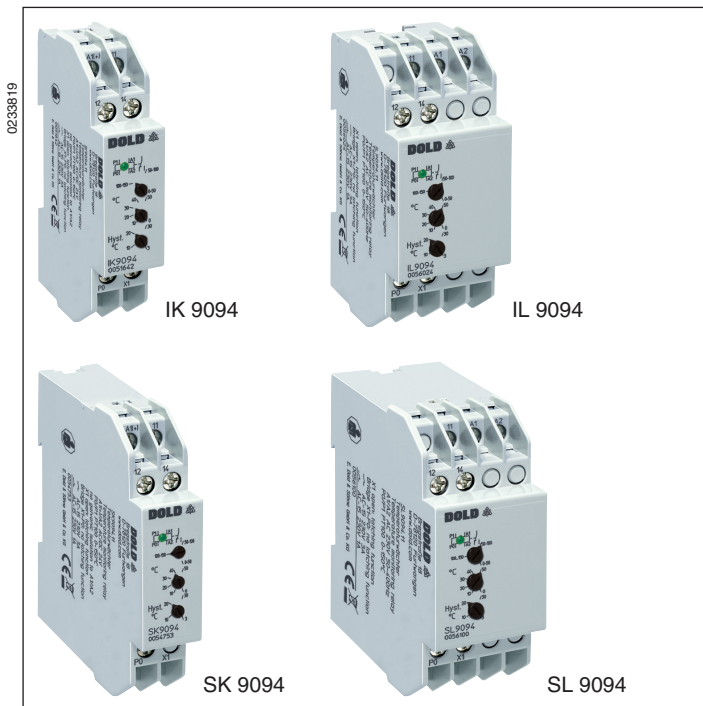


VARIMETER

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

Translation
 of the original instructions



Your Advantages

- Preventive maintenance
- For better productivity
- Quicker fault locating

Features

- According to IEC/EN 60255-1
- 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 43880
 - S-model: Depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- DIN rail or screw mounting
- IK 9094, SK 9094: 17.5 mm width
- IL 9094, SL 9094: 35 mm width

Product Description

The temperature monitoring relays IK 9094, IL 9094, SK 9094, SL 9094 of the VARIMETER series are used for temperature monitoring of motors, ball bearings and rooms. The early detection of impending failures and preventive maintenance prevent costly damage and as a user you benefit from the operational reliability and high availability of your system.

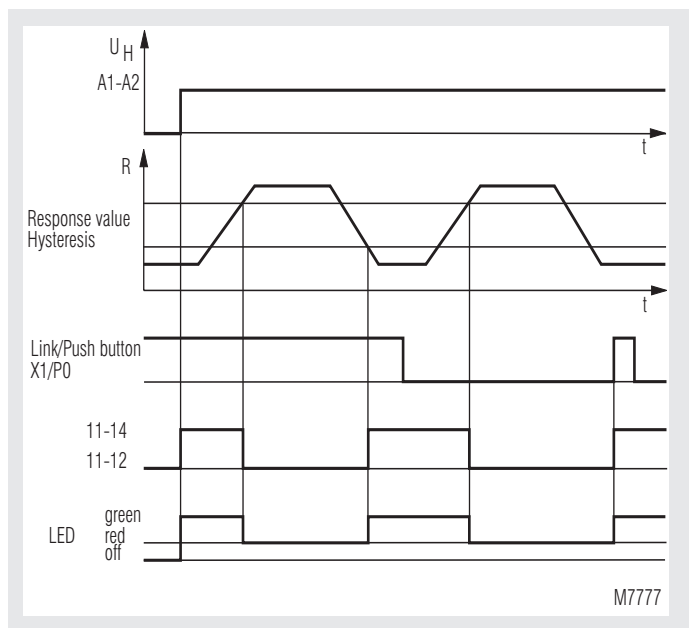
Further information about this topic

- Relay Workshop No. 19

Approvals and Markings



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
- For industrial and railway applications

