# RGC2P, RGC3P



#### 3-phase proportional switching controllers



#### Description

This series gives the possibility to control output power of 3-phase loads with an analog control input. The **RGC2P** is a 2-pole switching product whilst the **RGC3P** switches all 3 poles.

Input types cover a wide range of current and voltage ranges. Local setting by an external potentiometer is also possible. Switching modes cover phase angle control, distributed full cycle control and soft start for limiting inrush current of loads having a high temperature coefficient, such as short wave infrared heaters.

Detection of mains loss, load loss, SSR short circuit and overtemperature is integrated in some models. Alarm condition is signalled through an EMR output and is visually indicated by the alarm LED. Additional LEDs indicate input and load status.

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

#### Benefits

- Elimination of Analog to Digital convertors. The RGC2/3P can be directly controlled with an analog signal. The power output from the RGC2/3P is directly proportional to the analog control input. Output switching modes include phase angle, distributed full cycle, burst and soft stating switching.
- Panel space savings. Concentrated power; the RGC 3-phase switching range can handle up to 65 AAC per pole (or 75 AAC for 2-pole switching) in a 70 mm wide footprint.
- Long lifetime. Wire bonding technology reduces thermal and mechanical stresses of the output chips resulting in a larger number of possible operational cycles compared to other assembly technologies.
- Low machine downtime. Integrated overvoltage protection prevents the solid state relay from breaking down due to uncontrolled transients that may occur on the lines.
- Ease of use. The RGC2P and RGC3P are ready to use solutions provided with integrated heatsink thus eliminating the need for the user to calculate the size of heatsink needed for adequate thermal dissipation.
- Fast wiring. Power connections for models rated ≥30 A are equipped with terminals that can handle cables up to 25 mm² / AWG3 cables.
- Integrated monitoring for timely detection of malfunctions. The 3-phase RGC controllers can detect mains loss, load loss on any of the phases, over temperature and malfunction of the RGC2/3P controller.
- Accommodates UL508A requirements for Industrial Control Panels. The RGC 3-phase range is certified as a listed product. All models carry a 100 kArms Short Circuit Current Rating.

#### **Applications**

Plastic injection machines, thermoformers, dryers, electrical ovens, shrink tunnels, air handling units, climatic chambers, industrial printers, ovens and furnaces, battery manufacturing machines

#### Main features

- 3-phase (2-pole or 3-pole) proportional switching controllers with Phase angle switching mode, Full cycle firing, Burst firing or Soft starting switching mode
- Analog current (0-20/4-20/12-20 mA) or voltage (0-5/1-5/0-10 V or external potentiometer) control signal
- Ratings up to 660 VAC 75 AAC (RGC2P), 65 AAC (RGC3P) @ T₄ 40°C
- Integrated monitoring for load loss, over-temperature of the RGC2/3P, mains loss or malfunction of the RGC2/3P controller



# Order code

RGC2 P 60	

Enter the code entering the corresponding option instead of . Refer to selection guide section for valid part numbers.

Code	Option	Description	Comments
R		Solid State Bolov (BC)	
G	-	Solid State Relay (RG)	
С	-	With integrated heatsink	
2	-	2-pole switching, 1-pole direct	
Р	-	Switching mode: proportional	
60		Rated voltage: 180-660 VAC, 1200 Vp	
	AA	Control input: 4 - 20 mADC	Not available with monitoring 'M', not available with RGC75
	1	Control input: 0 - 20 mADC, 4 - 20 mADC, 12 - 20 mADC	Requires external supply (Us)
	V	Control input: 0-5 VDC, 1-5 VDC, 0-10 VDC	Requires external supply (Os)
	25	Rated current/pole @ 40°C: 25 AAC	
	40	Rated current/pole @ 40°C: 40 AAC	
	75	Rated current/pole @ 40°C: 75 AAC	
	C1	Switching mode: 1 FC ON, 1 FC OFF @ 50% input	
	C4	Switching mode: 4 FC ON, 4 FC OFF @ 50% input	
	D	External supply: 24 VAC/DC	
	Α	External supply: 90 - 250 VAC	
	F	Integrated fan	For RGC75 only
	M	Monitoring for Mains loss, Load loss, SSR short circuit, open circuit and OTP with EMR alarm output	Not available with control input type 'AA'

FC = Full Cycle

OTP = Over-Temperature Protection

EMR = Electromechanical Relay



# Order code

<b>(?</b> RGC3 P 60
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Enter the code entering the corresponding option instead of . Refer to selection guide section for valid part numbers.

Code	Option	Description	Comments
R	-	Solid State Relay (RG)	
G	-	Solid State Relay (RG)	
С	-	With integrated heatsink	
3	-	3-pole switching	
Р	-	Switching mode: proportional	
60	-	Rated voltage: 180-660 VAC, 1200 Vp	
	AA	Control input: 4 - 20 mADC	Not available with monitoring 'M' or 'P', not available with RGC65
	1	Control input: 0 - 20 mADC, 4 - 20 mADC, 12 - 20 mADC	Requires external supply (Us)
	V	Control input: 0-5 VDC, 1-5 VDC, 0-10 VDC	Trequires external supply (Os)
	20	Rated current/pole @ 40°C: 20 AAC	
	30	Rated current/pole @ 40°C: 30 AAC	
	65	Rated current/pole @ 40°C: 65 AAC	
	E	Switching mode: Phase Angle	Not available with RGCM
	C1	Switching mode: 1 FC ON, 1 FC OFF @ 50% input	
	C4	Switching mode: 4 FC ON, 4 FC OFF @ 50% input	
	C16	Switching mode: 16 FC ON, 16 FC OFF @ 50% input	
	S	Switching mode: Soft Start with digital input 5-10 V	With control input type 'V' only
	S16	Switching mode: Soft Start + mode C16	With control input type V only
	D	External supply: 24 VAC/DC	
	Α	External supply: 90 - 250 VAC	
	F	Integrated fan	For RGC65 only
0	Р	Integrated over temperature protection (OTP) and Mains loss with EMR alarm output	Applicable to switching mode 'E' only. Not available with control input type 'AA'
	M	Monitoring for Mains loss, Load loss, SSR short circuit, open circuit and OTP with EMR alarm output	Applicable to all switching modes except for mode 'E'. Not available with control input type 'AA'

FC = Full Cycle

OTP = Over-Temperature Protection

EMR = Electromechanical Relay



# ➤ Selection guide: 2-pole switching, 1-pole direct (RGC2P)

Current rating @ 40°C			Switchir	ng mode	
(l²t)	Input type	External supply	C1	C4	Part number
	AA: 4-20 mADC	-	•		RGC2P60AA25C1
	I: 0-20 mADC	24 VAC/DC	•		RGC2P60I25C1DM
25 AAC (1800 A²s)	4-20 mADC 12-20 mADC	24 VAOIDO		•	RGC2P60I25C4DM
	V: 0-5 VDC 1-5 VDC 0-10 VDC	24 VAC/DC	•		RGC2P60V25C1DM
	AA: 4-20 mADC	-	•		RGC2P60AA40C1
	l: 0-20 mADC	24 VAC/DC	•		RGC2P60I40C1DM
40 AAC (6600 A²s)	4-20 mADC 12-20 mADC			•	RGC2P60I40C4DM
	V: 0-5 VDC 1-5 VDC 0-10 VDC	24 VAC/DC	•		RGC2P60V40C1DM
		24 VAC/DC	•		RGC2P60I75C1DFM
	l: 0-20 mADC	24 VAO/BO		•	RGC2P60I75C4DFM
75 AAC (15000 A²s)	4-20 mADC 12-20 mADC	90-250 VAC	•		RGC2P60I75C1AFM
		30 200 77.0		•	RGC2P60I75C4AFM
	V: 0-5 VDC	24 VAC/DC	•		RGC2P60V75C1DFM
	1-5 VDC 0-10 VDC	90-250 VAC	•		RGC2P60V75C1AFM



# ➤ Selection guide: 3-pole switching (RGC3P)

Current rating @ 40°C	Input type	External supply		S	witchi	ng mo	de		Part number
(l²t)	input type	External Supply	Е	C1	C4	C16	S	S16	Part number
	AA:		•						RGC3P60AA20E
	4-20 mADC	-		•					RGC3P60AA20C1
			•						RGC3P60I20EDP
	I: 0-20 mADC	24 VAC/DC		•					RGC3P60I20C1DM
	4-20 mADC 12-20 mADC	24 VAC/DC			•				RGC3P60I20C4DM
20 AAC						•			RGC3P60I20C16DM
(1800 A²s)			•						RGC3P60V20EDP
	V:			•					RGC3P60V20C1DM
	0-5 VDC 1-5 VDC	24 VAC/DC			•				RGC3P60V20C4DM
	0-10 VDC					•			RGC3P60V20C16DM
								•	RGC3P60V20S16DM
	5-10 V, digital i/p	24 VAC/DC					•		RGC3P60V20SDM
	AA:		•						RGC3P60AA30E
	4-20 mADC			•					RGC3P60AA30C1
		24 VAC/DC	•						RGC3P60I30EDP
				•					RGC3P60I30C1DM
					•				RGC3P60I30C4DM
	I: 0-20 mADC					•			RGC3P60I30C16DM
	4-20 mADC 12-20 mADC	-	•						RGC3P60I30EAP
				•					RGC3P60I30C1AM
					•				RGC3P60I30C4AM
30 AAC						•			RGC3P60I30C16AM
(6600 A²s)			•						RGC3P60V30EDP
				•					RGC3P60V30C1DM
		24 VAC/DC			•				RGC3P60V30C4DM
	V:					•			RGC3P60V30C16DM
	0-5 VDC 1-5 VDC							•	RGC3P60V30S16DM
	0-10 VDC		•						RGC3P60V30EAP
		00.050.1/4.0		•					RGC3P60V30C1AM
		90-250 VAC			•				RGC3P60V30C4AM
						•			RGC3P60V30C16AM
	5-10 V, digital i/p	24 VAC/DC					•		RGC3P60V30SDM



