RESISTANCE THERMOMETERS

D

GENERAL

Resistance Thermometers are used widely from -200 to +850°C in different processes. Especially at low temperatures, resistance thermometers are preferred since their accuracy is much better than thermocouples. Up to 500°C standard types and between 500 - 850°C special types are used. The maximum temperatures given in the catalogue are in the air where there are not hazardous gases. In different processes, the life of the resistance thermometer will be different according to the corrosive media.

The application for the resistance thermometers,
- Tanks, pipes and engines, etc
- In gaseous or liquid media, such as air, vapour, gases, water, oil etc..
- Low and high pressure applications
- Surface measurements

DESIGN AND SELECTION

In order for the life-time of the resistance thermometer to be as long as possible and the results taken within this period to be relaible, resistance thermometer element, protecting tube and the type should be chosen according to process conditions.

RESISTANCE THERMOMETER STANDARD

Resistance Thermometer element Pt-100 and Ni-100 give resistance values according to DIN standard 43760 Pt-100 and Ni-100 elements have 100 ohms resistance value at 0 °C. Resistance thermometers are manufactured with inset.
Resistance thermometer bulb is first installed into the inset metal tube and it is filled with metal oxide powder. Then this inset is inserted into outertube. The advantage of inset is that it can be changed when it is damaged, without interrupting the process.

PROTECTING TUBES

Protecting tubes should be chosen according to the process. Most common tubes are used to produce resistance thermometers;

- Brass
- 1.4301 (304 quality stainless steel)
- 1.4571 (316 quality stainless steel)

For insets, 1.4301 metal tubes are used.

CONNECTION HEADS

B type aluminium cast heads are used for resistance thermometers. Inset is fixed to a ceramic terminal block which in turn is secured into the connection head by two spring loaded screws. Heads are according to DIN43729 standards. The temperature of the aluminium heads are limited with the temperature limits of the extention cables.

MOUNTING METHOD

The resistance thermometers in this catalogue are designed to be mounted by mounting bushes or flanges. Surface types should be well-mounted to the surface of the body.

INSTALLATION INSTRUCTIONS

The maximum immersion length of the resistance thermometers should be determined by considering the measurement errors that may be caused by heat transfer occurring along the protecting tube and R/T element. The fluid speed where the resistance thermometer is immersed is a factor affecting the measurement sensitivity. In general, R/T should be perpendicular to the flow direction. Copper conductive cables are used between resistance thermometer head and the instruments. Up to 10 meters, 2x1.5 mm copper cable, up to 150 meters 3x1.5 mm copper cable are used. In order to get accurate measurement, immersion length of the thermocouple should be not less than 10 times of the external diameter.

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 choose the standard type of resistance thermometers 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.

a) Application
b) Continuous and maximum operating temperatures
c) Technical drawings with size, diameter and other details,
d) Product code number, if ordered previously
e) Pressure and flow datas if known
f) Chemical corrosion factors

SPARE PARTS

All kinds of spare parts of resistance thermometers 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 resistance thermometers is not economical if almost all the elements are defective. As stated in the resistance thermometer spare section only when either the tube or the inset is working the other component can be repaired using spare parts.

HOW TO ORDER

a) Standart Types

Standard types are coded by using drawing number and 5 different groups of alpha numeric characters

