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datasheet
thermocouple measuring device
TH-ME-NiCr-Ni-231-20-8mm

The thermocouple measuring device serves for measuring the temperature of electrically conductive metal surfaces. In particular, the temperature of the metal surfaces, the emission factor pyrometers with largely undefined is, can this unit in Seconds measured.

For this purpose, the measuring device coupled with a hydraulic or pneumatic mechanical transport device.

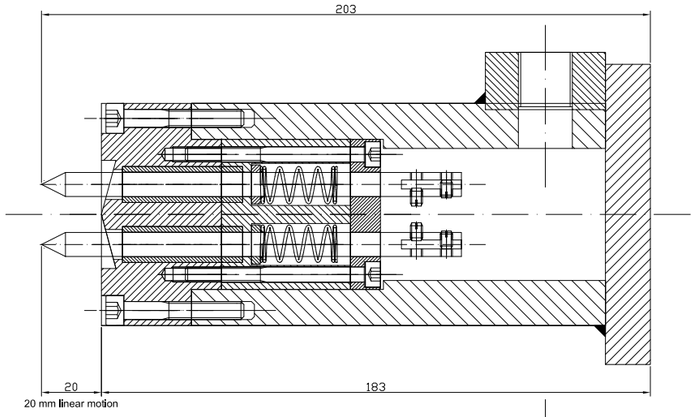
The probe tips in diameter 8 mm are biased by springs and by the hydraulic or pneumatic forward stroke with a spring force of about 28 N against the surface to be measured pressed. The measured value is available immediately after touching the probe tips to the metal surface. The spring path of the probes may be up to 20 mm.

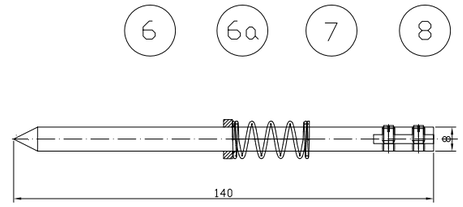
The housing consists of a massive steel pipe with welded flange bolt circle 100 mm. The sensor head is made of aluminum with internal parts of heat-resistant plastic and ceramic as an insulator. The probe tips are open thermocouple wires in NiCr (green)+ and Ni (white)- type K.

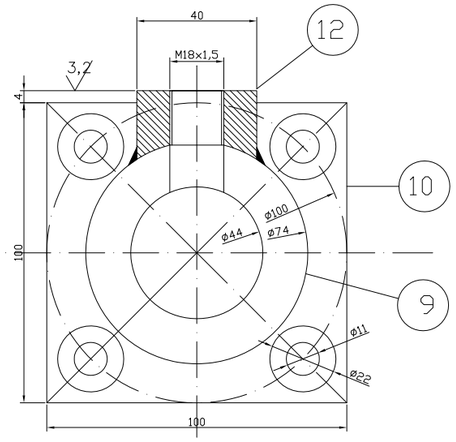
For the evaluation of the generated thermal voltage, a special transducer (type 231 with galvanic isolation) is required, which converts the thermal voltage into a standardized output signal 4 ... 20 mA (corresponds to the temperature measuring range) immediately after the delay time when the measuring tip is touched with the metal surface to be measured. Without touch (open measuring tips), the connected measuring transducer goes into the overflow (21 mA = over the measuring range end).

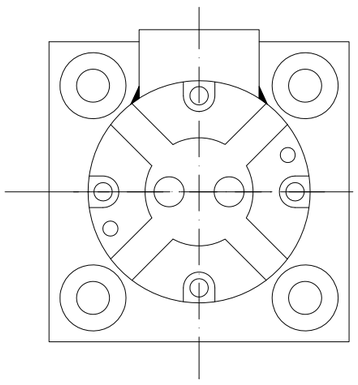
The transmitter can be mounted as a rail mount in a separate housing. We will be pleased to provide you with this measuring transducer. The electrical connection between the two measuring probes and the transmitter must be carried out by means of the provided compensation cable for Type K. ***If, contrary to expectation, this is too short, it may only be extended with the same compensating cable. The ends to be connected are to be clamped in a metallically conductive manner.***

The thermocouple measuring device is suitable for short time temperature measurement of metal surfaces to 600 ° C.







