

# MEASURING TECHNOLOGY & TEST SERVICE

for industry, laboratory and quality assurance

## SAUTER service guarantee

"We at SAUTER are only satisfied when we've found the very best solution for you. After all, our heritage from the Swabian Jura Mountains and the famous inventive talent of the people that live here, means we have an exceptional reputation to maintain."

### fast

- 24 hours delivery service – order today, on its way tomorrow
- Sales & service hotline from 8:00 am to 6:00 pm

### reliable

- 2 years warranty

### diverse

- One-stop-shopping: from force gauges up to light measuring instruments – everything from one supplier
- Quick as a flash, find the product you want with the "Measuring instruments Quick-Finder"

MEASURING TECHNOLOGY & TEST SERVICE – for industry, laboratory and quality assurance

2021

PROFESSIONAL MEASURING

# 2021



## Keyword index

Coating thickness gauge, digital	50-54
Force gauge, digital	9-16
Force gauge, mechanical	8
Hardness tester, digital	65, 67-74
Hardness tester, Leeb	67-71
Hardness tester, Shore	63-66
Hardness testing, (UCI)	72-74
Impact type sensor	68, 71
Integrated calliper gauge, digital	44-46
Leeb hardness tester, digital	67-71
Length meter, digital	44-46
Light measuring instrument	76, 77
Material thickness gauge, ultrasonic	55-62
Measuring head, external	51, 53-61, 68, 71, 73-74
Occupational safety	77-82
Printer	10, 12-13, 69, 71
Shore hardness tester, analogue	64
Software	32-34
Sound level meter	78-80
Spring balances	4-7
Spring tester	30
Test stand, force-, manual	19-21
Test stand, force-, motorised	22-29
Test stand, Shore-, manual	66
Torque gauges	48-50
Wall thickness gauge	55-62

## Force measurement accessories from page 35

1-jaw-clamp attachment	35
2 wide jaw grip attachment	35
3-point bending device	37
Adapter	43
Angle bracket	35
Attachments	43
Ball-shaped head, Stainless steel	37
Belt tension clamps	36
Cable fixture	35
Cable removal clamp	38
Carrying strap	43
Connection cable	43
Door tester	43
Drum clamps	35
Flat jaw attachment	35
Force measurement clamp	35, 36, 38-41
Handle bar, stainless steel	43
Long clamp	35
Parallel jaw grip	35
Pressure disc	37
Quick clamp	36
Ring fixture	35
Roll clamps, eccentric	35
Roller tension clamps	36
Rolling-clamp attachment	35
Rope and thread tension clamps	35, 36, 38
Screw-in tension clamp	35, 39-41
Sensor	37
Small clamp	35, 38
Tensiometer attachment	43
Threaded adapters	37
Threaded pin	37
Tombstone tester	43
Wedge tension clamp	35, 36, 38, 42
Wide jaw clamp	36, 38

## SAUTER Models A-Z

281/285	6
283	7
287/289	5
AFH FAST	32
AFH FD/AFH LD	33
AFI	34
CB	91
CD	89
CE Hx	83
CE WT	84
CJ	96
CK	95
CO	94
CP	87/88
CR	90
CT	92
CS	93/94
DA	48
DC Y1 · DC Y2	49
FA	8
FC	10
FC 1K-BT	11
FH-M	13
FH-S	12
FK	9
FL-S	14
FL-M	15
FL TM	16
HB	64
HD	65
HK-D/-DB	68
HMM/-NP	69
HMO	71
HN-D	70
HO	73/74
LB	45
LD	46
SD-M	30
SO	76
SP	77
SU	78
SW	79/80
TB	51
TB-US	56
TC	52
TD-US	57
TE	53
TF	54
TG	54
THM-N/-S	22
TI	66
TN-EE	60
TN-GOLD	58
TN-US	59
TO-EE	61
TPE-N	21
TU-US	62
TVL	19
TVL-XS	18
TVM-N/-NL	26/27
TVO	23
TVO-S	24/25
TVP/-L	20
TVS	28/29
YKV	82

## KERN Pictograms



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



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



**Protection against dust and water splashes IPxx:**  
The type of protection is shown in the pictogram.



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



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



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



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



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



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



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



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



**Rechargeable battery pack:**  
Rechargeable set



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



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



**Mains adapter:**  
230V/50Hz in standard version for EU. On request GB, AUS or USA version available



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



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



**Power supply:**  
Integrated, 230V/50Hz in EU. More standards e.g. GB, AUS or USA on request



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



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



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



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



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



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



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



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



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



**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.



**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



**Verification possible:**  
The time required for verification is specified in the pictogram



**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



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



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



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



**Measuring units:**  
Weighing units can be switched to e.g. non-metric at the touch of a key. Please refer to website for more details



