

Monitoring Technique

VARIMETER

Thermistor Motor Protection Relay

BA 9038, AI 938*)

*) Only for replacement!

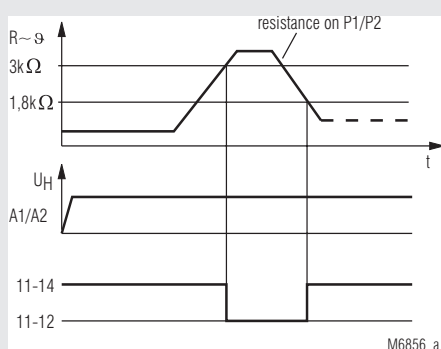
Replacements:

MK 9163N, BA 9038



- According to IEC/EN 60 947-8
- 1 input for PTC-resistors or bimetal contacts
- Broken wire detection in sensor circuit
- Optionally with no voltage reclosing interlock
- Closed circuit operation
- 1 or 2 changeover contacts
- Width 45 mm

Function Diagram



Approvals and Markings



Applications

To protect against thermal overload of motors caused by high switching frequency, heavy duty starting, phase failure on one phase, bad cooling, high ambient temperature.

Function

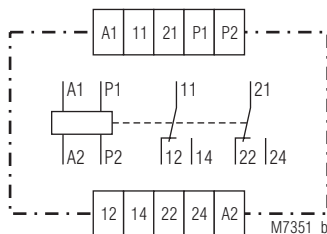
As sensors special PTC-resistors are used, which are normally built into the motor windings. Up to 6 PTC resistors can be connected in series. When the resistance reaches a certain value, the output relay deenergizes. An LED comes on. The thermistor motor protection relay works with closed circuit operation and also detects broken wire on the sensor circuit. Please note, that contact 11-12 and 21-22 may be closed for a short moment while the voltage is switched on.

The models AI 938.001/03 and BA 9038.11/003 include a thermal reclosing interlock. When the response temperature is reached the output relay deenergizes and the push button on the relay front comes out after approx. 1 s. This unit has no indicator LED.

The model BA 9038.____/100 includes an electromagnetic reclosing interlock. When the response temperature is reached the output relay deenergizes and the push button on the relay front comes out immediately. This model has 2 LEDs. One indicates connected auxiliary supply, the other one overtemperature.

The output relay of the units with reclosing interlock remains deenergized, also when the temperature goes back to normal. The interlock is no voltage safe, so also on loss of voltage its actual state is stored (VDE 0113 § 5.4.2). By pressing the button on the front the module can be reset again.

Circuit Diagram



BA 9038.12, AI 938.002,

Connection Terminals

Terminal designation	Signal description
A1, A2	Auxiliary voltage
P1, P2	Measuring input
11, 12, 14	Contacts relay 1
21, 22, 24	Contacts relay 2

Notes

The wires of the sensor circuit must not be influenced by other voltages therefore they should be routed separately or screened and earthed at one end only. The total resistance of the wiring should not exceed 100 Ω .

Technical Data	
Input Circuit	
Response value:	≥ 3 kΩ
Release value:	≤ 1.8 kΩ
Number of sensors:	1 ... 6 pcs
Operate delay:	≤ 20 ms
Release delay:	≤ 15 ms
Auxiliary Circuit	
Auxiliary voltage U_H:	
AI 938:	AC 24, 42, 110, 127, 230, 240 V
BA 9038:	AC 24, 42, 110, 127, 230, 240 V; AC/DC 110 ... 230 V
Voltage range of U_H:	0.8 ... 1.1 U _N
Nominal consumption:	2.2 VA
Nominal frequency of U_H:	50 / 60 Hz
Output	

Contacts	
BA 9038.11:	1 changeover contact
AI 938.001:	1 changeover contact
BA 9038.12:	2 changeover contacts
AI 938.002:	2 changeover contacts
Thermal current I_{th}:	5 A
Switching capacity	
to AC 15	
NO contact:	2 A / AC 230 V IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V IEC/EN 60 947-5-1
Electrical life	IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	2 x 10 ⁵ switching cycles
Short-circuit strength	
max. fuse rating:	4 A gG / gL IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10 ⁵ switching cycles

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Storage:	- 20 ... + 60 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages between		
wires for power supply:	1 kV	IEC/EN 61 000-4-5
between wired and ground:	2 kV	IEC/EN 61 000-4-5
HF wire guided:	10 v	IEC/EN 61 000-4-6
Interference suppressions:	Limit value class B	EN 55 011
AC/DC 110 ... 230 V:	Limit value class A*)	

*) The device is designed for the usage under industrial conditions (Class A, EN55011). When connected to a low voltage public system (Class B, EN 55011) radio interference can be generated. To avoid this, appropriate measures have to be taken.

Degree of protection

Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:		
	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm, IEC/EN 60 068-2-6 frequency 10 ... 55 Hz	
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1

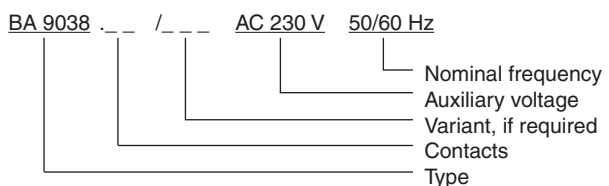
Technical Data	
Terminal designation:	EN 50 005
Wire connection:	2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Insulation of wires or sleeve length:	
	8 mm
Wire fixing:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque:	0.8 Nm
Mounting:	DIN rail IEC/EN 60 715
Weight:	
BA 9038:	250 g
AI 938:	240 g
Dimensions	
Width x height x depth:	
BA 9038:	45 x 74 x 124 mm
AI 938:	45 x 77 x 127 mm

Standard Type	
BA 9038.11/003	AC 230 V 50 / 60 Hz
Article number:	0028829
• Output:	1 changeover contact
• Auxiliary voltage U _H :	AC 230 V
• with thermal reclosing interlock (manual reset)	
• Width:	45 mm

Variants

BA 9038.11:	without thermal reclosing interlock (manual reset function)
BA 9038. __ /100:	with electro magnetic reclosing interlock (manual reset function)
AI 938.001:	without thermal reclosing interlock (manual reset function)

Ordering example for variants



Application Examples

