

VARIMETER

Temperature Monitoring Relay
IK 9094, IL 9094, SK 9094, SL 9094

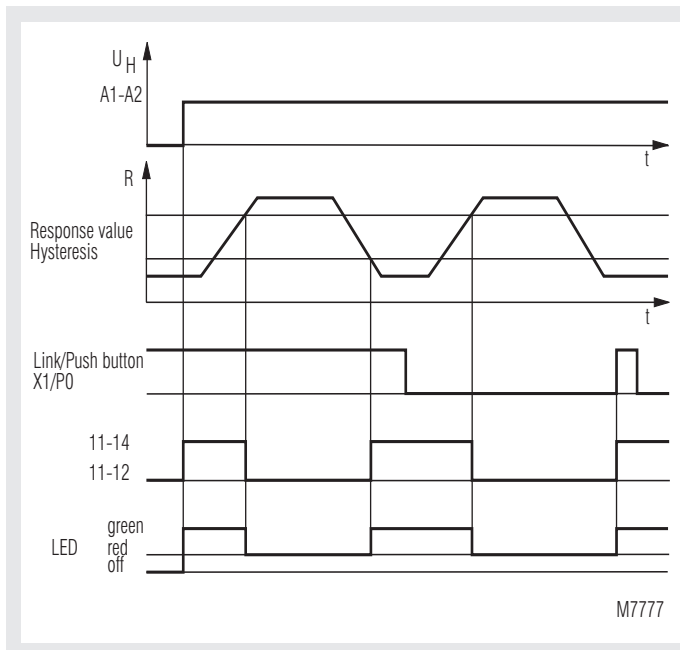


- According to IEC/EN 60 255, DIN VDE 0435-303
- 1 PT100 input, 2-wire connection
- 3 temperature ranges
- Adjustable response value
- Adjustable Hysteresis with wide range 3 ... 30 °C or 1 ... 15°C
- Broken wire detection in sensor circuit
- Programmable hysteresis or latching function via terminal X1
- IK 9094 no galvanic separation between measuring and Auxiliary Circuit
- Closed circuit operation
- LED indicator for operation and state of output relay
- 1 changeover contact
- As option with response value up to - 50°C, e.g. for refrigeration plants
- As option with galvanic separation between measuring and Auxiliary Circuit
- **Devices available in 2 enclosure versions:**
 - I-model:** depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
 - S-model:** depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- IK 9094, SK 9094: 17.5 mm width
- IL 9094, SL 9094: 35 mm width

Approvals and Marking



Function Diagram



Applications

- Monitoring of temperature e.g. Motors, ball bearings, rooms, refrigeration plants, etc.
- Temperature control
- Monitoring of humidity, see relay workshop no. 19

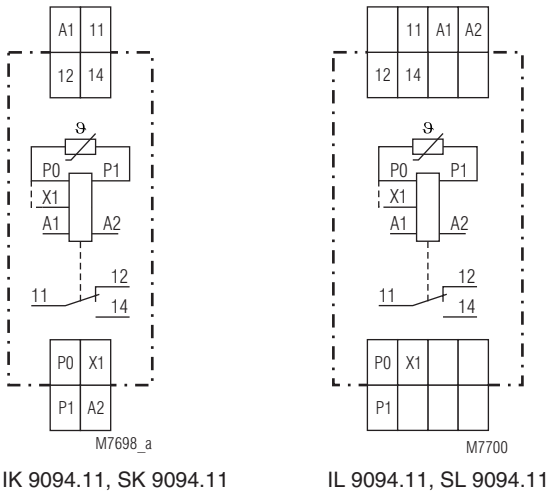
Function

On terminals P0 - P1 the resistance of the PT 100 is measured. On overtemperature and broken wire the output relay deenergises

Indicator

LED: green, when auxiliary supply connected
LED: red, when overtemperature

Circuit Diagram



Notes

Setting

Easy to set the temperature in °C:

Response value: Upper switch sets range (3 positions)
+ Middle potentiometer sets response value in °C

Release value: Lower potentiometer sets Hysteresis in °C

To operate the unit as temperature controller it has to be set to hysteresis function and to a small hysteresis (e.g. 3 °C).

With link X1-P0: Hysteresis function

Without link X1-P0: Latching function (the relay stays in off position even if the temperature is correct again.

The latching can be reset by bridging X1-P0 for a short time (Push button) or by disconnecting the auxiliary supply.

The IK/SK 9094 is designed to operate 2 wire PT 100 sensors. Therefore the setting must be corrected when using longer wires with about 2.6 °C per Ω of the connection wires (e.g. 2 pole cable 2 x 1.5 mm² of 40 m length has about 1Ω).

