

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**

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

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.

Solid State Relays GRSH Series 15-40A Models

Solid State Relays Selection Table GRSH Series 15-40A Models							
Part Number	Price	Contact Rating	Load Voltage	Input Voltage	Alarm Contact	Weight (lb)	Drawing Link
GRSH-15-48-D-0-0	\$45.00	15A	24-480 VAC	6-32 VDC	—	0.22	PDF
GRSH-15-48-A-0-0	\$61.00	15A	24-480 VAC	20-260 VAC	—		PDF
GRSH-15-48-D-2-0	\$63.00	15A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-15-48-A-5-0	\$71.00	15A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-15-60-D-0-0	\$56.00	15A	24-600 VAC	6-32 VDC	—		PDF
GRSH-15-60-A-0-0	\$65.00	15A	24-600 VAC	20-260 VAC	—		PDF
GRSH-15-60-D-2-0	\$67.00	15A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-15-60-A-5-0	\$75.00	15A	24-600 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-25-48-D-0-0	\$59.00	25A	24-480 VAC	6-32 VDC	—		PDF
GRSH-25-48-A-0-0	\$77.00	25A	24-480 VAC	20-260 VAC	—		PDF
GRSH-25-48-D-2-0	\$79.00	25A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-25-48-A-5-0	\$87.00	25A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-25-60-D-0-0	\$71.00	25A	24-600 VAC	6-32 VDC	—		PDF
GRSH-25-60-A-0-0	\$81.00	25A	24-600 VAC	20-260 VAC	—		PDF
GRSH-25-60-D-2-0	\$83.00	25A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-25-60-A-5-0	\$91.00	25A	24-600 VAC	20-260 VAC	Thermal alarm	0.36	PDF
GRSH-30-48-D-0-0	\$71.00	30A	24-480 VAC	6-32 VDC	—		PDF
GRSH-30-48-A-0-0	\$91.00	30A	24-480 VAC	20-260 VAC	—		PDF
GRSH-30-48-D-2-0	\$93.00	30A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-30-48-A-5-0	\$101.00	30A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-30-60-D-0-0	\$85.00	30A	24-600 VAC	6-32 VDC	—		PDF
GRSH-30-60-A-0-0	\$95.00	30A	24-600 VAC	20-260 VAC	—		PDF
GRSH-30-60-D-2-0	\$97.00	30A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-30-60-A-5-0	\$105.00	30A	24-600 VAC	20-260 VAC	Thermal alarm	0.42	PDF
GRSH-40-48-D-0-0	\$82.00	40A	24-480 VAC	6-32 VDC	—		PDF
GRSH-40-48-A-0-0	\$104.00	40A	24-480 VAC	20-260 VAC	—		PDF
GRSH-40-48-D-2-0	\$106.00	40A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-40-48-A-5-0	\$114.00	40A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-40-60-D-0-0	\$98.00	40A	24-600 VAC	6-32 VDC	—		PDF
GRSH-40-60-A-0-0	\$108.00	40A	24-600 VAC	20-260 VAC	—		PDF
GRSH-40-60-D-2-0	\$110.00	40A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-40-60-A-5-0	\$118.00	40A	24-600 VAC	20-260 VAC	Thermal alarm		PDF

