INSTALLATION MANUAL

T120

PRELIMINARY WARNINGS

The word **WARNING** preceded by the symbol ⚠ indicates conditions or actions that put the user's safety at risk.

The word **ATTENTION** preceded by the symbol ⚠ indicates conditions or actions that might damage the instrument or the connected equipment.

The warranty shall become null and void in the event of improper use or tampering with the module or devices supplied by the manufacturer as necessary for its correct operation, and if the instructions contained in this manual are not followed.

	**WARNING**: The full content of this manual must be read before any operation. The module must only be used by qualified electricians. Specific documentation is available using the QR-CODE shown on page 1.
	The module must be repaired and damaged parts replaced by the Manufacturer. The product is sensitive to electrostatic discharges. Take appropriate measures during any operation.
	Electrical and electronic waste disposal (applicable in the European Union and other countries with recycling). The symbol on the product or its packaging shows the product must be surrendered to a collection centre authorized to recycle electrical and electronic waste.

DOCUMENTATION

SENECA

QUALITY MANAGEMENT SYSTEM
ISO 9001:2015

SENECA s.r.l.; Via Austria, 26 – 35127 – PADOVA – ITALY; Tel. +39.049.8705359 - Fax +39.049.8706287

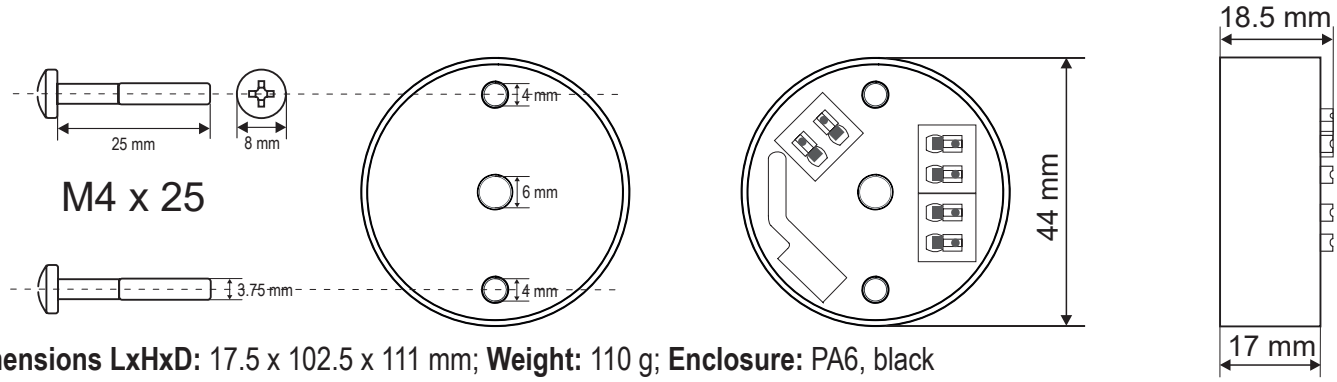
CONTACT INFORMATION

Technical support	support@seneca.it	Product information	sales@seneca.it

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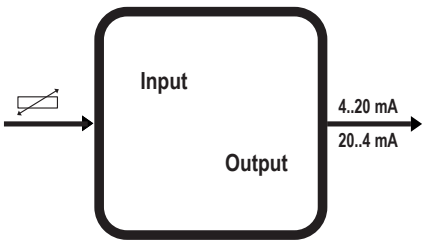
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MODULE LAYOUT



