

DATA SHEET

AR15049-01RAIL4-S

Version 2.6

Relay device for safety-related applications

Revision on 16.04.2021

Notice:

No liability or warranty can be accepted for any errors.
We reserve the right to make technical changes at any time.

Data Sheet

Relay Card AR15049-01RAIL4-S



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2. Foreword

All instructions and technical specifications in this data sheet have been prepared with great care and effective quality assurance measures have been applied to ensure their validity. If you have any questions, please contact AnTeCoS directly. AnTeCoS appreciates any suggestions regarding additional information that should be added to the data sheet.

We reserve the right to make changes regarding equipment. AnTeCoS also reserves the right to make changes to the written material without prior notice.

The AR15049-01RAIL4-S relay device is fail-safe. It can be used for railroad applications according to the EN 50129 standard up to SIL4. AR15049-01RAIL-S integrates two working relays and one diagnostic relay in the PCB. The AR15049-01RAIL-S relay device is designed in such a way that switching on and off in the event of an internal fault occurring is prohibited for safety reasons.

Applications:

- Safety relay according to EN 50129 SIL4 for railroad applications.
- For an immediate shutdown of the energy supply.
- Ensuring safety in secured areas.

3. Technical data

Control Voltage (U_N):	24VDC
Control Voltage Range (U_B):	21,5 V ... 30 V
Power Consumption @ 25°C:	approx. 2,2W
Residual ripple of the supply voltage:	5 %
Contact Material (Relay):	AgSnO ₂ +0,2 μm Au
Switching Voltage Min/Max	AC and DC 10 V / AC 400 V, DC 250 V ¹
Switching Current Min/Max	AC and DC 10 mA / 3 A ¹
Switching Capacity Min/Max	AC 3 VA, DC 0,1 W / AC 2000 VA, DC 200 W ¹
Switching Frequency @ 25°C	max. 9 Cycles /s
Lifetime:	
○ mechanical:	>20 x 10 ⁶
○ electrical:	
at AC 230 V, 5 A, cos φ= 1	>3 x 10 ⁵
at DC 24 V, 5 A resistive	>2 x 10 ⁵
Operating Temperature Range:	-40...+70°C
Isolation according to EN 50 178	
○ Rated Isolation Voltage:	250 VAC
○ Pollution Level:	2
○ Overvoltage Category:	III

¹ See operating voltage limit line and other diagrams

3.1 Switching Time

Supplied with 24 VDC @24°C

DC-Last

Switch on: ≤ 90 ms

Switch off: ≤ 26 ms

AC-Last

Switch on: ≤ 95 ms

Switch off: ≤ 26 ms

Operating Temperature:

-40 °C to 70 °C

Storage Temperature:

-40 °C to 85 °C

EMC:

EN50124-4, IEC61000-3, IEC61000-6-4

Impact and Vibration

EN50125-3

4. Safety-Related Application Conditions

- An external fuse must be available during the load-output cycle.
- The supply voltage of the relays (S1-On) must be fused.
- Cascading must be well checked by the user due to mutual heating. The user must ensure that the maximum value for the electrical and environmental conditions is not exceeded (see also Fig.1).
- The diagnostic circuit must be limited to 300mA@24VDC.
- The relay is suitable for use in an electrical enclosure or in a control box next to the rails.
- Industrial customers are responsible for proper disposal of the component.
- The relay unit is designed to operate at altitudes up to 2000m above sea level.
- Off-line test interval 1 year.
- Hazard Rate (HR) $3,060 \times 10^{\text{exp}-9}$ for applications AC15 3A at 230V ac.

The relay is not certified for severe, extreme conditions such a:

- Salt spray
- High ozone concentration
- Occurrence of mold, sponges, etc.
- Rodents and other vermin

5. Maintenance

5.1 Preventative Maintenance

Bevor die maximale mechanische Anzahl an Schaltzyklen (Minimum von bis zu 200.000 Zyklen) erreicht ist, muss das Relais ausgetauscht werden. Unter Bedingungen bei AC 230 V, 5 A, $\cos \phi = 1$ sind die Schaltzyklen $>3 \times 10^5$ und unter der Bedingung DC 24 V, 5 A resistiv wird $>2 \times 10^5$ erreicht und das Relais muss ebenfalls ersetzt werden.