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



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



**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



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

Works calibration of further measuring devices

## Factory calibration for force

Situation A: Force transducer (voltage ratio, in mV/V) <sup>*1,2</sup>		Situation B: Complete force gauge (in N) <sup>*2</sup>	
KERN	Measuring range	KERN	Measuring range
<b>Tensile force:</b>			
961-161V (R)	≤ 500 N	961-161 (R)	≤ 500 N
961-162V (R)	≤ 2 kN	961-162 (R)	≤ 2 kN
961-163V (R)	≤ 5 kN	961-163 (R)	≤ 5 kN
961-164V (R)	≤ 20 kN	961-164 (R)	≤ 20 kN
961-165V (R)	≤ 50 kN	961-165 (R)	≤ 50 kN
961-166V (R)	≤ 120 kN	961-166 (R)	≤ 120 kN
<b>Compression force:</b>			
961-261V (R)	≤ 500 N	961-261 (R)	≤ 500 N
961-262V (R)	≤ 2 kN	961-262 (R)	≤ 2 kN
961-263V (R)	≤ 5 kN	961-263 (R)	≤ 5 kN
961-264V (R)	≤ 20 kN	961-264 (R)	≤ 20 kN
961-265V (R)	≤ 50 kN	961-265 (R)	≤ 50 kN
961-266V (R)	≤ 120 kN	961-266 (R)	≤ 120 kN
<b>Tensile and Compression force:</b>			
961-361V (R)	≤ 500 N	961-361 (R)	≤ 500 N
961-362V (R)	≤ 2 kN	961-362 (R)	≤ 2 kN
961-363V (R)	≤ 5 kN	961-363 (R)	≤ 5 kN
961-364V (R)	≤ 20 kN	961-364 (R)	≤ 20 kN
961-365V (R)	≤ 50 kN	961-365 (R)	≤ 50 kN
961-366V (R)	≤ 120 kN	961-366 (R)	≤ 120 kN

(R): Recalibration

For each force gauge without interface or from other manufacturers we charge a surcharge

<sup>\*1</sup> Compatibility with our amplifiers required

<sup>\*2</sup> Installation in our measuring equipment required

## Factory calibration certificates

As DAkKS calibration certificates cannot be offered for all measuring devices or measurement sizes, or where it is not customary, we then offer factory calibration certificates. These calibration certificates meet international standards and are particularly suitable as proof of exacting calibration in the monitoring of your checking equipment, for example:

- Mechanical balances (spring balances, etc.)

- Force-measuring devices up to 120 kN

- Measuring devices for layer thickness 0 µm – 2000 µm

- Hardness testing devices in accordance with Leeb tests

- Ultrasonic material thickness testing device 25 mm – 300 mm

**We carry out calibrations independent of brand.** In order to avoid any unnecessary delays when processing your order, please send us the technical documents and necessary accessories with the checking device. Calibration time 4 working days.

### One-Stop-Shopping

From force gauge to test stand – everything from one supplier.

### Downloads

For each model there is an individual brochure, user manual or pictures.

## Factory calibration certificates

KERN	Physical unit	Measuring range	
<b>Factory calibration</b>			
<b>961-161 (O)</b>	Force: Tension	≤ 500 N	
<b>961-162 (O)</b>	Force: Tension	≤ 2 kN	
<b>961-163 (O)</b>	Force: Tension	≤ 5 kN	
<b>961-164</b>	Force: Tension	10 – 20 kN	
<b>961-165</b>	Force: Tension	≤ 50 kN	
<b>961-166</b>	Force: Tension	≤ 120 kN	
<b>961-261 (O)</b>	Force: Compression	10 – 500 N	
<b>961-262 (O)</b>	Force: Compression	≤ 2 kN	
<b>961-263 (O)</b>	Force: Compression	≤ 5 kN	
<b>961-264(O)</b>	Force: Compression	≤ 20 kN	
<b>961-265(O)</b>	Force: Compression	≤ 50 kN	
<b>961-266(O)</b>	Force: Compression	≤ 120 kN	
<b>961-361 (O)</b>	Force: Tens. and Comp.	≤ 500 N	
<b>961-362 (O)</b>	Force: Tens. and Comp.	≤ 2 kN	
<b>961-363 (O)</b>	Force: Tens. and Comp.	≤ 5 kN	
<b>961-364 (O)</b>	Force: Tens. and Comp.	≤ 20 kN	
<b>961-365 (O)</b>	Force: Tens. and Comp.	≤ 50 kN	
<b>961-366 (O)</b>	Force: Tens. and Comp.	≤ 120 kN	
<b>961-167</b>	Force (for digital dynamometer KERN MAP)	≤ 130 kg	
<b>961-110</b>	Coating thickness	≤ 2000 µm F or N	
<b>961-112</b>	Coating thickness	≤ 2000 µm FN	
<b>961-113</b>	Wall thickness (ultra sound)	≤ 300 µm (in stainless steel)	
<b>961-114</b>	Wall thickness (Test blocks)	≤ 300 mm	
<b>961-170</b>	Hardness comparison plate (Shore)	For sets up to 7 plates	
<b>961-131</b>	Hardness tester (Leeb)	400 – 800 HLD	
<b>961-132</b>	Hardness comparison plate (Leeb)	Hardness comparison plate (for Leeb durometer)	
<b>961-270</b>	Hardness (UCI)	200 – 800 HV	
<b>961-150</b>	Length	≤ 300 mm	
<b>961-190</b>	Light	≤ 200000 lx	
<b>961-100</b>	Mass (Mechanical balances/spring balances)	≤ 5 kg	
<b>961-101</b>	Mass (Mechanical balances/spring balances)	> 5 – 50 kg	
<b>961-102</b>	Mass (Mechanical balances/spring balances)	> 50 – 350 kg	
<b>961-103</b>	Mass (Mechanical balances/spring balances)	> 350 – 1500 kg	
<b>961-120</b>	Torque wrench test devices	1 Nm – 200 Nm	
<b>Additional services</b>			
<b>962-116</b>	Express service with 48 hour delivery		

