

Temperaturregelgerät TE-10

Bedienungsanleitung

Artikelnummer: HK-10

Gehäuse: Spelsberg AK03
Maße (BxHxT): 100 x 150 x 96 mm





Bedienungsanleitung

Allgemeines

Das Temperaturregelgerät TE-10 ermöglicht die Temperierung verschiedenster Objekte und Oberflächen mittels passender Heizelemente bzw. Heizmatten. Das Gerät ist für die gewerbliche Nutzung bestimmt. Das Regelgerät trägt das CE Zeichen (Typenschild). Die Niederspannungsrichtlinie 2014/35/EU wird dabei eingehalten.

Das Lesen und Verstehen der gesamten Bedienungsanleitung ist für den bestimmungsgemäßen Betrieb des Gerätes unbedingt notwendig!

Elektrische Sicherheit

Der Anschluss darf nur von einer Elektrofachkraft (qualifiziertes Personal) nach DIN EN50110/1 durchgeführt werden. Die Nennspannung des Gerätes muss mit der Netzspannung übereinstimmen. Bei direktem Anschluss an das Netz muss eine allpolige Trennung (Trennstrecke 3 mm) vom Netz sichergestellt sein. (Siehe VDE 0720 T 1/2.72 §2, 101). Um eine höhere elektrische Sicherheit zu erreichen, ist eine Fehlerstrom (FI)-Schutzschaltung vorzusehen. Um Störungen zu vermeiden, sollten max. elf Geräte oder max. 40 KW mit einem FI-Schutzschalter abgesichert werden. Vor Öffnung des Gerätes, Netzstecker ziehen!
Der Betrieb in explosionsgefährdeten Bereichen ist nicht zulässig.

Service und Reinigung

Das Temperaturregelgerät TE-10 arbeitet wartungsfrei und besitzt keine vom Kunden tauschbaren Verschleißteile. Die äußere Reinigung kann bei Bedarf mit einem leicht angefeuchteten Tuch und einem neutralen Reinigungsmittel erfolgen. **Dazu ist das Gerät unbedingt vom Netz zu trennen.**

Bedienelemente

Das Temperaturregelgerät wird durch Betätigen des Sicherungsschalters eingeschaltet. Der Regler ist damit betriebsbereit.

Weitere Informationen zur Konfiguration und Bedienung entnehmen Sie bitte der beiliegenden Betriebsanleitung des Regelbausteines.



Anschlussbelegung des Steckverbinders Binder 693

Heizmatte		Kontakt	Regler	
Belegung	Farbe		Farbe	Belegung
Heizung	braun	1	braun	eTron Klemme 5
frei		2		frei
Pt100	schwarz	3	weiß	eTron Klemme 1
Pt100	grau	4	rot	eTron Klemme 2
frei		5		frei
Heizung	blau	6	blau	N-Leiste
Erde	grün/gelb	PE	grün/gelb	PE-Leiste



6 Technische Daten

6.1 Analogeingang

6.1.1 Messeinganggruppe 1 (Widerstandsthermometer)

Bezeichnung	Norm	Messbereich	Messgenauigkeit ^a	Umgebungs-temperatureinfluss	ITS
PH100, PH1000 in 2-/3-Leiterschaltung	IEC 60751:2008	-200 bis +600 °C	≤ 0,25 %	≤ 0,1·10 ⁻³ 1/K	90
KTY 2X-6 in 2-Leiterschaltung		-50 bis +150 °C	≤ 1 %	≤ 0,1·10 ⁻³ 1/K	-
Kundentabelle		150 Ω bis 3000 Ω	≤ 0,25 %	≤ 0,1·10 ⁻³ 1/K	-
Messstrom		ca. 0,5 mA			
Sensoreitungswiderstand		≤ 30 Ω je Leitung bei 2- und 3-Leiterschaltung			
Leitungsabgleich		Bei 3-Leiterschaltung nicht erforderlich. Bei 2-Leiterschaltung erfolgt der Leitungsabgleich softwaremäßig durch Eingabe eines festen Leitungswiderstands.			
Besonderheiten		auch in "F" programmierbar			

^a Die Genauigkeitsangaben beziehen sich auf den maximalen Messbereichsumfang. Bei kleineren Messspannen verringert sich die Linearisierungsgenauigkeit.

