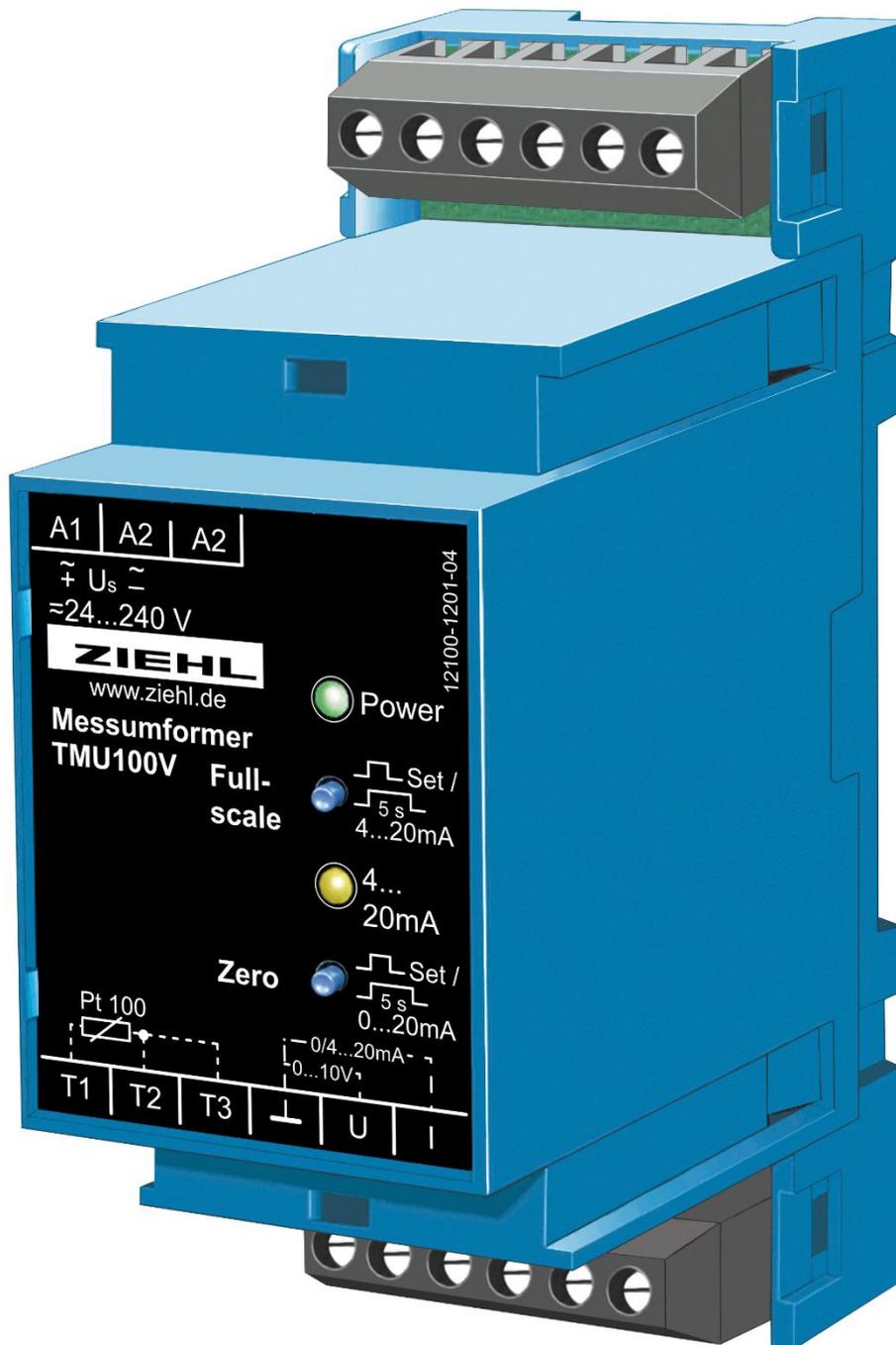


## Operating Manual TMU100V

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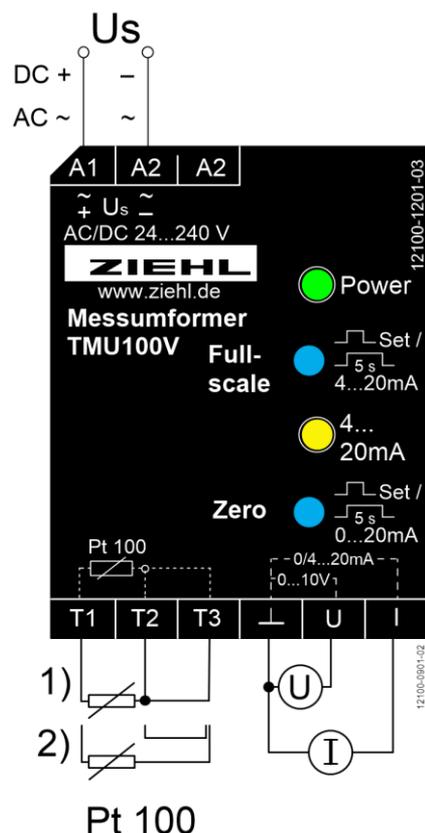
### - Measuring- Transducer for Potentiometers



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## 1 Display and controls



Power LED

Button „Full-scale“

LED 4...20mA

Button „Zero“

1) 3-Leiter/3-Wire

2) 2-Leiter/2-Wire

Brücke zwischen T2-  
T3/

Bridge from T2-T3

## 2 Application and short description

Model TMU100 Pt100 measuring transducers are suitable for measuring temperatures with sensors Pt100 (RTD). Zero and Full-scale can be freely set within the whole range -199 ...+850 °C. To do this, only resistors with the according value or a Pt 100-decade is connected. The adjustment is done by pressing a button. The built-in universal power supply AC/DC 24-240 V allows the connection to all common supply-voltages. The Pt100- sensor can be connected in 2- or 3-wire connection. The output delivers 0/4 ... 20 mA and 0 ... 10 V simultaneously.

### 3 Overview of functions

- Pt100-input 2- or 3-wire automatic compensation of line up to 500  $\Omega$  total resistance (sensor + line)
- Detection of sensor-break
- Easy adjustment of Zero and Full-scale by pressing a button
- Wide measuring-range -200... +850  $^{\circ}\text{C}$
- LEDs for display of operative state
- Analog output 0 ... 20 mA / 4 ... 20 mA. Analog output 0 ... 10 V
- Housing for DIN-rail or wall-mount, 35 mm wide, mounting height 55 mm
- Universal supply AC/DC 24-240 V

The sensor changes its resistance with the temperature (app. 0,385 Ohm/ $^{\circ}\text{C}$ ). The measuring transducer measures the resistance with a current  $<1$  mA and transduces it into a signal DC 0-10 V or 0/2-20 mA that is proportional to the temperature. At break of sensor or wire the output signal is app. 22 mA / 12 V, at short circuit 0 mA / 0 V.

- The output can be connected to displays, PLCs or monitored for over- or under-temperature.

