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TSE-URT-LP



Non-isolated low-profile converter, programmable powered loop for thermal resistor

User manual - Translation of the original instructions

TSE-URT-LP-GB-00-04-A

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GENERAL INFORMATION

This instruction manual is an integral part of the Non-isolated low-profile converter TSE-URT-LP and users should always make reference to it.

- The Non-isolated low-profile converter TSE-URT-LP, also referred herein as "product" or "device", to which this document refers, is provided for use by persons trained in its use. The instruction must provide for the knowledge of the product and of the maneuvers to be performed during the use, to allow its use in safe conditions.
- All persons trained to work with the product should carefully read this manual in all its sections and understand its contents.
- It is especially important that staff are informed on security with regard to general practices for the protection of people, the product and the surrounding environment.
- Only the correct use of the product as recommended will ensure its lasting and effective use, in full safety for the operators and for the product itself.
- EL.CO. S.r.l. reserves the right to make any formal or functional changes at any time without prior notice.
- The electrical installation where the component is installed must meet the safety requirements in force.
- EL.CO. S.r.l. and its legal representatives do not assume any responsibility for any damage to people, things or animals deriving from violation, misuse, wrong use or otherwise not in accordance with the device features.
- All rights to this documentation are reserved. Translations, reprints and copies of this manual, even if partial and/or otherwise expressly require the consent of EL.CO. S.r.l.

INTENDED USE

The Non-isolated low-profile converter TSE-URT-LP converts and linearizes with high precision an analogue signal from a thermal resistor, into a voltage or non-isolated current output.

Any other use of the product is not allowed and it is considered improper and therefore dangerous. EL.CO. S.r.l. shall not be liable in any way for damage to persons or property that could occur due to improper use.

Intended recipients of the manual

- This manual is intended for all authorized users and suitable to use the Non-isolated low-profile converter.
- All users must read and understand the contents of this manual, which they have to follow while working with the product.
- This manual is an integral part of the product to which it relates and shall be kept throughout its life cycle.
- In case of transfer or sale of the product, the manual and all accompanying documentation, or connected one, shall be maintained and delivered with it.

WARRANTY

The warranty provided by the manufacturer on the product is valid for one year. The following conditions will void the product warranty provided by EL.CO. S.r.l.:

- Improper use of the product, which is different than the expected one, as described in section Intended use;
- Use by unauthorized or untrained personnel;
- Total or partial disregard of these instructions;
- Power supply defects;
- Pollution coming from the outside;
- Changes and unauthorized repairs.

DESCRIPTION OF THE NON-ISOLATED LOW-PROFILE CONVERTER, PROGRAMMABLE POWERED LOOP FOR THERMAL RESISTOR TSE-URT-LP

The Non-isolated low-profile converter TSE-URT-LP converts and linearizes with high precision an analogue signal from a thermal resistor, into a voltage or non-isolated current output. The output signal may be direct or inverse. The device is fully programmable through the ELCO TSE-CONF software. The device is housed in a sturdy plastic container, whose thickness is 7.5 mm, suitable for mounting on DIN rails.

The device is fully compatible with the CE marking requirements and is housed in a solid 7.5mm thick plastic housing suitable for DIN rail mounting.

- Configurable input for thermal resistor
- Configurable output in voltage or current
- Power supply 14...30 Vdc
- Maximum versatility with programming via PC or Android
- High precision and speed
- A/D converter controlled by a microprocessor

- Reduced absorption
- Non-isolated
- High accuracy (0.1%)
- Conversion of the 14-bit measurement
- Voltage Signaling LED (Blue)
- Simplified installation with DIN rail mounting
- Extremely compact size (7.5 mm thick)
- Programming with software ELCO TSE-CONF and programmer ELCO TSE-USB or ELCO TSE-WIFI without the need for external wiring
- EMC compatibility meeting EN 50022 and EN 50035