b) Special types

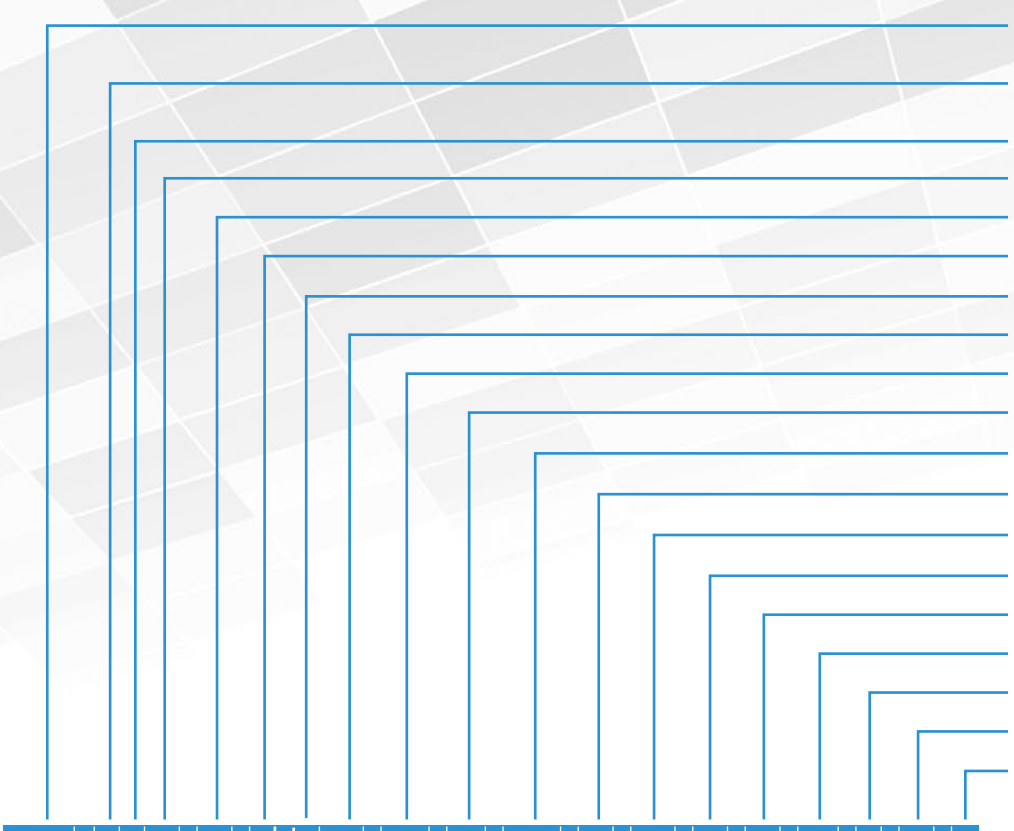
Special features are defined in the 5.digit or by additional information added to the end of the 5.digit. Fully special types are subjected to a different coding.

Example

RT01 - 1 K 09 -50 - U
1 2 3 4 5

- According to drawing nr. RT01
- With single element 1xPt-100
- Protecting tube 1.4571
- Protecting tube diameter 9 mm
- Immersion length 500 mm
- Three-wire installation

Elimko Resistance Thermometer Coding



	Drawing Number
1	Number of elements (single-double)
2	Protecting tube
3	Protecting Tube Diameter
4	Immersion Length
5	Number of Wires
*	Inset Structure
*	Element Class
*	Cable Length
*	Cable Type
*	Thread
*	Head
*	Element Type
*	Protecting tube body
*	Converter
*	Surface Coating
*	Flange
*	Thermowell
*	Certificate
*	IN = Manufacturing number

Note: IN = Manufacturing number is assigned by Elimko for special cases.

D

STANDARD CODE

It is coded with digits and letters containing the drawing number and 5 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

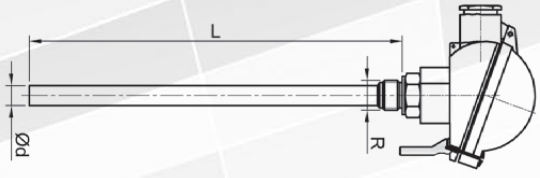
Additional features which are not fully defined with "STANDARD CODE" and “ADDITIONS TO STANDARD CODE” are coded with special drawing number. This code is expressed with IN=Manufacturing number.

Drawing Number	RT01, RT02, RT03, RT04, RT05, RT06, RT07, RT07-1, RT07-I, RT07-H, RT07-HD, RT07-Y, RT07-YA, RT08, RT09, RT10, RT11, RT15, RT16, RT21, RT22, RT23, RT24, RT25, RT26, RT27, RT28, RT29, RT30-N, RT30-NU, RT30-NUN, RT30-R, RT30-RK		Resistance thermometers are coded with different drawing numbers
1- Element Number	(1) Single Element	(2) Double Element	1 or 2 comes in the 1.digit in a accordance with the number of the elements of resistance thermometers
2- Protecting tube	D St-35.8 I İnconel P 1.4301 (304) E 1.4401 (316) H 1.4404 (316L) J 1.4541 (321)	K 1.4571 (316 Tİ) L 1.4749 / 1.4762 / 446 N 1.4841 / 1.4845 / 310S Y KER 610 Z KER 799 T Teflon	In 2.digit, the material of protecting tube is given by selecting in accordance with the process.

