

Solid State Relays Industrial, 2-Pole ZS Type RA2A..C



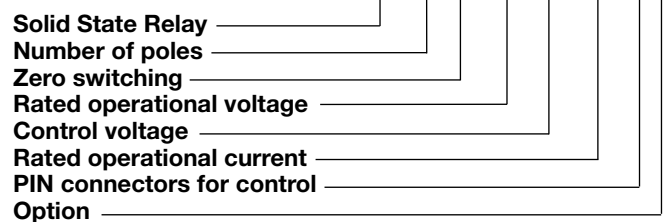
- 2 Pole AC Solid State Relay
- Zero Cross Switching
- Resistive AC loads
- Direct copper bonding (DCB) technology
- LED indication
- Rated operational current: 2x 40AACrms
- Rated operational voltage: 230VACrms
- Input range: 4.5- 32VDC
- Blocking voltage: 650Vp
- Opto-isolation: 4000VACrms
- Integrated overvoltage protection

Product Description

This 2-pole industrial relay minimises the space requirements in a control cabinet without compromising performance. By applying an input voltage on control A, the corresponding output semiconductor is activated at the first zero crossing of the line voltage. The same applies to control B. LEDs indicate the control status of each pole. The optimised design is free of moulding mass to reduce internal mechanical stress. The integrated varistor across each pole ensures protection against overvoltages.

Ordering Key

RA 2 A 23 D 40 C _



Selection Guide - RA2A23D40C

Rated operational voltage	Blocking voltage	Control voltage	Rated operational current 2 x 40AACrms
230VACrms	650V _p	4.5 - 32VDC	RA2A23D40C

Selection Guide - RA2A..H53 (RA2A mounted on heatsink RHS38)

Rated operational voltage	Blocking voltage	Control voltage	Rated operational current at 40°C 2 x 20AACrms
230VACrms	650V _p	4.5 - 32VDC	RA2A23D40CH53

Input Specifications

Control voltage range ¹	4.5 - 32VDC
Pick-up voltage	4.25VDC
Drop-out voltage	2VDC
Reverse Protection	32VDC
Input current per pole @ max. input voltage	≤10mA
Response time pick-up @ 50 Hz	≤10ms
Response time drop-out @ 50 Hz	≤10ms

1. DC control to be supplied by class 2 power source

General Specifications

Operational voltage range	24 to 265VACrms
Operational frequency range	45 to 65Hz
Blocking voltage	650Vp
Rated isolation	
Input to Output	4kVrms
Output to heatsink	4kVrms
Power factor	>0.9 @ 230VACrms
Zero voltage turn-on	<15V
LED ON indication (x2)	Yes (green)
CE marking	Yes
Approvals	UR, cUR
Integrated Output Varistor	Yes