Areas of use

- Industry, Energy, Control Panels, Food and Naval Industry

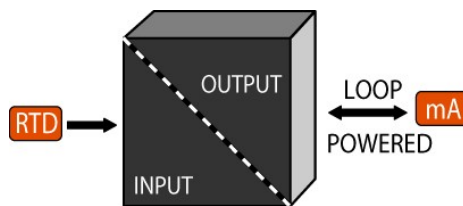
Applications

- Conversion of temperature signals
- Reduction of space in control cabinets

TECHNICAL DATA NON-ISOLATED LOW-PROFILE CONVERTER, PROGRAMMABLE POWERED LOOP FOR THERMAL RESISTOR TSE-URT-LP

POWER SUPPLY	14...30 Vdc (powered loop); 14...30 Vdc (voltage output)
CURRENT CONSUMPTION	max. 25 mA (current output) max. 35 mA (voltage output)
ABSORPTION	< 600 mW (max.)
RESPONSE TIME	35 ms
ACCURACY CLASS	0.1%
INSULATION	Non-isolated
OPERATING TEMPERATURE	-20°C...+70°C
STORAGE TEMPERATURE	-40 °C...+85 °C
HUMIDITY	0 ... 90% non-condensing
MATERIAL	Self-extinguishing plastic
PROTECTION DEGREE	IP 20
WEIGHT	approx. 65 grams
CONNECTIONS	Screw terminals and cables applicable up to 2.5 mm ²
DIMENSIONS (W x H x D) in mm	90 x 112 x 7.5
ASSEMBLY	on T35 DIN rail according to EN 50022
EMC (for industrial environments)	EN 61000-6-2 (Immunity); EN 61000-6-4 (Emission)
LINEARITY	
Thermal resistor	± 0.1% F.S.
INPUT IMPEDANCE	
Thermocouple and mV	≥ 1 MΩ
SENSOR EXCITATION CURRENT	< 600 μA
INFLUENCE of LINE RESISTANCE	
3-wire thermal resistor	0.05%/Ω (50 Ω max., balanced)
4-wire thermal resistor	0.05%/Ω (100 Ω max., balanced)
THERMAL DRIFT:	
Full-scale	± 0.01% F.S.
CONFIGURATION	ELCO TSE-CONF
CALIBRATION (referred to the input span)	
Thermal resistor	the greater of ± 0.1% and ± 2°C
OUTPUT CALIBRATION	
Last	± 5 μA

Voltage	± 10 mV
AUXILIARY VOLTAGE	>12 V @ 20 mA
OVER RANGE VALUES	
Output value with input > full scale	22 mA or 10.5 V
Output value with input > scale start	4 mA or 10.5 V
VALUES of WIRE BREAK or INPUT OVERLOAD	
Output value	24 mA or 11 V
LOAD RESISTANCE on OUTPUT - Rload	
Current output	See <i>5Load curveurve</i>
Voltage output	> 10 kΩ
Short-circuit current	30 mA max
INPUT TYPES AND SCALE FIELDS	
Thermal resistor (2, 3, 4 wires) mim. SPAN 50°C	
Pt100	-200 ÷ 850 °C
Pt1000	-85 ÷ 185 °C
Resistor (2, 3, 4 wires)	
0 ÷ 500 Ω	min. SPAN 50 Ω
0 ÷ 200 Ω	min. SPAN 50 Ω
NI100	-60 ÷ 180 °C
NIFE 604	-60 ÷ 200 °C
Potentiometer (3 wires)	
0 ÷ 100%	minimum SPAN 10%
Current	
	Minimum SPAN output 4 mA
0 ÷ 20 mA	4 mA
20 ÷ 0 mA	4 mA
Voltage	
	minimum SPAN 1 V
0 ÷ 10 V	1 V
10 ÷ 0 V	1 V



Overall dimensions (mm)

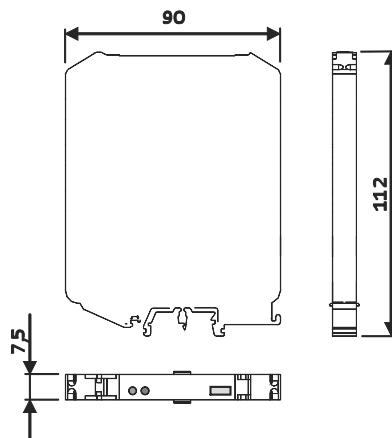


Figure 1- Overall dimensions

INSTALLATION

The device is suitable for mounting on DIN rails in the vertical position. For reliable operation and long life, follow the following guidelines:

- Do not allow the ventilation slots are obstructed by cable ducts or other objects close to them
- Avoid the mounting of the devices above equipment generating heat
- Install the device in a place without vibrations

Connections

Make the connections according to the following diagrams (5). Meet the following conditions:

- Use shielded cables and connect the shield to a ground terminal dedicated to the equipment.
- The cables must not be in the vicinity of cables for power installations as inverters, motors, induction furnaces and the like.

