

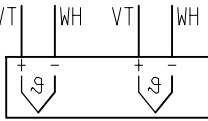
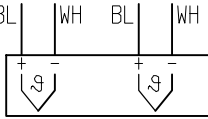
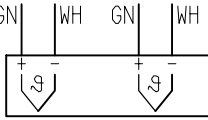
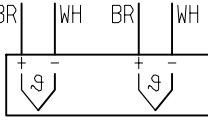
**General**

If two different metals are joined together, the different bonding energy of the electrons to the shell atoms sets up a thermoelectric current (Seebeck thermoelectric effect, 1822).

**Operation**

A thermoelement consists of two wires of different metals joined together at both ends. A thermoelectric current is set up at the two junctions. This is neutralised when the temperature at both junctions is identical. If the temperatures at the two junctions are different, a residual voltage is set up. The voltage must be linearised by means of electronics. On digitally operating devices linearisation tables are already programmed or corresponding restart points have to be keyed in by the user. The output signal can be used to activate further devices by means of limit-value switches.

Diese technische Unterlage hat gesetzlichen Schutz ( DIN 34 )

Element	Type	American designation	Terminal diagrams
NiCr-Ni	E	Chromel vs. Constantan	 <p><b>Fig. 1: Thermoelement</b></p>
Fe-CuNi	J	Iron vs. Constantan	 <p><b>Fig. 2: Thermoelement</b></p>
NiCr-Ni	K	Chromel vs. Alumel	 <p><b>Fig. 3: Thermoelement</b></p>
Cu-CuNi	T	Copper vs. Constantan	 <p><b>Fig. 4: Thermoelement</b></p>

**Table 1:** Selection table of double thermoelements with terminal diagram

### Technical data

- Type of protection Terminal head: IP 65
- Accuracy: Class 2
- Ambient temperature range for J head: -20 °C to +100 °C
- Ambient temperature range for protective tube: -50 °C to +200 °C

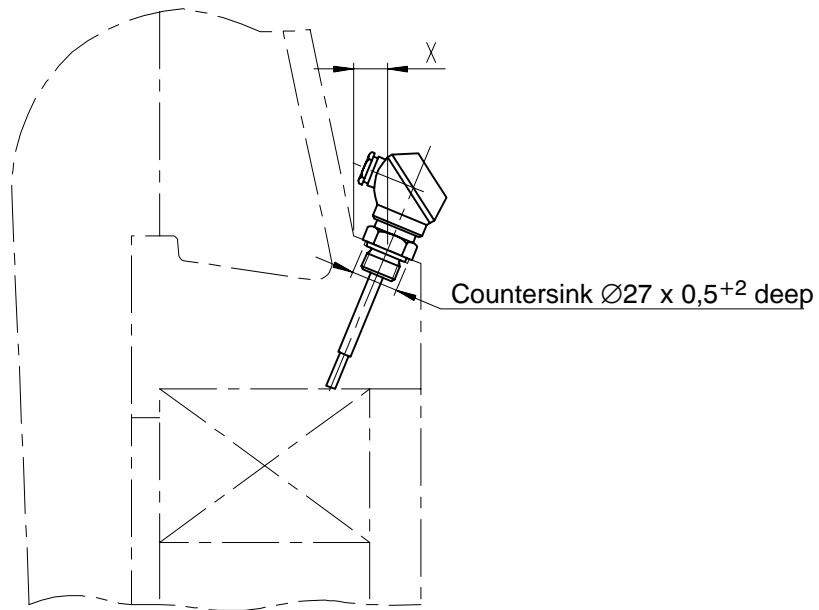
### Material

- Terminal head: GD-AISI9Cu3
- Protective sleeve for thermoelement 1.4571
- Spring: wire DIN 2076-A-0.8 (stainless steel)
- Guide tube: 1.4571
- Terminal base: ceramic
- Adapter: 1.4301
- Gasket: NBR (Perbunan)

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**Space required for installing the thermoelement**

