



STRAIGHT TYPE THERMOCOUPLES



C

■ GENERAL

Straight thermocouples with metal and ceramic protecting tubes are widely used in a variety of processes between $-200\text{ }^{\circ}\text{C}$ and $2320\text{ }^{\circ}\text{C}$. The maximum operating temperatures given in the catalogue apply to the air where there are no corrosive gases.

EMF characteristics of the thermocouples in this catalog conform to DIN 43710 and IEC 60584 standards.

■ DESIGN AND SELECTION

In order to increase the life-span of thermocouples the materials for the thermocouple, element wire insulator, protecting tube and connection head must be selected according to operating conditions. The maximum operating temperatures given in the catalogue apply to the conditions where operating medium is air. Although the exceeding of the maximum temperature limits specified for short periods do not effect the results, they will reduce the life of the thermocouples. Corrosive substances in the process also causes the upper temperature limit to be lower for the protecting tube.

■ PROTECTING TUBES

Protecting tubes must be selected in accordance with the conditions of the process. As a rule, metal protecting tubes are used up to $1200\text{ }^{\circ}\text{C}$ and ceramic tubes are used over $1200\text{ }^{\circ}\text{C}$.

In order to prevent the thermocouples element wire from being effected by corrosive gases and increase the life span of the thermocouple, a second ceramic protecting tube is placed inside. Ceramic protecting tubes being used as gas-tight have below given specifications;

KER 610

- Better gas-tight characteristics
- High heat resistance
- High aluminium oxide percentage
- More economical than KER 799

KER 799

- Much better gas-tight characteristics
- Maximum heat resistance
- Pure aluminium oxide percentage
- Better and more expensive than KER 610

In L-type thermocouples protecting tubes are connected to the body in two ways. Si-Cr and Si-Ni type of ceramics are connected in TC06 drawing code and the others are in TC07 drawing code. Since the mineral insulated thermocouples have a special structure, they do not have the opportunity to be used with various cases with different alternatives like other thermocouples. The protecting tubes of mineral insulated thermocouples can be inconel or 316 stainless steel. Elimko standards are usually inconel and are used up to $1200\text{ }^{\circ}\text{C}$. Thermocouples could be welded with or without grounded at the end point. It is required to give the details at ordering stage.

■ CONNECTION HEAD

Element wires and compensation cables are connected in right polarities to the ceramic terminal in connection head which the thermocouple tubes are fastened A-type large and B-type small heads in standards are used. Connection heads are available having dimensions according to DIN 43729. Metal heads are suitable for a maximum ambient temperature of 200°C.

■ MOUNTING METHODS

The thermocouples given in detail in this catalogue are generally considered to be connected by means of an adjustable flange or adjustable bushing. These mounting parts can be supplied when customers specify exact needs.

■ INSTALLATION INSTRUCTIONS

In order for a thermocouple to measure accurately, it should be immersed in 6 to 10 times the minimum outside diameter. It is recommended to use the maximum immersion length of thermocouple assembly, thus keeping measuring errors caused by heat transfer along the protecting tube and wires to a minimum. In order to prevent the long tubes from bending, it is advisable to mount them upright position or to provide for appropriate support. A compensating cable should be used between the thermocouple head and the instrument. Please be sure that a proper compensating cable is selected and the connection is made properly. In order to get accurate measurement, insertion length of the thermocouple should be not less than 10 times of the external diameter. For the L-type thermocouples, the head of the thermocouple should be away from the corrosive gases over the bath level.

For mineral insulated thermocouples insertion length of the thermocouple can be 5 times of its external diameter in case of liquids, and 20 times of its external diameter in case of gases. Minimum bending-radius changes according to the diameter of the mineral insulated thermocouples.

■ STANDARD TYPES

The standard types ordered by the customers are delivered in short periods and at reasonable prices provided that the priority is given to the competition factors.

To chose the standard type of thermocouples are easy by using code list and can be delivered from stock.

■ SPECIAL TYPES

Special types according to the application can be ordered by giving the answers of the questions below.

- Application
- Continuous and maximum operating temperatures
- Technical drawings with size, diameter, and other details
- Product code number, if ordered previously
- Pressure and flow data if known
- Chemical corrosion factors

■ SPARE PARTS

All kinds of spare parts for thermocouples can be ordered by using the selection table in the catalogue. According to the stock level, the spare parts may be delivered from stock or within a certain delivery period.

