SAUTER

EN

Industry — Laboratory — Quality Assurance

HARDNESS TESTING OF METALS (LEEB)

PROFESSIONAL MEASURING

180 YEARS since 1844 KERN & SOHN

24

SAUTER Pictograms

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 decentralised 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

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SAUTER Hotlines

Technical questions about our products?
You will find assistance here quickly: **+49 7433 9933- ...**

Service Hotline **→199**
for general technical questions about your SAUTER product

SAUTER Measuring Instruments **→555**
for all technical questions concerning our SAUTER measuring instruments, test benches, force measuring accessories (clamps etc.), SAUTER software

Industrial Scales **→333**
for all technical questions concerning our basic scales (laboratory & industry), pocket balances, school balances, bench scales, price-computing scales, platform scales, counting scales, counting systems, floor scales, pallet truck scales, crane scales, veterinary scales

System Solutions Industry 4.0 **→200**
for all technical questions concerning the interlocking of the latest information and communication technology with our scales, load cells and measuring devices as well as questions about KERN software


1


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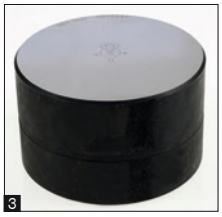
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Premium Leeb hardness tester – also with hardness comparison block included

Features

- External impact sensor standard (Type D)
- Mobility: In comparison with stationary table-top devices and testing devices with an internal sensor, using the SAUTER HK-D offers the highest level of mobility and flexibility
- All measurement directions possible (360°) thanks to an automatic compensation function
- 1 SAUTER HK-DB: Hardness comparison block, hardness approx. 800 HLD, included in delivery
- Measurement value display: Rockwell (Type A, B, C), Vickers (HV), Shore (HS), Leeb (HL), Brinell (HB
- Internal memory for up to 600 data groups, with up to 32 values per group forming the average value of the group
- Mini statistics function: displays the measured result, the average value, the impact direction, date and time
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units
- Measuring with tolerance range (limit-setting function): Upper and lower limiting can be programmed individually. The process is supported by an audible and visual signal
- Matrix display: Backlit multi-function display for all relevant functions at a glance
- Robust metal housing
- 2 Delivered in a robust carrying case

Technical data

- Precision: ± 1 % at 800 HLD
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Thinnest measurable material thickness: 2 mm, with coupling on fixed base
- The lowest weight of the test item on solid support unit: 2 kg with fixed coupling
- Overall dimensions W×D×H 148×21×21 mm
- Permissible ambient temperature -10 °C/40 °C
- Battery operation, 2×1.5 V AA standard, operating time up to 200 h
- Net weight approx. 0,45 kg

Accessories

- Plug-In for data transfer of measuring data from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®, SAUTER AFI-2.0, see internet
- Software BalanceConnection, for flexible recording or transmission of measured values, in particular also to Microsoft® Excel or Access as well as transfer of this data to other Apps and programs, for more details see internet, scope of supplies: 1 CD, 1 license, KERN SCD-4.0, **€ 210,–**
- Support rings for bended test objects, SAUTER AHMR 01, **€ 370,–**
- Impact body Type D, net weight approx. 0,05 kg, hardness ≥ 1600 HV, tungsten carbide, impact ball ⌀ 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 125,–**
- External impact sensor Type C. Low energy sensor: requires only 25 % impact energy compared to type D, for testing tiny or light objects or the surface of hardened layer, SAUTER AHMR C, **€ 630,–**
- External impact sensor Type D, SAUTER AHMR D, **€ 630,–**
- External impact sensor Type D+15. Slim front section for holes, grooves or re-entrant surfaces, SAUTER AHMR D+15, **€ 630,–**
- External impact sensor Type DL, for very narrow surfaces (⌀ 4,5 mm), SAUTER AHMR DL, **€ 1565,–**
- External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMR G, **€ 1565,–**
- Connection cable impact sensor, SAUTER HMO-A04, **€ 125,–**
- 3 Test block Type D/DC, ⌀ 90 mm (± 1 mm), net weight < 3 kg, hardness range
  790 ± 40 HL, SAUTER AHMO D02, **€ 205,–**
  630 ± 40 HL, SAUTER AHMO D03, **€ 205,–**
  530 ± 40 HL, SAUTER AHMO D04, **€ 205,–**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 159,–**

STANDARD

HK-DB

OPTION

HK-D

Model	Sensor	Measuring range	Readout	Test block	Price excl. of VAT ex works	Option Factory calibration certificate	
SAUTER		HL	[d] HL	Typ D/DC approx. 800 HL	€	KERN	€
HK-D	D	170 – 960	1	not standard	**1420,–**	961-131	159,–
HK-DB	D	170 – 960	1	standard	**1520,–**	961-131	159,–


