Solid State Relays
Industrial, 3-Phase ZS
Type RZ3A

- **3-phase Solid State Relay**
- **Zero switching**
- **Rated operational current: 3 x 25, 40, 55 or 75 A**
- **Rated operational voltage: Up to 600 VAC**
- **Control voltage 5 VDC, 4-32 VDC or 24-275 VAC**
- **Integral snubber networks**
- **Over-temperature protection option with alarm output**
- **IP 10 back-of-hand protection**
- **LED indication of control input and over-temperature alarm status**

Product 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.

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 over-temperature alarm (optional). A version that can be controlled with 5 VDC @ 15 mA (max) is also available (LD).

The series covers a range of load currents up to 75 AACrms.

Ordering Key

RZ 3 A 60 D 75 P

- **Solid State Relay**
- **Number of poles**
- **Switching mode**
- **Rated opertional voltage**
- **Control voltage**
- **Rated opertional current**
- **Options**

Type Selection

Switching mode	Rated operational voltage	Rated operational current	Control voltage	Option
A: Zero Switching	40: 400 VACrms 60: 600 VACrms	25: 3 x 25 AACrms 40: 3 x 40 AACrms 55: 3 x 55 AACrms 75: 3 x 75 AACrms	LD: 5 VDC D: 4-32 VDC A: 24-275 VAC/24-50 VDC	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 40 A	3 x 55 A	3 x 75 A
400 VACrms	5 VDC	**RZ3A40LD25**	**RZ3A40LD40**	**RZ3A40LD55**	**RZ3A40LD75**
	4-32 VDC	**RZ3A40D25**	**RZ3A40D40**	**RZ3A40D55**	**RZ3A40D75**
	24-275 VAC/24-50 VDC	**RZ3A40A25**	**RZ3A40A40**	**RZ3A40A55**	**RZ3A40A75**
600 VACrms	5 VDC	**RZ3A60LD25**	**RZ3A60LD40**	**RZ3A60LD55**	**RZ3A60LD75**
	4-32 VDC	**RZ3A60D25**	**RZ3A60D40**	**RZ3A60D55**	**RZ3A60D75**
	24-275 VAC/24-50 VDC	**RZ3A60A25**	**RZ3A60A40**	**RZ3A60A55**	**RZ3A60A75**

Notes
Over-temperature protection and alarm output: add suffix P to include over-temperature protection and alarm output.
Example: RZ3A60D75P. Not available with “LD” type control.

Insulation

Rated insulation voltage	
Input to output	≥ 4000 VACrms
Output to case	≥ 4000 VACrms

Thermal Specifications

Operating temperature	-30° to +80°C (-22° to +158° F)
Storage temperature	-40° to +100°C (-40° to + 212° F)
Junction temperature	≤ +125°C (+ 257°F)

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General Specifications

	RZ3A40..	RZ3A60..
Operational voltage ranges	24-440 VAC	42-660 VAC
Non-rep. peak voltage	850 V_p	1200 V_p
Operational frequency range	45 to 65 Hz	45 to 65 Hz
Overvoltage category	III	III
Pollution degree	3	2
Approvals	UL, cUL, CSA	UL, cUL,CSA
CE-marking	Yes	Yes