# Product group index 2021

<p>Force measurement · Accessories</p>		<p>4-43</p>	<p>01</p>
<p>Length measurement</p>		<p>44-46</p>	<p>02</p>
<p>Torque measurement</p>		<p>47-49</p>	<p>03</p>
<p>Coating thickness measurement</p>		<p>50-54</p>	<p>04</p>
<p>Material thickness measurement</p>		<p>55-62</p>	<p>05</p>
<p>Hardness testing of plastics (Shore)</p>		<p>63-66</p>	<p>06</p>
<p>Hardness testing of metals (Leeb)</p>		<p>67-71</p>	<p>07</p>
<p>Hardness testing of metals (UCI)</p>		<p>72-74</p>	<p>08</p>
<p>Occupational safety/Environment</p>		<p>75-80</p>	<p>09</p>
<p>System solutions Industry 4.0/Display devices</p>		<p>81-84</p>	<p>10</p>
<p>Measuring cells</p>		<p>85-97</p>	<p>11</p>
<p>Calibration service</p>		<p>98-99</p>	

# 01



## Force measurement

**Note:** All standard force-measuring devices are available with a factory calibration certificate as an option. All electronic force-measuring devices with a measuring range of  $\leq 5$  kN are also available with a DAkkS calibration certificate as an option. For details on our calibration services, please see page 98 or visit our on the internet.

### Quick-Finder

Readout [d] N	Measuring range [Max] N	Model  SAUTER	Page
0,001	2	FH 2	12
0,001	5	FH 5	12
0,002	5	FL 5	14
0,005	10	FK 10	9
0,005	10	FH 10	12
0,005	10	FL 10	14
0,01	1	289-100	5
0,01	1	283-152	7
0,01	10	FC 10	10
0,01	20	FH 20	12
0,01	25	FL 20	14
0,01	25	FK 25	9
0,01	50	FC 50	10
0,01	50	FH 50	12
0,01	50	SD 50N100	31
0,02	3	283-252	7
0,02	50	FK 50	9
0,02	50	FL 50	14
0,02	100	SD 100N100	31
0,05	5	289-102	5
0,05	6	283-302	7
0,05	10	FA 10	8
0,05	100	FH 100	12
0,05	100	FK 100	9
0,05	100	FL 100	14
0,05	200	SD 200N100	31
0,1	10	289-104	5
0,1	10	283-402	7
0,1	20	FA 20	8
0,1	100	FC 100	10
0,1	200	FH 200	12
0,1	250	FK 250	9

Readout [d] N	Measuring range [Max] N	Model  SAUTER	Page
0,1	250	FL 200	14
0,1	500	FC 500	10
0,1	500	FH 500	12
0,1	500	SD 500N100	25
0,2	25	283-422	7
0,2	30	FA 30	8
0,2	500	FK 500	9
0,2	500	FL 500	14
0,25	50	FA 50	8
0,5	50	283-483	7
0,5	100	FA 100	8
0,5	1000	FH 1K	13
0,5	1000	FK 1K	9
0,5	1000	FL 1K	14
1	100	283-502	7
1	200	FA 20	8
1	1000	FC 1K	10
1	2000	FH 2K	13
1	2500	FL 2K	15
1	5000	FH 5K	13
2	200	283-602	7
2	300	FA 300	8
2	5000	FL 5K	15
2,5	500	FA 500	8
5	500	283-902	7
5	10.000	FH 10K	13
5	10.000	FL 10K	15
10	20.000	FL 20K	15
10	20.000	FH 20K	13
10	50.000	FH 50K	13
50	100.000	FH 100K	13
1000	1	FC 1K-BT	11

New 2021 Suitable test stands for your SAUTER force measuring device can be found from page 18 onwards

