



K120RTD

2 WIRE - LOOP POWERED TRANSMITTER FOR PT100 AND NI100 PROBES

General Description

The K120RTD instrument converts a temperature signal read by a PT100 (EN 60 751) or NI100 probe with connection by 2, 3 or 4 wires into a signal normalised in current for 4..20 mA loop (2 wires technology).

The module's main features are: high precision, resolution 16 bit, compact size (6.2 mm), attachment to a 35 mm DIN rail, quick connection by spring terminals, and easy configuration in the field by DIP-switch.

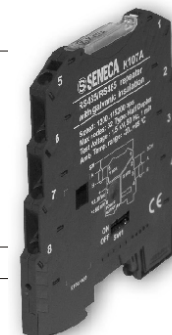
Technical Features

PT100 Input- EN 60751/A2 (ITS-90)

Measurement Range :	-200..650 °C
Resistance Range :	18,5 Ω.. 330 Ω
Minimum span :	20 °C
Current on sensor :	750 µA rated
Cable resistance :	Max 25 Ω per wire
Connection :	2, 3 or 4 wires

NI100 Input

Measurement Range :	-60..250 °C
Resistance Range :	69 Ω.. 290 Ω
Minimum span :	20 °C
Current on sensor :	750 µA rated
Cable resistance :	Max 25 Ω per wire
Connection :	2, 3 or 4 wires



Output/Power Supply

Functioning Voltage :	5..30 V _{DC}
Current output :	4..20 mA, 20..4 mA (2 wires technology)
Load resistance :	1 kΩ @ 26 V _{DC} , 21 mA (see on page 2, Load Resistance vs Minimum Functioning Voltage diagram)
Resolution :	0,5 µA (15 bits)
Output in case of over-range :	102,5% of full scale value (see Table on Page 5)
Output in case of malfunction :	105% of full scale value (see Table on Page 5)
Current output protection :	approximately 30 mA

Other Features

Disturbance Rejection :	50 Hz and 60 Hz
Transmission error :	Max of 0,1% (of measurement range) or 0,1 °C
Error caused by EMI (*)	< 0,5 %
Influence of cable resistance :	0,005 Ω / Ω
Temperature Coefficient :	< 100 ppm, Typical : 30 ppm
Sampling Time:	100 ms (without filter) / 300 ms (with filter)
Response time (10..90 %) :	< 220 ms (without filter) / < 620 ms (with filter)
Protection Index :	IP20

(*) EMI: electromagnetic interferences.

This document is property of SENECA srl. Duplication and reproduction are forbidden, if not authorized. Contents of the present documentation refers to products and technologies described in it. All technical data contained in the document may be modified without prior notice Content of this documentation is subject to periodical revision.

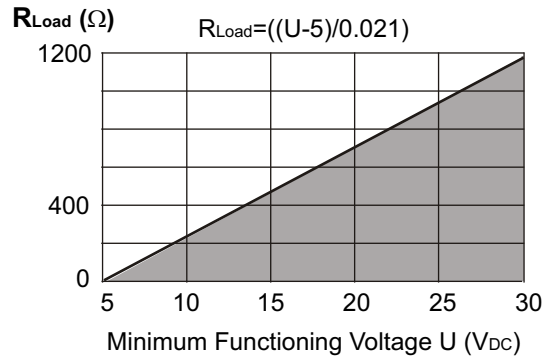


Brought to you by **SENECAUK**
PO Box 1 - Ilkley - West Yorkshire - LS29 8EU
Tel:01943 816796 - Fax: 01943 816796
Web: www.SenecaUK.com - Email: sales@SenecaUK.com

Operating Conditions :	Temperature -20..+65 °C Humidity 30..90 % at 40°C (non-condensing) Altitude: up to 2000 m.a.s.l
Storage Temperature:	-40..+85 °C
LED Signalling :	Setting error, connection malfunction, internal malfunction
Connections :	Spring terminals
Conductor Section :	0,2..2,5 mm ²
Wire stripping :	8 mm
Box:	PBT (black colour)
Dimensions, Weight :	6,2 x 93,1 x 102,5 mm, 45 g
Standards :	EN61000-6-4/2002-10 (electromagnetic emission, industrial surroundings) EN61000-6-2/2006-10 (electromagnetic immunity, industrial surroundings)



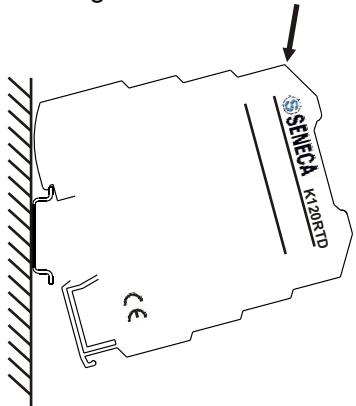
Diagram: Load Resistance vs Minimum Functioning Voltage



Installation rules

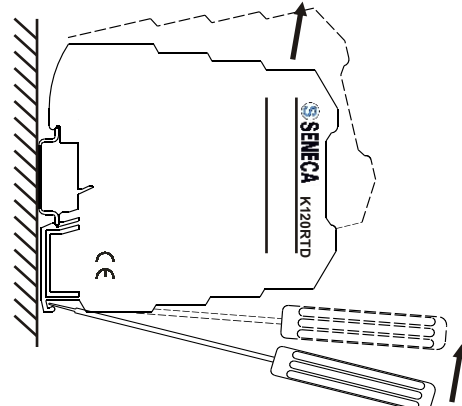
This module has been designed for assembly on a DIN 46277 rail.