# ➤ Selection guide: 3-pole switching (RGC3P)

Current rating @ 40°C	Input type	External supply	Switching mode			Part number			
(I²t)	Input type	External supply	Е	C1	C4	C16	S	S16	Part number
			•						RGC3P60I65EDFP
				•					RGC3P60I65C1DFM
		24 VAC/DC			•				RGC3P60I65C4DFM
	I: 0-20 mADC					•			RGC3P60I65C16DFM
	4-20 mADC 12-20 mADC		•						RGC3P60I65EAFP
		00 050 \/AC		•					RGC3P60I65C1AFM
		90-250 VAC			•				RGC3P60I65C4AFM
						•			RGC3P60I65C16AFM
65 AAC	V:	24 VAC/DC	•						RGC3P60V65EDFP
(15000 A²s)				•					RGC3P60V65C1DFM
					•				RGC3P60V65C4DFM
						•			RGC3P60V65C16DFM
	0-5 VDC 1-5 VDC							•	RGC3P60V65S16DFM
	0-10 VDC		•						RGC3P60V65EAFP
		90-250 VAC		•					RGC3P60V65C1AFM
		90-250 VAC			•				RGC3P60V65C4AFM
						•			RGC3P60V65C16AFM
	5-10 V, digital i/p	24 VAC/DC					•		RGC3P60V65SDFM

# Carlo Gavazzi compatible components

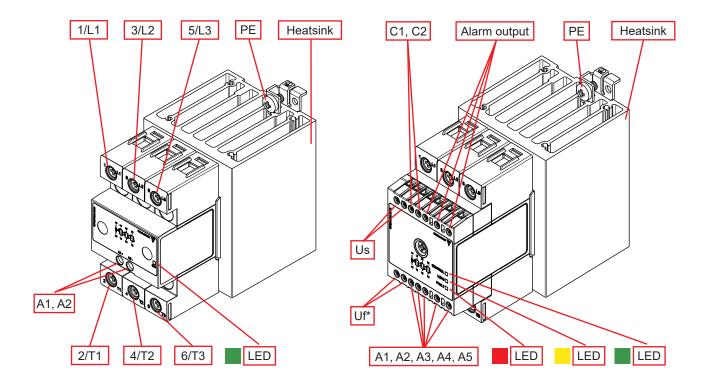
Description	Component code	Notes
Fans	RG3FAN60	Fan accessory for RGC275 and RGC365



# **Structure**

RGC3P..AA..

RGC3P..I.. RGC3P..V..



Element	Component	Function
1/L1, 3/L2, 5/L3	Power connections	Mains connection
2/T1, 4/T2, 6/T3	Power connections	Load connection
A1, A2	Control input	4-20 mA (RGCAA), 4-20 mA (RGCI), 1-5 V (RGCV)
A1, A3	Control input	12-20 mA (RGCI), 0-5 V (RGCV)
A1, A4	Control input	0-20 mA (RGCI), 0-10 V (RGCV)
A5	Potentiometer input	External Potentiometer input (RGCV)
Us	Supply connection	Terminals for supply voltage
C1, C2	Configuration	External short link ONLY for 4-wire, 3-phase systems
Uf*	Fan connection	Terminals for fan supply voltage. Connection terminated by manufacturer
Alarm output	Electro mechanical relay	Alarm output; normally open, normally closed
Green LED	CONTROL indicator	Indicates presence of control voltage and supply voltage
Yellow LED	LOAD indicator	Indicates the load status
Red LED	ALARM indicator	Indicates presence of an alarm condition
Heatsink	Integrated heatsink	DIN rail mounting
PE	Protective Earth	Connection for Protective Earth

 $<sup>\</sup>ensuremath{^*}$  only for RGC2..75, RGC3..65 versions that have an integrated fan



# **Features**

# G

### General data

Material	PA6 or PA66 (UL94 V0), RAL7035 conforms to the glow wire requirements of IEC/EN	PA6 or PA66 (UL94 V0), RAL7035 conforms to the glow wire requirements of IEC/EN 60335-1					
Mounting	DIN rail						
Touch protection	IP20						
Overvoltage category	III, 6 kV (1.2/50 μs) rated impulse withstand voltage	9					
Isolation	Input and Output to Case: Input to Output: External supply to input: Us to A1, A2, A3, A4, A5, Uf, C1, C2, 11, 12, 14 External supply & input to EMR: Us, A1, A2, A3, A4, A5, Uf, C1, C2 to 11, 12, 14	4000 Vrms 2500 Vrms 1500 Vrms (n/a for RGCAA) 1500 Vrms (n/a for RGCAA)					
Weight	RGC225 (M):       approx. 600 g (660 g)         RGC320 (M or P):       approx. 600 g (670 g)         RGC240, RGC330 (M or P):       approx. 840 g (920 g)         RGC275, RGC365:       approx. 990 g						

# **Performance**



# RGC2.. Output

	RGC225	RGC240	RGC275				
Operational voltage range, Ue Line to line voltage, L1/L2/L3	180-660 VAC						
Permissible voltage unbalance		10% between L1/L2/L3					
Blocking voltage		1200 Vp					
Max. operational current per pole¹: AC-51 @ Ta=25°C	32 AAC	50 AAC	85 AAC				
Max. operational current per pole¹: AC-51 @ Ta=40°C	27 AAC	40 AAC	75 AAC				
Max. operational current per pole <sup>2</sup> : AC-55b @ Ta=40°C	27 AAC	40 AAC	75 AAC				
Output power	0 to 100%						
Operational frequency range		45 to 65 Hz					
Output protection	In	tegrated varistor across each pol	e				
Leakage current @ rated voltage		5 mAAC per pole					
Minimum operational current	500 mAAC	1 AAC	1 AAC				
Repetitive overload current, PF= 0.7, UL508: Ta=40°C, $t_{\rm ON}$ =1 s, $t_{\rm OFF}$ =9 s, 50 cycles	61 AAC 107 AAC 154 AAC						
Non-repetitive surge current ( $I_{TSM}$ ), t=10 ms	600 Ap 1150 Ap 1750 Ap						
I²t for fusing (t=10 ms), minimum	1800 A²s	6600 A²s	15000 A²s				
No. of starts per hour <sup>2</sup>	35	10	240				
Power factor	> 0.7 @ rated voltage						
Critical dV/dt (@Tj init = 40°C)		1000 V/μs					

<sup>1.</sup> Refer to Current derating curves

<sup>2.</sup> Overload profile for AC-55b, le: AC-55b: 6x le - 0.2: 80 - x, where le = nominal current (AAC), 6x le = overload current (AAC), 0.2 = duration of overload current (s), 80 = ON duty cycle (%), x= number of starts. The overload profile for RGC2..75 is AC-55b: 3.2x le - 0.2: 80 - x



# RGC3.. Output

	RGC320	RGC330	RGC365				
Operational voltage range, Ue Line to line voltage, L1/L2/L3	180-660 VAC						
Permissible voltage unbalance		10% between L1/L2/L3					
Blocking voltage		1200 Vp					
Max. operational current per pole¹: AC-51 @ Ta=25°C	25 AAC	37 AAC	71 AAC				
Max. operational current per pole¹: AC-51 @ Ta=40°C	20 AAC	30 AAC	66 AAC				
Max. operational current per pole <sup>2</sup> : AC-55b @ Ta=40°C	20 AAC 30 AAC 66 AAC						
Output power	0 to 100%						
Operational frequency range		45 to 65 Hz					
Output protection	Integrated varistor across each pole						
Leakage current @ rated voltage		5 mAAC per pole					
Minimum operational current	500 mACC	1 AAC	1 AAC				
Repetitive overload current, PF= 0.7, UL508: Ta=40°C, $t_{on}$ =1 s, $t_{off}$ =9 s, 50 cycles	61 AAC 107 AAC 154 AAC						
Non-repetitive surge current (I <sub>TSM</sub> ), t=10 ms	600 Ap 1150 Ap 1750 Ap						
I²t for fusing (t=10 ms), minimum	1800 A²s	6600 A²s	15000 A²s				
No. of starts per hour <sup>2</sup>	140	18	230				
Power factor	> 0.7 @ rated voltage						
Critical dV/dt (@Tj init = 40°C)		1000 V/μs					