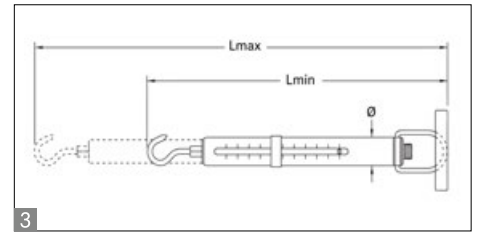
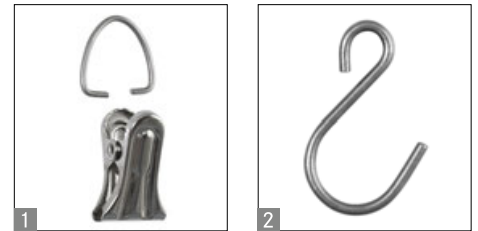
**Note:** You will find a wide range of further spring balances with gram division on our website



SAUTER 289



SAUTER 287



## Mechanical weight and force measurement with quality spring for long service life

### Features

- The very best price/performance ratio thanks to the transparent plastic housing, ideal for schools and educational institutions
- Newton scale: The SAUTER 289 range can display the results in Newtons instead of in grammes, specifically for measuring tensile forces
- Double scale: For fast or precise recording of the measurement result
- High precision: Zero-play spring bearing with integrated tare screw for highly-precise adjustment
- Non-fatigue stainless steel spring
- Abrasion-resistant, colour precision scale with high resolution
- Thanks to the rotating inner tube, the scale is always easy to read
- The bracket which is delivered as standard can easily be swapped for another suspension device, so that the system can be individually adapted to the items being weighed

### Technical data

- Measuring precision:  $\pm 0,3 \%$  of [Max]
- Tare range: 20 % of [Max]

### Accessories

- **1** Bracket for spring balances of 10–1000 g/0,1–10 N, SAUTER 287-A01
- **2** Hook for spring balances 10–1000 g/0,1–10 N, SAUTER 287-A02

STANDARD OPTION



Model	Measuring range	Division	Load support	3 Dimensions			Option	
				Lmin	Lmax	Ø	Factory calibration certificate	
SAUTER	N	N		mm	mm	mm	KERN	
289-100	1	0,01   0,05	hook	230	335	12	961-1610	
289-102	5	0,05   0,5	hook	230	335	12	961-1610	
289-104	10	0,1   0,5	hook	230	335	12	961-1610	

Model	Weighing range	Division	Load support	3 Dimensions			Option	
				Lmin	Lmax	Ø	Factory calibration certificate	
SAUTER	g	g		mm	mm	mm	KERN	
287-100	10	0,1	clip	225	330	12	961-100	
287-102	20	0,2	clip	225	330	12	961-100	
287-104	50	0,5	clip	225	330	12	961-100	
287-106	100	1	clip	225	330	12	961-100	
287-108	500	5	clip	225	330	12	961-100	
287-110	1000	10	clip	225	330	12	961-100	



SAUTER 281



SAUTER 285



Precise, mechanical spring balances in robust aluminium housing with g/kg readout

Features

- Aluminium scale tube: robust, long service life, rustproof
- Gramme/Kilogram scale: Measuring result display in grammes (SAUTER 281) or kilograms (SAUTER 285) instead of N
- Double scale: For fast or precise recording of the measurement result
- Compressive force measurement: possible using an optional pressure set, see accessories
- Drag pointer and carrying handle: as standard on all models of the SAUTER 285 range
- Suspension bow: thanks to the rotating suspension bow the scale can always be aligned to be at the very best line of sight
- High precision: Zero-play spring bearing with integrated tare screw for highly-precise adjustment

- Non-fatigue stainless steel spring
- Clip loop which can be freely rotated of the lower suspension bracket by 360° for models with [Max] ≤ 1 kg
- High-quality workmanship: Wear-resistant, colour-anodised precision scale with high resolution for accurate readout of the measuring result

Technical data

- Measuring precision: ± 0,3 % of [Max]
- Tare range: 20 % of [Max]

Accessories

- **1** Pressure-Set, suitable for models with weighing range < 2,5 kg/25 N, SAUTER 281-890
- **2** Pressure-Set, suitable for models with weighing range ≥ 5 kg/50 N, SAUTER 285-890
- **3** Clip, suitable for models with weighing range ≤ 2,5 kg/25 N, SAUTER 281-151-002
- **4** Drag pointer for spring balances, suitable for models with weighing range < 2,5 kg/25 N, SAUTER 281-051-001
- Drag pointer for spring balances, suitable for models with weighing range ≥ 5 kg/50 N, SAUTER 285-897



Model	Weighing range [Max]	Division [d]	Load support	5 Dimensions			Option	
				Lmin	Lmax	φ	Factory calibration certificate	
SAUTER	g	g		mm	mm	mm	KERN	
281-101	10	0,1	clip	220	300	12	961-100	
281-151	30	0,25	clip	220	300	12	961-100	
281-201	60	0,25	clip	220	300	12	961-100	
281-301	100	1	clip	220	300	12	961-100	
281-401	300	2	clip	220	320	12	961-100	
281-451	600	5	clip	220	320	12	961-100	
281-601	1000	10	clip	220	320	12	961-100	
281-752	2500	20	hook	225	325	12	961-100	
285-052	5000	50	hook	370	510	32	961-100	
285-102	10000	100	hook	370	510	32	961-101	
285-202	20000	200	hook	370	510	32	961-101	
285-352	35000	500	hook	370	460	32	961-101	
285-502	50000	500	hook	370	460	32	961-101	



