BEYOND TECHNOLOGY

GEFRAN Solid State Relays

Solid State Relays GQ and GRSH Series



GQ-25-24-D-1-3





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

Solid State Relays GRSH Series 15-40A Models

	Solid S	State Relays S	election Table	GRSH Series	15-40A Mode	ls	
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	_		<u>PDF</u>
GRSH-15-48-A-0-0	\$61.00	15A	24-480 VAC	20-260 VAC	_		<u>PDF</u>
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	_		<u>PDF</u>
GRSH-15-60-A-0-0	\$65.00	15A	24-600 VAC	20-260 VAC	_		<u>PDF</u>
GRSH-15-60-D-2-0	\$67.00	15A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		<u>PDF</u>
GRSH-15-60-A-5-0	\$75.00	15A	24-600 VAC	20-260 VAC	Thermal alarm	0.22	PDF
GRSH-25-48-D-0-0	\$59.00	25A	24-480 VAC	6-32 VDC	_		<u>PDF</u>
GRSH-25-48-A-0-0	\$77.00	25A	24-480 VAC	20-260 VAC	_		<u>PDF</u>
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		<u>PDF</u>
GRSH-25-60-D-0-0	\$71.00	25A	24-600 VAC	6-32 VDC	_		<u>PDF</u>
GRSH-25-60-A-0-0	\$81.00	25A	24-600 VAC	20-260 VAC	_		<u>PDF</u>
GRSH-25-60-D-2-0	\$83.00	25A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		<u>PDF</u>
GRSH-25-60-A-5-0	\$91.00	25A	24-600 VAC	20-260 VAC	Thermal alarm		<u>PDF</u>
GRSH-30-48-D-0-0	\$71.00	30A	24-480 VAC	6-32 VDC	_		<u>PDF</u>
GRSH-30-48-A-0-0	\$91.00	30A	24-480 VAC	20-260 VAC	_		<u>PDF</u>
GRSH-30-48-D-2-0	\$93.00	30A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm		<u>PDF</u>
GRSH-30-48-A-5-0	\$101.00	30A	24-480 VAC	20-260 VAC	Thermal alarm	0.36	<u>PDF</u>
GRSH-30-60-D-0-0	\$85.00	30A	24-600 VAC	6-32 VDC	_		<u>PDF</u>
GRSH-30-60-A-0-0	\$95.00	30A	24-600 VAC	20-260 VAC	_		<u>PDF</u>
GRSH-30-60-D-2-0	\$97.00	30A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm		<u>PDF</u>
GRSH-30-60-A-5-0	\$105.00	30A	24-600 VAC	20-260 VAC	Thermal alarm		<u>PDF</u>
GRSH-40-48-D-0-0	\$82.00	40A	24-480 VAC	6-32 VDC	_		<u>PDF</u>
GRSH-40-48-A-0-0	\$104.00	40A	24-480 VAC	20-260 VAC	_		<u>PDF</u>
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	0.42	<u>PDF</u>
GRSH-40-60-D-0-0	\$98.00	40A	24-600 VAC	6-32 VDC	_	U.4Z	PDF
GRSH-40-60-A-0-0	\$108.00	40A	24-600 VAC	20-260 VAC	_		<u>PDF</u>
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		<u>PDF</u>



Solid State Relays GRSH Series 50-75A Models

	Solid	State Relays S	election Table	GRSH Series	50-75A Mode	ls	
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	_		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		<u>PDF</u>
GRSH-50-48-A-5-0	\$139.00	50A	24-480 VAC	20-260 VAC	Thermal alarm	0.42	PDF
GRSH-50-60-D-0-0	\$123.00	50A	24-600 VAC	6-32 VDC	_	0.42	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	_		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	_		<u>PDF</u>
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	0.70	PDF
GRSH-75-48-D-0-0	\$156.00	75A	24-480 VAC	6-32 VDC	_	0.70	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		<u>PDF</u>
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		<u>PDF</u>

Solid State Relays With Fan GRSH Series 90A Models

	Solid Stat	e Relays With	Fan Selection	Table GRSH S	Series 90A l	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	<u>PDF</u>
GRSH-90-48-D-0-60	\$183.00	90A	24-480 VAC	6-32 VDC	_	230VAC	0.98	<u>PDF</u>
GRSH-90-48-D-0-61	\$183.00	90A	24-480 VAC	6-32 VDC	_	115VAC	0.98	<u>PDF</u>
GRSH-90-48-A-0-60	\$193.00	90A	24-480 VAC	20-260 VAC	_	230VAC	0.98	<u>PDF</u>
GRSH-90-48-A-0-61	\$193.00	90A	24-480 VAC	20-260 VAC	_	115VAC	0.98	<u>PDF</u>
GRSH-90-48-D-2-63	\$208.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	<u>PDF</u>
GRSH-90-48-D-2-62	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	<u>PDF</u>
GRSH-90-48-D-2-60	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	0.98	<u>PDF</u>
GRSH-90-48-D-2-61	\$195.00	90A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	0.98	<u>PDF</u>
GRSH-90-48-A-5-60	\$202.00	90A	24-480 VAC	20-260 VAC	Thermal alarm	230VAC	0.98	<u>PDF</u>
GRSH-90-48-A-5-61	\$202.00	90A	24-480 VAC	20-260 VAC	Thermal alarm	115VAC	0.98	<u>PDF</u>
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	<u>PDF</u>
GRSH-90-60-A-0-60	\$196.00	90A	24-600 VAC	20-260 VAC	_	230VAC	0.98	<u>PDF</u>
GRSH-90-60-A-0-61	\$196.00	90A	24-600 VAC	20-260 VAC	_	115VAC	0.98	<u>PDF</u>
GRSH-90-60-D-2-63	\$212.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	<u>PDF</u>
GRSH-90-60-D-2-62	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	<u>PDF</u>
GRSH-90-60-D-2-60	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	0.98	<u>PDF</u>
GRSH-90-60-D-2-61	\$198.00	90A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	0.98	<u>PDF</u>
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	<u>PDF</u>