1


2


3


4


5

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, **€ 355,–**
- Connection cable, without impact sensor, SAUTER HMM-A02, **€ 55,–**
- 5 Support rings for bended test objects, SAUTER AHMR 01, **€ 370,–**
- 4 Impact body Type D, net weight approx. 0,05 kg, hardness ≥ 1600 HV, tungsten carbide, impact ball ⌀ 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 125,–**
- Test block Type D/DC, ⌀ 90 mm (± 1 mm), net weight < 3 kg, hardness range
  790 ± 40 HL, SAUTER AHMO D02, **€ 205,–**
  630 ± 40 HL, SAUTER AHMO D03, **€ 205,–**
  530 ± 40 HL, SAUTER AHMO D04, **€ 205,–**
- Paper roll, 1 piece, SAUTER ATU-US11, **€ 17,–**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 159,–**

STANDARD

HMM

OPTION

Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works	Option Factory calibration certificate	
SAUTER		HL	[d] HL	€	KERN	€
HMM	D	170 – 960	1	**1180,–**	961-131	159,–
HMM-NP	D	170 – 960	1	**1060,–**	961-131	159,–


1


2

“Pen type“ Leeb hardness tester for mobile hardness testing of metals

Features

- User-friendly operation: The compact version enables the product to be used in a significantly wider range of applications compared with traditional devices
- The measuring device has been designed for one-hand operation and this allows the user to work more quickly and flexibly
- Modern LCD display: Optimised for industrial applications: increased luminosity and backlight can be switched on, that way the display can be read from any angle
- All measurement directions possible (360°) thanks to an automatic compensation function
- Internal impact sensor included (Type D)
- Measurement value display: (B & C), Vickers (HV), Brinell (HB), Leeb (HL)
- Standard block for calibration not included in scope of delivery
- Internal data memory for up to 500 measurements with date and time
- Data interface USB, including USB interface cable
- 1 Delivered in a robust carrying case

Technical data

- Measurement uncertainty ± 4 HLD
- Minimum sample weight on a solid and stable support: 2 kg with fixed coupling
- Thinnest measurable material thickness: 3 mm, with coupling on fixed base
- Overall dimensions W×D×H 22×35×147 mm
- Rechargeable battery pack integrated, as standard, operating time up to 16 h without backlight, charging time approx. 3 h
- Mains adapter external, standard
- Net weight approx. 0,20 kg

Accessories

- Plug-In for data transfer of measuring data from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®, SAUTER AFI-2.0, see internet
- 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, **€ 125,–**
- 2 Test block Type D/DC, ø 90 mm (± 1 mm), net weight < 3 kg, hardness range
  790 ± 40 HL, SAUTER AHMO D02, **€ 205,–**
  630 ± 40 HL, SAUTER AHMO D03, **€ 205,–**
  530 ± 40 HL, SAUTER AHMO D04, **€ 205,–**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 159,–**

STANDARD: MEMORY, USB, IR, STATISTIC, ACCU, 230 V, 1 DAY

OPTION: CAL BLOCK, SOFTWARE, ISO +4 DAYS

Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works	Option Factory calibration certificate	
SAUTER		HL	[d] HL	€	KERN	€
HN-D	D	170 – 960	1	**930,–**	961-131	159,–

PREMIUM ★★★


1


2


3


4

Advanced features for professional applications

Features

- Innovative touchscreen
- Automatic recognition of the impact (rebound) sensor connected to the SAUTER HMO
- Mobility: In comparison with stationary table-top devices and testing devices with an internal sensor, using the SAUTER HMO offers the highest level of mobility and flexibility
- All measurement directions possible (360°) by defining the direction of impact on the device
- USB socket for connection to the printer and charging the batteries
- 1 Hardness test block for calibration included
- Internal data memory for up to 500 values
- Mini statistics function: Displays the measure value, the average value, the difference between the maximum and minimum values, date and time
- Measurement value display: (B & C), Vickers (HV), Brinell (HB), Leeb (HL), tensile strength (MPa)
- Automatic unit conversion: The measuring result is automatically converted into all specified hardness units
- 2 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: Sensor D + DC: 2 kg with fixed coupling
- Minimum sample material thickness: Sensor D + DC: 3 mm with coupling on fixed base
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Overall dimensions W×D×H 24×83×135 mm
- Internal rechargeable battery pack, operating time up to 50 h without backlight, charging time approx. 8 h, standard
- Mains adapter included
- Net weight approx. 4,6 kg