Inserting the module in the rail



- 1 - Attach the module in the upper part of the rail.
- 2 - Press the module downwards.

Removing the module from the rail

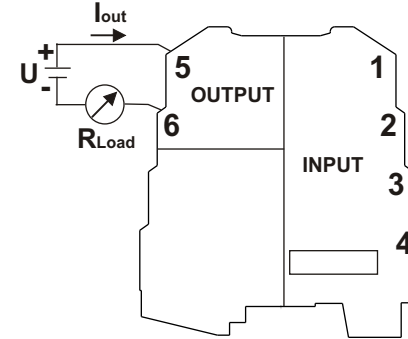


- 1 - Apply leverage using a screwdriver (as shown in the figure).
- 2 - Rotate the module upwards.

Output

Current connection (regulated current).

The use of shield cables is recommended for the electronic connections.



Note: in order to reduce the instrument's dissipation, we recommend guaranteeing a load of > 250 Ω to the current output.

LED indications on the front

LED	Meaning
Rapid flashing 3 pulses/sec.	Internal malfunction
Slow flashing 1 pulse/sec.	DIP-switch setting error (full scale and start range limits)
Steady light	RTD connection wire malfunction. Measurement out of range , 3 rd wire resistance out of range.

Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collection programs)



This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, waste disposal service or the retail store where you purchased this product.

This document is property of SENECA srl. Duplication and reproduction are forbidden, if not authorized. Contents of the present documentation refers to products and technologies described in it. All technical data contained in the document may be modified without prior notice Content of this documentation is subject to periodical revision.



SENECA s.r.l.

Via Germania, 34 - 35127 - Z.I. CAMIN - PADOVA - ITALY
Tel. +39.049.8705355 - 8705359 - Fax +39.049.8706287
e-mail: info@seneca.it - www.seneca.it

Input

The module accepts input from a PT100 (EN 60 751) or NI100 temperature probe with connection by 2, 3 or 4 wires.

The use of shield cables is recommended for the electronic connections.

2-wire connection

This is the connection to be used for short distances (< 10 m) between module and probe, bearing in mind that it adds an error equivalent to the resistance contributed by the connection cables to the measurement.

DIP-switch SW1-1 set in Position 1 (ON) (2 / 4 wires).

With bridges between Terminals 1 and 2 and Terminals 3 and 4.

3-wire connection

This is the connection to be used for media-long distances (> 10 m) between module and probe. The instrument performs compensation for the resistance of the connection cables. In order for compensation to be correct, it is necessary that the resistance values of all cables be equal because in order to perform compensation the instrument measures the resistance of only one cable and assumes the resistance of the others cables to be exactly the same.

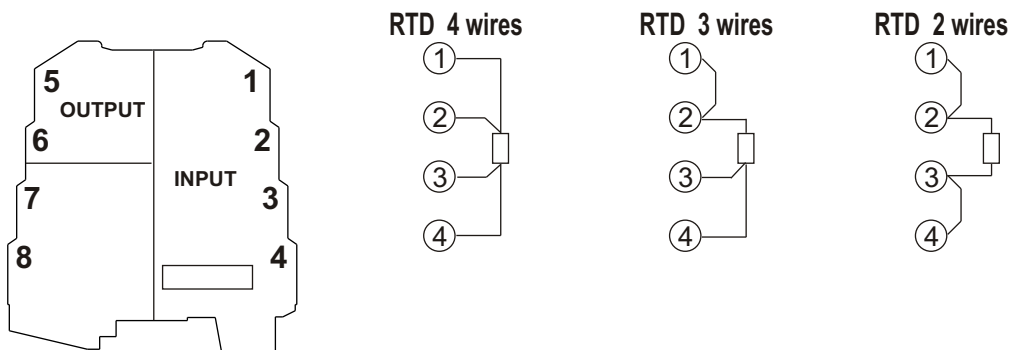
DIP-switch SW1-1 set in Position 0 (OFF) (3 wires).

With bridge between Terminals 3 and 4.

4-wire connection

This connection to be used for media-long distances (> 10 m) between module and probe. Provides the maximum precision because the instrument measure the resistance of the sensor independently of the resistance of the connection cables.

DIP-switch SW1-1 set in Position 1 (ON) (2 / 4 wires).



Assembly in vertical position is recommended in order to increase the module's ventilation, and no raceways or other objects that compromise aeration must be positioned in the vicinity.

Do not position the module above equipment that generates heat; we recommend positioning the module in the lower part of the control panel or container compartment.

SETTING OF THE DIP-SWITCHES

Factory setting

All the module DIP switches are at pos. 0 as default configuration.