Output Specifications

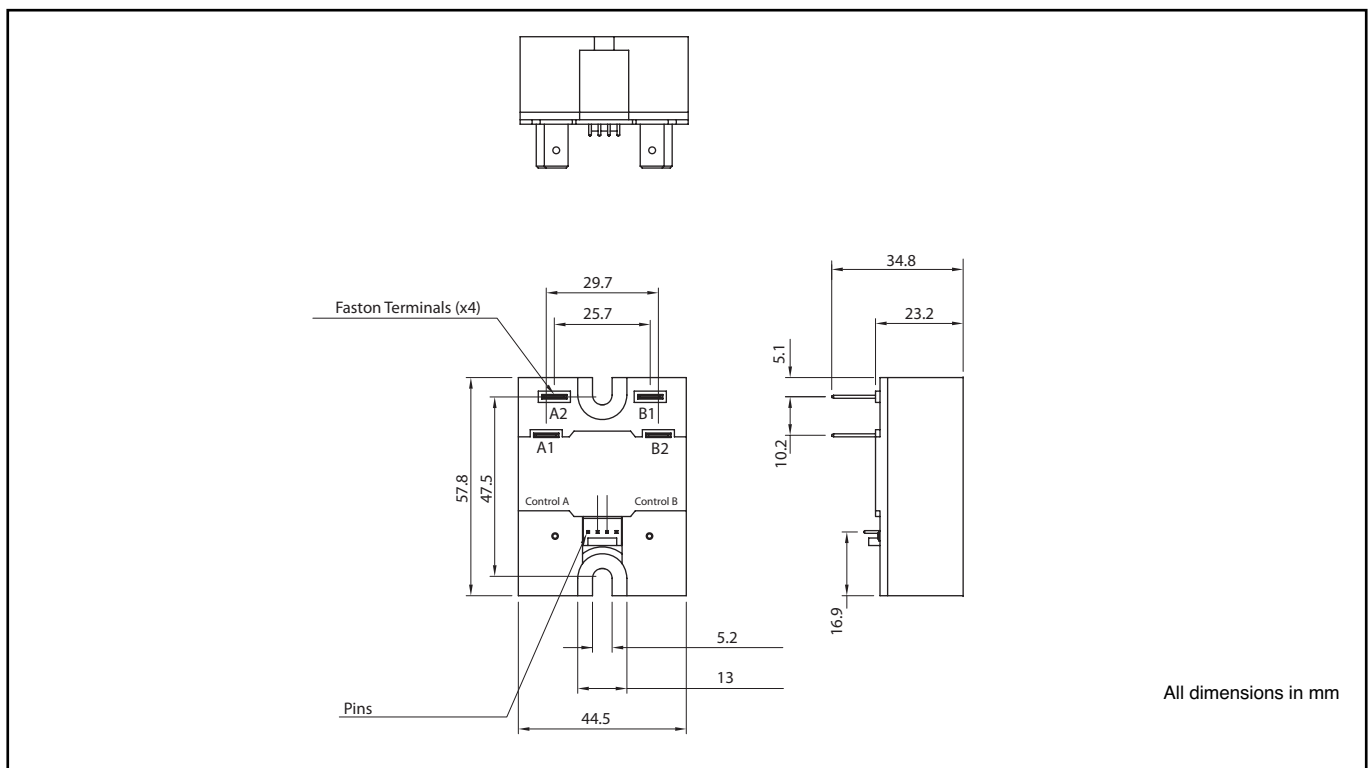
Rated operational current AC 51	2 x 40AACrms
Minimum operational current	250mA
Non-rep. surge current t=10 ms	600A _p
Off-state leakage current	< 3mA
I ² t for fusing t=10 ms	1800A ² s
On-state voltage drop @ rated current	≤ 1.6Vrms
Critical dV/dt off-state min.	000V/μs
Zero crossing detection	Yes

Housing Specifications

Control terminals ²	4 PIN connector 0.64mm square pin with 2.54mm centre distance
Power terminals	4 x Fastons; 6.35 x 0.8mm
Baseplate	Aluminium
Weight	Approx. 85g
Max. Pull out force for power terminals	130N

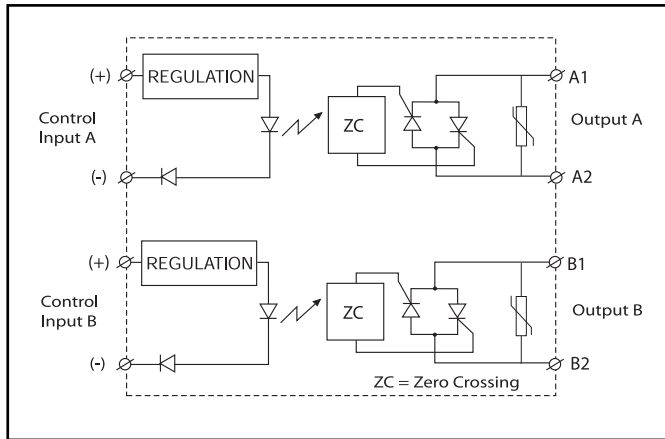
2: Possible mating connector model CE100F22-4-D from MAS-CON

Dimensions





Functional Diagram



Thermal Specifications

Operating temperature	-20° to 70°C
Storage temperature	-20° to 80°C
Junction temperature	≤ 125°C
R _{th} junction to case	1 pole 2 pole
	1K/W 0.5K/W
R _{th} junction to ambient	≤ 20K/W

Heatsink Dimensions (load current versus ambient temperature)

RA 2....40

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	
80	0.68	0.56	0.44	0.32	0.19	0.07	82
72	0.87	0.73	0.59	0.45	0.31	0.17	72
64	1.10	0.94	0.78	0.62	0.45	0.29	62
56	1.41	1.22	1.03	0.83	0.64	0.45	52
48	1.8	1.6	1.36	1.13	0.90	0.67	43
40	2.3	2.0	1.7	1.4	1.1	0.86	35
32	3.0	2.6	2.2	1.9	1.5	1.11	27
24	4	4	3	2.6	2.0	1.5	20
16	6	6	5	4	3	2.4	13
8	13	12	10	8	7	5	6