5.2 Repair

Repair of the relay should not be carried out by the user. Defective equipment must be returned, after a brief description of the fault by the supplier, to the AnTeCoS company or local representatives. The safety-related equipment has a certificate of a competent testing organization. The validity of the certificate expires if unauthorized repairs are performed on the relay device. Opening the case or damaging the relay device will invalidate the warranty.

Repair maintenance by the customer:

See repairs above

Repair maintenance by the manufacturer:

See repairs above

6 LED Status Diagram & Block Diagram

Figure 8 below illustrates the basic circuit of the AR15049-01RAIL4-S.

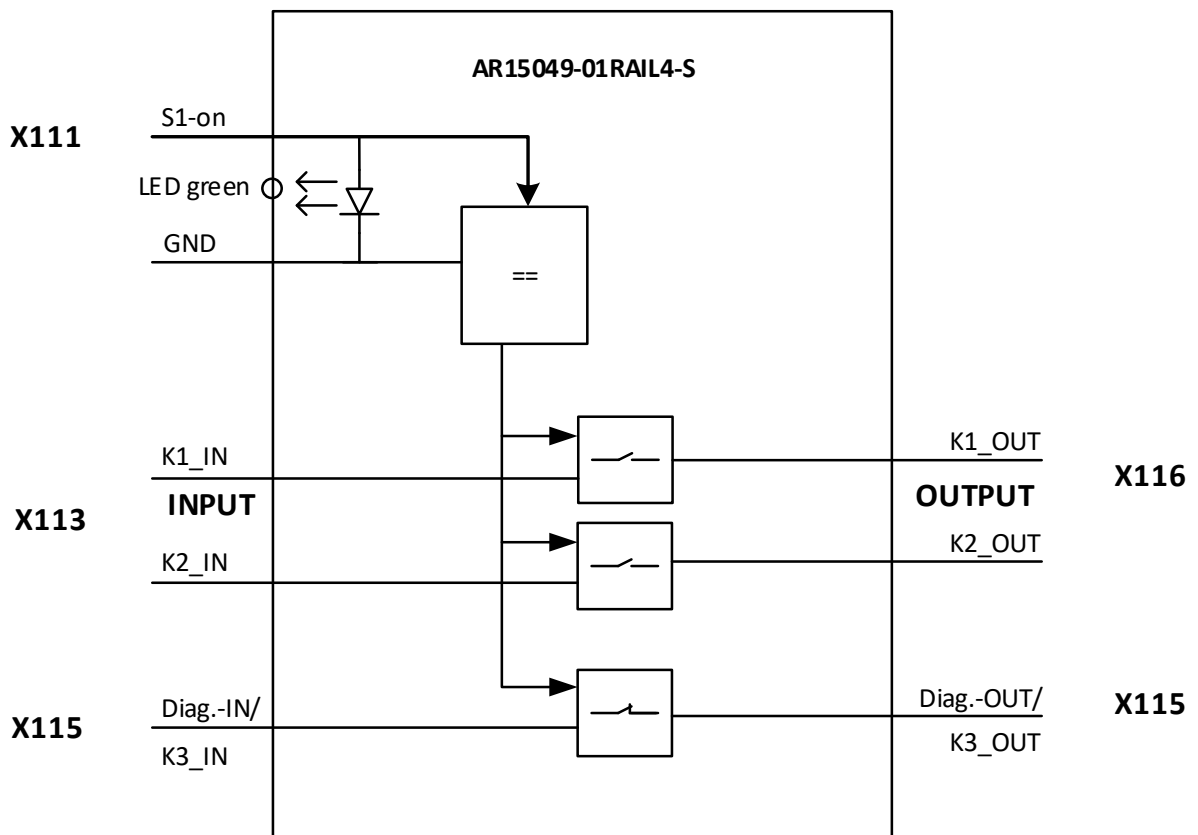


Figure 2: Block diagram

7 Test Report

Table 1: Relay coil energy consumption

Control voltage [V]	Stationary current position [mA]		Power consumption [mW]	
	Coil 2	Coil 3	Coil 2	Coil 3
18	25,2	25,2	453,6	453,6
20	27,9	27,7	558,0	554,0
22	30,7	30,6	675,4	673,2
24	33,7	33,6	808,8	806,4
26	36,6	36,4	951,6	946,4
28	38,7	38,6	1083,6	1080,8
30	42,0	42,3	1260,0	1269,0
32	44,1	45,0	1411,2	1440,0

