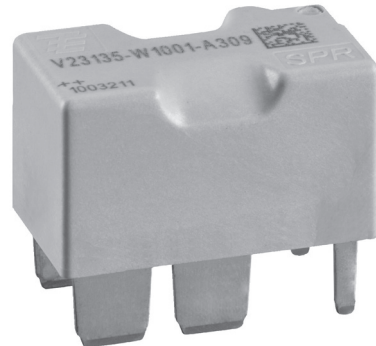


**Star Point Relay SPR**

- Full, symmetric star-point disconnection of an electric power steering motor
- Limiting continuous current 90A at 85°C
- Disconnection of high over-currents up to 200A in 12VDC and up to 60A in 36VDC power nets
- Contact arrangement fulfills 42VDC power net requirements
- Optimized dimensions: lhw (in mm) 32x18.5x18
- Resistant against high ambient temperature up to 125°C
- Contact resistance typ. <2mΩ per path for load current 20A after fritting

Typical applications  
All EPA/EPS applications.



F135\_fw3b

**Contact Data**

Contact arrangement	1 form 3, 3 NO
Rated voltage	12VDC
Max. switching voltage	depends on load parameters <sup>A)</sup>
Rated current	120A
Limiting continuous current <sup>1)</sup>	
23°C	120A
85°C	90A
125°C	60A
Limiting breaking current	200A <sup>2)</sup>
Breaking capacity max.	>10 ops. at 200A
Contact material	AgNi0.15
Contact style	triple
Min. recommended contact load <sup>5)</sup>	1A at 5VDC
Initial voltage drop, after fritting with 90A for 30s	<180mV at 90A
Operate/release time max. <sup>3)</sup>	<20/10ms
Bounce time max. <sup>3)</sup>	see footnote <sup>3)</sup>
Electrical endurance	
120A, dry switching <sup>4)</sup> at 23°C, 500ms on/off	>2x10 <sup>5</sup> ops.
Mechanical endurance	>10 <sup>6</sup> ops.

**Contact Data (continued)**

- A) Please contact TE relay application engineer.
- 1) Max. terminal temperatures up to 180°C are allowed. Final temperatures depend on the leadframe layout.
  - 2) Without relay coil voltage: suppression component (see Application Note "Automotive Applications").
  - 3) Release and bounce time depend on component in parallel to the coil, please contact application support.
  - 4) Load only carried, not switched!
  - 5) See Application Note "Diagnostics of Relays"

**Coil Data**

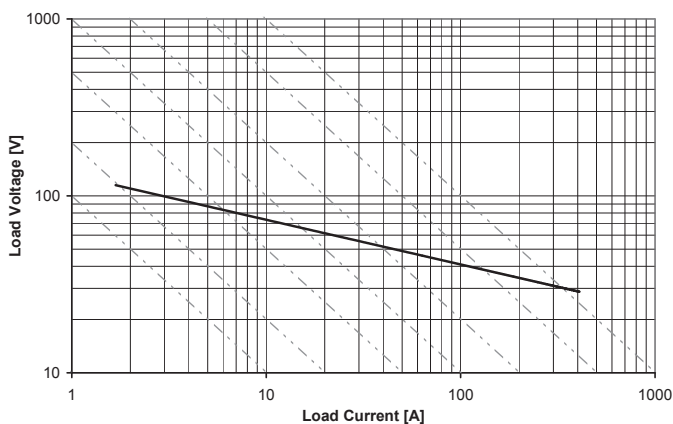
Coil voltage range	12VDC
Max. coil temperature	<180°C

**Coil versions, DC coil**

Coil code	Rated voltage VDC	Operate voltage VDC	Release voltage VDC	Coil resistance Ω±10%	Rated coil power W
001	12	6.4	1	150	0.96
002	10	5.2	0.8	97	1.03

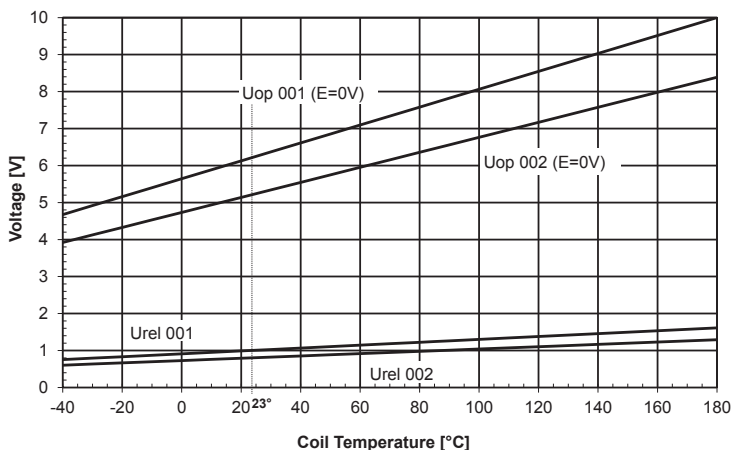
All figures are given for coil without preenergization, at ambient temperature +23°C.

**Max. DC load breaking capacity**



Load limit Curve II: valid for load path through pin 4 and pin 5, no coil suppression used.