## Precise, mechanical spring balances in robust aluminium housing with Newton readout

### Features

- Aluminium scale tube: robust, long service life, rustproof
- Newton scale: Measuring result displayed in Newton
- Double scale: For fast or precise recording of the measurement result
- Compressive force measurement: possible using an optional pressure set, see accessories
- Carrying handle as standard
- Drag pointer as standard on all models of the SAUTER 283 range with [Max] ≥ 50 N
- Suspension bow: thanks to the rotating suspension bow the scale can always be aligned to be at the very best line of sight, on all models of the SAUTER 283 range with [Max] ≥ 50 N
- High precision: Zero-play spring bearing with integrated tare screw for highly-precise adjustment
- Non-fatigue stainless steel spring
- Clip loop which can be freely rotated of the lower suspension bracket by 360°
- High-quality workmanship: Wear-resistant, colour-anodised precision scale with high resolution for accurate readout of the measuring result

### Technical data

- Measuring precision: ± 0,3 % of [Max]
- Tare range: 20 % of [Max]

### Accessories

- **1** Pressure-Set, suitable for models with weighing range < 2,5 kg/25 N, SAUTER 281-890
- **2** Pressure-Set, suitable for models with weighing range ≥ 5 kg/50 N, SAUTER 285-890
- **3** Clip, suitable for models with weighing range ≤ 2,5 kg/25 N, SAUTER 281-151-002
- **4** Drag pointer for spring balances, suitable for models with weighing range < 2,5 kg/25 N, SAUTER 281-051-001
- Drag pointer for spring balances, suitable for models with weighing range ≥ 5 kg/50 N, SAUTER 285-897

STANDARD



OPTION



Model	Measuring range [Max] N	Division [d] N	Load support	5 Dimensions			Option	
				Lmin	Lmax	∅	Factory calibration certificate	
SAUTER				mm	mm	mm	KERN	
283-152	1	0,01	clip	225	305	12	961-1610	
283-252	3	0,02	clip	225	325	12	961-1610	
283-302	6	0,05	clip	225	325	12	961-1610	
283-402	10	0,1	hook	225	325	12	961-1610	
283-422	25	0,2	hook	225	325	12	961-1610	
283-483	50	0,5	hook	370	510	32	961-1610	
283-502	100	1	hook	370	510	32	961-1610	
283-602	200	2	hook	370	510	32	961-1610	
283-902	500	5	hook	370	460	32	961-1610	



## Mechanical force gauge for for tensile and compressive force measurements with peak hold function

### Features

- Dual scale: shows Newton and kg
- Turnable display unit for an easy zero setting of the instrument
- Peak hold function by drag pointer
- Can be mounted on all manual test stands
- Zeroing by a short push of the switch
- **1** Delivered in a robust carrying case
- **2** Standard attachments: as shown below, extension rod: 90 mm

### Technical data

- Measuring precision: 1 % of [Max]
- Overall dimensions W×D×H 230×60×50 mm
- Thread: M6
- Net weight approx. 0,65 kg

### Accessories

- **2** Standard attachments, as standard, can be reordered, SAUTER AC 43
- For further accessories see page 35 onwards or our website

STANDARD

OPTION

Model	Measuring range [Max] N	Readout [d] N	Option <b>Factory calibration certificate</b>							
			Tensile force		Compressive force		Tensile/Compressive force			
			KERN		KERN		KERN			
SAUTER										
FA 10	10	0,05	961-1610		961-2610		961-3610			
FA 20*	20	0,1	961-1610		961-2610		961-3610			
FA 50	50	0,25	961-1610		961-2610		961-3610			
FA 100	100	0,5	961-1610		961-2610		961-3610			
FA 200	200	1	961-1610		961-2610		961-3610			
FA 300	300	2	961-1610		961-2610		961-3610			
FA 500	500	2,5	961-1610		961-2610		961-3610			

**1** \*ONLY WHILE STOCKS LAST!

**2** Further calibration options on request





## Robust, digital force gauge for for tensile and compressive force measurements

### Features

- Turnable display: automatic direction identification
- Secure operability due to the ergonomic design
- Peak-Hold function to capture peaks (value is "frozen" for approx. 10 seconds) or Track function mode for a continuous measurement indication
- Selectable measuring units: N, lbf, kgf, ozf
- Auto-Power-Off
- **1** Standard attachments: as shown below, extension rod: 90 mm
- Can be mounted on all SAUTER test stands up to 10 kN

### Technical data

- Measuring precision: 0,5 % of [Max]
- Internal measuring frequency: 1000 Hz
- Overload protection: 200 % of [Max]
- Overall dimensions W×D×H 195×82×35 mm
- Thread: M8
- Ready for use: Batteries included, 6×1,5 V AA
- Net weight approx. 0,72 kg

