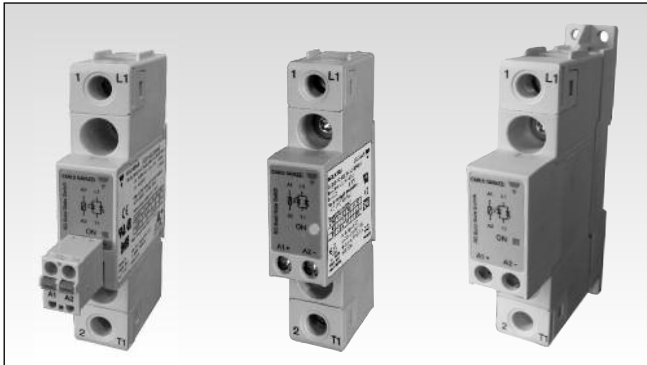


Solid State Relays Industrial, 1-Phase, 17.5mm with built-in varistor Types RGS..E, RGS..EDIN

CARLO GAVAZZI



- Zero cross switching AC solid state relay
- Rated Operational voltage: Up to 600Vrms
- Rated Operational current: Up to 90Arms
- Up to 18000A²s for I²t
- Control voltages: 3-32 VDC, 20-275 VAC (24-190VDC)
- Design according to IEC/EN60947-4-2, IEC/EN60947-4-3, IEC/EN62314, UL508, CSA22.2 No. 14-10
- Integrated voltage transient protection with varistor
- RoHS compliant
- 100kA short circuit current rating according to UL508
- VDE approval
- Option for DIN mounting (RGS...DIN)

Product Description

Aim of this solid state switching device is to switch heater loads and motor loads frequently. The range offers solutions up to 90AAC in 17.5mm width. Output connections are via a screw connection, having a captivated washer allowing for safe looping or via box clamp which can handle cables up to 25mm² (AWG3). Input connection is provided either via a

screw connection having a captivated washer or via a pluggable spring loaded input. Other options with integrated heatsink are available in RGC ranges.

The RGS...DIN provides an option for DIN mounting of the RGS series. Minimum AC51 rating @ 40°C is 10AAC.

Specifications are at a surrounding temperature of 25°C unless otherwise specified.

Ordering Key **RGS 1 A 60 D 75 K K E**

Solid state relay	_____
Number of poles	_____
Switching mode	_____
Rated operational voltage	_____
Control voltage	_____
Rated operational current	_____
Connection type for control	_____
Connection type for power	_____
Connection configuration	_____
Option	_____

Ordering Key (Refer to page 2 for available part numbers)

1Phase SSR with no heatsink	Rated voltage	Control voltage	Rated current, Blocking voltage	Connection control	Connection power	Connection configuration	Options
RGS1A: ZC*	23: 230V +10% - 15%	D: 3 or 4-32VDC A: 20 - 275VAC,	25: 25A, 1200Vp 50: 50A, 1200Vp 51: 50A, 1600Vp 75: 75A, 1200Vp 90: 90A, 1200Vp 91: 90A, 1600Vp 92: 90A, 1200Vp, high I ² t	K: Screw M: Pluggable spring-loaded	K: Screw G: Box clamp	E: Contactor	HT: Thermal pad H51: Heatsink RHS37A DIN: DIN rail mount
RGS1B: IO**	60: 600V +10% - 15%	24-190 VDC					

* ZC: Zero cross switching

**IO: Instant-On switching

Selection Guide - RGS..

Rated voltage, Blocking voltage, Switching mode	Control voltage	Connection Control/ Power	Rated operational current @ 40°C (I ² t value)				
			25 AAC (525A ² s)	50 AAC (1800A ² s)	75 AAC (3200A ² s)	90 AAC (6600A ² s)	90 AAC (18000A ² s)
230V, 800Vp ZC	3-32VDC	Screw/Screw	RGS1A23D25KKE	RGS1A23D50KKE	RGS1A23D75KKE	-	-
		Spring/Screw	RGS1A23D25MKE	RGS1A23D50MKE	-	-	-
	20-275VAC, 24-190VDC	Screw/Screw	RGS1A23A25KKE	RGS1A23A50KKE	RGS1A23A75KKE	-	-
		Spring/Screw	RGS1A23A25MKE	RGS1A23A50MKE	-	-	-
600V, 1200Vp ZC	4-32VDC	Screw/Screw	RGS1A60D25KKE	RGS1A60D50KKE	RGS1A60D75KKE	RGS1A60D90KKE	RGS1A60D92KKE
		Screw/Box	-	RGS1A60D50KGE	-	-	RGS1A60D92KGE
		Spring/Screw	RGS1A60D25MKE	RGS1A60D50MKE	-	RGS1A60D90MKE	RGS1A60D92MKE
	20-275VAC, 24-190VDC	Spring/Box	-	RGS1A60D50MGE	-	-	RGS1A60D92MGE
		Screw/Screw	RGS1A60A25KKE	RGS1A60A50KKE	RGS1A60A75KKE	RGS1A60A90KKE	RGS1A60A92KKE
		Screw/Box	-	RGS1A60A50KGE	-	-	RGS1A60A92KGE
600V, 1600Vp ZC	4-32VDC	Screw/Screw	-	RGS1A60D51KKE	-	RGS1A60D91KKE	-
	20-275VAC, 24-190VDC	Screw/Screw	-	RGS1A60A51KKE	-	RGS1A60A91KKE	-
600V, 1200Vp IO	4-32VDC	Screw/Screw	RGS1B60D25KKE	RGS1B60D50KKE	RGS1B60D75KKE	RGS1B60D90KKE	-

Selection Guide - RGS..HT (RGS with attached Thermal Pad)¹

Rated voltage, Blocking voltage, Switching mode	Control voltage	Connection Control/ Power	Rated operational current @ 40°C (I ² t value)		
			50 AAC (1800A ² s)	90 AAC (6600A ² s)	90 AAC (18000A ² s)
230V, 800Vp ZC	3-32VDC	Screw/Screw	RGS1A23D50KKEHT	-	-
		Spring/Screw	RGS1A23D50MKEHT	-	-
600V, 1200Vp ZC	4-32VDC	Screw/Screw	RGS1A60D50KKEHT	RGS1A60D90KKEHT	RGS1A60D92KKEHT
		Screw/Box	RGS1A60D50KGEHT	-	RGS1A60D92KGEHT
		Spring/Screw	RGS1A60D50MKEHT	RGS1A60D90MKEHT	RGS1A60D92MKEHT
		Spring/Box	RGS1A60D50MGEHT	-	RGS1A60D92MGEHT

1: The thermal pad with suffix 'HT' is available with any RGS part no. upon request. The above part numbers are some examples of RGS selection with attached thermal pad

Selection Guide - RGS..H51 (RGS mounted on heatsink RHS37A)²

Rated voltage, Blocking voltage, Switching mode	Control voltage	Connection Control/ Power	Rated operational current @ 40°C (I ² t value)	
			30 AAC (18000A ² s)	
600V, 1200Vp ZC	4-32VDC	Screw/Screw	RGS1A60D92KKEH51	
		Screw/Box	RGS1A60D92KGEH51	
		Spring/Screw	RGS1A60D92MKEH51	
		Spring/Box	RGS1A60D92MGEH51	

2: Any of the available RGS part numbers can be factory mounted upon request on RHS37A. The above part numbers are some examples of RGS with factory mounted heatsink.

Selection Guide - RGS..DIN (RGS for DIN Rail mounting)³

Rated voltage, Blocking voltage, Switching mode	Control voltage	Connection Control/ Power	Rated operational current @ 40°C (I ² t value)		
			10 AAC (525A ² s)	12 AAC (1800A ² s)	12 AAC (6600A ² s)
230V, 600Vp ZC	3-32VDC	Screw/Screw	RGS1A23D25KKEDIN	RGS1A23D50KKEDIN	-
		Screw/Screw	RGS1A23A25KKEDIN	RGS1A23A50KKEDIN	-
600V, 1200Vp ZC	4-32VDC	Screw/Screw	RGS1A60D25KKEDIN	RGS1A60D50KKEDIN	RGS1A60D90KKEDIN
		Screw/Screw	RGS1A60A25KKEDIN	RGS1A60A50KKEDIN	-

3: Any of the available RGS part numbers can be factory mounted upon request to the RGS1DIN accessory. The above are some examples. Refer to 'Accessories' section for further details.

