

# Solid State Relays Industrial, Rear Integrated Heatsink 3-Phase w LED Types RJ2A, RJ3A



- AC Semiconductor contactor
- Two and three pole switching types
- Direct copper bonding (DCB) technology
- LED indication
- Integrated over-voltage protection
- Housing free of moulding mass
- 2 Input ranges: 5 - 32 VDC and 24-275VAC/24-190VDC
- Operational ratings: up to 3x32AAC, 600VAC
- Non repetitive peak voltage: Up to 1200V<sub>p</sub>
- Opto-isolation > 4000 VAC<sub>rms</sub>

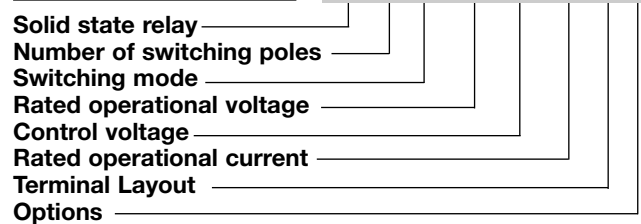
## Product Description

This product is designed in such a way as to replace electro-mechanical contactors, especially when switching is frequent. It has an integrated heatsink and over-voltage protection. The heatsink is moved to the back for optimal space saving in the panel and easy wire mounting at the front of the relay. The relay with antiparallel thyristor output is the most widely used industrial SSR

due to its multiple application possibilities and robust construction. This relay can be used for resistive and inductive loads. The zero switching relay switches ON when the sinusoidal curve crosses zero and switches OFF when the current crosses zero. A green and a red LED give status of the control input and alarm respectively.

## Ordering Key

**RJ 3 A 60 D 32 E P**



## Type selection

Switching poles	Switching mode	Rated operational voltage	Control voltage	Rated operational current
RJ2: 2 poles RJ3: 3 poles	A: Zero switching	22: 220 VAC <sub>rms</sub> 60: 600 VAC <sub>rms</sub>	D: 5 - 32 VDC A: 24 - 275 VAC/ 24 - 190 VDC	20: 3 x 20 AAC <sub>rms</sub> (RJ3A) 25: 3 x 25 AAC <sub>rms</sub> (RJ2A/RJ3A) 32: 3 x 32 AAC <sub>rms</sub> (RJ2A/RJ3A)

## Selection Guide

Rated operational voltage	Control voltage	Rated operational current					
		2-Pole switching/1-Pole direct		3-Pole switching			
		3x25A (MIDI)	3x32A (POWER)	3x20A (MIDI)	3x25A (POWER)	3x32A (MIDI) <sup>4</sup>	
220 VAC <sub>rms</sub>	5 - 32 VDC	RJ2A22D25	RJ2A22D32	RJ3A22D20	RJ3A22D25	RJ3A22D32EP	
	24 - 275 VAC/ 24 - 190 VDC	RJ2A22A25E	RJ2A22A32E	RJ3A22A20E	RJ3A22A25E	RJ3A22A32EP	
600 VAC <sub>rms</sub>	5 - 32 VDC	RJ2A60D25	RJ2A60D32	RJ3A60D20	RJ3A60D25	RJ3A60D32EP	
	24 - 275 VAC/ 24 - 190 VDC	RJ2A60A25E	RJ2A60A32E	RJ3A60A20E	RJ3A60A25E	RJ3A60A32EP	

## Options

Model Type	Alarm LED indication	Alarm connections	Fan supply input
DC control	No	No	No
DC control + OTP	Yes	Yes	No
DC control + OTP + Fan	Yes	Yes	Yes
AC control	No	No	No
AC control + OTP	Yes	Yes	No
AC control + OTP + Fan	Yes	No	Yes

### Notes

- 1 Basic models with DC control input (without over-temperature protection or fan) have both U-type and E-type terminal connections
- 2 All models with over-temperature protection option (suffix "P") or AC control input are only available with type "E" terminals
- 3 Fan switching is internally controlled. Fan requires an external supply connected to the fan supply input(s)
- 4 With integrated fan and over-temperature protection - fan will automatically switch on when necessary