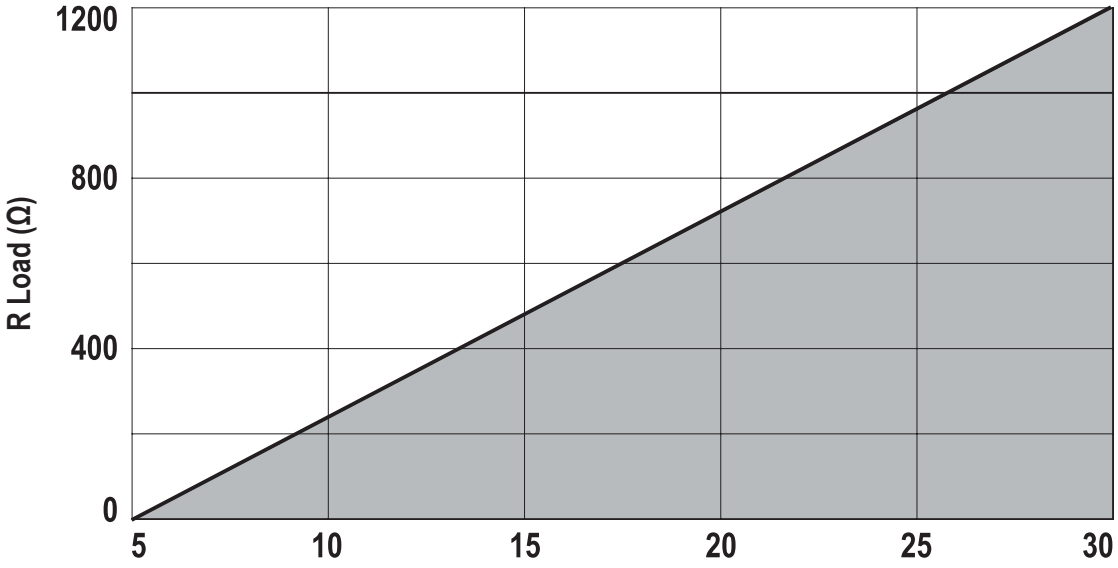
Dimensions LxHxD: 17.5 x 102.5 x 111 mm; **Weight:** 110 g; **Enclosure:** PA6, black

TECHNICAL SPECIFICATIONS

CERTIFICATIONS	CE UKCA
INSULATION	
OUTPUT / POWER	Operating range 5 ÷ 30 Vdc; Current output: 4 ÷ 20 mA; 20 ÷ 4 mA (2 wire technology) Load resistance: 1kΩ @ 26Vdc, 21mA; Resolution: 1µA (> 14 bit) Output in case of over-range: 102.5% of full scale; Output in case of failure: 105% of full scale Current output protection: approximately 30 mA
ENVIRONMENTAL CONDITIONS	Temperature: -40 ÷ +85°C; Humidity: 30% ÷ 90% non-condensing; Storage temperature: -40 ÷ +105°C; Degree of protection: IP20.
CONNECTIONS	6 spring clamps for cable from 0.2 to 2.5mm^2 (recommended stripping 8mm) 4-pin TTL serial programming connector
PT100 INPUT EN 60751/A2 (ITS-90)	Measuring range: -200 ÷ +650°C; Resistance range: 18.5 Ω - 330 Ω Minimum span: 20 °C; Current on sensor: 750 µA Nominal Resistance of cables: 25 Ω Maximum per wire Connection: 2, 3 o 4 wires; Resolution: ~ 6 mΩ
NI100 INPUT	Measuring range: -60 ÷ +250°C; Resistance range: 69 Ω - 290 Ω Minimum span: 20 °C; Current on sensor: 750 µA Nominal Resistance of cables: 25 Ω Maximum per wire Connection: 2, 3 o 4 wires; Resolution: ~ 6 mΩ
OTHER SPECIFICATIONS	Sampling period: 100 ms (with 50/60 Hz rejection disabled) 300 ms (with 50/60 Hz rejection enabled) Temperature coefficient: < 100 ppm, Typical: 30 ppm Rejection to mains frequency: 50 Hz and 60 Hz (settable) Transmission error: 0.05% of measurements + 0.05% of spam with min. 0.1°C EMI error (*): < 0.5% Influence of cable resistance: 0.005 Ω/Ω Response time (10. 90%): < 220 ms (with 50/60 Hz rejection disabled) < 620 ms (with 50/60 Hz rejection enabled)

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LOAD RESISTANCES / MINIMUM OPERATING VOLTAGE



R Load= ((U-5) / 0.021)

FACTORY CONFIGURATION

The instrument leaves the factory with the following default configuration which corresponds (unless otherwise indicated on the instrument) to:

RTD connection → 3 wires
Input filter → Present
Inversion output → NO
RTD type → PT100
Measurement scale beginning → 0 °C
Measurement scale end → 100 °C
Output on failure → Up the output scale
Over range → YES: 2.5% out-of-range allowed; failure at 5%