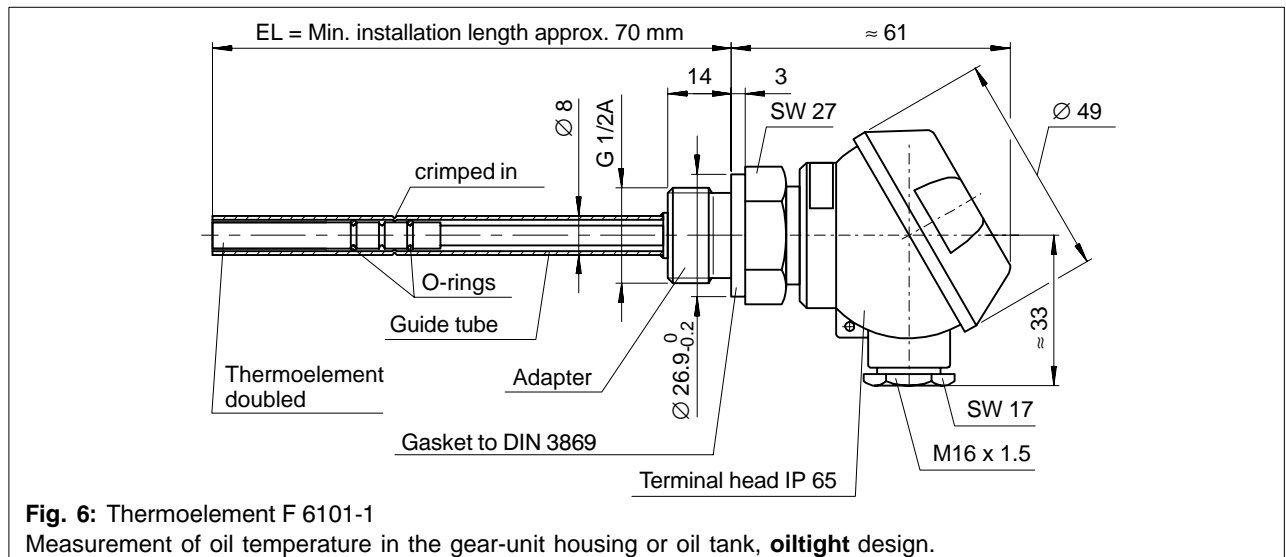
When determining dimension "X" in the design, it must be noted that the complete thermoelement can be screwed in with the connection lead.



**Fig. 5:** Space required for installing the thermoelement

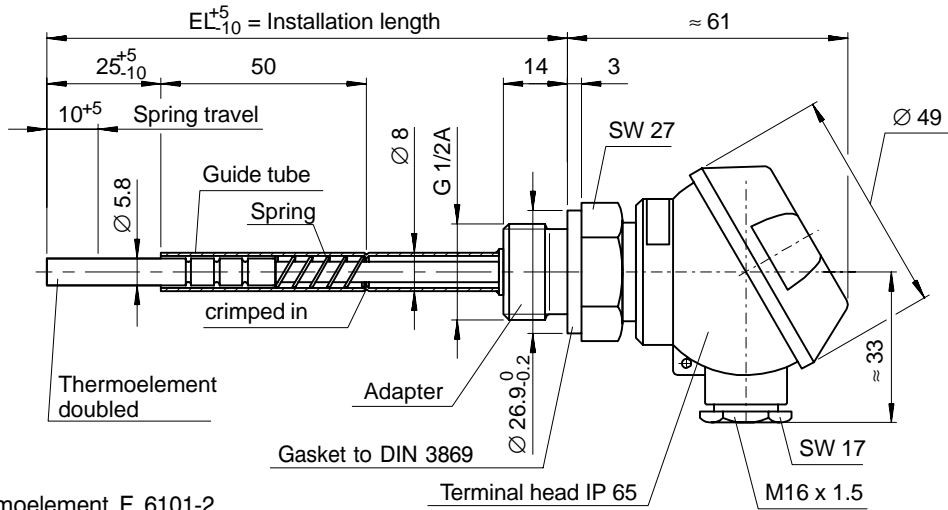
**Thermoelements**

**Types**



**Fig. 6:** Thermoelement F 6101-1  
Measurement of oil temperature in the gear-unit housing or oil tank, **oiltight** design.

