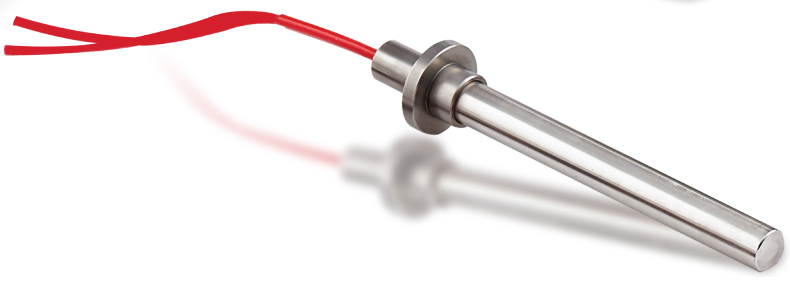
VITAR®

INDUSTRIAL HEATING ELEMENTS & THERMOSENSORS

TUBULAR HEATER • CARTRIDGE HEATER
BAND HEATER • THERMOSENSOR



50 YEARS OF EXCELLENCE
1966 - 2016

VBC
MANUFACTURING Sdn. Bhd.

Established in 1982, VBC Manufacturing Sdn. Bhd. (VBCM) is Malaysia's leading manufacturer of custom made industrial heating elements and thermo-sensor.

VBCM manufactures most of the heating element produced in Malaysia as result of effective optimisation of manufacturing process backed by committed and skill workforce.

VBCM also has earned the enviable position of being the first and only thermosensor manufacturer in SEA with an accredited laboratory awarded with ISO/IEC 17025.

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Our Company

- Vitar Group of Companies was established in 1966
- We use technology acquired from Japan, UK and the USA
- 50 Years Industry Experience
- The first thermosensor manufacturer in Southeast Asia equipped with calibration laboratory accredited to ISO/IEC 17025

Our Strengths

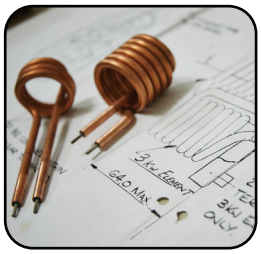
QUALITY

- All the heating elements are manufactured according to IEC 60335-1 Standards. Our tubular/sheathed heater series conform to requirements of UL/CSA and CE Standards.
- Our thermosensors can be calibrated as per customer requirement to ensure measurement accuracy.

TRACEABILITY

- Every step of the manufacturing process is documented from the moment the customer's order is received, from design, fabrication, quality inspection and delivery process.
- Product technical and quality records are kept to expedite customer's succeeding orders, ensuring shorter manufacturing leadtime.

PRODUCT DESIGN & PRODUCTION



- Product design is optimized to fulfill customer requirements, as well as, ensure product quality, safety, reliability and maximum performance.
- All our products are manufactured using well-established techniques performed by a skilled workforce.

DELIVERY

- We are committed to deliver in the shortest-time possible to support our customers' requirement. We deliver within 5 working days!

Terms and Conditions Apply

ACCURACY

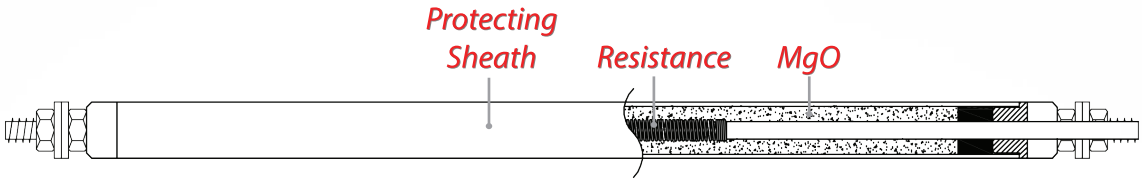
- Our well-established calibration laboratory is accredited to ISO/IEC 17025 to support our customers' requirement for accuracy in temperature, dimensional, mechanical, humidity and electrical measurements.
- Our laboratory quality control and services adheres to various international standards (ASTM,IEC, JIS, BS)

Tubular Heater - Introduction

Construction

Tubular and Finned Tubular Heaters

Tubular and Finned Tubular Heaters provide a highly efficient, reliable and low cost means of rapidly supplying heat directly to air, metals and various types of liquids, depending on the application.



Nickel-chromium resistance wire is uniformly stretched and imbedded into magnesium-oxide powder.
Resistance wire is accurately aligned within a copper, steel or alloy sheath.
Cold pin terminals are inserted into the heating coil, welded and comes with various connection option.

Features:

- Elements can be formed or shaped into almost any design configuration
- Wide variety of wattages and voltages
- Wide variety of termination types
- Wide variety of sheath material
- Finned sheath optional
- High purity compacted MgO provides maximum heat conductivity
- Integral cold pins provide optimum in-current carrying capacity.

Design Parameters

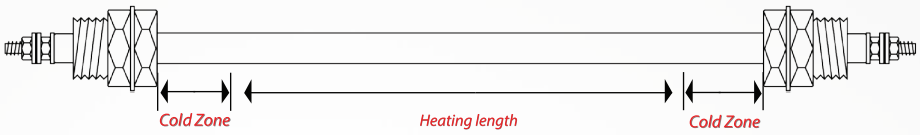
Heater Watt Density

Standard Length = Heating Length + Non-Heating Length (Cold Zone)
Standard Cold Zone = minute. 1.5 to 2.0 inches

Watt density factors affecting element life. Watt density (watts per square inch of heating surface area) determines heater operating temperature for a given set of conditions.

Watt density is calculated as follows:

$$\text{Watt density } (w/in^2) = \frac{\text{Element Wattage}}{3.14 \times \text{Element Diameter (in inch)} \times \text{Heated Length (in inch)}}$$



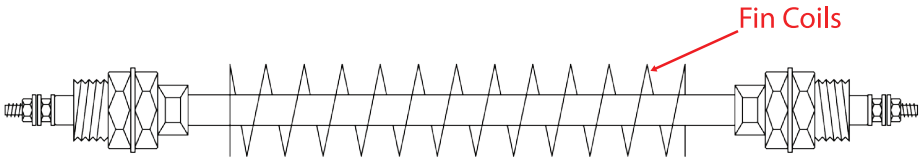
Finned Tubular Heaters

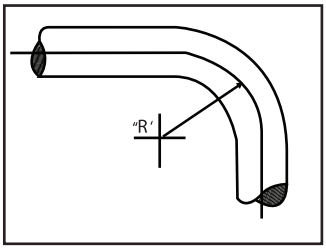
By using a dedicated fin coiling machine to force coil fins directly to heater body, a perfect contact is formed between fin and heater surface and thus ensure a high performance tubular heater.
Standard fin pitch per inch is between 5~6 turns

The additional of fins increase heat transfer surface area thus allowing for higher wattage (watt density) in the same space requirements of nonfinned units. Continuous spiral fins of steel with rust and corrosion protection can withstand upto 650°C
Stainless steel fins and stainless steel elements are available for operation up to 650°C

Finned and Unfinned air heaters are ideal for heating air and selected gases in forced and natural convection applications.

Tubular heaters are available in sizes to meet many applications.
We can form our tubular heaters into almost any shape you need!