### 4 Connecting diagram

See 1 Display and controls

### 5 Important Information



**DANGER!**  
**Hazardous voltage!**  
**Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.**



**Attention!**  
**The device has a universal power supply, that is suitable for DC- and AC voltages. Before connecting the device to supply- voltage make sure that the connected voltage corresponds with the voltage on the lateral type on the device.**

**Observe the maximum temperature permissible when installing in switching cabinet. Make sure sufficient space to other equipment or heat sources. If the cooling becomes more difficult e.g. through close proximity of apparatus with elevated surface temperature or hindrance of the cooling air, the tolerable environmental temperature is diminishing.**

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.

Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units.

The equipment is built according to DIN / EN and checked and leave the plant according to security in perfect condition. If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.

To maintain this condition, you must observe the safety instructions in this instruction manual titled "Important Information". Failure to follow the safety instructions may result in death, personal injury, or property damage to the equipment itself and other equipment and facilities.

Instead of the industrial norms and regulations written in this instruction manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.

## 6 Installation

The unit can be installed as follows:

- Installation in switchgear cabinet on 35 mm mounting rail according to EN 60715 for protection against fire, external environmental conditions and mechanical effects.
- With screws M4 for installation on walls or panel. (additional latch is not included in delivery)
- Connection according to connection plan or type plate.

Failure to comply with the information in this instruction manual will not guarantee the function of the device.