Connection of the switching time (load circuit) @25°C:

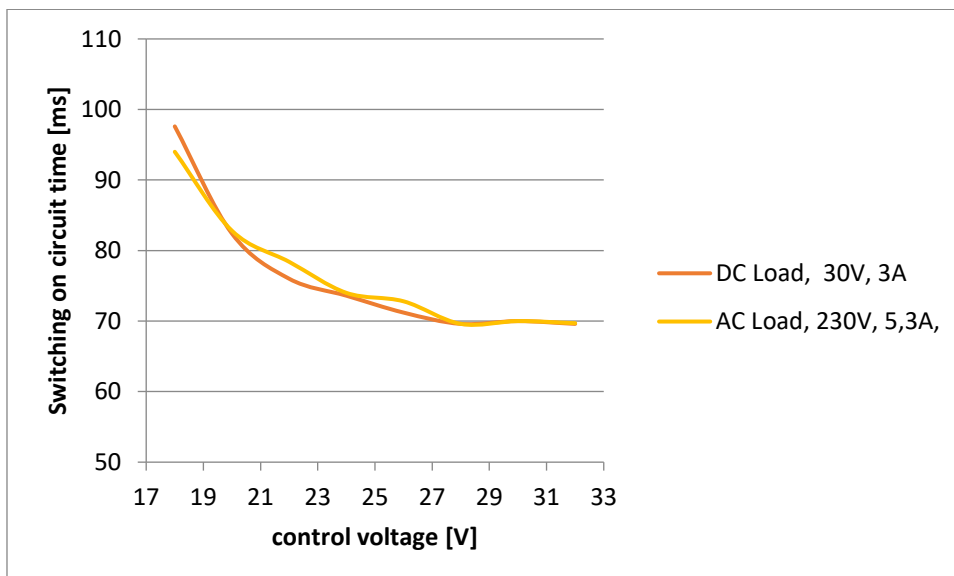


Figure 3: Changeover to switching time

Switching time off (load circuit) @25°C

AC-Last: ≤ 26 ms

DC-Last: ≤ 23 ms

8 Features

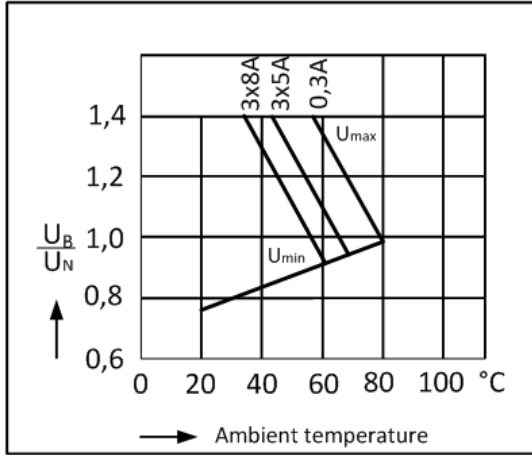


Figure 4: Operating voltage limit curve

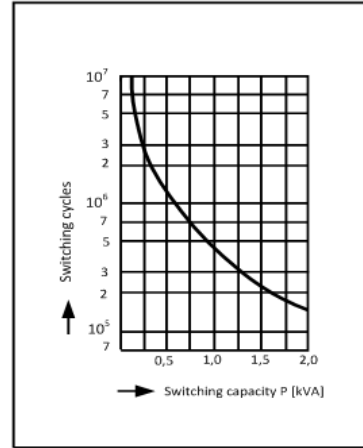


Figure 5: Contact service life (AgSnO₂)

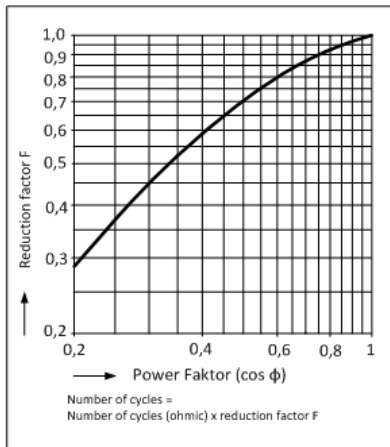


Figure 6 Reduction factor for inductive loads

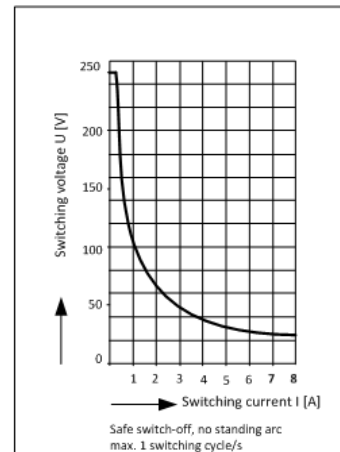


Figure 7: Limit curve for arc-free operation (load limit curve)