Output Voltage Specifications

		RGS..23..	RGS..60..
Operational voltage range		24-240 VAC, +10%, -15% on max	42-600 VAC, +10% -15% on max
Blocking voltage	RGS..25/50/75/90/92 RGS..51/91	800Vp -	1200 Vp 1600 Vp
Internal varistor	RGS..25/50/75/90/92 RGS..51/91	275V -	625V 680V

General Specifications

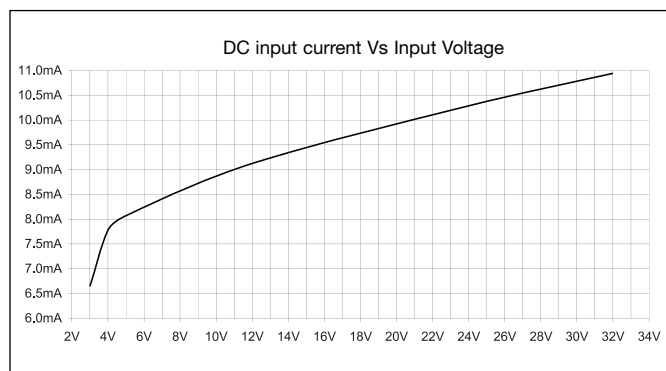
Latching voltage (across L1-T1)	≤20V	Pollution degree	2 (non-conductive pollution with possibilities of condensation)
Operational frequency range	45 to 65Hz	Over-voltage category	III (fixed installations)
Power factor	> 0.5 @ Vrated	Isolation	
CE marking	Yes	Input to Output	4000Vrms
Touch protection	IP20	Input&Output to Case	4000Vrms
Control input status	continuously ON Green LED, when control input is applied		

Input Specifications

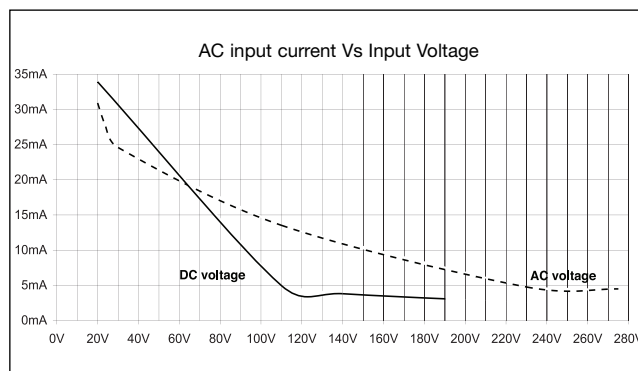
		RGS..D..	RGS..A..
Control voltage range ⁴	RGS..23..	3 - 32 VDC	20 - 275 VAC, 24 (-10%) - 190 VDC
	RGS..60..	4 - 32 VDC	20 - 275 VAC, 24 (-10%) - 190 VDC
Pick-up voltage	RGS..23.. RGS..60..	3.0 VDC 3.8 VDC	20 VAC/DC
Drop-out voltage	RGS..23.. RGS..60..	1 VDC 1 VDC	5 VAC/DC
Maximum Reverse voltage		32 VDC	-
Response time pick-up ZC (RGS1A..)		0.5 cycle + 500μs @ 24VDC	2 cycles @ 230VAC/110VDC
Response time pick-up IO (RGS1B..)		350μs @ 24 VDC	N/A
Response time drop-out		0.5 cycle + 500μs @ 24VDC	0.5 cycle + 40ms @ 230 VAC/ 110 VDC
Input current @ 40°C		See diagrams below	See diagrams below

4: DC control to be supplied by a Class 2 power source according to UL1310

RG..D..



RG..A..



Motor Ratings⁵: HP (UL508) / kW (EN/IEC60947-4-2) @ 40°C

	115 VAC	230 VAC	400 VAC	480 VAC	600 VAC
RGS..25	½HP / 0.18kW	1-½HP / 0.37kW	3HP / 0.75kW	3HP / 1.1kW	5HP / 1.5kW
RGS..50/51	1HP / 0.37kW	3HP / 1.1kW	5HP / 1.5kW	5HP / 2.2kW	7-½HP / 3.7kW
RGS..75	1-½HP / 0.56kW	3HP / 1.5kW	5HP / 3kW	7-½HP / 4kW	10HP / 4kW
RGS..90/91/92	2HP / 0.75kW	5HP / 2.2kW	7-½HP / 4kW	10HP / 4kW	15HP / 5.5kW

5: Refer to heatsink selection table

Output Specifications

	RGS..25..	RGS..50/51..	RGS..75..	RGS..90/91..	RGS..92..
Rated operational current AC-51 rating @ Ta=40°C (IEC60947-4-3/UL508) ⁵	25 AAC	50 AAC	75 AAC	90 AAC	90AAC
AC-53a rating @ Ta=40°C (IEC60947-4-2/ UL508)	5 AAC	10 AAC	14.8 AAC	18 AAC	18AAC
Number of motor starts (x:6, Tx:6s, F:50%)at 40°C ^{5, 6}	30	30	30	30	30
Min. operational current	150 mAAC	250 mAAC	400 mAAC	400 mAAC	500 mAAC
Rep. overload current - UL508: T _{AMB} =40°C, t _{ON} =1s, t _{OFF} =9s, 50cycles	67 AAC	107 AAC	126 AAC	168 AAC	168 AAC
Maximum Transient Surge Current (I _{TSM}), t=10ms	325Ap	600Ap	800Ap	1150Ap	1900Ap
Maximum Off-state leakage current @ rated voltage	3 mAAC	3 mAAC	3 mAAC	3 mAAC	3 mAAC
I ² t for fusing (t=10ms) Minimum	525 A ² s	1800A ² s	3200A ² s	6600A ² s	18000A ² s
Critical dv/dt (@ T _j init = 40°C)	1000V/us	1000V/us	1000V/us	1000V/us	1000V/us

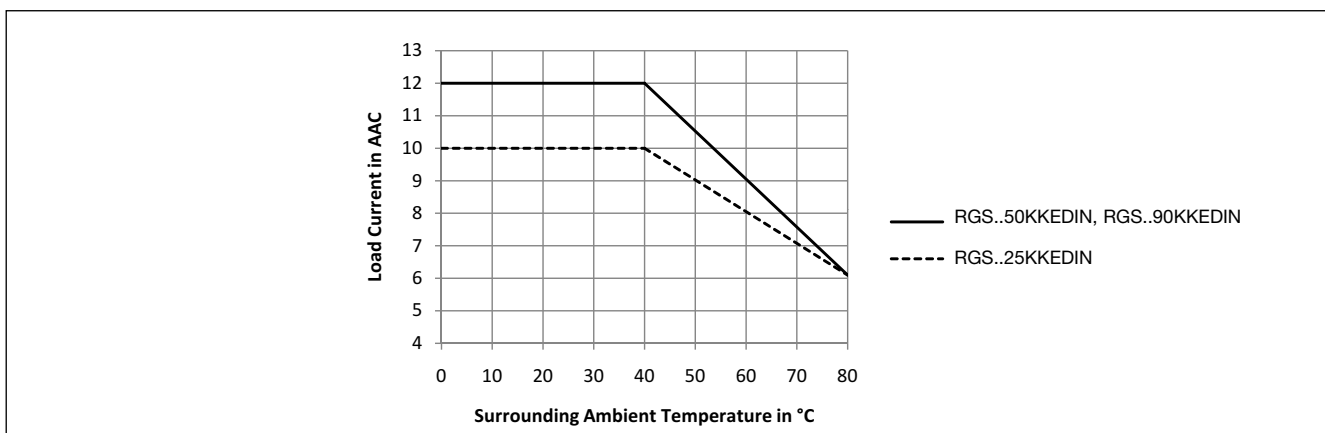
6 x: multiple of AC-53a current rating, Tx: duration of current surge, F: duty cycle.