SHEATH DIAMETER	MIN. BEND DIA. (mm)
Ø6.5	6
Ø8	8
Ø11	15
Ø12	16
Ø9.5	10
Ø12.7	16
Ø14	24
Ø16	30
Ø17.5	40
Ø18	40

Typical Design Shapes & Forms

Figure 1

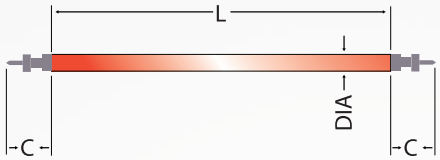
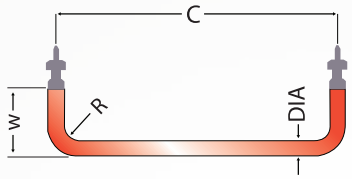


Figure 2



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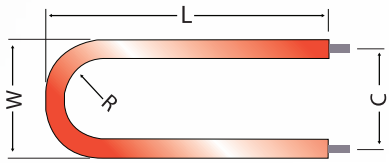

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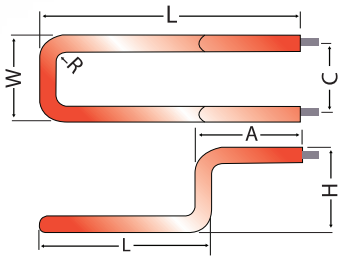

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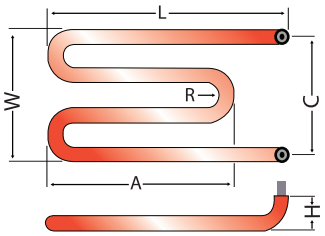

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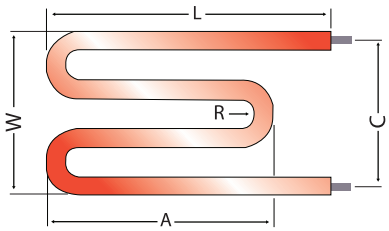

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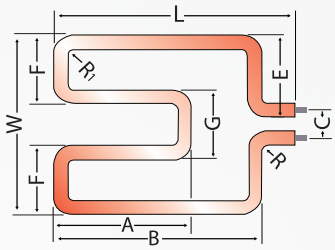

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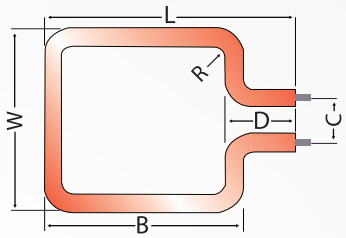

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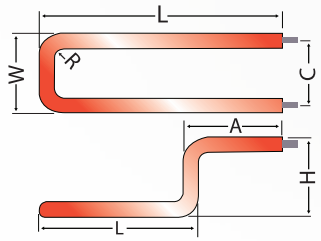

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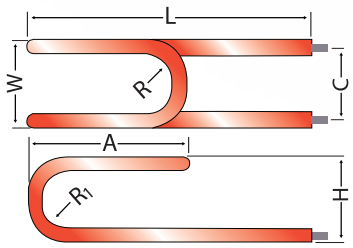

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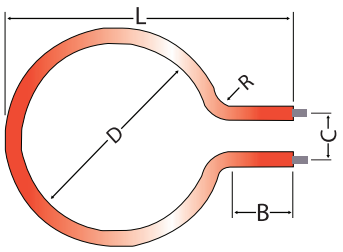

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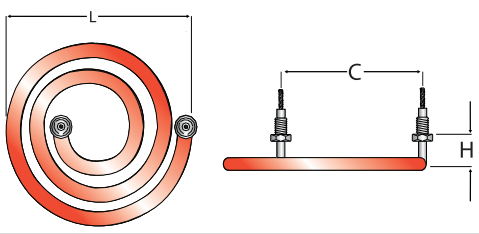
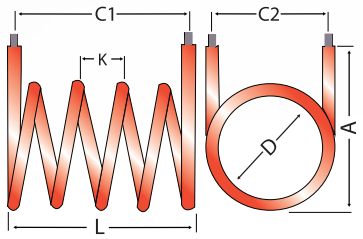


Typical Design Shapes & Forms

Figure 13



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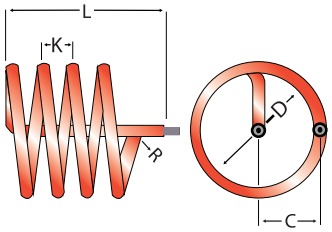

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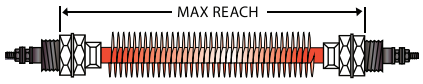

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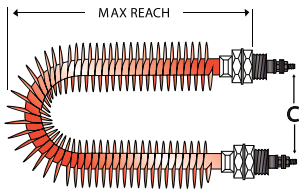

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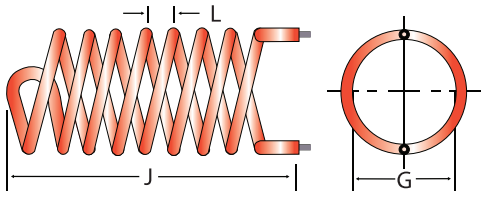

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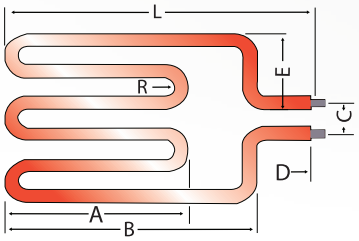

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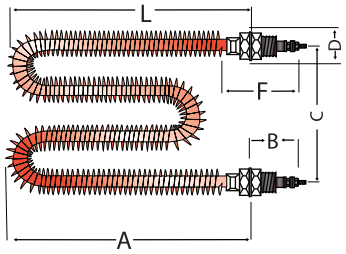

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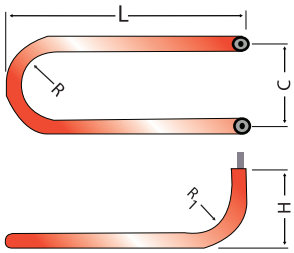

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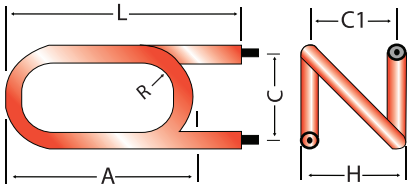

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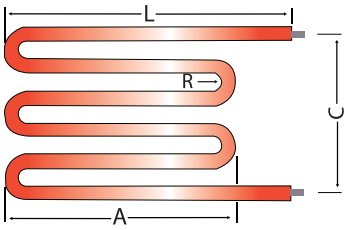


Specifications

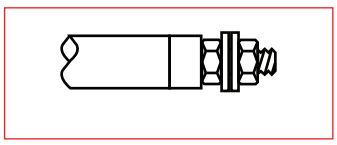
SHEATH DIAMETER (mm)	TOLERANCE DIA.	LENGTH		MAXIMUM VOLTAGE	PIN Ø	MAX CURRENT	SHEATH MATERIALS
		MIN	MAX				
Ø6.5	± 0.2	8″	205″	UP TO 440V	M2.2	12.5A	S/S 316 , INCOLOY
Ø8	± 0.2	8″	205″		M3.5	24A	S/S 304, S/S 316, INCOLOY, SEAMLESS 316
Ø11	± 0.2	11″	205″		M4	32A	S/S 316, INCOLOY, SEAMLESS 316
Ø12	± 0.2	11″	205″		M4	32A	S/S 316, SEAMLESS 316
NON - STANDARD							
Ø9.5	± 0.2	11″	205″	UP TO 440V	M3.5	24A	S/S 304
Ø12.7	± 0.2	11″	205″		M4	24A	S/S 304
Ø14	± 0.2	11″	205″		M4	32A	S/S 304
Ø16	± 0.2	12″	205″		M5	50A	S/S 304
Ø17.5	± 0.2	12″	205″		M6	72A	S/S 304
Ø18	± 0.2	12″	205″		M6	72A	S/S 304

SHEATH DIAMETER	MIN. COLD ZONE	MAX. COLD ZONE	WATTAGE TOLERANCE	RESISTANCE TOLERANCE
Ø6.5	1″	DEPEND ON APPLICATION	INTERNATIONAL STANDARD +5% ~ -10% IEC 335	INTERNATIONAL STANDARD +10% ~ -5% IEC 335
Ø8	1″			
Ø11	1.5″			
Ø12	1.5″			
Ø9.5	1.5″	DEPEND ON APPLICATION		
Ø12.7	1.5″			
Ø14	1.5″			
Ø16	1.5″			
Ø17.5	1.5″			
Ø18	1.5″			