Input Specifications

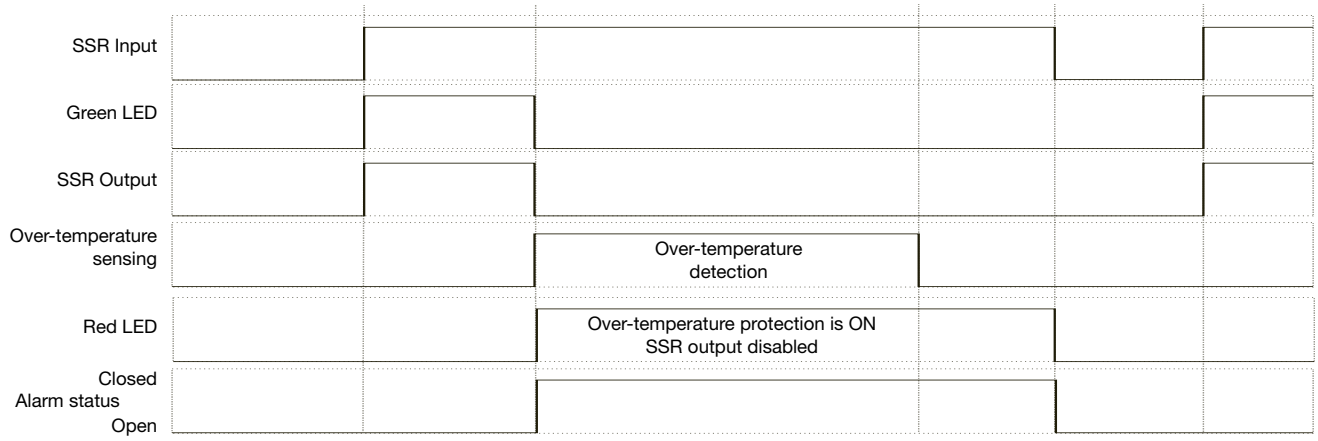
	RZ3A..LD..	RZ3A..D..	RZ3A..A..
Control voltage range	5 VDC	4-32 VDC	24-275 VAC/24-50 VDC
Pick-up voltage	4.5 VDC	3.8 VDC	18 VAC/20 VDC
Drop-out voltage	1.2 VDC	1.2 VDC	9 VAC/DC
Input current	≤ 15 mA	≤ 23 mA	≤ 15 mA
Response time pick-up Power output = 50 Hz	10 ms	10 ms	20 ms
Response time drop-out Power output = 50 Hz	10 ms	10 ms	30 ms

All data at 25°C

Output Specifications

	RZ3A..25..	RZ3A..40..	RZ3A..55..	RZ3A..75..
Rated operational current AC51 @ Ta=25°C AC53a @ Ta=25°C	 25 Arms 5 Arms	 40 Arms 8 Arms	 55 Arms 15 Arms	 75 Arms 20 Arms
Minimum operational current	150 mArms	150 mArms	150 mArms	150 mArms
Rep. overload current t=1 s	37 Arms	60 Arms	< 125 Arms	< 150 Arms
Non-rep. surge current t = 10 ms	230 A_p	300 A_p	600 A_p	1000 A_p
Off-state leakage current	< 3 mArms	< 3 mArms	< 3 mArms	< 3 mArms
I^2t for fusing t = 10 ms	265 A^2s	450 A^2s	1800 A^2s	6600 A^2s
Critical dI/dt @ 50 Hz	≥ 100 A/µs	≥ 100 A/µs	≥ 100 A/µs	≥ 100 A/µs
On-state voltage drop	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms
Critical dV/dt off-state	≥ 500 V/µs	≥ 500 V/µs	≥ 500 V/µs	≥ 500 V/µs

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

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Heatsink Dimensions (load current versus ambient temperature)

RZ ..25

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
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
	20	30	40	50	60	70	80	T_A

Ambient temp [°C]

RZ ..40

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
40.0	0.54	0.44	0.34	0.24	0.14	0.04	--	101
36.0	0.66	0.55	0.44	0.33	0.22	0.11	--	91
32.0	0.81	0.68	0.56	0.43	0.31	0.18	0.06	80
28.0	1.00	0.86	0.72	0.57	0.43	0.29	0.14	70
24.0	1.26	1.09	0.93	0.76	0.59	0.42	0.25	60
20.0	1.62	1.42	1.21	1.01	0.81	0.61	0.41	49
16.0	2.03	1.78	1.52	1.27	1.02	0.76	0.64	39
12.0	2.72	2.38	2.04	1.70	1.36	1.02	1.03	29
8.0	4.11	3.59	3.08	2.57	2.05	1.54	1.81	19
4.0	8.26	7.22	6.19	5.16	4.13	3.10	4.14	10
	20	30	40	50	60	70	80	T_A

Ambient temp [°C]

RZ ..55

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
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
	20	30	40	50	60	70	80	T_A

Ambient temp [°C]

RZ ..75

Load current [A]	Thermal resistance [K/W]							Power dissipation [W]
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
	20	30	40	50	60	70	80	T_A

Ambient temp [°C]