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6.3 Digitaleingang und Digitalausgang

Bezeichnung	Funktion
Potenzialfreier Kontakt (Option) oder Photomos-B-Relais (Option)	Zum Anschluss an einen handelsüblichen Schalter oder Kontakt Einschaltwiderstand < 1 kΩ, Ausschaltwiderstand > 50 kΩ.
Relaisausgang	Relais (Wechsler) AC 250 V, 10 A (ohmsche Last) 100000 Schaltungen bei Nennlast

6.4 Display

Art, Auflösung	Dot-Matrix-LCD-Anzeige mit 64 × 80 Pixeln
Einstellungen	Kontrast, Helligkeit und Funktion der Hintergrundbeleuchtung

6.5 Gehäuse

Aufstellhöhe	maximal 2000 m über N.N.
Gehäuseart, Material	Kunststoffgehäuse, Polycarbonat nach DIN EN 45545 (halogenfrei, Verwendung nur in Innenräumen)
Brennbarkeitsklasse	UL94 V0
Elektrischer Anschluss	Über Trinkklemmen mit Push-In Technologie
Montage auf	Tragschiene 35 mm × 7,5 mm nach DIN IEC 60715
Dicht-an-dicht-Montage	erlaubt
Einbaulage	vertikal (senkrecht)
Schutzart	IP20 nach DIN EN 60529

7 China RoHS 25

7 China RoHS

产品名称 Product group: 701052	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
组件名称 Component Name	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 (Prozessanschluss)	○	○	○	○	○	○
螺母 (Mutter)	○	○	○	○	○	○
螺钉 (Schraube)	○	○	○	○	○	○

本表格按照GB/T 11364的要求编制。
This table is prepared in accordance with the provisions SJ/T 11364.
* 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials for the part is below the limit of the GB/T 26572.
* 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous material of the part is exceeded the limit of the GB/T 26572.

Bezeichnung	Norm	Messbereich	Messgenauigkeit ^b	Umgebungs-temperatureinfluss ^c	ITS
Fe-Cu/Ni "L"	DIN 43710:1985-12	-200 bis +900 °C	±0,4 %	≤ 0,1·10 ⁻³ 1/K	68
Fe-Cu/Ni "J"	DIN EN 60584-1:2014	-20 bis +1200 °C	±0,4 % ab -100 °C	≤ 0,1·10 ⁻³ 1/K	90
NiCr-Ni "K"	DIN EN 60584-1:2014	-270 bis +1300 °C	±0,4 % ab -80 °C	≤ 0,1·10 ⁻³ 1/K	90
Kundentabelle		-15 bis 75 mV	±0,4 %	≤ 0,1·10 ⁻³ 1/K	-

Messbereichsanfang/-ende	innerhalb der Grenzen in 0,1-K-Schritten beliebig programmierbar
Vergleichsstelle	interne Messung über PT1000 oder extern konstant 0 °C
Vergleichstellengenauigkeit (intern)	±1 K
Besonderheiten	auch in "F" programmierbar

^b Die Genauigkeitsangaben beziehen sich auf den maximalen Messbereichsumfang. Bei kleineren Messspannen verringert sich die Linearisierungsgenauigkeit.
^c Der Umgebungs-temperatureinfluss ist im Bereich von -20 bis +55 °C gültig.

6.1.3 Messeinganggruppe 3 (Einheitssignal)

Bezeichnung	Messbereich	Messgenauigkeit ^d	Umgebungs-temperatureinfluss
Strom (Spannungsabfall ≤ 2,5 V), frei skalierbar	0 bis 20 mA 4 bis 20 mA	≤ 0,125 %	≤ 0,1·10 ⁻³ 1/K Abweichung von 22 °C
Kundentabelle	0 bis 20 mA	≤ 0,125 %	
Besonderheiten	Skalierung einstellbar		

^d Die Genauigkeitsangaben beziehen sich auf den maximalen Messbereichsumfang. Bei kleineren Messspannen verringert sich die Linearisierungsgenauigkeit.

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Gewicht	ca. 110 g
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6.6 Elektrische Daten