- 1. Refer to Current derating curves
- 2. Overload profile for AC-55b, le: AC-55b: 6x le 0.2: 80 x, where le = nominal current (AAC), 6x le = overload current (AAC), 0.2 = duration of overload current (s), 80 = ON duty cycle (%), x= number of starts. The overload profile for RGC3..65 is AC-55b: 3.6x le 0.2: 80 x

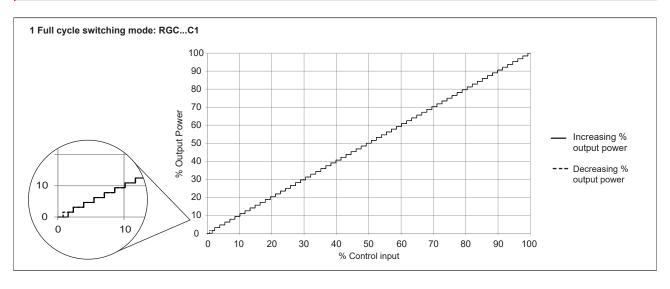
# Inputs

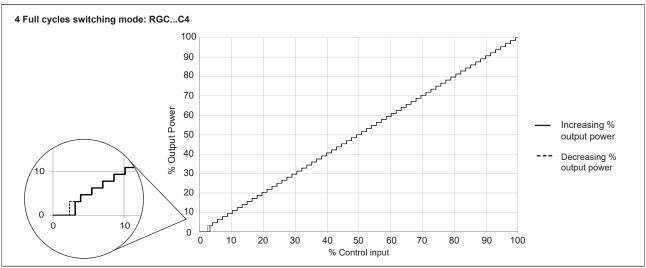
	RGCAA	RGCI	RGCV		
Control input		0 - 20 mADC	0 - 5 VDC		
	4 - 20 mADC	4 - 20 mADC	1 - 5 VDC		
		12 - 20 mADC	0 - 10 VDC		
RGC3PS			5 - 10 VDC (digital)		
Drop out voltage RGC3PS	n	/a	< 4 VDC		
External notantiameter input	n	/a	10 kΩ		
External potentiometer input	rı	/a	(terminal A1, A3, A5)		
Maximum initialisation time	250 ms				
Response time (Input to Output)					
RGCE, S	2 half cycles				
RGCC1, C4, C16, S16		3 half cycles			
Input impedance	n/a	< 250 Ω	100 kΩ		
Linearity, Output resolution	Refe	er to Transfer Characteristics se	ction		
Voltage drop	< 10 VDC @ 20 mA	n,	/a		
Reverse protection	Yes				
Maximum allowable input current	50 mA for max. 30 s n/a				
Input protection vs. surges	Yes				
Overvoltage protection	n/a Up to 24 VDC				

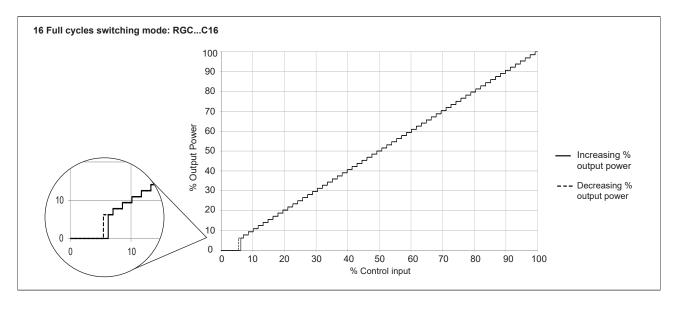
Note: Control input serial connection of multiple units is ONLY possible for RGC..AA versions and versions that require an AC external supply and hence the RGC..I..AFM, RGC..I..AFM, RGC..I..AFP and RGC..I..AFP models



#### **Transfer characteristics**



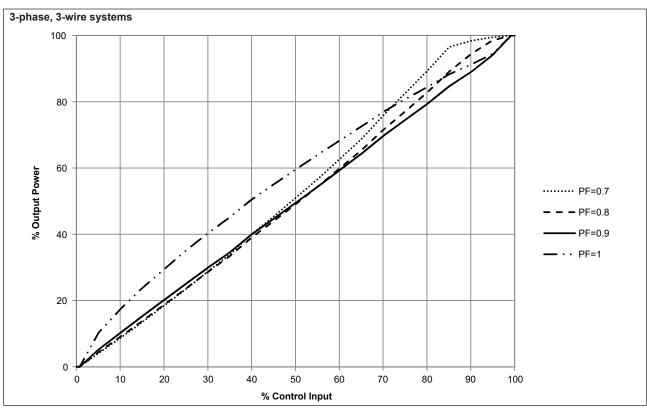


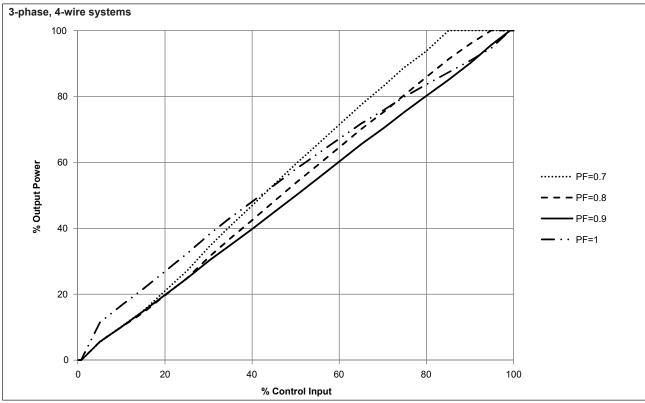




# Transfer characteristics (continued)

### Phase angle switching mode: RGC3P..E







# Power supply specifications

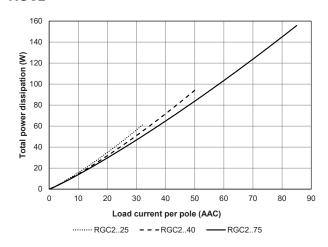
	RGCD	RGCA	
Supply voltage range, Us	24 VDC, -15% / +20% 24 VAC, -15% / +15%	90-250 VAC	
Overvoltage protection	Up to 32 VDC/AC for 30 seconds	n/a	
Reverse polarity protection	Yes	n/a	
Max. supply current no fan, RGCP, RGCM with fan, RGCFP, RGCFM	90 mA 175 mA	30 mA 60 mA	
Surge protection	Yes, integrated	Yes	

# ► Alarm output specifications (12, 14, 11)

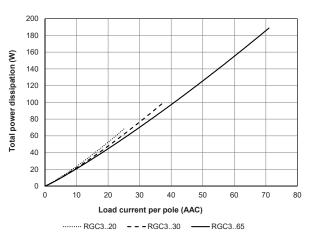
	RGCP, RGCM			
Function	Operates in case of an alarm condition on the RGCP or the RGCM			
Output type	EMR, 1 Form C Normally closed (12-11) Normally open (14-11)			
Contact rating	2 A @ 250 VAC / 30 VDC			
Isolation between open contacts	1000 VAC			

### Output power dissipation

#### RGC2

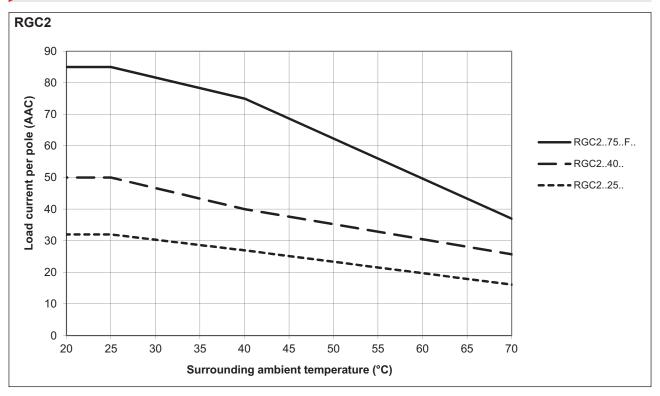


#### RGC3

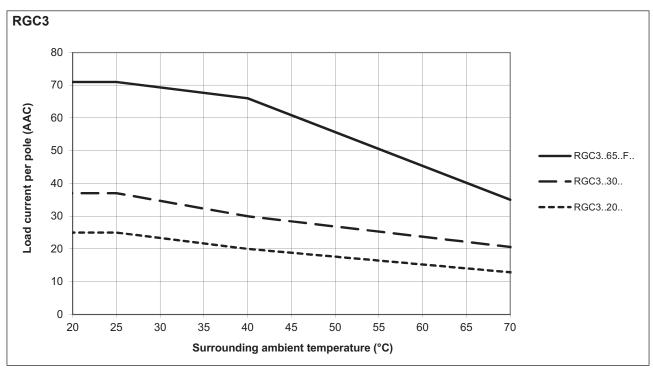




### Current derating



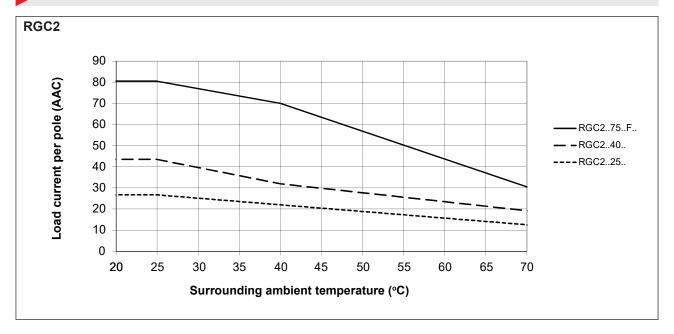
Note: Versions that utilise 24 VAC external supply (Us) are limited to a maximum operating temperature of 60°C (140°F)

