

HARDNESS TESTING OF METALS (LEEB)

Industry | Laboratory | Quality Assurance



SAUTER Pictograms

 Adjusting program (CAL) For quick setting of the instrument's accuracy. External adjusting weight required	 Data interface USB To connect the measuring instrument to a printer, PC or other peripheral devices	 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	 Motorised drive The mechanical movement is carried out by an electric motor
 Calibration block Standard for adjusting or correcting the measuring device	 Bluetooth* data interface To transfer data from the balance/measuring instrument to a printer, PC or other peripherals		 Motorised drive The mechanical movement is carried out by a synchronous motor (stepper)
 Peak hold function Capturing a peak value within a measuring process	 WIFI data interface To transfer data from the balance/measuring instrument to a printer, PC or other peripherals	 GLP/ISO record keeping of measurement data with date, time and serial number. Only with SAUTER printers	 Fast-Move The total length of travel can be covered by a single lever movement
 Scan mode Continuous capture and display of measurements	 Data interface infrared To transfer data from the measuring instrument to a printer, PC or other peripheral devices	 Measuring units Weighing units can be switched to e.g. non-metric. Please refer to website for more details	 Conformity assessment Models with type approval for construction of verifiable systems
 Push and Pull The measuring device can capture tension and compression forces	 Control outputs (optocoupler, digital I/O) To connect relays, signal lamps, valves, etc.	 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	 DAKkS calibration possible The time required for DAKkS calibration is shown in days in the pictogram
 Length measurement Captures the geometric dimensions of a test object or the movement during a test process	 Analogue interface To connect a suitable peripheral device for analogue processing of the measurements	 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	 Factory calibration (ISO) The time required for factory calibration is specified in the pictogram
 Focus function Increases the measuring accuracy of a device within a defined measuring range	 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)	 Battery operation Ready for battery operation. The battery type is specified for each device.	 Package shipment The time required for internal shipping preparations is shown in days in the pictogram
 Internal memory To save measurements in the device memory	 Statistics Using the saved values, the device calculates statistical data, such as average value, standard deviation etc.	 ZERO Resets the display to “0”	 Pallet shipment The time required for internal shipping preparations is shown in days in the pictogram
 Data interface RS-232 Bidirectional, for connection of printer and PC	 PC Software To transfer the measurement data from the device to a PC	 Rechargeable battery pack Rechargeable set	
 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	 Printer A printer can be connected to the device to print out the measurement data	 Integrated power supply unit Integrated, 230V/50Hz in EU. More standards e.g. GB, AUS or US on request	
 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	 Network interface For connecting the scale/measuring instrument to an Ethernet network		

*The *Bluetooth®* word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by KERN & SOHN GmbH is under license. Other trademarks and trade names are those of their respective owners.


SAUTER Models A-Z

281/285	6
283	7
287/289	5
A	
AE 500	34
AFH FAST	35
AFH FD/AFH LD	36
AFI 2.0	37
C	
CB	92
CE HSx	84
CE WT	85
CJ	96
CK	90
CP	88-89
CR	91
CT	93
CS	94-95
CW	98-100
D	
DA	41
DB	42
DC Y1 · DC Y2	87
F	
FA	8
FC	10
FC 1K-BT	21
FG	20
FH-M	13
FH-S	12
FK	9
FL-M	15
FL-S	14
FS	16-17
FS Set	18-19
H	
HB	60
HD	61
HE	58
HK-D/-DB	64
HMM/-NP	65
HMO	67
HN-D	66
HO	70-71
J	
JCS	80-81
JCT	48
JIT	78
L	
LB	39
S	
S71	24
SD-M	32
SO	73
SP	74
SU	75
SW	76-77
T	
TB	44
TB-US	50
TC	45
TD-US	51
TE	46
TF/TG	47
TI	62
TI-HE	59
TN-EE	54
TN-GOLD	52
TN-US	53
TO-EE	56
TU-US	55
TVL/-E/-O/XLS	22
TVM-N/-NL/-LB	28-29
TVO	25
TVO-S/-LD	26-27
TVP/-L	23
TVS/-LD	30-31
Y	
YKV	83


SAUTER Customer Consultants

With questions about our products and services, we will be happy to advise you:

Product Specialist Measuring Technology




Irmgard Russo
Tel. +49 7433 9933-208
info.sauter@kern-sohn.com




Mark Hauder
Tel. +49 7433 9933-310
Mobil +49 160 3378426
mark.hauder@kern-sohn.com

Product Specialist Measuring Technology




Helga Biselli
Tel. +49 7433 9933-188
info.sauter@kern-sohn.com




Ariana Sevcenco
Tel. +49 7433 9933-203
Mobil +49 151 72434692
ariana.sevcenco@kern-sohn.com

Product Specialist Measuring Technology




Andreas Vossler
Tel. +49 7433 9933-243
info.sauter@kern-sohn.com




Corinna Matthes
Tel. +49 7433 9933-215
Mobil +49 151 44568364
corinna.matthes@kern-sohn.com

UK, BE, IRE, IS, LUX, NL




Maren Neff
Tel. +49 7433 9933-132
Mobil +49 151 46143240
maren.neff@kern-sohn.com



