TEMPERATURE MEASUREMENT METHODS and CALIBRATION UNIT

H981

Year 1
study

Features

- Allows Investigation of Temperature Measurement Methods and Temperature Scales
- Safe and Suitable For Unsupervised Student Operation
- Allows Investigation of Practical Problems in Measurement of Temperature Using a Variety of Instrument Types
- Optional Computerised Data Acquisition Upgrade
- Optional UKAS/NAMAS Calibration Certificate

Description

The Hilton Temperature Measurement Methods and Calibration Unit H981 allows students to thoroughly examine a large variety of temperature measurement devices, how errors can be introduced and avoided, methods of calibration and the structure of the International Temperature Scale (ITS-90). The bench mounted console provides power and connection points for a variety of instruments and sensors. The console is self contained and is supplied with a wide range of ancillary items and sensors that are stored in a latching aluminium case for security. The console also provides power for an external temperature controlled heater that allows sensor calibration and performance at elevated temperatures including the steam reference point (100°C). Alternatively this may be supplemented by the optional H981A Dry Well Calibrator. An external stainless steel vacuum flask allows ice point reference to be established. Electrical safety is provided by a double pole overload and earth leakage circuit breakers. Digital panel mounted instruments include, Platinum resistance temperature indicator, Thermistor temperature indicator, Thermocouple (type K, nickel-chrome, nickel-aluminium) temperature indicator with multi-way selector switches, Millivolt meter. All of the electronic indicators provide re-transmission signals for use either by user supplied chart recorders/data acquisition systems or the optional Data Acquisition System.

Related Laws/Applications

- Engineering
- Science
- Physics
- Technology

Learning capabilities

- The use of (expansion) liquid in glass thermometers for measurement of fixed scale points.
- The use of vapour pressure for temperature measurement.
- The use of bi-metallic expansion devices for temperature measurement.
- The Peltier and Seebeck thermo-electric effects.
- Investigation of junction voltage from different thermocouple types.
- The use of ice point reference with a thermocouple.
- The law of intermediate metals and intermediate temperatures associated with thermocouples.
- Voltage calibration of different thermocouple types using a water-ice reference.
- The effect of lead resistance and voltmeter meter impedance on thermocouple measurements.
- Use of a direct reading, internally compensated thermocouple indicator.
- Connection of thermocouples in series for signal amplification and parallel for averaging of measured temperatures.
- Investigation of the response rate of various thermocouples and sensors.
- Investigation of the platinum resistance sensor (PRT), its resistance change with temperature and the reference PRT equation of ITS-90.
- Investigation of the use of 2, 3 and 4 wire PRT sensor connection and the error effects of lead resistance.
- The use of a direct reading PRT indicator device.
- Investigation of the resistance change of a negative temperature coefficient thermistor sensor with temperature.
- The use of a direct reading thermistor indicator device.
- Calibration of all of the supplied sensors with reference to an accurate

Technical Specification

- 2 x Type K Thermocouples (exposed)
- 2 x Type K Thermocouples (shrouded)
- 2 x Type T Thermocouples (shrouded)
- 2 x Type J Thermocouples (shrouded)
- 1 x Thermistor Probe
- 1 x Vapour Pressure Dial Gauge - Bi Metalic Dial Gauge 0-120°C
- 1 x Handheld Digital Multimeter

Recommended Ancillaries

- H981A - Optional Dry-Well Heat Source

What's in the Box?

- 1 x H981 console
- 1 x Transformer (115V only)
- 2 x Type K exposed thermocouples
- 2 x Type K shrouded thermocouples
- 2 x Type J shrouded thermocouples
- 2 x Type K thermocouple extension leads
- 1 x Temperature controlled hotplate
- 1 x Stainless steel flask
- 1 x Platinum resistance probe
- 1 x Hand held digital multimeter
- 1 x Stainless steel vessel
- 8 x stackable plugs
- Instruction manual
- Packing list
- Test sheet
- 1 x Power lead
- 1 x Red Spirit Thermometer

Weights & Dimensions

- Weight: 10 kg
- Weight: 14 kg (115V version)
- Length: 430mm
- Width: 280mm
- Height: 240mm

Essential Services

- 220-240 Volts, Single Phase, 50Hz (With earth/ground).
- Line current up to 2.5A at 230v.
- 110-120 Volts, Single Phase, 60Hz (With earth/ground).
- Line current up to 5.0A at 110V.

Ordering information

To order this product, please call PA Hilton quoting the following codes:
H981/230 - Temperature Measurement Methods & Calibration Unit
H981/115 - Temperature Measurement Methods & Calibration Unit
H981/230/HC - Temperature Measurement Methods & Calibration Unit Computer Linked
H981/115/HC - Temperature Measurement Methods & Calibration Unit Computer Linked
H981A - Dry Well Calibrator