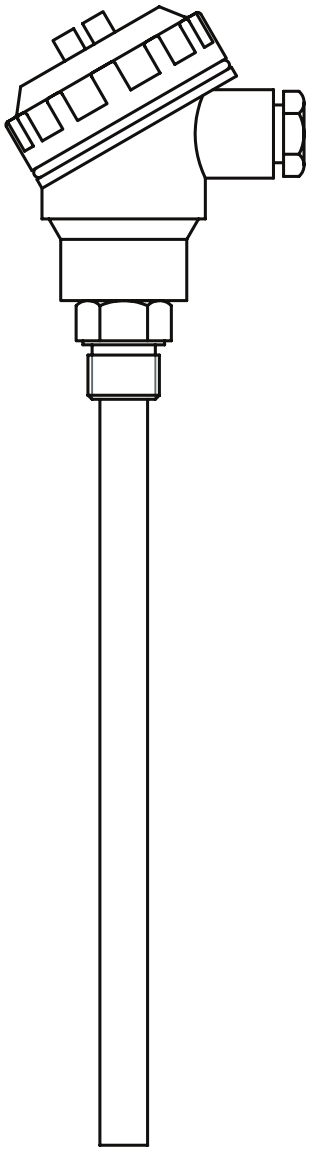
Resistance Thermometer



Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification without notice.

EN
ENGLISH

DEFINITION

Resistance thermometers are widely used in various processes from -200 ° C to + 850 ° C. They provide more accurate values than thermocouples, especially at low temperatures. Standards are used for up to 500°C, and special types are used for requests up to 500-850 °. Maximum operating temperatures given in the catalogue are for air environment without harmful gases. In environments with intense harmful effects, the service life of resistance thermometers will be shortened depending on to the effects of harmful gases.
Resistance thermometers are used for surface measurements and low and high pressure processes in enviroments such as.

Resistance Thermometer Selection :

For long-lasting, accurate and reliable operation of resistance thermometers, its element, protective sheath and mounting type should be selected. For the right check the general information section on Resistance Thermometers.
Resistance thermometer element gives resistance values in accordance with Pt-100, Pt-1000 and Ni-1000 DIN Standard 43760 or IEC 751 Standard. Pt-100 and Ni-1000 elements have 100 ohm resistance values at 0°C. Resistance thermometers are manufactured with an inset. Inset is a second protector placed inside the outer protective sheath. Resistance thermometer element is placed inside the inset outer sheath and then filled with metal oxide powder. The inset is then placed inside the outer sheath of the resistance thermometer. The biggest advantage of resistance thermometers with inset is that only inset is changed without stopping the process. In addition, by providing only the inset of a resistance thermometer whose other parts such as outer protector and head are intact, more economical material is obtained.

Protective Cases:
Resistance thermometer protective covers should be selected in accordance with the process conditions.Usually;
1.4301 (AISI304 Quality Stainless),
1.4571 (AISI316 Quality Stainless) pipes are used. 1.4571 (AISI316) stainless pipe is used as the inset material. It can also be produced in pipes required by other standards.

Resistance Thermometer : DIN 43760 ve IEC 751

Head Standard: DIN 43729 standard A,B ve C type head
Protective Cover Standard: Metal in DIN and AISI standard
Connection Head :
The inset is attached to the aluminum cast head, to which the resistance thermometer protective sheath are attached, with spring compression and two screws. By installing with spring compression, problems caused by vibration are minimized. In addition, the problems that may arise due to the expansion are eliminated and a better heat conduction is provided. Generally, Type B aluminium casting heads are used in resistance thermometers. Type C head can also be used on demand. The heads comply with the DIN43729 standard.

Connection and Assembly Forms : Resistance thermometers specified in this catalogue are generally thought to be connected to the process with raccord or flange. Copper conductive cables are used between the resistance thermometer head and the device. The connection cable of resistance thermometers up to 10 meters is connected with two wires, three wires from 10 meters to 150 meters and four wires after 150 meters. The fluid velocity of the process in which the resistance thermometer is immersed is a factor affecting the measurement accuracy. Resistance thermometers should generally be placed perpendicular to the flow direction. In order for resistance thermometers to measure the ambient temperature accurately, it should be immersed in the environments at least 6, maximum 15 times of the outer diameter.

