

## Stand Alone Four Point Bending Machine



### CRT-SA4PT-BB

***A low cost, accurate beam testing system which facilitates the rapid throughput of modulus and fatigue tests***

Bending tests are widely used for measuring the stiffness modulus and assessing the fatigue resistance of asphaltic paving materials. The specimen is a prismatic beam which is subjected to sinusoidal loading in either the controlled strain or controlled stress modes. The SA4PT uses advanced servo pneumatic technology and a high-speed digital data acquisition and control system together with user-friendly software. During testing both graphical and tabular data are displayed on screen and test data is stored to disc in Microsoft Excel™ compatible format. The clamps are at 118.5mm centres (the distance between the outer clamps is 335.6mm (14 inches) according to AASHTO specifications<sup>2</sup> but the height and width of the beam can be varied).

<sup>2</sup> Tests on beams containing aggregates greater than 20mm are not strictly in accordance with annex D of EN 12697-24 which states that this non-compliance should be explicitly mentioned in the test report.

### Standards

- EN 12697-24 Annex D
- EN 12697-26 Annex B
- ASTM D7460
- AASHTO T321

### Key Features

- Fully complies with EN 12697-24 Annex D, EN 12697-26 Annex B, ASTM D7460, and AASHTO T321
- Advanced software allows the user to build and modify test routines for research-level testing
- Frequency range 0.1 to 60Hz \*
- Utilizes a super low-friction actuator and high-performance ceramic spool servo-valve
- On-specimen and floating beam measurement system
- The market leader in performance (participant 13) as determined in the international fatigue Round Robin organized by TU Delft [https://www.civil.uminho.pt/4pb/information/Report/FINAL\\_REPORT\\_4PB\\_Ref\\_Beam\\_Project.pdf](https://www.civil.uminho.pt/4pb/information/Report/FINAL_REPORT_4PB_Ref_Beam_Project.pdf)
- Very low compliance test frame
- Sinusoidal controlled strain or controlled stress fatigue test modes

- User defined wave shapes can be used to simulate different types of vehicles
  - Advanced software allows the user to run EN, ASTM and AASHTO analysis concurrently
  - Multistage and multi-frequency sequences for Master Curves
  - Relaxation periods can be programmed - for the investigation of healing
  - Camera can be triggered by software for crack initiation and propagation analysis
  - Save full-wave data for any or every cycle for hysteresis analysis
  - Constant torque motorized specimen clamping to eliminate errors due to localized beam indentation
  - Supplied with a certificate of calibration
  - Manufactured in the United Kingdom
- \* Load limitations apply at higher frequencies

### Key Uses

- Mix design
- End product specification
- Assessment of new materials

### Software - DIMENSION

- User-friendly, intuitive and reliable Windows™ software developed using LabVIEW™
- Specifically written to meet EN 12697-24 Annex D and EN 12697-26 Annex B
- The user interface can be translated into the user's preferred language - please enquire
- Stored test data can be analysed and compared with other test data utilising a spreadsheet package
- Utilities are included for curve fitting of acquired data; testing of system's inputs and outputs; phase correction and a transducer database for storing calibration factors

### Data Acquisition - cDAC

- Measurement of up to 32 transducers
- Wave Types: Haversine, Pulse, Square, Triangle, Constant, Ramped, Rest Periods

### 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

CRT-PVC-BEAM PVC Dummy Specimen 50x50mm

### Specifications

Technical specifications are subject to change without notice.

|                                       |  |
|---------------------------------------|--|
| Force Transducer                      | ±5kN   |
| Specimen Transducer Range mm          | ± 1  |
| Actuator stroke mm                    | 10   |
| Frequency Hz                          | 0.1 to 60*   |
| Electrical Supply <sup>1</sup>        | 220-240 Volts 50 Hz @ 13A  |
| Compressed Air                        | 7-10 bar @ 600 L/min   |
| Dimension mm (W x D x H)              | Test Frame 440 x 190 x 570<br>Data Acquisition Box 360 x 280 x 140 |
| Working space required mm (W x D x H) | 826 x 1650 x 2100 when fitted in cabinet CRT-TCC                   |
| Weight (approx.) Kg                   | Test Frame 45<br>Data Acquisition Box 6                            |
| PC                                    | Included   |

<sup>1</sup> others available upon

\* Load limitations apply at higher frequencies **Calibration & Maintenance**

Calibration, Annual Service and Maintenance Contracts are available for this device.

Please enquire for further details. Note: This device should be checked and calibrated annually.