Output Specifications for RGS..DIN

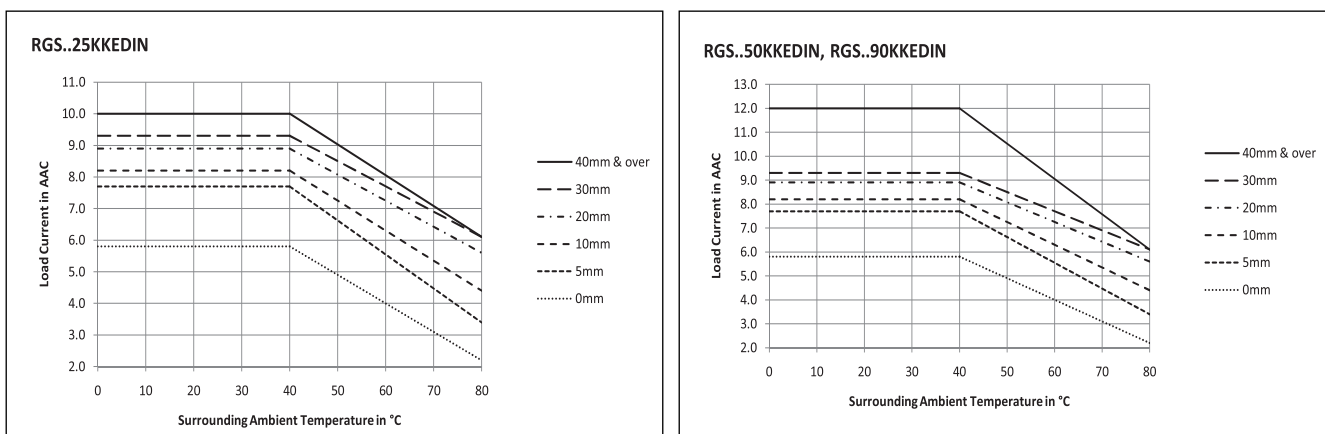
	RGS..25..DIN	RGS..50..DIN	RGS..90..DIN
Rated operational current ⁷ AC-51 rating @ Ta = 40°C	10 AAC	12 AAC	12 AAC
AC-53a rating @ Ta=40°C	5 AAC	5 AAC	5 AAC
Number of motor starts (x:6, Tx:6s, F:50%) at 40°C ⁶	30	30	30
Min. operational current	150 mA	250 mA	400 mA
Maximum transient surge current I _{TSM} , t=10ms	325Ap	600Ap	1150Ap
Maximum Off-state leakage current @ rated voltage	3 mAAC	3 mAAC	3 mAAC
I ² t for fusing (t=10ms) Minimum	525 A ² s	1800 A ² s	6600 A ² s
Critical dv/dt (@ T _j init = 40°C)	1000V/us	1000V/us	1000V/us

7: Refer to Derating Curves

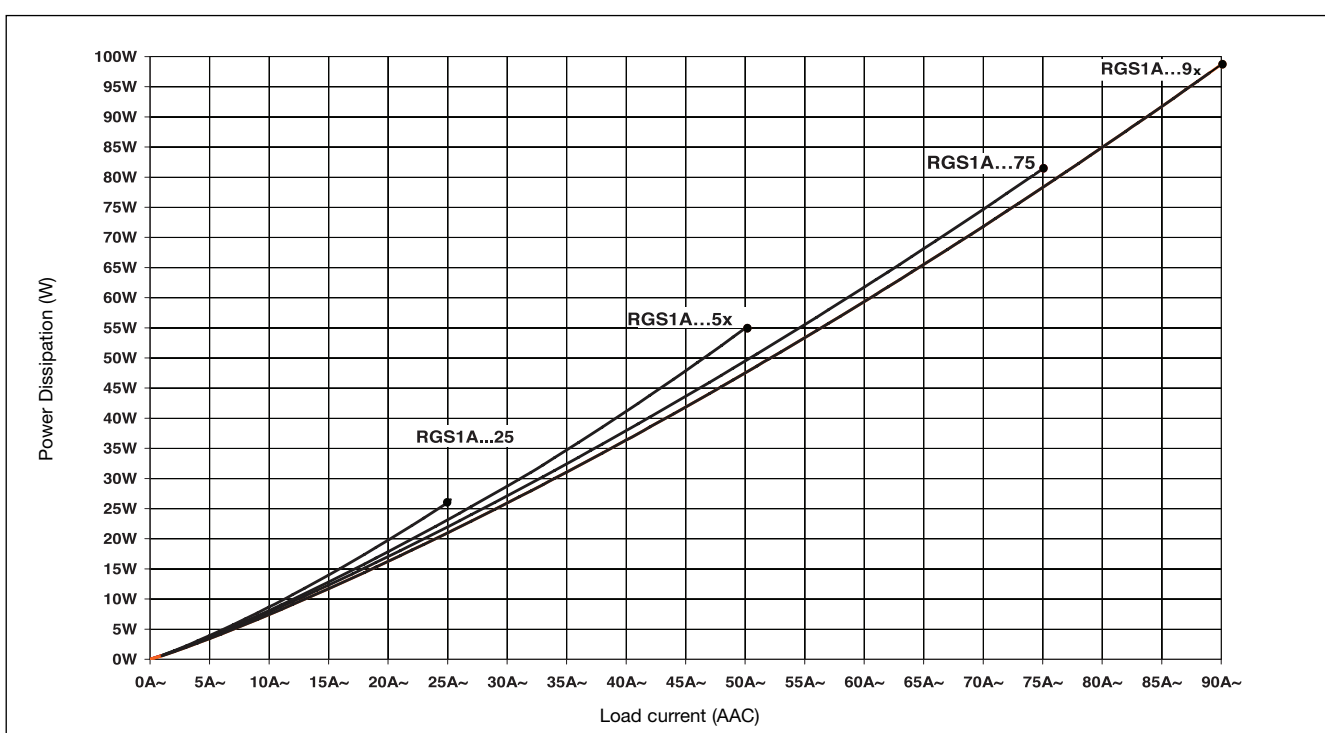
Derating Curves for RGS...DIN



Derating vs. Spacing Curves for RGS...DIN



Output Power Dissipation



Electromagnetic Compatibility

EMC Immunity	IEC/EN 61000-6-2	Radiated Radio Frequency Immunity	IEC/EN 61000-4-3
Electrostatic Discharge (ESD) Immunity	IEC/EN 61000-4-2	10V/m, 80 - 1000 Mhz	Performance Criteria 1
Air discharge, 8kV	Performance Criteria 1	10V/m, 1.4 - 2.0GHz	Performance Criteria 1
Contact, 4kV	Performance Criteria 1	3 V/m, 2.0 - 2.7GHz	Performance Criteria 1
Electrical Fast Transient (Burst) Immunity	IEC/EN 61000-4-4	Conducted Radio Frequency Immunity	IEC/EN 61000-4-6
Output: 2kV, 5kHz	Performance Criteria 1	10V/m, 0.15 - 80 MHz	Performance Criteria 1
Input: 1kV, 5kHz	Performance Criteria 1	Voltage Dips Immunity	IEC/EN 61000-4-11
Electrical Surge Immunity	IEC/EN 61000-4-5	0% for 10ms/20ms	Performance Criteria 2
Output, line to line, 1kV	Performance Criteria 1	40% for 200ms	Performance Criteria 2
Output, line to earth, 2kV	Performance Criteria 1	70% for 500ms	Performance Criteria 2
Input, line to line, 1kV	Performance Criteria 2	Voltage Interruptions Immunity	IEC/EN 61000-4-11
Input, line to earth, 2kV	Performance Criteria 2	0% for 5000ms	Performance Criteria 2
EMC Emission	IEC/EN 61000-6-4	Radio Interference	
Radio Interference		Field Emission (Radiated)	IEC/EN 55011
Voltage Emission (Conducted)	IEC/EN 55011	30 - 1000MHz	Class A (industrial)
0.15 - 30MHz	Class A (industrial) with filters - see filter information IEC/EN 60947-4-2, 60947-4-3 Class A (no filtering needed)		

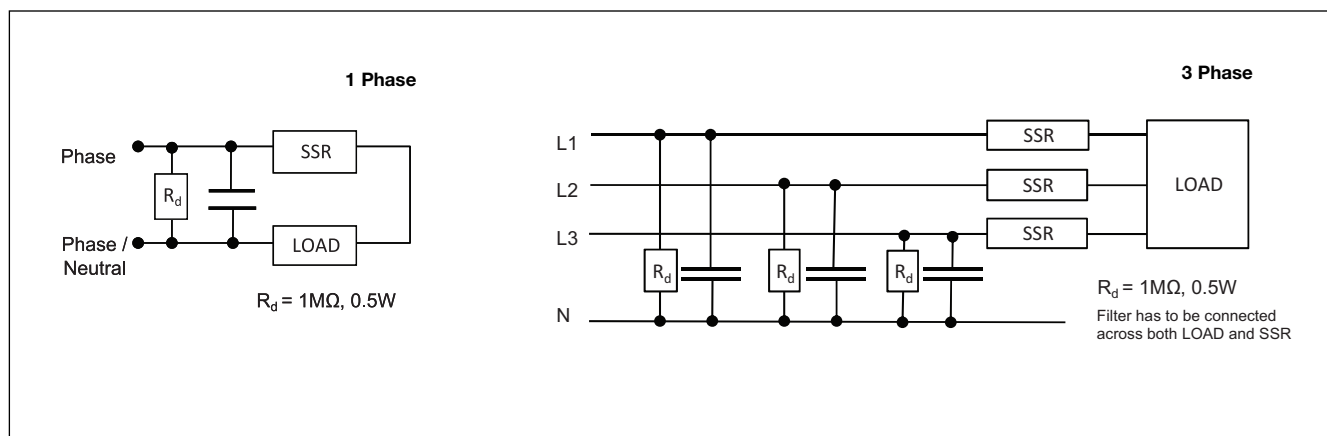
Filtering - IEC/EN 55011 Class A compliance (for class B compliance contact us)

