

VARIMETER

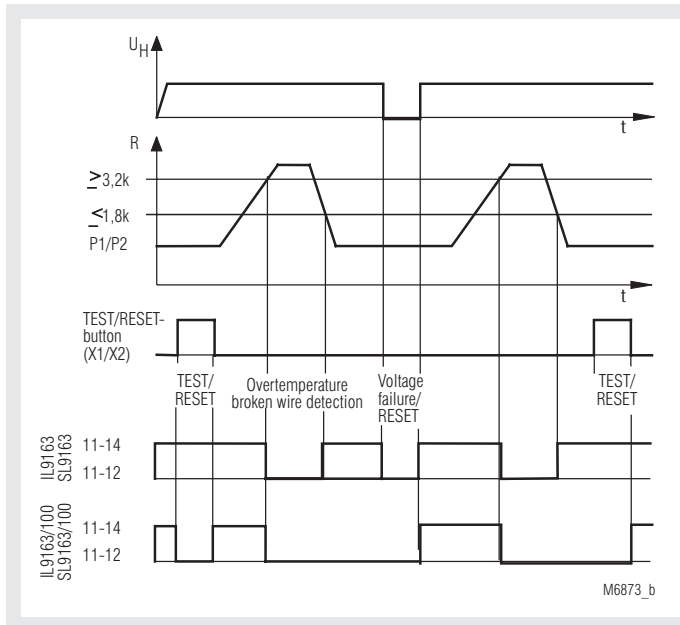
Thermistor Motor Protection Relay

IL 9163, SL 9163



- According to IEC/EN 60 255-1
- Monitoring of:
 - overtemperature
 - broken wire detection in sensor circuit
- 1 input for 1 to 6 PTC-resistors
- With manual reset variant /100
- Optionally with button for reset and test function
- Remote reset on A1/A2 (NC contact) or X1/X2 (NO contact)
- Closed circuit operation
- LED indicator for
 - auxiliary supply
 - state of contact
- 2 changover contacts
- Devices available in 2 enclosure versions:
 - IL 9163: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
 - SL 9163: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 35 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.

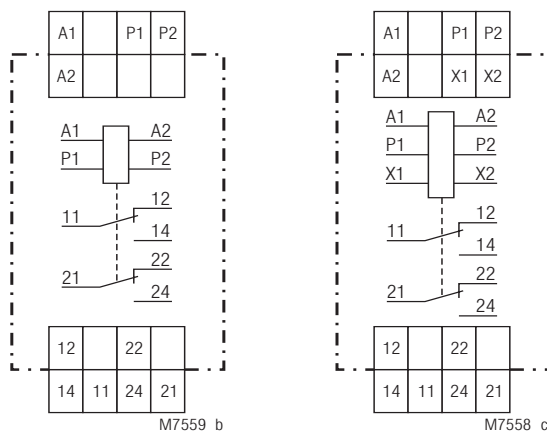
Function

If one of the sensors in the Measuring Circuit reaches the response temperature (or broken wire is detected), the device indicates failure. This failure is stored in the device /100 even if the temperature goes back to normal. The unit can be resetted by pressing the Test/Reset button, by bridging X1/X2 for a short moment or by disconnecting the auxiliary supply for a short time.

Test/Reset button:

Besides the reset function this button provides in normal operation a test facility. The unit indicates fault as long as the button is activated.

Circuit Diagram



IL 9163.12,
SL 9163.12

IL 9163.12/100,
SL 9163.12/100

Indicators

- green LED: on, when auxiliary supply connected
- red LED: on, when overtemperature or broken wire is detected

Notes

The unit with AC/DC 24 V has no galvanic separation between auxiliary supply (A1/A2) and measuring input (P1, P2), and therefore it should only be used for battery powered systems or with safety transformers according to IEC/EN 60 742.

Technical Data	
Measuring Circuit	
Temperature sensors:	PTC-Resistor according to DIN 44081/082
No. of sensors:	1 ... 6 in series
Response value:	3.2 ... 3.8 k Ω
Release value:	1.5 ... 1.8 k Ω
Loading of measuring circuit:	< 5 mW (at R = 1.5 k Ω)
Broken wire detection:	> 3.1 k Ω
Measuring voltage:	\leq 2 V (at R = 1.5 k Ω)
Measuring current:	\leq 1 mA (at R = 1.5 k Ω)
Voltage at broken wire:	DC approx. 9 V
Current when short circuit on input:	DC approx. 1.1 mA

Auxiliary Circuit	
Auxiliary voltage U_H:	AC/DC 24 V AC 110, 230, 400 V 50 / 60 Hz
Voltage range:	AC 0.9 ... 1.1 U_H DC 0.9 ... 1.25 U_H
at 10 % residual ripple:	
at 48 % residual ripple:	DC 0.9 ... 1.1 U_H
Nominal consumption:	AC: 1.5 VA DC: 0.85 W
Nominal frequency:	50 / 60 Hz
Frequency range:	45 ... 65 Hz
Max. bridging time on failure of aux. supply:	approx. 70 ms
Operate delay:	< 40 ms
Release delay:	< 100 ms
Control input (X1/X2)	
Function:	Remote reset with NO contact (voltage free)
Remark:	This input is not galvanic separated from measuring input P1/P2

Output	
Contacts	
IL/SL 9163.12:	2 changeover contacts
Thermal current I_{th}:	5 A
Switching capacity to AC 15	
NO contact:	3 A / AC 230 V IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60 947-5-1
Electrical life	IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	\geq 5 x 10 ⁵ switching cycles
to AC 15 at 5 A, AC 230 V:	\geq 1.5 x 10 ⁵ switching cycles
Short-circuit strength max. fuse rating:	4 AgL IEC/EN 60 947-5-1
Mechanical life:	\geq 1 x 10 ⁸ switching cycles

General Data	
Operating mode:	Continuous operation
Temperature range:	- 20 ... + 60°C
Clearance and creepage distances	
rated 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:	10 V / m IEC/EN 61 000-4-3
Fast transients:	4 kV IEC/EN 61 000-4-4
Surge voltages between wires for power supply:	2 kV IEC/EN 61 000-4-5
between wire and ground:	4 kV IEC/EN 61 000-4-5
HF-wire guided:	10 V IEC/EN 16 000-4-6
Interference suppressions:	Limit value class B EN 55 011
Degree of protection	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529

Technical Data	
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm, frequency 10 ... 55 Hz, IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1
Terminal designation:	EN 50 005
Wire connection:	2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded ferruled DIN 46 228-1/-2/-3/-4
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	
IL 9163:	150 g
SL 9163:	200 g

Dimensions	
Width x height x depth	
IL 9163:	35 x 90 x 58 mm
SL 9163:	35 x 90 x 98 mm

Standard Type	
IL 9163.12 AC 230 V 50 / 60 Hz	
Article number:	0049222
• Auxiliary voltage U_H :	AC 230 V
• Automatic reset	
• Width:	35 mm
SL 9163.12 AC 230 V 50 / 60 Hz	
Article number:	0054752
• Auxiliary voltage U_H :	AC 230 V
• Automatic reset	
• Width:	35 mm

Variant	
IL 9163.12/100:	2 changeover contacts with manual reset

