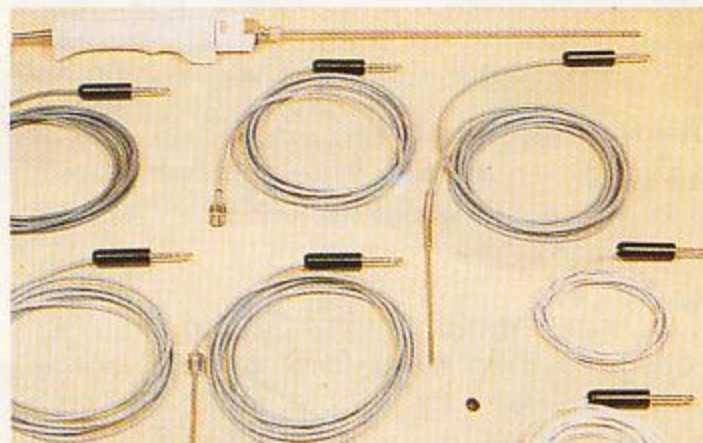




TEMPERATURE

Probes and Accessories



◆ VERSATILITY ◆ ACCURACY ◆ RELIABILITY

THERMOCOUPLES

- ◆ Straight
- ◆ Right Angled
- ◆ Explosion Proof
- ◆ High Vacuum
- ◆ High Temperature
- ◆ High Pressure
- ◆ Bow
- ◆ Roller
- ◆ Needle
- ◆ Mineral Insulated

R.T.D.'s

- ◆ PT 100 :
 - 2 Wire
 - 3 Wire
 - 4 Wire
- ◆ Flat-wafer
- ◆ Epoxy Encapsulated

THERMOWELLS

- ◆ Forged Bar Stock
- ◆ Fabricated
- ◆ 1 B.R./Mining Applns.

ACCESSORIES

Connectors :

- ◆ Bipolar
- ◆ Multipolar

CABLES

- ◆ Mineral Insulated
- ◆ Rubber/PVC/PTFE

HRPVC Insulated

- ◆ 2 core, multicore

THERMOCOUPLES

FYKAYS offer a very wide choice of Thermocouples and accessories for industrial applications. Carefully chosen components including premium grade thermocouple wires and other quality raw materials and special "Made to specs" designs, ensure close accuracies, fast response, long deterioration-free service and such other high "benefits to cost" advantages to users.

Types:

Sheathed • Bare • Button type • Bow type • Needle type
• Roller type • Flexible bow type.

Useful ranges of measurement:

Copper-Constantan	- 1850°C to + 400°C
Iron-Constantan	- 1850°C to + 875°C
Chromel-Constantan	0°C to + 975°C
Chromel-Alumel	-1850°C to + 1250°C
Platinum- Platinum Rhodium 10%	0°C to + 1550°C
Platinum- Platinum-Rhodium 13%	0°C to + 1600°C
Platinum-Rhodium 6%	
Platinum-Rhodium 30%	1000°C to + 1800°C
Tungsten- Tungsten Rhenium 26%	100°C to + 2800°C

Choice of sheath material:

Non-metallic

Mullite • Silliminite • Recryst. Alumina
Fused Silica • Beryllia • Graphite, etc.

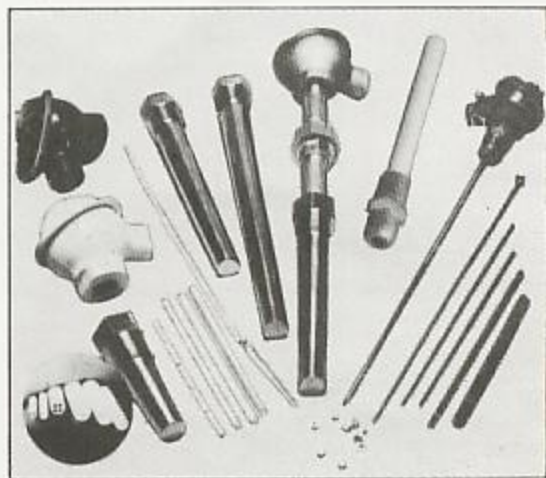
Metallic

Carbon Steel: • SS 304 • SS 316 • SS 410
Hastelloy, A,B,C or X, Monel, Tantalum, Inconel, Incolloy
Mollybdenum, etc.

Choice of construction:

Simplex/Duplex, Straight, Right angle, 45° angle,
Adjustable flange.

Hot Junction:- Exposed Junction, Covered Grounded or
Ungrounded Junction.



CALIBRATION:

Unless specified all our thermocouples are as per IPTS-68.
Other calibrations can be made on request.

Accuracy:

Normal: $\pm 3/8\%$ of the read value.

Special: $\pm 1^\circ\text{C}$ in specified range of operation.

Certification: Special certification at specific reference
points can be provided at extra cost.