Michael Stingel
Tel. +49 7433 9933-293
michael.stingel@kern-sohn.com

Sales & Marketing Manager



Stephan Ade
Tel. +49 7433 9933-121
Mobil +49 171 3060086
ade@kern-sohn.com

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





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*
- BalanceConnection software for flexible measured value recording or transmission, compatible with Microsoft® Excel, Access and other applications, scope of delivery: 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 \varnothing 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 120,-**
- 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, **€ 690,-**
- External impact sensor Type D, SAUTER AHMR D, **€ 610,-**
- External impact sensor Type D+15. Slim front section for holes, grooves or re-entrant surfaces, SAUTER AHMR D+15, **€ 690,-**
- External impact sensor Type DL, for very narrow surfaces (\varnothing 4,5 mm), SAUTER AHMR DL, **€ 1720,-**
- External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMR G, **€ 1720,-**
- Connection cable impact sensor, SAUTER HMO-A04, **€ 120,-**
- **■** Test block Type D/DC, \varnothing 90 mm (\pm 1 mm), net weight < 3 kg, hardness range 790 \pm 40 HL, SAUTER AHMO D02, **€ 205,-** 630 \pm 40 HL, SAUTER AHMO D03, **€ 205,-** 530 \pm 40 HL, SAUTER AHMO D04, **€ 205,-**
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132, **€ 167,-**

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
- **■** 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 and programmable limit values. The process is supported by an audible and visual signal
- Matrix display: Backlit multi-function display
- Robust metal housing
- **■** Delivered in a robust carrying case

Technical data

- Precision: \pm 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
- Battery operation, 2×1.5 V AA standard, operating time up to 200 h
- Permissible ambient temperature -10 °C/40 °C
- Overall dimensions W×D×H 132×82×31 mm

STANDARD



OPTION



Model	Sensor	Measuring range	Readout	Test block	Net weight	Price excl. of VAT ex works €	Option	
							Factory calibration certificate	
SAUTER		HL	[d] HL	Typ D/DC approx. 800 HL	approx. kg		KERN	€
HK-D	D	170 - 960	1	not standard	0,45	1420,-	961-131	167,-
HK-DB	D	170 - 960	1	standard	0,45	1520,-	961-131	167,-



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
- High levels of mobility and flexibility in comparison with stationary table-top devices and hardness testing devices with internal sensors
- 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 measuring results is included with 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)
- Batteries included, 3×1.5 V AAA, operating time up to 30 h, AUTO-OFF function to preserve the battery
- SAUTER HMM: External mains adapter for printer, as standard
- Overall dimensions W×D×H 150×80×30 mm

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 Ø 3 mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 120,-**
- 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, **€ 167,-**
- Paper roll, 1 piece, SAUTER ATU-US11, **€ 17,-**

STANDARD

CAL BLOCK

MEMORY

IR

STATISTIC

PRINT

BATT

1 DAY

HMM

OPTION

ISO

+4 DAYS

Model	Sensor	Measuring range	Readout	Net weight	Price excl. of VAT ex works €	Option	
						Factory calibration certificate	
SAUTER		HL	[d] HL	approx. kg		KERN	€
HMM	D	170 – 960	1	0,25	1180,-	961-131	167,-
HMM-NP	D	170 – 960	1	0,25	1060,-	961-131	167,-



7

“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
- Rechargeable battery pack integrated, as standard, operating time up to 16 h without backlight, charging time approx. 3 h
- Mains adapter external, standard
- Overall dimensions WxDxH 22x35x147 mm
- 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 $\varnothing 3$ mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 120,-**
- **2** Test block Type D/DC, $\varnothing 90$ 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, **€ 167,-**

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	
			[d] HL		KERN	€
SAUTER HN-D	D	170 – 960	1	930,-	961-131	167,-



Advanced features for professional applications

Features

- LCD 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: $\pm 1\%$ 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)
- Internal rechargeable battery pack, operating time up to 50 h without backlight, charging time approx. 8 h, standard
- Mains adapter included
- Overall dimensions W×D×H 24×83×135 mm
- 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, **€ 530,-**
- 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 $\varnothing 3$ mm, in accordance with standard ASTM A956-02, SAUTER AHMO D01, **€ 120,-**
- Connection cable impact sensor, SAUTER HMO-A04, **€ 120,-**
- Test block Type D/DC, $\varnothing 90$ 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, **€ 167,-**
- Paper roll, 1 piece, SAUTER ATU-US11, **€ 17,-**

STANDARD



OPTION



Model	Sensor	Measuring range	Readout	Price excl. of VAT ex works €	Option	
					Factory calibration certificate	
			[d] HL		KERN	€
SAUTER		HL				
HMO	D	170 – 960	1	2020,-	961-131	167,-

The oldest Precision Balance Factory in Germany

SAUTER GmbH

c/o KERN & SOHN GmbH

Ziegelei 1
72336 Balingen
Germany
Tel. +49 7433 9933-0
info@sauter.eu
www.kern-sohn.com

Discover the multifaceted World of Balances and Measuring Technology from SAUTER online: www.kern-sohn.com

- Full KERN & SAUTER Product Range
- Convenient 24/7 Ordering
- Selection of more than 5,000 Items across Weighing and Measuring Technology, Optical Instruments as well as Accessories and Services
- Extensive Information and useful Download Options
- Technical Product Data Sheets
- Operating Instructions
- Descriptive Image and Video Material
- Useful KERN Services
- Technical Glossary
- KERN Dealer Portal
- Practical Filter and Search Functions



Follow us on our social media
channels too



Printed in Germany by SAUTER GmbH
z-cs-en-kp-20251



CONFORMITY
ASSESSMENT
ACCORDING TO
NAWID:
2014/31/EU