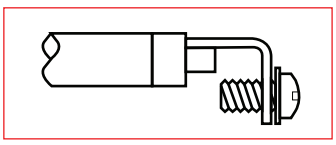
Electrical Limitations and Minimum/Maximum Sheath Lengths

ELEMENT DIAMETER		MAXIMUM AMPERAGE	SHEATH LENGTH			
INCH	MM		MIN		MAX	
			inch	mm	inch	mm
0.26	6.5	12.5	8	203	205	5207
0.315	8.0	24	8	203	205	5207
0.375	9.5	24	11	279	205	5207
0.43	11	32	11	279	205	5207
0.475	12	32	11	279	205	5207
0.625	16	72	12	305	205	5207

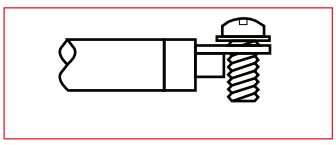
TERMINAL OPTION



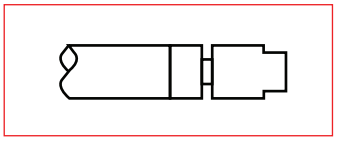
Threaded stud



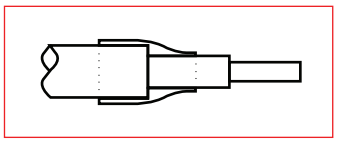
Right angle lug terminal



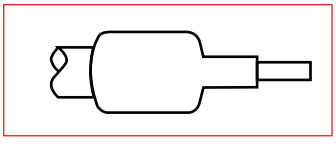
Flag Terminal



Quick - disconnect spade



Flexible lead wire



Silicon Rubber Mold

Tubular Heater - Sheath Material

Incoloy 840 A Chromium (18-22%), Nickel (18-20%), Iron Alloy having about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost.
Maximum sheath temperature is 1600°F (872°C).

304 Stainless Steel A Chromium (18-20%), Nickel (8-11%), Iron Alloy used in the food industry, sterilizing solutions, and many organic and inorganic chemicals.
Maximum sheath temperature is 1200°F (649°C).

316 Stainless Steel A Chromium (16-18%), Nickel (11-14%), Iron Alloy with Molybdenum (2-3%) added to improve corrosion resistance in certain environments, especially those which would tend to cause pitting due to the presence of chlorides. Applications include deionized water.
Maximum sheath temperature is 1200°F (649°C).

Copper Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks. Maximum sheath temperature is 350°F (177°C).

(TEFLON)PTFE used ideally for heating of pure or corrosive liquids. Teflon is usually selected for the superior corrosion resistance and compared to metal. Teflon feature low watt density of only 10 watts per square inch.

Titanium It is a light, strong metal with natural resistance to marine, chlorine, and strong corrosion resistance to most acidic chemical. Titanium also widely used in chemical base heater design and thermo-sensor protection sheath.

Products

VITAR Stainless Steel 316 Immersion Heater C/W Thermostat Pocket and Enclosure 1 1/2" BSP Thread

MODEL	IMMERSION LENGTH (mm)	POWER (Kw)	VOLTAGE (V)	Ø OF ELEMENT (mm)
VSH-3545S	350	4.5	240/415	8
VSH-5060S	500	6.0		
VSH-6090S	600	9.0		

VITAR Copper Nickel Plated Coil Immersion Heater C/W 3/8" BSP Brass Screw And Thermostat Pocket

MODEL	IMMERSION LENGTH (mm)	POWER (Kw)	VOLTAGE (V)	Ø OF ELEMENT (mm)
VCHT-45-3KW	45	3	240	8

VITAR Copper Immersion Heater With 11"L x 8.3mm ID Thermostat Pocket 2 1/4" BSP Brass Thread

MODEL	IMMERSION LENGTH (mm)	POWER (Kw)	VOLTAGE (V)	Ø OF ELEMENT (mm)
VIH-3K-11-B	11	3	240	8

VITAR Food Warmer Immersion Heater C/W 3/8" BSP S/S Screw and Brass Nut

MODEL	IMMERSION LENGTH (mm)	POWER (Kw)	VOLTAGE (V)	Ø OF ELEMENT (mm)
VTH-54-3K	54	3	240	8

VITAR Water Boiler Heater

MODEL	SPECIFICATIONS			SHEATH		MOUNTING SCREW		REMARKS
	REACH	KW	VOLTAGE	OUTER Ш	MATERIAL	SIZE	MATERIAL	
VEH-100B254-30-IN-T	254mm	3.0	1Ø240V	8mm	Incoloy	1" BSP	Brass	M4 Terminal Wire
VEH-100B254-30-IN-W								Wire Length 254mm

VITAR Bain Marie Heater

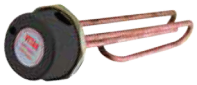
MODEL	SPECIFICATIONS			SHEATH		MOUNTING SCREW		REMARKS
	REACH	KW	VOLTAGE	OUTER Ш	MATERIAL	SIZE	MATERIAL	
VIH-037B584-30-S4	584	3.0	1Ø240V	8mm	S/S304	⅜ BSP	Brass	C - C = 305mm
VIH-037B914-30-S4	914							

VITAR Solar Hot Water Heater

MODEL	SPECIFICATIONS			SHEATH		MOUNTING SCREW		REMARKS
	REACH	KW	VOLTAGE	OUTER Ш	MATERIAL	SIZE	MATERIAL	
VEH-270-24-TS85	270	2.4	1Ø240V	8mm	Copper	1¼ BSP	Brass	With Termostat

VSH Series

VCHT-45-3KW

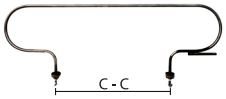


VIH-3K-11-B

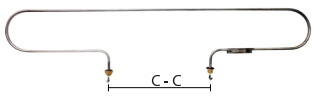
VIH-54-3K

VEH-270-24-TS85

VEH-100B254-30-IN-W



VIH-037B584-30-S4



VIH-037B914-30-S4

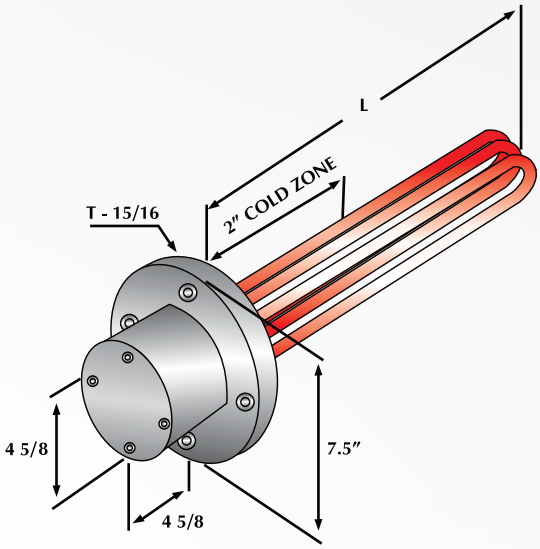
VEH-100B254-30-IN-T

Flange Immersion Heater

** 50-60 watts/in S/S 316 Sheath
** 150psi S/S 304 fange - ANSI rated
** Min. 2″ cold zone
** 240 / 415V

3-150 psl fange, 3 elements in fange

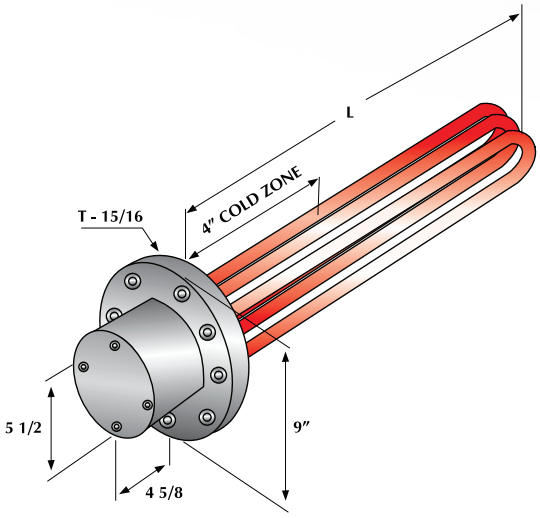
NO	KW	IMMERSION LENGTH L. INCH	MODEL NO	NET WEIGHT (KG)
1	4.5	14	VFIH-3-13104	6.0
2	6.0	18	VFIH-3-13106	6.5
3	7.5	19	VFIH-3-13107	6.5
4	9.0	25	VFIH-3-13109	7.0
5	10.5	28	VFIH-3-13110	7.5
6	12.0	32	VFIH-3-13112	7.5
7	15.0	39	VFIH-3-13115	8.0
8	18.0	47	VFIH-3-13118	8.5
9	22.5	54	VFIH-3-13122	9.0