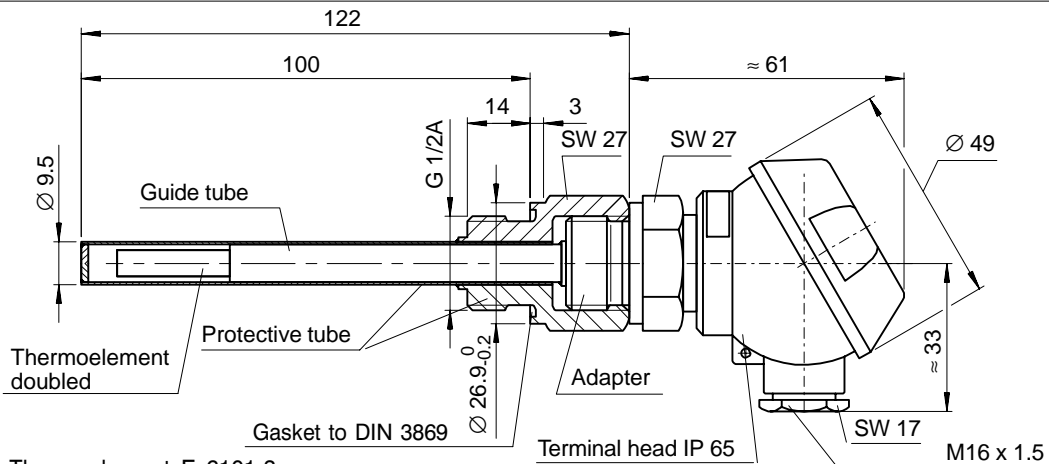
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**Fig. 7:** Thermoelement F 6101-2

**This design is oil tight when not under pressure.**

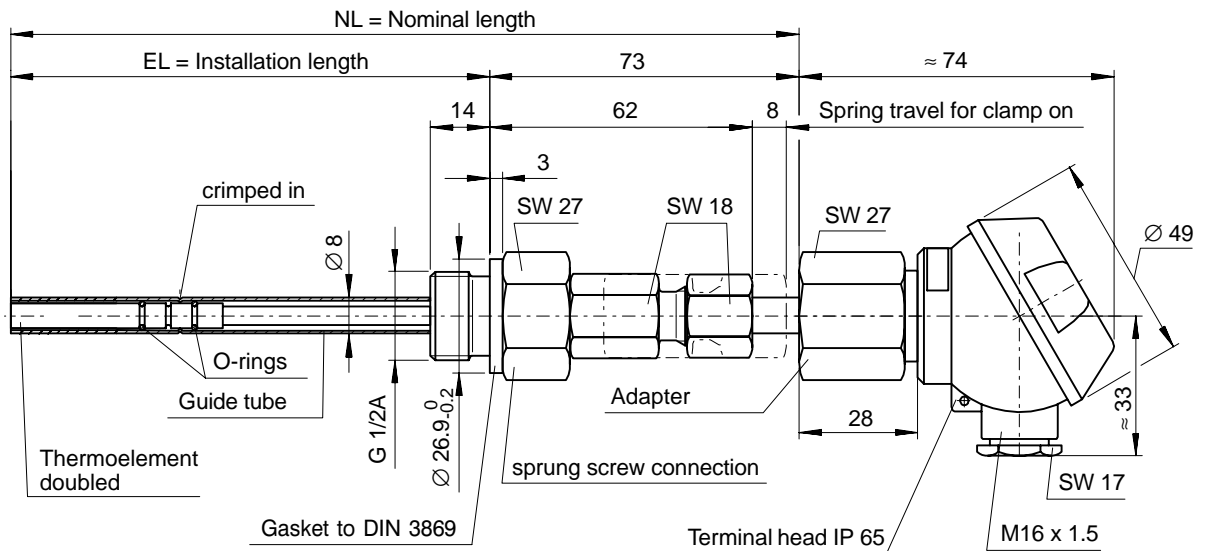
Measurement of bearing temperatures only with installation lengths up to approx. 300 mm.