Spannungsversorgung	AC 230 V, +10/-15 %, 48 bis 63 Hz oder AC 115 V, +10/-15 %, 48 bis 63 Hz oder DC 12 bis 24 V +15/-15 % / AC 24 V +15/-15 %, 48 bis 63 Hz (Geräte mit dieser Spannungsversorgung dürfen nur an SELV- oder PELV-Stromkreise angeschlossen werden)
Leistungsaufnahme	bei Spannungsversorgung 230 V: max. 1,5 W, 2,0 VA bei Spannungsversorgung 115 V: max. 1,5 W, 2,0 VA bei Spannungsversorgung DC 12 bis 24 V: max. 0,7 W bei Spannungsversorgung AC 24 V +15/-15 %: max. 0,8 W, 1,8 VA
Ein- und Ausgänge Leiterquerschnitt	max. 2,5 mm ² , Draht oder Litze mit Adernhülse
Elektrische Sicherheit	nach DIN EN 61010-1 Überspannungskategorie III, Verschmutzungsgrad 2
Abtastrzyklus	250 ms
Eingangfilter	digitale Filter 2. Ordnung, Filterzeitkonstante einstellbar von 0 bis 100,0 s
Genauigkeit Timer und Betriebsstundenzähler	1 %

^f Alle DC-Versorgungsspannungen ist bei Bahnverwendungen (Typensatz 950) nur DC 24V +15/-15% zugelassen

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6.1.4 Messeinganggruppe 4 (NTC Bahn)

Bezeichnung	Messbereich	Messgenauigkeit	Umgebungs-temperatureinfluss
NTC Widerstand (5 kΩ bei 25 °C) für Bahnverwendung	-55 bis +150 °C	Messgenauigkeit % 	

JUMO


Operating instructions

701650017/2000K000

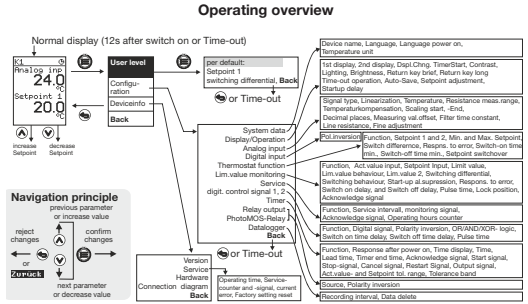
701650017/2000K000

Electronic thermostat with timer

JUMO eTRON T100



QR code: 4701052-eTRON T100



1 Brief description

The electronic thermostat acquires the temperature via a RTD temperature probe, thermocouple, or current I(4) to 20 mA and can be configured as a simple heating or cooling thermostat depending on the set switching behavior. Using the timer function, it is possible to control time-limited functions such as setpoint changeover.

The switching statuses of the relay and of the optional digital input and digital output, as well as the actual value and setpoint value are shown simultaneously in the display. It has a resolution of 64 x 80 pixels, has background lighting, and can be switched to the national languages German, English, French, and Spanish.

The device is operated via 4 keys on the front panel. The electrical connection is carried out via terminal blocks with PUSH IN technology.

A PhotoMOS® relay or a digital input for connecting a potential-free contact are available as options. A setup program is available as an accessory for simple configuration, parameterization, and reading out of the data logger.

1.1 Safety information

Symbol	Meaning	Explanation
	Note	This symbol refers to important information about the product, its handling, or additional benefits.
	Danger	This symbol indicates that personal injury from electrocution may occur if the appropriate precautionary measures are not taken.
	Caution	This symbol in connection with the signal word indicates that material damage or data loss will occur if the respective precautionary measures are not taken.

Symbol	Meaning	Explanation
	Warning	This symbol in connection with the signal word indicates that personal injury may occur if the respective precautionary measures are not carried out.
	Read	This symbol, which is attached to the device, indicates that the associated device documentation must be followed. This is necessary in order to recognize the nature of the potential danger and take the necessary measures to prevent it. Manipulations not described in the operating manual or expressly forbidden will jeopardize your warranty rights.
	Reference	This symbol refers to further information in other manuals, chapters, or sections.
	Footnote	Remarks at the end of a page that refer to specific text passages and are marked with a number placed in superscript.
	Action instruction	The steps (marked with an asterisk) must be carried out one after another in the reading order.

2 Identifying the device version

Caution
The voltage supply that is connected must correspond to the voltage specified on the nameplate!

The device can be supplied with power via the USB socket for testing purposes, and configured (relay does not activate).

* Press key and under **Menu->Deviceinfo->Hardware** you will find information about the power supply unit, input, and options.
The nameplate is affixed to the side of the device.

