

# SPTMAN

Hammer energy tester



**The SPTMAN is an easy to use and portable system that is used to calculate hammer energy.**

The SPTMAN system measures the actual energy transferred from the drive hammer to the drive rods and calculates the hammer energy coefficient by comparison with the theoretical potential energy.

The heart of the system is a rugged, portable analyser with solid state memory. The system is supplied with a standard 54mm diameter instrumented SPT rod, as well as a waterproof carry case for added protection.

Tests are carried out using as easy to follow menu display which enables hammer energy and energy ration to be displayed in real-time.

## System service and calibration

The measurement of SPT hammer energy is now recommended for all Standard Penetrometer Test (SPT) systems.

BS EN ISO 22476-3 states that the hammer energy ratio has to be known and have a certificate of calibration available if N values are going to be used for the quantitative evaluation of foundations or for the comparison of results.

This standard also recommends that checks should be carried out on a six monthly basis. We recommend that it is also good practice to carry out a calibration at the start of any large contract.

Follow the link to our SPT hammer calibration service page for more information.

## Benefits

- Instant hammer energy measurement and transfer coefficient calculation
- Rugged and lightweight system
- Storage for over 700 results
- Complies with the relevant parts of both BS EN ISO 22476-3 and ASTM D 4633-10
- Backlit LCD screen for working in dark environments
- Our calibration service available

## Software

The SPTMAN analysis software is supplied as standard, and adapts a user friendly, Windows based platform for downloading data, analysing results and producing calibration certificates.

The certificate includes plots of force, velocity, acceleration and displacement; as well as measured energy, theoretical energy and energy ratio. Full details of the rig and site can also be shown.

## How it works

The SPT hammer energy measurement method is based on the propagation of waves in long elastic cylinders. When the SPT rod is struck with a falling weight, the rod section is deformed (enlarged) and this enlargement travels down the pile to the base of the rod where it is reflected back.

The force transmitted to the rods is calculated by measuring the axial strain in the rod over a period of time and taking the modulus and cross section of the rod into account by:

$F(t) = Aa \times Ea \times Em(t)$ . The particle velocity of the measurement section is determined by integrating data from the accelerometers over a period of time. The energy which passes into the drive rods can be determined from the force and velocity data using:  $E(t) = \int_0^t F(t) v(t) dt$



SPTMAN unit	
Features	On-site energy measurement Standard energy check unit included for on-site verification Daylight viewable screen Rugged lightweight unit with waterproof connectors Tactile large keys for operating with gloves Low power with long battery life Flash memory for instant start up and power down
Keypad	Sealed colour coded and full alphanumeric keypad, tactile and audio feedback
Operating temperature	0 to +50°C
Screen	Monochrome LCD transfective with backlight Contrast keypad adjustable Display area 122mm x 70mm Protective anti-reflective glass
Acquisition	2 channel, 16 bit acquisition at 100KHz sample rate Pre-trigger on both channels, auto-ranging gain feature
Frequency range	0Hz to 5000Hz
Storage	700+ results, 3 data sets per pile with full header information including site, test no, drop height, drop weight and date/time stamp
Display	Acceleration v time Force v time Energy measurement as % of theoretical
Accuracy	± 2% of hammer energy
Power	Battery: 1.2V NiMH rechargeable AA cells Auto power off and battery indicator
Battery life	8 hours + operation on full charge
Charge time	Approx 6 hours
Charging	External wall plug-in charger for 100/110/250VAC inputs (trickle charge) External cigar plug-in charger for 12VDC inputs (fast charge)
Dimensions	L 218mm x W 187mm x D 55mm
Weight	1.35Kg

Instrumental rod	
Type	To suit clients requirements- normally BW/NW/AW
Length	Dependent on diameter- typically 1m
Accelerometers	2No 10000g 'shock' type with ICP power supply
Strain gauge type	Foil
Connection	3m fly leads with rugged bayonet connectors

All of our equipment is supplied fully calibrated to UK national standards.

## SPTMAN user training

We provide full training for all our purchased equipment. Our training sessions are created and led by our in-house experts, providing you with the skills and knowledge needed to operate the equipment safely, efficiently and with confidence.

We offer classroom and site training within the UK, on-site training overseas and virtual classroom training. No matter what your needs or technical experience we can provide the right training solution for your requirements.