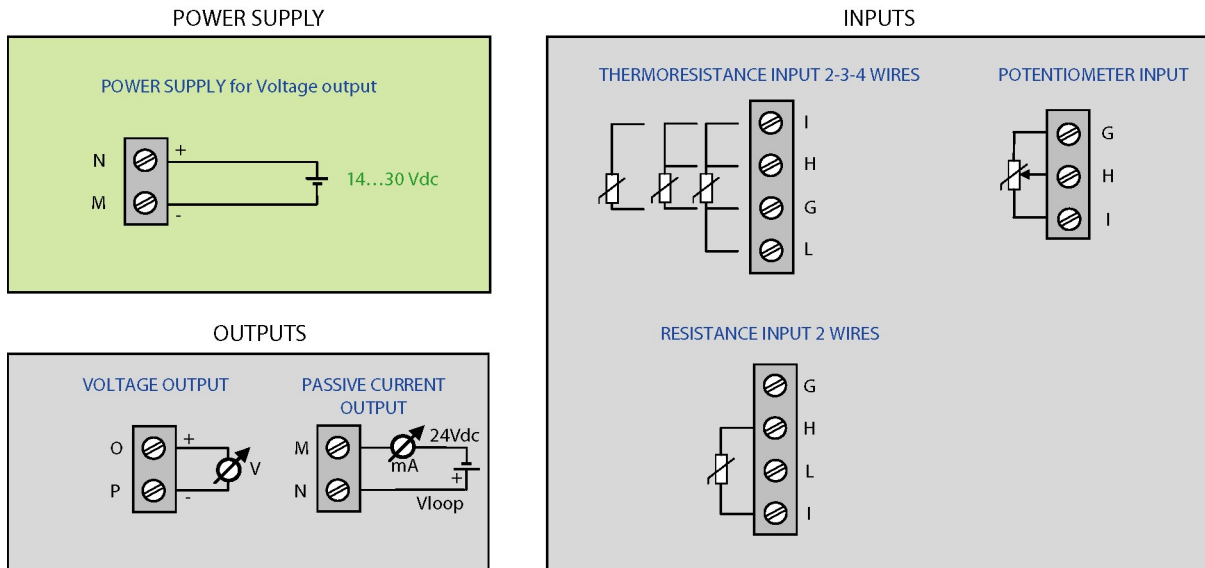


Figure 2- Connections

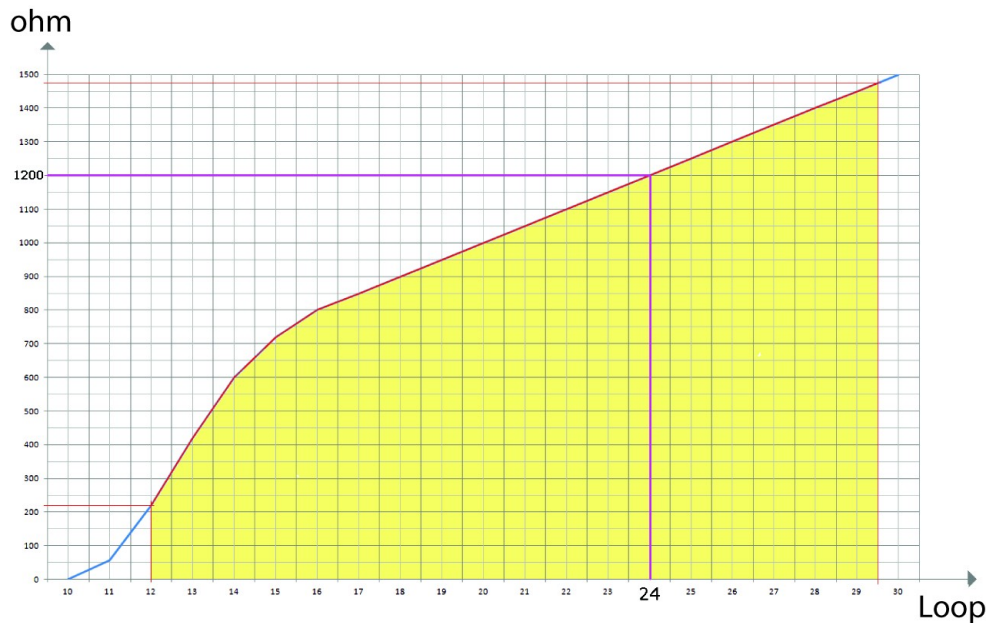


Figure 3- Load curve

Use

Please refer to *Connections* and Figure 2- .

The device must be powered by a continuous voltage between 14 and 30 V applied between N (V+) and M (V-) terminals. The analogue channel acquires the value from the sensor connected to G-I (2-wire Pt100), G, H, I, L (4-wire Pt100) terminals and transfers the output measurement to M, N, O and P terminals.

The input and output connections must be made as shown above *Connections*.

Signaling LEDs

BLUE LED - PS (power supply)	ON	Proper power
	OFF	Device not powered
	Flashing	Device under calibration (reserved)

Programming the Non-isolated low-profile converter, programmable powered loop for thermal resistor TSE-URT-LP

Configuration via PC

The configuration is done through the software ELCO TSE-CONF and the programmer ELCO TSE-USB as follows.

- 1- Open the protection plastic door on the front of the device
- 2- Connect the controller to the PC and the device with a USB-micro USB cable m/m
- 3- The programmer is powered directly from the PC
- 4- Open the configuration program
- 5- When scanning is enabled, the configuration software ELCO TSE-CONF will automatically detect the connected device
- 6- Set the programming data
- 7- Press the buttons dedicated to read/write data in the device.