Standard and Special Types
Standard types specified in the catalogue and frequently used in the market can be ordered by selecting them in accordance with the coding system. In addition to the standard types specified in the catalog, special type resistance thermometers are also produced according to the characteristics of the process.
In order to order a special type resistance thermometer;
1- If there is a resistance thermometer used before, a sample should be given.
2- If the special resistance thermometer has been purchased from Vira before, the order number or the technical drawing number must be given.
3- Technical drawing indicating the diameter, length and shape of the resistance thermometer, if any, should be given.
4- If a new resistance thermometer is purchased, the process should be described clearly.
5- Continuous and maximum operating temperatures should be specified.
6- If known, report chemical wear factors along with flow and pressure information of the process.

Spare Materials and Repair
All parts of resistance thermometers can be ordered according to the types specified in the catalogue. Resistance thermometers can be repaired. It would be very economical to change only the element of a resistance thermometer whose main parts such as the inset, outer protective head and terminal are intact and only the Pt-100 element is defective. In addition, replacing only the inset when the inset is the only defective part in the resistance thermometer is much more economical than buying a complete new one.

Type Determination For Order
The Vira is made according to the code created with standard codes and additions to the standard code.
It is coded according to the features determined by drawing number and 6 digits.

Special Types; It is expressed with additional information added to the end of the 6th digit. All products, except the standard product, are called "Special types". Special types are coded with "OS" production number.

Creating a Sample Order
VR02-B1H06-10 Ü EF
*The picture conforms to VR02
*In B Class feature
*Single Element
*Outer protector 1,4571
*Protective diameter 6mm Immersion length 100 mm
*Three wire connection
*Film elements

CREATING A SAMPLE SPECIAL TYPE
VR-OS-001-XXXX-000
Note: Special code will be given by Vira.