Part Number	Suggested filter for compliance	Maximum Heater current
RGS1A23..25	100 nF / 275 V / X1	25 A
RGS1A23..50	220 nF / 275 V / X1	30 A
	330 nF / 275 V / X1	35 A
RGS1A23..51	150 nF / 275 V / X1	20 A
	220 nF / 275 V / X1	35 A
RGS1A23..75	330 nF / 275 V / X1	35 A
RGS1A23..90/91/92	330 nF / 275 V / X1	35 A
RGS1A60..25	150 nF / 760 V / X1	25 A
	220 nF / 760 V / X1	30 A
RGS1A60..50	330 nF / 760 V / X1	30 A
RGS1A60..51	220 nF / 760 V / X1	30 A
RGS1A60..75	220 nF / 760 V / X1	30 A
RGS1A60..90/91/92	220 nF / 760 V / X1	30 A

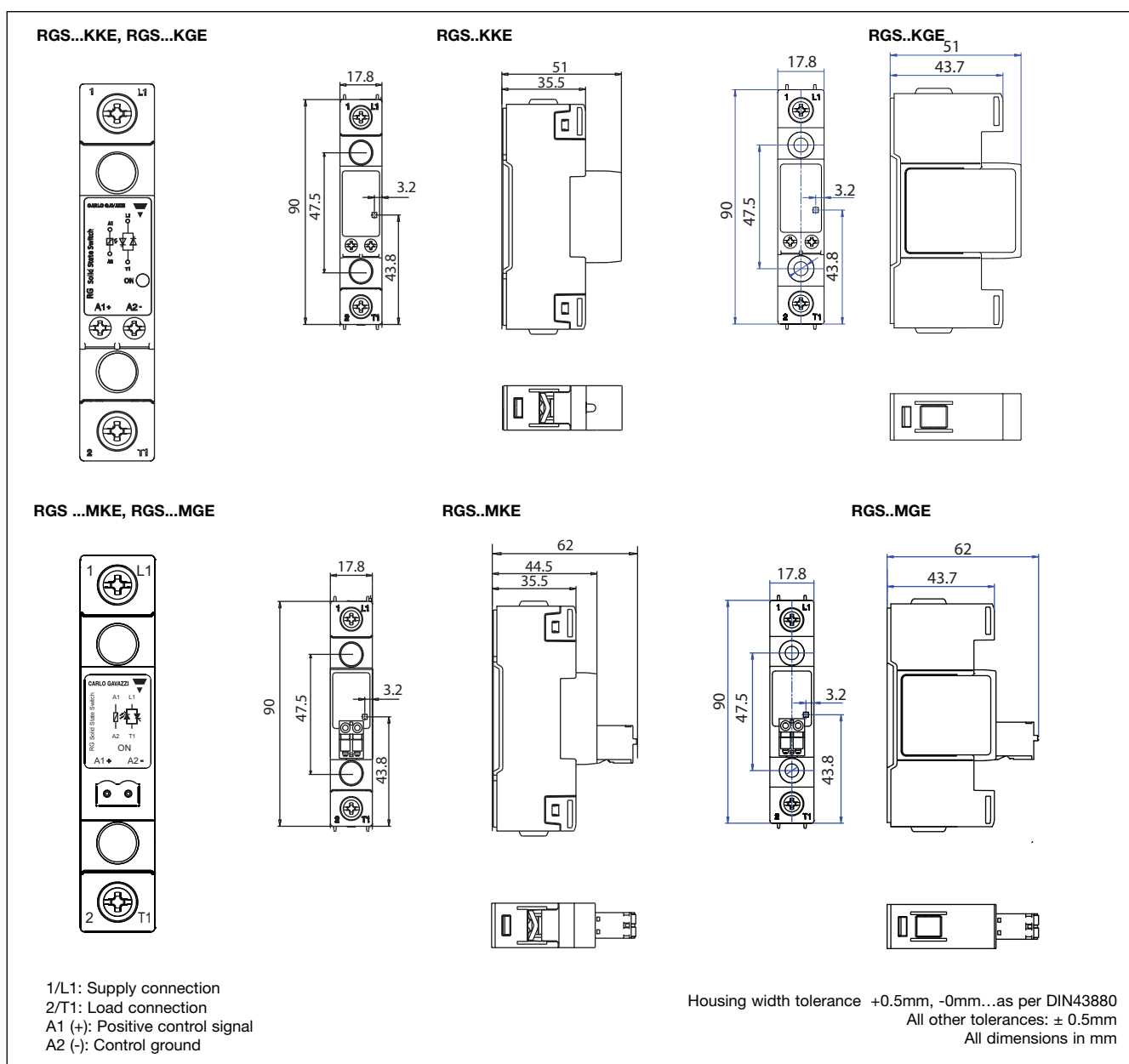
Note:

- Control input lines must be installed together to maintain products' susceptibility to Radio Frequency interference. Use of AC solid state relays may, according to the application and the load current, cause conducted radio interferences. Use of mains filters may be necessary for cases where the user must meet E.M.C requirements. The capacitor values given inside the filtering specification tables should be taken only as indications, the filter attenuation will depend on the final application. DC input type require surge suppression for full compliance to EN55011.
- Performance Criteria 1: No degradation of performance or loss of function is allowed when the product is operated as intended.
- Performance Criteria 2: During the test, degradation of performance or partial loss of function is allowed. However when the test is complete the product should return operating as intended by itself.
- Performance Criteria 3: Temporary loss of function is allowed, provided the function can be restored by manual operation of the controls.

Filter Connection Diagram

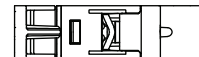
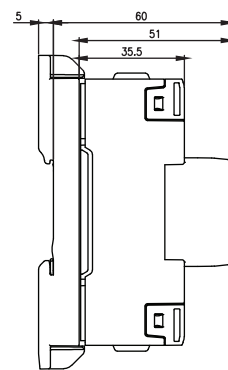
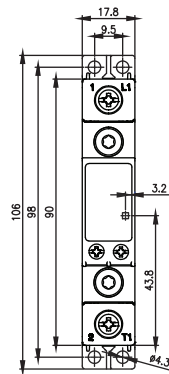
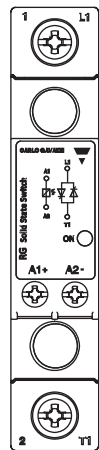


Terminal Layout and Dimensions

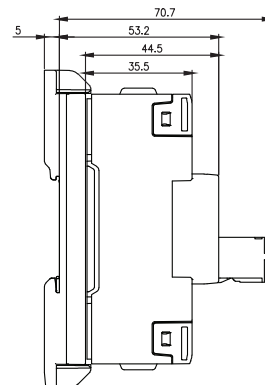
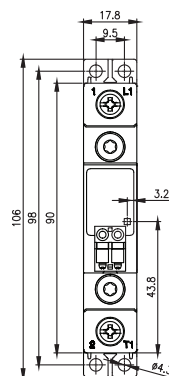
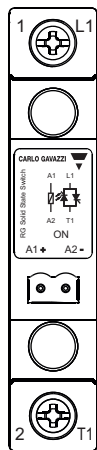


Terminal Layout and Dimensions (cont.)

