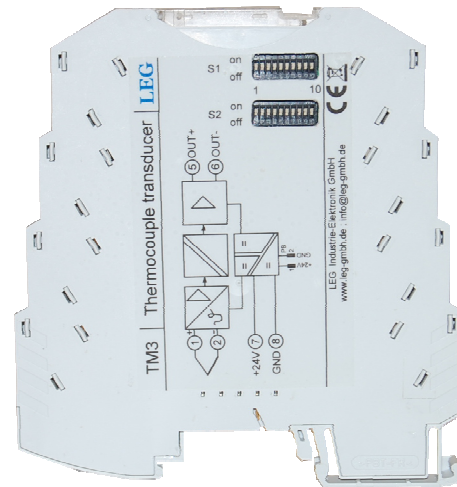


Thermocouple - Transducer

TM3

Characteristics:

- Thermocouple type J, K, R, S, T, E, B, N
- Linearity error < 1%
- Measurement range configurable -210...+1820°C
- Built-in cold junction compensation
- Galvanic 3-way isolation between input – output – power supply
- Current- or voltage output configurable
- Sensor monitoring
- Supply 24VDC
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Shape 6,2mm
- High reliability, 5 years warranty



Description:

The devices of the thermocouple transducer series TM3 have been developed for analyzing and converting of thermocouples type J, K, R, S, T, E, B, N into linear temperature norm signals of 0/4...20mA, 0/2...10mA resp. 0/2...10V, 0/1...5V. The build-in connectible cold junction compensation of the terminals prevents measuring errors caused by a change of the ambient temperature. The measurement range is -210...+1820°C (depending on the thermocouple which is used) and is via Dip-switch (see table 2) or USB interface (all Dip-switches position "off") configurable by the user. The smallest measurement range is fixed at 50°C. The start temperature is in the range of -210°...0°C and the end temperature 0°...1820°C selectable. The behavior of the analog output during a sensor error can also be determined. This makes it possible to limit the output value at over range or underflow of the measurement range or at wire breakage. (Clipping) A yellow LED in front panel signals the state of readiness. A red LED signals a wrong adjusted measurement range and the reaching of the adjusted error margin.

Optional the devices can be configured via an integrated USB interface. (All Dip-switches in position „off“). You only need the LEG parameterization software LEGset and a USB wire, an additional adapter is **not** necessary.

Input, output and supply power are isolated with a true 3-way isolation.

For supply of the measuring amplifier an auxiliary supply power of 24V is needed.

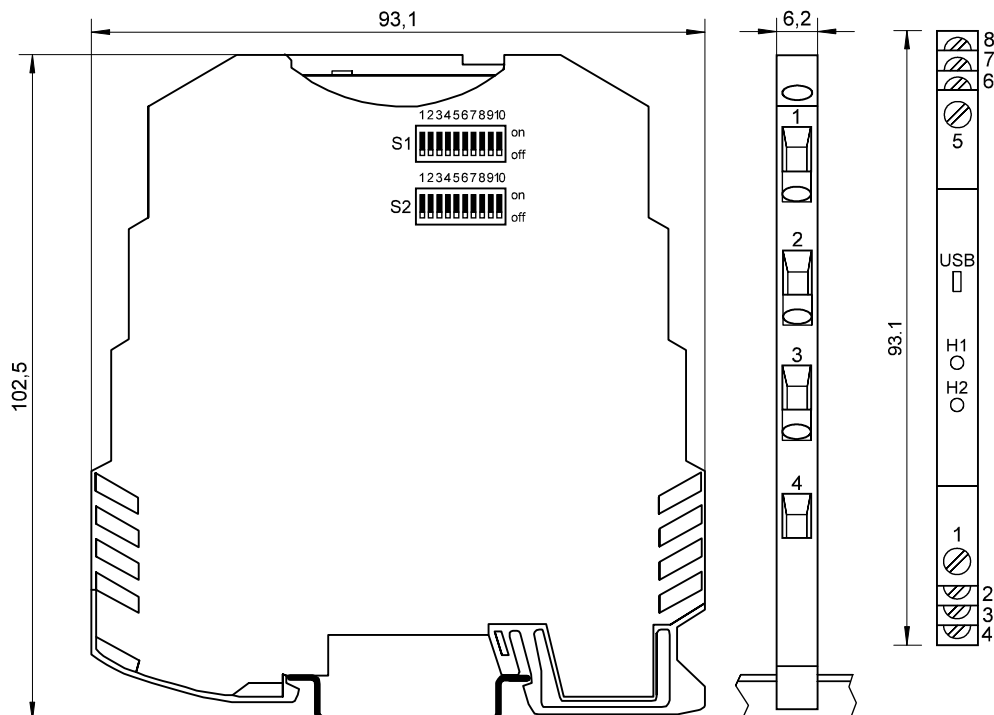
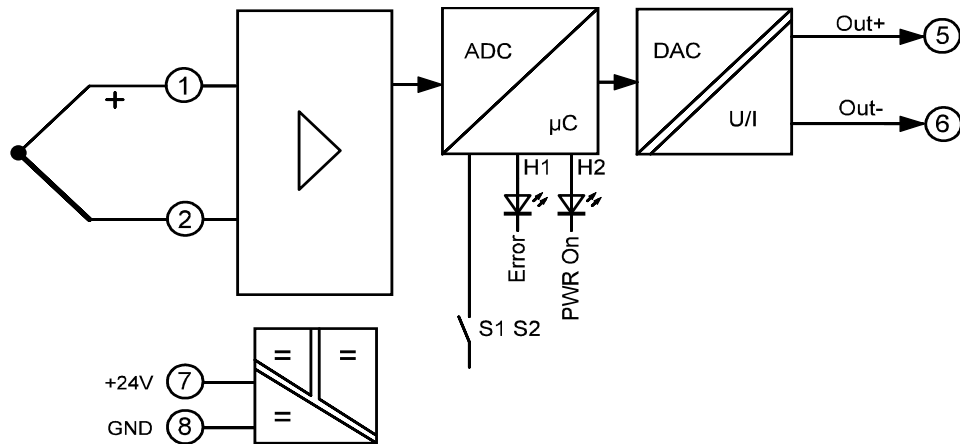