Resistance Thermometer Coding

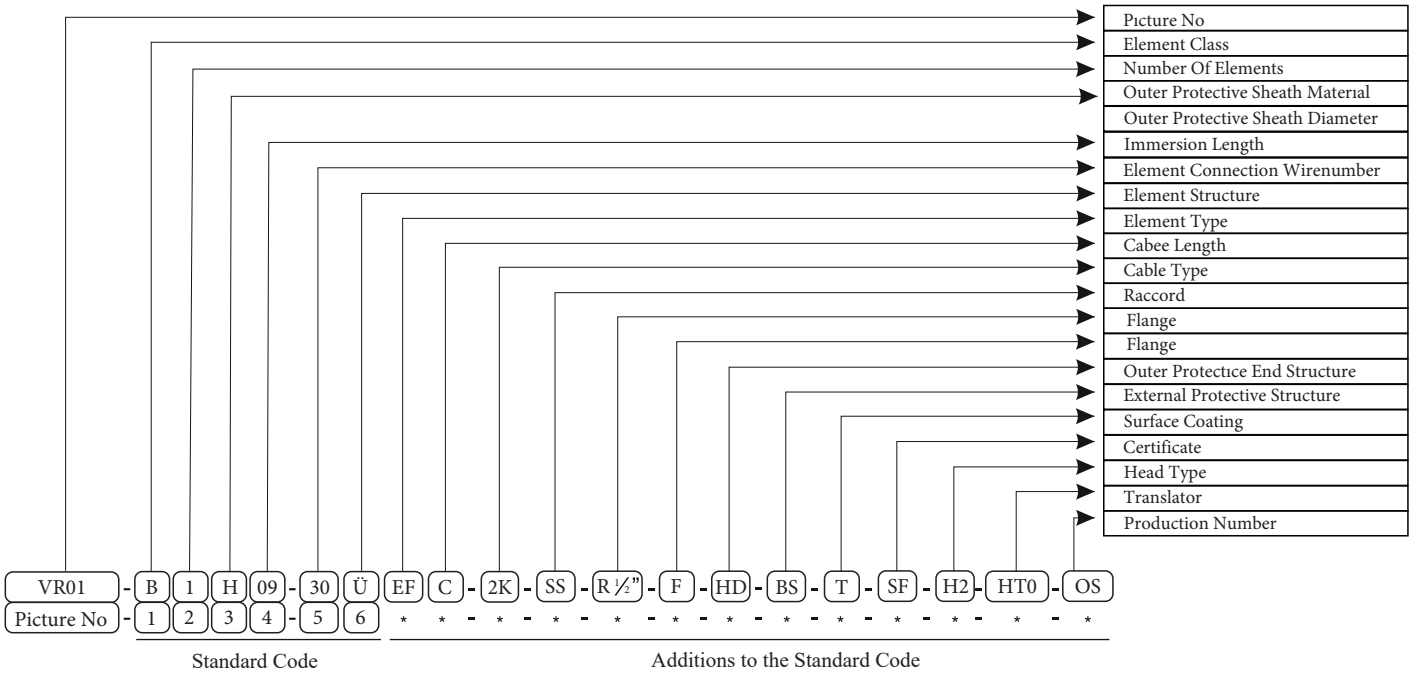


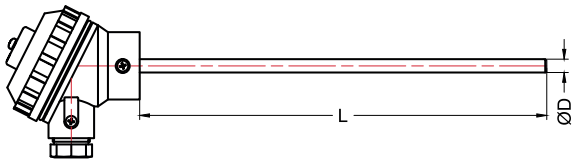
Image No.	VR01, VR02, VR03, VR04, VR05, VR06,VR07 VR08, VR09, VR10, VR11, VR12, VR14, VR15, VR16, VR20, VR30, VR40, VR50, VR60				Manufacturing methods of resistance thermometers are determined with different drawing numbers.
Element Class	(B) = B Class , (A) = A Class				**1.**In section (1), the class of the desired resistance thermometer element is written.
Number of Elements	(1) Single element, (2) Double element				**2**.In section (2), the number of elements is written.
External Protector Cover Material	Standard Cases	Vira Code	Standard Cases	Vira Code	**3.** Protective sheath selected according to household process conditions corresponding to the material
	1.4301 (304) 1.4401 (316) 1.4404 (316L) 1.4541 (321) 1.4571 (316TI) Yellow (Brass)	E F B J H U	1.4749,1.4762,446 1.4841,1.4845,310S Inconel-600 Ker 610 Ker 799 Teflon	M L N P A T	**Not:** Thermocouple for choosing the right protective sheath outer protective cover in the general information section part, the resistance of metal pipes to liquids examine the table

Outer Protective Sheath Diameter (mm)	02	09	16	24	**4.** Numbers corresponding to the protective sheath diameters selected according to the process conditions are written. (two digits)
	03	10	17	26	
	04	12	18	28	
	05	14	20	30	
	06	15	22	32	
	08	**Note:** These dimensions are in “mm”			
Immersion Length	5	30	71	180	**5.** The number corresponding to the immersion length selected in accordance with the process is written. In order for resistance thermometers to make accurate measurements, the protective sheath diameter must be immersed in the process at least 6 and a maximum of 15 times of the outer diameter.
	10	35	100	200	
	15	40	120	250	
	18	50	140	300	
	20	60	160	380	
	25	**Note:** These dimensions are in “mm”			
Element Wıre Connection	Ü (3 Wires) D (4 Wires) **Note:** No code is added when two wire connection is requested				**6.** The element wire number is written. This digit is very important in terms of the distance between the resistance thermometer and the device. Cable distance should be two wires up to 9 m, three wires for 10 m and above, four wires for 150 m and above.
Element Structur	EF-Film Element ES-Ceramic Element EG- Glass Element				The letters expressing whether the element has film element or ceramic element are written. Film element works between -70.... + 500 ° C, Ceramic element at -200....+600° C range. **Note:** Please call our company for higher temperature elements.
Element Type	Pt-50 (A) Ni-100 (N) Pt-500 (B) Ni-500 (B) Pt-1000 (C) Glass Element(C)				In this section, If an element other than Pt-100 is desired, the desired element type is expressed with letters
Cable Length	0,5K 50cm 2,5K 2,5m 1K 1m 3K 3m 1,5K 1,5m 4K 4m 2K 2m 5K 5m				In this section, the desired cable length is expressed in numbers and letters
Cable Type	PP - PVC + PVC				In this section, the cable insulation types selected depending on the ambient conditions and temperature of the cable to be used in the resistance thermometer are named with letters.
	SS - Silicone + Silicone				
	CC - Glass Fiber + Glass Fiber				
	TT - Teflon + Teflon				
	CCB - Glass Fiber + Glass Fiber + Shielding				
	TS - Teflon + Silicone				
	TCB - Teflon + Glass Fiber + Shielding				
	TBS - Teflon + Shielding + Silicone				
	TBT - Teflon + Shielding + Teflon				
	SCBS - Slicone + Glass Fiber + Shielding + Silicone				
Record	R½” R½”NPT RM10x1				In this section, If raccord is requested, the character related to the raccord measure is encoded in the additions section to the standard code. Standard raccords are specified in this section. Specify the size of the raccord you want to produce in all standards.
	R½” R½”NPT RM12x1				
	R⅛” R⅛”NPT RM10x1,5				
	R¾” R¾”NPT RM20x1,5				
	R1 R1”NPT RM27x1,5				
	Note: The standard raccord sizes mentioned above are fixed type raccords. When these raccords are requested as adjustable raccords (moving), the raccords are coded as "RA".For example RA½ "Adjusted Record				
Flange	Casting Flange F **Note:** Production is made in all flange sizes. It will be sufficient to specify the flange size.				If the process connection is requested with a flange, "F" is written on the flange digit. Our standard flange sizes are available in the reserves section.
Outer Protectıve End Structure	HS Air Slotted HD Air Perforated İ Needle End Y Surface Probe				If the end assembly is requested differently, it is defined by the codes specified in the standards.
Outer Protectıve Structure	BS Fulled Material BSY Half Full Material				External protectors are made of pipe or filled material. No addition to the type code is made for tubular protectors.