This set corresponds to the following configuration :

RTD wiring	→	3 wires
Input filter	→	present
Reversed Output	→	NO
RTD Type	→	PT100
Measurement Range	→	0 °C
Start	→	100 °C
Measurement Full- Scale	→	Towards the top of the output range
Output signal in case of Malfunction	→	YES: a 2.5% over-range value is acceptable; a 5% over-range value is considered a malfunction.

It is understood that this configuration is valid only with all the DIP switches at position 0.

If also one Dip is moved, it is necessary to set all the other parameter as indicated on the following tables.

Customized Setting

For a customized setting of the module, the positions of the DIP-switch are illustrated on the following tables.

Note: for all following tables:

The indication ● indicates that the DIP-switch is set in Position 1 (ON).

No indication is provided when the DIP-switch is set in Position 0 (OFF).

RTD WIRING	
SW1	1
	● 2 / 4 wires connection
	3 wires connections

INPUT FILTER (*)	
SW1	2
	● Absent
	Present

(*) The input filter slows down the response time to around 620 ms and guarantees the repeating of the disturbance signal at 50 / 60 Hz overlapping the measurement signal.

REVERSED OUTPUT	
SW1	3
	● Reversed: 20..4 mA
	Normal: 4..20 mA

RTD TYPE	
SW1	4
	● NI100
	PT100

NOT USED	
SW1	5 Not used

MEASUREMENT RANGE START			
SW1	6	7	8 °C
			0
	●		-10
		●	-20
	●	●	-40
		●	-50
	●	●	-100
		●	-150
	●	●	-200

MEASUREMENT FULL SCALE						
SW2	1	2	3	4	5	6 °C
						0
	●					5
		●				10
	●	●				15
			●			20
	●	●	●			25
		●	●			30
	●	●	●			35
				●		40
	●			●		45
	●	●		●		50
	●	●	●			55
		●	●			60
	●	●	●			65
		●	●			70
	●	●	●			75
				●		80
	●			●		85
		●		●		90
	●	●		●		95
			●	●		100
	●	●		●		110

SW2	1	2	3	4	5	6 °C
		●	●		●	120
	●	●	●		●	130
			●	●		140
	●		●	●		150
		●	●	●		160
	●	●	●	●		170
			●	●	●	180
	●	●	●	●	●	190
		●	●	●	●	200
	●	●	●	●		210
					●	220
	●				●	230
		●			●	240
	●	●			●	250
			●		●	260
	●	●			●	270
		●	●		●	280
	●	●	●		●	290
			●		●	300
	●		●		●	310
		●	●		●	320
	●	●	●		●	330

SW2	1	2	3	4	5	6 °C
			●	●		340
	●	●	●		●	350
		●	●	●		360
	●	●	●	●		370
				●	●	380
	●			●	●	390
		●		●	●	400
	●	●		●	●	410
			●	●	●	420
	●	●	●	●	●	430
	●	●	●	●	●	440
	●	●	●	●	●	450
			●	●	●	480
	●		●	●	●	500
		●	●	●	●	520
	●	●	●	●	●	550
			●	●	●	580
	●	●	●	●	●	600
		●	●	●	●	620
	●	●	●	●	●	650

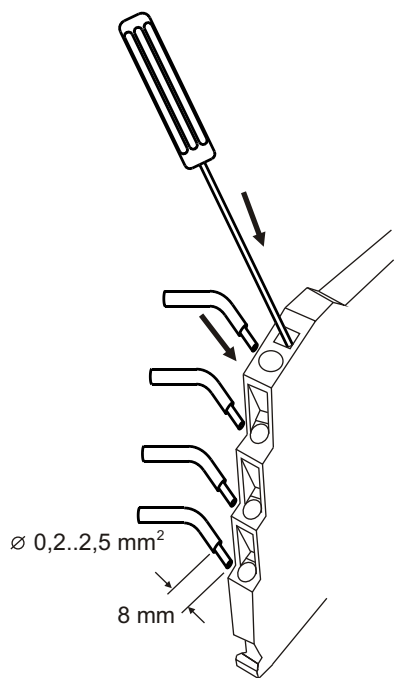
OUTPUT SIGNAL IN CASE OF MALFUNCTION	
SW2	7
	● Towards the bottom of the output range
	Towards the top of the output range

OVER-RANGE (*)	
SW2	8
	● NO: the malfunction alone causes a 2.5% over-range value.
	YES: a 2.5% over-range value is acceptable; a 5% over-range value is considered a malfunction.

(*) See the table below for the corresponding values.

Output signal limit	Over-range / Malfunction ± 2,5 %	Malfunction ± 5 %
20 mA	20,4 mA	21 mA
4 mA	3,6 mA	< 3,4 mA

Electrical Connections



The module has been designed for spring-type terminal electrical connections.

Proceed as follows to make the connections:

- 1 - Strip the cables by 0.8 mm
- 2 - Insert a screwdriver in the square hole and press it until the cable lock spring opens.
- 3 - Insert the cable in the round hole.
- 4 - Remove the screwdriver and make sure that the cable is tightly fastened in the terminal.