T_a
Ambient temp. [°C]

Heatsink Selection

Carlo Gavazzi Heatsink (see Accessories)	Thermal resistance...	...for power dissipation
No heatsink required	---	N/A
RHS300	5.00K/W	> 0 W
RHS100	3.00K/W	> 25 W
RHS38	2.85K/W	> 50 W
RHS45C	2.70K/W	> 60 W
RHS45B	2.00K/W	> 60 W
RHS90A	1.35K/W	> 60 W
RHS45C plus fan	1.25K/W	> 0 W
RHS45B plus fan	1.20K/W	> 0 W
RHS112A	1.10K/W	> 100 W
RHS301	0.80K/W	> 70 W
RHS90A plus fan	0.45K/W	> 0 W
RHS112A plus fan	0.40K/W	> 0 W
RHS301 plus fan	0.25K/W	> 0 W
Consult your distribution	> 0.25K/W	N/A
Infinite heatsink - No solution	---	N/A

Note: Add the currents of both poles and compare with datasheets for proper heatsink.
Each pole can handle up to the maximum current specified. Example:
Each pole of the RA2A23D40C can handle a maximum of 40A.

Applications

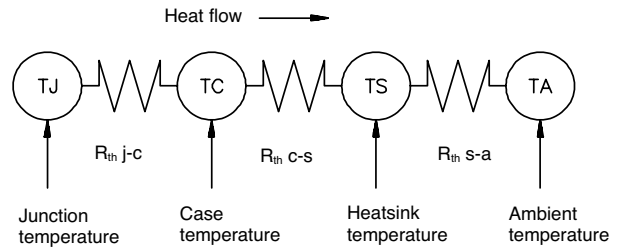
Thermal stress will reduce the lifetime of the SSR. Care must be taken to ensure proper heatsinking when the relay is is to be used at high sustained currents. Ade-quate electrical connection between relay terminals and cable must be ensured.

Thermal characteristics

The thermal design of Solid State Relays is very important. It is essential that the user

makes sure that cooling is adequate and that the maximum junction temperature of the relay is not exceeded.

If the heatsink is placed in a small closed room, control panel or the like, the power dissipation can cause the ambient temperature to rise. The heatsink is to be calculated on the basis of the ambient temperature and the increase in temperature.

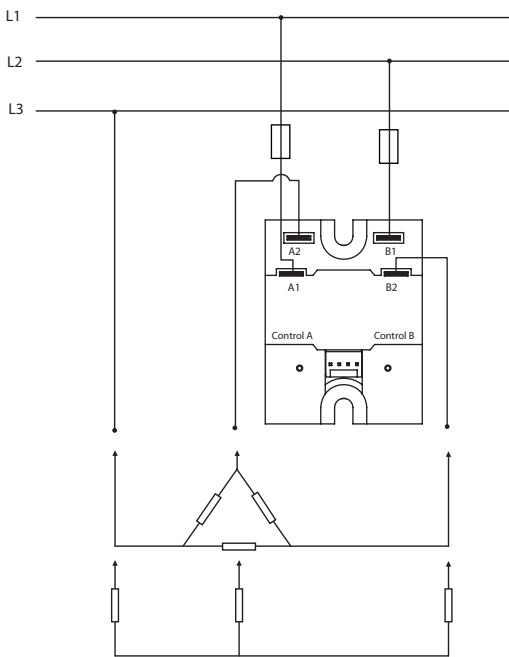


Thermal resistance:
 $R_{th\ j-c}$ = junction to case

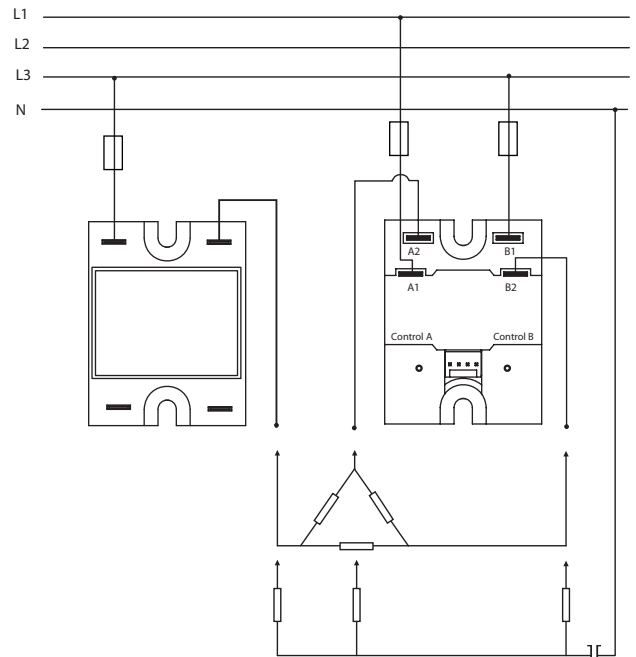
$R_{th\ c-s}$ = case to heatsink
 $R_{th\ s-a}$ = heatsink to ambient

