

## The Safety Test Heads - An Introduction.

A “Safety Test Head” is a barrier placed between an operator and the test equipment being used. This barrier protects the operator from any possible risk of electrical shock should a fault occur in the test equipment. Various safety regulations, for example IEC 348, BS4743 etc., specify the conditions that give risk and therefore imply the need for a Safety Test Head but usually, any voltage > 40 volts will require a Safety Test Head.

The barrier is a collection of electrical isolation contacts, which connect the test equipment to the DUT (Device Under Test). The design must ensure that whenever the operator can touch the DUT, these isolation contacts are fully open.

All Challenge Innovations Safety Test Heads rely on a mechanical means of operating the isolation contacts. Should the contacts weld together, due to some catastrophic failure of the DUT or the test equipment, this mechanical link will either force the contacts open or keep the DUT inaccessible until the fault is repaired.

The design of the isolation contacts and the mechanical link is optimised to suit the DUT package and the voltages / currents available from the tester.

Challenge Innovations make Safety Test Heads suitable for a wide range of DUT packages. Some designs have options of heated DUT, different box sizes and shapes, housings for special circuitry etc..

This range includes:

### OSC - 5;

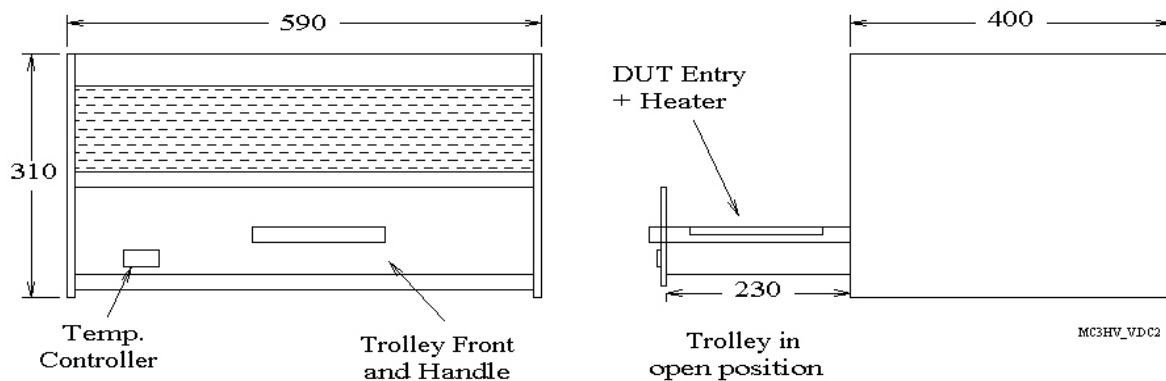
- For the smaller DUT
- package, TO-220, TO-247, TO-3 etc., using commercially available DUT sockets.
- DUT socket mounted on an “Industry Standard” matrix plate. Please ask for details.
- Case top is 300mm square. The height can be any value from 60mm to 600mm.
- Top cover fastened to an internal shaft mounted on ball bearings. Shaft carries up to 20 Safety Contacts made by C & K type O.
- Top cover also operates contacts to start the external tester.
- Optional mechanical or pneumatic latch on top cover, keeping it closed. Operated by the tester.
- Optional heater block for the DUT with external temperature controller.



### MCP – 3HV;

- New design (Feb-03) incorporates many improvements including much larger up/down pneumatics, re-sited temperature controller with improved heaters and many more details.
- Uses the Bed-of-Nails concept to make contact to top of the DUT. Wide range of commercial probes and special design contacts are available to suit the DUT contacts and the max. voltages / currents used.
- Suitable for the modern 130mm x 140mm, 190mm x 140mm based modules.
- Exchangeable Bed-of-Nails and DUT base locator plate means that many different packages and multiple packages can be tested on one Test Head.
- Pneumatic Bed-of-Nails up / down movement.
- DUT loaded on to a sliding drawer containing the optional heater / cooler block. Pushing the drawer closed will activate the test sequence on an attached **ATS-2 Static Parameter Tester**. This drawer is mechanically clamped closed during the test sequence.
- DUT base area is 280mm x 190mm with max. DUT height of 80mm. Options to increase this height are available.
- Optional heated base plate to 150°C or 200°C to special order, with digital display temperature controller.
- Overall size for the MCP-3HV is 590mm wide by 400mm deep by 310mm high. The two trolley runners will overhang the rear by approx. 60mm when the trolley is closed.
- This Safety Test Head is normally made part of a multiplexer but can be used separately or incorporated into other manufacturer's equipment.
- **The Multiplexers – An Introduction** section, page 6 shows an example of the MCP-7HV.