Heatsink Selection

Carlo Gavazzi Heatsink (see Accessories)	**Thermal resistance**	
No heatsink required	$R_{th\ s\text{-}a}$	> 8.0 K/W
RHS 300 Assy or backplate		5.0 K/W
RHS 112 Assy		1.1 K/W
RHS 301 Assy		0.8 K/W
RHS 112 F Assy		0.4 K/W
RHS 301 F Assy		0.25 K/W
Consult your distributor		< 0.25 K/W

Alarm Output Specifications

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

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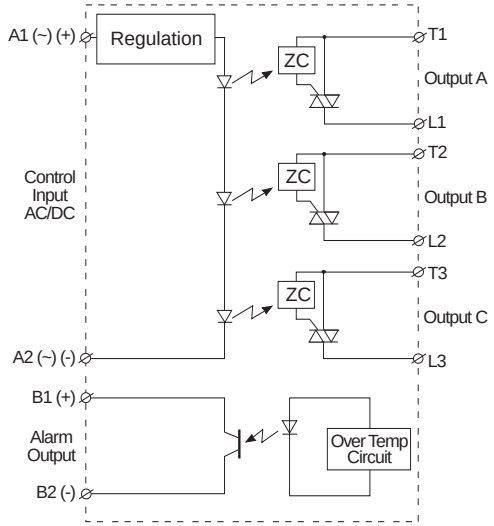
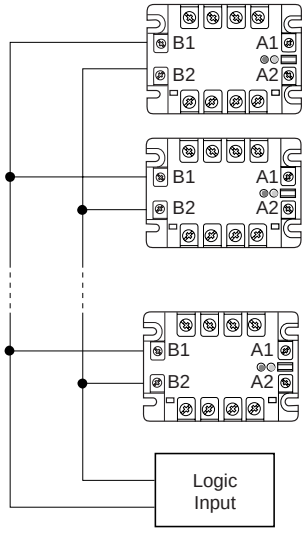
Connection Diagrams

Terminal Wiring



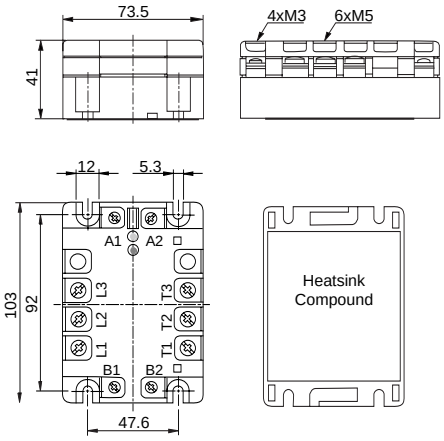
Common Alarm Wiring



Housing Specifications

Weight		Approx. 380 g
Material		Noryl
Base plate		
25, 40, 55A		Aluminum, nickel-plated
75A		Copper, nickel-plated
Potting compound		Polyurethane
Relay		
Mounting screws		M5
Mounting torque		≤ 1.5 Nm
Control terminal		
Mounting screws		M3
Mounting torque		≤ 0.5 Nm
Wire size	Max.	2 x 2.5 mm²
	Min.	2 x 1.0 mm²
Power terminal		
Mounting screws		M5
Mounting torque		≤ 2.5 Nm
		2 x 6 mm² (AWG8)
Wire size	Max.	2 x 6 mm²
	Min.	2 x 1 mm²

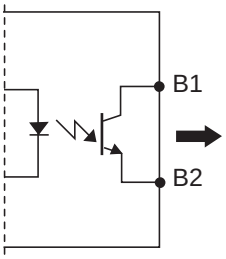
Dimensions



Relay On LED

Over-temperature Alarm Trip LED (suffix "P" option)

Alarm Output Connection



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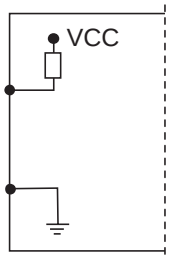
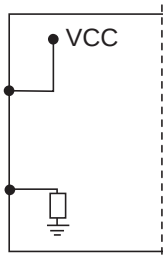
Alarm Output

Active Low



Logic Input

Active High



Logic Input

Forward voltage ≤35 VDC
Reverse voltage ≤6 VDC
Through current ≤50mA

Alarm reset: interrupt control input for more than 20ms

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