Flokal® expands and proudly presents new service – temperature calibration

Issue 1-November 2003

New Flokal® technologies

- TC calibration process improving;
- Temperature metering.

Improve your process!

We invite you to our services!
E-newsletter free subscription

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ABOUT US

FLOKAL® - the ultimate resource for:

- **MFC's** accessories - **Valves** & Accessories - **Gas-systems** & Accessories;
- **Thermo-elements** (spike and profile)
- Gas/Liquid Filtration and Purification & Accessories
- **Vacuum** measure and control devices

We are ISO 9001 certified

New Flokal® technologies

TC calibration process improving

For improving our calibration process we have expanded our possibilities in this field of activity by using of the new Saturn calibration system.

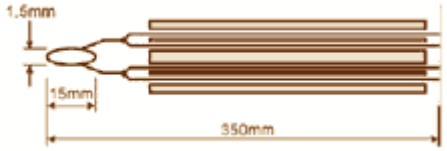
The Saturn was developed from the concept that the best way to calibrate thermocouples (T/Cs) was to have all the junctions touching one other. The only way to achieve this is to have them arranged like spokes in a wheel with the junctions at the centre. This consists of a ceramic ball into which are moulded up to 16 ceramic tubes.

Name for this 'the spider'. Spider is made to the our requirements including having a tube which passes through the ball so that T/Cs with multiple junctions along their length - as used in the semiconductor industry- can be calibrated. The spider has the advantages of enabling good thermal transfer between the heat source and the T/Cs. This could not be achieved if the T/Cs are bundled in order to get their junctions together, and unlike most tube furnaces it also enables short T/Cs to be calibrated. The spider is mounted inside a spherical ceramic shell which houses the heaters.

The Saturn has a temperature range of 100°C to 1300°.

The Saturn was thermally surveyed using type R T/Cs and Platinum resistance thermometers (PRTs) up to 850°C, and then only the T/Cs up to 1300°C. Although the Saturn is not meant to be used with PRTs the ones used were constructed so they were suitable for the tests.

They were used because they gave a more accurate result than could be obtained with T/Cs. The PRT's construction consisted of special high temperature resistance elements, made by Thermal Developments International, mounted on 4 Platinum wires which were supported by a 5 bore ceramic tube, and there was no sheathing. This meant that the probes had a short isothermal depth of immersion and a fast time response.



The worst case absolute temperature stability (any one thermometer) of the Saturn was measured over its whole working temperature range and found to be +/-0.1°C for 10mins and +/- 0.2°C for 60mins.

The uncertainty of the Saturn's isothermal volume has been assessed for a Platinum covered 8 tubed spider and at worst it is about ±0.5°C and at best it is about ±0.2°C across the range 100°C to 1300°C, dependent on the calibration procedure used.

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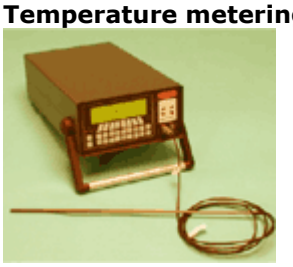
Temperature metering



-200°C

to

2315°C

High Accuracy PRT and Thermocouple Thermometer

It is a very high accuracy multi purpose digital thermometer for both platinum resistance thermometers and thermocouples. Errors and Self Heating Errors along with provision to store the calibration data of up to 20 PRT probes. Dual Channel input allows a probe on Channel B to calibrated against a standard on Channel A – directly compare any combination of PRT and Thermocouple. Thermometer supports ten thermocouple Types, B,C, D, E, J, K, N, R, S and T and Pt100 thermometers. Connect up to 16 sensors via the optional switchboxes, Model 954 and 958.

The thermometer includes an inbuilt data logger internally storing up to 4,000 date and time stamped readings. Recall the data from the front panel or send to a PC or Printer via the PC interface which is included as standard. The powerful math function enables statistical analysis of the captured data, mean, max, min, peak and standard deviation.

This thermometer has the features for high accuracy temperature measurement. With resistance thermometers used at high temperatures unwanted thermal EMFs are generated, the thermometer can take two measurements switching the polarity then computing the average to eliminate this error source. Many other instruments lack the ability to eliminate thermal EMFs.