Solid State Relays GRSH Series 50-75A Models

Solid State Relays Selection Table GRSH Series 50-75A Models							
Part Number	Price	Contact Rating	Load Voltage	Input Voltage	Alarm Contact	Weight (lb)	Drawing Link
GRSH-50-48-D-0-0	\$103.00	50A	24-480 VAC	6-32 VDC	—	0.42	PDF
GRSH-50-48-A-0-0	\$129.00	50A	24-480 VAC	20-260 VAC	—		PDF
GRSH-50-48-D-2-0	\$131.00	50A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-50-48-A-5-0	\$139.00	50A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-50-60-D-0-0	\$123.00	50A	24-600 VAC	6-32 VDC	—		PDF
GRSH-50-60-A-0-0	\$133.00	50A	24-600 VAC	20-260 VAC	—		PDF
GRSH-50-60-D-2-0	\$135.00	50A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-50-60-A-5-0	\$143.00	50A	24-600 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-60-48-D-0-0	\$129.00	60A	24-480 VAC	6-32 VDC	—	0.70	PDF
GRSH-60-48-A-0-0	\$159.00	60A	24-480 VAC	20-260 VAC	—		PDF
GRSH-60-48-D-2-0	\$161.00	60A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-60-48-A-5-0	\$169.00	60A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-60-60-D-0-0	\$153.00	60A	24-600 VAC	6-32 VDC	—		PDF
GRSH-60-60-A-0-0	\$163.00	60A	24-600 VAC	20-260 VAC	—		PDF
GRSH-60-60-D-2-0	\$165.00	60A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-60-60-A-5-0	\$173.00	60A	24-600 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-75-48-D-0-0	\$156.00	75A	24-480 VAC	6-32 VDC	—		PDF
GRSH-75-48-A-0-0	\$188.00	75A	24-480 VAC	20-260 VAC	—		PDF
GRSH-75-48-D-2-0	\$190.00	75A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-75-48-A-5-0	\$198.00	75A	24-480 VAC	20-260 VAC	Thermal alarm		PDF
GRSH-75-60-D-0-0	\$183.00	75A	24-600 VAC	6-32 VDC	—		PDF
GRSH-75-60-A-0-0	\$192.00	75A	24-600 VAC	20-260 VAC	—		PDF
GRSH-75-60-D-2-0	\$194.00	75A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		PDF
GRSH-75-60-A-5-0	\$202.00	75A	24-600 VAC	20-260 VAC	Thermal alarm		PDF

Solid State Relays With Fan GRSH Series 90A Models

Solid State Relays With Fan Selection Table GRSH Series 90A Models								
Part Number	Price	Contact Rating	Load Voltage	Input Voltage	Alarm Contact	External Fan Voltage Required	Weight (lb)	Drawing Link
GRSH-90-48-D-0-62	\$183.00	90A	24-480 VAC	6-32 VDC	—	24VDC	0.89	PDF
GRSH-90-48-D-0-60	\$183.00	90A	24-480 VAC	6-32 VDC	—	230VAC	0.98	PDF
GRSH-90-48-D-0-61	\$183.00	90A	24-480 VAC	6-32 VDC	—	115VAC	0.98	PDF
GRSH-90-48-A-0-60	\$193.00	90A	24-480 VAC	20-260 VAC	—	230VAC	0.98	PDF
GRSH-90-48-A-0-61	\$193.00	90A	24-480 VAC	20-260 VAC	—	115VAC	0.98	PDF
GRSH-90-48-D-2-63	\$208.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	PDF
GRSH-90-48-D-2-62	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	PDF
GRSH-90-48-D-2-60	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	0.98	PDF
GRSH-90-48-D-2-61	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	0.98	PDF
GRSH-90-48-A-5-60	\$202.00	90A	24-480 VAC	20-260 VAC	Thermal alarm	230VAC	0.98	PDF
GRSH-90-48-A-5-61	\$202.00	90A	24-480 VAC	20-260 VAC	Thermal alarm	115VAC	0.98	PDF
GRSH-90-60-D-0-62	\$187.00	90A	24-600 VAC	6-32 VDC	—	24VDC	0.89	PDF
GRSH-90-60-D-0-60	\$187.00	90A	24-600 VAC	6-32 VDC	—	230VAC	0.98	PDF
GRSH-90-60-D-0-61	\$187.00	90A	24-600 VAC	6-32 VDC	—	115VAC	0.98	PDF
GRSH-90-60-A-0-60	\$196.00	90A	24-600 VAC	20-260 VAC	—	230VAC	0.98	PDF
GRSH-90-60-A-0-61	\$196.00	90A	24-600 VAC	20-260 VAC	—	115VAC	0.98	PDF
GRSH-90-60-D-2-63	\$212.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	PDF
GRSH-90-60-D-2-62	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	PDF
GRSH-90-60-D-2-60	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	0.98	PDF
GRSH-90-60-D-2-61	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	0.98	PDF
GRSH-90-60-A-5-60	\$206.00	90A	24-600 VAC	20-260 VAC	Thermal alarm	230VAC	0.98	PDF
GRSH-90-60-A-5-61	\$206.00	90A	24-600 VAC	20-260 VAC	Thermal alarm	115VAC	0.98	PDF

* The -63 models are internally powered and do not require external power.