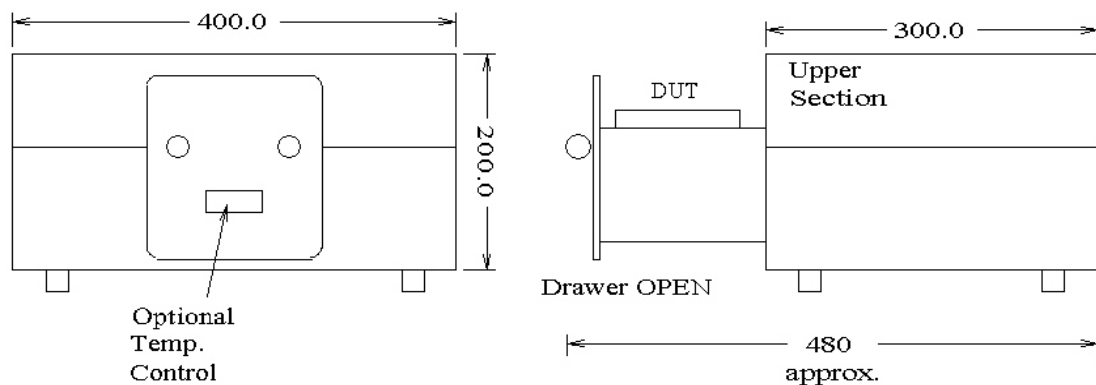
MCP-3HV Outline all dims in mm



### MCP - 5;

- Uses the Bed-of-Nails idea to make contact to the sides and/or the top of the DUT. Wide range of commercial probes and special design contacts are available to suit the DUT design and the max. voltages / currents used.
- Suitable for most of the smaller modules.

- Exchangeable Bed-of-Nails housed in the upper section of this design together with the base locator plate means that many different packages can be tested on one Safety Test Head.
- DUT loaded on to a sliding drawer containing the optional heater block. Pushing the drawer closed will activate the test sequence when used with an **ATS-2 Static Parameter Tester**. This drawer is mechanically clamped closed during the test sequence.
- Maximum available DUT base area is 70mm wide x 140mm deep with max. DUT height of 30mm (options to 60 mm).
- Optional heated base plate to 150°C (options to 200oC) with digital display temperature controller.



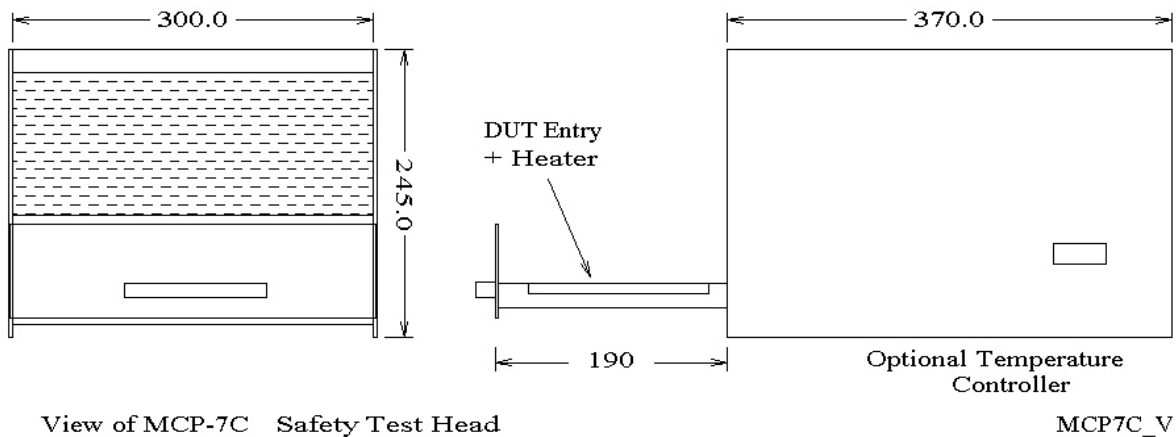
View of MCP-5 Safety Test Head.

MCP5\_V

### MCP – 7C;

- Uses the Bed-of-Nails idea to make contact to the top of the DUT. Wide range of commercial probes and special design contacts are available to suit the DUT contacts and the max. voltages / currents used.
- Suitable for most of the smaller modules for example, the “ECONO2”, “ECONO3” and similar packages.
- Exchangeable Bed-of-Nails and DUT base locator plate means that many different packages and multiple packages can be tested on one Test Head.
- Pneumatic Bed-of-Nails up / down movement.
- DUT loaded on to a sliding drawer containing the optional heater block. Pushing the drawer closed will activate the test sequence if used with an **ATS-2 Static Parameter Tester**. This drawer is mechanically clamped closed during the test sequence.
- Maximum DUT base area is 160mm wide x 150mm deep with max. DUT height of 30mm ( option to 60mm).

- Optional heated base plate to 150°C (option to 200oC) with digital display temperature controller.



### Special Designs;

There is a wide variation of DUT packages within the industry. Challenge Innovations have been making Safety Test Heads for many years and many of these variations have been accommodated. These include;

- Test Heads for the smaller size of the “Hockey Puck” package used for power bipolars and IGBT,
- “shuttle” designs where two entry points are provided for the DUT. Whilst one DUT is being tested, the other is being loaded/unloaded.

If the standard range above is not suitable, special designs will be needed. Usually a variation of our standard designs will be suitable.

For Dynamic Parameter Testing, the MCP range is used as the basis of the Test Head design with appropriate modifications. Please refer to the STA-3 Tester information pages.

Please contact Challenge Innovations to tell us your requirements.

### Auto handling of the DUT;

All the above Safety Test Heads are designed for manual loading and unloading of the DUT. The design of these Heads is highly modular and all can be adapted for auto-handling of the DUT. For example, the loading / unloading could be made using a robot arm, a conveyor etc..

Please contact Challenge Innovations or their Agent/s to tell us your requirements. The “Useful Web Sites” page lists some of the commercial auto handling manufacturers.