Do not disconnect the device during the programming procedure

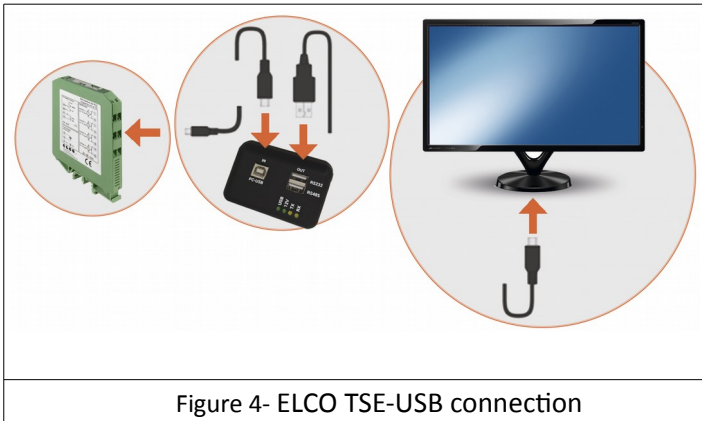
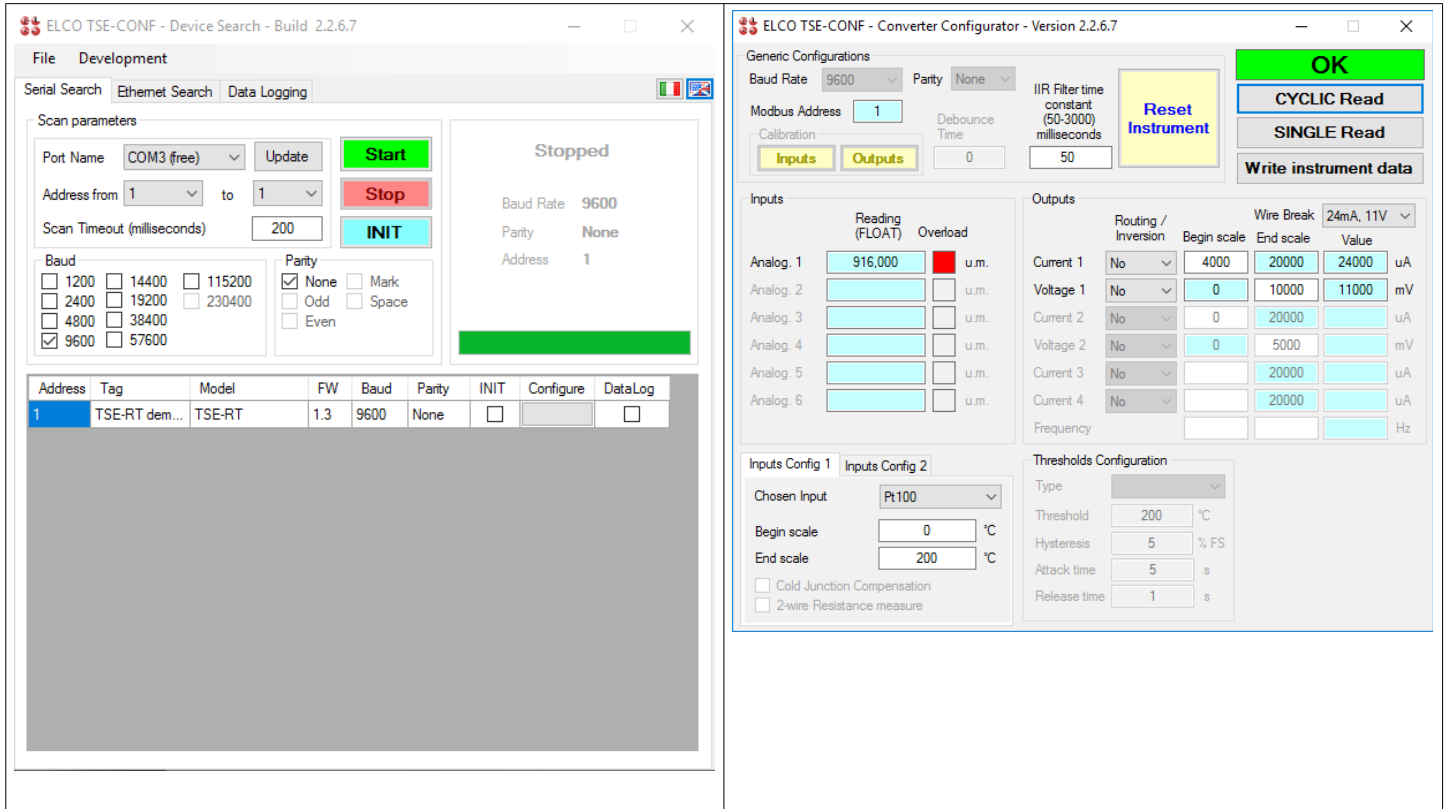


Figure 4- ELCO TSE-USB connection




Also refer to the manual for the configuration software.

Configuration via smartphone or tablet

The configuration is done through the software ELCO TSE-CONF and the programmer ELCO TSE-WIFI as follows.

- 1- Open the protection plastic door on the front of the device
- 2- Connect the programmer to your smartphone or tablet via Wi-Fi and to the device via a USB-micro USB cable m/m
- 3- The programmer is powered directly from its internal battery
- 4- Open the configuration program
- 5- When scanning is enabled, the configuration software ELCO TSE-CONF will automatically detect the connected device
- 6- Set the programming data
- 7- Press the buttons dedicated to read/write data in the device.