SETTINGS

SOFTWARE CONFIGURATION

Configuring the module via PC is possible using the following accessories:
S117P: Opto-insulated, asynchronous USB-TTL, USB-RS232 and USB-RS485 serial converter
EASY-USB: Non-isolated USB-UARTTTL converter
EASY SETUP: Dedicated programming software
The module can be configured even if not powered by the 4..20 mA loop, drawing power through the programming connector.
Once you have the accessories described above, you can set the following parameters:

- Measurement scale start and end.
- Rejection at 50 and 60 Hz (*): Absent or present
- RTD Connection: 2-wire, 3-wire and 4-wire.
- Measurement filter: Excluded/Included.
- Output: Normal (4 ÷ 20 mA) or Inverted (20 ÷ 4 mA).
- RTD type PT100 or NI100
- Compensation on cable resistance for 2-wire measurement.
- Setting the output value in case of failure: down the output scale or up the output scale.
- Cold junction compensation: YES/NO
- Over-Range (**): NO (only the failure causes a 2.5% out-of-scale) or YES (2.5% out-of-scale allowed, failure at 5%)

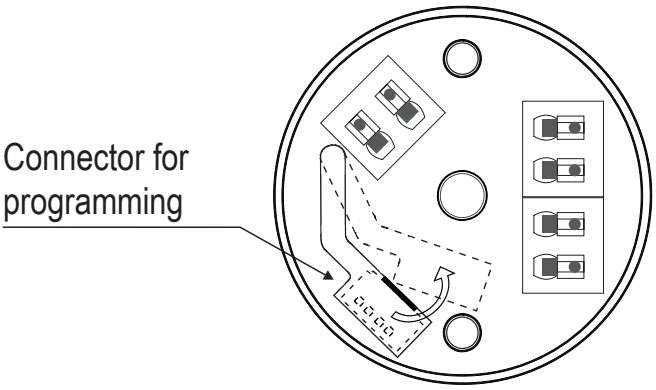
It is also possible to calibrate the output scale.
(*) The filter stabilizes the measurement but slows down the response time bringing it to about 620 ms, it also guarantees the rejection of the 50 / 60 Hz disturbance superimposed on the measurement signal.
(**) For the corresponding values see the table below.

TABLE OF OUTPUT / OVER-RANGE / FAULT LIMITS

Output limits	Over-range / ± 2.5%	Fault ±5%
20mA	20.4mA	21mA
4mA	3.6mA	< 3.4mA

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ACCESS TO THE CONNECTOR FOR PROGRAMMING



1. Raise the protective plastic using the appropriate slot;
2. Move the protective plastic as per the drawing.

ELECTRICAL CONNECTIONS

⚠ CAUTION

To meet the electromagnetic immunity requirements:
- Use shielded signal cables;
- Connect the shield to a preferential instrumentation earth system;
- Separate shielded cables from other cables used for power installations (transformers, inverters, motors, etc.).

Input:

The module accepts a PT100 (EN 60 751) or NI100 temperature probe as input with 2, 3 or 4 wire connection.
For the electrical connections, we recommend using a screened cable.

2-wire connection

This connection can be used for short distances (< 10 m) between module and probe. Remember that this connection introduces a measurement error equal to the resistance of the connection cables (which can be eliminated via software).
The module must be appropriately programmed from a PC for 2-wire connection.

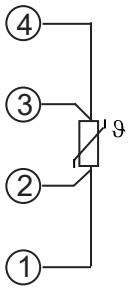
3-wire Connection:

A connection to be used for medium-long distances (> 10 m) between module and probe. The instrument compensates the resistance of the connection cables. For this compensation to be correct, the resistance of each conductor must be the same, since the instrument used to perform the compensation measures the resistance of one conductor and assumes that the resistance of the other cables is identical.
The module must be appropriately programmed from a PC for 3-wire connection.

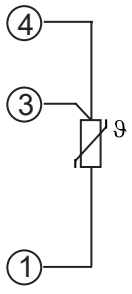
4-wire Connection:

A connection to be used for medium-long distances (> 10 m) between module and probe. It offers maximum precision, in view of the fact that the instrument reads the resistance of the sensor independently from the resistance of the conductors.
The module must be appropriately programmed from a PC for 4-wire connection.