■ REPAIR

Repair of the thermocouples is not economical if almost all the elements are defective. As stated in the thermocouple spares section, only when either the tube or the element wire is working the other component can be repaired using spare parts.

■ HOW TO ORDER

a. Standard Types

Standard types are coded by using drawing number and 6 different groups of alphanumeric characters. Additional features are defined in the 7th digit or by additional information added to the end of the 7th digit. Fully special types are subjected to a different coding.

Example

TC01 - 1 K 2 N 22 - 50 PY
1 2 3 4 55 - 66 77

- Drawing nr TC01
- With single element
- NiCr-Ni
- Element wire dia 2mm
- Seconder protection 1.4841
- Seconder protection 22 mm
- Immersion length 500 mm
- Gas-tight KER 610.
- Process connection G1"

b. Special Types

Special features are defined in the 7th digit or by additional information added to the end of the 7th digit. Fully special types are subjected to a different coding

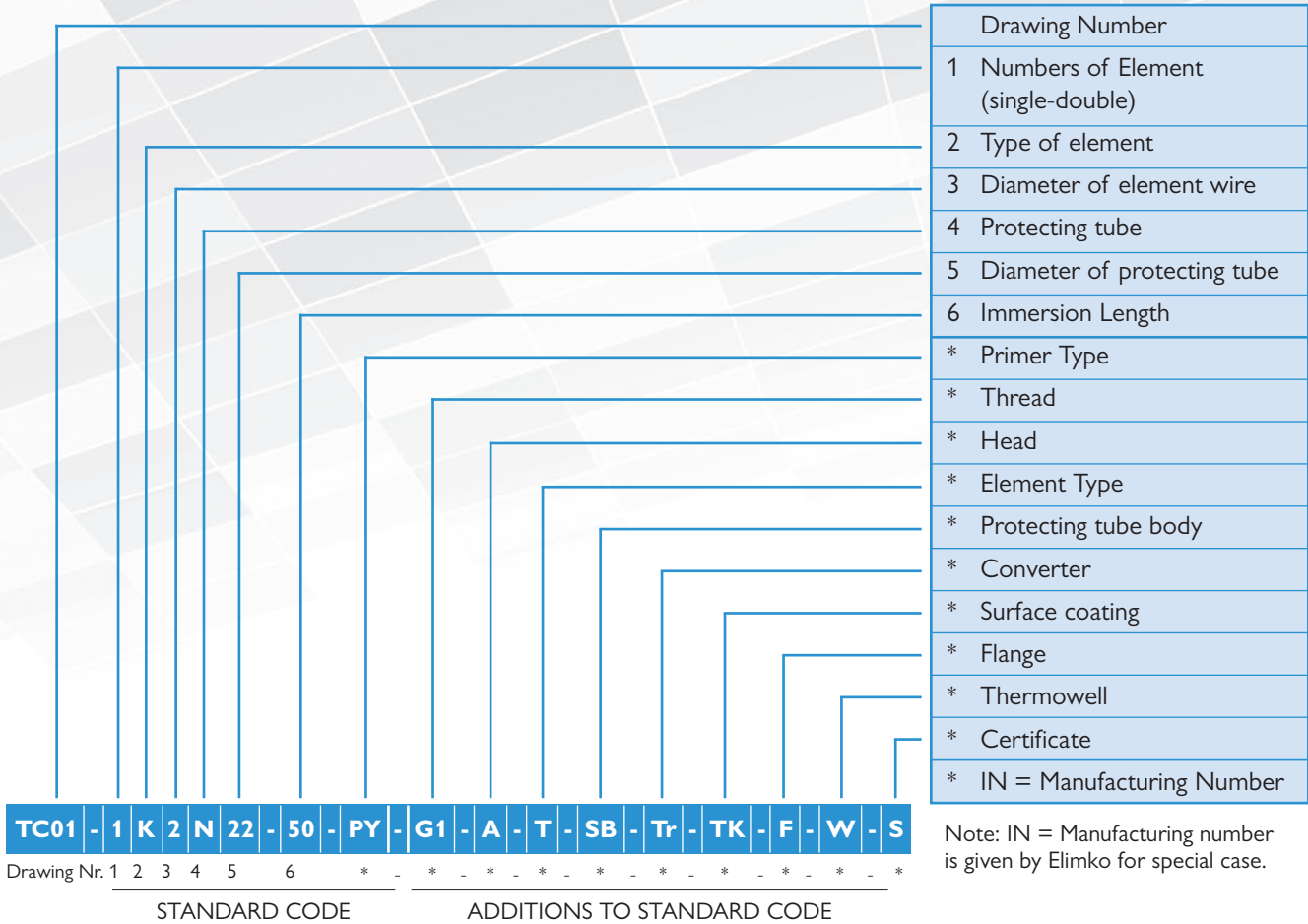
defined with IN = Manufacturing Number.