Solid State Relays With Fan GRSH Series 120A Models

Solid State Relays With Fan Selection Table GRSH Series 120A Models								
Part Number	Price	Contact Rating	Load Voltage	Input Voltage	Alarm Contact	External Fan Voltage Required	Weight (lb)	Drawing Link
GRSH-120-48-D-0-62	\$273.00	120A	24-480 VAC	6-32 VDC	—	24VDC	1.13	PDF
GRSH-120-48-D-0-60	\$273.00	120A	24-480 VAC	6-32 VDC	—	230VAC	1.13	PDF
GRSH-120-48-D-0-61	\$273.00	120A	24-480 VAC	6-32 VDC	—	115VAC	1.13	PDF
GRSH-120-48-A-0-60	\$282.00	120A	24-480 VAC	20-260 VAC	—	230VAC	1.13	PDF
GRSH-120-48-A-0-61	\$282.00	120A	24-480 VAC	20-260 VAC	—	115VAC	1.13	PDF
GRSH-120-48-D-2-63	\$298.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	PDF
GRSH-120-48-D-2-62	\$284.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	PDF
GRSH-120-48-D-2-60	\$284.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	1.13	PDF
GRSH-120-48-D-2-61	\$284.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	1.13	PDF
GRSH-120-48-A-5-60	\$292.00	120A	24-480 VAC	20-260 VAC	Thermal alarm	230VAC	1.13	PDF
GRSH-120-48-A-5-61	\$292.00	120A	24-480 VAC	20-260 VAC	Thermal alarm	115VAC	1.13	PDF
GRSH-120-60-D-0-62	\$277.00	120A	24-600 VAC	6-32 VDC	—	24VDC	0.89	PDF
GRSH-120-60-D-0-60	\$277.00	120A	24-600 VAC	6-32 VDC	—	230VAC	1.13	PDF
GRSH-120-60-D-0-61	\$277.00	120A	24-600 VAC	6-32 VDC	—	115VAC	1.13	PDF
GRSH-120-60-A-0-60	\$286.00	120A	24-600 VAC	20-260 VAC	—	230VAC	1.13	PDF
GRSH-120-60-A-0-61	\$286.00	120A	24-600 VAC	20-260 VAC	—	115VAC	1.13	PDF
GRSH-120-60-D-2-63	\$301.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	PDF
GRSH-120-60-D-2-62	\$288.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	PDF
GRSH-120-60-D-2-60	\$288.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	1.13	PDF
GRSH-120-60-D-2-61	\$288.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	1.13	PDF
GRSH-120-60-A-5-60	\$257.00	120A	24-600 VAC	20-260 VAC	Thermal alarm	230VAC	1.13	PDF
GRSH-120-60-A-5-61	\$257.00	120A	24-600 VAC	20-260 VAC	Thermal alarm	115VAC	1.13	PDF

* The -63 models are internally powered and do not require external power.