## General Specifications

	RJ..22..	RJ..60..
Operational voltage range	24 - 280 VAC	48 - 660 VAC
Non-rep. peak voltage	650 V <sub>p</sub>	1200 V <sub>p</sub>
Operational frequency range	45 - 65 Hz	45 - 65 Hz
Power factor	≥ 0.5 @ 230 VACrms	≥ 0.5 @ 600 VACrms
Internal Varistor	Yes	Yes
Approvals	UL, cUL, CSA	UL, cUL, CSA
CE-marking	Yes	Yes
Pollution degree	2	2

## Input Specifications

	RJ..D..	RJ..A..
Control voltage range	5 - 32 VDC	24-275 VAC/ 24-190 VDC
Pick-up voltage	4.7 VDC	22 VAC/ VDC
Reverse voltage	32 VDC	N/A
Drop-out voltage	1.2 VDC	6 VAC/ 6VDC
Maximum input current	24 mA	15mA
Response time pick-up	<1 cycle	<1 cycle
Response time drop-out	<1 cycle	<1 cycle

## Output Specifications

	2-Pole switching/1-Pole direct		3-Pole switching		
	RJ2A..25 (MIDI)	RJ2A..32 (POWER)	RJ3A..20 (MIDI)	RJ3A..25 (POWER)	RJ3A..32 (MIDI)*
Rated operational current					
AC51 @Ta=25°C	3 x 25 A	3 x 32 A	3 x 20 A	3 x 25 A	3 x 32 A
AC53a @Ta=25°C	3 x 15 A	3 x 15 A	3 x 15 A	3 x 15 A	3 x 15 A
Min. operational current	150mA	150mA	150 mA	150mA	150mA
Rep. overload current t=1s	<125 A	<125 A	<125 A	<125 A	<125 A
Non rep. surge current					
Tj(init.)= 25°C and t=10ms	580 Apk	580 Apk	580 Apk	580 Apk	580 Apk
Off-state leakage current					
@ rated voltage & frequency	< 3 mA	< 3 mA	< 3 mA	< 3 mA	< 3 mA
I <sup>2</sup> t for fusing (t = 1-10 ms)	1680 A <sup>2</sup> s	1680 A <sup>2</sup> s	1680 A <sup>2</sup> s	1680 A <sup>2</sup> s	1680 A <sup>2</sup> s
Critical di/dt	≥ 50 A/μs	≥ 50 A/μs	≥ 50 A/μs	≥ 50 A/μs	≥ 50 A/μs
On-state voltage drop					
@ rated current	1.6 Vrms	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	500 V/μs

\* With integrated fan and over-temperature protection

## Housing Specifications

Weight	
MIDI	Approx. 380 g
MIDI + FAN	Approx. 415 g
POWER	Approx. 680 g
Housing material	PBT, Flame Retardant
Conductors	
Size	0.5...4.0 mm <sup>2</sup> (AWG 20...12) 0.5...2x2.5 mm <sup>2</sup> (AWG 20...2x14)
Mounting torque max.	0.6 Nm with Posidrive 0 bit
Terminal screws	M3

