RZ3A

Industrial, 3-phase zero switching

Main features

- 3-phase Solid State Relay
- Zero switching
- Rated operational current: 3 x 25, 55 or 75 A
- Rated operational voltage: Up to 690 VAC
- Control voltage, 4-32 VDC or 24-275 VAC
- Integral snubber network
- Built-in varistor
- Over-temperature protection option with alarm output
- IP 10 back-of-hand protection
- LED indication of control input and over-temperature alarm status

Description

A Solid State Relay family designed to switch various loads such as heating elements, motors and transformers.
The relay is capable of switching high voltages up to 600 VACrms. The built-in varistor secures transient protection for heavy industrial applications.
For higher reliability and load cycle capability three semiconductor power units are soldered directly on to the direct copper bonded (DCB) substrate.
AC- or DC-controlled versions are available. Built-in LED status indication for applied control voltage and overtemperature alarm (optional).
The series covers a range of load currents up to 75 AACrms.

Applications

Plastic extrusion machines, thermoforming machines, blow moulding machines, coffee machines, electrical ovens, vending machines, soldering ovens, dryers, climatic chambers, air handling units, plastic sealing machines, shrink tunnels, etc.

Main functions

- 3-pole switching AC solid state relay

References

Order code

RZ3A □□□□

Enter the code entering the corresponding option instead of □

Code	Option	Description	Notes
RZ	-	Solid State Relay	
3	-	Number of poles	
A	-	Switching mode: zero switching	
□	40	Rated operational voltage: 400 VACrms	
	48	Rated operational voltage: 480 VACrms	
	60	Rated operational voltage: 600 VACrms	
	69	Rated operational voltage: 690 VACrms	
□	D	Control voltage: 4 - 32 VDC	
	A	Control voltage: 24-275 VAC / 24-50 VDC	
□	25	Rated operational current: 3 x 25 AACrms	
	55	Rated operational current: 3 x 55 AACrms	
	75	Rated operational current: 3 x 75 AACrms	
□			
	P	Over-temperature protection and alarm output	Available only for A and D input

Selection guide

Rated operational voltage	Control voltage	Rated operational current		
		3 x 25 A	3 x 55 A	3 x 75 A
400 VACrms	4-32 VDC	**RZ3A40D25**	**RZ3A40D55**	**RZ3A40D75**
	24-275 VAC/24-50 VDC	**RZ3A40A25**	**RZ3A40A55**	**RZ3A40A75**
480 VACrms	4-32 VDC	**RZ3A48D25**	**RZ3A48D55**	**RZ3A48D75**
	24-275 VAC/24-50 VDC	**RZ3A48A25**	**RZ3A48A55**	**RZ3A48A75**
600 VACrms	4-32 VDC	**RZ3A60D25**	**RZ3A60D55**	**RZ3A60D75**
	24-275 VAC/24-50 VDC	**RZ3A60A25**	**RZ3A60A55**	**RZ3A60A75**
690 VACrms	4-32 VDC	-	-	**RZ3A69D75**
	24-275 VAC/24-50 VDC	-	-	**RZ3A69A75**

Notes
Over-temperature protection and alarm output: add suffix P to include over-temperature protection and alarm output.
Example: RZ3A60D75P. Not available on 690VACrms versions.

CARLO GAVAZZI compatible components

Purpose	Component name/code	Notes
Heatsinks	RHS	Heatsinks and fans
Thermal pad	RZHT	Packing qty. 10 pcs.