3- Protecting tube Diameter (mm)	02 08 14 20 30 MINERAL INSULATED 03 09 15 22 32 20 2.0 mm 60 6.0 mm 04 10 16 24 30 3.0 mm 80 8.0 mm 05 11 17 26 45 4.5 mm 06 12 18 28 09/06 D=9 mm d=6 mm Note: These sizes are in mm 14/12 D=14 mm d=12 mm	In 3.digit, the material of protecting tube is given by selecting in accordance with the process.
4- Resistance Thermometer length (immersion in cm)	05 50 200 50/74 L_1=50 L=74 10 71 71/91 L_1=70 L=91 16 100 18 120 25 140 Note: These sizes are in mm 35 160 Only inset lengths given in mm	In 4.digit, the immersion length is given. In order to ensure an accurate measurement, immersion length of the resistance thermometers should be at least 6 or 10 times of the protecting tube diameter. Note: 4.digit has two digits.
5- Number of wires	It is not written if 2 wires exit Ü 3 wires D 4 wires	Element wire number is written on the 5th digit.
* Inset Structure	Z no insets M with insets Note: If no expression is written for inset it means it has standard insets.	
* Element Class	E1 Pt-100 - Ceramic - A class E2 Pt-100 - Ceramic - B class E3 Pt-100 - Film - A class E4 Pt-100 - Film - B class E5 Pt-1000 - Ceramic - A class E6 Pt-1000 - Ceramic - B class E7 Pt-1000 - Film - A class E8 Pt-1000 - Film - B class E9 Pt-50 E10 Pt-500 E11 Ni 100 E12 Other elements	
* Cable Length	K05 50 cm K15 1.5 m K25 2.5 m K10 1 m K20 2 m ...	
* Cable Type	SS Silicon +Silicon PP PVC + PVC CC Fiber Glass+Fiber Glass CCB Fiber Glass+Fiber Glass+Annealing TT Teflon + Teflon SCB Silicon + Fiber Glass + Annealing	Note: Please contact Elimko for other cable types.
* Thread	G1 1NPT M10x1 G½ ½NPT M12x1 G¼ ¼NPT M12x1.5 G⅛ ⅛NPT M27x2 G1 S Adjustable 1NPT S Adjustable M10x1 S Adjustable	If there is a thread, it is indicated by the letters in the standard. Note: Some of these field standards are written. All standards are in production. Specify your request.
* Head	A Type A head C2 Type C2 head Ex Type Exx head ½" B Type B head P Plastic head Ex-proof certified C1 Type C1 head SS Stainless head	Please specify the type of head.
* Element Type	H Air slot UA Open Ended YA Surface Angle I Needle type Y Surface YU Surface type open HD Air Hole YD Surface Spherical V Vibrationı resistant	Details of the resistance thermometer end point are given with their codes.
* Protecting tube body	SB Perforated with fill material PSB Half Pipe – half full	Protecting tube can be machined from pipe and rod material. If the protecting tube is a pipe, no letters written.
* Converter	Tr Elimko converter installed range (Specify the during order.) Tr/I Elimko insulated converter installed Tr/k To use Elimko converter Tr/d Other brand converter to be installed Tr/dk To use other brand converter	Elimko or other brand converters can be installed in the thermocouple head.
* Surface Coating	TK Teflon coating TH Teflon hose STK Stellitecoating	Protecting tubes can be coated with known materials. If it is coated, it is coded according to its type.
* Flange	F Flange exists. Flange codes valid.	It means flange exits if F is written on the flange digit. Please refer to its catalogue for flange details.
* Thermowell	W Thermowell exists. Thermowell codes are valid.	It means thermowell exists if W is written on Thermowell digit. Please refer to Elimko catalog for Thermowell details.
* Certificate	S calibration certificate	Note: Please refer to Elimko for your certificate.