Example

TC-IN-003-XXXX-000

Note: Supplied by Elimko since it is a special code.

Elimko Straight Thermocouple Coding



STANDARD CODE

It is coded with digits and letters containing the drawing number and 6 separate pieces of information.

ADDITIONS TO STANDARD CODE

In addition to the technical specifications contained in the standard codes, the required features are listed in the "ADDITIONS TO STANDARD CODE". These features are given below. In this section only needed features are written. See examples.

SPECIAL CASES

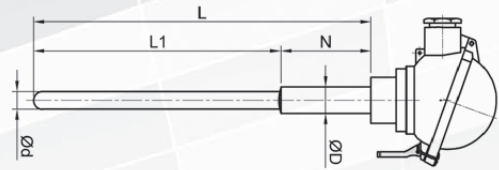
Additional features which are not fully defined with "STANDARD CODE" and "ADDITIONS TO STANDARD CODE" are coded with special drawing number. This code is expressed with IN=Manufacturing number.

Drawing nr.	TC01, TC02, TC03, TC04, TC05, TC06, TC07, TC07-SB, TC07-A, TC22, TC30-R, TC30-N, TC30-NU, TC30-NUN	Thermocouples are coded with different drawing numbers.
1- Single element Double element	(1) Single Element (2) Double Element (3) Three Elements (...) Multiple number of elements shall be written	1,2 or 3 comes in the 1. digit in a accordance with the number of the elements of thermocouple
2- Element Type	T Cu-Const IEC 60584 S Pt%10Rh-Pt IEC 60584 J Fe-Const IEC 60584 R Pt%13Rh-Pt IEC 60584 K NiCr-Ni IEC 60584 B Pt%18Rh-Pt IEC 60584 E Cr-Const IEC 60854 N Nicrosil-Nisil IEC 60584	In 2. digit, corresponding letter represents the type of the element
3- Element Diameter	ELEMENT WIRE 1 1 mm 2 2 mm 3 3 mm 4 0.35 mm 5 0.5 mm 7 1.5 mm 8 0.8 mm MINERAL INSULATED 05 0.5 mm 80 8.0 mm 10 1.0 mm 90 9.0 mm 15 1.5 mm 20 2.0 mm 30 3.0 mm 45 4.5 mm 60 6.0 mm	In 3. digit diameter of the element wire is given. It refers to the temperature which thermocouple works. In general, the diameters of 0.35 mm, 0.5 mm and 0.8 mm are for PtRh-Pt elements. Mineral Insulated thermocouple diameters are two digits

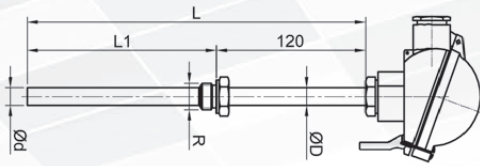
Elimko Straight Thermocouples



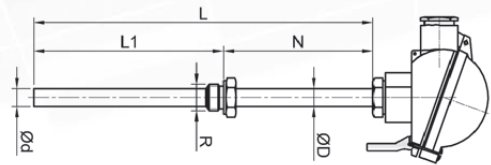
TC01



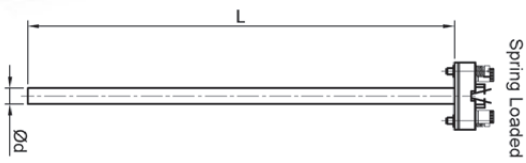
TC02



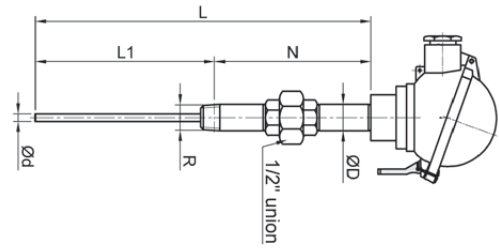
TC03



TC04



TC05



TC30

C



The company's policy is one of continuous product improvement. We reserve the right to modify the information contained herein without notice.



[/elimkoldsti](#)
[/elimkoldsti](#)
[/elimkoldsti](#)