Technical Data

Input

Inputs : P0 and P1 for PT100 sensors according to DIN 43 760 / DIN IEC 751
X1 to set hysteresis or latching function:
- with bridge X1-P0: hysteresis function
- without bridge X1-P0: latching function (Fault signal remains stored when temperature goes over set point)

Setting range of response value: 0 ... 150°C in 3 ranges
(0 ... 50°C, 50 ... 100°C, 100 ... 150°C)
(on request 100 ... 250°C in 3 ranges of 50°C)

IL/SL 9094.11/010: - 50 ... +25°C in 3 ranges
(- 50 ... -25°C, -25 ... 0°C, 0 ... +25°C)

Release value: Adjustable hysteresis on absolute scale 3 ... 30°C,

IL/SL 9094.11/010: Hysteresis 1 ... 15°C adjustable
(Release value = response value minus hysteresis)

Voltage and temperature influence: < 1 % of setting value

Measuring current: approx. 2.5 mA

Dissipation of PT 100: approx 0.6 mW

Voltage on open terminals P0-P1: approx. 6 V

Broken wire detection: A broken wire in the PT 100 sensor wires is detected as fault (over-temperatur)

Technical Data

Auxiliary Circuit (A1-A2)

Auxiliary voltage U_H
IK/SK 9094: AC/DC 24 V
IL/SL 9094: AC 230 V (galvanic separation to measuring circuit)

Voltage range
at AC: 0.8 ... 1.1 U_N
at DC: 0.9 ... 1.25 U_N

Nominal consumption
IK/SK 9094.11
at AC: approx. 1 VA
at DC: approx. 0.6 W

IK/SK 9094.11/001
at AC: approx. 1.2 VA
at DC: approx. 0.7 W
IL/SL 9094.11: approx. 2 VA

Nominal frequency (AC): 50/60 Hz

Galvanic isolation between measuring and auxiliary inputs

IK/SK 9094.11/001 DC 1000 V
IL/SL 9094.11: 4 kV / 2

Output

Contacts

IK/SK 9094.11, IL/SL 9094.11: 1 changeover contact

Thermal current I_{th} : 4 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: $\geq 3 \times 10^5$ Switching cycles

Short circuit strength

max. fuse rating: 4 A gL

IEC/EN 60 947-5-1

Mechanical life: $\geq 30 \times 10^6$ Switching cycles

General Data

Operating mode: Continuous operation

Temperature range: - 20 ... + 60 °C

Clearance and creepage distances

rated impuls voltage /

pollution degree

IK/SK 9094.11:

Between A1-A2 auxiliary supply: 0.5 kV / 2 IEC 60 664-1

IK/SK 9094.11/001:

Between measuring input P0-P1

(-X1) and auxiliary supply: 1 kV / 2 IEC 60 664-1

IL/SL 9094.11: 4 kV / 2 IEC 60 664-1

Between input and output

contacts: 4 kV / 2 IEC 60 664-1

Airgap: ≥ 3 mm

Creepage distance on PCB: ≥ 3 mm,

Inside enclosure: ≥ 5.5 mm

Outside enclosure: ≥ 5.5 mm

EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2

Fast transients: 2 kV IEC/EN 61 000-4-4

Surge voltages

between

wires for power supply

IK/SK 9094: 0.5 kV IEC/EN 61 000-4-5

IL/SL 9094: 2 kV IEC/EN 61 000-4-5

Interference suppression: Limit value class B EN 55 011

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,

frequency 10 ... 55 Hz IEC/EN 60 068-2-6

20 / 060 / 04

Climate resistance: IEC/EN 60 068-1

Technical Data

Terminal designation:	EN 50 005
Wire connection:	2 x 2.5 mm ² solid DIN 46 228-1/-2/-3/-4 2 x 1.5 mm ² stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Wire connection:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Weight	
IK 9094:	65 g
SK 9094:	83 g
IL 9094:	137 g
SL 9094:	164 g

Dimensions

Width x height x depth

IK 9094:	17.5 x 90 x 59 mm
SK 9094:	17.5 x 90 x 98 mm
IL 9094:	35 x 90 x 59 mm
SL 9094:	35 x 90 x 98 mm

Standard Types

IK 9094.11 AC/DC 24 V 0 ... 150°C	
Article number:	0051642 stock item
SK 9094.11 AC/DC 24 V 0 ... 150°C	
Article number:	0054753
• Output:	1 changeover contact
• Auxiliary voltage U _H :	AC/DC 24 V
• Response value:	0 ... 150°C
• Width:	17.5 mm
IL 9094.11 AC 230 V 0 ... 150°C	
Article number:	0056024
SL 9094.11 AC 230 V 0 ... 150°C	
Article number:	0056100
• Output:	1 changeover contact
• Auxiliary voltage U _H :	AC 230 V
• Response value:	0 ... 150°C
• Width:	35 mm

Variants

IK 9094.11 /001:	with galvanic isolation between measuring and Auxiliary Circuit
IL 9094.11/010:	for refrigeration plants Art.-no.: 0056080

Ordering example for variants

IK 9094 .11 / _ _ _ AC/DC 24 V 0 ... 150°C	
_____	Response value
_____	Auxiliary voltage
_____	Variant, if required
_____	Contacts
_____	Type

Application Example