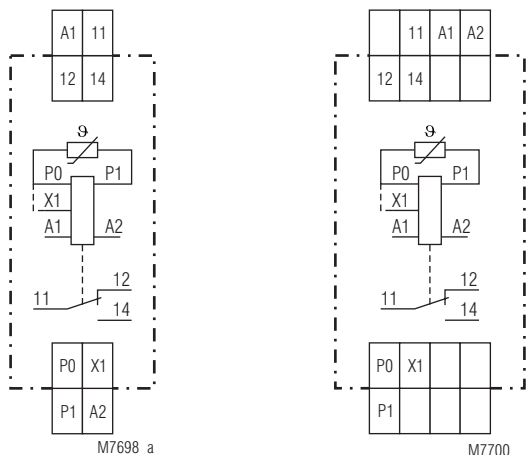
Function

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

Indicators

LED: Green, when auxiliary supply connected
 LED: Red, when overtemperature

Circuit Diagrams



IK 9094.11, SK 9094.11

IL 9094.11, SL 9094.11

Connection Terminal

Terminal designation	Signal description
A1, A2	Auxiliary voltage
P0, P1	Connection for resistance thermometer PT100
X1, P0	Control input (manual reset / hysteresis function) X1/P0 not bridged: Manual reset X1/P0 bridged: Hysteresis function
11, 12, 14	Changeover contact

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).

A temperature sensor with insulation must be used (AC 300 V).

Technical Data

Input

Inputs:

- With bridge X1-P0:
- Without bridge X1-P0:

P0 and P1 for PT100 sensors according to DIN 43760 / DIN IEC 751
X1 to set hysteresis or latching function:
Hysteresis function
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:

IL/SL 9094.11/010:

Adjustable hysteresis on absolute scale 3 ... 30 °C,
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)

Auxiliary Circuit (A1-A2)

Auxiliary voltage U_H

IK/SK 9094:

AC/DC 24 V

IK/SK 9094/001:

AC/DC 24 V, AC/DC 48 V,

(galvanic separation to measuring circuit)

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:

50/60 Hz

Output

Contacts

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

IL 9094.12/801: 2 changeover contacts

Thermal current I_{th} : 4 A (see characteristics)

Switching capacity

to AC 15

NO contact:

3 A, AC 230 V

IEC/EN 60947-5-1

NC contact:

1 A, AC 230 V

IEC/EN 60947-5-1

To DC 13 at 0.1 Hz:

1 A / DC 24 V

IEC/EN 60947-5-1

Electrical life

IEC/EN 60947-5-1

at 1 A, AC 230 V $\cos \varphi = 1$:

$\geq 3 \times 10^5$ Switching cycles

Short circuit strength

max. fuse rating:

4 A gG / gL

IEC/EN 60947-5-1

Mechanical life:

$\geq 30 \times 10^6$ Switching cycles

Technical Data**General Data****Operating mode:** Continuous operation**Temperature range**Operation: - 20 ... + 60 °C
(see characteristics)

Storage: - 25 ... + 60 °C

Altitude: ≤ 2000 m**Clearance and creepage distances**Rated impulse voltage /
pollution degree

IK/SK 9094:

Measuring input / contact: 4 kV / 2 IEC/EN 60664-1

Auxiliary voltage / contact: 4 kV / 2 IEC/EN 60664-1

IK/SK 9094/001:

Measuring input / aux. voltage: 1 kV / 2 IEC/EN 60664-1

Measuring input / contact: 4 kV / 2 IEC/EN 60664-1

Auxiliary voltage / contact: 4 kV / 2 IEC/EN 60664-1

IL/SL 9094:

Measuring input / aux. voltage: 4 kV / 2 IEC/EN 60664-1

Measuring input / contact: 4 kV / 2 IEC/EN 60664-1

Auxiliary voltage / contact: 4 kV / 2 IEC/EN 60664-1

Overvoltage category: III

EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61000-4-2

HF-irradiation

80 MHz ... 6 GHz: 20 V / m IEC/EN 61000-4-3

Fast transients: 4 kV IEC/EN 61000-4-4

Surge voltages

between

wires for power supply

IK/SK 9094: 1 kV IEC/EN 61000-4-5

IL/SL 9094: 2 kV IEC/EN 61000-4-5

Between wire and ground:

IK/SK 9094: 2 kV IEC/EN 61000-4-5

IL/SL 9094: 4 kV IEC/EN 61000-4-5

Damped oscillatory wave
immunity test

Differential mode voltage: 1 kV IEC/EN 61000-4-18

Common mode voltage: 2.5 kV IEC/EN 61000-4-18

HF wire guided: 10 V IEC/EN 61000-4-6

Interference suppression: Limit value class B EN 55011

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

Terminal designation: EN 50005**Wire connection:**Cross section: 2 x 2.5 mm² solid
2 x 1.5 mm² stranded wire with sleeve
DIN 46228-1/-2/-3/-4

Stripping length: 10 mm

Wire connection: Flat terminals with self-lifting
clamping piece IEC/EN 60999-1**Fixing torque:** 0.8 Nm**Mounting:** DIN rail mounting (IEC/EN 60715) or
screw mounting M4, 90 mm hole pattern,
with additional clip available as accessory**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

Classification to DIN EN 50155 for IK 9094**Vibration and****shock resistance:** Category 1, Class B IEC/EN 61373**Service temperature classes:** OT1 compliant**Protective coating of the PCB:** No**Standard Types**

IK 9094.11 AC/DC 24 V 0 ... 150 °C

Article number: 0051642

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

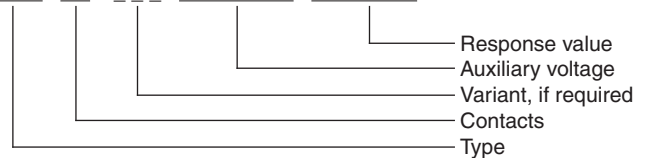
• Auxiliary voltage U_H: AC 230 V

• Response value: 0 ... 150 °C

• Width: 35 mm

Variants**Ordering example for variants**

IK 9094 .11 / - - - AC/DC 24 V 0 ... 150 °C



IK/SK 9094.11:

Without galvanic isolation between
measuring and auxiliary circuit

IK/SK 9094.11/001:

With galvanic isolation between
measuring and auxiliary circuit

IK 9094.11/010:

As IK 9094.11, but
with hysteresis 1 ... 15 °C

IL/SL 9094.11/010:

As IL/SL 9094.11, but
with hysteresis 1 ... 15 °C

IL 9094.12/801:

Consisting of two independent
IK 9094.11 in one housing.

Each with a fixed response value:

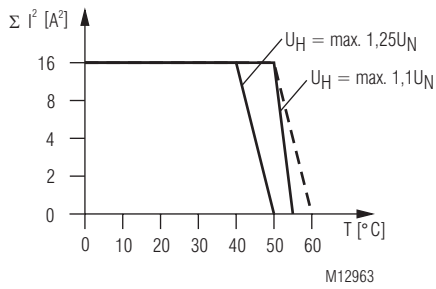
Article number:	0056812	0059393
Auxiliary voltage U _H :	AC/DC 24 V	AC/DC 24 V
Response value	250 °C	270 °C
Hysteresis:	3 ... 30 °C	3 ... 30 °C

Accessories

ET 4086-0-2:

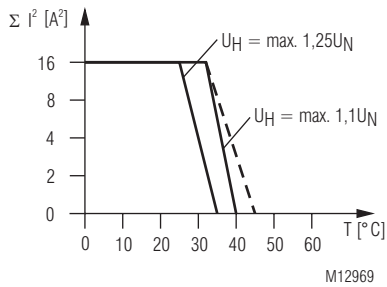
Additional clip for screw mounting
Article number: 0046578

Characteristic



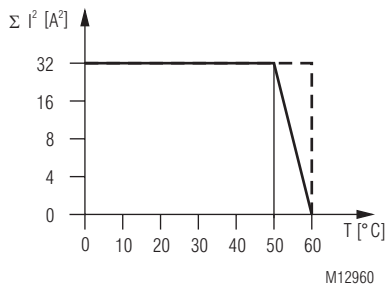
- Device mounted away from heat generation components > 2cm.
- Device mounted without distance heated by devices with same load.

Continuous current limit curve IK/SK 9094.11/001 AC/DC 24 V



- Device mounted away from heat generation components > 2cm.
- Device mounted without distance heated by devices with same load.

Continuous current limit curve IK/SK 9094.11/001 AC/DC 48 V



- Device mounted away from heat generation components > 2cm.
- Device mounted without distance heated by devices with same load.

Quadratic total current limit curve IL 9094.12/801

Application Examples

