

# Manufacturing Equipment Division (MED)

MICC bring the unique competitive advantage of being able to offer a total 'end to end solution' to the global temperature sensor manufacturing industry.

With over 300 machines sold worldwide the our Manufacturing Equipment division (MED) provides many unique business advantages to sensor manufacturers the World over;

- Consultancy / Technical advice service
- Industry standard machinery or bespoke design, we have the solution for;
- Welding machines
- Drilling machines
- Cable striping machines
- Calibration solutions
- A wide range of associated accessories
- World widest range of MI cable and accessories

Save time and money;

- Innovative technologies make manufacture faster & easier!
- Don't waste time searching the market what you need
- Benefit from 'valued' customer service and multi-buy discounts



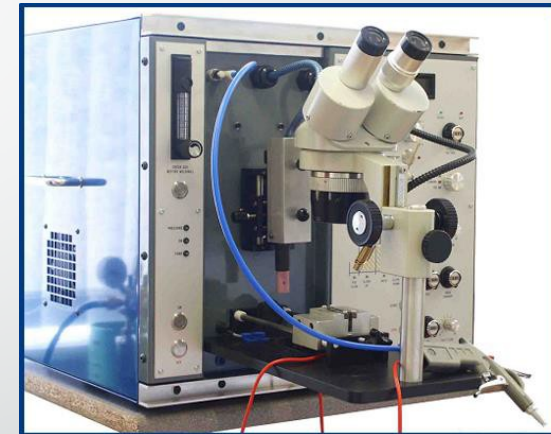
# Manufacturing Equipment Division (MED)

## MI Welding Machine

The New revised version of the TET MI Thermocouple welding machine incorporates a new weld torch assembly and a new vice jaw arrangement for easier changing of thermocouple sizes.

A comprehensive tool kit and extended manual is provided with all Welders. Key features include;

- Welds all Mineral Insulated thermocouples from 1.0mm to 6.0mm
- Fully automatic weld cycle under microprocessor control
- Both conductors and sheath closure weld carried out on one machine
- Removable Microscope included with optical light guide for maximum visibility
- Separate weld actions for conductors and sheath closure (CD & TIG)
- Automatic recharge on CD ready for next weld
- TIG weld has slope-up and slope-down functions for accurate weld control envelope
- Bench mounted
- Single phase supply



This machine is specifically designed for welding the hot junctions of mineral insulated thermocouples. Either Earthed (Bonded) Junction or Insulated Junction welds can be accommodated. The machine will weld thermocouples from 1.0mm to 6.0 mm outside diameter. The welder is divided into two sections to accommodate the two welding processes associated with the junction of an MI thermocouple.

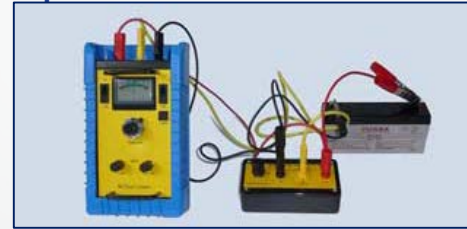


# Manufacturing Equipment Division (MED)

## Fault Locator

The TET Ltd High Resistance Fault Locator helps you quickly find faults occurring in cables through damage caused in storage, transit or during installation. These faults are generally evident as impact marks or punctures in the cable sheath. Any moisture ingress through a damaged sheath results in a local lowering of the insulation resistance.

Our High Resistance Fault Locator is equally suitable for use in the factory or on site to locate faults in an installed cable system; it incorporates a solid-state galvanometer with a backlight and adjustable sensitivity.



The instrument has been designed to meet the requirements of cable testing and locating cable faults where the resistance ranges from zero to 100M $\Omega$ . Faults can be between two conductors or between a conductor and sheath. The circuit is essentially a classic Wheatstone bridge with a highly sensitive detector.

When the bridge is at the balance point the control indicates the position of the fault as a percentage of the cable root length. Two sensitivity levels are provided to accommodate all ranges of cables. The instrument is housed in a rugged case manufactured from a high impact co-polymer. The TET Limited High Resistance Fault Locator comes complete with a Check Box to check the operation and general accuracy of measurement.



# Manufacturing Equipment Division (MED)

## Ultrasonic Welding Machine

New products in development include an Ultrasonic Welding machine designed to attach flexible wire strands to the conductors of MI Thermocouples.

Ultrasonics' are good at this type of welding and have several advantages over traditional methods.

In comparison with electrical spot welding there is;

1. No burning,
2. No heat affected zone,
3. No embrittlement
4. And materials hard to weld electrically will readily weld ultrasonically.

In comparison with soldering there is;

1. No flux residue
2. And no flame required so the weld can be much closer to the wire insulation.

The new design will weld both conductor to their respective flex wires in one operation which will improve not only the quality and repeatability of the actual welds but will reduce the time needed for this operation.



# Manufacturing Equipment Division (MED)

## **ION Pulse Welder**

Welding sub-millimetre MI Thermocouples using Ion Pulse Technology.

This revolutionary new welding machine uses Ion pulse technology to create a controlled clean weld on sub-millimetre MI Thermocouples.