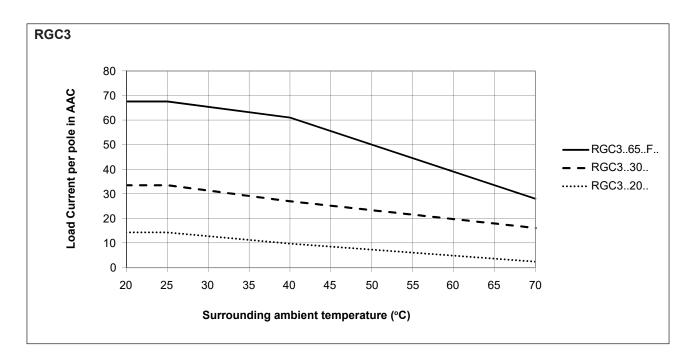


Note: Versions that utilise 24 VAC external supply (Us) are limited to a maximum operating temperature of  $60^{\circ}$ C ( $140^{\circ}$ F)



# Current derating with 0 mm spacing







# Compatibility and conformance

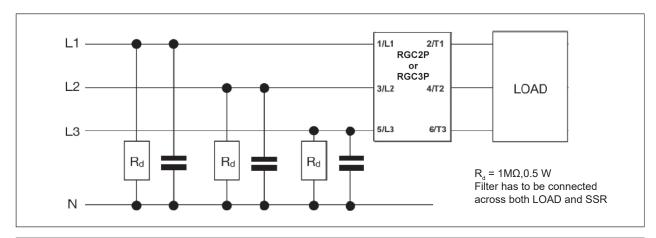
Approvals	CE LISTED LISTED LA
Standards compliance	LVD: EN 60947-4-3 EMCD: EN 60947-4-3 EE: EN 60947-4-3 EMC: EN 60947-4-3 UL: UL508 (E172877), NMFT cUL: C22.2 No. 14 (E172877), NMFT7 CCC: GB/T 14048.5-2017 (IEC 60947-5-1)
UL short circuit current rating	100 kArms (refer to short circuit current section, Type 1 – UL508)

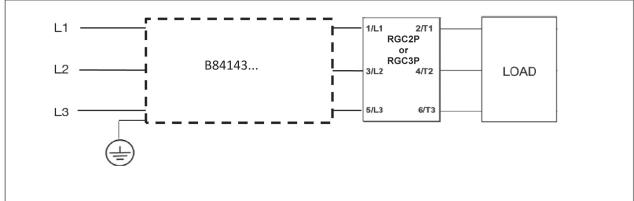
Electromagnetic compatibility (EMC) - Immunity			
Electrostatic discharge (ESD)	EN/IEC 61000-4-2 8 kV air discharge, 4 kV contact (PC2)		
Radiated radio frequency	EN/IEC 61000-4-3 10 V/m, from 80 MHz to 1 GHz (PC1) 10 V/m, from 1.4 to 2 GHz (PC1) 3 V/m, from 2 to 2.7 GHz (PC1)		
Electrical fast transient (burst)	EN/IEC 61000-4-4 Output: 2 kV, 5 kHz (PC1) Input (A1, A2, A3, A4, A5): 1 kV, 5 kHz (PC1) Signal (Us, 11, 12, 14): 1 kV, 5 kHz (PC1)		
Conducted radio frequency	EN/IEC 61000-4-6 10 V/m, from 0.15 to 80 MHz (PC1)		
RGCAA RGCI, RGCV RGCI, RGCV RGCI, RGCV RGCI, RGCV	EN/IEC 61000-4-5 Output, line to line: 1 kV (PC2) Output, line to earth: 2 kV (PC2) A1, A2, line to line: 500 V (PC1) A1, A2, line to earth: 500 V (PC1) Us+, Us-, line to line: 500 V (PC2) Us+, Us-, line to earth: 500 V (PC2) A1, A2, A3, A4, A5, line to earth: 1 kV (PC2) Us~, 11, 12, 14, line to line: 1 kV (PC2) Us~, 11, 12, 14, line to earth: 2 kV (PC2)		
Voltage dips	EN/IEC 61000-4-11 0% for 0.5, 1 cycle (PC2) 40% for 10 cycles (PC2) 70% for 25 cycles (PC2) 80% for 250 cycles (PC2)		
Voltage interruptions	EN/IEC 61000-4-11 0% for 5000 ms (PC2)		

Electromagnetic compatibility (EMC) - Emissions				
Radio interference field emission (radiated)				
Radio interference voltage emissions (conducted)	EN/IEC 55011 Class A: from 0.15 to 30 MHz (with external filtering)			



# Filter connection diagrams





### Filtering

Part number	Suggested filter for EN 55011 Class A compliance	Maximum heater current
RGC2PC1	2.2 uF, max. 760 VAC / X1	25 AAC
KGC2FC1	2.2 ur, 111ax. 700 VAC / X1	40 AAC
RGC2PC4	1.0 uF, max. 760 VAC / X1	25 AAC
RGC2FC4	1.0 ur, max. 700 vAC / X1	40 AAC
RGC3PE	Epcos, B84143A0025R105 / 530 VAC	20 AAC
RGC3PE	Epcos, B84143D0050R127 / 530 VAC	30 AAC
RGC3PC1	2.2 uF may 760 VAC / V4	20 AAC
RGC3PCT	2.2 uF, max. 760 VAC / X1	30 AAC
RGC3PC4	1.0 uF may 760 VAC / V1	20 AAC
RGC3PC4	1.0 uF, max. 760 VAC / X1	30 AAC
DCC2D C4C	4.0 v.F. may 760 VAC / V4	20 AAC
RGC3PC16	1.0 uF, max. 760 VAC / X1	30 AAC
RGC3PS	1.0 uF may 760 VAC / V1	20 AAC
	1.0 uF, max. 760 VAC / X1	30 AAC



#### Filtering (continued)

Part number	Suggested filter for EN 55011 Class B compliance	Maximum heater current
DCC2D C4	Epcos, B84143A0025R105 / 530 VAC	25 AAC
RGC2PC1	Epcos, B84143A0050R105 / 530 VAC	40 AAC
DCC2D C4	Epcos, B84143A0025R105 / 530 VAC	25 AAC
RGC2PC4	Epcos, B84143A0050R105 / 530 VAC	40 AAC
RGC3PE	Epcos, B84143A0025R105 / 530 VAC	13 AAC
	Epcos, B84143A0025R105 / 530 VAC	20 AAC
RGC3PC1	Epcos, B84143A0050R105 / 530 VAC	30 AAC
DCC2D C4	Epcos, B84143A0025R105 / 530 VAC	20 AAC
RGC3PC4	Epcos, B84143A0050R105 / 530 VAC	30 AAC
D000D 040	Epcos, B84143A0025R105 / 530 VAC	20 AAC
RGC3PC16	Epcos, B84143A0050R105 / 530 VAC	30 AAC
RGC3PS	Epcos, B84143A0025R105 / 530 VAC	20 AAC
	Epcos, B84143A0050R105 / 530 VAC	30 AAC

The suggested filtering is determined by tests carried out on a representative setup and load. The RGC2P.., RGC3P.. is intended to be integrated within a system where conditions may differentiate from conditions utilised for tests, such as load, cable lengths and other auxiliary components that may exist within the end system. It shall be the responsibility of the system integrator to ensure that the sytsem containing the above component complies with the applicable rules and regulations.

Epcos installation recomendations shall be taken in consideration when utilising such filters.

#### Note:

- Control input lines must be installed together to maintain products' susceptability 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.
- This product has been designed for Class A equipment. Use of this product in domestic environments may cause radio interference, in which case the user may be required to employ additional mitigation methods.
- · Surge tests on RGC..A models were carried out with the signal line impedence network. In case the line impedance is less than  $40\Omega$ , it is suggested that AC supply is provided through a secondary circuit where the short circuit limit between conductors or between conductors and ground is 1500VA or less.
- A deviation of one step in the distributed full cycle models and up to 1.5% Full Scale Deviation in phase angle models is considered to be within PC1 criteria.
- Performance Criteria 1 (PC1): No degradation of performance or loss of function is allowed when the product is operated as intended.
- Performance Criteria 2 (PC2): 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 (PC3): Temporary loss of function is allowed, provided the function can be restored by manual operation of the controls.



### Environmental specifications

Operating temperature	-40°C to +70°C (-40°F to +158°F) -40°C to +60°C (-40°F to +140°F) if Us = 24 VAC		
Storage temperature	-40 to +100°C (-40 to +212°F)		
Relative humidity	95% non-condensing @ 40°C		
Pollution degree	2		
Installation altitude	0-1000 m. Above 1000 m derate linearly by 1% of FLC per 100 m up to a maximum of 2000 m		
Vibration resistance	2g / axis (2-100Hz, IEC60068-2-6, EN50155, EN61373)		
Impact resistance	15/11 g/ms (EN50155, EN61373)		
EU RoHS compliant	Yes		
China RoHS	25)		

The declaration in this section is prepared in compliance with People's Republic of China Electronic Industry Standard SJ/ T11364-2014: Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products.