Applications

A single two pole relay in a three phase application. Star and Delta (Economy switch)



A two pole relay and a single pole relay connected on a three phase application. Delta, star and star with a neutral point.



For use in a circuit where devices or systems, including filters or air gaps, are used to control overvoltages at the maximum rated impulse withstand voltage peak of 6.0kV. Devices or systems shall be evaluated using the requirements in the standard for Transient Voltage Surge Suppressors, UL1449 and shall also withstand the available short circuit current in accordance with UL 1449.

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

Ferraz Shawmut Max. size [A]	Size	Part number	Current [kA]	Voltage [Vac]
40A	14 x 51	6.9xx CP gRC 14x51/40	10	600

xx= 00 without fuse trip indication

xx = 21 with fuse trip indication

Protection with Miniature Circuit Breakers

Model no. for Z - type M. C. B. (rated current)	Model no. for B - type M. C. B. (rated current)	Wire cross sectional area [mm ²]	Minimum length of Cu wire conductor [m] ³
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
S202 - Z25 (25A)	S202-B13 (13A)	2.5	19.0
		4.0	30.4

3: Between MCB and SSR (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. Specifications are per pole.

Accessories

Heatsink RHS38



Ordering Key

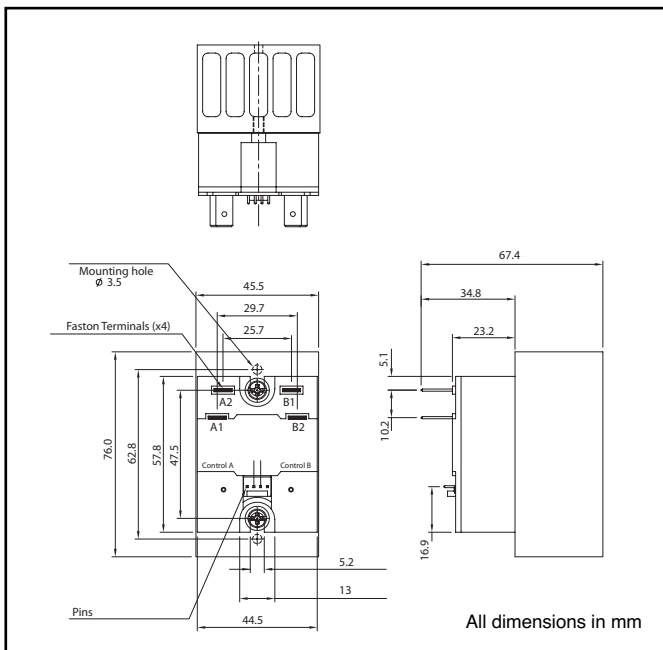
Heatsink

RHS38

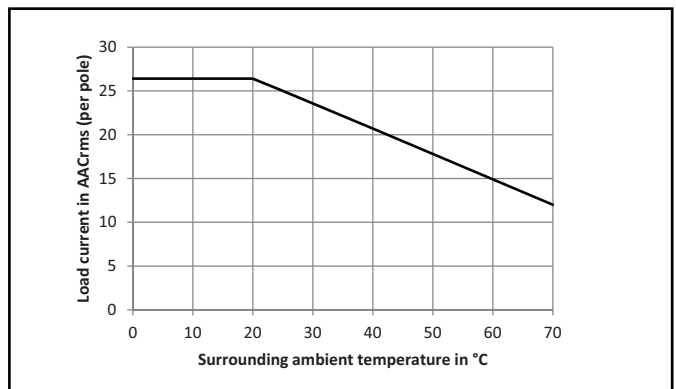
Factory mounted heatsink to RA2A

RA2A...H53

Dimensions



Derating Curve for RA2A23D40H53



Applicable for vertical mounting