RGS....KKEDIN



RGSMKEDIN



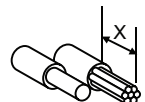
1/L1: Supply connection
2/T1: Load connection
A1 (+): Positive control signal
A2 (-): Control ground

Housing width tolerance +0.5mm, -0mm...as per DIN43880
All other tolerances: $\pm 0.5\text{mm}$
All dimensions in mm

Connection Specifications

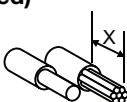
POWER CONNECTIONS: 1/L1, 2/T1

Use 75°C copper (Cu) conductors

	RGS...KKE ; RGS...MKE	RGS...KGE ; RGS...MGE
Stripping Length (X)	12mm	11mm
Connection type	M4 screw with captivated washer	M5 screw with box clamp
Rigid (Solid & Stranded) UL/ cUL rated data	 2 x 2.5..6 mm ² 2 x 14.. 10 AWG	 1 x 2.5..6 mm ² 1 x 14.. 10 AWG
Flexible with end sleeve	 2 x 1.0 ... 2.5mm ² 2 x 2.5..4mm ² 2 x 18.. 14 AWG 2 x 14.. 12 AWG	 1 x 2.5..25mm ² 1 x 14...3 AWG
Flexible without end sleeve	 2 x 1.0 ... 2.5mm ² 2 x 2.5.. 6mm ² 2 x 18.. 14 AWG 2 x 14.. 10 AWG	 1 x 2.5..16mm ² 1 x 14.. 6 AWG
Torque specifications	 Pozidriv 2 UL: 2Nm (17.7lb-in) IEC: 1.5 - 2.0Nm (13.3 - 17.7lb-in)	Pozidriv 2 UL: 2.5Nm (22lb-in) IEC: 2.5 - 3.0Nm (22-26.6lb-in)
Aperture for termination lug	12.3mm	N/A

CONTROL CONNECTIONS: A1(+), A2(-)

Use 60/75°C copper (Cu) conductors

	RGS...KKE, RGS...KGE	RGS...MKE, RGS...MGE
Torque specifications	 M3, Pozidriv 1 UL: 0.5Nm (4.4lb-in) IEC: 0.5 - 0.6Nm (4.4 - 5.3lb-in)	
Stripping Length (X)	8mm	12 - 13mm
Rigid (Solid & Stranded) UL/ cUL rated data	 2 x 0.5..2.5mm ² 2 x 18..12 AWG	 1 x 0.5..2.5mm ² 1 x 18..12 AWG
Flexible with end sleeve	 2 x 0.5..2.5mm ² 2 x 18..12AWG	 1 x 0.5..2.5mm ² 1 x 18..12AWG

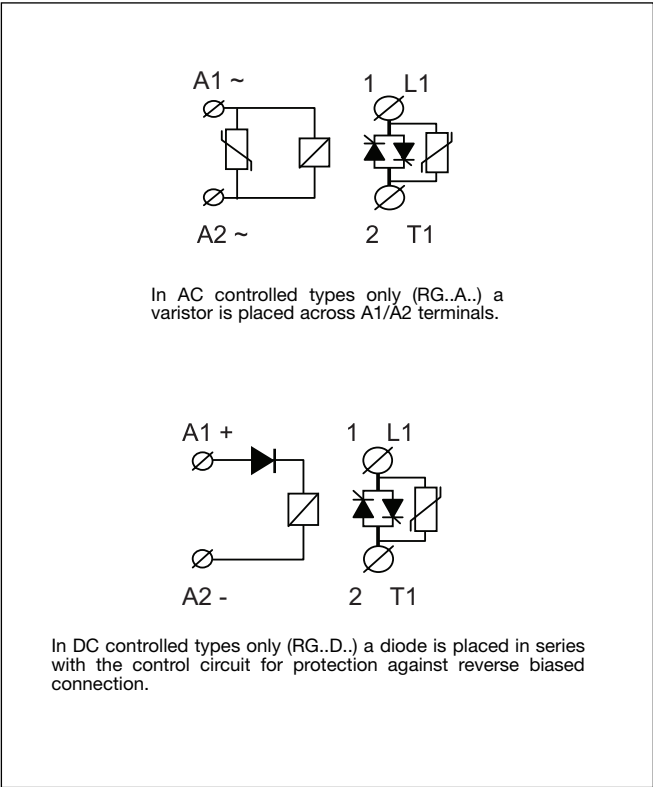
Environmental Specifications

Operating Temperature	-40°C to 80°C (-40°F to +176°F)	Relative humidity	95% non-condensing @ 40°C
Storage Temperature	-40°C to 100°C (-40°F to +212°F)	UL flammability rating (housing)	UL 94 V0
RoHS (2002/95/EC)	Compliant	Installation altitude	0-1000m. Above 1000m derate linearly by 1% of FLC per 100m up to a maximum of 2000m
Impact resistance (EN 50155, EN 61373)	15/11 g/ms	Weight	approx. 103g
Vibration resistance (2-100Hz, IEC60068-2-26, EN 50155, EN 61373)	5g per axis 2g per axis (RGS..H51)	RGS...DIN RGS...H51	approx. 155g approx. 260g

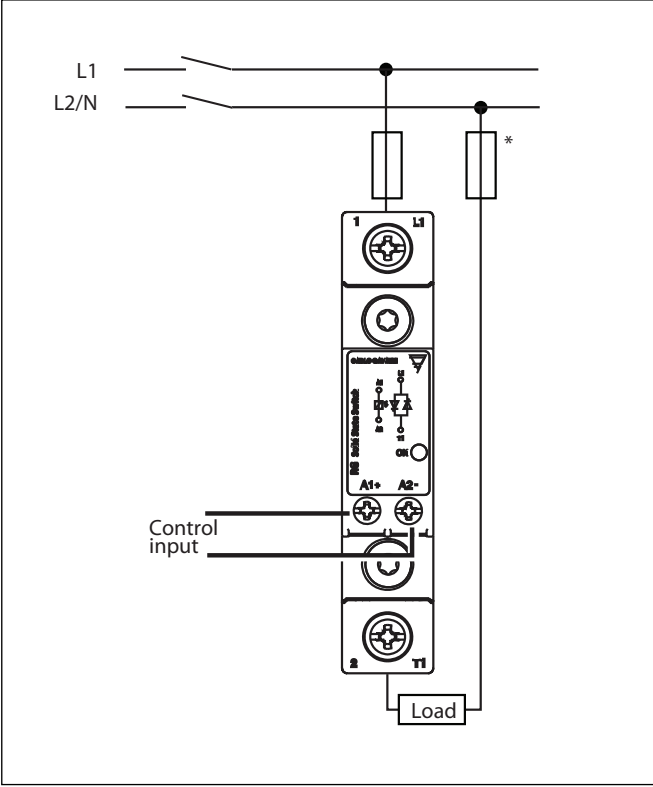
Agency Approvals and Conformance

Conformance	IEC/EN 62314 IEC/EN 60947-4-2 IEC/EN 60947-4-3	Agency Approvals	UL508 Recognised (E172877) CSA 22.2 No.14-10 (204075) VDE (0660-109)
   		Short circuit current rating	100kA, UL508

Functional Diagram



Connection Diagram



* depends on system requirements

Heatsink Selection

RGS1...25

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
25.0	3.11	2.72	2.33	1.94	1.55	1.17	0.78	25.7
22.5	3.55	3.10	2.66	2.22	1.77	1.33	0.89	22.6
20.0	4.10	3.59	3.08	2.56	2.05	1.54	1.03	19.5
17.5	4.83	4.23	3.63	3.02	2.42	1.81	1.21	16.6
15.0	5.83	5.10	4.37	3.64	2.91	2.18	1.46	13.7
12.5	7.24	6.34	5.43	4.53	3.62	2.72	1.81	11.0
10.0	9.43	8.25	7.07	5.89	4.71	3.54	2.36	8.5
7.5	13.17	11.53	9.88	8.23	6.59	4.94	3.29	6.1
5.0	---	18.35	15.73	13.11	10.49	7.86	5.24	3.8
2.5	---	---	---	---	---	17.21	11.47	1.7
	20	30	40	50	60	70	80	T _A
Ambient temp [°C]								

RGS1...5x

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
50.0	1.45	1.28	1.06	0.87	0.68	0.49	0.30	52.8
45.0	1.72	1.50	1.29	1.07	0.85	0.64	0.42	46.3
40.0	2.00	1.75	1.50	1.25	1.00	0.75	0.50	40.0
35.0	2.35	2.06	1.76	1.47	1.18	0.88	0.59	34.0
30.0	2.83	2.48	2.13	1.77	1.42	1.06	0.71	28.2
25.0	3.52	3.08	2.64	2.20	1.76	1.32	0.88	22.7
20.0	4.58	4.01	3.44	2.86	2.29	1.72	1.15	17.5
15.0	6.40	5.60	4.80	4.00	3.20	2.40	1.60	12.5
10.0	10.19	8.92	7.64	6.37	5.10	3.82	2.55	7.8
5.0	---	19.51	16.72	13.94	11.15	8.36	5.57	3.6
	20	30	40	50	60	70	80	T _A
Ambient temp [°C]								

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.45 K/W
Case to heatsink thermal resistance, R _{thcs} ⁸	< 0.25 K/W

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.3 K/W
Case to heatsink thermal resistance, R _{thcs} ⁸	< 0.25 K/W

Heatsink Selection (cont.)