3″ 150# ANSI fange S/S 304
c/w std. terminal cover

4-150 psl fange, 6 elements in fange

NO	KW	IMMERSION LENGTH L. INCH	MODEL NO	NET WEIGHT (KG)
1	9.0	14	VFIH-4-16119	6.5
2	12	18	VFIH-4-16112	7.0
3	15	19	VFIH-4-16115	7.0
4	18	25	VFIH-4-16118	7.5
5	21	28	VFIH-4-16121	8.0
6	24	32	VFIH-4-16124	8.0
7	30	39	VFIH-4-16130	8.5
8	36	47	VFIH-4-16136	9.0
9	45	54	VFIH-4-16145	9.5



4″ 150# ANSI fange S/S 304

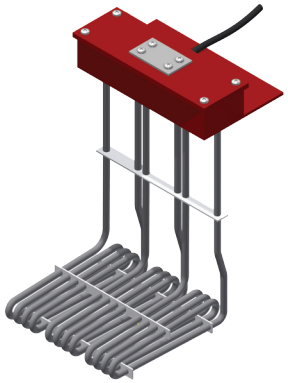
c/w std. terminal cover

Teflon Heater

Designed for used in acid baths, arodzing, Plating pickling solution.

Features:

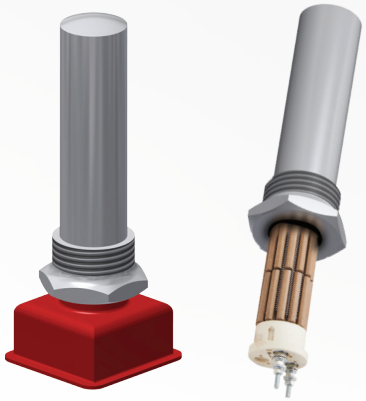
Watts density for Teflon coated elements are approx 10 watts per square inch for low power output for long life. Teflon coated heater are grounded to ensure safety.



Bobbin Heater

Bobbin Ceramic Heater

Bobbin heaters are used in the heating of air and heating various liquids when disassembly without draining is absolutely necessary. These heaters are available in various lengths. These type of heaters are replaceable, inserted in to S/S 304 or S/S 316 pipe and suitably used for heating of Oil, Water, Plating Solution and Chemicals.



Construction

Open helical coils of high resistance wire evenly stretched and laid through fluted refractory bobbins. These heating elements are than inserted into 1 1/2" or higher diameter S/S 304 or S/S 316 pipes.

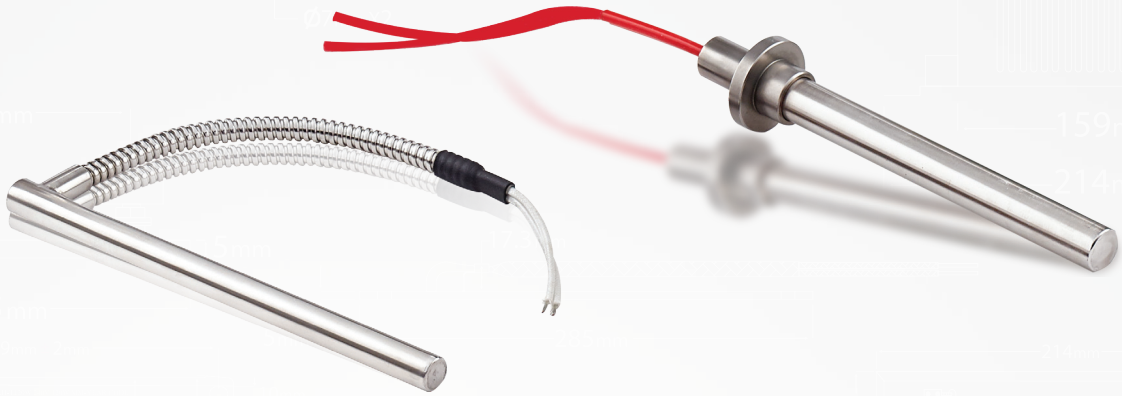
Watt Density

Diameter	BOBBIN HEATER			
	Water Heating		Oil Heating	
Bobbin (inch)	Watts density for 1st 6"	Additional watts density per inch	Watts density for 1st 6"	Additional watts density per inch
1.5"	339	85	226	56
2"	468	117	322	81

Dimension

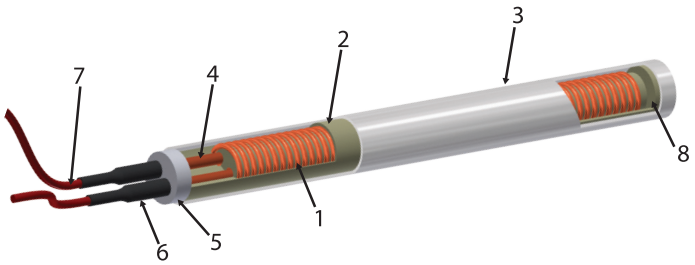
	DIAMETER Ш(mm)		
Ceramic Element	45	32	29
Pocket S/S 316	51	38	38
Pocket S/S 304	51	38	38

Cartridge Heater - Introduction



Construction

1. Use high quality Nickel-Chromium resistance wire, precisely wound and centered on a supporting core to ensure even and efficient distribution of heat to the heater body.
2. High purity magnesium oxide powder densely packed for maximum heat transfer and able to withstand normal shock and vibration.
3. Stainless steel alloy metal sheath with excellent thermal conductivity, self-protective oxidation properties, chemical corrosion resistance and ability to withstand constant heating and cooling cycles.
4. Top quality nickel terminals provide positive connection with resistance wire.
5. Protective end filled with High Grade Magnesium Oxide or Mortar to withstand abrasion, vibration and shock.
6. Silicone fiberglass sleeve at terminal joints.
7. Flexible stranded leads are externally connected to the pins with a strong mechanically bonded leads for high temperature application. (up to maximum 400 degC)
8. Welded end dics provides maximum protection against contamination and water tight features.



Heater Diameter Range

Available cartride heater diameter range are
6.00 / 6.35 / 6.50 / 7.00 / 8.00/ 9.50 / 10.00 / 11.00 / 11.50 / 12.00 / 12.50 / 12.70 / 13.00 / 14.00 / 15.00 / 15.80 / 16.00 / 17.00 / 18.00 / 19.00 / 20.00 (mm).

For heater diameter more than 20mm, pls. consult factory

Introduction

Feature

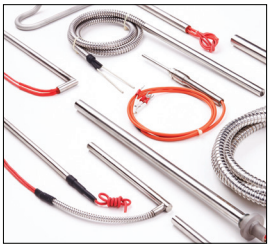
- High watt density 400 w/in^2
- Even and efficient heat distribution.
- Sheath temperature 880 degree C.
- Resistant to impact and vibration.
- Standard voltage 120V or 240V.
- Other voltages upon on request.

Sheath temperature at 880 degress C in free air.