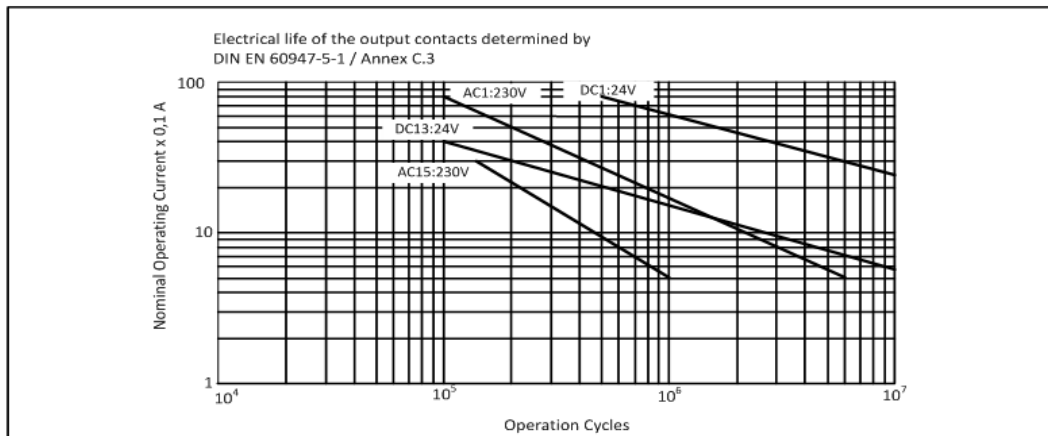


Figure 8: Electrical life

9 Circuit

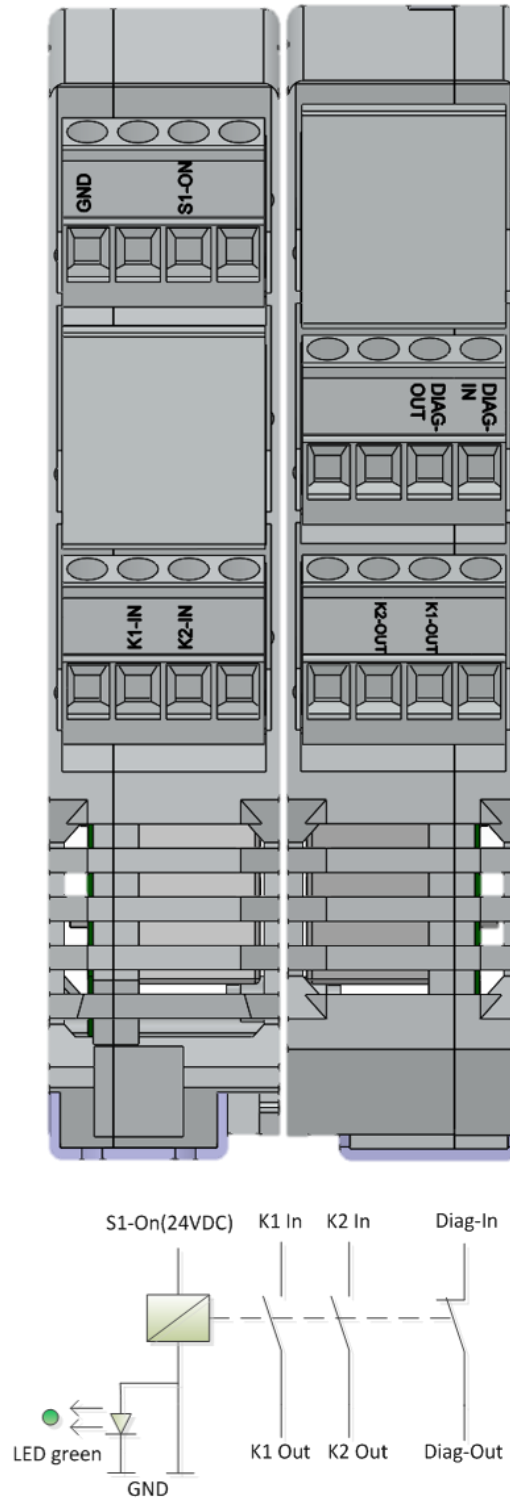