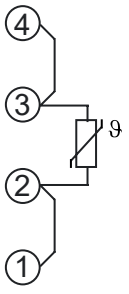
4-Wire RTD connection



3-Wire RTD connection

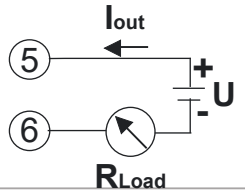


2-Wire RTD connection



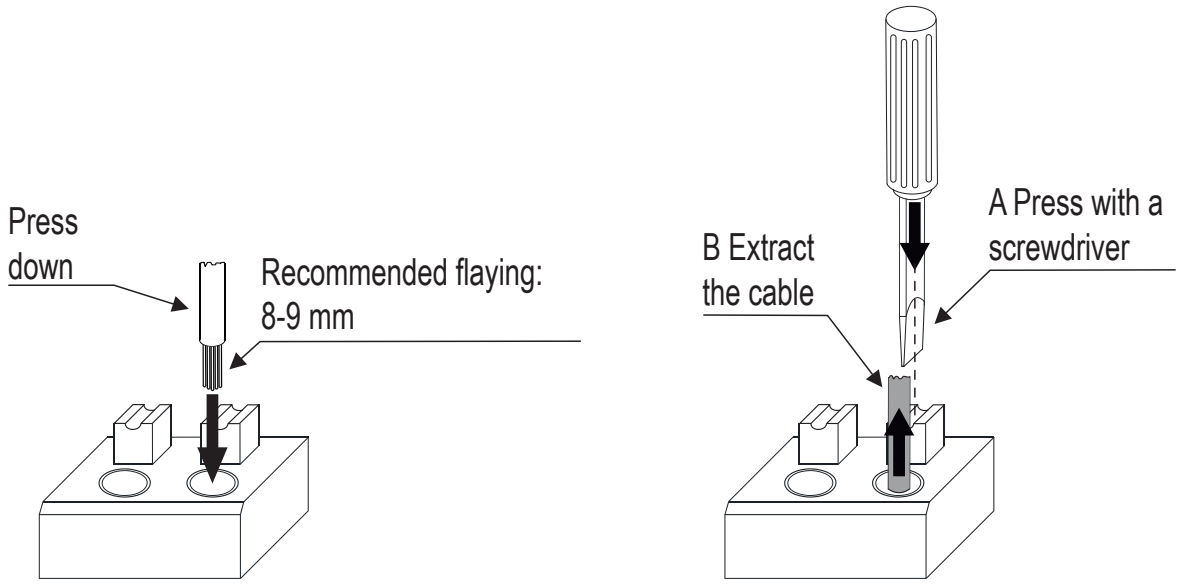
Output:

Current loop connection (regulated current):

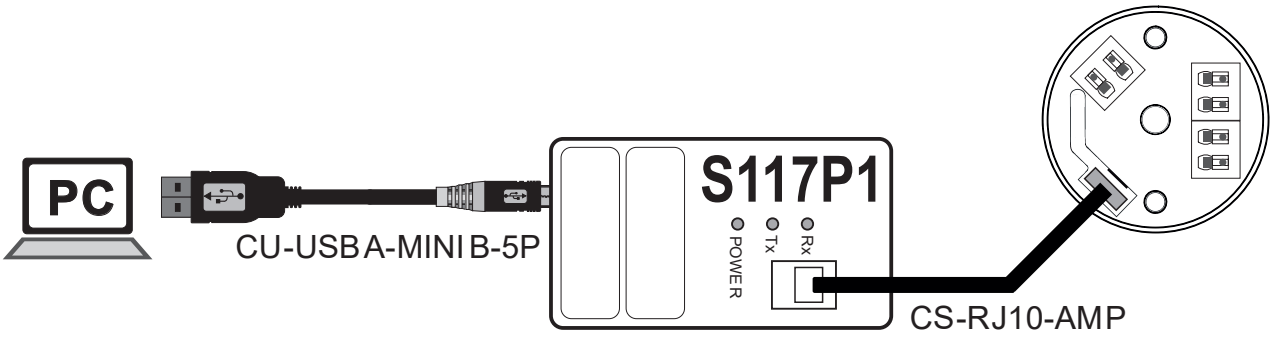


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INSERTION AND EXTRACTION FROM SPRING CLAMPS WITH A PUSH-WIRE CONNECTION



CONNECTION TO THE CONVERTER FOR S117P1 PROGRAMMING



CONNECTION TO THE CONVERTER FOR EASY-USB PROGRAMMING