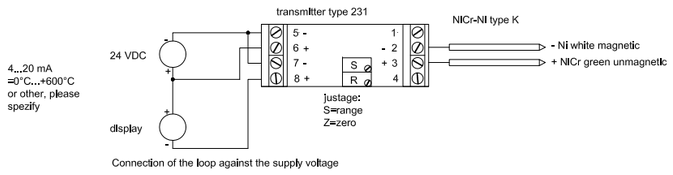


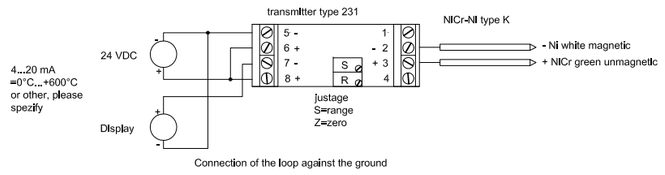
Assembly: Cable entry 90° for alignment of the measuring tips

pos.	description
1	in front part Aluminium
2	middle part Ketron Peek 1000
3	back part Ketron Peek 1000
4	screw M6x40
5	screw M5x60
6	measuring probe Ni - white - magnetic
6a	measuring probe NiCr + green - nonmagnetic
7	spiral spring D-150C
8	ring 13x8x3 mm
9	tube 74x15, 138 mm long
10	flange 100x100x15 mm,
11	ceramic hull alu-oxid Rapal 100 out diameter 12,0 +/-0,2 x in diameter 8,3 +/-0,2 x 40 +/-0,55
12	socket in M18x1,5, lengh 23 mm
13	for cable entry M18x1,5: cabelgland Dose BORNEO CVKS 18 Z18-06 cr

more material:
10 m compensating cable,
insulation: silicone, fiberglass and
galvanized steel wires,
wire stranded 48x0,2 mm
2 x 1,5 mm², type K, shape: round
order.-no.: AGL-1XK-2X1,5SGPR-IEC
with standard plug green NiCr-Ni
with standard coupling green NiCr-Ni

transmitter type 231 (galv. sep.)
for thermocouples type K to analog signal 4...20 mA, range 0...600°C or other, Loop voltage: 24 VDC





8 mm measured peaks, 20 mm linear motion

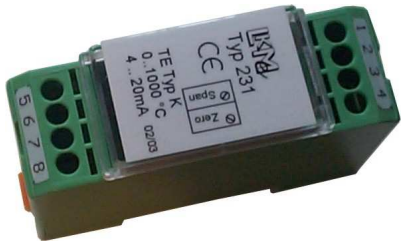
(Verwendungsbereich)		(Zul. Abw.)	(Oberfl.)	Maßstab 1:2	(Gewicht)
				(Werkstoff, Halbzeug) (Rohteil-Nr.) (Modell- oder Gesenk-Nr.)	
			Datum	Name	TH-ME-NiCr-Ni-231-20-8mm
		Bearb.	08.06.17	ZINGLER	
		Gepr.	08.06.17	ZINGLER	
		Norm			
		ROLF HEUN GMBH Hufelsen 16 21218 Seevetal/Germany			Blatt Bl.
Zust.	Änderung	Datum	Name	(Urspr.)	(Ers. f.) (Ers. d.)

ROLF HEUN GMBH

LKM231 FOR THERMOCOUPLES

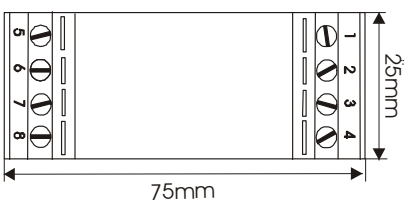
Analogue galvanically isolated measurement converter for thermocouples to be mounted on 35mm track with a 4..20mA output signal

The LKM 231 is an analogue measurement converter for various thermocouples in accordance with DIN EN 60584 and DIN EN 43710. It converts the temperature-dependent thermoelectric voltage from the sensors into a standard current signal of 4 .. 20 mA. It features galvanic isolation between input and output. The temperature compensation for the reference junction takes place in the actual measurement converter. The measurement converter is supplied with a factory calibration according to customer requirements. You will find further technical data in the instructions for use of the LKM231. Power can be supplied from a voltage source.

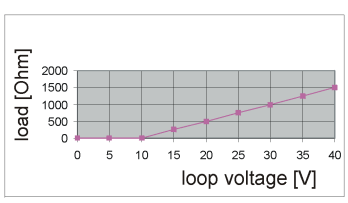


TECHNICAL DATA

Input:	*thermocouples K,J(L),T(U), E,*	*N, S, B with higher error*
Zero:	*-200..600°C*	*depending upon thermocouple*
Span:	*>200 K*	*depending upon thermocouple*
Linearity error:	*<1% FS*	*depending upon thermocouple*
Error of reference junction:	*<±0.5°C*	
Ancillary voltage:	*24VDC ±10%*	*with security against polarity reversal*
Loop voltage:	*10..35VDC*	*polarity - safe*
Current consumption:	*max. 40mA*	
Output:	*4..20mA*	*current loop*
Test voltage:	*1kV*	
Probe break:	*>20mA*	
Short circuit:	*current value for room temperature*	
Reaction time:	*<0.1s*	
TC:	*<100ppm/°C*	
Operating temperature range:	*-25..85°C*	
Humidity:	*<95%*	
Mounting:	*35mm rail*	
Housing:	*EMG25-LG made of polycarbonate*	
Dimensions:	*75x25x53mm*	*HxWxD*
Type of terminal:	*screw clamps*	
Clamping range:	*0.2..2.5mm²*	
Weight:	*approx. 60g*	
Vibration:	*5g/10..200Hz*	
EMC:	*EN 61000-6-3:2001 EN 61000-6-2:2001*	*Emission and Resistance to interference*