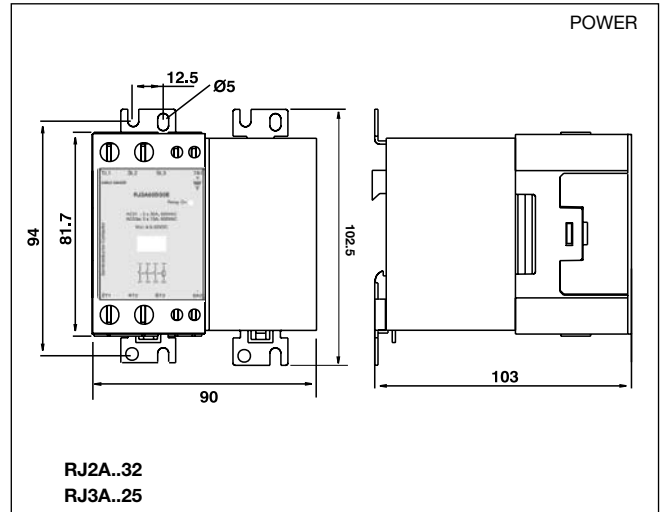
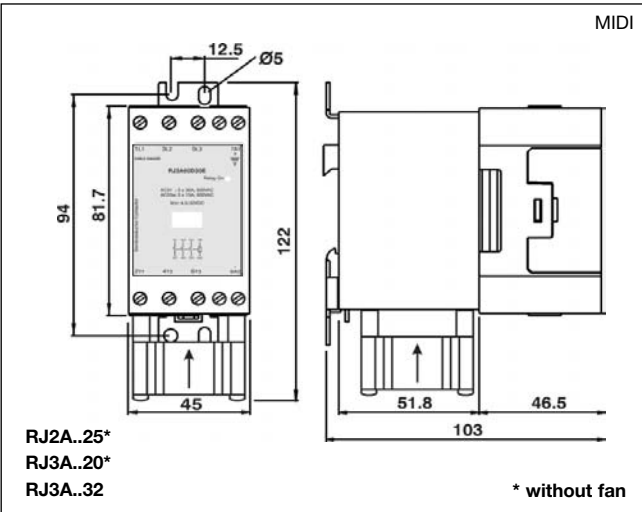
## Thermal Specifications

Operating Temperature	-30 to +70°C (-22 to +158°F)
Storage temperature	-40 to +80°C (-40 to +178°F)