	Toxic or Harardous Substances and Elements					
Part Name	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominat- ed biphenyls (PBB)	Polybromi- nated diphenyl ethers (PBDE)
Power Unit Assembly	х	0	0	0	0	0

O: Indicates that said hazardous substance contained in homogeneous materials fot this part are below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

这份申明根据中华人民共和国电子工业标准

SJ/T11364-2014: 标注在电子电气产品中限定使用的有害物质

			有毒或有害	物质与元素		
零件名称	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(Vl))	多溴化联苯 (PBB)	多溴联苯醚 (PBDE)
功率单元	Х	0	0	0	0	0

O:此零件所有材料中含有的该有害物低于GB/T 26572的限定。

X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。





### 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 100,000 Arms Symmetrical Amperes, 600 Volts maximum when protected by fuses. Tests at 100,000 A were performed with Class J fuses, fast acting; please refer to the table below for maximum allowed ampere rating of the fuse. Use fuses only. Tests with Class J fuses are representative of Class CC fuses.

Protection co-ordination Type 1 according to UL 508					
Part number	Prospective short circuit current [kArms]	Max fuse size [A]	Class	Voltage [VAC]	
RGC225 RGC320		30	J or CC		
RGC240 RGC330	100	40	J	Max. 600	
RGC275 RGC365		60 <sup>3</sup>	J		

<sup>3.</sup> Consult a Carlo Gavazzi sales representative for use of 70 A class J fuses

Protection co-ordination Type 2							
Part	Prospective	Ferraz Sha	awmut (Mersen)	Siba			
number	short circuit current [kArms]	Max fuse size [A]	Part number	Max fuse size [A]	Part number	Voltage [VAC]	
	10		660 URC 14x51/40				
RGC225	10	40	6.9xx gRC URD 22x58/40	32	50 142 06 32		
KGC225	100	40	660 URD 22x58/40	32	30 142 00 32	600	
	100		A70QS40-4				
	10	63	6.9xx gRC URC 14x51/63				
RGC240	100	63	6.9xx gRC URD 22x58/63	63	50 194 20 63		
		60	A70QS60-4				
	10	100	6.9xx gRC URD 22x58/100	125	50 196 20 125		
RGC275	100		660 URQ 27x60/100				
			A70QS100-4				
	10	32	6.9xx gRC URC 14x51/32		50 142 06 32		
RGC320	100	32	6.9xx gRC URC 14x51/32	32			
	100	40	A70QS40-4				
	10		6.9xx gRC URC 14x51/40				
RGC330	100	40	6.9xx gRC URC 14x51/40	40	50 194 20 40		
	100		A70QS40-4			_	
	10	100	6.9xx gRC URC 22x58/100				
RGC365	100	90	660 URD 22x58/90	125	50 196 20 125		
	100	100	A70QS100-4	1			



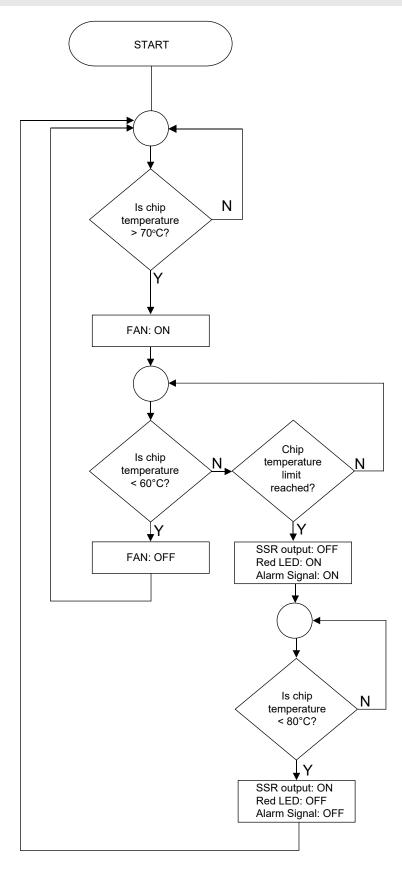
	ABB Model no. for Z - type	ABB Model no. for B - type	Wire cross sectional area	Minimum length of Cu
Solid State Relay type	M. C. B. (rated current)	M. C. B. (rated current)	[mm <sup>2</sup> ]	wire conductor [m] <sup>4</sup>
RGC225	S203 - Z10 (10 A)	S203 - B4 (4 A)	1.0	7.6
RGC320			1.5	11.4
(1800 A <sup>2</sup> s)			2.5	19.0
	S203 - Z16 (16 A)	S203 - B6 (6 A)	1.0	5.2
			1.5	7.8
			2.5	13.0
			4.0	20.8
	S203 - Z20 (20 A)	S203 - B10 (10 A)	1.5	12.6
			2.5	21.0
	S203 - Z25 (25 A)	S203 - B13 (13 A)	2.5	25.0
	0200 220 (2071)	0200 010 (1071)	4.0	40.0
RGC240	S203 - Z20 (20 A)	S203 - B10 (10 A)	1.5	4.2
RGC240 RGC330	3203 - 220 (20 A)	3203 - BTO (TO A)	2.5	7.0
			4.0	11.2
(6600 A <sup>2</sup> s)			4.0	11.2
	S203 - Z32 (32 A)	S203 - B16 (16 A)	2.5	13
	, ,	, ,	4.0	20.8
			6.0	31.2
	0000 =00 (00 4)	2000 240 (40.4)		
RGC275	S203 - Z25 (25 A)	S203 - B16 (16 A)	2.5	3.1
RGC365			4.0	5.0
(15000 A²s)			6.0	7.5
	S203 - Z50 (50 A)	S203 - B25 (25 A)	4.0	8.0
	32 =22 (2214)		6.0	12.0
			10.0	20.0
			16.0	32.0
	S203 - Z63 (63 A)	S203 - B32 (32 A)	6.0	11.3
		_ ()	10.0	18.8
			16.0	30.0
		1		

<sup>4.</sup> Between MCB and Load (including return path which goes back to the mains)

Note: A prospective current of 6 kA and a 230 / 400 V power supply 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.



### Fan operation for versions with integrated fan



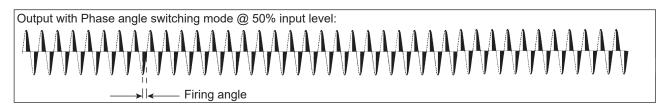




#### **Switching modes**

#### PHASE ANGLE switching - Mode E

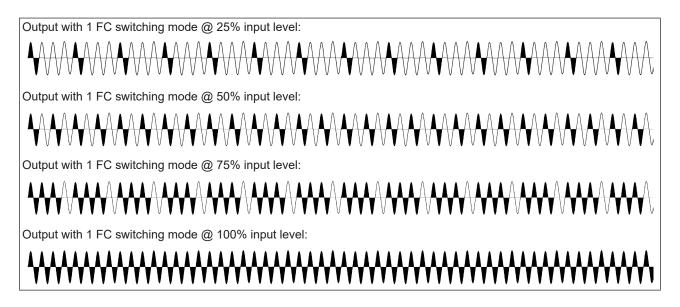
The Phase angle switching mode works in accordance with the phase angle control principle. The power delivered to the load is controlled by the firing of the thyristors over each half supply cycle. The firing angle varies in relation to the input signal level which determines the output power to be delivered to the load.



#### Full cycle switching:

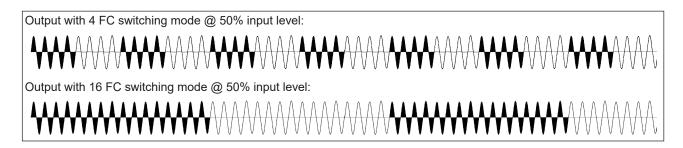
#### Single full cycle switching - Mode C1

In this switching mode only full cycles are switched. The number of full cycles delivered to the load over a specific time base is determined by the level of the analog input. The full cycles are DISTRIBUTED over this time base so as to ensure a fast and accurate control of the load. In mode C1, the switching resolution is 1 full cycle. Hence, @ an input level of 50% the output switching will be 1 FC ON, 1 FC OFF, @ 25% input 1 FC ON, 3 FC OFF and @ 75% input 1 FC OFF, 3 FC ON as shown in figure below.



#### Burst full cycle switching - Mode C4 and Mode C16

The modes C4 and C16 work on the same principle of the C1 mode and hence a number of full cycles are switched in accordance to the input level distributed over a specific time base. In the case of mode C4 the lowest resolution is 4 full cycles whilst for mode C16 it is 16 full cycles. These modes are suitable for loads which have a low thermal inertia.