Accessories

- External impact sensor Type D, as standard, can be reordered, SAUTER AHMO D, **€ 355,–**
- 3 External impact sensor Type DC. Short impact sensor for tests in holes or hollowed objects, SAUTER AHMO DC, **€ 480,–**
- On request: Support rings for bended test objects, SAUTER AHMR 01, **€ 370,–**
- 4 Impact body Type D, net weight approx. 0,05 kg, hardness ≥ 1600 HV, tungsten carbide, impact ball ⌀ 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 125,–**
- Connection cable impact sensor, SAUTER HMO-A04, **€ 125,–**
- Test block Type D/DC, ⌀ 90 mm (± 1 mm), net weight < 3 kg, hardness range
  790 ± 40 HL, SAUTER AHMO D02, **€ 205,–**
  630 ± 40 HL, SAUTER AHMO D03, **€ 205,–**
  530 ± 40 HL, SAUTER AHMO D04, **€ 205,–**
- Paper roll, 1 piece, SAUTER ATU-US11, **€ 17,–**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 159,–**

STANDARD: CAL BLOCK, MEMORY, IR, STATISTIC, PRINT, TOL, ACCU, 230 V, 1 DAY

OPTION: ISO +4 DAYS

Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works	Option Factory calibration certificate	
SAUTER		HL	[d] HL	€	KERN	€
HMO	D	170 – 960	1	2020,–	961-131	159,–

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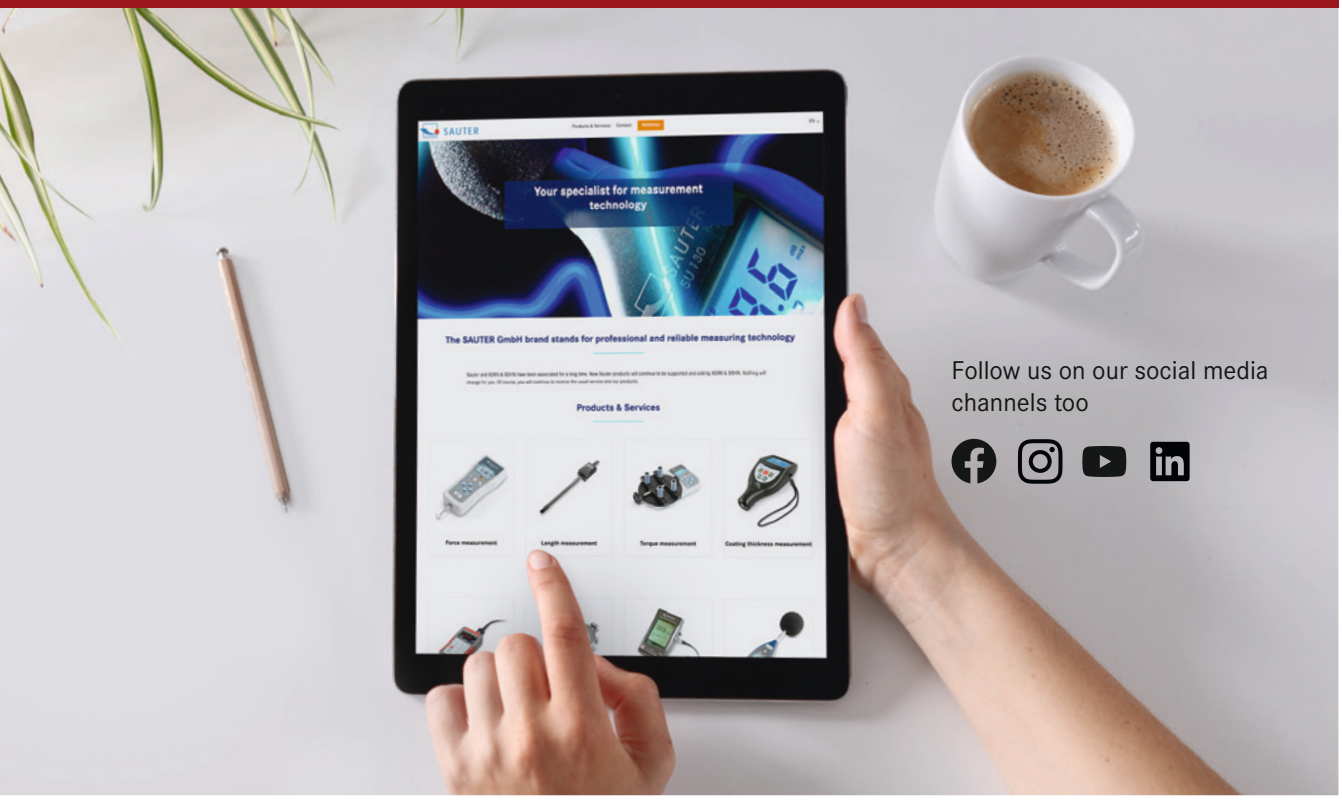

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Printed in Germany by SAUTER GmbH
z-cs-en-kp-20241

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