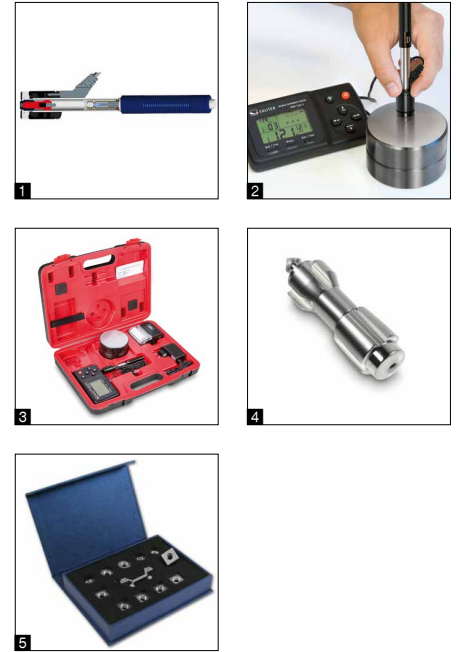Mobile Leeb Hardness Tester SAUTER HMM · HMM-NP







# Advanced features for demanding applications

## Features

- **1** Impact (rebound) sensor: The bounce module is accelerated by a spring against the item being tested. Depending on how hard the object is, the kinetic energy of the module will be absorbed. The speed reduction will be measured and converted to Leeb hardness values
- External impact sensor (Type D) included
- Mobility: In comparison with stationary table-top devices and testing devices with an internal sensor, using the SAUTER HMM offers the highest level of mobility and flexibility
- All measurement directions possible (360°) thanks to an automatic compensation function
- **2** Hardness test block for calibration included (790 ± 40 HL)
- Internal memory for up to 9 measurement values
- Mini statistics function: displays the measured result, the average value, the impact direction, date and time
- SAUTER HMM: Infrared printer for direct output of the measurement results included in the scope of delivery
- SAUTER HMM-NP: identical product features as the SAUTER HMM model, but comes without the printer

- Measurement value display: (B & C), Vickers (HV), Brinell (HB), Shore (HSD), Leeb (HL), tensile strength (MPa)
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units
- **3** Delivered in a robust carrying case

## Technical data

- Precision: ± 1 % at 800 HLD (± 6 HLD)
- Measuring range tensile strength: 375–2639 MPa (steel)
- Minimum sample weight on a solid and stable support: 2 kg with fixed coupling
- Minimum sample material thickness: 3 mm with coupling on fixed base
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Overall dimensions W×D×H 150×80×30 mm
- SAUTER HMM: External mains adapter for printer, as standard
- Batteries included, 3×1.5 V AAA, operating time up to 30 h, AUTO-OFF function to preserve the battery
- Net weight approx. 0,25 kg

## Accessories

- External impact sensor Type D, as standard, can be reordered, SAUTER AHMO D
- Connection cable, without impact sensor, SAUTER HMM-A02
- **5** Support rings for bended test objects, SAUTER AHMR 01
- **4** Impact body Type D, net weight approx. 0,05 kg, hardness ≥ 1600 HV, tungsten carbide, impact ball Ø 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01
- Test block Type D/DC, Ø 90 mm (± 1 mm), net weight < 3 kg, hardness range
  790 ± 40 HL, SAUTER AHMO D02
  630 ± 40 HL, SAUTER AHMO D03
  530 ± 40 HL, SAUTER AHMO D04
- Paper roll, 1 piece, SAUTER ATU-US11
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132

**STANDARD**

| CAL BLOCK | MEMORY | IR | STATISTIC | PRINT HMM | BATT | 1 DAY |

**OPTION**

ISO +4 DAYS

| Model | Sensor | Measuring range | Readout [d] | Option **Factory calibration certificate** |
|---|---|---|---|---|
| **SAUTER** | | HL | HL | KERN |
| **HMM** | D | 170 – 960 | 1 | 961-131 |
| **HMM-NP** | D | 170 – 960 | 1 | 961-131 |

