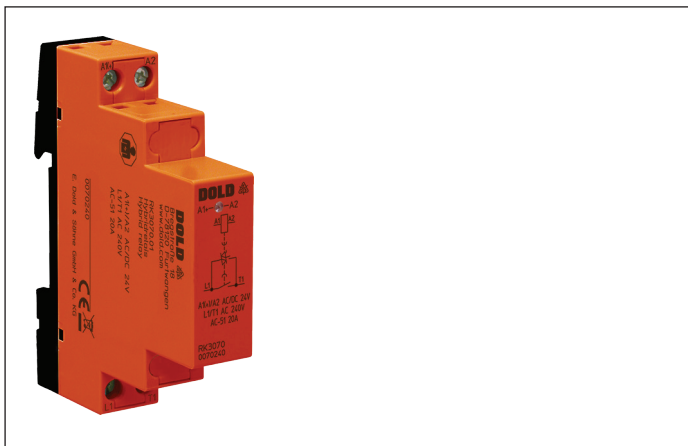


Hybrid Relay RK 3070

Translation
of the original instructions



0285586



Your Advantages

- Long service life thanks to hybrid technology
- Space saving, only 17.5 mm width
- DIN-rail mounting
- Compact design
- No sparking
- High switching cycles, low maintenance
- Reduced contact wear
- Low heat generation

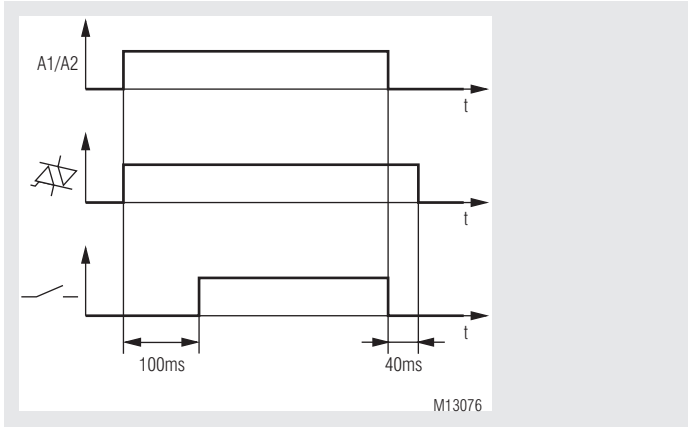
Features

- Load current up to 20 A
- According to IEC/EN 60947-4-3
- Switching at zero crossing
- LED status indicator
- Peak reverse voltage up to ± 800 V
- Insulation voltage 4000 V

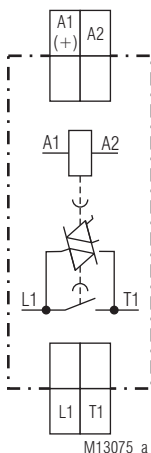
Product Description

The RK 3070 hybrid relay is used to switch high inductive or capacitive loads, e.g., energy-saving and LED lamps. In addition to the electromechanical output relay, a triac is connected in parallel, which is switched at the zero crossing of the mains voltage. This combination enables high inrush currents to be switched without contact bounce or arcing, which reduces mechanical wear and tear and ensures a long service life. One advantage over conventional semiconductor relays is that the low contact resistance of the electromechanical relay reduces heat dissipation from the load current to a minimum. The LED display shows the status of the control input.

Function Diagram



Circuit Diagram



Approvals and Markings



Applications

Applications can be found in automation technology, the process industry, heating, air conditioning, ventilation, and lighting technology, offshore wind turbines, switching power supplies with high input currents, and AC heating rods for feeding into PV systems.

Function

When switched on, the semiconductor switches on during the zero crossing of the AC voltage. A few milliseconds later, the relay contact takes over the continuous current and ensures low power loss. When the relay is switched off, the current is first transferred from the relay to the semiconductor, which then switches off at the zero crossing of the current. This minimizes overvoltages and overcurrents in the load circuit. The combination of different switching technologies makes the RK 3070 particularly suitable for applications that require high switching capacity and a long service life. It demonstrates its strengths in systems where downtime leads to high costs.