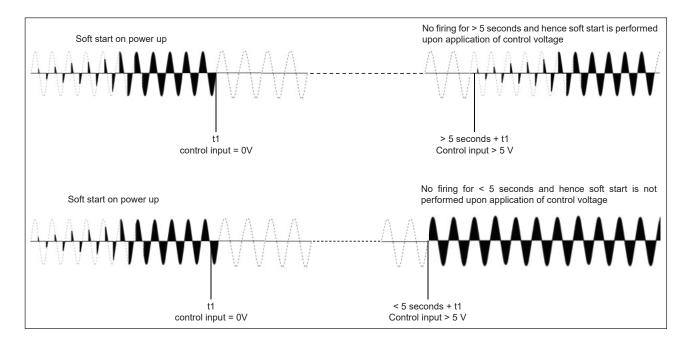
#### Switching modes (continued)

#### Soft Start switching:

In this mode the thyristor firing angle is gradually increased in order to apply the voltage (and current) to the load smoothly and thus reduce the start-up current of loads which have a high cold to hot resistance ratio such as short wave infrared heaters.

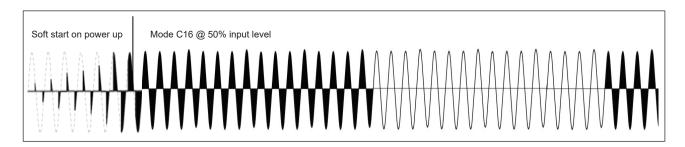
#### Soft start with digital input - Mode S

On power up, the RGC3P60V..S.. performs a soft start as soon as a control input is applied. The ramp time can be set to a maximum of 5 seconds through an onboard potentiometer. After the ramp is completed, full cycles are delivered to the output as long as a control voltage (between 5 - 10V) is present on terminals A1-A4. Soft start is not performed every time the control input is applied but only in the cases where firing has been cut off for more than 5 seconds. If for some reason ramping is stopped before ramp completion, a start is assumed to have been performed and hence the 5 seconds count start once ramping is stopped.



#### Soft start with analog input - Mode S16

This switching mode is a combination of 2 switching modes described above and hence soft start with mode S and full cycle control with mode C16. The RGC3P60V..S16 switching mode works on the principle of the mode C16 but on power up soft starting is performed to limit inrush currents loads which have a low resistance when cold. After the soft start is completed, where ramping time can be set to maximum of 5 seconds through an onboard potentiometer, the mode C16 comes into affect. Full cycles are thus delivered to the load in accorance to the input level. Soft starting is performed on power up and in case firing has been cut in the previous 5 seconds. If for some reason ramping is stopped before ramp completion, a start is assumed to have been performed and hence the 5 seconds count start once ramping is stopped.







### Mode of operation

#### RGC..AA...

The diagram below, Operation diagram 1, indicates the behaviour of models having input type 'AA' in different operating conditions. The models with this type of input are able to detect abnormal conditions such as Mains Loss and SSR Internal Fault. The presence of these abnormal conditions is indicated through the green LED which in normal operating conditions is associated with status of the control input. A flashing sequence of this LED is utilised to distinguish such abnormal conditions. Refer to LED Indications section for further details.

#### Operation diagram 1:

	Normal Operation SSR OFF	Normal Operation SSR ON	Mains L	.oss	Mains automatically restored	Interna Dete		Mains reset	Internal Fault Detection
Mains Supply (L1, L2, L3)									
Load Supply (T1, T2, T3)								 	
		% Pout proportional to input level			% Pout proportional to input level				
Output Power								 	
Control Input (A1, A2)	> 0mA < 4mA	> 4mA	> 4mA	> 0mA < 4mA	> 4mA	> 4mA	> 0mA < 4mA	> 0mA < 4mA	> 0mA < 4mA
		varying intensity			varying intensity				
Green LED (Control input)									
						automatic switch Ol	ally. If alarm F device su	does not reco pply (Us) and	rm may recover over automatically, I switch back ON. evice to factory.

#### RGC..I, RGC..V..

The versions with input type 'I' or 'V' have integrated system monitoring for the detection of system and also SSR faults. An external supply of 24VDC/AC or 90-250VAC, selectable through part no. configuration, is required for the operation of these models.

In case of a fault condition, an alarm signal is issued through an EMR. A red LED is also used for visual indication with a specific flash rate for easy identification of the alarm type. Refer to section LED Indications for further details. Additionally, a yellow LED is present on the models with 'I' or 'V' input type which gives an indication of the status of the load. This LED is ON every time the SSR output, and hence the load, is in the ON state.

System monitoring is identified with suffix 'P' or 'M' at the end of the RGC part no. The following is a description of the difference between the two suffixes.

Note: Monitoring for system and SSR faults is not active during the soft start function available with models RGC3P60V..S.. and RGC3P60V..S16.





### Mode of operation (continued)

#### 1. RGC..I..P, RGC..V..P

The versions with suffix 'P' are available only with switching mode 'E', i.e., phase angle. The detectable alarm conditions in this series are the following:

- Mains Loss (Operation diagram 2)
- SSR Over Temperature (Operation diagram 3)
- SSR Internal Fault (Operation diagram 3)

The following operation diagrams show the behaviour of the RGC..I..P and RGC..V..P under different operating and abnormal conditions.

#### Operation diagram 2:

	Normal Operation SSR OFF	Normal Operation SSR ON	Mains Loss >1s	Mains automatically restored	Supply Us Loss
Mains Supply (L1, L2, L3)				(1s)	
Load Supply (T1, T2, T3)					
Load Current		% Pout proportional to input level		% Pout proportional to input level	
Supply Voltage (Us)					
Control Input (A1-A2/A3/A4/A5)					
Green LED (Control & Supply)	ШШ				
Yellow LED (Load status)					
Red LED (Alarm LED)		 	11 11 11 11		
Alarm Output, NO (11-14)		! ! !			
Alarm Output, NC (11-12)					
			Alarm is issued in case mains loss is present >1s	Alarm is cleared if mains is restored and present for >1s	

#### Operation diagram 3:

	Normal Operation SSR ON		ternal Fault Detection	Supply Us Reset	Internal Fault cleared	Over temperature condition	Over temperature condition cleared
Mains Supply (L1, L2, L3)							
Load Supply (T1, T2, T3)							
	% Pout proportional to input level	1 1 1 1 1 1			% Pout prop. to input level		% Pout proportional to input level
Load Current							
Supply Voltage (Us)							
Control Input (A1-A2/A3/A4/A5)							
Green LED (Control & Supply)							
Yellow LED (Load status)							
Red LED (Alarm LED)	 	ш					
Alarm Output, NO (11-14)	! ! !						
Alarm Output, NC (11-12)							





### Mode of operation (continued)

#### 2. RGC..I..M, RGC..V..M

Suffix 'M' is available with all switching modes apart from mode 'E'. The detectable alarm conditions for the versions with suffix 'M' are the following:

- Mains Loss (Operation diagram 2)
- SSR Over Temperature (Operation diagram 3)
- SSR Internal Fault (Operation diagram 3)
- Load Loss (Operation diagram 4)
- SSR Open Circuit (Operation diagram 4)
- SSR Short Circuit (Operation diagram 5)

The operation diagrams for Mains Loss, SSR Over Temperature and SSR Internal Fault for the RGC..l..M and RGC..V..M are identical to those of RGC..l..P and RGC..V..P shown in Operation Diagrams 2 and 3. The following diagrams show the behaviour of the RGC..l..M and RGC..V..M under the additional detectable abnormal conditions available only with the 'M' suffix versions.

#### Operation diagram 4:

					Load loss /	
Load loss or Open circuit	Normal Operation SSR OFF	Normal Operation SSR ON	Load loss or Open Circuit on one of the phases		Open Circuit automatically restored	Supply Us Loss
Mains Supply (L1, L2, L3)						
Load Supply (T1, T2, T3)			2-phases only	2-phases only		
		% Pout proportional to input level	2-phases only	2-phases only	% Pout proportional to input level	
Load Current						
Supply Voltage (Us)						
Control Input (A1-A2/A3/A4/A5)						
Green LED (Control & Supply)	ШШ					
Yellow LED (Load status)						
Red LED (Alarm LED)			шш	шш	i !	
Alarm Output, NO (11-14)		 				
Alarm Output, NC (11-12)						
		i 	Load loss and O are detectable only d			! ! ! !