**Adjusting program (CAL)**
For quick setting of the instrument's accuracy. External adjusting weight required

**Calibration block**
Standard for adjusting or correcting the measuring device

**Peak hold function**
Capturing a peak value within a measuring process

**Scan mode**
Continuous capture and display of measurements

**Push and Pull**
The measuring device can capture tension and compression forces

**Length measurement**
Captures the geometric dimensions of a test object or the movement during a test process

**Focus function**
Increases the measuring accuracy of a device within a defined measuring range

**Internal memory**
To save measurements in the device memory

**Data interface RS-232**
Bidirectional, for connection of printer and PC

**Profibus**
For transmitting data, e.g. between scales, measuring cells, controllers and peripheral devices over long distances. Suitable for safe, fast, fault-tolerant data transmission. Less susceptible to magnetic interference

**Profinet**
Enables efficient data exchange between de-centralised peripheral devices (balances, measuring cells, measuring instruments etc.) and a control unit (controller). Especially advantageous when exchanging complex measured values, device, diagnostic and process information. Savings potential through shorter commissioning times and device integration possible

**Data interface USB**
To connect the measuring instrument to a printer, PC or other peripheral devices

**Bluetooth\* data interface**
To transfer data from the balance/measuring instrument to a printer, PC or other peripherals

**WIFI data interface**
To transfer data from the balance/measuring instrument to a printer, PC or other peripherals

**Data interface infrared**
To transfer data from the measuring instrument to a printer, PC or other peripheral devices

**Control outputs (optocoupler, digital I/O)**
To connect relays, signal lamps, valves, etc.

**Analogue interface**
To connect a suitable peripheral device for analogue processing of the measurements

**Analogue output**
For output of an electrical signal depending on the load (e.g. voltage 0 V – 10 V or current 4 mA – 20 mA)

**Statistics**
Using the saved values, the device calculates statistical data, such as average value, standard deviation etc.

**PC Software**
To transfer the measurement data from the device to a PC

**Printer**
A printer can be connected to the device to print out the measurement data

**Network interface**
For connecting the scale/measuring instrument to an Ethernet network

**KERN Communication Protocol (KCP)**
It is a standardized interface command set for KERN balances and other instruments, which allows retrieving and controlling all relevant parameters and functions of the device. KERN devices featuring KCP are thus easily integrated with computers, industrial controllers and other digital systems

**GLP/ISO record keeping**
of measurement data with date, time and serial number. Only with SAUTER printers

**Measuring units**
Weighing units can be switched to e.g. non-metric. Please refer to website for more details

**Measuring with tolerance range (limit-setting function)**
Upper and lower limiting can be programmed individually. The process is supported by an audible or visual signal, see the relevant model

**Protection against dust and water splashes IPxx**
The type of protection is shown in the pictogram cf. DIN EN 60529:2000-09, IEC 60529:1989 +A1:1999+A2:2013

**ZERO**
Resets the display to "0"

**Battery operation**
Ready for battery operation. The battery type is specified for each device

**Rechargeable battery pack**
Rechargeable set

**Plug-in power supply**
230V/50Hz in standard version for EU. On request GB, AUS or US version available

**Integrated power supply unit**
Integrated, 230V/50Hz in EU. More standards e.g. GB, AUS or US on request

**Motorised drive**
The mechanical movement is carried out by a electric motor

**Motorised drive**
The mechanical movement is carried out by a synchronous motor (stepper)

**Fast-Move**
The total length of travel can be covered by a single lever movement

**Conformity assessment**
Models with type approval for construction of verifiable systems

**DAkkS calibration possible**
The time required for DAkkS calibration is shown in days in the pictogram

**Factory calibration (ISO)**
The time required for factory calibration is specified in the pictogram

**Package shipment**
The time required for internal shipping preparations is shown in days in the pictogram

**Pallet shipment**
The time required for internal shipping preparations is shown in days in the pictogram