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

Solid State Relays With Fan GRSH Series 120A Models

	Solid Stat	e Relays With	Fan Selection	Table GRSH S	eries 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	<u>PDF</u>
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	<u>PDF</u>
GRSH-120-48-D-2-62	\$284.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	24VDC	0.89	<u>PDF</u>
GRSH-120-48-D-2-60	\$284.00	120A	24-480 VAC	6-32 VDC	Thermal/load interruption alarm	230VAC	1.13	<u>PDF</u>
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	<u>PDF</u>
GRSH-120-48-A-5-61	\$292.00	120A	24-480 VAC	20-260 VAC	Thermal alarm	115VAC	1.13	<u>PDF</u>
GRSH-120-60-D-0-62	\$277.00	120A	24-600 VAC	6-32 VDC	_	24VDC	0.89	<u>PDF</u>
GRSH-120-60-D-0-60	\$277.00	120A	24-600 VAC	6-32 VDC	_	230VAC	1.13	<u>PDF</u>
GRSH-120-60-D-0-61	\$277.00	120A	24-600 VAC	6-32 VDC	_	115VAC	1.13	<u>PDF</u>
GRSH-120-60-A-0-60	\$286.00	120A	24-600 VAC	20-260 VAC	_	230VAC	1.13	<u>PDF</u>
GRSH-120-60-A-0-61	\$286.00	120A	24-600 VAC	20-260 VAC	_	115VAC	1.13	<u>PDF</u>
GRSH-120-60-D-2-63	\$301.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	*	0.89	<u>PDF</u>
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	<u>PDF</u>
GRSH-120-60-D-2-61	\$288.00	120A	24-600 VAC	6-32 VDC	Thermal/load interruption alarm	115VAC	1.13	<u>PDF</u>
GRSH-120-60-A-5-60	\$257.00	120A	24-600 VAC	20-260 VAC	Thermal alarm	230VAC	1.13	<u>PDF</u>
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 Sta	te Relay:	s Specifi	cations	GRSH Se	ries 15-	120A Ma	dels		
Part Number Series		GRSH-15	GRSH-25	GRSH-30	GRSH-40	GRSH-50	GRSH-60	GRSH-75	GRSH-90	GRSH-120
Rated Working	ı Voltage			480VAC (ma	ax. range 24–5	30VAC) 600VA	C (max range	24-660VAC)		
Rated Frequen	су					50/60 Hz				
Non-Repetitive	voltage		1200Vp	for model with	rated voltage 4	80VAC 1400V	p for model wit	h rated voltage	600VAC	
Switching Volta	age for Zero					< 20V				
Activation Time	е					1/2 cycle				
Deactivation To	ime					1/2 cycle				
Potential Drop	At Rated Current					< 1.2 Vrms				
Power Supply								H-xx-xx-D-5-x r voltage: 36VD		
Rated Current (Continuous So		15A	25A	30A	40A	50A	60A	75A	90A	120A
	Max. Input		•			< 9mA				
	Max. Reverse Voltage					36VDC				
DC Input	Control Voltage					32VDC				
6-32 VDC	Activation Voltage	> 5.1 VDC								
	Deactivation Voltage	< 5VDC								
	Input Impedance					500kΩ				
Non-repetitive	Overcurrent	t = 20ms: 620A						t = 20m	s: 1500A	
I ² t For Blowout	t	≤1800^2s ≤12800^2s ≤11250^2s								
Critical dV/dt V	Vith Output Deactivated	≥ 100V/µs								
Relay Configui	ration	SPST								
Output Type						(1) N.O.SCR				
Switching Type	9					Zero Cross				
Operating Tem	0 to 80°C [0 to 176°F]									
Storage Tempe	-20 to 85°C [-4 to 185°F]									
Max Relative H	90% non-condensing at 40°C									
Protection Level			IP20							
Pollution Level					2					
Status Indicate	Green LED Control, Yellow LED Temp Alarm, Red LED Fault/Out Alarm									
Connector Typ					Push-in spring					
Mount Type						35mm DIN rail				
Agency Appro	vals *				CE, o	CURus File E24	3386	-		

^{*} 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	10.5 x 10.7 mm M5		
Minimum Allowed Section 1 Conductor / 2 Conductors					5 mm² / 2 x 075 SAWG / 2 x 18A					
Maximum Allowed Section 1 Conductor / 2 Conductors		1 x 25mm² / 2 x 16mm² 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 Constraint 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]				
45 25 20	J	40					
15, 25, 30	СС	30					
40		40					
50		80	400				
60		80	100				
75	J	80					
90		125					
120		125					

GEFRAN Solid State Relays

Solid State Relays GRSH Series Derating Curves

DERATING CURVES (UL508)