2 Identifying the device version

JUMO GmbH & Co. KG	JUMO GmbH & Co. KG	JUMO GmbH & Co. KG
Müller-Jauregg-Str. 1, 36039 Fulda Germany	Müller-Jauregg-Str. 1, 36039 Fulda Germany	Müller-Jauregg-Str. 1, 36039 Fulda Germany
Typ: 701052/8-61-62-91-000	Typ: 701052/8-61-62-91-000	Typ: 701052/8-61-31-60-000
~AC 230V ±15%/10%, 48, 63 Hz	~AC 115V ±15%/10%, 48, 63 Hz	~AC 24V ±15%, 48, 63 Hz, +DS 12, 24V ±5%

Voltage supply AC 230 V:

Voltage supply AC 115 V:

Voltage supply AC/DC 24 V:

(5) Options

00 None (connection of RTD temperature probes in three-wire circuit is possible)

01 Digital output PhotoMOS® relay (connection of a three-wire circuit is not possible)

02 digital input for potential-free contact (connection of a three-wire circuit is not possible)

(6) Extra codes

950 Suitable for railway applications according to DIN EN 50155*, declaration of manufacturer at <http://www.jumo.de>

a. The only DC voltage supply approved for railway applications (extra code 950) is DC 24 V +15/-15 %

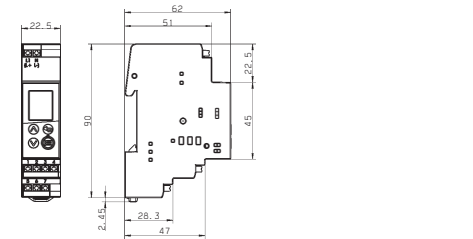
Order code: (1) (2) (3) (4) (5) (6)

Order example: 701052 / 8 - 01 - 02 - 00 / 950

3 Mounting

3.1 Dimensions

The device size described in DIN 43880 (Built-in equipment for electrical installations; overall dimensions and related mounting) is complied with.



3.2 Mounting site, DIN-rail mounting

Warning
The device is not suitable for installation in potentially explosive areas.

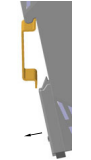
The device is not suitable for a 35-mm DIN rail (DIN EN 60715) from the front and locked into place by pressing downwards.

The ambient conditions at the mounting site must meet the requirements specified in the technical data.

→ Chapter 6 "Technical data"

Install it in a way that, insofar as possible, it is free from vibration.

The atmosphere must be free from aggressive media (e.g., strong acids and bases), as well as free from dust, flour, or other suspended solids to prevent blocking of the cooling slots!



3.3 Close mounting

Maintain the minimum distance of 20 mm above and below.

- So that the release slot can still be accessed with a screwdriver from the bottom.
- So that when dismounting, the device can be swivelled upwards and removed from the DIN rail.

Several devices can be mounted right next to one another without a minimum distance.

(1) Basic type

701052 eTRON T100 for mounting on DIN rail (1 relay output changeover contact 10A)

(2) Version

8 Standard with default settings

→ Customer-specific configuration (specifications in plain text)

(3) Input

01 RTD temperature probes Pt100, Pt1000, KTY2X-6

02 Thermocouple

03 Current I(4) to 20 mA

04 NTC (5 kΩ at 25 °C) for railway applications

05 Ni1000 DIN 43760, Ni1000 Landis & Gyr TK 5000 for railway applications

(4) Voltage supply

02 AC 230 V ±10/-15 %*, 48 to 63 Hz

03 AC 115 V ±10/-15 %*, 48 to 63 Hz

01 DC 12 to 24 V ±15/-15 %*/ AC 24 V ±15/-15 %, 48 to 63 Hz
(the device may only be connected to SELV or PELV electrical circuits)

2.1 Scope of delivery

- Type 701052 in the ordered version
- operating manual (leaflet)
- A detailed version of the documentation is available for download via QR code.

2.2 Service addresses

→ See back cover, at the end of the leaflet

Caution
Any interference with the inside of the device is prohibited!
Repairs may only be performed by JUMO in the company's headquarters in Fulda.
If you have any problems, please contact the nearest branch office or the head office.

2.3 Care and treatment of the front cover

The front plate can be cleaned with commercial detergents, rinsing, and cleaning agents.

2 Identifying the device version

4 Electrical connection

Screen	Connection	Symbol and terminal designation
4.2.1 Actual value of analog input	RTD temperature probe in 2-wire circuit	
	RTD temperature probe in 3-wire circuit	
	Thermocouple	
	Current I(4) to 20 mA	

||| Default setting

2 Identifying the device version

Screen	Connection	Symbol and terminal designation
4.2.2 Digital input or output (option)	Digital input or PhotoMOS® relay K2	
Note: If the PhotoMOS® relay or digital input option is selected, an RTD temperature probe cannot be connected in a 3-wire circuit.		
4.2.3 Digital outputs	Relay output K1 (zero-current state)	