Further reading

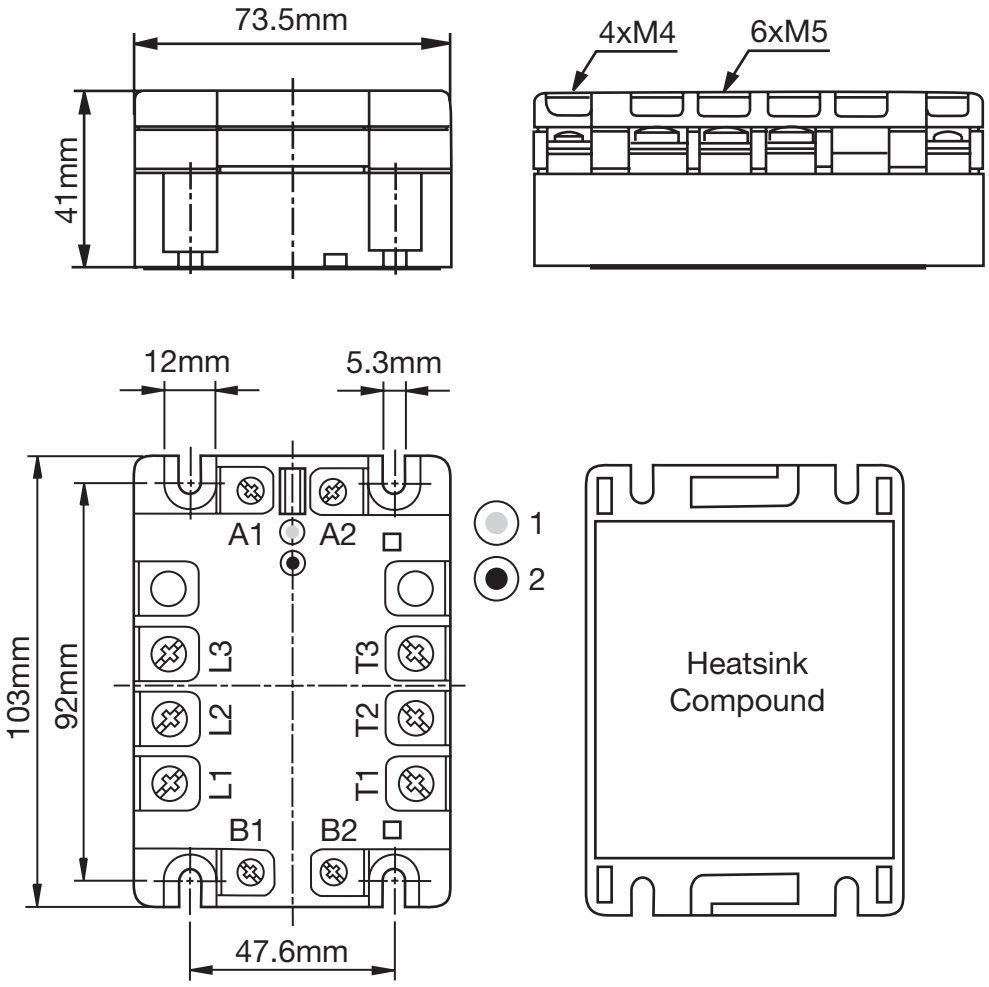
Information	Where to find it
Online heatsink selector tool	http://www.productselection.net/heatsink/heatsinkSelector.php?LANG=UK

Features

General

Material	Noryl
Potting compound	Polyurethane
Weight	Approx. 380 g
Rated isolation voltage	Input to output: 4000 VACrms Output to case: 4000 VACrms
Pollution degree	3
Base plate	25, 55A: aluminum, nickel-plated 75A: copper, nickel-plated

Dimensions



1. Relay On LED
2. Over-temperature Alarm Trip LED (suffix “P” option)

Performance

Mains supply

	RZ3A40..	RZ3A48..	RZ3A60..	RZ3A69..
Operational voltage range	24-440 VAC	42-530 VAC	42-660 VAC	42-750 VAC
Operational frequency range	45 to 65 Hz			
Blocking voltage	850 Vp	1200 Vp	1600 Vp	1600 Vp
Overvoltage category	III			

Outputs

	RZ3A..25..	RZ3A..55..	RZ3A..75..
Rated operational current **AC 51 @ T_a = 25°C** **AC 53a @ T_a = 25°C**	 25 Arms 5 Arms	 55 Arms 15 Arms	 75 Arms 20 Arms
Min. operational load current	150 mArms	250 mArms	400 mArms
Rep. overload current t=1 s	37 Arms	< 125 Arms	< 150 Arms
Non-rep. surge current t=10 ms	325 Ap	600 Ap	1150 Ap
Off-state leakage current	< 3 mArms		
I^2t for fusing t=10 ms	525 A^2s	1800 A^2s	6600 A^2s
Critical dV/dt off state min.	≥ 500 V/µs		
On-state voltage drop	< 1.6 Vrms		

