

Thermocouple Probes, Industrial Thermocouple Assemblies and RTD Probes

Thermocouples Probes and Assemblies

Industrial Thermocouples Assemblies



INTRODUCTION

A thermocouple is a sensor for measuring temperature. It consists of two dissimilar metals, joint together at one end, which produce a small unique voltage at a given temperature. This voltage is measured and interpreted by thermocouple thermometer.

Vaiseshika manufactures thermocouples available in different combinations of metals. The available thermocouples, J, K, T, R, S, B, E etc. Each type of thermocouple has a different temperature range and environment, although the maximum temperature varies with the diameter of the wire used in thermocouple.

Because thermocouples measure in wide temperature ranges and can be relatively rugged, they are very often used in industry. The following criteria are used in selecting a thermocouple :-

- Temperature Range.
- Chemical resistance of the thermocouple or sheath material.
- Abrasion and vibration resistance.
- Installation requirements like length, diameter and holding assembly.

Sheathed thermocouple probes are available with one of three junction types : grounded, ungrounded or exposed.

DESCRIPTION

Vaiseshika Thermocouples cover a wide range of temperature measurement in a number of solids, liquids and gases in a variety of applications in the industries like heat treatment, cement, glass and ceramics, chemical, iron and steel, non-ferrous metals, power station etc.

Complete thermocouple assemblies, thermowells as well as spare parts are normally offered with quick deliveries, Special designs of thermocouple assemblies are also offered on request.

THERMOWELLS

Vaiseshika offers wide range of Industrial and Research Thermowells and Thermocouple assemblies. It includes a wide selection of components parts, partial assemblies and complete assemblies ready for installation.

In general the thermowell material to be chosen for an installation is governed mainly by the corrosion conditions the well will face. The high polish given to all stainless and monel wells provides maximum corrosion resistance.

Occasionally, the primary consideration is one of strength rather than corrosion resistance. For example a stainless steel well may be required for high pressure water service instead of brass well which would be satisfactory from a corrosion stand point.

The distance from the tip of the well to the underside of the thread or other connection means is the insertion length. For best accuracy, this length should be great enough to permit the entire temperature - sensitive part of the element to project into the medium being measured. A properly installed element will project into a liquid a distant equal to its sensitive length + atleast one inch. In air or gas, the element should be immersed its sensitive length + atleast three inches.

Vaiseshika is always glad to quote based on your special needs.

PROTECTING SHEATHS :

The thermocouples mentioned above need protection against mechanical injury and chemical attack. Metallic or ceramic protecting sheaths are provided as a cover for the thermocouple element.

METALLIC PROTECTING SHEATHS:

These are suitable for uses upto the temperature approximately 1200°C maximum, depending on the particular application. Our standard diameter of these sheaths are 22mm outer diameter (OD) and 3mm wall thickness. Other diameters from 4mm to 52mm outer diameter in various wall thickness are available on request.

CERAMIC PROTECTING SHEATHS:

These are suitable beyond 1200°C. Ceramic sheaths are sometimes used as additional covering along with either metallic or ceramic outer sheath for special applications.

Thermocouple Calibration

Type	Thermocouple	Calibration	Equipment calibration	Temp. Range °C
K	Chromel-Alumel	IS : 2054	IPTS-1968 DIN 43710 BS-4937 iv	0-1200
T	Copper-Constantan	IS : 2056	IPTS-1968 DIN 43710 BS-4937 v	0-400
J	Iron-Constantan	IS : 2057	IPTS-1968 ANSI/MC96 BS 4937 iii	0-900
R	Pt 13% Rh-Pt	IS : 2055	IPTS-1968 DIN 43710 BS 4937 ii	0-1600
S	Pt 10% Rh-Pt	IS : 2055	IPTS-1968 DIN 43710 BS 4937 i	0-1600
B	Pt 30% Rh-Pt 6% Rh	IS : 6270	IPTS-1968 DIN IEC B8 BS 4937 vii	0-1800

Sheath Materials

Sheath	Melting Point °C	Usable Temp. °C	Character
SS-304	1400	900	High resistance to heat and corrosion.
SS-316	1400	900	Excellent resistance to heat, Acids & Alkalies.
SS-310	1410	1150	Good Oxidation resistance and sulphur atmospheres at low temperatures.
SS-321	1400	900	Excellent resistance to corrosion.
HRS-446	1400	1150	Good oxidation resistance at elevated temperature & sulphur atmosphere .
Inconel 600	1410	1150	Excellent oxidation resistance (do not use in sulphur atmosphere)
Ceramic 610		1600	Excellent thermal, mechanical, electrical and corrosion resistance.