Solid State Relays GRSH Series 15-120A Models

Solid State Relays Specifications GRSH Series 15-120A Models										
Part Number Series		GRSH-15	GRSH-25	GRSH-30	GRSH-40	GRSH-50	GRSH-60	GRSH-75	GRSH-90	GRSH-120
Rated Working Voltage		480VAC (max. range 24–530VAC) 600VAC (max range 24–660VAC)								
Rated Frequency		50/60 Hz								
Non-Repetitive Voltage		1200Vp for model with rated voltage 480VAC 1400Vp for model with rated voltage 600VAC								
Switching Voltage for Zero		< 20V								
Activation Time		1/2 cycle								
Deactivation Time		1/2 cycle								
Potential Drop At Rated Current		< 1.2 Vrms								
Power Supply		GRSH-xx-xx-D-1-x, GRSH-xx-xx-D-2-x, GRSH-xx-xx-D-3-x, GRSH-xx-xx-D-5-x models: range from 6 to 32VDC, I _{max} < 14 mA at 32V) Max reverse voltage: 36VDC								
Rated Current @ 40°C (Continuous Service)		15A	25A	30A	40A	50A	60A	75A	90A	120A
DC Input 6-32 VDC	Max. Input	< 9mA								
	Max. Reverse Voltage	36VDC								
	Control Voltage	32VDC								
	Activation Voltage	> 5.1 VDC								
	Deactivation Voltage	< 5VDC								
	Input Impedance	500kΩ								
Non-repetitive Overcurrent		t = 20ms: 620A			t = 20ms: 1600A			t = 20ms: 1500A		
I²t For Blowout		≤1800²s			≤12800²s			≤11250²s		
Critical dV/dt With Output Deactivated		≥ 100V/μs								
Relay Configuration		SPST								
Output Type		(1) N.O.SCR								
Switching Type		Zero Cross								
Operating Temperature Range		0 to 80°C [0 to 176°F]								
Storage Temperature Range		-20 to 85°C [-4 to 185°F]								
Max Relative Humidity		90% non-condensing at 40°C								
Protection Level		IP20								
Pollution Level		2								
Status Indicators		Green LED Control, Yellow LED Temp Alarm, Red LED Fault/Out Alarm								
Connector Type		Push-in spring								
Mount Type		35mm DIN rail								
Agency Approvals *		CE, cURus File E243386								

* To obtain the most current agency approval information, see the Agency Compliance & Certifications Checklist section on the specific part number's web page.

Solid State Relays GRSH Series 15-120A Models

Power Terminals									
Wiring Type	Rigid/Flexible/Ferrule Conductor Cross Section								
Nominal Current of the Load	15A	25A	30A	40A	50A	60A	75A	90A	120A
Contact Area (WxD) Screw Type	9.2 x 8mm M5						10.5 x 10.7 mm M5		
Minimum Allowed Section 1 Conductor / 2 Conductors	1 x 0.75 mm ² / 2 x 075 mm ² 1 x 18AWG / 2 x 18AWG								
Maximum Allowed Section 1 Conductor / 2 Conductors	1 x 25mm ² / 2 x 16mm ² 1 x 3AWG / 2 x 6AWG						1 x 50mm ² / 2 x 25mm ² 1 x 1/0 AWG / 2 x 3AWG		
Stripping Length	11mm						13mm		
Tightening Torque	2.5-3 N•m [22-26.6 lb-in]								

Control Signal Terminals	
Wiring Type	Rigid/Flexible/Cable Lug Conductor Cross Section
1 Conductor Section 2 Conductors Sections	1 x 0.2 – 0.75 mm ² / 2 x 0.1 – 0.5 mm ² 1 x 24 – 18AWG / 2 x 27 – 20AWG
Stripping Length / Cable Lug	1x 8 – 10mm 2 x 10 – 12mm

Note: Use 60/75°C (140/167°F) copper (CU), multi-stranded conductors.

Ground Terminal *	
Contact Area (WxD) Screw Type	9x9mm M5
Tightening Torque	1.5 – 2.5 N•m [13.3 – 22 lb-in]

*The screw terminals are only suitable for on-site wiring connection when the wire is equipped with a tube terminal with eyelet. It is possible to make ground connection using a copper bar suitably ground connected and fixed to the heatsink of more GRS-H. (WxD) = Width x depth

Protection Co-ordination (Type 1) According To UL 508

The devices are suitable for use on a circuit capable of delivering not more than 100,000 A rms symmetrical Amperes, 600V maximum when protected by UL listed fuses with size and class as specified in the table below.