### Accessories

- **2** With one of the two optional attachments for tensile strength testing, the SAUTER FK can become a tensiometer for testing the material tension characteristics of cables, threads, wires, twine etc. (up to Ø 5 mm): Illustration shows accessories SAUTER FK-A02
- Tensiometer attachment with Safe-insert function: Pull and release to insert the running cable in between the rolls, for tensile strength testing up to 250 N, aluminium attachment, rolls can be adjusted inwards, SAUTER FK-A01
- Tensiometer kit for high-capacity tensile strength testing up to 1000 N, steel attachment and steel rolls, rolls cannot be adjusted, SAUTER FK-A02
- **1** Standard attachments, as standard, can be reordered, SAUTER AC 430
- For further accessories see page 35 onwards or our website

STANDARD

PEAK 
 PUSH/PULL 
 ZERO 
 BATT 
 230 V 
 1 DAY

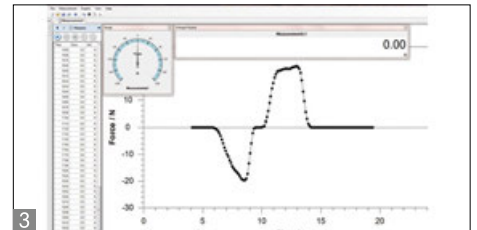
OPTION

ISO 
 +4 DAYS

Model	Measuring range [Max] N	Readout [d] N	Option <b>Factory calibration certificate</b>								
			Tensile force		Compressive force		Tensile/Compressive force				
			KERN		KERN		KERN				
SAUTER											
FK 10	10	0,005	961-1610		961-2610		961-3610				
FK 25	25	0,01	961-1610		961-2610		961-3610				
FK 50	50	0,02	961-1610		961-2610		961-3610				
FK 100	100	0,05	961-1610		961-2610		961-3610				
FK 250	250	0,1	961-1610		961-2610		961-3610				
FK 500	500	0,2	961-1610		961-2610		961-3610				
FK 1K	1000	0,5	961-1620		961-2620		961-3620				

**1** Further calibration options on request

Order Hotline: Go to back page of catalogue



## Compact force gauge for tensile and compressive force measurements

### Features

- Turnable display with backlight
- Peak-Hold function to capture peaks (measurement result will be “frozen” for a short time) or Track function mode for a continuous measurement indication
- Metal housing for durable use in harsh environmental conditions
- Capacity display: A bar lights up to show how much of the measuring range is still available
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, between 10 and 100% of [MAX], in pull and push direction. The process is supported by an acoustic and visual signal.
- Safety: If loads exceed 110 % of the measuring range, the device will give clear acoustic and visual signals
- Internal memory for up to 500 measurement values
- USB- and interface cable standard
- Data interface RS-232 standard, only for connection to the printer

- Selectable: AUTO-OFF function or permanent operation
- 1 Delivered in a robust carrying case
- Selectable measuring units: N, kgf, ozf, lbf
- 2 Standard attachments: as shown below
- Can be mounted on all SAUTER test stands up to 10 kN

### Technical data

- Measuring precision: 0,3 % of [Max]
- Internal measuring frequency: 1000 Hz
- Overload protection: 150 % of [Max]
- Overall dimensions W×D×H 145×73×34 mm
- Thread: M6
- Rechargeable battery pack integrated, standard, operating time up to 20 h without backlight, charging time approx. 4 h
- Net weight approx. 0,94 kg

### Accessories

- Data transfer software with graphic display of the measurement process 3, Force-time, SAUTER AFH FAST Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- RS-232/PC-Connecting cable to connect models from the SAUTER FC range to a printer, SAUTER FC-A01
- 2 Standard attachments, as standard, can be reordered, SAUTER AC 43
- Matrix needle printer, KERN YKN-01
- Thermal printer, KERN YKB-01N
- Statistics thermal printer, KERN YKS-01
- Label printer, KERN YKE-01
- For further accessories see page 35 onwards or our website

#### STANDARD



#### OPTION



Model	Measuring range [Max] N	Readout [d] N	Option DAKkS calibration certificate					
			Tensile force		Compressive force		Tensile/Compressive force	
			DAKkS KERN		DAKkS KERN		DAKkS KERN	
SAUTER FC 10	10	0,01	963-161		963-261		963-361	
FC 50	50	0,01	963-161		963-261		963-361	
FC 100	100	0,1	963-161		963-261		963-361	
FC 500	500	0,1	963-161		963-261		963-361	
FC 1K	1000	1	963-162		963-262		963-362	