 Do not disconnect the device during the programming procedure

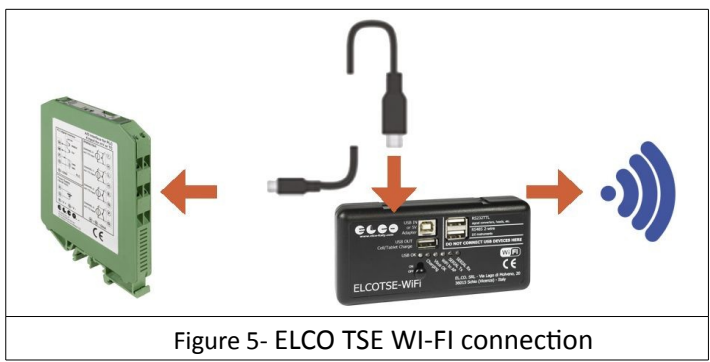
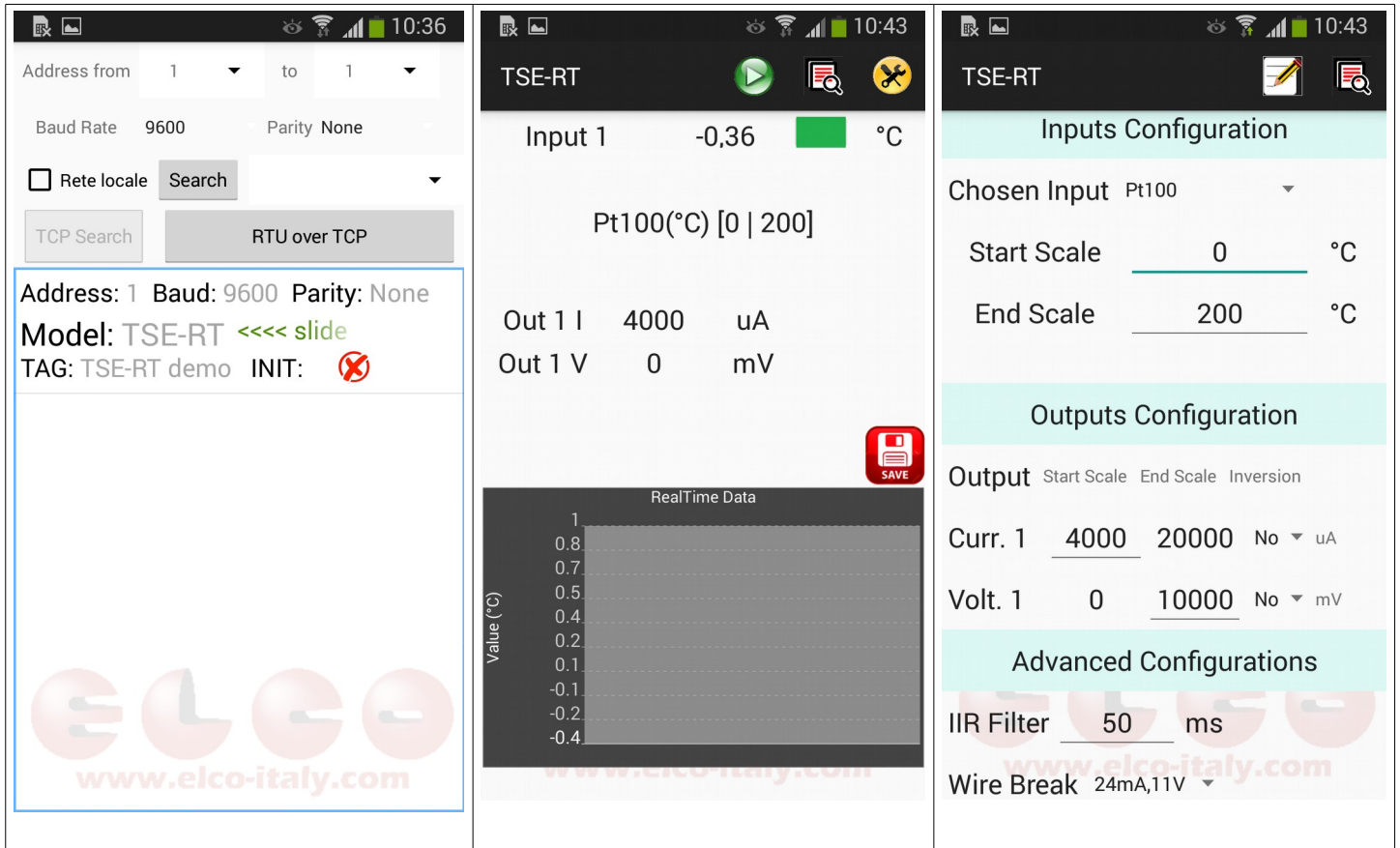


Figure 5- ELCO TSE WI-FI connection



Also refer to the manual for the configuration software.

ORDERING DATA

The device comes pre-configured with the following parameters:

- Entry ticket: Pt100
- Field of the input scale 0-100 °C
- Output: 4-20 mA

Other configurations will be set by the final user.

When ordering, you can require the configuration of the device that will be provided at no extra charge. The order must show:

- Input Type
- Field of the input scale
- Output Type
- Field of the output scale

Example: TSE-URT-LP - Pt100 – 0...200 °C – 0...10 V