]	Dimension WxHxD mm [inch]
HS-60-10	15	≤ 2.6	60 x 10 x 100 [2.36 x 0.39 x 3.93]
HS-52-50	25	≤ 1.5	52.5 x 50 x 90 [2.07 x 1.97 x 3.54]
HS-70-67	35	≤ 0.96	70 x 67 x 90 [2.76 x 2.64 x 3.54]
DIS-90G-KIT	65	≤ 0.63	127 x 100 x 100 [5 x 3.94 x 3.94]
HS-52-50-FAN	75	≤ 0.45	52.5 x 50 x 125 [2.07 x 1.97 x 4.92]
HS-70-67-FAN	90	≤ 0.36	70 x 67 x 130 [2.76 x 2.64 x 5.12]

Note: Data relating to 40°C ambient temperature, heatsink in vertical position, using part number 10-PAD-GQ.