1 Further calibration options on request

NEW



## Compact force measuring instrument

### Features

- Checking the consistency of sprayed concrete is essential to ensure the maximum strength of the concrete during the curing process
- The FC 1K-BT determines exactly the forces required for the needle to penetrate the concrete. This allows reliable conclusions to be made regarding the compressive strength of the concrete during the dry phase
- Peak hold function to capture the peak value or track function for continuous display of measurement
- Metal housing for continuous use in tough environmental conditions
- Capacity display: A bar lights up to show how much of the measuring range is still available
- Limit value function, programming of Max./Min., with output of acoustic and optical signal
- Safety: If loads exceed 110 % of the measuring range, the device will give clear acoustic and visual signals
- Internal memory for up to 500 values
- Delivered in a robust carrying case
- Turnable display with backlight
- Selectable: AUTO-OFF function or continuous operation, charge indicator

### Technical data

- Measuring frequency: 1000 Hz
- Accuracy: 0,3 % of Max
- Overload protection up to 150 % of Max
- Overall dimensions W×D×H 140×71×36
- Net weight approx. 400 g
- Selectable measuring units: N, kgf, ozf, lbf
- Robust, cleanable and portable construction
  - Built-in 1000 N force measuring cell
  - Rapid and simple changing of the penetration needle
  - Inverted display for better readability
  - Live peak force value for immediate monitoring
  - Measurement precision  $\pm 0,1 \%$
  - Memory for up to 500 measurements
  - USB interface
- Penetration needle and adapter
  - Removable if necessary
  - Needle diameter: 3 mm
  - Upper angle: 60 degrees
  - Length: 15 mm
  - Included: 15 needles

### Accessories

- Needle for concrete tester, SAUTER BT-A01
- For further accessories see page 35 onwards or our website

#### STANDARD



#### OPTION



Model	Measuring range	Readout	Option DAKkS calibration certificate			
			Tensile force		Compressive force	
			DAKkS	KERN	DAKkS	KERN
SAUTER FC 1K-BT	[Max] N 1000	[d] N 1	963-162		963-262	



## Universal digital force gauge for tensile and compressive force measurements with integrated measuring cell

### Features

- Turnable display with backlight
- **1** Can be mounted on all SAUTER test stands up to 10 kN
- Data interface RS-232, standard
- **2** Standard attachments: as shown below, extension rod: 90 mm
- **3** Delivered in a robust carrying case
- Selectable measuring units: N, kN, kgf, lbf
- Peak-Hold function to capture peaks (measurement result will be “frozen” for a short time) or Track function mode for a continuous measurement indication
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, in pull and push direction. The process is supported by an audible and visual signal.
- Auto-Power-Off
- Internal memory for up to 10 measurement values
- Mini Statistics Kit: calculates the average result from up to 10 stored measured values, as well as min., max., n

### Technical data

- Internal measuring frequency: 2000 Hz
- Transfer rate to PC: approx. 25 measured values per second
- Measuring precision: 0,5 % of [Max]
- Overload protection: 150 % of [Max]
- Overall dimensions W×D×H 66×36×230 mm
- Thread: M6
- Rechargeable battery pack integrated, standard, operating time up to 12 h without backlight, charging time approx. 4 h
- Net weight approx. 0,64 kg

### Accessories

- Data transfer software with graphic display of the measurement process, SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LD, SAUTER AFH LD  
Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- RS-232/PC connection cable to connect models from the SAUTER FH range to a PC or a printer, SAUTER FH-A01
- **2** Standard attachments, as standard, can be reordered, SAUTER AC 43
- Matrix needle printer, KERN YKN-01
- Thermal printer, KERN YKB-01N
- Statistics thermal printer, KERN YKS-01
- Label printer, KERN YKE-01
- For further accessories see page 35 onwards or our website

#### STANDARD



#### OPTION



Model	Measuring range	Readout	Option DAKkS calibration certificate						
			Tensile force		Compressive force		Tensile/Compressive force		
			DAKkS KERN		DAKkS KERN		DAKkS KERN		
SAUTER	[Max] N	[d] N							
FH 2	2	0,001	-		-		-		
FH 5	5	0,001	-		-		-		
FH 10	10	0,005	963-161		963-261		963-361		
FH 20	20	0,01	963-161		963-261		963-361		
FH 50	50	0,01	963-161		963-261		963-361		
FH 100	100	0,05	963-161		963-261		963-361		
FH 200	200	0,1	963-161		963-261		963-361		
FH 500	500	0,1	963-161		963-261		963-361		

**1** Further calibration options on request



## Universal digital force gauge for tensile and compressive force measurements with external measuring cell

### Features

- Turnable display with backlight
- Data interface RS-232, standard
- Delivered in a robust carrying case
- Selectable measuring units: N, kN, kgf, tf
- Peak-Hold function to capture peaks (measurement result will be "frozen" for a short time) or Track function mode for a continuous measurement indication
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, in pull and push direction. The process is supported by an audible and visual signal.
- Auto-Power-Off
- Internal memory for up to 10 measurement values
- Mini Statistics Kit: calculates the average result from up to 10 stored measured values, as well as, min., max., n