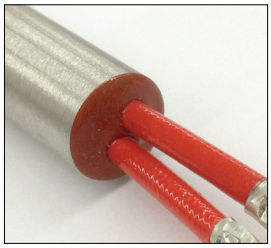
Special Designs

- Uneven Watt Density
- With Built-In Thermocouple
- Hot Air Blower
- Finned Cartridge Heater
- Immersion Heater

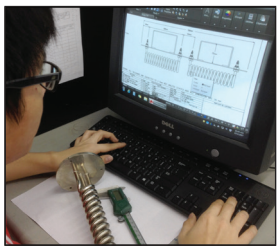
Quality



High grade and quality materials are used to manufacture cartridge heater.

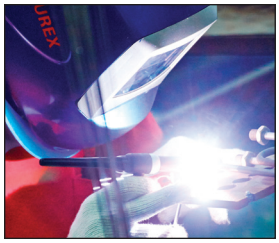


High quality cap ensures Magnesium Oxide is sealed and resists contamination.

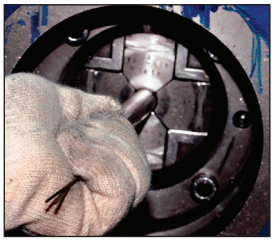


Computerized heater design

Centre of core and windings are closed to the sheath to ensure even heat distribution and longer heater life.



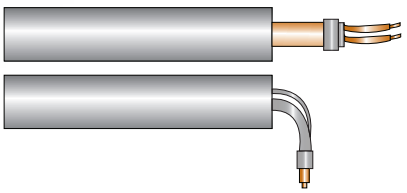
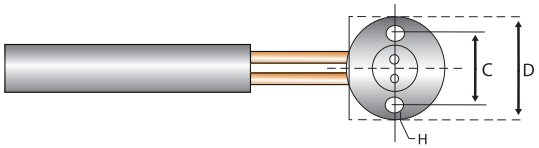
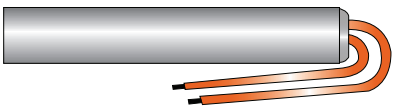
Welded end disc is free from moisture or contaminants and withstands pressure.



Diameter tolerance -0.02mm to -0.04mm

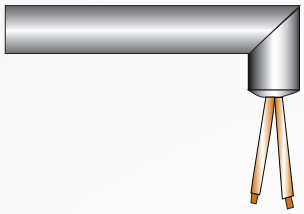
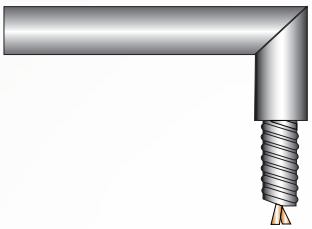
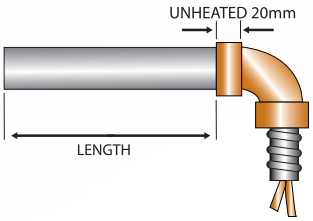
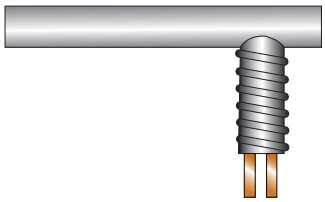
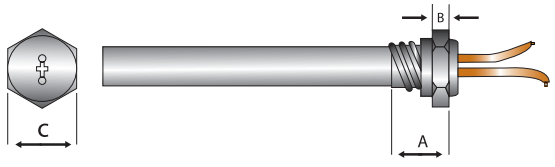
Type of Termination

- **Standard Type**

Type/Apperance	Description
Type A - Straight Leads	It has 10" lead wire connected externally to permit replacement of wire. 2" fibreglass sleeving at cap standard on all sizes.
Type B - Post Terminal	With 10-24 screw terminal. Standard termination on size 15/16" and larger. For smaller diameter consult factory.
Type C - Straight Stainless Steel Hose	Straight 10" stainless steel armor covered lead wire. Specify your length requirement, abrasion protection. Available with moisture-proof seated below with 1/2" dia. type tubing or less has copper fitting outside of sheath. Larger than 1/2" has copper fitting inside of sheath.
Type CB - Solid Nickle Pins With Ceramic Bead Insulation	This type of insulation of leads is necessary when the ambient temperature is above 300 Degress Celcius. Normal flexible wire can attached to these pins upon request. Specify length other than 10".
Type DS/DN-DS Straight Lead Support **DN 90 Degree Lead Support** **(DS)** **(DN)** 	Support helps strain on leads at cap, support attached to case by welding to sheath and crimped around leads. Standard 10" leads. Specify lead length.
Type F - Flanges 	Straight 10" stainless steel armor covered lead wire. Specify your length requirement, abrasion protection. Available with moisture-proof seated below with 1/2" dia. type tubing or less has copper fitting outside of sheath.Larger than 1/2" has copper fitting inside of sheath.
Type G - Flexible Leads 	Lead wuire are internally connected under cap. Offers maximum flexibility. Leads can be bent close to cap. Leads 10" standard, longer lengths available.

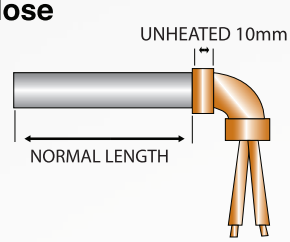
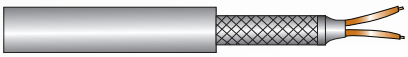
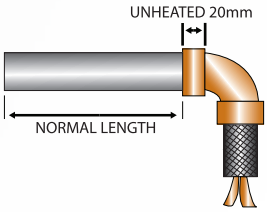
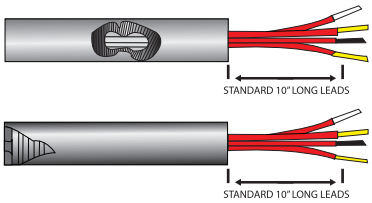
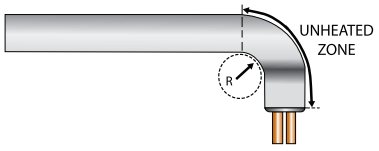
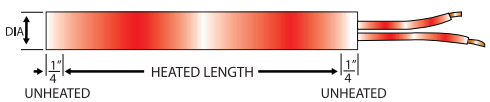
Type of Termination

- **Optional**

Type/Apperance	Description
Type L - Right Angle Protection 	For extremely short right angle lead, sheath is cut and brazed on 5/16" through 1/2" sizes. Slightly altered construction for larger sizes. Specify lead length other than 10".
Type L1 - Right Angle With Stainless Steel Hose 	Right Angle with stainless steel armor covered leads wires for abrasion protection. Standard length 10". Specify armor lengh require.
Type M - Right Angle Copper Elbow With Stainless Steel Hose 	A 90 degree copper elbow with stainless steel armor covered leads wire for abrasion protection. Specify armored leads length other than 10".
Type N - Right Angle Leads	With right angle leads passing through the side of the heater sheath. This type is particulary good where space is limited. Minimum available size diameter 9.5mm. Specify leads length other than 10".
Type N1 - Right Angle Stainless Steel Hose 	With leads covered by stainless steel house from abrasion against sharp edges. Minimum available size 9.5mm. Specify armor and leads length other than 10".
Type P - Male Pipe Threaded Fittings 	Threaded fittings etc. are specify adaptable for heating water and other liquids. Available in brass or stainless steel. Specify leads length other than 10".