Inputs

	RZ3A..D..	RZ3A..A..
Control voltage	4-32 VDC	24-275 VAC/24-50 VDC
Pick-up voltage	3.8 VDC	18 VAC/20 VDC
Drop-out voltage	1.2 VDC	9 VAC/DC
Input current	≤ 23 mA	≤ 15 mA
Response time pick-up **Power output = 50 Hz**	 10 ms	 20 ms
Response time drop-out **Power output = 50 Hz**	 10 ms	 30 ms

Thermal data

Operating temperature	-30° to +80°C (-22° to +176° F)
Storage temperature	-40° to +100°C(-40° to + 212° F)
Junction temperature	+125°C (+ 257°F)

Compatibility and conformity

Approvals	

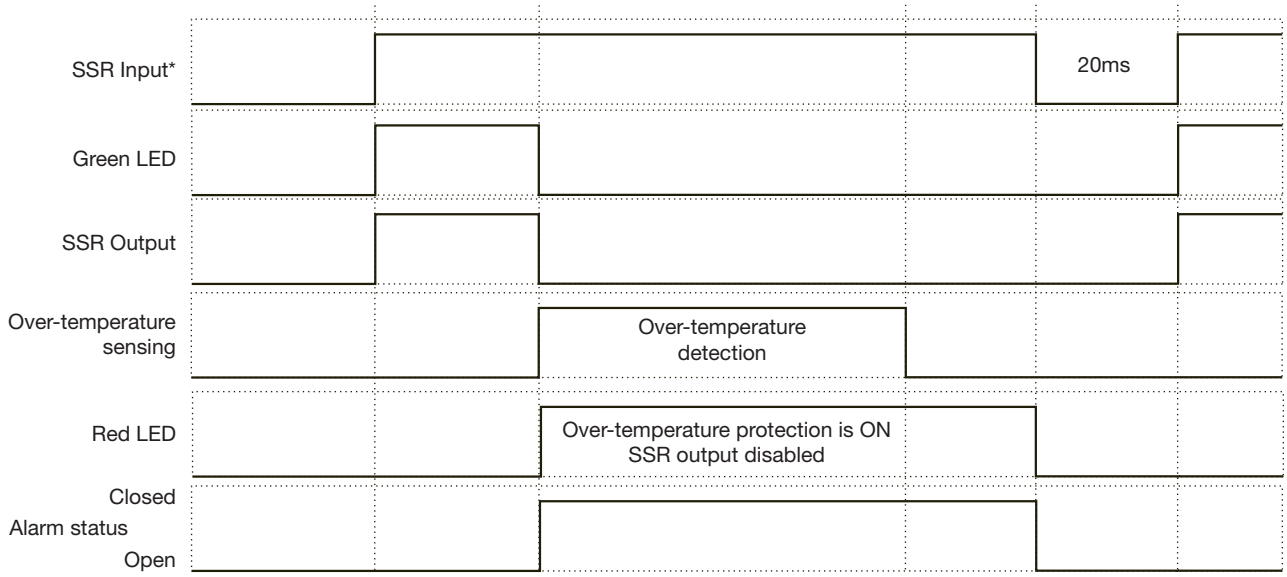
Electromagnetic compatibility (EMC) - immunity	
Electrostatic discharge (ESD)	EN 61000-4-2 8 kV air discharge, 4 kV contact (PC2)
Radiated radio frequency	EN 61000-4-3 10 V/m, from 80 MHz to 1 GHz (PC1) 10 V/m, from 1.4 to 2 GHz (PC1) 3 V/m, from 2 to 2.7 GHz (PC1)
Electrical fast transient (burst)	EN 61000-4-4 Output: 2 kV, 5 kHz (PC1) Input: 1 kV, 5 kHz (PC1)
Conducted radio frequency	EN 61000-4-6 10V/m, from 0.15 to 80 MHz (PC1)
Electrical surge	EN 61000-4-5 Output, line to line: 1 kV (PC1) Output, line to earth: 2 kV (PC1) Input, line to earth: 2 kV (PC1)
Voltage dips	EN 61000-4-11 0% for 0.5, 1 cycle (PC2) 40% for 10 cycles (PC2) 70% for 25 cycles (PC2)
Voltage Interruptions	EN 61000-4-11 0% for 5000ms (PC2)