#### Operation diagram 5:

	Normal Operation SSR OFF	SSR short circuit condition during control OFF (>120ms)
Mains Supply (L1, L2, L3)		
Load Supply (T1, T2, T3)		
Load Current		
Supply Voltage (Us)		
Control Input (A1-A2/A3/A4/A5)		
Green LED (Control & Supply)	Ш	
Yellow LED (Load status)		
Red LED (Alarm LED)		
Alarm Output, NO (11-14)		
Alarm Output, NC (11-12)		



# ► LED indicators

		RGCAA	RGCI, RGCV
CONTROL	Green	Control >4 mA: varying intensity with control level Control <4 mA: Flashing 0.5 s ON, 0.5 s OFF	Supply ON, Control ON: ON Supply ON, Control OFF: Flashing 0.5 s ON, 0.5 s OFF
LOAD	Yellow	n/a	Load ON: ON
	Red	n/a	Refer to Alarm management section
ALARM	Green	Refer to Alarm Management section (Mains loss and SSR internal fault only)	n/a

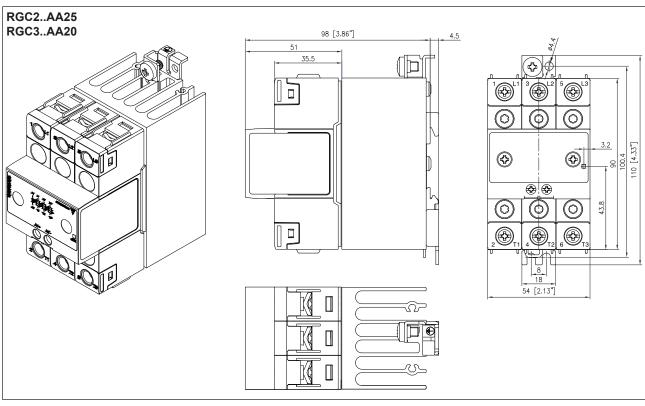
### Alarm management

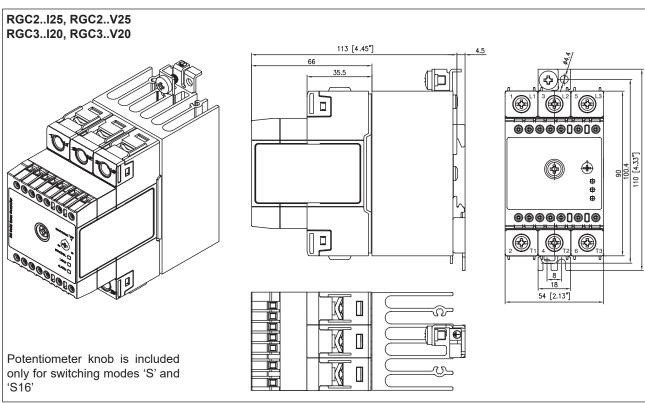
Flashes	Description of Fault	Timing Diagram
2	Mains loss	
3	Load loss, SSR open circuit or SSR short circuit	0.5s → <del>**</del>
4	SSR internal fault	0.5s
100%	SSR over temperature	

In case of an internal error, attempt to reset the Mains supply by Switching OFF and back ON to clear the error condition. If this condition is still present, return device to factory.



### **Dimensions**



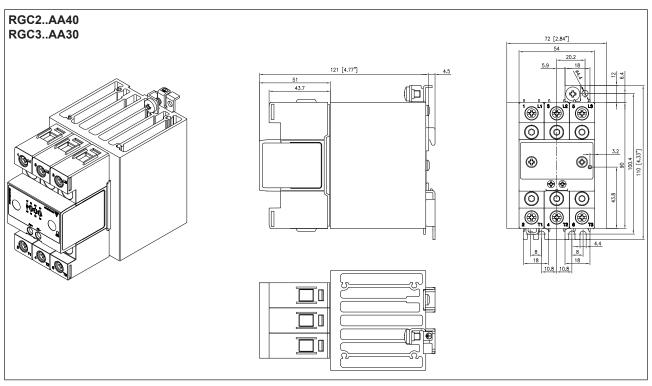


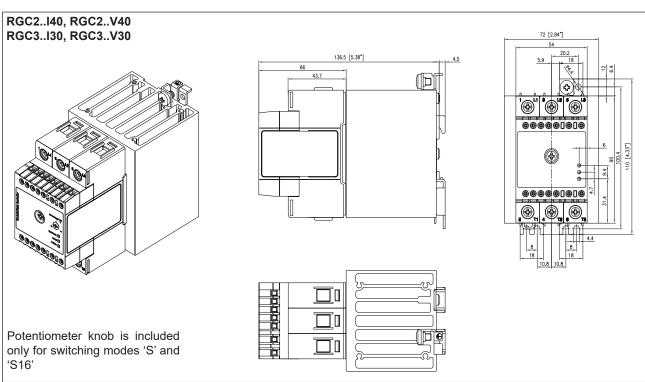
Housing width tolerance +0.5mm, -0mm as per DIN 43880. All other tolerances +/- 0.5mm. Dimensions in mm.

28



### Dimensions (continued)



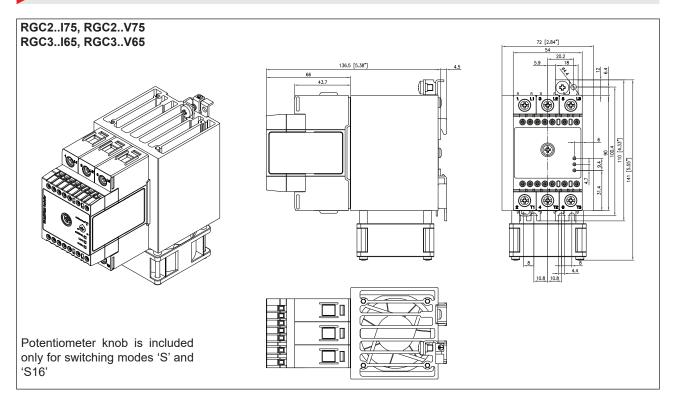


Housing width tolerance +0.5mm, -0mm as per DIN 43880. All other tolerances +/- 0.5mm. Dimensions in mm.

29



# Dimensions (continued)

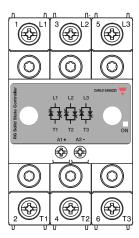


Housing width tolerance +0.5mm, -0mm as per DIN 43880. All other tolerances +/- 0.5mm. Dimensions in mm.

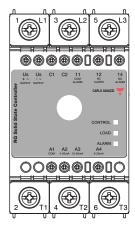
30



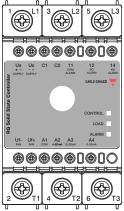
#### **Terminal layout**



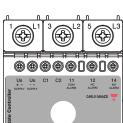
RGC2P..AA25, RGC2P..AA40 RGC3P..AA20, RGC3P..AA30



RGC2P...125, RGC2P...140 RGC3P..120, RGC3P..130



RGC2P..175 RGC3P..165



**\*\*\* \*\*\*** 

RGC2P..V75 RGC3P..V65

### Terminals labelling:

1/L1, 2/L2, 3/L3: Line connections 2/T1, 4/T2, 6/T3: Load connections

Control input A1, A2:

4-20 mA (RGC..AA..), 4-20 mA (RGC..I..),

1-5 V (RGC..V..)

Control input A1, A3:

12-20 mA (RGC..I..), 0-5 V (RGC..V..)

Control input A1, A4:

0-20 mA (RGC..I..), 0-10 V (RGC..V..)

External Potentiometer input (RGC..V..) A5:

External supply, positive signal Us (+, ~):

(RGC..DM, DFM, DP, DFP),

AC signal (RGC..AM, AFM, AP, AFP)

External supply, ground Us (-, ~):

(RGC..DM, DFM, DP, DFP),

AC signal (RGC..AM, AFM, AP, AFP)

C1, C2: Configuration mode selection

> External short link between C1 & C2 is required ONLY in case of 4-wire, 3-phase

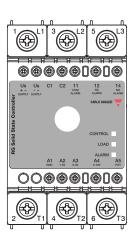
systems

Uf+: Fan supply positive signal

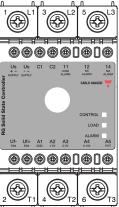
Uf -: Fan supply ground

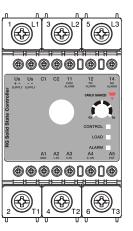


Connections to Uf-, Uf+ are readily terminated by manufacturer. No other connection is required by end

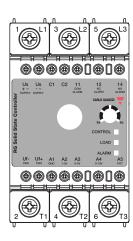


RGC2P..V25, RGC2P..V40 RGC3P..V20, RGC3P..V30





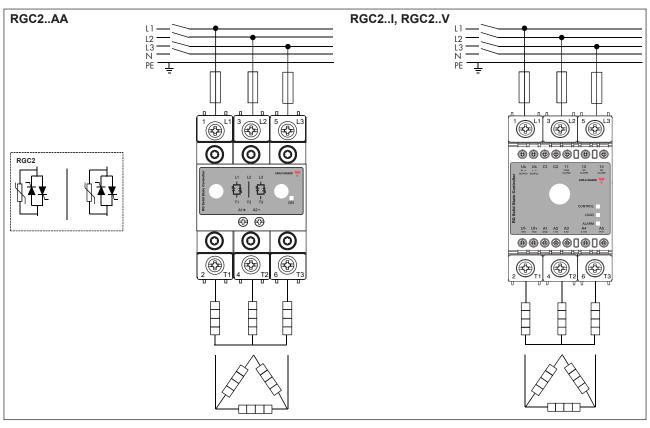
RGC3P..V20S.., RGC3P..V30S..

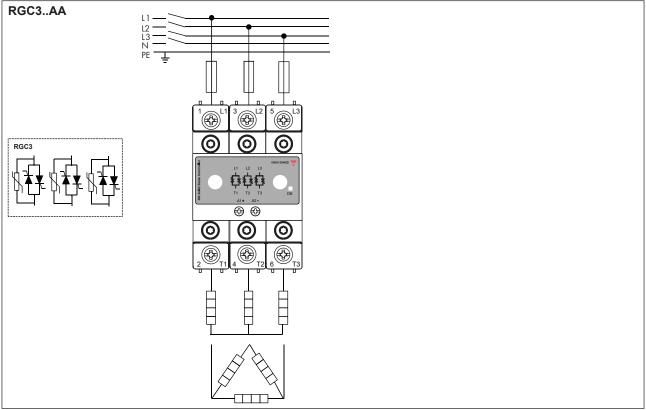


RGC3P..V65S..