RGS1...75

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	80
75.0	0.80	0.68	0.55	0.43	0.30	0.18	0.06
67.5	0.99	0.84	0.70	0.56	0.42	0.28	0.14
60.0	1.22	1.06	0.89	0.73	0.56	0.40	0.24
52.5	1.53	1.33	1.14	0.95	0.76	0.56	0.37
45.0	1.86	1.63	1.40	1.16	0.93	0.70	0.47
37.5	2.32	2.03	1.74	1.45	1.16	0.87	0.58
30.0	3.01	2.64	2.26	1.88	1.51	1.13	0.75
22.5	4.21	3.68	3.16	2.63	2.10	1.58	1.05
15.0	6.68	5.85	5.01	4.18	3.34	2.51	1.67
7.5	14.53	12.71	10.89	9.08	7.26	5.45	3.63
	T _A						Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.25 K/W
Case to heatsink thermal resistance, R _{thcs} ⁸	< 0.25 K/W

RGS1...9x

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	80
90.0	0.62	0.52	0.41	0.31	0.21	0.11	0.01
81.0	0.77	0.66	0.54	0.42	0.31	0.19	0.07
72.0	0.97	0.83	0.70	0.56	0.43	0.29	0.16
63.0	1.23	1.07	0.91	0.75	0.59	0.43	0.27
54.0	1.55	1.35	1.16	0.97	0.77	0.58	0.39
45.0	1.93	1.69	1.45	1.21	0.97	0.73	0.48
36.0	2.53	2.21	1.89	1.58	1.26	0.95	0.63
27.0	3.55	3.11	2.66	2.22	1.77	1.33	0.89
18.0	5.67	4.97	4.26	3.55	2.84	2.13	1.42
9.0	12.46	10.90	9.34	7.79	6.23	4.67	3.11
	T _A						Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.20 K/W
Case to heatsink thermal resistance, R _{thcs} ⁸	< 0.25 K/W

8: Thermal resistance case to heatsink valves are applicable upon application of a fine layer of silicon based thermal paste HTS02S from Electrolube between SSR and heatsink.

Mounting Instructions

Thermal stress will reduce the lifetime of the SSR. Therefore it is necessary to select the appropriate heatsinks, taking into account the surrounding temperature, load current and the duty cycle.

A fine layer of thermally conductive silicone paste must be evenly applied to the back of the SSR. RGS should be mounted on the heatsink with two M5 x 30mm screws. Gradually tighten each screw (alternating between the two)

until both are tightened with a torque of 0.75Nm. Then tighten both screws to their final mounting torque of 1.5Nm.

In case of a thermal pad attached to the back of the SSR, no thermal paste is required. The RGS is gradually tightened (altering between the 2 screws) to a maximum torque of 1.5Nm.

Heatsink Selection for RGS...HT

RGS1...25..HT

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
	20	30	40	50	60	70	80	T _A
25.0	2.73	2.34	1.95	1.56	1.18	0.79	0.40	25.7
22.5	3.30	2.86	2.42	1.97	1.53	1.09	0.64	22.6
20.0	4.04	3.52	3.01	2.50	1.98	1.47	0.96	19.5
17.5	4.83	4.23	3.63	3.02	2.42	1.81	1.21	16.6
15.0	5.83	5.10	4.37	3.64	2.91	2.18	1.46	13.7
12.5	7.24	6.34	5.43	4.53	3.62	2.72	1.81	11.0
10.0	9.43	8.25	7.07	5.89	4.71	3.54	2.36	8.5
7.5	13.17	11.53	9.88	8.23	6.59	4.94	3.29	6.1
5.0	---	18.35	15.73	13.11	10.49	7.86	5.24	3.8
2.5	---	---	---	---	---	17.21	11.47	1.7

Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.45 K/W
Case to heatsink thermal resistance, R _{thcs}	< 0.9 K/W

RGS1...5x..HT

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
	20	30	40	50	60	70	80	T _A
50.0	0.84	0.65	0.46	0.27	0.08	---	---	52.8
45.0	1.12	0.90	0.69	0.47	0.25	0.04	---	46.3
40.0	1.47	1.22	0.97	0.72	0.47	0.22	---	40.0
35.0	1.94	1.64	1.35	1.06	0.76	0.47	0.17	34.0
30.0	2.57	2.22	1.86	1.51	1.15	0.80	0.44	28.2
25.0	3.48	3.03	2.59	2.15	1.71	1.27	0.83	22.7
20.0	4.58	4.01	3.44	2.86	2.29	1.72	1.15	17.5
15.0	6.40	5.60	4.80	4.00	3.20	2.40	1.60	12.5
10.0	10.19	8.92	7.64	6.37	5.10	3.82	2.55	7.8
5.0	---	19.51	16.72	13.94	11.15	8.36	5.57	3.6

Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.3 K/W
Case to heatsink thermal resistance, R _{thcs}	< 0.85 K/W

RGS1...75..HT

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
	20	30	40	50	60	70	80	T _A
75.0	0.25	0.13	0.00	---	---	---	---	80.7
67.5	0.44	0.29	0.15	0.01	---	---	---	70.7
60.0	0.67	0.51	0.34	0.18	0.01	---	---	61.0
52.5	0.98	0.78	0.59	0.40	0.21	0.01	---	51.8
45.0	1.39	1.16	0.93	0.70	0.46	0.23	---	42.9
37.5	1.99	1.70	1.41	1.12	0.83	0.54	0.25	34.5
30.0	2.91	2.53	2.15	1.78	1.40	1.02	0.65	26.5
22.5	4.21	3.68	3.16	2.63	2.10	1.58	1.05	19.0
15.0	6.68	5.85	5.01	4.18	3.34	2.51	1.67	12.0
7.5	14.53	12.71	10.89	9.08	7.26	5.45	3.63	5.5

Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.25 K/W
Case to heatsink thermal resistance, R _{thcs}	< 0.80 K/W

RGS1...9x..HT

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
	20	30	40	50	60	70	80	T _A
90.0	0.07	---	---	---	---	---	---	98.4
81.0	0.22	0.11	---	---	---	---	---	85.9
72.0	0.42	0.28	0.15	0.01	---	---	---	74.0
63.0	0.68	0.52	0.36	0.20	0.04	---	---	62.5
54.0	1.03	0.84	0.65	0.45	0.26	0.06	---	51.7
45.0	1.54	1.30	1.05	0.81	0.57	0.33	0.09	41.4
36.0	2.32	2.00	1.69	1.37	1.05	0.74	0.42	31.6
27.0	3.55	3.11	2.66	2.22	1.77	1.33	0.89	22.5
18.0	5.67	4.97	4.26	3.55	2.84	2.13	1.42	14.1
9.0	12.46	10.90	9.34	7.79	6.23	4.67	3.11	6.4

Ambient temp [°C]

Maximum junction temperature	125°C
Heatsink temperature	100°C
Junction to case thermal resistance, R _{thjc}	<0.20 K/W
Case to heatsink thermal resistance, R _{thcs}	< 0.80 K/W

Short Circuit Protection

Protection Co-ordination, Type 1 vs Type 2:

Type 1 protection implies that after a short circuit, the device under test will no longer be in a functioning state. In type 2 co-ordination the device under test will still be functional after the short circuit. In both cases, however the short circuit has to be interrupted. The fuse between enclosure and supply shall not open. The door or cover of the enclosure shall not be blown open. There shall be no damage to conductors or terminals and the conductors shall not separate from terminals. There shall be no breakage or cracking of insulating bases to the extent that the integrity of the mounting of live parts is impaired. Discharge of parts or any risk of fire shall not occur.

The product variants listed in the table hereunder are suitable for use on a circuit capable of delivering not more than 100,000A rms Symmetrical Amperes, 600Volts maximum when protected by fuses. Tests at 100,000A were performed with Class J, fast acting; please refer to the table below for maximum allowed ampere rating of the fuse. Use fuses only.

Class CC fuses are represented by tests performed on Class J fuses.