Type of Termination

- **Optional**

Type/Apperance	Description
Type R - Right Angle Copper Elbow without Hose 	A 90 degree copper elbow to protect lead. Consult factory if required. Specify lead length other than 10".
Type W - Copper Nicker Plating Braid 	Excellent mechanical properties braid woven directly over twin lead wires. Provides small radius bending not possible with armor cable type. 10" braided lengths standard.
Type W1 - Right Angle Copper Braid 	A 90 degree copper elbow with braid cover over twin leads wires. Standard length is 10", other length is available.
Type TCC/TCD - TCC With Built-In Thermocouple (Centre Position) TCD With Built-In Thermocouple (End Position) **(TCC)** **(TCD)** 	All stainless steel heaters can be manufactured with built-in thermocouple type K or J. The lead wires internally connected under cap and offers maximum flexibility. Standard lead length is 10". Longer length is also available.
Type UB - Unheated Bend 	Manufactured with bent unheated sections. This type is suitable for situations where a more robust right angle exit is required for very hot applications. All lead configurations can be use on beat heaters. Specify leads length other than 10".
Uneven Watt Density Cartridge Heater 	Heater can be manufactured with unheated or different watt density section on request. This is useful when compensation for high heat losses along the edges of heated parts.

Band Heater - Introduction

VITAR standard band heater are designed following stringent Japan industrial quality requirements, using high quality materials and precision machineries.
There are 50 standard models available for industrial applications.
Metal parts are built from high quality stainless material that ensure maximum performance and quality.

Description

Mica band heaters are normally used in cylindrical surface heating application.
It can accommodate various termination designs, as well as, holes and cut-outs, thus making it the most suitable for plastic moulding industry.
The practical construction layers allows high watt densities up to 55W/in^2 and quick heat transfer between resistance wire to heater surface.
Thickness of each mica insulation layer is carefully selected to enhance insulation properly and ensure maximum heat transfer between heating wire to heater surface..
Its high grade temperature resistance wire ribbon is carefully selected through computer-aided design process.

Item

Aside from the 50 Vitar standard models available, custom-made designs can be manufactured according to customers' specific requirements and application.
Custom-made design band heaters can be manufactured with different holes, cut-out positions, terminations and mounting condition.

Application

Band heaters are used in the following industries :
a) Packaging
b) Plastic injection
c) Plastic extrusion
d) Tank/container/pipe heating
e) Food industry

Introduction

Features

- Standard clamping arrangement consist of full width, low expansion straps for improved heat transfer.
- High performance element precision wound from computer designed specification for superior heat uniformity.
- Best quality mica insulation is used ensuring high dielectric strength and maximum heat transfer.
- The wide selection of lead styles and mouting systems available permit customising of the heater to the application for improved performance.
- Large inverntory of stock sizes and styles maximize availbility and minimize customer down time.
- Availability of standard and custom made design units simplify customer replacement requirement and provide special protection features.
- A wide range of sizes, terminations, sheath materials, voltages are available for custom made design.
- Fast delivery can be arranged to reduce the downtime cost.

Benefits

- Highly flexible
- Uniform heat distribution
- Energy efficient
- Low-cost heating solution

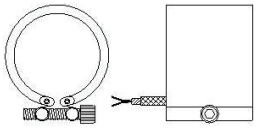
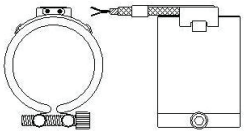
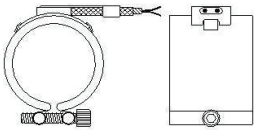
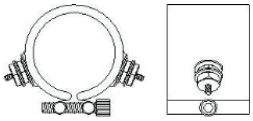
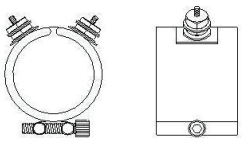
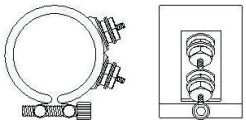
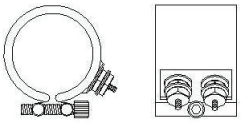
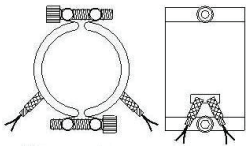
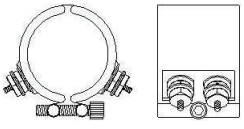
Material

- High quality metal sheath, high temperature resistance wire, advanced process mechanism and highly skilled labour ensure production of high quality heaters.

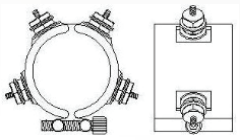
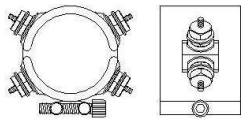
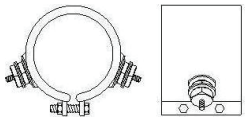
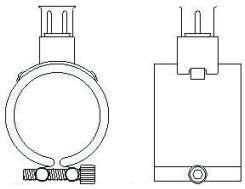
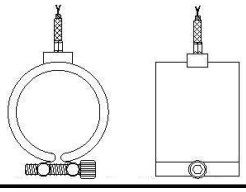
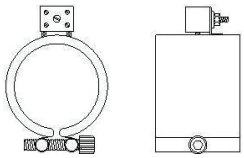
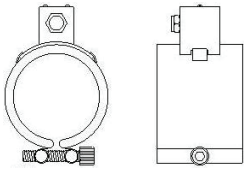
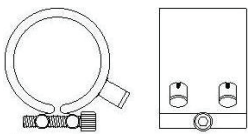
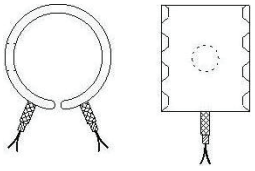
STD. Model Band heater

	PART NUMBER	DIA. - ØID (mm)	OVERALL DIA. (mm)	SL (mm)	Screw (mm)	WIDTH (mm)	VOLTAGE (V)	TOTAL POWER (W)	DUAL CIRCUIT 1 & 2 (W)	HOLE (H1-Ø20mm)
1	HBAA001					132	220	1050	-	YES
2	HBAA002	80	145	40	M5	132	220	1050	-	YES
3	HBAA003					132	230	1050	-	YES
4	HBAA004					132	230	1150	-	YES
5	HBAA005	100	164.4	40	M5	116	220	1250	-	YES
6	HBAA006					118	220	1450	-	YES
7	HBAA007					150	220	1500	-	YES
8	HBAA008					150	220	1700	-	YES
9	HBAA009					116	220	1250	-	YES
10	HBAA010					116	220	1450	-	YES
11	HBAA011					116	230	1250	-	YES
12	HBAA012					116	230	1450	-	YES
13	HBAA013					130	230	1350	-	YES
14	HBAA014					130	230	1500	-	YES
15	HBAA015					150	230	1500	-	YES
16	HBAA016					150	230	1700	-	YES
17	HBAA017	110	174.4	40	M5	169	220	1850	-	YES
18	HBAA018					169	230	1850	-	YES
19	HBAA019					169	230	2000	-	YES
20	HBAA020	120	180	40	M5	150	220	1900	-	YES
21	HBAA021					167.5	220	2300	-	YES
22	HBAA022	130	196	40	M5	200	230	2650	-	YES
23	HBAA023					200	230	2850	-	YES
24	HBAA024	145	210	40	M5	220	220	3200	-	YES
25	HBAA025					220	220	3500	-	YES
26	HBAA026					195	230	3200	-	YES
27	HBAA027					220	230	3500	-	YES
28	HBAA028	160	232	50	M5	243	220	3900	-	YES
29	HBAA029					243	220	4300	-	YES
30	HBAA030					243	230	3900	-	YES
31	HBAA031					243	230	4300	-	YES
32	HBAA032	170	246.5	50	M5	128	230	2350	-	YES
33	HBAA033					128	230	2350	-	NO
34	HBAA034	185	268	50	M5	150	230	3000	-	YES
35	HBAA035					150	230	3000	-	NO
36	HBAA036	200	276	50	M5	174	230	3800	-	NO
37	HBAA037					174	220	3800	-	YES
38	HBAA038					174	220	3800	-	NO
39	HBAA039					174	230	3800	-	YES
40	HBAA040					174	230	3800	-	NO
41	HBAA041	215	284	50	M5	195	220	4750	-	YES
42	HBAA042					195	220	4750	-	NO
43	HBAA043					195	230	4750	-	YES
44	HBAA044					195	230	4750	-	NO
45	HBAA045	250	340	50	M5	250	220	6500	2620 / 3880	NO
46	HBAA046					250	220	6500	2620 / 3880	YES
47	HBAA047					222	220	6000	2420 / 3580	NO
48	HBAA048					222	230	6000	2420 / 3580	YES
49	HBAA049					222	230	6000	2420 / 3580	NO
50	HBAA050					250	230	6500	2620 / 3880	YES
51	HBAA051					250	230	6500	2620 / 3880	NO
52	HBAA052					279	230	7500	3020 / 4480	YES
53	HBAA053					279	230	7500	3020 / 4480	NO