## Insulation

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

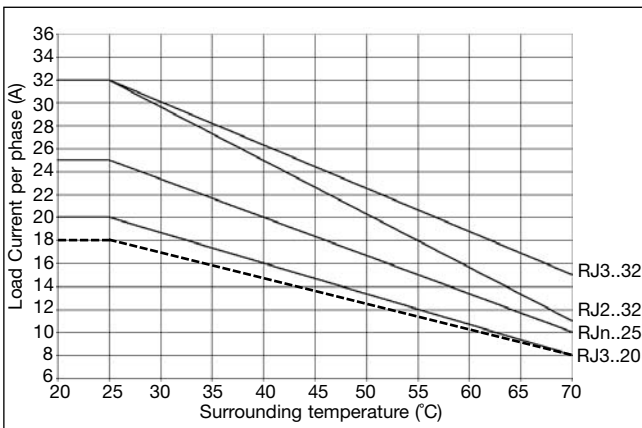
## Dimensions



All dimensions in mm

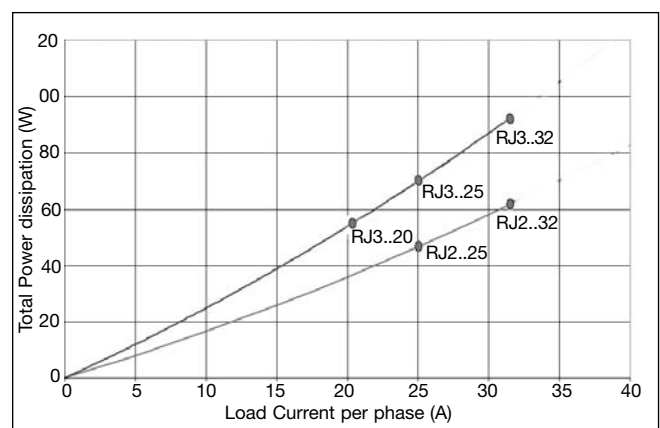
All dimensions in mm

## Derating Curve

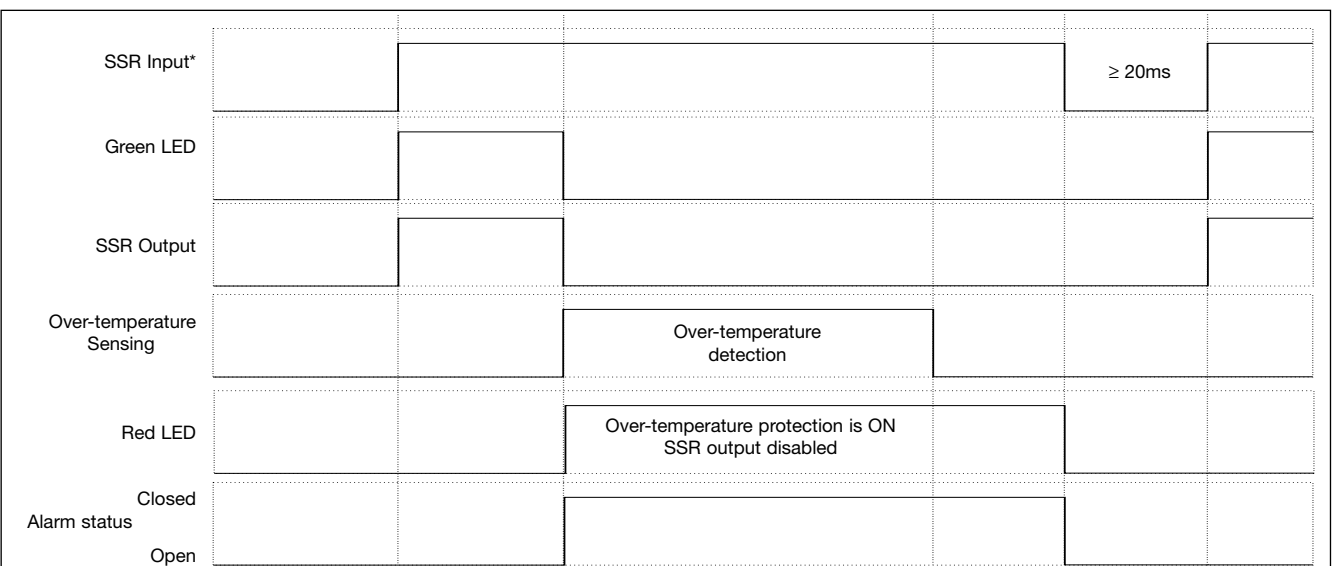


Note: dotted line indicates UL rating for RJ3..20