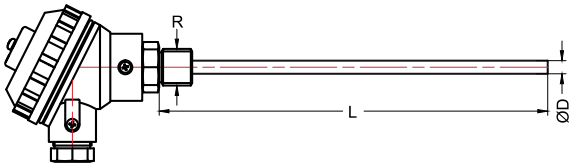
Surface Coating	T Teflon Coating TH Teflon Hose ST Stellite Coating	External protectors can be coated as required by the process conditions. If there is a coating, it is defined as specified.
Certificate	SF	If resistance thermometers are requested with an accredited certificate it must be defined with "SF".
Head	H1 - Sgs Type Head H2 - C Type Head H3 - BUZ-H Head H4 - Windowed BUZ-H Head H5 - Plastic Head H6 - Pvc Head H7 - Stainless Head H8 - B Type Head H9 - A Type Head H10 - A Type bakalite head H11 - C tipi bakalite head Ex-proff head (certified)	Our production for resistance thermometers is type B head. When other heads are requested, please specify which head. **Note:** See Thermocouple spares section for other heads.
Converter	HTO - Vira Converter HT1 - Vira İnsulated Convarter HTH - Hart Protocol Convarter HTE - Ex-Proof Convarter	Resistance Thermometers may have a head converter, whether made by Vira or another brand in resistance thermometers. It can be defined according to the desired features in the order.

Rezistans Termometreler

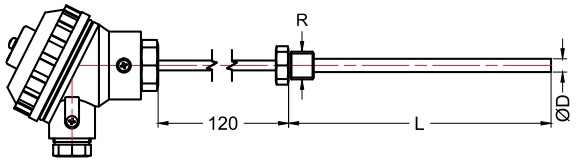
VR01 Resistance thermometer is straight type without raccord. B type head is used in standard production. Diameters of 9mm and above are inset type. It contains VR05. Inset type can be made in diameters less than 9mm upon request.



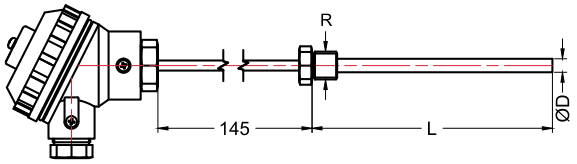
VR02 resistance thermometer is raccord type. Standard is ½"raccord. Diameters of 9mm and above are inset type. It contains VR05. Inset production can be made in diameters below 9mm if desired.