**Fig. 8:** Thermoelement F 6101-3

Measurement of oil temperature in the gear-unit housing, oil tank or pressure lines.

The thermoelement can be changed without draining the oil.

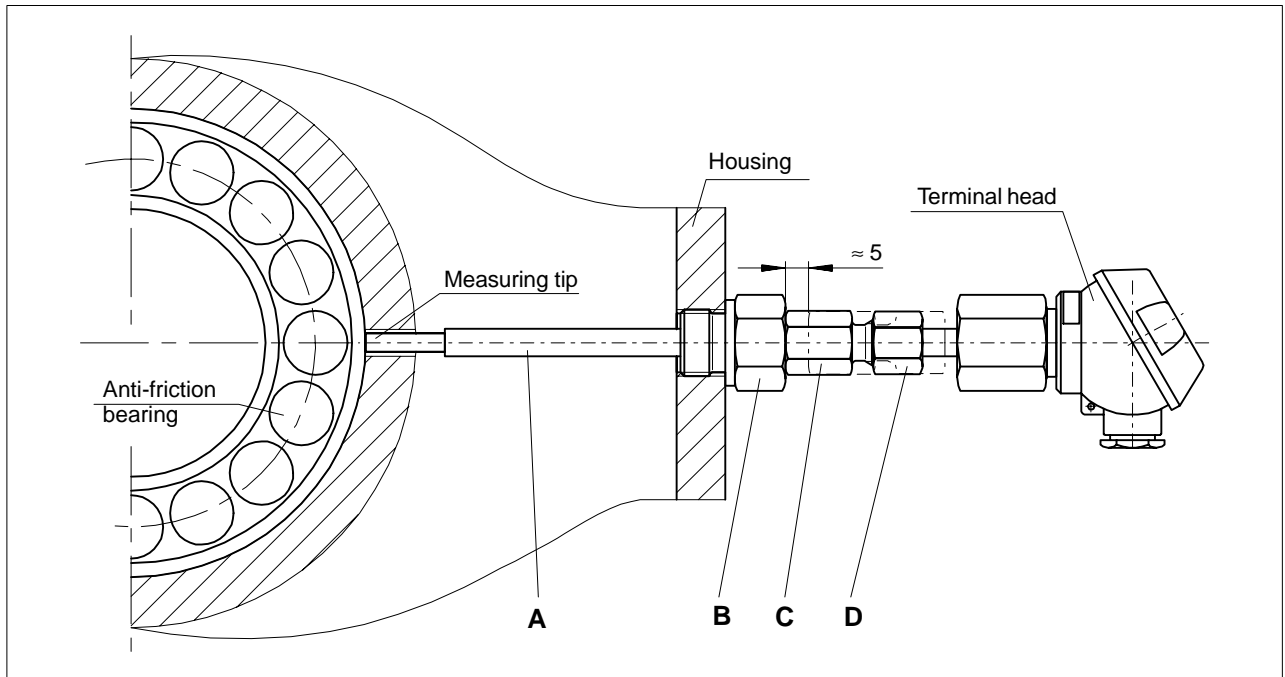


**Fig. 9:** Thermoelement F 6101-4

Measurement of bearing temperatures for installation lengths > 300 mm, oil-tight design.

Diese technische Unterlage hat gesetzlichen Schutz (DIN 34)

**Adjustment by means of sprung screw connection**



- a) Insert guide tube "A" into hole in housing until the measuring tip of the thermoelement makes contact.
- b) Screw screw connection "B" into the housing as far as it will go.
- c) Pull out screw connection "C" approx. 5 mm towards the terminal head. Then lock nut "D" with screw connection "C". This ensures that the pretensioned spring keeps the measuring tip permanently in contact with the part to be measured.