ACCESSORIES FOR THERMOCOUPLES

Thermowells:

Manufactured out of Forged bar stock or fabricated out of
selected materials, these form protective barriers between
the thermocouples and the media whose temperature is
desired – especially for high pressure, high vacuum,
corrosive and erosive applications. Choice of screwed or
flanged connections or combinations of both are available.

Typical materials of construction are :

SS 310

SS 304

SS 316

Hastelloy

Monel

Tantalum etc.

Compensating cables:

Fykays offer a wide range of compensating cables with a
number of combinations of insulations like PVC, PTFE,
Asbestos, Fibreglass, Silica yarn, Aluminised polyester,
Silicone, rubber (butyl, nitrating, silicone etc.), enamelled
or plain conductors, single or multi-strand, overall
mechanical protection by G.I., tinned copper or stainless
steel wire braiding with guaranteed accuracy of $\pm 3^\circ\text{C}$
within the range of 150°C .

For critical applications, special Mineral Insulated, Copper
sheathed compensating cables (1 pair or multi pair) are
also available.

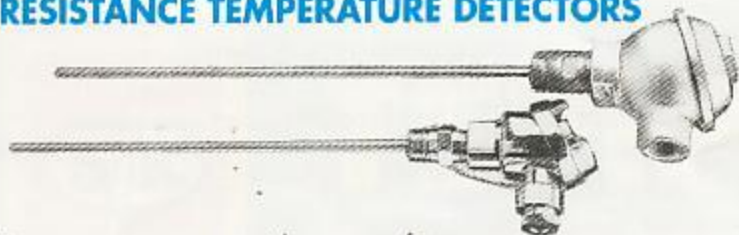
Accessories:

Quick disconnect connectors, (2 pole or multi pole)
thermocouple head (normal weather proof or explosion
proof), spring loading for the probe, adjustable flange,
heat shrinkable PVC or epoxy sealed termination etc.

Application:

Power Stations • Railways • Aircraft • Nuclear • Ferrous
and non-ferrous foundries • Steel plants for direct reduction
kilns • Blast furnaces • Hot blastline • Coke oven dome
• Convertors • Surface temperature for ingots • Blooms
• Billets and Slabs • Re-heating and Heat treatment
furnaces • Rolling mills • Pickling and galvanising lines
etc. • Paper • Chemical • Petro-chemical • Sugar
• Fertilizer • Cement • Dairy • Pharmaceutical and
various such other industrial applications.

RESISTANCE TEMPERATURE DETECTORS



For accuracy over a wide range of temperatures as a crucial factor, RTD's are unequalled in performance. Guaranteed for stability over long periods of continued use, RTD's are manufactured from precision material and workmanship. These are highly interchangeable for easy replacement without calibration.

Made out of 99.99% pure platinum, the wire is wound on ceramic or glass core and hermetically sealed. Thus it is not affected by the process atmosphere. Other wires like copper or nickel can be made available on special request.

Platinum elements are normally available to European calibration ($\alpha = 0.00385$ ohms/ohm/deg. C).

On special request American calibration ($\alpha = 0.00385$ ohms/ohm/deg. C) can be supplied.

Thin and extra thin film RTD's are available for special applications like electrical windings of motors, generators, transformers etc.



The Probe:

A probe is an assembly composed of an element, a sheath, lead wire, and a termination or connection.

The Termination:

Probes may be terminated in a connector head, quick disconnect, terminal block, or extension wire. FYKAYS' standard terminations are weather proof terminal head, quick disconnect connectors, epoxy sealed flexible leads etc. Other terminations are available upon special request. Please give a full description and send sketches.

The Lead Wire:

Lead styles are offered in one of our configurations. Be sure to select the configuration that is compatible with your instrumentation.

The Sheath:

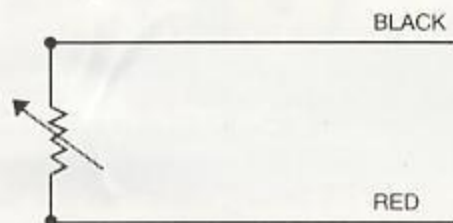
The sheath, a closed end tube, immobilizes the element protecting against moisture and the environment to be measured. The sheath also provides protection and stability to the transition lead wires from the fragile element wires. Fykays' standard sheaths are 1/8" and 1/4" O.D. 304 stainless steel tubes. Other O.Ds and material are available upon request.

The element:

The standard Fykays RTD probe is made with a 100 ohm European curve element ($\alpha = 0.00385$).