## Dissipation Curve

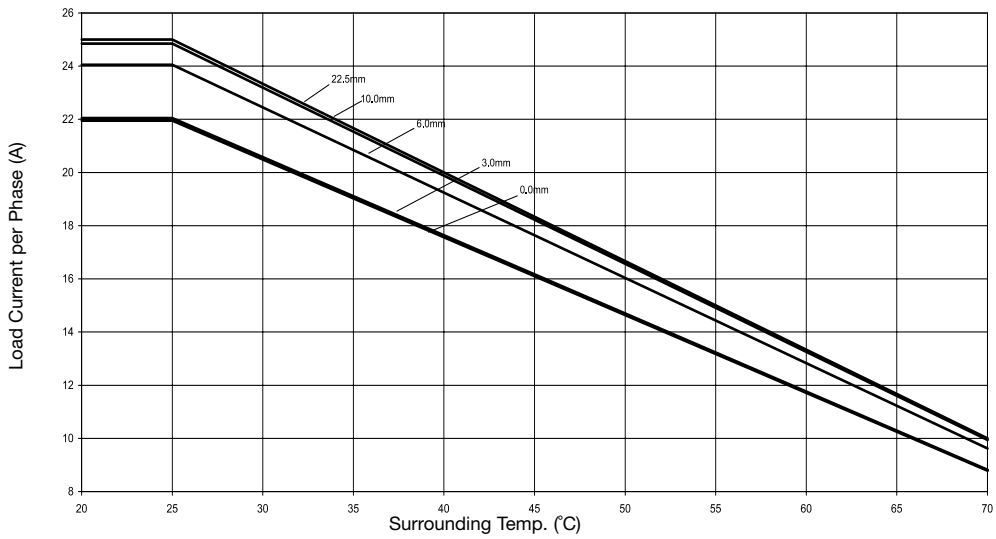


## Over-temperature Protection (Option: ...P)

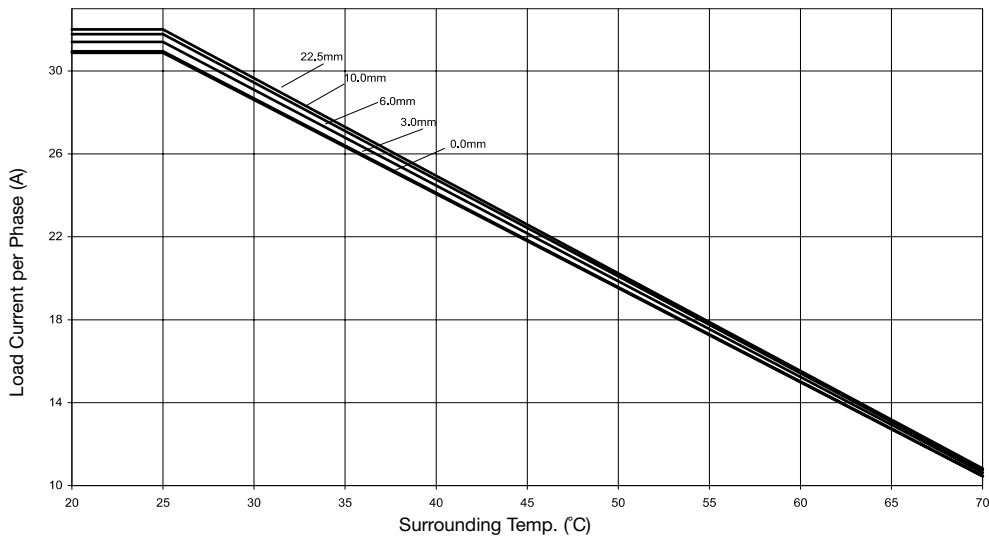


\*After over-temperature condition is removed, SSR can be reset by switching OFF the control input for more than 20 ms and switching back ON: this will switch ON the SSR output