Elimko Resistance Thermometers

RT01



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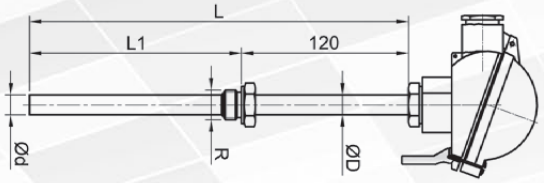

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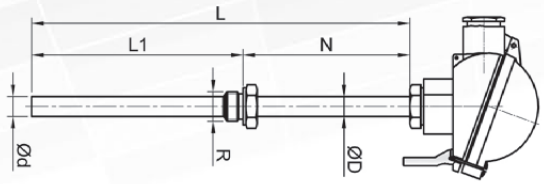

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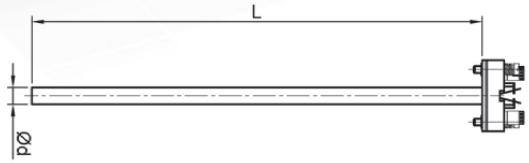

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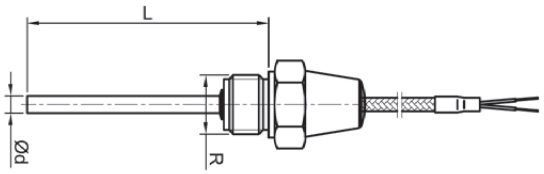

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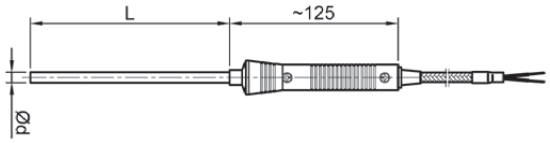

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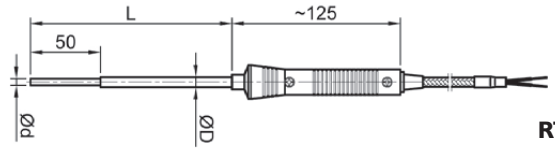
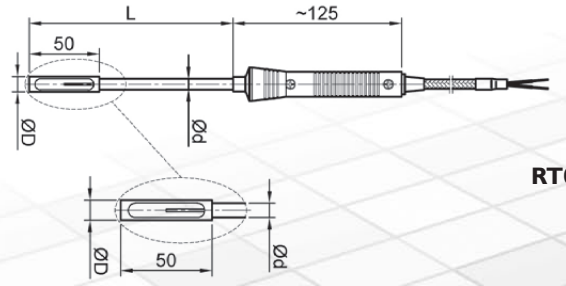


RT07-1



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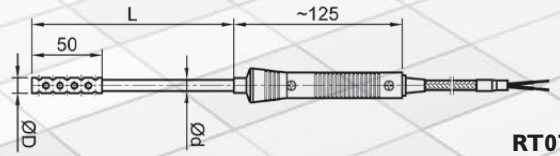

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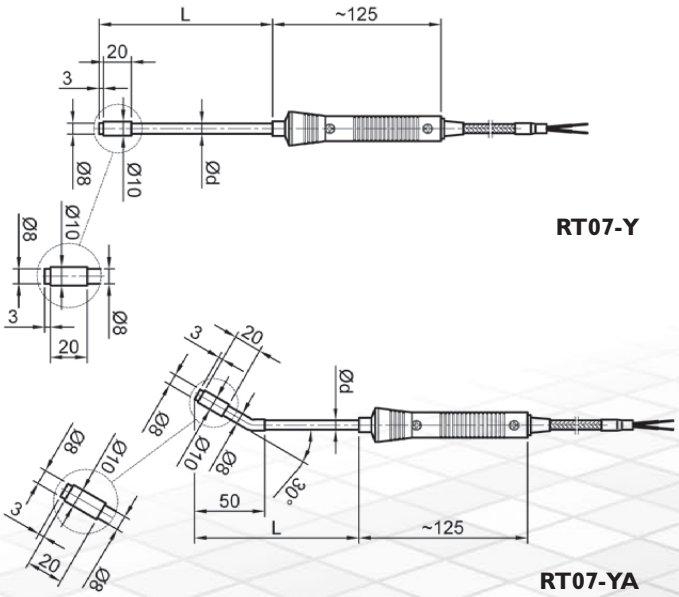
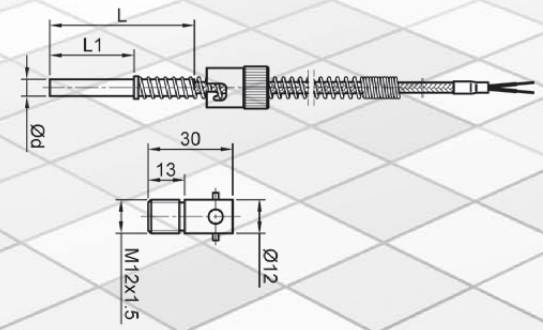