**A circuit-breaker or switch must be situated within easy reach of the unit and fused. Installation excess current protection should be  $\leq 10$  A.**

## 7 Commissioning

LED Power on = ready

LED Power flashes = parameter setting mode

LED 4..20 mA flashes 3 times in commissioning mode = value stored

LED 4..20 mA flashes = sensor error

LED 4..20 mA on = output 4...20 mA

### 7.1 Commissioning mode (Power LED FLASHES)

Press button Zero and hold it. Switch on power supply while holding button Zero. Wait until LED power starts blinking and release button.

Leave commissioning mode by pressing buttons Zero and Full-scale simultaneously. Commissioning mode is finished automatically after 10 min.

Set values remain stored also when power is switched off.

### 7.2 Adjusting of Zero

Simulate temperature for zero at input of TMU100V with a resistor or a decade for Pt 100. Resistance see table in this manual. Shorten terminals T2 and T3 (3-wire connection).

Press button Zero shortly.

Storing of value is confirmed by LED 4...20 mA blinking 3 times (yellow). If not repeat procedure.

### 7.3 Adjusting of full-scale

Simulate temperature for full-scale at input of TMU100V with a resistor or a decade for Pt 100. Press button Zero shortly.

Storing of value is confirmed by LED 4...20 mA blinking 3 times (yellow). If not repeat procedure.

### 7.4 Output current / output voltage

To change output to signal 4...20 mA keep button full-scale pressed until LED 4...20 mA (yellow) is on.

To change output to signal 0...20 mA keep button full-scale pressed until LED 4...20 mA (yellow) is off.

Output for voltage remains 0...10 V, independently from current output.

## 8 Factory setting

Default setting ex works of input/output is 0...200°C / 0...20 mA.

## 9 Technical data

<b>Rated supply voltage <math>U_s</math> (A1, A2)</b>		DC/AC 24 – 240 V 0/50/60 Hz
Tolerance		DC 20.4 - 297 V AC 20 - 264 V
Power consumption		< 3 W < 5 VA
<b>Temperature measuring input (T1, T2, T3)</b>		
Sensor		Pt100 according to EN60751
Measuring range		-200 ... 850 °C
Short circuit		< 15 Ohm
Brake		> 400 Ohm
Sensor + line resistance		max. 500 Ohm
Measuring cycle/Measuring time		< 1.5 s
Resolution		0.1 K
Absolute error		±0.5 % of measured value ±0.5 K
Sensor current		≤0.8 mA
Temperature drift		<0.04°C/K
<b>Analog output (GND, U, I)</b>		Not electrically isolated from the input
Voltage output 0...10 V		Absolute error 0.3 % of Full-scale
Temperature drift		< 0,01 %/K
Current output 0/4...20 mA		max. 500 Ω accuracy 0,3 % of Full-scale
Temperature drift		< 0,015 %/K
Fault burden		(250 Ω - burden)/250 Ω * 0,3 % of the current

For parameter error Full-scale approx. 22mA / 12V are output.

For parameter error zero approx. 0mA / 0V are output.

<b>Test conditions</b>	EN 61010-1
Rated impulse voltage	4000 V
Overvoltage category	II reinforced insulation
Pollution degree	2
Rated insulation voltage $U_i$	250 V
On-period	100 %

<b>EMC-tests</b>	
Emission	EN 61000-6-3
Immunity	EN 61000-6-2

<b>Installation conditions</b>	
Permissible ambient temperature	-20 °C ... +60 °C
Permissible storage temperature	-20 °C ...+70 °C
Installation height	< 2000 m over N.N.
Climatic conditions	5 - 85% rel. humidity, no condensation
Permissible wiring temperature	-5 °C ...+70 °C
Vibration resistance EN 60068-2-6	2...25 Hz ±1,6 mm 25 ... 150 Hz 5 g