Table 1

DIP switch S1 (● = On)													
Cold junction compensation			Sensor type			Output signal			9	10	Measurement range underflow	Measurement range over range	Wire breakage
1	2		3	4	5	6	7	8					
		Switched on				J					Output range start - 5%* **	Output range end +2,5%*	Output range end+5%*
●		Switched off	●			K	●						
				●		R		●		●	Output range start	Output range end +2,5%	Output range end +5%
				●	●	S	●	●					
					●	T		●		●	Output range start	Output range end	Output range end +5%
				●	●	E	●	●					
				●	●	B		●		●	Output range start	Output range end	Output range start
			●	●	●	N	●	●	●	●	Output range start	Output range end	Output range start

* ac. NAMUR NE43

** but not at output 0V or 0mA

Table 2

DIP switch S2 (● = On)																					
Start temperature*				End temperature*																	
1	2	3	4	°C	°F	5	6	7	8	9	10	°C	°F	5	6	7	8	9	10	°C	°F
												0	32							160	320
●				-200	-328	●						10	50	●						170	338
	●			-175	-283		●					20	68		●					180	356
●	●			-150	-238	●	●					30	86	●	●					190	374
		●		-125	-193			●				40	104			●				200	392
●	●	●		-100	-148	●		●				50	122	●	●					210	410
	●	●		-90	-130		●	●				60	140		●	●				220	428
●	●	●		-80	-112	●	●	●				70	158	●	●	●				230	446
			●	-70	-94				●			80	176				●			240	464
●			●	-60	-76	●			●			90	194	●			●			250	482
	●		●	-50	-58		●		●			100	212		●		●			260	500
●	●		●	-40	-40	●	●		●			110	230	●	●		●			270	518
		●	●	-30	-22			●	●			120	248			●	●			280	536
●	●	●		-20	-4	●		●	●			130	266	●	●	●				290	554
		●	●	-10	14		●	●	●			140	284		●	●	●			300	572
●	●	●		0	32	●	●	●				150	302	●	●	●				320	608

The smallest measurement range is fixed at 50°C *Start- and end range are depending on the used thermocouple, a wrong setting is signaled by the red LED

Standard setting

In delivery condition all Dip-switches are switched on position "off". This is the necessary setting to configure the devices via USB interface.	
Function	Setting
Contact compensation	ON
Measurement sensor	Type K
Measurement range start	0 °C
Measurement range end	200 °C
Output	0...10 V
Measurement cycle	100 ms
Measurement range underflow	0 V
Measurement range over range	10 V
Wire breakage	0 V

Technical data

Auxiliary power:

Supply voltage : 19...32V DC
 Power consumption : < 0,7VA

Inputs:

Type	Measurement range
J	-210...+1200°C
K	-210...+1372°C
R	-50...+1768°C
S	-50...+1768°C
T	-210...+ 400°C
E	-210...+1000°C
B	100...+1820°C
N	-210...+1300°C

Step response : 100ms at DIP-switch configuration
 3, 5, 7, 5, 14, 26, 50, 100, 200, 400 or 800ms at software configuration
 Measurement range error : Adjustable, see table 1

Analog outputs:

Voltage output : 0(2)...10 V resp. 0(1)...5V / Last > 10KΩ
 Current output : 0(4)...20 mA resp. 0(2)...10 mA / load resistor max. 500Ω
 Load resistor error : < 0, 01%

Accuracy:

Linearity error : < 0, 2%
 Cold junction error : max. 3K (typical 2K)
 Measurement accuracy : < 0, 1% at full measurement range
 Measurement accuracy of measurement range : ((150K / measurement range [K]) + 0,1)% of the measurement range
 Resolution : 16 Bit meets 0, 1°C
 Temperature coefficient : < 0, 01% / K

General data:

Operating temperature : 0...50°C
 Storage temperature : -25...+85°C, condensation before putting into operation is not allowed
 Test voltage : 1,5kVAC / 50Hz / 60 seconds / between input / output / auxiliary power
 Rated insulation voltage: 150V AC/DC
 Basic insulation, Surge voltage category 2, pollution degree 2 according to DIN EN61010-1.
 MTBF : 168 years mean time between failures – according to EN 61709 (SN 29500).
 Requirements: Stationary operation in clean rooms, average ambient temperature 40 ° C, no aeration, continuous operation
 CE conformity : EN 61326-1, EN 61000-4-2/3*/4/5/6*, EN 61000-6-4
 * during measurements are small deviations possible

Body:

Dimension : 6,2mm adjoin body, 6,2x93,1x102,5
 Material : PA / V0
 Protection category : IP20

Connection : M3-screw-type terminal 0, 14 - 2,5mm², flexible or inflexible

Fixing : Snap-on mounting for norm rail TS35

Weight : 60g

Note on safety:



Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.

Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.

If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.



Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

Installation Information:

Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

Wiring advice:

Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

Limited warranty:

The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.

It is up to the choice of LEG to repair or to exchange an inoperative unit.

Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.

This limited warranty is only valid if ...

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the "General Conditions for the supply of products and services of the Electrical and Electronics Industry" including the "Complementary Clause: Extended Reservation of Property" of the ZVEI e.V. (German Association of Electrical Manufacturers).

Miscellaneous:

We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.