Electromagnetic compatibility (EMC) - emissions	
Radio interference field emission (radiated)	EN 55011 Class A: from 30 to 1000 MHz
Radio interference voltage emissions (conducted)	From 0.15 to 30 MHz EN 55011 Class A (industrial) with filters EN 60947-4-3 Class A (no filtering needed)

Note:

- 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.
- Control input lines must be installed together to maintain products' susceptability to Radio Frequency interference.

Over-temperature protection (option: ...P)



*After over-temperature condition is removed, SSR can be reset by switching OFF the control input for more than 20 ms and switching back ON: this will switch ON the SSR output

Heatsink selection

Thermal resistance [K/W] of RZ3..25

Load current [A]	Ambient temp. [°C]							Power dissipation [W]
	20	30	40	50	60	70	80	
25.0	0.44	0.34	0.23	0.12	0.01	-	-	**92**
22.5	0.62	0.49	0.37	0.24	0.12	-	-	**80**
20.0	0.84	0.69	0.54	0.40	0.25	0.10	-	**68**
17.5	1.12	0.95	0.78	0.60	0.43	0.25	0.08	**58**
15.0	1.51	1.30	1.09	0.88	0.67	0.46	0.25	**47**
12.5	2.06	1.80	1.54	1.27	1.01	0.75	0.48	**38**
10.0	2.75	2.40	2.06	1.72	1.37	1.03	0.69	**29**
7.5	3.83	3.35	2.87	2.39	1.91	1.43	0.96	**21**
5.0	6.01	5.26	4.51	3.76	3.01	2.25	1.50	**13**
2.5	12.62	11.04	9.46	7.89	6.31	4.73	3.15	**6**

Thermal resistance [K/W] of RZ3 ..55

Load current [A]	Ambient temp. [°C]							Power dissipation [W]
	20	30	40	50	60	70	80	
55.0	0.29	0.23	0.17	0.11	0.05	-	-	**164**
50.0	0.36	0.29	0.22	0.16	0.09	0.02	-	**148**
45.0	0.44	0.36	0.29	0.21	0.14	0.06	-	**133**
40.0	0.54	0.46	0.37	0.29	0.20	0.12	0.03	**118**
35.0	0.67	0.58	0.48	0.38	0.28	0.19	0.09	**103**
30.0	0.85	0.74	0.62	0.51	0.39	0.28	0.16	**87**
25.0	1.10	0.96	0.82	0.68	0.55	0.41	0.27	**73**
20.0	1.38	1.21	1.04	0.87	0.69	0.52	0.35	**58**
15.0	1.85	1.62	1.39	1.16	0.93	0.70	0.46	**43**
10.0	2.80	2.45	2.10	1.75	1.40	1.05	0.70	**29**
5.0	5.62	4.92	4.21	3.51	2.81	2.11	1.40	**14**
2.5	11.26	9.85	8.45	7.04	5.63	4.22	2.82	**7**

Thermal resistance [K/W] of RZ3 ..75

Load current [A]	Ambient temp. [°C]							Power dissipation [W]
	20	30	40	50	60	70	80	
75.0	0.27	0.22	0.17	0.12	0.07	0.02	-	**201**
70.0	0.32	0.27	0.21	0.16	0.10	0.05	-	**184**
65.0	0.38	0.32	0.26	0.20	0.14	0.08	0.02	**167**
60.0	0.44	0.38	0.31	0.25	0.18	0.11	0.05	**151**
55.0	0.52	0.45	0.38	0.30	0.23	0.16	0.08	**136**
50.0	0.62	0.54	0.45	0.37	0.29	0.21	0.12	**121**
45.0	0.74	0.64	0.55	0.46	0.36	0.27	0.17	**106**
40.0	0.87	0.76	0.65	0.54	0.43	0.32	0.22	**92**
35.0	1.01	0.89	0.76	0.63	0.51	0.38	0.25	**79**
30.0	1.21	1.06	0.91	0.76	0.60	0.45	0.30	**66**
25.0	1.49	1.30	1.11	0.93	0.74	0.56	0.37	**54**
20.0	1.90	1.67	1.43	1.19	0.95	0.71	0.48	**42**
15.0	2.60	2.28	1.95	1.63	1.30	0.98	0.65	**31**
10.0	4.01	3.51	3.01	2.51	2.01	1.50	1.00	**20**
5.0	8.24	7.21	6.18	5.15	4.12	3.09	2.06	**10**