**Coil operating range**



Does not take into account the temperature rise due to the contact current  
E = pre-energization

**Star Point Relay SPR** (Continued)

**Insulation Data**

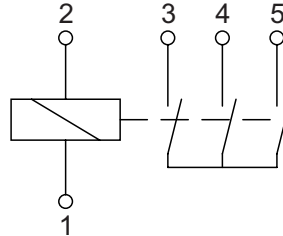
Initial dielectric strength between contact and coil	500VAC <sub>rms</sub>
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**Other Data**

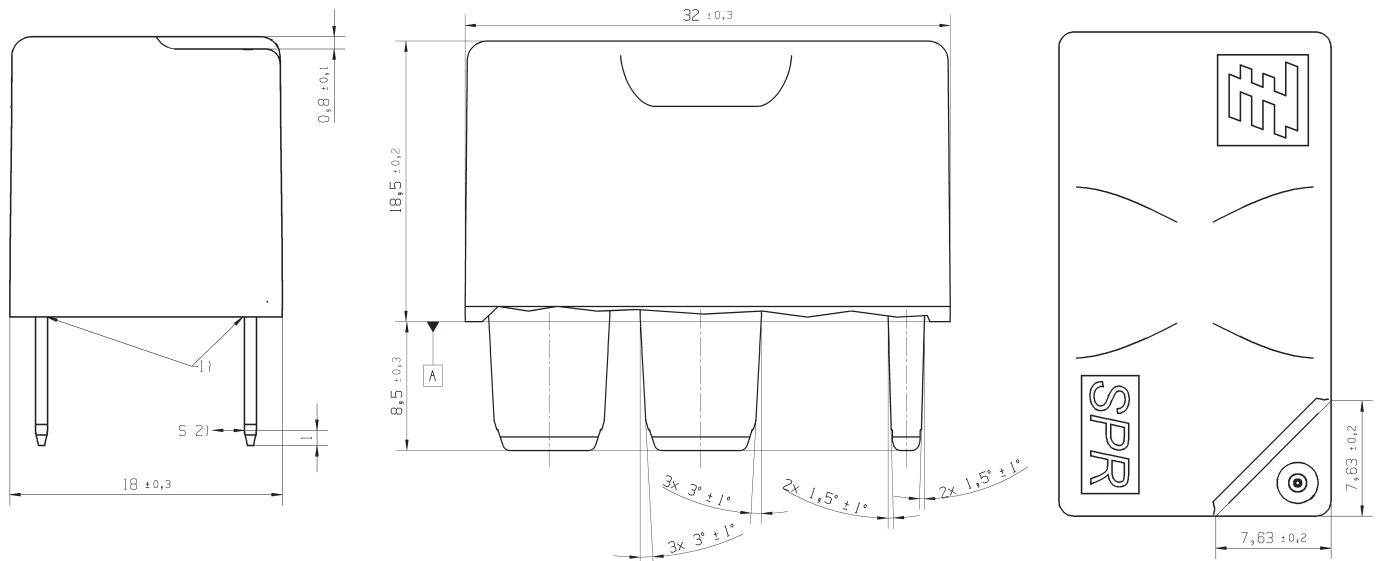
EU RoHS/ELV compliance	compliant
Ambient temperature	-40°C to 125°C
Cold storage, IEC 60068-2-1	2000h; -40°C
Dry heat, IEC 60068-2-2	500h; +135°C
Temperature cycling (shock), IEC 60068-2-14, Na	500 cycles; -40/+135°C
Damp heat cyclic, IEC 60068-2-30, Db, Variant 1	83 cycles (2000h) 25°C/55°C/93%RH
Flowing mixed gas corrosion test, IEC 60068-2-60, Ke, method 1	10 days
Degree of protection	IP67 (IEC 60529), RT III (IEC 61810)
Vibration resistance (functional), IEC 60068-2-64 (random) energized	20 to 1000Hz >6g ms
IEC 60068-2-64 (random) not energized	20 to 1000Hz >4g ms
Shock resistance (functional), IEC 60068-2-27 (half sine) 6ms, energized	>40g
IEC 60068-2-27 (half sine) 6ms, not energized	>10g
Mounting	welding process on leadframe
Weight	approx. 30g (1.06oz)
Packaging unit	357 pcs.

**Terminal Assignment**

1 form 3, 3 NO



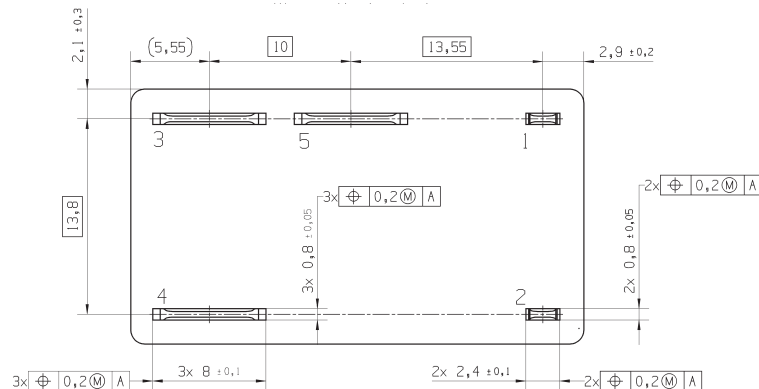
**Dimensions**



**View of the terminals**

Bottom view

- 1) Epoxy at terminals exceeds max. 0.9mm over coverage.
  - 2) Permanent acceptable deformation 0.25mm respectively 0.5mm temporarily.
- Maximum permissible thermal load of the terminals during the resistance welding process depends on leadframe design.



**Star Point Relay SPR** (Continued)

**Product code structure**

Typical product code **V23135 -W 1 001 -A3 09**

<b>Type</b> V23135 Star Point Relay						
<b>Terminal and enclosure</b> W Welding version, sealed						
<b>Design</b> 1 Single relay						
<b>Coil version</b> 001 Standard      002 Sensitive						
<b>Contact type and material</b> A3 Standard, AgNi0.15						
<b>Contact arrangement</b> 09 Standard (triple make)						

Product code	Terminal and enclosure	Design	Coil	Contact	Arrangement	Part number
V23135-W1001-A309	Welding version, sealed	Single relay	12VDC	Standard, AgNi0.15	1 form 3, 3 NO	1-1414704-0
V23135-W1002-A309			10VDC			1-1414705-0