Custom-Made Band Heater

NO	Type	Description	Appearance
1	B1	Flexible leads exiting out from end of the heater. Use only where application has minimal physical abuse to the leads.	
2	B2	Flexible leads exiting out of the top surface of the heater. Clip leads are supplied as standard.	
3	B3	Similar to B2 but leads are exited at a 90 °angle. Please specify the direction of the leads.	
4	B4	Single terminal mounted at each end near the gap. This type is used for both small and large band heater.	
5	B5	Similar to B4 but terminals are at the opposite end.	
6	B6	Terminals are exited at a tandem position. Ideal for narrow area. Please specify the location of the terminals.	
7	B7	Similar to B6 but terminals are in parallel. Please specify the location of the terminals.	
8	B8	Two half band with flexible leads. Ideal for >Ø4" . Please specify the location of the leads.	
9	B9	Similar to B8 but come with terminals for easier replacement of connecting cables. Please specify total V/W or V/W per half band.	

Custom-Made Band Heater

NO	Type	Description	Appearance
10	B10	Single terminal located at each end near the gap. Please specify total V/W or V/W per half band.	
11	B11	Similar to B10 but located at 90° away from the gap. Please specify total V/W or V/W per half band.	
12	B12	Bracket clamping for application with very narrow clearance.	
13	B13	2-pin socket system. Please specify location of socket. Socket price to be added to the heater.	
14	B14	Fitted with flexible conduit for harsh environment. Please specify location of termination. Flexible conduit price is to be added to heater.	
15	B15	Terminated with 2-pole ceramic connector. Please specify location of connector. Connector price is to be added to heater.	
16	B16	Terminated with a terminal box and cable gland (conduit gland is preferred). Box size: W2" x H1½" x L2" to W4" x H4"x L4".	
17	B17	Ceramic end caps for terminals. Convenient way to terminate cable. Ceramic end cap price to be added to heater.	
18	B18	Complete serraction of folds to aid the "opening out" of heater when fitted to barrel. Not recommended for high watt density application.	

Thermosensor- Introduction

Thermosensor

Different factors determine the right choice for the right temperature sensor for a given job.

- Temperature range
- Accuracy
- Vibration constancy
- Dimension
- Application

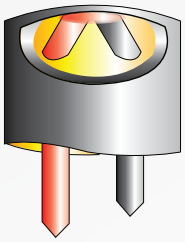
No temperature sensor/ measuring method can accommodate all factors equally well. Thus, when choosing a temperature sensor, it is important to decide which parameters are the most significant for the job in question.

Thermocouple

Thermocouples are pairs of dissimilar metal wires joined at one end, which generate a net thermoelectric voltage between the open pair according to potential of temperature difference between the ends, the relative Seebeck coefficient of the wire pair and the uniformity of the wire-pair relative Seebeck coefficient.

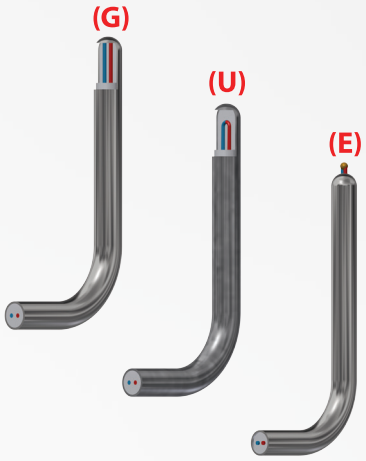
For temperature range of -200°C to 1100°C, options of type K, J, T, N and E are available.
For extreme temperature range upto 1800°C, options of type R, S and B are avaialble.

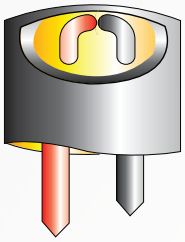
Hot Measuring Junction Types



(G) Grounded Junction

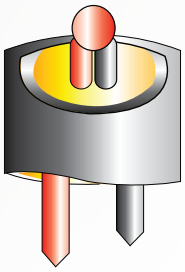
Welded to form a completely sealed integral junction, the G junction component is recommended for liquids, moisture, gas, or high pressure.





(U) Ungrounded Junction

Fully insulated from the welded sheath end, this junction is excellent for applications where stray EMF's would affect the reading and for rapid or frequent temperature cycling.



(E) Exposed Junction

Exposed Junction thermocouple wires are butt welded with insulation sealed against liquid or gas penetration. This component provides the fastest response time, but is unprotected against corrosive or mechanical damage.

Maximum temperature rating of thermocouple

The diameter of the sensor wires determines the upper most operating temperature. The larger the diameter, the higher the temperature rating.

MgO Insulated Thermosensor

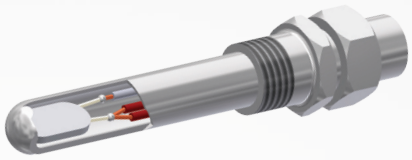
An MgO thermosensor assembly consists of a thermosensor element swaged in hard-packed standard purity (96%) Magnesium Oxide mineral insulation and encased in a metal sheath. Thermosensor sheaths are fully annealed and they can be formed into many configurations and bent into a radius of twice the size of the outer sheath.

RTD - Pt 100 (Single or Duplex Elements) Thermocouple types

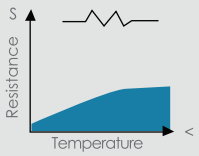
- E, J, K, T, N (Single or Duplex Elements) sheath diameters
- 1.0mm, 1.6mm, 2.2mm, 2.8mm, 3.2mm, 6.4mm, 9.5mm.
Sheath Materials - Stainless Steel 316 , Stainless Steel 310, (Teflon coating) and Inconel 600. Measuring Junction Styles: Grounded, ungrounded, exposed and custom built specials are available upon request.

Resistance Temperature Detector (RTD)

Resistance Temperature Detectors or RTDs for short, are wire wound and thin film devices that measure temperature using the physical principle of the positive temperature coefficient of electrical resistance of metals. The hotter they become, the larger or higher the value of their electrical resistance.



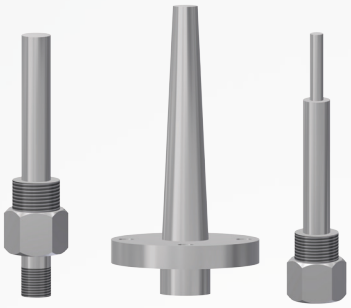
RTDs are best for most industrial measurements over a wide temperature range, especially when sensor stability is essential for proper control. RTDs are designed to measure temperature in a variety of process and laboratory applications. Custom build assemblies with no standard Construction Styles: 2, 3 or 4 wire; single or duplex elements.
Sheath Materials: 316 Stainless steel is standard (Teflon coating available).