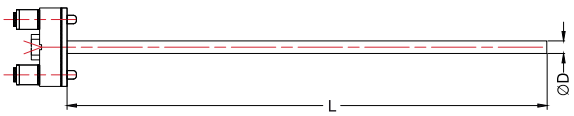
VR03 There is 120mm distance between VR03 Raccord type and head-raccord.½"standard raccord. It is inset type. It contains VR05.



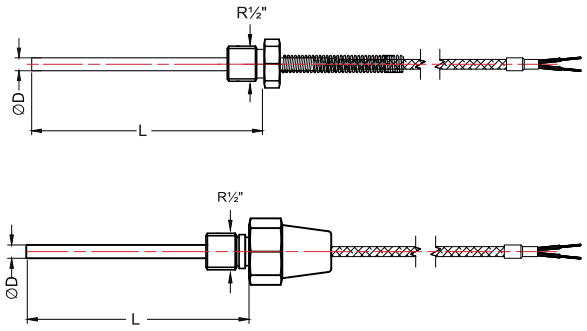
VR04 There is 145mm distance between VR04 raccord type and head-raccord. 1⁄2 "standard raccord. If a distance of more than 145mm between head and raccord is requested, it should be specified. It is inset type. It contains VR05.



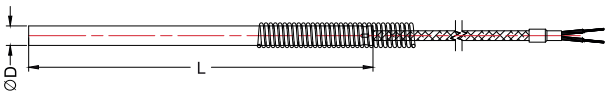
VR05 Is inset type. Resistance thermometers are generally used with inset. RT element is placed in a stainless sheath. It is filled with metal oxide powders. Inset is a second protector placed inside the outer shield.VR01, VR02, VR03, VR04 and VR20 have VR05. While coding VR05, the immersion length is written in "mm".



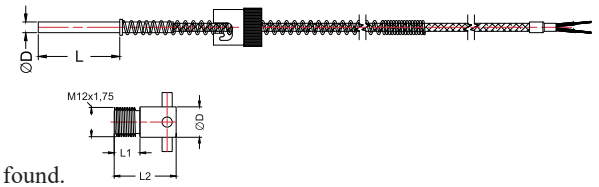
VR06 Type resistance thermometer is a simple resistance thermometer with raccord and fixed cable. 1⁄2 "standard raccord. Other raccord sizes can be produced. Since it is fixed cable, the cable length must be specified in the order. Raccord temperature should not exceed 100 °C. It is produced in two different types as VR06 and VR06-A (Conical Raccord).



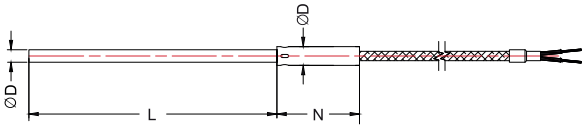
VR07 Type resistance thermometer has a simple flat type structure with fixed cable. Cable length must be specified in the order. There is a pipe at the end of the cable. This pipe can be given in "L" length in different diameters. In standard production, VR07 cable outlet is springy.



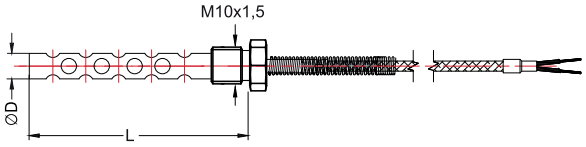
VR08 Type resistance thermometer is bayonet type with fixed cable. The tip of the resistance thermometer is clamped into metal blocks or heating processes with a spring and fixed with raccord. In standard production, the pin raccord is M12x1.5 threaded. L length is 30mm. It is manufactured in different lengths. Since it has a fixed cable, the cable length must be specified in the order. The cable type should be selected according to the ambient conditions in which the cable will be found.



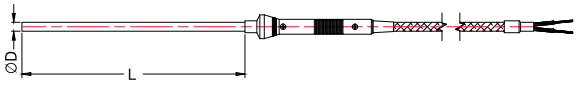
VR09 Is fixed wired type. It is used for portable purposes. It is produced in desired lengths up to 9mm diameter in stainless steel protected pipes. Especially in laboratory applications, metal or glass containers can be used in many different areas by immersing them in erlanmayer. Cable connection point should not exceed 100 ° C.



