Servo-Pneumatic Universal Testing Machine

Rapid determination of modulus, permanent deformation and fatigue of bituminous mixtures using cylindrical specimens that are cored from the highway or prepared in the laboratory

This machine is a development of the NAT which was developed by Keith Cooper and Professor Steven Brown at the University of Nottingham. The use of a high precision servo-pneumatic valve in conjunction with a low-friction actuator and sophisticated data acquisition and control, results in a performance that is equal to many servo-hydraulic systems. Accurate, digitally generated waveforms are applied by the actuator producing repeatable stress variations in test specimens that are simulative of those in a road pavement due to moving traffic. The actuator is double-acting allowing both compressive and tensile forces to be applied. A triaxial cell system is available for the measurement of the resilient modulus of unbound materials.

Standards

- EN 12697-24 Annex E
- EN12697-25 Method A and B
- EN 12697-26 Annex C and E
- ASTM D4123
- ASTM D7369
- ASTM D7313
- ASTM D8044
- AASHTO TP31
- AASHTO TP62
- AASHTO TP 105
- AASHTO TP124
- AASHTO T307
- AASHTO T322
- AASHTO T342
- NCHRP 9-19

Key Features

- Low cost dynamic loading universal test system ideally suited to testing asphalt and unbound granular materials
- Double acting low friction actuator with integral stroke transducer
- High performance ceramic spool servo-valve
- High quality stainless steel frame
- Issued with UKAS accredited certificate of calibration for EN 12697-24; EN 12697-25, EN 12697-26
- Accessories available to perform a range of standard and non standard test methods
Key Uses

- Assessment of resistance to permanent deformation (rutting)
- Measurement of stiffness modulus
- Assessment of resistance to fatigue cracking
- Resilient modulus of unbound materials
- Mix design

Control System and Software

This machine can be controlled using our Standard Acquisition and Control System along with Universal Software™. Universal Software™ is user friendly, intuitive and reliable Windows® software developed using LabVIEW™. Universal test software for the development of test methods using static, sinusoidal, haversine, square, triangular with user selected frequencies and data collection rates. Stored test data can be imported into a spreadsheet package to be analysed by the user. Utilities are included for transducer check, diagnostic routines and calibration. Alternatively, our next generation digital data acquisition and control unit cDAC™ Advanced Data Acquisition System brought together in alliance with our flagship software DIMENSION™ gives you the power to perform the most demanding of tests with your materials testing equipment. cDAC™, our next generation class leading digital controller is unparalleled in its field and suitable for advanced testing required for research.

Accessories

Accessories are not included in the price of main device (unless stated otherwise) and may be purchased separately if required.

- CRT-TCC - Temperature Controlled Cabinet for UTM-NU
- CRT-ITSMFAT-SET - Indirect tensile stiffness modulus and fatigue measurement system to perform EN 12697-26 (Annex C) EN 12697-24 (Annex E) Ø100Ø150mm specimens.
- CRT-ITSM-SET - Indirect tensile stiffness modulus measurement system to perform EN 12697-26 (Annex C) Ø100Ø150mm specimens.
- CRT-FAT-SET - Indirect tensile fatigue measurement system to perform EN 12697-24 (Annex E) for Ø100mm specimens. To be used with CRT-ITSM-SET.
- CRT-FAT-SET100_150 - Indirect tensile fatigue measurement system to perform EN 12697-24 (Annex E) for Ø100mm specimens. To be used with CRT-ITSM-SET.
- CRT-FAT-SET150 - Add-on for CRT-FAT-SET for 150mmØ specimens. To be used with CRT-ITSM-SET and CRT-FAT-SET.
- CRT-PD-SET - Dynamic and static creep measurement system to perform EN12697-25 (Method A)
- CRT-PRESTRIAX-SET - Dynamic and static creep measurement system - confining stress to perform test according to EN 12697-25 Method B.
- CRT-IT-RESMOD - Resilient modulus test system to perform AASHTO TP31 and ASTM D4123
- CRT-D7369 - Resilient modulus test system to perform ASTM D7369
- CRT-INDTENS-CREEP - Indirect Tensile Creep measurement system according to AASHTO T322
- CRT-OTC-NU - Direct Compression & Tension Measurement System to perform test according to EN 12697-26 Annex E for CRT-UTM-NU
- CRT-T307 - Triaxial system to perform AASHTO T307 for Ø200x100mm specimens of unbound materials
- CRT-T307+ - Triaxial system to perform AASHTO T307 for Ø200x100mm and Ø150x300mm specimens of unbound materials. To use with CRT-UTM-NU pillar extensions are required.
- CRT-T307-EXTRA - Additional parts to upgrade from T307 to T307+
- CRT-NUI-PILLAR-LG - Larger Pillars for UTM-NU (for CRT-T307+)
- CRT-SPTLV - Test system to perform dynamic modulus according to AASHTO TP62, SPT flow number (NCHRP 9-19), SPT flow time (NCHRP 9-19)
- CRT-INDTENS-CREEP - Indirect Tensile Creep measurement system according to AASHTO T322
- CRT-PUMA - PUMA - Precision Unbound Materials Analyser for 150mmØ specimens
- CRT-UTM-SCB - Semi circular bending system to perform EN 12697-44 SCB test
- CRT-MEM100 - Neoprene membrane 100mm Diameter 400x1mm - set of 10
- CRT-MEM150 - Neoprene membrane 150mm Diameter 420x1mm - set of 10
- CRT-MEM100WH - Membrane 100mm Diameter 400x0.35mm - set of 10
- CRT-MEM150WH - Membrane 150mm Diameter 420x0.35mm - set of 10

Specifications

Technical specifications are subject to change without notice.

Models Available: 220V 50/60Hz 1ph 110V 50/60Hz 1ph

Maximum Load: Electronically limited to 15.5kN

Load Transducer: ±20kN

Actuator Stroke mm: 30

Frequency Hz: 0 to 30
<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Electrical Supply¹</td>
<td>220-240 Volts 50 Hz @ 13A</td>
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<tr>
<td>Compressed Air</td>
<td>7-10 bar at 600 L/min</td>
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<tr>
<td>Dimension mm (W x D x H)</td>
<td>Frame 360 x 400 x 740</td>
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<td></td>
<td>Control Box 360 x 280 x 140</td>
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<tr>
<td>Working space required mm (WxDxH)</td>
<td>825 x 1650 x 2100 when fitted in cabinet CRT-TCC</td>
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<tr>
<td>Weight (approx.) Kg</td>
<td>Frame 30</td>
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<td>Control box 6</td>
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<tr>
<td>PC</td>
<td>Included</td>
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¹ others available upon request

**Calibration & Maintenance**

Calibration, Annual Service and Maintenance Contracts are available for this device. UKAS accreditation to satisfy typed testing as described in EN 13108. Please enquire for further details. Note: This device should be checked and calibrated annually.