Alarm output specifications

Collector - emitter voltage	35 VDC
Emitter - collector voltage	6 VDC
Collector current	50 mA
Delay time on reset	20 ms

Connection Diagrams

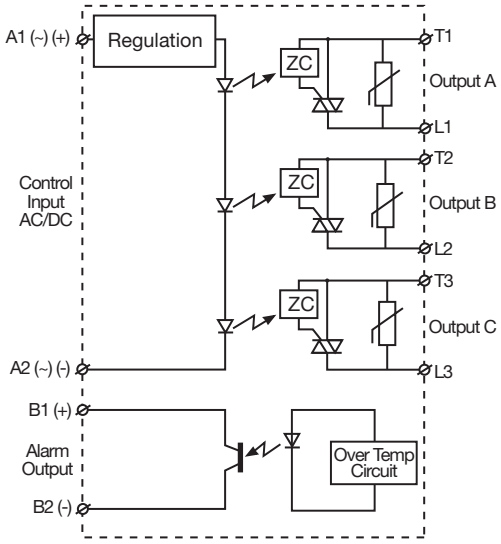


Fig. 1 *Terminal wiring*

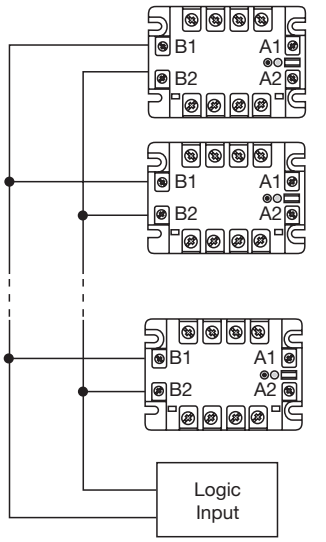
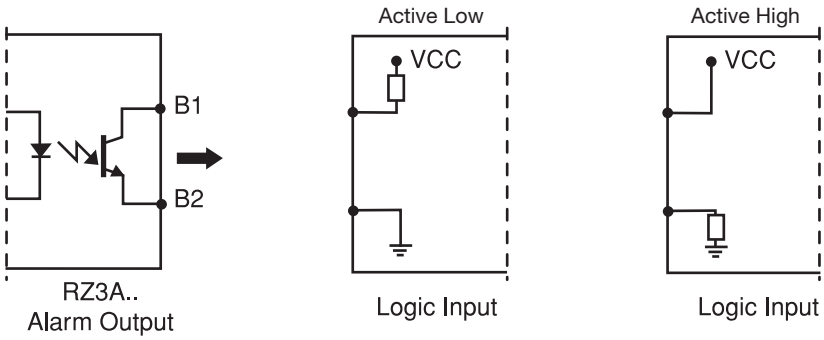


Fig. 2 *Common alarm wiring*

Connection specifications

Relay	
Mounting screws **Mounting torque**	M5 ≤ 1.5 Nm
Control terminal	
Mounting screws **Mounting torque** **Wire size**	M4 ≤ 0.5 Nm Max: 2 x 2.5 mm² (AWG14) Min: 2 x 1 mm²
Power terminal	
Mounting screws **Mounting torque** **Wire size**	M5 2.5 Nm Max: 2 x 6 mm² (AWG8) Min: 2 x 1 mm²

Alarm output connection



Forward voltage ≤35 VDC
Reverse voltage ≤6 VDC
Through current ≤50mA
Alarm reset: interrupt control input for more than 20ms