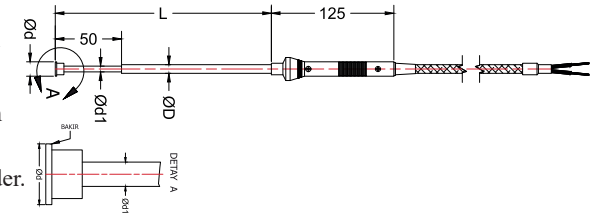
VR10 Miniature type resistance thermometer is used to measure air temperatures precisely. There is air-hole pipe protecting the element. Process connection is threaded M12x1.5. It is also produced with glass elements. Glass element is more sensitive t han standard element. However, it is expensive compared to the standard element.



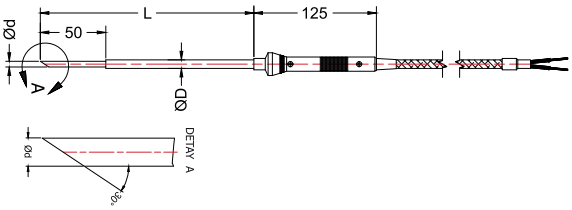
VR11 Is a portable type resistance thermometer with fixed cable. It is produced in desired lengths up to 4,5,6,8 and in special cases 9mm diameter. When choosing the size of the resistance thermometer, care must be taken to ensure that the handle and hand held by hand are long enough not to be affected by the process temperature. In order to get accurate measurements, RT should be immersed in the process at least 6, maximum 15 times the outer diameter. Since it is a fixed cable production, the cable length and cable type must be specified in the order.



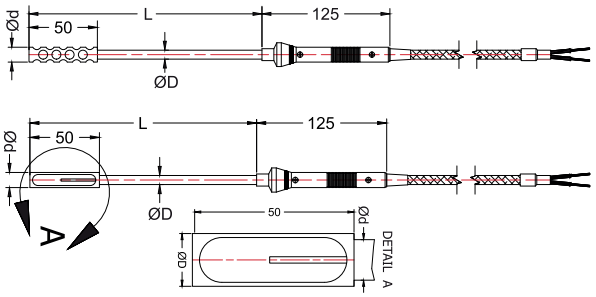
VR11-Y Sis a resistance thermometer with fixed cable, which is used to measure flat surfaces. It should be contacted by pressing firmly on the flat surface. It does not give correct results on uneven rough surfaces. If the Surface Type resistance thermometer tip is desired at an angle, it should be encoded as VR11-YA. Since it is a fixed cable production, the cable length and cable type must be specified in the order.



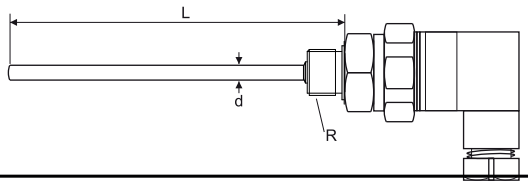
VR11-A is used to measure soft process temperatures. For example, dough, rubber, sponge, meat, etc. are needle-tipped. The measurement is made by pressing strongly on the medium to be measured.



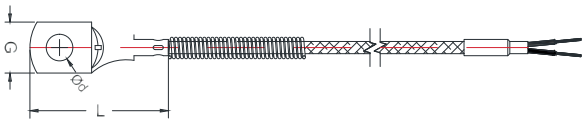
VR11-HD air perforated RT is used for temperature measurements of clean air environment. There is an air-perforated stainless protector in the 50mm section of the tip. With this structure, the sensor is able to measure precisely. When requested with RT air slot, it is coded as VR11-HS. Since it is a fixed cable production, the cable length and cable type must be specified in the order.



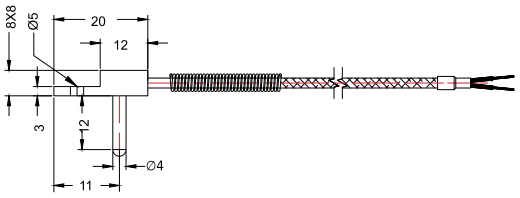
VR12 Type resistance thermometer 43650 is electrical or M12 socket. Standard raccord size is 1⁄2". For detailed and different types of choices, please check our VR12 type resistance thermometer catalog in Resistance thermometers section.