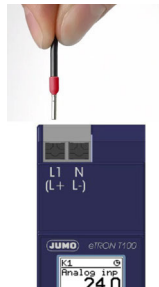
||| Default setting

4 Electrical connection

4.1 Installation notes

- Check to see if the device is installed in a manner appropriate to the application (temperature measurement) and that it is operated within the admissible plant parameters. When it comes to controlling heating processes, overtemperature protection or another form of safety equipment that is independent of the device must be used for monitoring that the process functions properly.
- The device is intended to be installed in control cabinets, machines, or plants.
- Ensure that the customer's fuse protection does not exceed 20 A.
- Disconnect the device from the mains voltage on all poles prior to starting service or repair work.
- All incoming and outgoing lines without a connection to the power supply network should be laid with shielded and twisted lines. The shield must be grounded on the device side.
- Do not lay the input and output cables close to components or lines through which current is flowing.
- Do not connect any additional loads to the screw terminals for the voltage supply of the device.
- Both the choice of cable material for the installation as well as the electrical connection of the device must conform to the local requirements of VDE 0100 "Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V" or the appropriate regulations for the country.
- Suitable measures must be taken to protect the relay circuit.
- The maximum switching capacity is 230 V, 10 A (resistive load).
- The electromagnetic compatibility conforms to the standards and regulations cited in the technical data.
- Chapter 6 "Technical data"
- Compared with the USB interface, the analog input and digital input are not galvanically isolated. This is why, when connecting the USB interface, unwanted coupling via the protective conductor terminal may occur. Please test the isolation on the sensor side, or use a laptop in battery mode for setup applications.

Caution!
The electrical connection and settings in the configuration level up to system startup may only be carried out by qualified personnel.



4.2 Connection diagram

The connection is made via terminal blocks with PUSH IN technology.

Conductor	Admissible cross section
Rigid or flexible	0.2 to 2.5 mm ²
Flexible with ferrule with or without plastic sleeve	0.25 to 2.5 mm ²
AWG	12 to 24
Stripping length	10 mm
Flammability class	V0

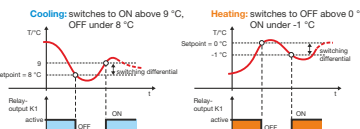
4 Electrical connection

5 Starting operation of the device

5.2 Checking device function

The default setting is **Thermostatfunction -> Function -> Heating**. Initially, the relay output K1 is disabled when the default setpoint value is 0 °C, because, at a room temperature of 20 °C, the setpoint value has already been reached, or even exceeded.

* If the probe is now cooled down to a temperature of below -1 °C, the relay will activate and K1 will appear on the display.



Another way of carrying out the device test involves changing the setpoint value in the following way:

- * From the normal display, press or until setpoint value 1 flashes.
- * Set a value that is at least 1K above the measured actual value and confirm with the key.


The relay switches OFF (K1 disappears from the display).

Information
All of the other parameters are outlined in the section on configuration in the detailed documentation.

4 Electrical connection

5 Starting operation of the device

5.1 Display and control elements

* Apply the voltage supply and you will see: 

Then the actual value and setpoint value is displayed:

||| If an error message appears, see Chapter 10 "Fehlermeldungen" (in the detailed operating manual).

If a suitable temperature probe is connected, the device in the example shown here will display an actual value of 21.5 °C. The default setpoint value 1 is 0.0 °C.

5 Starting operation of the device

5 Starting operation of the device

Screen	Connection	Symbol and terminal designation
4.2.4 Voltage supply (according to nameplate)	AC: L1 line conductor N Neutral conductor	AC 115 V or AC 230 V
→ Chapter 2 "Identifying the device version"	DC: (L+) (L-)	DC 12 to 24 V or AC 24 V (The device may only be connected to SELV or PELV electrical circuits)

5 Starting operation of the device

Legend

1 **LCD display**
Black/white with background lighting, 64 x 80 pixels

(A) Alarm function flashes when a limit value is exceeded

flashes in cause of an error

block symbol appears, if timer is configured and flashes the timer has started

Relay output is active

K1 is active when the relay output is active

if an ordered PhotoMOS-Relay or the digital input is active

Screen


(1)

(2) **Keys**
Increase value / previous menu item
Reduce value / next menu item
Back / cancel change,
(special function: quick return or press and hold key for longer)
One level down in the menu, confirm change

(3) **USB device**
For connection with the setup program.

5 Starting operation of the device

5.1 Display and control elements

* Apply the voltage supply and you will see: 

Then the actual value and setpoint value is displayed:

||| If an error message appears, see Chapter 10 "Fehlermeldungen" (in the detailed operating manual).