The thermal EMF error can be greater than the quoted accuracy of an instrument, if you need small measurement uncertainty for high temperature PRT work you need this feature. High accuracy, highest accuracy is for Pt100 inputs, the thermometer Uncertainty of Measurement in the range -100°C to 500°C is 0.01°C. The thermometer is optimized over the most frequently used and useful temperature range. For thermocouple measurements the automatic CJC is far better than 0.1°C at 20°C. Great design care was taken, both thermocouple inputs are measured with separate Pt100 sensors. This approach gives outstanding CJC performance, again a point to check against other instruments which can have significantly less performance.

Features

Accuracy to 0.01C, 0.001C. Resolution (Pt100 Inputs).
PRT and Thermocouple Inputs True Dual Input.
Eliminate Unwanted Thermal EMFs with current reversal.
Store 4000 Measurements.
PC Interface and Software.

Improve your process !

For improvement quality of the provided services and consequently for improvement of the functioning of the equipment of our clients, Flokal constantly works toward higher level of activity.

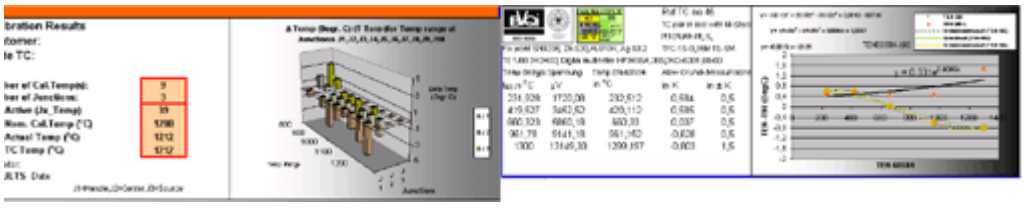
Amongst service of the temperature measurement & calibration:

- Temperature measurement and display;
- Accredited temperature calibrations;
- Temperature controllers.

All are our equipment and service are founded on use the scale ITS-90 that in addition raises accuracy of the measurements of the temperature and it correspondence to measured relative importances to real physical importances. (International Temperature scale of 1990 (ITS90) defines a temperature scale in terms of fixed points; states in nature in which pure materials exhibit equilibrium states temperature is invariant. It has become popular to refer to these equilibrium conditions as 'intrinsic standarts').

All our thermo calibrations, thermo calculations and thermo measuring are realized on the base of 'intrinsic standarts'.

Our new designed software makes results of thethermo process suitable for client. We make also calculation of standart deviation for our calculations and calibrations.



All our features is directed to the way of impoving our service and improving our clients equipment.

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We invite you into the world of our services!

We provide Products and services for the front end Semiconductor Market (Diffusion/ LPCVD / APCVD / PECVD / MOCVD and epitaxial processes), for Fiber Optical Manufacturing and for various processes in the petrochemical and chemical industry. We focus on product and service excellence. We offer:

For the semiconductor industry

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- Spin-coater
- Hot-plates
- Temperature controller
- Clean room equipment
- Dry &Wet etch & clean
- Photochemical filtration and dispense systems
- Thermal control systems
- Gas systems
- MFC's & Valves
- Pressure and Vacuum measurement & control
- Gas flow standards
- Gas/Liquid purification and filtration
- Vacuum products
- Vacuum inlet and waste gas collision traps
- Chemical blending and delivery modules
- Power supply/readout
- Accredited calibrations (flow, temperature, pressure, geometry)
- Cleaning, repair and maintenance
- Automation and Software
- Humidity sensors
- Specialty gases, liquids, solids
- Heating elements
- Thermocouples
- Precursor delivery technology
- Process Analysis
- Quartz; Tungsten; Molybdenum; Tantalum; Graphite; Platinum; Others

For the process industry

- Gas / liquid flow measurement & display
- Temperature measurement & display
- Pressure measurement & display
- Valve positioners & control valves
- Level measurement & display
- Turbidity measurement & display
- Humidity measurement & display
- Accredited calibrations (flow, temperature, pressure, level)
- Process Analytical solutions
- Automation and Software
- Flow meters

For the pharmaceutical industry

- Cryotechnology
- Gas / liquid flow measurement & display
- Temperature measurement & display
- Pressure measurement & display
- Accredited calibrations (flow, temperature, pressure, level)
- in-line particle analyzers
- Fluid dispensers & metering pumps
- Filter and separation systems
- Process Analytical solutions
- Automation and Software

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