The basic principle utilises a cross between TIG welding and vacuum plasma welding but unlike costly vacuum plasma welders the heat energy source components are simple and require very little maintenance.

- Low Cost alternative to Laser Welding
- Consistent Weld quality
- Conductor and sheath closure welding
- Quick turnaround
- No alignment problems
- Clean Oxide free Welds
- Long cables accommodated
- Automatic Weld control
- Low running costs
- Reduced strip down



# Manufacturing Equipment Division (MED)

## **Precision Drilling Machine**

This new Drilling Machine is designed to remove the insulation from the end of a prepared sample of M.I. cable in order to facilitate a complete welded measurement junction.

The insulation is removed along with a section of conductor by drilling the end of the cable precisely to the required depth. The machine cleanly cuts away the conductors without twisting them together at the same time as removing the insulation.

- Sizes from 1.0mm to 6.0mm MI cables
- Precise alignment even at 1mm
- Reduces preparation time
- Selectable footswitch Control option
- Selectable speeds up to 4000rpm
- Comprehensive accessories
- All drills, guides and collets supplied
- Bench fixing kit
- Full printed instruction manual (pdf also available on CD or via e-mail)



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# Manufacturing Equipment Division (MED)

## Ultrasonic Stripper

The New TET UCES-400 uses powerful pulses of Ultrasonic energy to strip the sheath from mineral insulated cable.

The ultrasonic energy transfers to the insulation on contact and de-compacts and liquefies the powder, which escapes from the end of the cable.

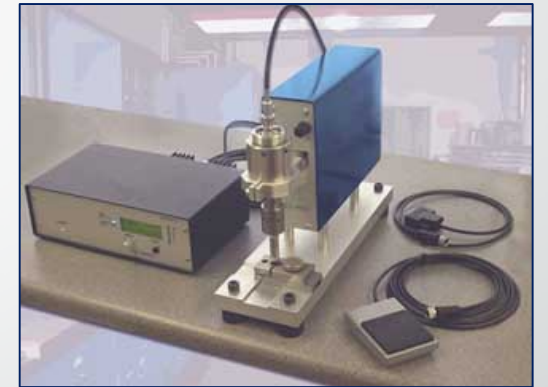
The result is that all the powder in the stripped section is cleanly removed leaving the conductors completely untouched.

The whole action is completed in seconds (in the case of small cables in a fraction of a second).

All cable sizes can be accommodated from 1.0mm (0.04") to 6.0mm (or ¼")

The only preparation needed prior to stripping is to ring through the sheath at the break point (up to 25mm from the cable end).

The machine is supplied with a ringing tool and a pair of electronic side cutting pliers for the smaller sizes.





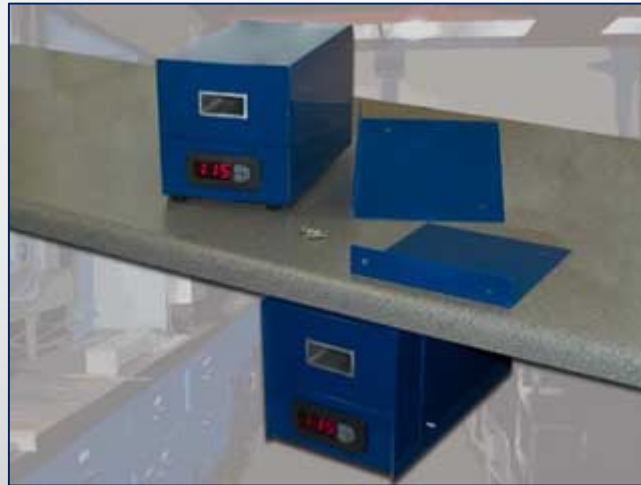
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## **Cable End Heater**

When making the Measuring (hot) junction of MI Thermocouples and RTD 's it is advisable to keep the open end of the cable warm.

This avoids the slow ingress of moisture into the cable insulation, which would lower the Insulation Resistance. This parameter is important for high measurement integrity.

Keeping the cable warm also has a beneficial effect on the welding process.



# Manufacturing Equipment Division (MED)

## Calibration System

In Response to the 2006 revision of the Aerospace Material Specification AMS2750D TET Limited has designed a purpose built Automatic emf Calibration System. AMS2750D Specification Covers pyrometric requirements for thermal processing equipment. The specification is used as a basis for the NADCAP certification programme.

The specification covers the following;

- Temperature sensors
- Instrumentation
- Thermal processing equipment
- System accuracy tests
- Temperature uniformity surveys

Many First Class MI thermocouple manufacturers are seeking inclusion on the Qualified Manufacturers List (QML) within the NADCAP programme. In order to do this company's have to increase their calibration facility at least fourfold and seek to improve the relevance, accuracy and delivery of calibration data and to improve the archiving and retrieval of relevant data for analytical purposes.

AMS2750D requires suppliers to show evidence of conformity and accuracy of material. For MI Cable manufacturers this is achieved by sampling coils of cable prior to conversion into thermocouple sensors and producing calibration evidence for a number of stated reference points across the temperature range.