RT07-Y

RT07-YA



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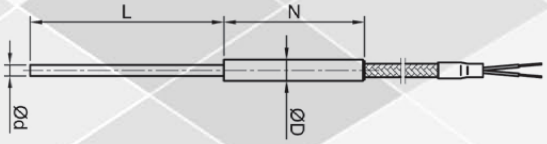

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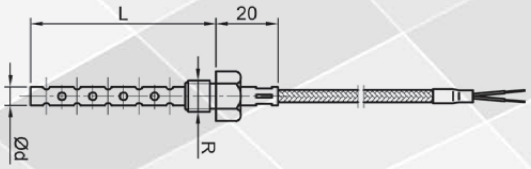
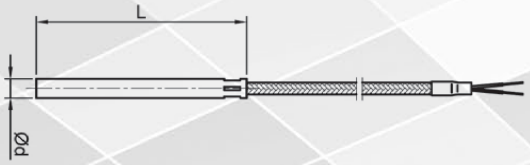
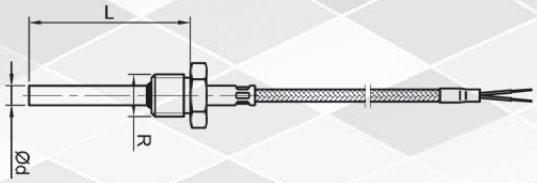


RT10

RT11



RT15



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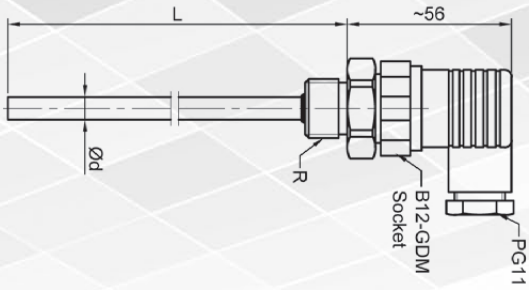

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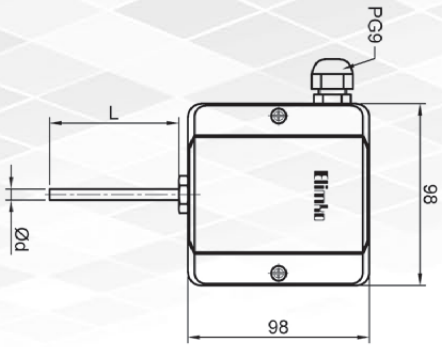

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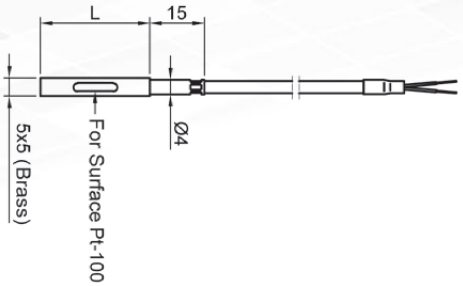