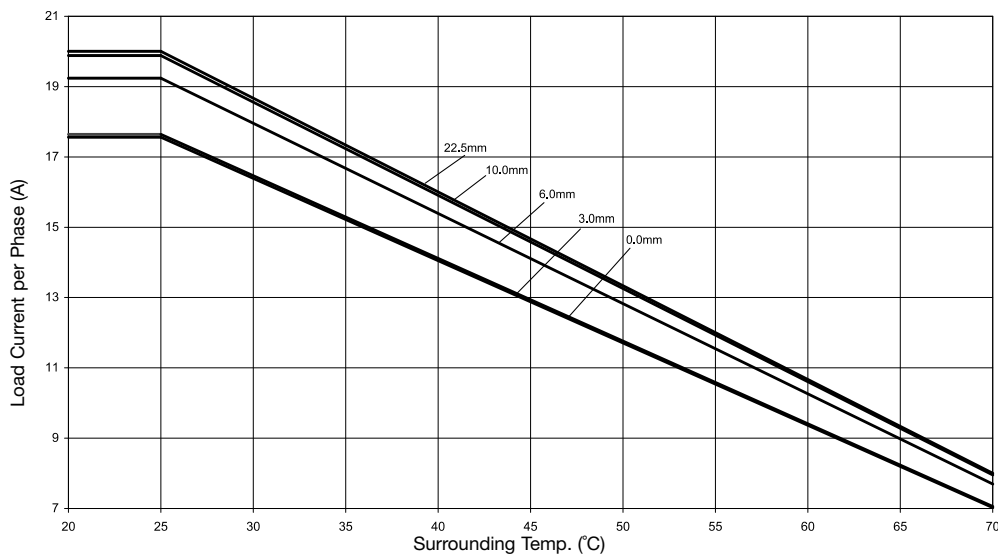
## Derating vs. Spacing Curves



RJ2...25

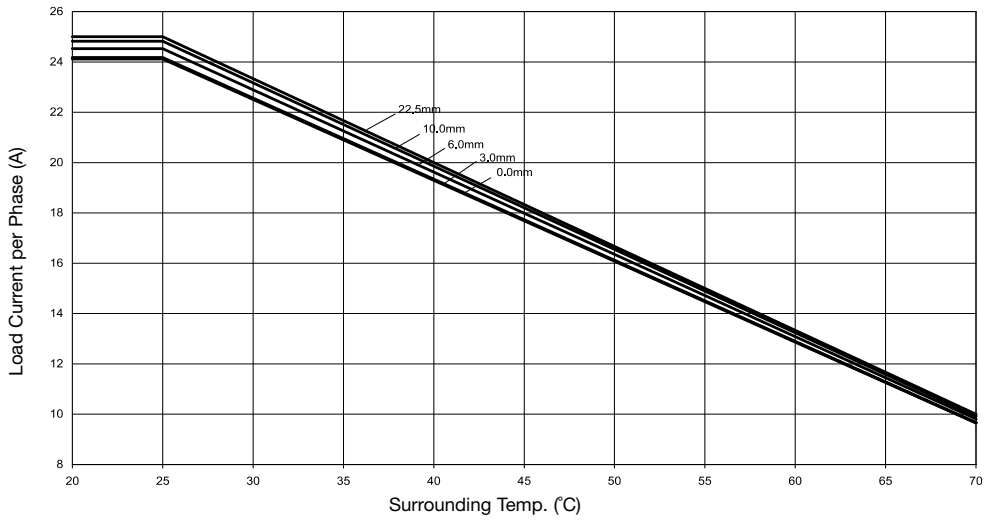


RJ2...32

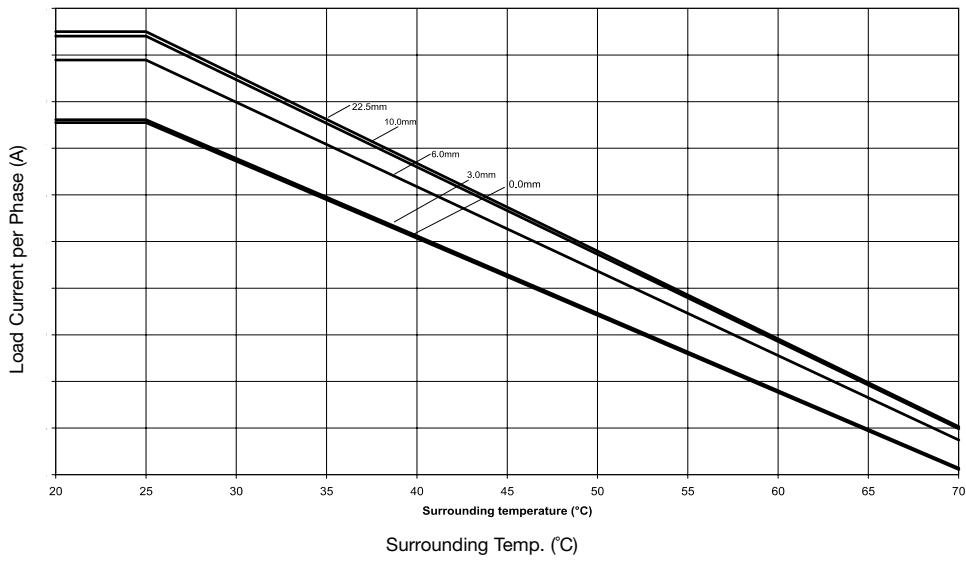


RJ3...20

## Derating vs. Spacing Curves (cont.)

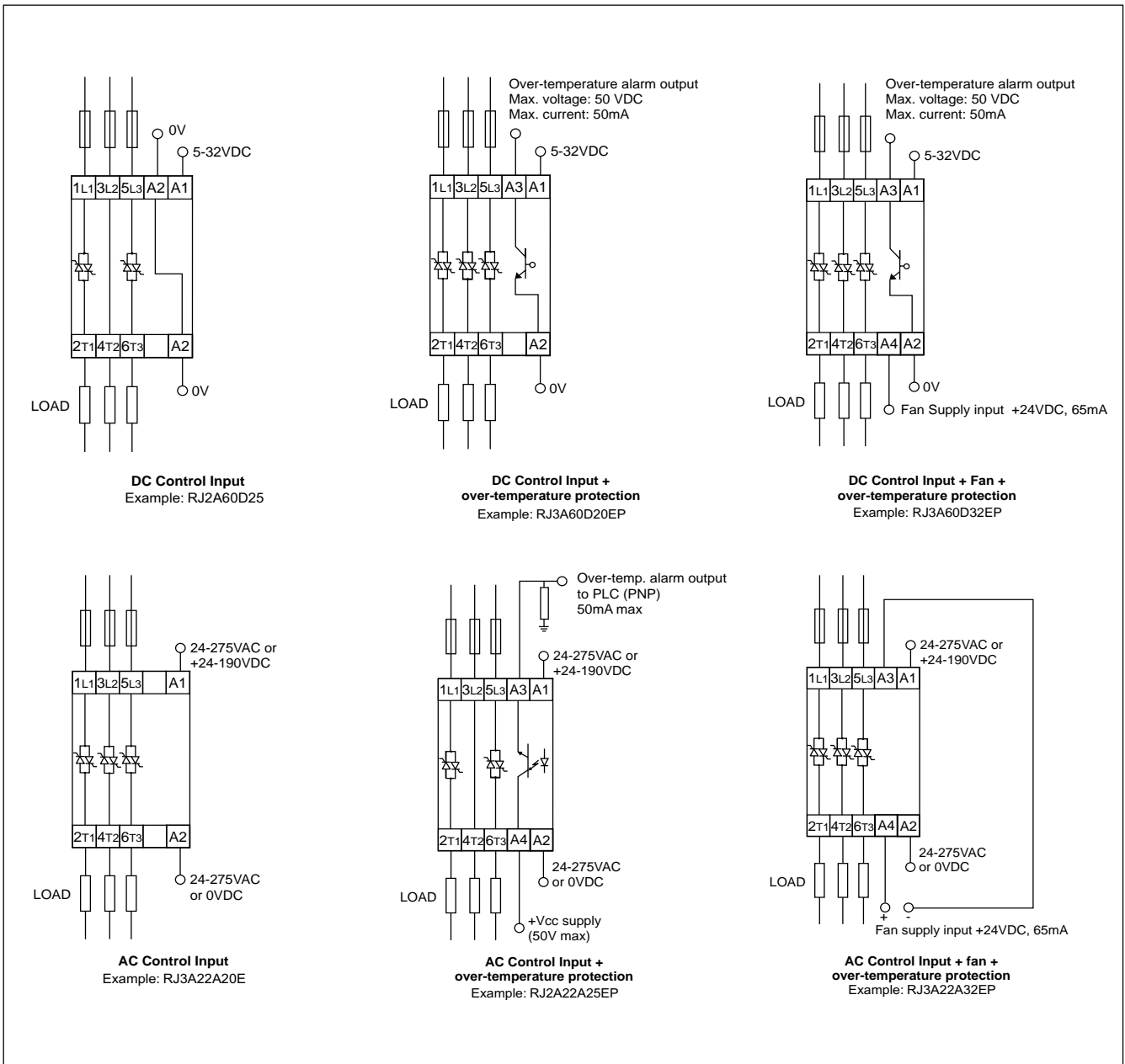


RJ3...25



RJ3...32EP

## Connection Examples



## Applications

### Safety

When using a semiconductor contactor, the electric configuration is split into a safety part and a control part. In the safety part the isolation of the load from the mains is assured by inserting switchgear that provides galvanic isolation from the power supply. A contactor or isolator can be mounted in series with the Solid State Relay to achieve this isolation. The contactor can be a very economical type as the switching is done by the Solid State Relay.