Co-ordination type 1 (UL508)

Part No.	Prospective short circuit current [kArms]	Max. fuse size [A]	Class	Voltage [VAC]
RGS..25	100	30	J or CC	max. 600
RGS..50 / 51	100	30	J or CC	max. 600
RGS..51	100	30	J or CC	max. 600
RGS..75	100	30	J or CC	max. 600
RGS..90 / 91	100	30	J or CC	max. 600
RGS..92	100	80	J	max. 600

Co-ordination type 2 (IEC/EN 60947-4-2/ -4-3)

Part No.	Prospective short circuit current [kArms]	Ferraz Shawmut		Siba		Voltage [VAC]
		Max fuse size [A]	Part number	Max fuse size [A]	Part number	
RGS..25	10	40	6.6xx CP URD 22x58 /40	32	50 142 06.32	max. 600
	100	40	6.6xx CP URD 22x58 /40	32	50 142 06.32	max. 600
RGS..50	10	80	6.621 CP URQ 27x60 /80	50	50 142 06.50	max. 600
	10	70	A70QS70-4	50	50 142 06.50	max. 600
	100	80	6.621 CP URQ 27x60 /80	50	50 142 06.50	max. 600
	100	70	A70QS70-4	50	50 142 06.50	max. 600
RGS..51	10	80	6.621 CP URQ 27x60 /80	-	-	max. 600
	10	70	A70QS70-4	-	-	max. 600
	100	80	6.621 CP URQ 27x60 /80	-	-	max. 600
	100	70	A70QS70-4	-	-	max. 600
RGS..75	10	100	6.621 CP URQ 27x60 /100	80	50 194 20.80	max. 600
	10	100	A70QS100-4	80	50 194 20.80	max. 600
	100	100	6.621 CP URQ 27x60 /100	80	50 194 20.80	max. 600
	100	100	A70QS100-4	80	50 194 20.80	max. 600
RGS..90 / 91	10	125	6.621 CP URQ 27x60 /125	100	50 194 20.100	max. 600
	10	125	A70QS125-4	100	50 194 20.100	max. 600
	100	125	6.621 CP URQ 27x60 /125	100	50 194 20.100	max. 600
	100	125	A70QS125-4	100	50 194 20.100	max. 600
RGS..92	10	125	6.621 CP URD 22x58 /125	125	50 194 20.125	max. 600
	10	125	A70QS125-4	125	50 194 20.125	max. 600
	100	125	6.621 CP URD 22x58 /125	125	50 194 20.125	max. 600
	100	125	A70QS125-4	125	50 194 20.125	max. 600

Type 2 Protection with Miniature Circuit Breakers (M. C. B.s)

Solid State Relay type	ABB Model no. for Z - type M. C. B. (rated current)	ABB Model no. for B - type M. C. B. (rated current)	Wire cross sectional area [mm ²]	Minimum length of Cu wire conductor [m] ⁹
RGS..25	1-pole S201 - Z4 (4A) S201 - Z6 UC (6A)	S201 - B2 (2A) S201 - B2 (2A)	1.0	21.0
			1.0	21.0
			1.5	31.5
RGS..50 RGS..51	1-pole S201 - Z10 (10A)	S201-B4 (4A)	1.0	7.6
			1.5	11.4
			2.5	19.0
	S201 - Z16 (16A)	S201-B6 (6A)	1.0	5.2
			1.5	7.8
			2.5	13.0
			4.0	20.8
	S201 - Z20 (20A)	S201-B10 (10A)	1.5	12.6
			2.5	21.0
	S201 - Z25 (25A)	S201-B13 (13A)	2.5	25.0
			4.0	40.0
	2-pole S202 - Z25 (25A)	S202-B13 (13A)	2.5	19.0
			4.0	30.4
	1-pole S201 - Z25 (25A)	S201-B13 (13A)	2.5	7.0
			4.0	11.2
			6.0	16.8
RGS...90, RGS...91	1-pole S201 - Z20 (20A)	S201-B10 (10A)	1.5	4.2
			2.5	7.0
			4.0	11.2
	S201 - Z32 (32A)	S201-B16 (16A)	2.5	13.0
			4.0	20.8
			6.0	31.2
	2-pole S202 - Z20 (20A)	S202-B10 (10A)	1.5	1.8
			2.5	3.0
			4.0	4.8
	S202 - Z32 (32A)	S202-B16 (16A)	2.5	5.0
			4.0	8.0
			6.0	12.0
			10.0	20.0
	S202 - Z50 (50A)	S202-B25 (25A)	4.0	14.8
			6.0	22.2
			10.0	37.0
RGS...92	1-pole S201 - Z32 (32A)	S201-B16 (16A)	2.5	3.0
			4.0	4.8
			6.0	7.2
	S201 - Z50 (50A)	S201-B25 (25A)	4.0	4.8
			6.0	7.2
			10.0	12.0
			16.0	19.2
	S201 - Z63 (63A)	S201-B32 (32A)	6.0	7.2
			10.0	12.0
			16.0	19.2

9. Between MCB and Load (including return path which goes back to the mains).

Note: A prospective current of 6kA and a 230/400V power supply system is assumed for the above suggested specifications. For cables with different cross section than those mentioned above please consult Carlo Gavazzi's Technical Support Group.

Accessories

Heatsink RHS37A



Ordering Key

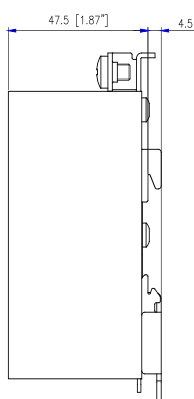
Heatsink with
DIN rail clip

RHS37A

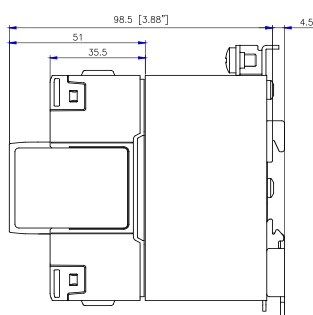
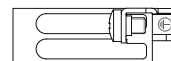
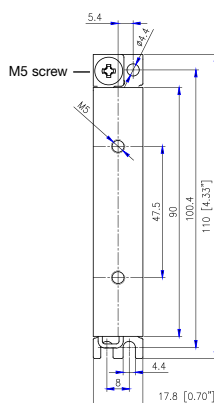
Factory mounted
heatsink to RGS

RGS....H51

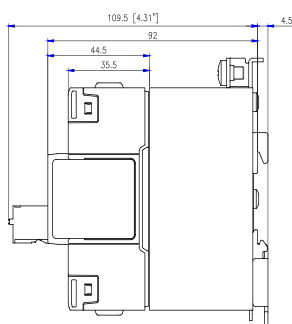
RHS37A Dimensions



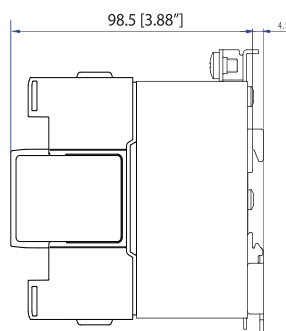
RHS37A



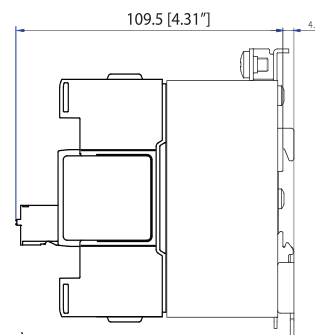
RGS...KKEH51



RGS...MKEH51



RGS...KGEH51



RGS...MGEH51

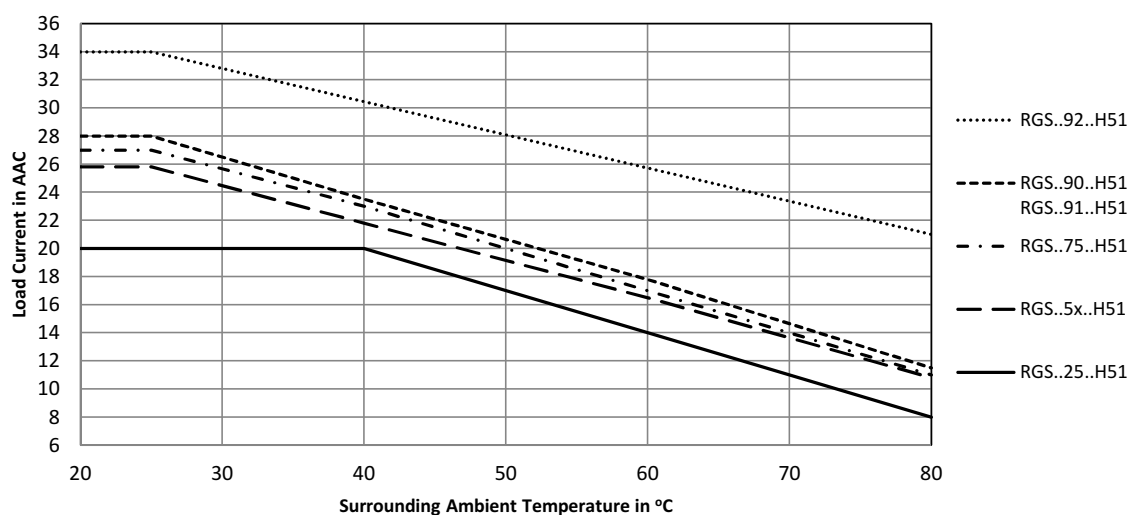
Tolerances: $\pm 0.5\text{mm}$
All dimensions in mm

Note: M5 PE screw not provided with SSR. Maximum mounting torque 1.5Nm (13.3 in-lb).
PE connection required when product is intended to be used in Class 1 applications according to EN/IEC 61140.