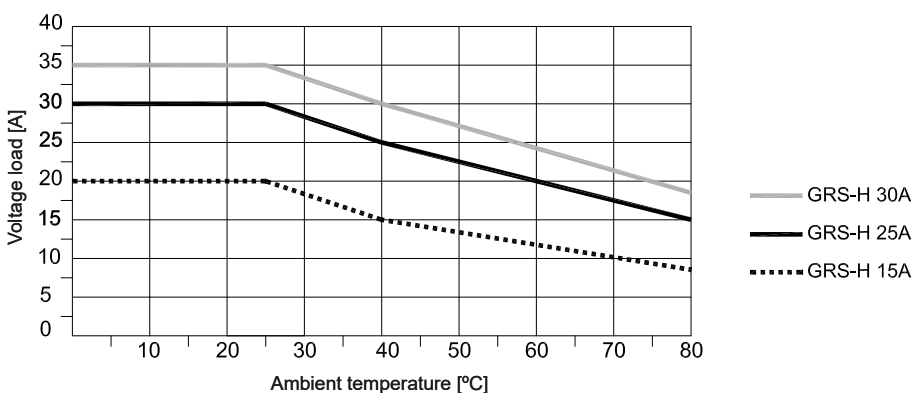
Protection Co-ordination (Type 1) According To UL 508			
Size Device	Fuse Class	Fuse Current Max Size [A]	Prospective Short Circuit Current [kArms]
15, 25, 30	J	40	100
	CC	30	
40	J	40	
50		80	
60		80	
75		80	
90		125	
120		125	

Solid State Relays GRSH Series Derating Curves

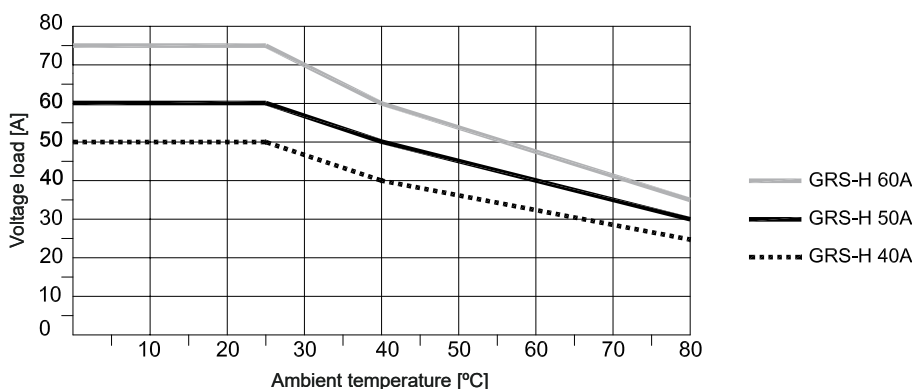
DERATING CURVES (UL508)

Rated current curves as a function of ambient temperature (minimum distance between GRS-H of 20mm).

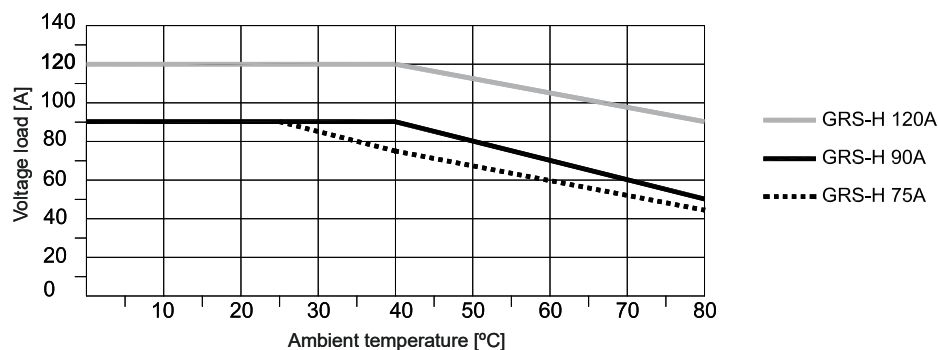
DERATING CURVES GRS-H 15 & 30A



DERATING CURVES GRS-H 40 & 60A



DERATING CURVES GRS-H 75 & 120A



N.B: The curves of the GRS-H 90/120 refer to the device complete with a working specified fan.

Solid State Relays