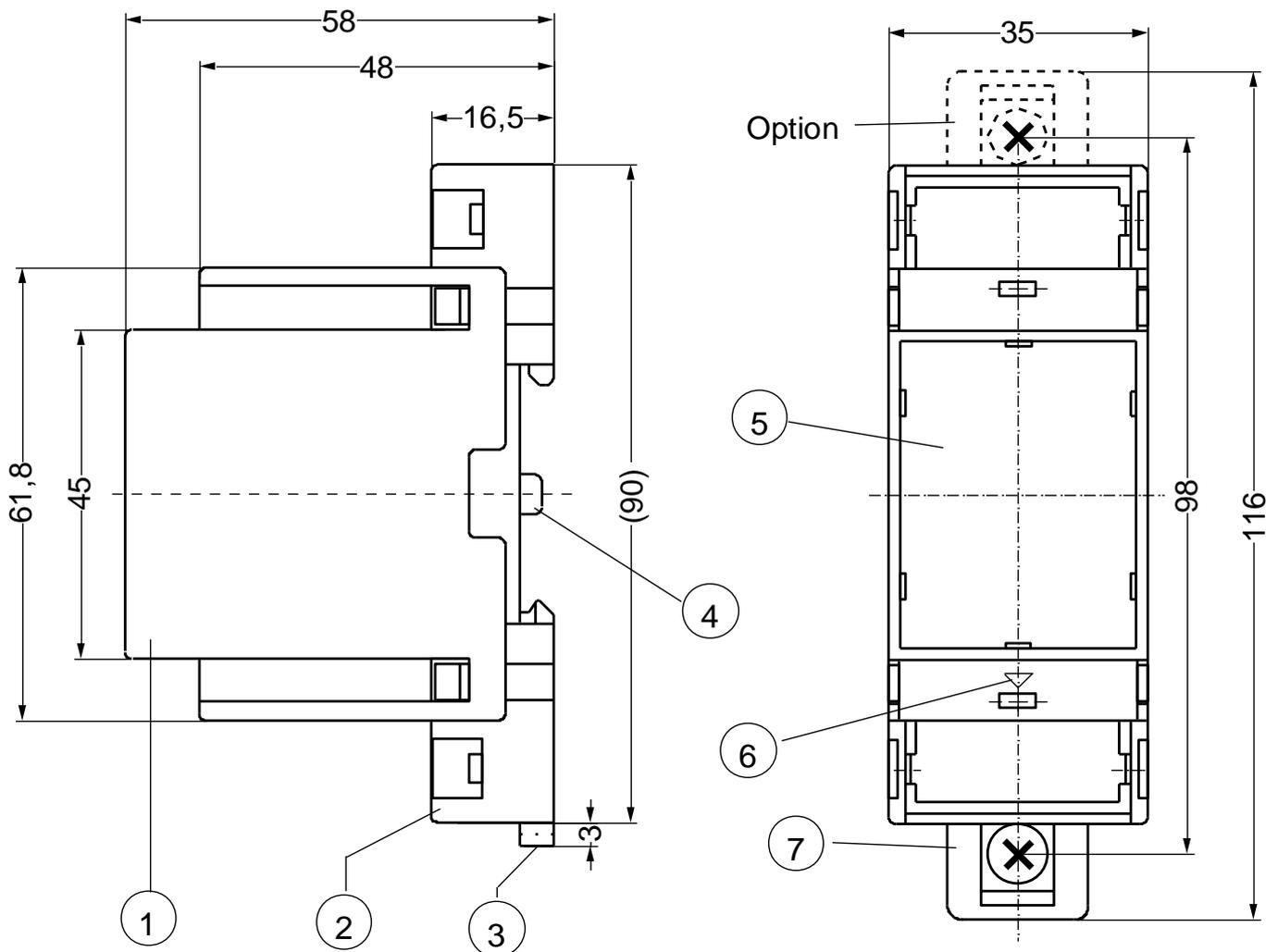
<b>Housing</b>	
Design	V2
Dimension (H x W x D)	90 x 35 x 58 mm
Plastic material	PA66
Fire protection class	UL94V-2
Connection terminal	
Line connection solid wire	1 x 0,34 - 1,5 mm <sup>2</sup> / AWG 22 - 14
Standard wire with insulated ferrules	1 x 0,1 - 1,0 mm <sup>2</sup> / AWG 27 - 16

Insulation strip length min. / Tightening torque  
 Protection class housing / terminals  
 Mounting EN60715  
 Optional: screw mounting  
 Weight

8 mm / 0,5 Nm  
 IP 40 / IP20  
 Standard rail 35 mm  
 M4, only with additional bolt (not part of delivery)  
 approx. 130 g

**Subject to technical modifications**  
**10 Housing Type V2**

Dimension in mm



- 1 Oberteil / cover
- 2 Unterteil / base
- 3 Riegel / bar for snap mounting
- 4 Plombenlasche / latch for sealing
- 5 Frontplatteneinsatz / front panel
- 6 Kennzeichen für unten / position downward
- 7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung  $\varnothing$  4,2 mm / for fixing to wall with screws,  $\varnothing$  4,2