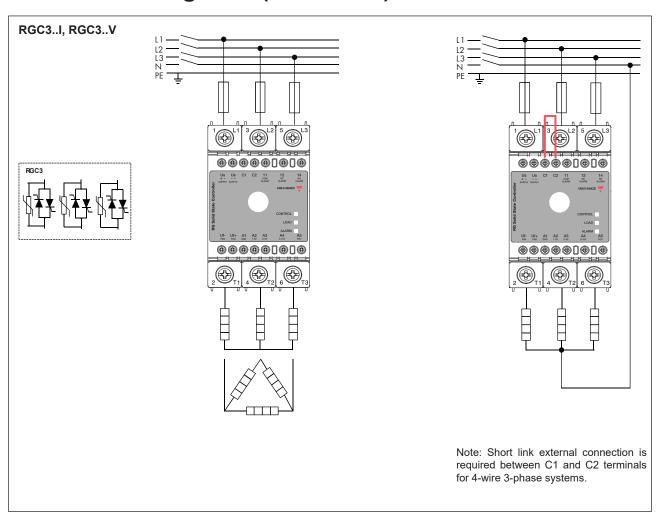
# **Connection diagrams**





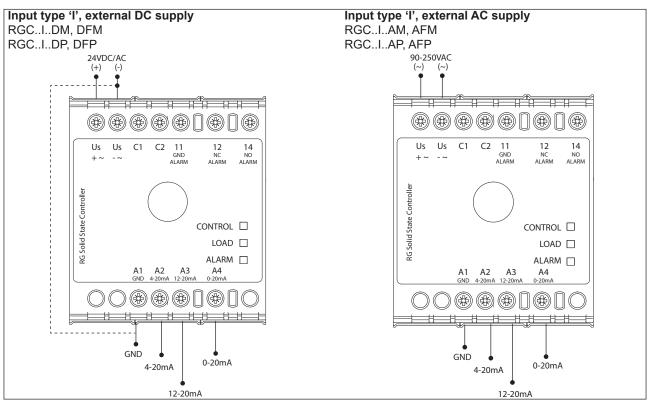


# **Connection diagrams (continued)**

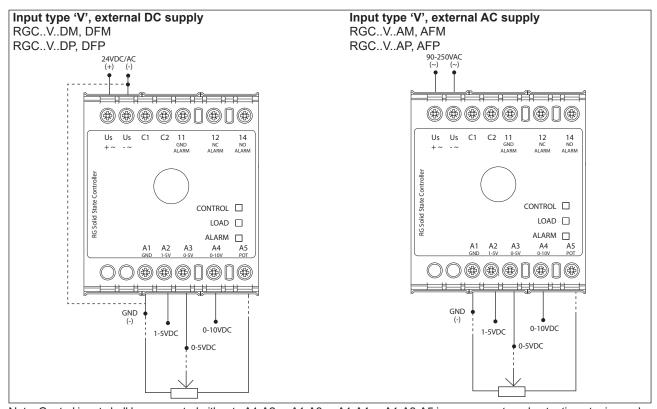




### **Connection configuration**



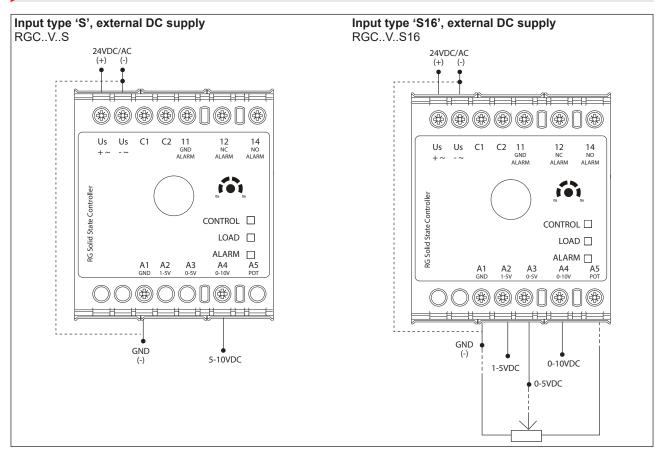
Note: Contol input shall be connected either to A1-A2 or A1-A3 or A1-A4 only



Note: Control input shall be connected either to A1-A2 or A1-A3 or A1-A4 or A1-A3-A5 in case an external potentiometer is used.

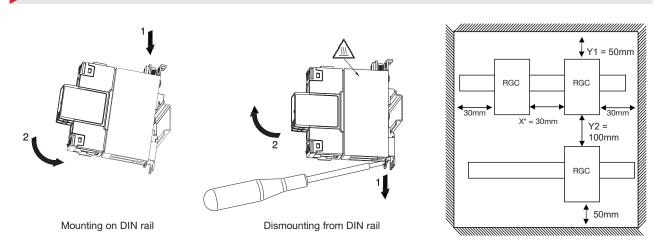


### **Connection configuration (continued)**



Note: Control input shall be connected to terminals A1-A4 in the case of the RGC3P..S.. In the case of the RGC3P..S16.., the control input shall be connected to either A1-A2 or A1-A3 or A1-A4 or A1-A3-A5 in case an external potentiometer is used.

#### Installation



<sup>\*</sup> Refer to Current Derating curves at 0mm for 0mm spacing between units



# **Connection specifications**

Power connection	Power connection							
Terminal	1/L1, 3/L2, 5/L3, 2	/T1, 4/T2, 6/T3						
Conductors	Use 75°C copper (	(Cu) conductors						
	RGC225 RGC320		RGC240, RGC275 RGC330, RGC365					
Stripping length	12 mm		11 mm					
Connection type	M4 screw with cap	tivated washer	M5 screw with box clamp					
Rigid (solid & stranded) UL/cUL rated data	2 x 2.5 – 6.0 mm <sup>2</sup> 2 x 14 – 10 AWG	1 x 2.5 – 6.0 mm <sup>2</sup> 1 x 14 – 10 AWG	1 x 2.5 – 25.0 mm <sup>2</sup> 1 x 14 – 3 AWG					
Flexible with end sleeve	2 x 1.0 – 2.5 mm <sup>2</sup> 2 x 2.5 – 4.0 mm <sup>2</sup> 2 x 18 – 14 AWG 2 x 14 – 12 AWG		1 x 2.5 – 16.0 mm <sup>2</sup> 1 x 14 – 6 AWG					
Flexible without end sleeve	2 x 1.0 – 2.5 mm <sup>2</sup> 2 x 2.5 – 6.0 mm <sup>2</sup> 2 x 18 – 14 AWG 2 x 14 – 10 AWG		1 x 4.0 – 25.0 mm <sup>2</sup> 1 x 12 –3 AWG					
Torque specifications	Posidrive bit 2 UL: 2.0 Nm (17.7 lb-in) IEC: 1.5 – 2.0 Nm (13.3 – 17.7 lb-in)		Posidrive bit 2 UL: 2.5 Nm (22 lb-in) IEC: 2.5 – 3.0 Nm (22 – 26.6 lb-in)					
Aperture for termination lug (fork or ring)	12.3 mm		n/a					
Protective Earth (PE) connection	M5, 1.5 Nm (13.3 lb-in) M5 PE screw is not provided with the solid state relay. PE connection is required when product is intended to be used in Class 1 applications according to EN/IEC 61140							



# **Connection specifications (continued)**

Control, supply and alarm connection						
	A1, A2		A1, A2, A3, A4, A5, Us, Uf, 11, 12, 14, C1, C2			
	RGCAA		RGCI, RGCV			
Terminals						
Conductors	Use 60/75°C copp	er (Cu) conductors				
Stripping length	8 mm		8 mm			
Connection type	M3 screw with captivated washer		M3 screw with box clamp			
Rigid (solid & stranded) UL/cUL rated data	2 x 0.5 - 2.5 mm <sup>2</sup> 2 x 18 - 12 AWG	1 x 0.5 - 2.5 mm <sup>2</sup> 1 x 18 - 12 AWG	1 x 1.0 - 2.5 mm <sup>2</sup> 1 x 18 - 12 AWG			
Flexible with end sleeve	2 x 0.5 - 2.5 mm <sup>2</sup>		1 x 0.5 - 2.5 mm <sup>2</sup> 1 x 20 - 12 AWG			
Torque specification	Posidrive 1 UL: 0.5 Nm (4.4 lb-in) IEC: 0.5-0.6 Nm (4.4-5.3 lb-in)		Posidrive 1 UL: 0.5 Nm (4.4 lb-in) IEC: 0.4-0.5 Nm (3.5-4.4 lb-in)			



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<u>RGC3P60V65C1DFM</u> <u>RGC2P60V25C1DM</u> <u>RGC3P60V20EDP</u> <u>RGC3P60I65EDFP</u> <u>RGC2P60V40C1DM</u>

<u>RGC3P60AA20E</u> <u>RGC2P60V75C1DFM</u> <u>RGC3P60AA30E</u> <u>RGC2P60AA40C1</u> <u>RGC3P60I30C1DM</u> <u>RGC3P60V30EDP</u>

<u>RGC2P60AA15C1</u> <u>RGC3P60AA20C1</u>