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

0233819


IK 9094


IL 9094


SK 9094

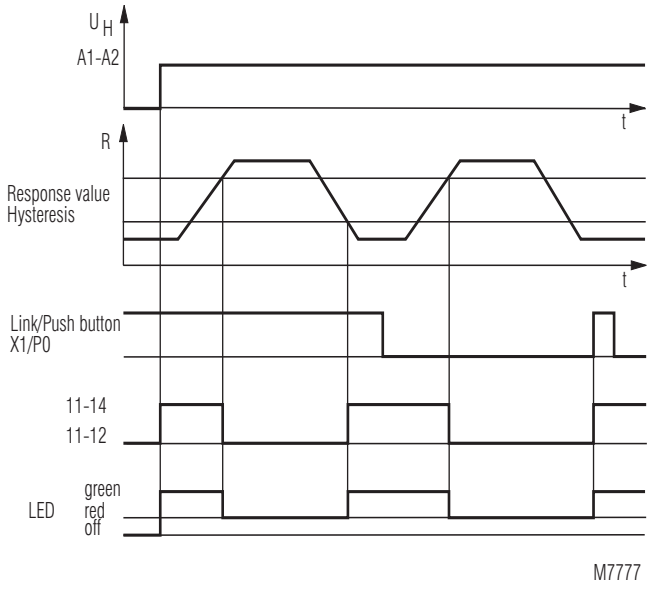

SL 9094

- 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 Markings

CE

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

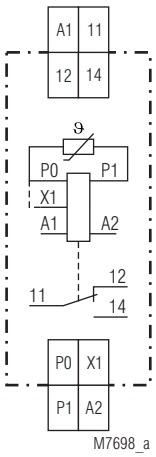
Function

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

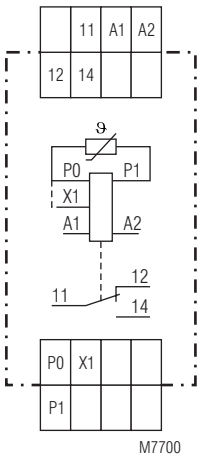
Indicator

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

Circuit Diagram



IK 9094.11, SK 9094.11



IL 9094.11, SL 9094.11

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 postion 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:	≥ 3 x 10^5 Switching cycles	
Short circuit strength		
max. fuse rating:	4 A gL IEC/EN 60 947-5-1	
Mechanical life:	≥ 30 x 10^6 Switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impulse 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
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1	

Technical Data

Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire connection:	Flat terminals with self-lifting clamping pieceIEC/EN 60 999-1	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 9094:	65 g	
SK 9094:	83 g	
IL 9094:	137 g	
SL 9094:	164 g	

Dimensions

Width x heigth 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 61 373
Protective coating of the PCB:	No	

Standard Types

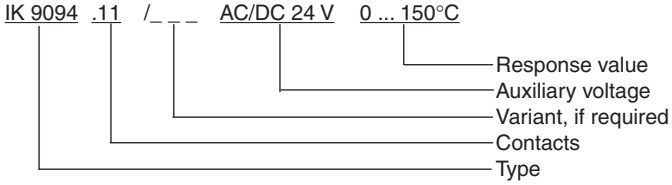
IK 9094.11 AC/DC 24 V 0 ... 150°C
Article number: 0051642
SK 9094.11 AC/DC 24 V 0 ... 150°C
Article number: 0054753
- Output: 1 changeover contact
- Auxiliary voltage U_H: AC/DC 24 V
- Response value: 0 ... 150°C
- Width: 17.5 mm

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

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



Application Example