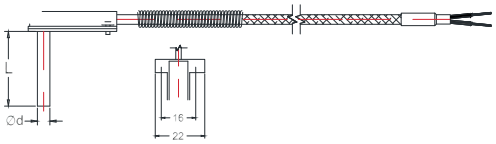
VR13 is fixed wired type. It is used for flat surface measurements. It is fixed to the surface to be measured with bolts. When ordering, you must specify the "d" diameter. When the cable length and maximum measuring range are specified, the cable type is selected more accurately.



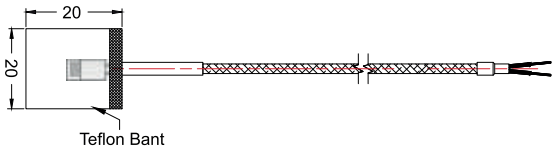
VR14 Is fixed wired. It is mounted on metal and heater blocks in processes that have difficulty in assembly. The resistance thermometer is fixed to the process with a screw. Cable length, diameter and length information should be specified in the order.



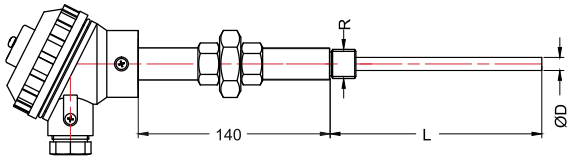
VR15 is fixed wired. It is an elbow type mounted in metal block housings. It is preferred in processes with assembly difficulties. Cable length, diameter and length information should be specified in the order.

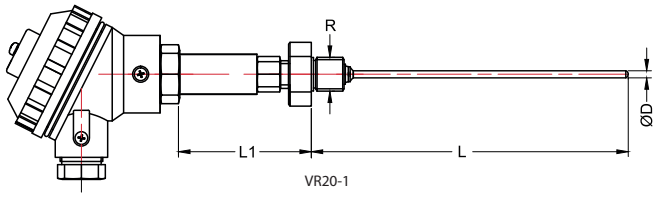


VR16 is fixed wired. It is the type used by the bonding method on flat surfaces. It is used by mounting an element between the tape. Cable length, diameter and length information should be specified in the order.

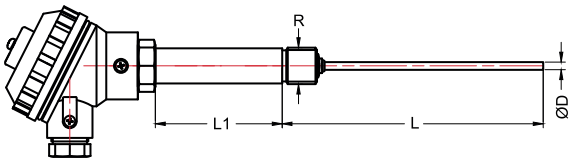


VR20RTs are used as Nipple, Nipple-Fitting, Nipple-Union-Nipple (Union) connection in their assembly to the thermowell. In standard production, the head and vel connection are½"NPT.

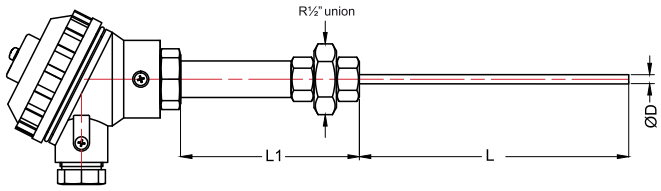




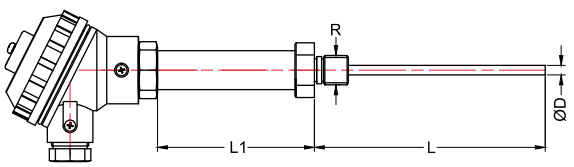
VR20-1



VR20-2

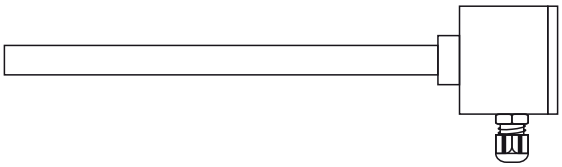


VR20-3

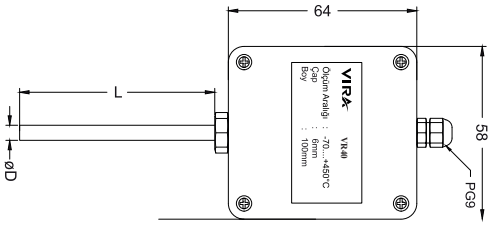


VR20-4

VR30 Aggressive resistance thermometer is processed from PVC, DERLİN or TEFLON filled material. Used in processes of strong acids, organic solvents, petroleum products and mineral oils. It is given in a minimum diameter of 15mm. Please contact Vira for your requests for diameter less than 15mm. For detailed and different types of choices, please check the VR30 catalog in the resistance thermometers section.

