Monitoring Technique

VARIMETER
Thermistor Motor Protection Relay
BA 9038, AI 938*)

Translation of the original instructions

***) Only for replacement!**
Replacements:
MK 9163N, BA 9038

DOLD

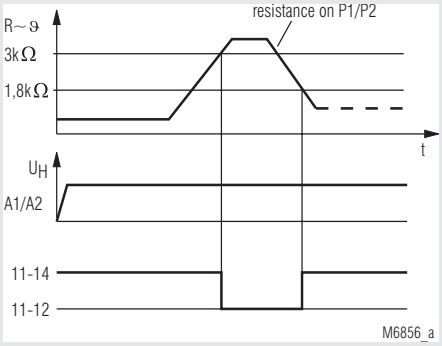
0225095

BA 9038

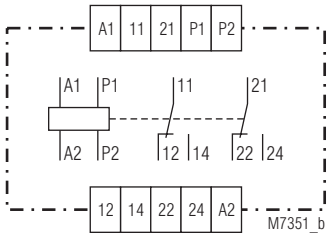
AI 938*)

- According to IEC/EN 60947-8
- 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



Circuit Diagram



BA 9038.12, AI 938.002,

Approvals and Markings

CE

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 use, 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.

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 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1
To DC 13:	1 A / DC 24 V	IEC/EN 60947-5-1
Electrical life		IEC/EN 60947-5-1
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 60947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Storage:	- 20 ... + 60 °C	
Altitude:	< 2000 m	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	4 kV / 2	IEC 60664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61000-4-2
HF irradiation		
80 MHz ... 2.7 GHz:	10 V / m	IEC/EN 61000-4-3
Fast transients:	2 kV	IEC/EN 61000-4-4
Surge voltages		
Between		
wires for power supply:	1 kV	IEC/EN 61000-4-5
Between wired and ground:	2 kV	IEC/EN 61000-4-5
HF wire guided:	10 v	IEC/EN 61000-4-6
Interference suppressions:	Limit value class B	EN 55011
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 60529
Terminals:	IP 20	IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm, frequency 10 ... 55 Hz	IEC/EN 60068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60068-1

Technical Data

Terminal designation:	EN 50005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46228-1/-2/-3/-4	
Insulation of wires or sleeve length:	8 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60715
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

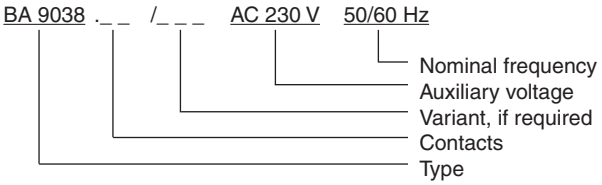
BA 9038.11/003 AC 230 V 50 / 60 Hz

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