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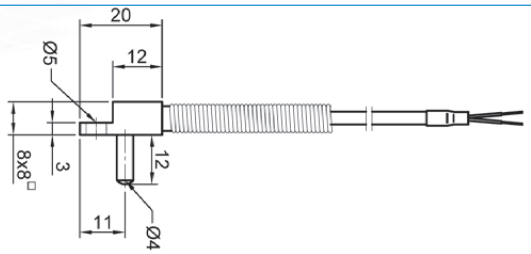

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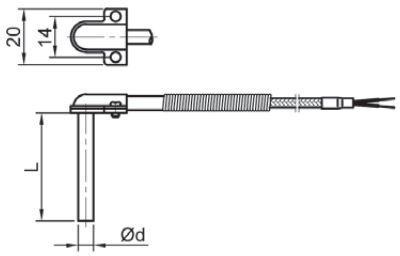

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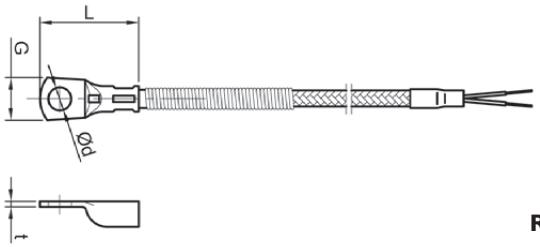

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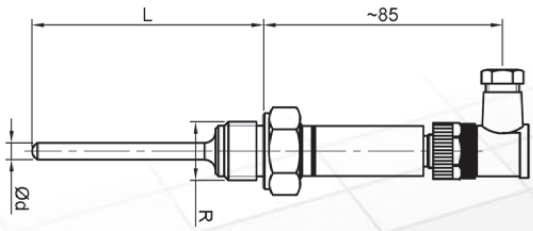

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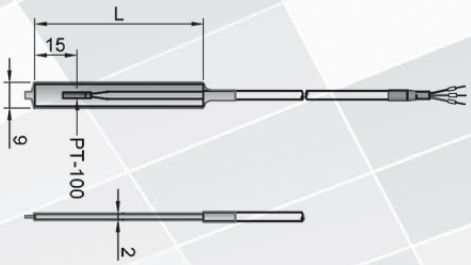
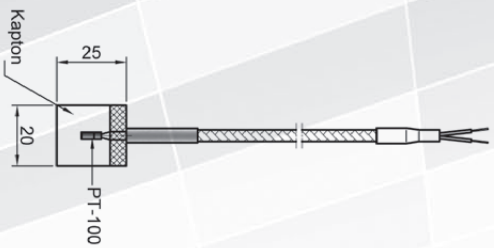
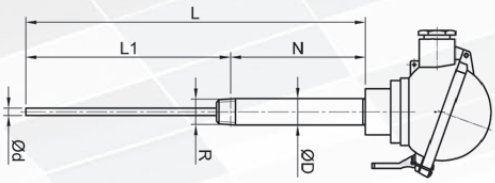


Material: Fiber

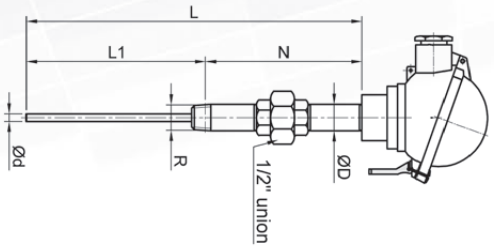
RT28



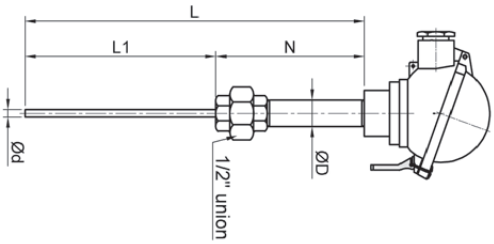
RT29



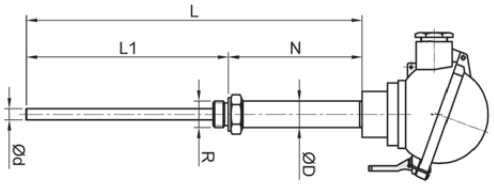
RT30-N Nipple



RT30-NUN Nipple-Union-Nipple



RT30-NU Nipple-Union



RT30-R Flat-Thread

D