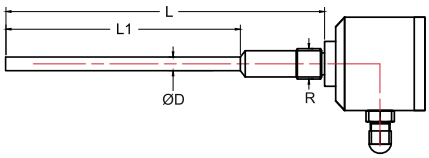


VR40 type resistance thermometers are used to measure air temperature in many areas. It is preferred in areas requiring precise measurement of air temperature. It is also produced with air holes. It is encoded as VR40-HD. It is produced as wall mounted in special boxes of 58x117x35mm dimensions. With analog output, the converter can be supplied mounted. For detailed and different types of choices, please check our VR40 catalog in the resistance thermometers section.

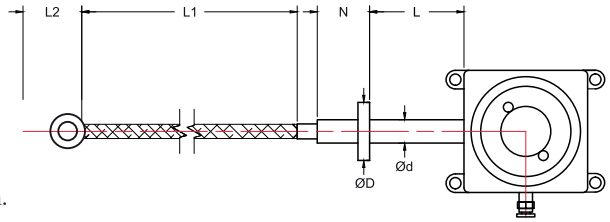


VR50 Is produced as a winding temperature sensor (Slot Type). It is used to measure the temperatures of electric motors and generators. It is mounted on stator windings. For detailed and different types of choices, please check the VR50 catalog in the resistance thermometers section.

VR60 Type resistance thermometer is a temperature sensor designed to measure tank temperatures. Temperature measurement can be made from more than one point in proportion to the size of the tank. For example (4-14 pcs. Pt-100) AISI316 flexible hoses are used. In standard production,the process connection is flanged. It is also produced with analog output and averaging feature. For detailed, different types and features, please check our VR90 catalog in the resistance thermometers section.



VR90 Type resistance thermometer is a temperature sensor designed to measure tank temperatures. Temperature measurement can be made from more than one point in proportion to the size of the tank. For example (4-14 pcs. Pt-100) AISI316 flexible hoses are used. In standard production, the process connection is flanged. It is also produced with analog output and averaging feature. For detailed, different types and features, please check our VR90 catalog in the resistance thermometers section.



Resistance Thermometer Coding Examples

Picture No	-	Element Class	Number of Elements	Outer Protective Sheath Material	Outer Protective Sheath Diameter	-	Immersion Length	-	Element Connection Number of Wires	Exception	Explanation
VR02	-	B	1	H	06	-	25	-	Ü	EF EX	**VR02** RSuitable for VR02, B Class Film Pt-100 element, number of elements 1, outer protective diameter 6mm, protective sheath material 1,4571 DIN Stainless (AISI316), immersion length 250mm, 1⁄2"raccord connection, three-wire connection, Ex-Proof head.
VR04	-	A	2	H	08	-	30	-	Ü	ES	**VR04** Suitable for VR04, with A Class Pt-100 ceramic element, number of elements 2, outer protective diameter 8mm, protective sheath material 1.4571 DIN Stainless (AISI316), immersion length 300mm, 1⁄2 "raccord connection, distance between head and raccord 145mm, three with wire connection.
VR08	-	B	1	E	05	-	3	-	Ü	EF EX	**VR08** Suitable for VR08, B Class Pt-100 film element, number of elements 1, outer protective diameter 5mm, protective sheath material 1.4301 DIN Stainless (AISI304), immersion length 30mm, M12x1.75 bayonet raccord connection, three-wire connection, 5 m wired.

The manufacturer reserves the right to make change without prior notification.

VİRA ISI VE ENDÜSTRİYEL ÜRÜNLER A.Ş

Metal İş Sanayi Sitesi 11.Blok No:37-39 İkitelli/İstanbul

Phone: +90 212 549 57 70 Fax: +90 212 549 58 48

Web: www.viraisi.com E-mail: info@viraisi.com