If a suitable temperature probe is connected, the device in the example shown here will display an actual value of 21.5 °C. The default setpoint value 1 is 0.0 °C.

5 Starting operation of the device

6 Technical data

6.1 Analog input

6.1.1 Measurement input group 1 (RTD temperature probe)

Designation	Standard	Measuring range	Measuring accuracy ^a	Ambient temperature influence	ITS
PT100, PH1000 in two/three-wire circuit	IEC 60751:2008	-200 to +600 °C	≤ 0.25 %	≤ 0.1×10 ⁻³ 1/K	90
KTY 2X-6 in two-wire circuit		-50 to +150 °C	≤ 1 %	≤ 0.1×10 ⁻³ 1/K	-
Customer table		150 Ω to 3000 Ω	≤ 0.25 %	≤ 0.1×10 ⁻³ 1/K	-
Measuring current	Approx. 0.5 mA				
Sensor line resistance	≤ 30 Ω per line for two and three-wire circuit				
Lead compensation	Not required for 3-wire circuit. In 2-wire circuits, lead compensation is performed in the software by entering a fixed line resistance.				
Special features	Can also be programmed in "F"				

^a The accuracy specifications refer to the maximum measuring range. Smaller measuring spans lead to reduced linearization accuracy.

6.3 Digital input and digital output

Designation	Function
Potential-free contact (option) or	For connection to a commercial switch or contact Switch-on resistance < 1 kΩ, switch-off resistance > 50 kΩ
PhotoMOS® relay (option)	Max. DC 45 V, 200 mA, max. AC 30 V, 200 mA
Relay output	Relay (changeover contact) AC 250 V, 10 A (resistive load) 100000 switching operations at rated load

6.4 Display

Type, resolution	Dot matrix LCD display with 64 × 80 pixels
Settings	Contrast, brightness, and backlight function

6.5 Housing

Site altitude	Maximum 2000 m above sea level
Housing type, material	Plastic housing, polycarbonate according to DIN EN 45545 (halogen free, use indoors only)
Flammability class	UL94 V0
Electrical connection	Via terminal blocks with PUSH IN technology
Mounting on	Mounting rail 35 mm × 7.5 mm according to DIN IEC 60715
Close mounting	Permitted
Installation position	Vertical
Protection type	IP20 according to DIN EN 60529

6 China RoHS

产品名称 Product group: 701052	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
组件名称 Component Name	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Housing)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nut (Mutter)	○	○	○	○	○	○
螺钉 Screw (Schraube)	○	○	○	○	○	○

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Indicates the hazardous substances in all homogeneous materials for the part is below the limit of the GB/T 26572.
* 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicates the hazardous substances in at least one homogeneous material of the part is exceeded the limit of the GB/T 26572.

Designation	Standard	Measuring range	Measuring accuracy ^b	Ambient temperature influence ^c	ITS
Fe-CuNi "L"	DIN 43710:1985-12	-200 to +900 °C	±0.4 %	≤ 0.1×10 ⁻³ 1/K	68
Fe-CuNi "J"	DIN EN 60584-1:2014	-210 to +1200 °C	±0.4 % from -100 °C	≤ 0.1×10 ⁻³ 1/K	90
NiCr-Ni "K"	DIN EN 60584-1:2014	-270 to +1300 °C	±0.4 % from -80 °C	≤ 0.1×10 ⁻³ 1/K	90
Customer table		-15 to 75 mV	±0.4 %	≤ 0.1×10 ⁻³ 1/K	-
Measuring range start/end	Freely programmable within the limits in increments of 0.1 K				
Cold junction	Internal measurement via PT1000 or external constant 0 °C				
Cold junction accuracy (internal)	±1 K				
Special features	Can also be programmed in "F"				

^b The accuracy specifications refer to the maximum measuring range. Smaller measuring spans lead to reduced linearization accuracy.

^c The ambient temperature influence is valid (1) in the range of -20 to +65 °C.

6.1.3 Measurement input group 3 (standard signal)

Designation	Measuring range	Measuring accuracy ^d	Ambient temperature influence
Current (voltage drop ≤ 2.5 V), freely scalable	0 to 20 mA 4 to 20 mA	≤ 0.125 %	≤ 0.1×10 ⁻³ 1/K, deviation of 22 °C
Customer table	0 to 20 mA	≤ 0.125 %	
Special features	Scaling adjustable		

^d The accuracy specifications refer to the maximum measuring range. Smaller measuring spans lead to reduced linearization accuracy.