Figure 9: Pin assignment

10 Dimensions/Measurements

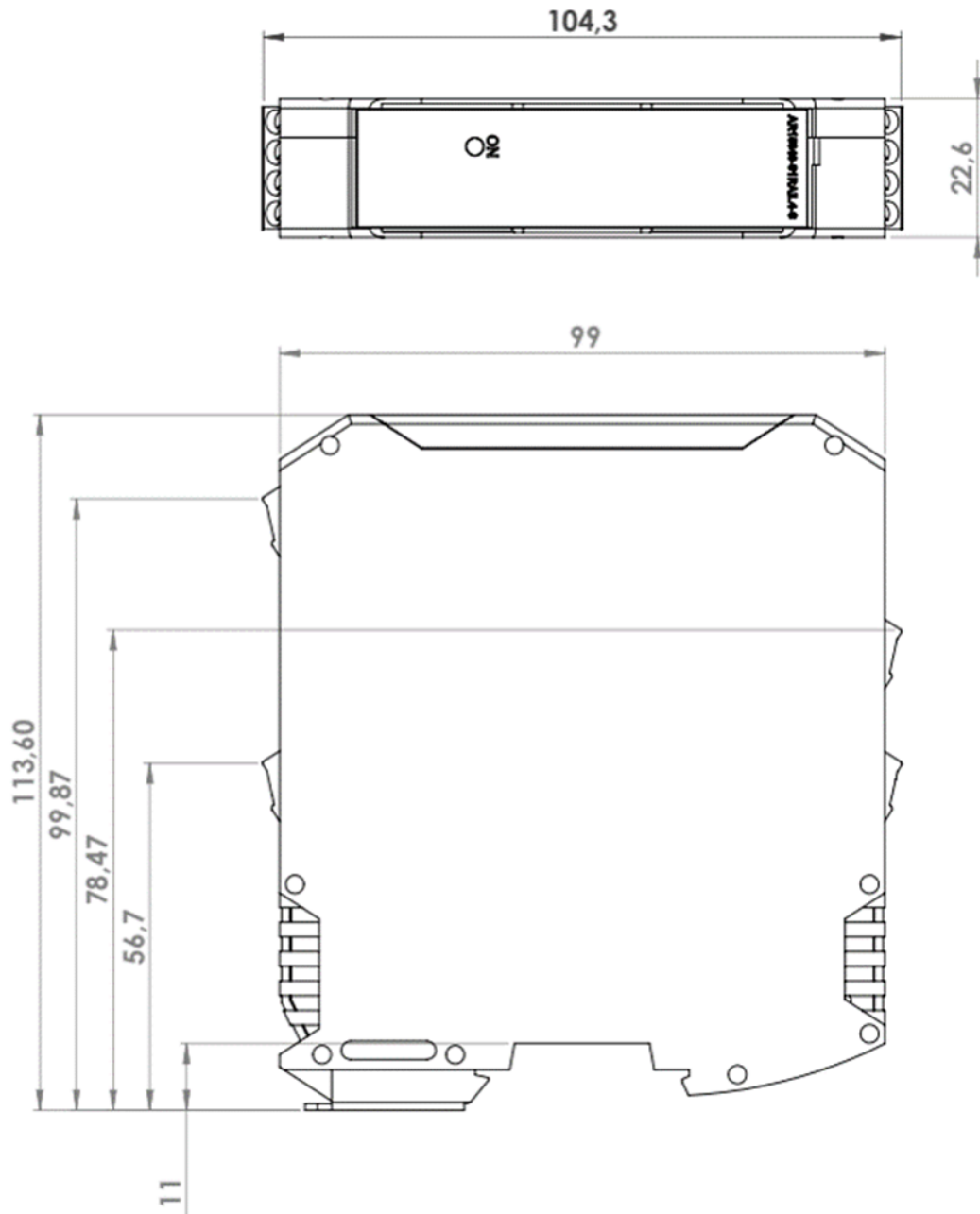


Figure 10: Dimensions of the relay case