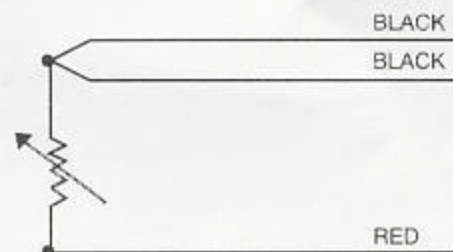
Lead configurations of RTD probes:

STYLE 1:



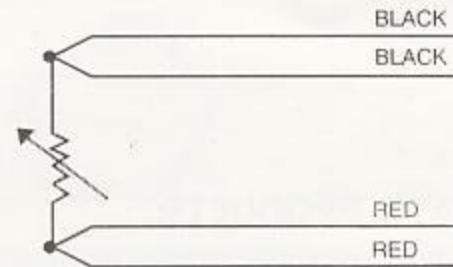
Lead configuration 1 provides one connection to each end of the sensor. This construction is suitable where the resistance of the run of lead wire may be considered as an additive constant in the circuit, and particularly where changes in lead resistance due to ambient temperature changes may be ignored.

STYLE 2:



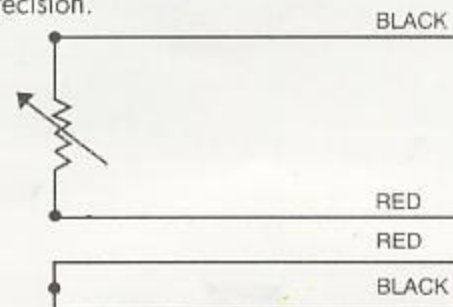
Lead configuration 2 provides one connection to one end and two to the other end of the sensor. Connected to an instrument designed to accept three wire input, compensation is achieved for lead resistance and temperature change in lead resistance. This is the most commonly used configuration.

STYLE 3:



Lead configuration 3 provides two connection to each end of the sensor. This construction is used for measurements of the highest precision.

STYLE 4:



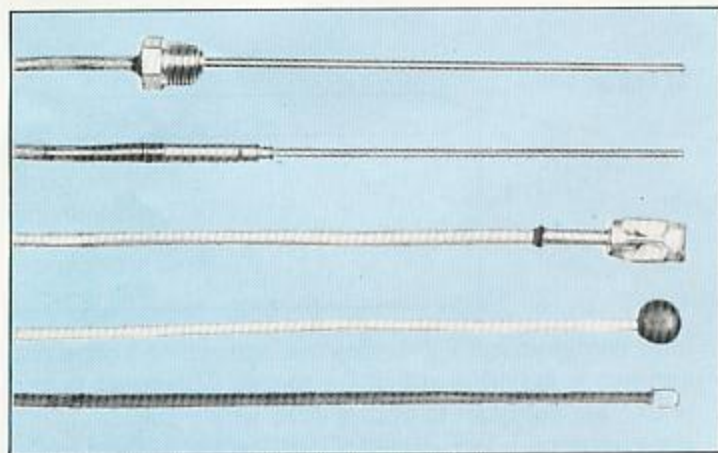
Lead configuration 4 is similar to lead configuration 3 except that a separate pair of wires is provided as a loop to provide compensation for lead resistance and ambient temperature changes in lead resistance.

THERMISTORS

For high precision low temperature applications (typical - 40 to +100°C) Fykays now offer Thermistors and complete Thermistor probe assemblies.

Manufactured from oxides of Nickel, Manganese, Iron, Cobalt, Copper, Magnesium, Titanium or other metals, thermistors are easily interchangeable. Also their large change in resistance with reference to temperature makes them invaluable in terms of precision. Encapsulated either in epoxy or PTFE (teflon), thermistors can be used on a precision resistance bridge (Wheatstone type) based instrument as in case of RTD's.

Use of Composites enable differential temperature applications.



Wide range of resistance values, high chemical stability, resistance to ageing and being unaffected by even hard nuclear radiation are hallmarks of thermistors.

Low time - constant and repeatability of temperature measured are assured.

Typical applications:

- Biological – animal & botanical
- Geographic, Oceanographic
- Process gas; air, liquid temperature measurement and control
- Foundries:- returned sand, moulds, cooling water etc.
- Surface temperature measurement
- Process control, Master-Slave relation
- Hospitals, dairies-Incubators, test rooms, genetic engineering
- Energy audit and control for monitoring; for monitoring heat loss from insulations of vessels, piping etc.
- Many others.

FYKAY'S PRODUCTS:

THERMOTIP • MINITIP • ANSPLATIP • FOND TIP • DIGITAL PYROMETERS • CARBOTIP FOR STEELS AND IRONS • THERMOXYTIP • OXY-COMP G • OXYCOMP AUTOMATIC O₂ ANALYSER IN STEELS • IN-SITU OXY PROBES FOR COMBUSTION CONTROL AND HEAT TREATMENT FURNACES REGULATION • OXYMONITORS FOR COMBUSTION & ATMOSPHERE CONTROL • METALLIPOPS: SAMPLERS FOR METAL BATH, STREAMS, INGOTS, 2-IN-1, ETC • VARIOUS TYPES OF THERMOCOUPLES • VARIOUS TYPES OF PANEL INSTRUMENTS • TEMPERATURE CONTROLLERS AND INDICATORS • MICOUPLE AND MICAB • INSTAMETER INSTANT CALIBRATOR • OXYCOMP-D • AND MANY MORE.



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