Load resistance



Subject to modifications arising from errors or technical advancements *July 2011*

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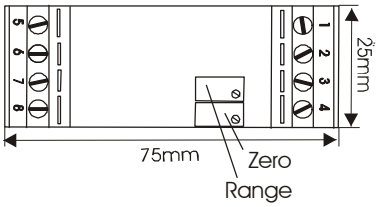
LKM231 INSTRUCTIONS FOR USE

The Type 231 is an analog transmitter and electrically isolated base mainly for thermocouples. It converts the temperature-dependent thermal voltage linear voltage into a standard current signal of 4 .. 20 mA. The transmitter model 231 is designed for installation in 35 mm DIN rail.

OPENING THE HOUSING AND LOCATION OF CONTROLS



To open the clear view cover this must be carefully pressed inwards on the narrow sides and lifted off. The location of the potentiometers can be seen in the adjacent figure. The potentiometers are protected against inadvertent adjustments. The null point potentiometer can be adjusted to make small corrections. The range potentiometer should be adjusted as little as possible.

THERMOCOUPLE CONNECTIONS

The plus leg of the thermocouple is connected to terminal 3 of the transmitter and the minus leg to terminal 2.

Color identifiers for compensating leads in accordance with DIN EN 60584

Couple	Type	Sleeve color	Plus leg	Minus leg
Fe-CuNi	J	black	black	white
NiCr-Ni	K	green	green	white
Cu-CuNi	T	brown	brown	white

Color identifiers for compensating leads in accordance with DIN 43713

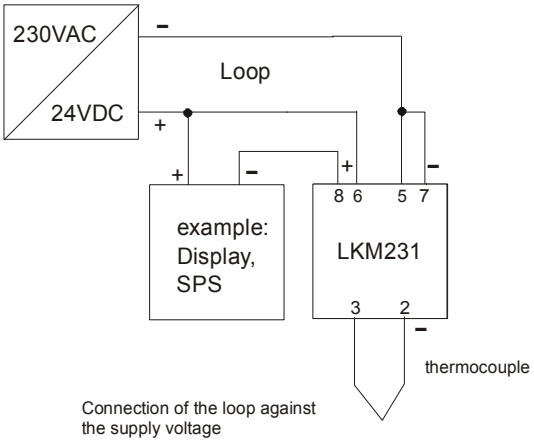
Couple	Type	Sleeve color	Plus leg	Minus leg
Fe-CuNi	L	blue	red	blue
Cu-CuNi	U	brown	red	brown

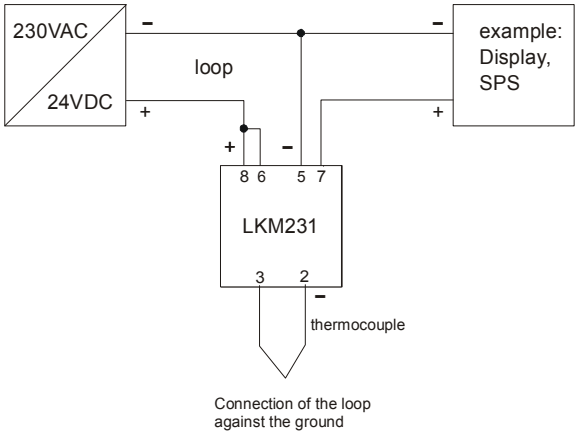
Color identifiers for compensating leads in accordance with DIN 43714

Couple	Type	Sleeve color	Plus leg	Minus leg
NiCr-Ni	K	green	red	green

EXTERNAL CIRCUIT

The output voltage follows the temperature signal at input linearly.





DEBUGGING AND CORRECTION

A thermocouple supplies a voltage signal that is proportional to the temperature difference between the measurement location and the reference junction, i.e. the thermocouple does not supply a voltage if the measured temperature is equal to the reference junction temperature. In the event of a short circuit of the thermocouple or the compensating lead the new measurement location is sited at the place where the short circuit occurs.

Fault observed	*Cause of the fault*
No current in the loop	*No supply voltage* *Incorrect polarity* *Defective Display unit* *Lead fractured*
Output signal corresponds to room temperature	*Short circuit in sensing element*
Output signal >20 mA	*Sensing element fractured*
Absolute value in the display looks correct, but it has a negative sign	*Polarity reversed on the evaluation unit*
If the measurement location is heated up the output signal reduces	*Thermocouple polarity incorrect*
Display obviously too high or too low	*Incorrect compensating lead or connected up with polarity reversed* *Incorrect thermocouple*
When only one pole of the couple is clamped up a value is still displayed	*Electromagnetic disturbances are coupled into the input lead*

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