Weight	Approx. 110 g		
Voltage supply	AC 230 V, +10/-15 %, 48 to 63 Hz or AC 115 V, +10/-15 %, 48 to 63 Hz or DC 12 to 24 V +15/-15 % ¹ / AC 24 V +15/-15 %, 48 to 63 Hz (The device may only be connected to SELV or PELV electrical circuits)		
Power consumption	With voltage supply 230 V: max. 1.5 W, 2.0 VA With voltage supply 115 V: max. 1.5 W, 2.0 VA With voltage supply DC 12 to 24 V: max. 0.7 W With voltage supply AC 24 V, +15/-15 %: max. 0.8 W, 1.8 VA		
Inputs and outputs	Conductor cross section Max. 2.5 mm ² , wire or stranded wire with ferrule		
Electrical safety	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2		
Sampling rate	250 ms		
Input filter	Digital filter, 2nd order; filter time constant can be adjusted from 0 to 100.0 s		
Accuracy of timer and operating hours counter	1 %		

¹ The only DC voltage supply approved for railway applications (extra code 859) is DC 24 V +15/-15 %.



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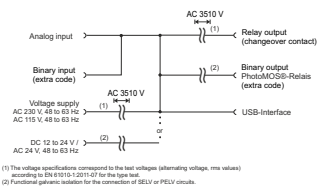
6.1.4 Measurement input group 4 (NTC railway)

Designation	Measuring range	Measuring accuracy	Ambient temperature influence
NTC resistance (5 kΩ at 25 °C) for railway applications	-55 to +150 °C	Measuring accuracy [%] 	Deviation of 22 °C in the following ranges: -55 °C to 100 °C: ≤ 0.1×10 ⁻³ 1/K 100 °C to 130 °C: ≤ 0.2×10 ⁻³ 1/K 130 °C to 150 °C: ≤ 0.45×10 ⁻³ 1/K
Customer table	400 Ω to 40 kΩ	≤ 0.15%	≤ 0.1×10 ⁻³ 1/K
Connection type	Two-wire circuit		
Measuring current	Approx. 0.1 mA		

6.1.5 Measurement input group 5

Designation	Measuring range	Measuring accuracy ^e	Ambient temperature influence	ITS	
Ni1000	DIN 43760:1987-09	-60 to +250 °C	≤ 0.2 %	≤ 0.1×10 ⁻³ 1/K, deviation of 22 °C	68

6.7 Galvanic isolation



6.8 Environmental influences

Operating, storage temperature range	-40 to +55 °C (display to min. -10 °C), -40 to +70 °C
Resistance to climatic conditions	≤ 85% relative humidity, annual average, no condensation
Electromagnetic compatibility	According to DIN EN 61326-1, DIN EN 50121-1/50121-3-2
Interference emission	Class B ⁹
Interference immunity	Industrial requirement

⁹ The product is suitable for industrial use as well as for households and small businesses.

Designation	Measuring range	Measuring accuracy ^e	Ambient temperature influence	ITS
LG-Ni1000	Landis & Gyr TK5000 (Siemens HVAC)	-60 to +250 °C	≤ 0.2 %	≤ 0.1×10 ⁻³ 1/K, deviation of 22 °C
Customer table	150 Ω to 3000 Ω	≤ 0.25%		
Sensor line resistance	≤ 30 Ω per line			
Connection type	Two-wire circuit			
Special features	Can also be programmed in "F"			

^e The accuracy specifications refer to the maximum measuring range. Smaller measuring spans lead to reduced linearization accuracy.

6.2 Measuring circuit monitoring

In the event of a malfunction, the outputs change to defined (configurable) statuses.