Connection Terminals

Terminal designation	Signal description
A1(+), A2	Control input
L1	Mains connection
T1	Load output

Operation Notes

Depending on the application, it may be advisable to protect the hybrid relay against short circuits with special super-fast semiconductor fuses. Multiple devices mounted on the same DIN rail must be at least 20 mm apart in order to carry the full rated current. If this is not possible, the load current must be reduced by 30 %. If multiple hybrid relays are mounted together, sufficient cooling and ventilation must be provided. EMC interference during operation must be reduced by appropriate measures and filters.

Safety Notes



Risk of fire or other thermal hazards!

Danger to life, risk of serious injuries or property damage.

- The device has no overtemperature alarm or shut-off. If the relay fails, it may overheat and become a fire hazard.



Risk of electrocution!

Danger to life or risk of serious injuries.

- Voltage is still present at the output terminals even when the device is switched off.



The LED indicator shows the status of the control input, not the status of the output.

Control Circuit

Control voltage range [V]:	AC/DC 24	AC/DC 85 ... 265
Max. pick-up voltage [V]:	20	50
Min. drop-out voltage [V]:	3	13
Maximum input current [mA]:	48 (AC) / 20 (DC)	AC/DC 19 ... 5

Output

Load voltage range AC [V]:	24 ... 280
Peak reverse voltage [V]:	± 800
Frequency range [Hz]:	47 ... 63

Hybrid relay

AC-51 Load current I_{enn} [A] at $T_u = 40^\circ\text{C}$ (acc. to EN 60947-4-3):	20
Max. overload current [A], $t = 20\text{ ms}$:	≤ 190
Max. I^2t for fusing [A^2s]:	180
Off-state leakage current at rated voltage [mA]	≤ 0.5
Min. operational current [mA]	100
Off-state voltage dV/dt [$\text{V}/\mu\text{s}$]:	1000
Rate of rise of current dI/dt [$\text{A}/\mu\text{s}$]:	44
Maximum switching frequency (F_{enn}) [/min]:	60
Repetition rate derating above 40°C [$\text{A} / ^\circ\text{C}$]:	- 1.25*

* $F_{Tu} = F_{\text{enn}} - [1.25 \times (T_u - 40^\circ\text{C})]$

General Technical Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 25 ... 60 °C	
Storage:	- 25 ... 85 °C	
Relative air humidity:	< 95 % non-condensing at 40 °C	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	4 kV / 3	IEC/EN 60664-1
EMC:	IEC/EN 61000-6-4	IEC/EN 61000-4-1
Electrostatic discharge (ESD):	8 kV air / 6 kV contact	IEC/EN 61000-4-2
HF irradiation:	10 V / m	IEC/EN 61000-4-3
Fast transients:	2 kV	IEC/EN 61000-4-4
Surge voltages		
control circuit between A1 / A2:	1 kV	IEC/EN 61000-4-5
Between output and ground:	2 kV	IEC/EN 61000-4-5
HF-wire guided:	10 V	IEC/EN 61000-4-6
Interference suppression:	Limit value class A	IEC/EN 60947-4-3
Degree of protection:	IP 20	IEC/EN 60529
Vibration resistance:	Amplitude 0.35 mm	
	Frequency 10 ... 55 Hz, IEC/EN 60068-2-6	
Housing material:	PC flame resistant; UL 94 V0	
Connections Load and Control Circuit:	M3.5 Pozidrive PZ1 Plus-minus	
Mounting torque:	1.2 Nm	
Wire cross section:	1 x 0.5 ... 6 mm ² solid or	
	1 x 0.5 ... 6 mm ² stranded wire with sleeve	
Nominal insulation voltage		
Control circuit – load circuit:	4 kV _{eff.}	
Overvoltage category:	III	
Mounting:	DIN rail	IEC/EN 60715
Weight:	67 g	

Dimensions

Width x height x depth: 17.5 x 90 x 71 mm

Standard Type

RK 3070.01	AC/DC 24 V	50/60 Hz
Article number:	0070240	
• Load voltage:	AC 24 ... 280 V	
• Load current:	20 A	
• Control voltage:	AC/DC 24 V	
• Width:	17.5 mm	

Ordering Example

RK 3070.01	AC/DC 24 V	50/60 Hz	
			Nominal frequency
			Nominal control voltage
			Type

Connection Example