RTDs	Advantages	Disadvantages
	• Most stable, accurate • Contanmination resistant • More linear than thermocouple • Area temperature sensin • Most repeatable temperature measurement	• Expensive • Current source required • Self-heating • Slow response time • Low sensitivity to small temperature changes

Resistance Temperature Detector -(RTDs)
Table of Tolerance Values

Temperature (degC)	Resistance (ohm)			Tolerance DIN-IEC-60751			
				Class (A)		Class (B)	
	PT-50	PT-100	PT-1000	℃	%	℃	%
-200	9.26	18.52	185.2	±0.55		±1.30	
-100	30.13	60.26	602.6	±0.35	0.06%	±0.80	0.12%
0	50.00	100.00	1,000.0	±0.15		±0.30	
10	51.95	103.90	1,039.0	±0.17		±0.37	
20	53.90	107.79	1,077.9	±0.19		±0.40	
30	55.84	111.67	1,116.7	±0.21		±0.45	
40	57.77	115.54	1,155.3	±0.23		±0.50	
50	59.70	119.39	1,193.9	±0.25		±0.55	
60	61.62	123.24	1,232.3	±0.27		±0.60	
70	63.54	0.00	1,270.7	±0.29		±0.65	
80	65.45	130.89	1,308.9	±0.31		±0.70	
90	67.36	134.70	1,347.0	±0.33		±0.75	
100	69.26	138.50	1,385.0	±0.35		±0.80	
110	71.15	142.29	1,422.8	±0.37		±0.85	
120	73.04	146.07	1,460.7	±0.39		±0.90	
130	74.92	149.82	1,498.2	±0.41		±0.95	
140	76.79	153.58	1,535.7	±0.43		±1.00	
150	78.67	157.32	1,573.1	±0.45		±1.05	
160	80.53	161.05	1,610.4	±0.47		±1.10	
170	82.39	164.76	1,647.6	±0.49		±1.15	
180	84.24	168.47	1,684.8	±0.51		±1.20	
190	86.09	172.16	1,721.6	±0.53		±1.25	
200	87.93	175.85	1,758.4	±0.55		±1.30	
300	106.03	212.05	2,120.5	±0.95		±1.80	
400	123.55	247.09	2,470.9	±0.95		±2.30	
500	140.49	280.98	2,809.8	±1.15		±2.80	
600	156.86	313.71	3,137.1	±1.35		±3.30	
650	196.82	393.64	3,936.4	±1.45		±3.60	

Thermosensor- Sheath Material



Metallic Protection Tube

Material	304 S.S	316 S.S	Inconel 600	Sandvic 253MA
Operating Temp.(^{0}C)	1000	1000	1000	1000
Maximum Temp.(^{0}C)	1100	1100	1200	1150

Non-Metallic Protection Tube

Recrystallized Silicon Carbide	Recrystallized Alumina	Silicone carbide	Ceramic
1400	1600	1200	1200
1600	1800	1400	1400

	Material	Features
Metallic Protection Tube	304 S/S	Good resistance to acid and alkalis. Recommendable for the use in neutral atmospheres up to 1500^{0}C and also in molten zinc, aluminium, lead, copper, etc.
	316 S/S	Contains Mo and excellent resistance to heat, acids and alkalis.
	Inconel 600	Excellent resistance to oxidizing and reducing atmospheres at high temperatures, but sulphurous atmospheres should be avoided
	Sandvic 253MA	It is an austenitic, chromium-nickel stainless alloyed with nitrogen and reactive elements. It is suitable for a wide range of high-temperature application such as recuperator in steel mills and PCI lances blast furnaces.
Non-Metallic Protection Tube	Recrystallized Silcon Carbide	Widely used as common protection tube against heat and corrosion but recommended for use in the presence of sulphur or reducing flame.
	Recrystallized Alumina	Recommendable for use in molten steel, slag and molten glass.
	Nitride bonded Silicon Carbide	Most suitable for use in molten aluminium, reheating
	Ceramic	Sintered alumina. Recommendable for use in heating firnace.

Note: 1. Operating and maximum temperatures vary depending on the atmospheres.
2. Other metallic & non-metallic tubes are also available upon request.

Protection Tubes Sleeving

This is also available upon request for example : Teflon, PVC, Polyorefin.

Note: 1. Mineral insulated RTD for vibration proof and other designed fabrication are available upon request.

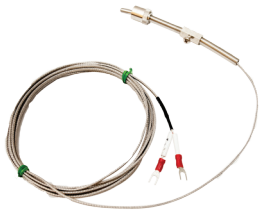
Product

MODEL	SPECIFICATIONS					REMARKS
	TYPE	MAX °C	SHEATH Ш	MATERIAL	INSULATION MATERIAL	
Low Operating Temperature Application						
VITAR RTD Type						
SP-RB-2M-120L-250	Pt100Ω	250	4.8mm	120mm	Pvc	Grey Jacket
SP-RB-3M-120L-250						Orange Jacket
VITAR ThermocoupleType						
PC-B-2M-100L-K-200	K	200	4.8mm	100mm	Fiberglass	White Jacket
PC-B-3M-100L-K-200						Blue Jacket
PC-B-3M-65L-K-200				65mm		Blue Jacket
PS-C-1M-K			1¼"BSW	30mm	S/S Braided	¼"BSW Screw Head
PS-C-2M-K						
PS-C-3M-K						
High Operating Temperature Application						
VITAR RTD Type						
SP-RB-3M-120L-400	Pt100Ω	400	4.8mm	120mm	Pvc	Orange Jacket
VITAR ThermocoupleType						
PC-B-3M-65L-K-400	K	400	4.8mm	65mm	Fiberglass	Blue Jacket
PC-B-3M-100L-K-400				100mm		
PC-B-3M-180L-K				180mm		
PC-B-3M-65L-J	J			65mm	Fiberglass	Yellow Jacket
PC-SB-3M-65L-K	K			65mm	Fiberglass	Bayonet Locking Nut
PC-SB-3M-100L-K				100mm		
PC-SB-3M-127L-K				127mm		
PC-SG-2M-K				25mm	S/S Braided	Adjustable Bayonet Lock Nut

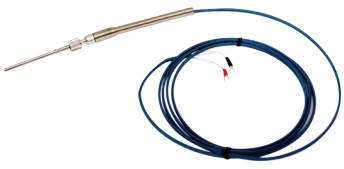
PC-B-2M-100L-K-200

PS-C-2M-K

SP-RB-2M-120L-250



PC-SG-2M-K



PC-SB-3M-100L-K

SP-RB-3M-120L-400

PC-B-3M-100L-K-400

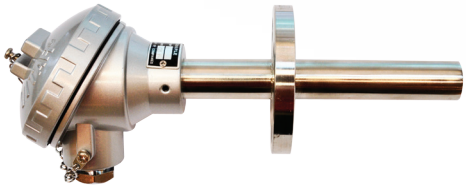
Customized Thermosensor

We are a specialist designer and manufacturer for custom specified temperature sensors. Special assemblies can be supplied according to sample (existing) probe, a customer drawing or a written specification. Special close tolerance, high accuracy sensors can be produced for the most exacting requirements. New machinery or processes, may require a new design of temperature sensor and we can undertake such requirements. Advice is freely available on the best choice of sensor type, probe material, termination method and installation technique to best suit the process application.

Telflon coated pocket with bakelite thermocouple head

Ceramic tube with exposed termination

Alumina tube for thermal shock



Aluminum head TC with flange mounting

Stainless steel head TC

Calibration & Measurement Centre

VITAR - SEGATEC SDN. BHD. was established in 1994 to support VITAR thermosensor manufacturing capability and to satisfy many customers' requirement for temperature measurement accuracy.

S/N: 0413

STANDARDS MALAYSIA

Certificate of Accreditation

No: SAMM 109 Valid until: 1 April 2020

This is to certify that

VITAR-SEGATEC SDN. BHD.
KLANG, SELANGOR
MALAYSIA
(FIELDS OF CALIBRATION: ELECTRICAL, TEMPERATURE, MASS, DIMENSIONAL, PRESSURE & TORQUE)

has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the *Skim Akreditasi Makmal Malaysia* (SAMM), the Laboratory Accreditation Scheme of Malaysia.

"This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)".

(DATUK FADILAH BAHARIN)
Director General
Department of Standards Malaysia

Date of issue: 9 May 2017

Issuance of this Certificate is governed by Section 16 Subsections (2) and (3) of Standards of Malaysia Act, 1996 (Act 549)

Establishing quality standard in the calibration services compliance to ISO/IEC 17025 and to ensure that work and services meet the needs and wants of our customers and employees.

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