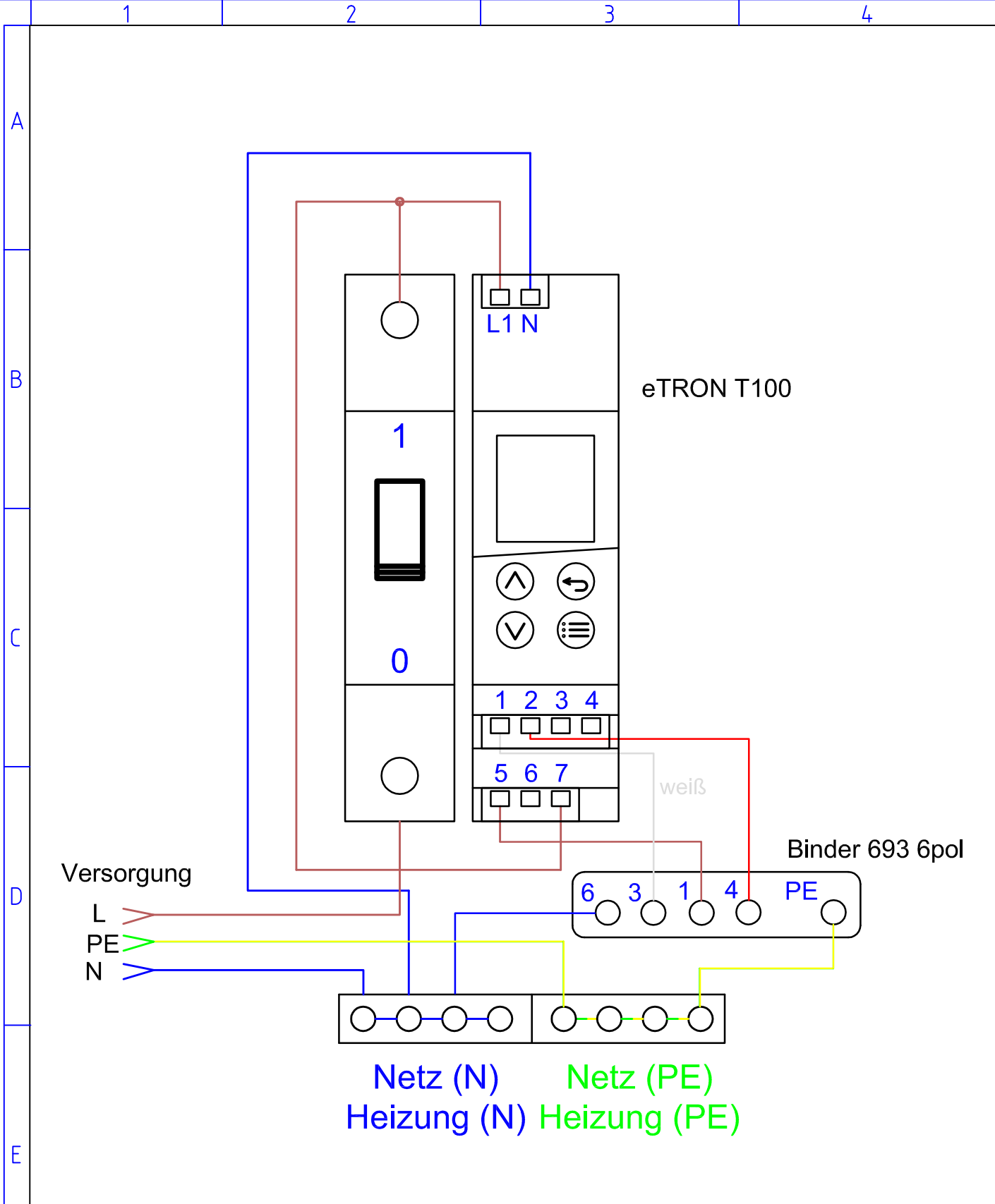
Measuring probe	Probe/cable break	Probe/cable short circuit
RTD temperature probe	Is detected	Is detected
KTY 2X-6	Is detected	Is detected
Thermocouple (single)	Is detected	Is not detected
Current 4 to 20 mA 0 to 20 mA	Is detected Is not detected	Is detected Is not detected
NTC railway applications Ni1000, LG-Ni1000	Is detected	Is detected

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	Approval submitted	UL 61010-1	All modules

6.10 Data logger

The configuration and the data logger data are saved in the EEPROM. They are retained after a power failure.

Recording rate	Recording duration
1 min	Approx. 1 day, 20 hours
5 min	Approx. 9 days, 8 hours
15 min	Approx. 28 days, 2 hours
30 min	Approx. 1 month, 25 days
60 min	Approx. 3 months, 9 days



Zuschnitt		(Zul. Abw.)	(Oberfl.)	Maßstab	MABSTAB	(Gewicht)
				(Werkstoff, Halbzeug) (Rohteil-Nr) (Modell- oder Gesenk-Nr)		
		Datum	Name	Temperaturregelgerät TE-10 eTRON T100		
	Bearb.	03.07.20	A. Neubert			
	Gepr.					
	Norm					
				Anschlussplan		Blatt
						Bl.
Zust	Änderung	Datum	Name (Urspr.)	(Ers. f.:)		(Ers. d.:)