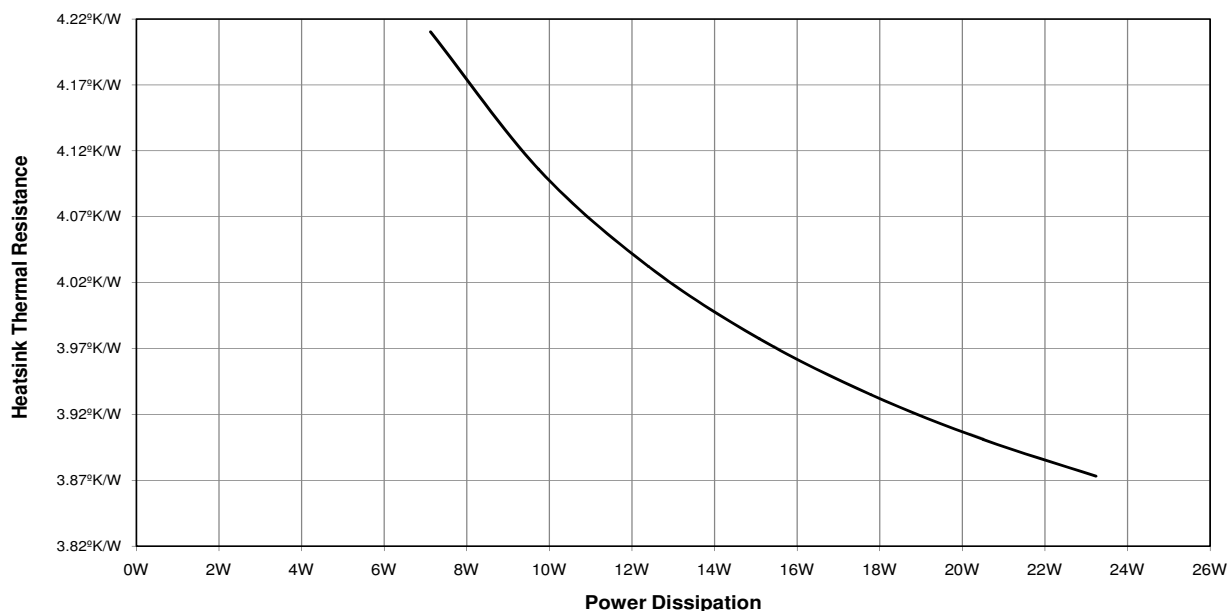
Specifications are subject to change without notice (18.06.2013)

Accessories (cont.)

Derating Curves (RGS assembled to heatsink RHS37A)



RHS37A Thermal Resistance Curve



Accessories (cont.)

RG DIN Clip



Ordering Key

DIN clip mounted to RGS

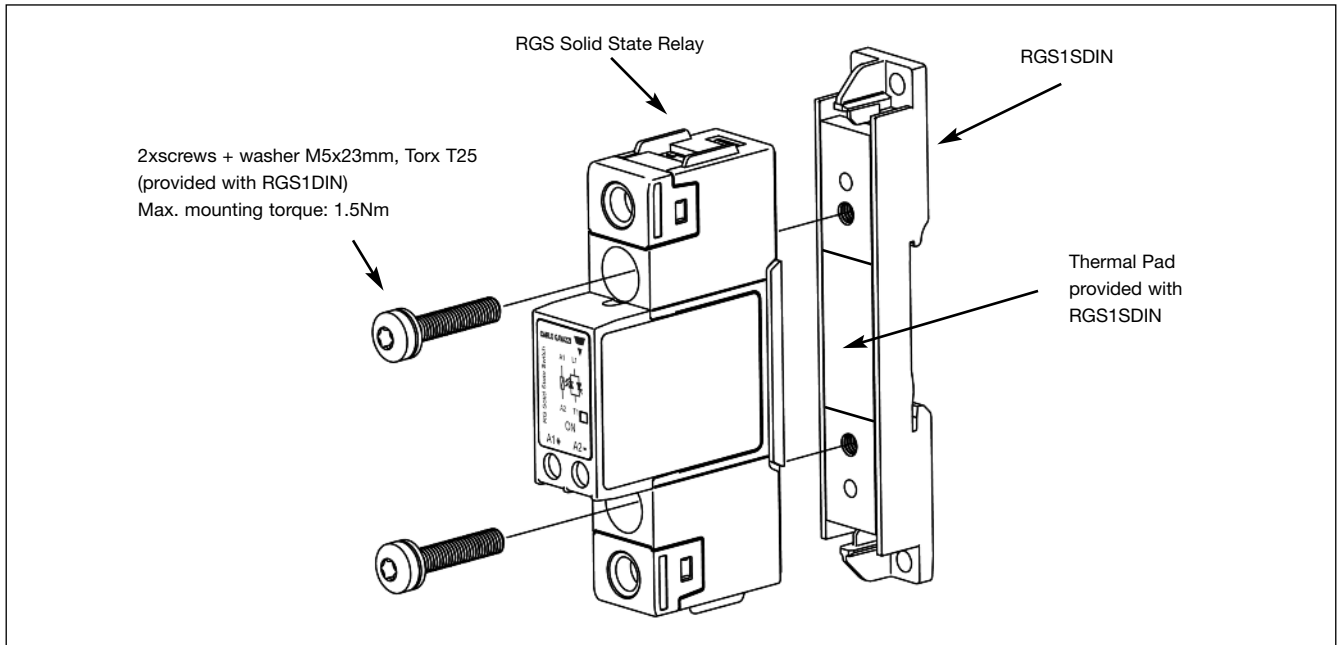
RGS....DIN

DIN clip accessory

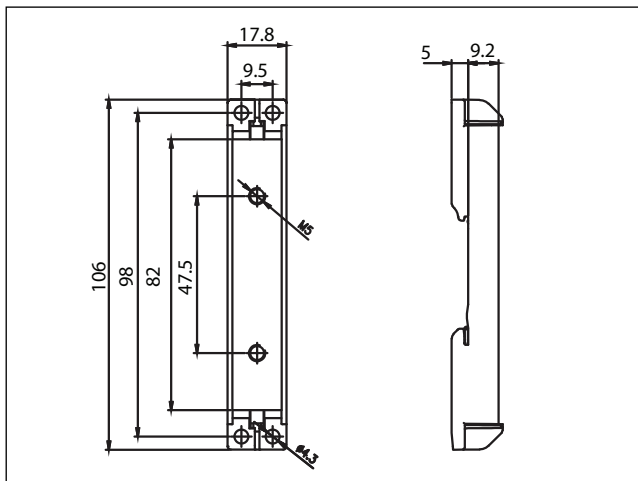
RGS1DIN

This DIN Clip accessory can be mounted to any RGS model and will enable the RGS to be DIN rail mount. Minimum current rating @ 40°C is 10AAC. Refer to 'Current Derating' section. Gradually tighten the SSR, alternating between the 2 screws, to a maximum torque of 1.5Nm.

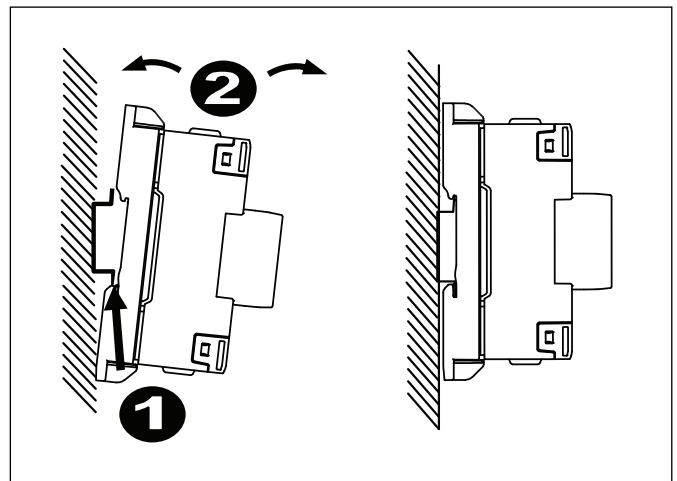
Mounting Instructions for RGS1DIN to RGS



RGS1DIN Dimensions



Installation Instructions



Accessories

Thermal Pads



Ordering Key

Thermal pad
mounted on RGS

RGS...HT

Pack of 10 thermal pads
size 34.6 x 14mm

RGHT

Control Plugs



Ordering Key

Pack of 10 spring
loaded control plugs

RGM25

* Refer to 'Connection Specifications' section for further details.