### Technical data

- Measuring frequency: 2000 Hz
- Transfer rate to PC: approx. 25 measured values per second
- Measuring precision: 0,5 % of [Max]
- Overload protection: 150 % of [Max]
- Dimensions housing W×D×H 66×36×230 mm
- Rechargeable battery pack integrated, standard, operating time up to 12 h without backlight, charging time approx. 4 h
- **1** Tension loops and compression plates are included in delivery
- Cable length approx 3 m

### Accessories

- Data transfer software with graphic display of the measurement process, SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LD, SAUTER AFH LD
- Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- RS-232/PC connection cable to connect models from the SAUTER FH range to a PC or a printer, SAUTER FH-A01
- Matrix needle printer, KERN YKN-01
- Thermal printer, KERN YKB-01N
- Statistics thermal printer, KERN YKS-01
- Label printer, KERN YKE-01
- For further accessories see page 35 onwards or our website

#### STANDARD



#### OPTION



Model	Measuring range [Max] kN	Readout [d] N	Dimensions load cell W×D×H mm	Thread	Option <b>DAkkS calibration certificate</b> (≤ 5 kN)/ <b>Factory calibration certificates</b> (> 5 kN)			
					Tensile force		Compressive force	
SAUTER					KERN	KERN	KERN	
FH 1K	1	0,5	76,2×51×19	M12	963-162	963-262	963-362	
FH 2K	2	1	76,2×51×19	M12	963-162	963-262	963-362	
FH 5K	5	1	76,2×51×28,2	M12	963-163	963-263	963-363	
FH 10K	10	5	76,2×51×28,2	M12	961-164	961-264	961-364	
FH 20K	20	10	76,2×51×28,2	M12	961-164	961-264	961-364	
FH 50K	50	10	108×76,3×25,5	M18 × 1,5	961-165	961-265	961-365	
FH 100K	100	50	178×152,2×51,3	M30 × 2	961-166	961-266	961-366	

**1** Further calibration options on request

Order Hotline: Go to back page of catalogue



## Universal digital force gauge with graphic-assisted display and integrated measuring cell

### Features

- Turnable display with backlight
- Peak-Hold function to capture peaks (measurement result will be “frozen” for a short time) or Track function mode for a continuous measurement indication
- Metal housing for durable usage in harsh environmental conditions
- Can be mounted on all SAUTER test stands up to 10 kN
- Capacity display: A bar lights up to show how much of the measuring range is still available
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, in pull and push direction. The process is supported by an visual signal.
- Internal memory for up to 500 measurement values
- Continuous analogue output: Linear voltage signal in dependence to the load (-2 to +2 V)
- Data interface USB standard

- Data interface RS-232 standard, only for connection to the printer
- **1** Standard attachments: as shown above
- Selectable measuring units: N, kN, kgf, lbf
- **2** Delivered in a robust carrying case

### Technical data

- Internal measuring frequency: 1000 Hz
- Transfer rate to PC: approx. 25 measured values per second
- Measuring precision: 0,2 % of [Max]
- Overload protection: 120 % of [Max]
- Overall dimensions W×D×H 175×75×30 mm
- Thread: M6
- Rechargeable battery pack integrated, standard, operating time up to 10 h without backlight, charging time approx. 8 h
- Net weight approx. 0,5 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-1.0
- Data transfer software with graphic display of the measurement process, SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LD, SAUTER AFH LD  
Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- USB cable, as standard, can be reordered, SAUTER FL-A01
- RS-232 adapter cable, SAUTER FL-A04
- Thermal printer, KERN YKB-01N
- Statistics thermal printer, KERN YKS-01
- Label printer, KERN YKE-01
- Supports for fastening of objects as well as additional accessories, please see page 35 onwards or our website

STANDARD



OPTION



Model	Measuring range	Readout	Option DAKkS calibration certificate						
			Tensile force		Compressive force		Tensile/Compressive force		
			DAKkS KERN		DAKkS KERN		DAKkS KERN		
SAUTER	[Max] N	[d] N							
FL 5	5	0,002	-		-		-		
FL 10	10	0,005	963-161		963-261		963-361		
FL 20	25	0,01	963-161		963-261		963-361		
FL 50	50	0,02	963-161		963-261		963-361		
FL 100	100	0,05	963-161		963-261		963-361		
FL 200	250	0,1	963-161		963-261		963-361		
FL 500	500	0,2	963-161		963-261		963-361		
FL 1K	1000	0,5	963-162		963-262		963-362		

**1** Further calibration options on request



Powerful digital force gauge with graphic assisted display for tensile and compressive force measurements with external measuring cell

**Features**

- Premium force gauge with external measuring cell, tension loops included in delivery
- Turnable display with backlight
- Peak-Hold function to capture peaks (measurement result will be “frozen” for a short time) or Track function mode for a continuous measurement indication
- Metal housing for durable usage in harsh environmental conditions
- Can be mounted on all SAUTER test stands
- Capacity display: A bar lights up to show how much of the measuring range is still available
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, in pull and push direction. The process is supported by an visual signal.
- Internal memory for up to 500 measurement values
- Continuous analogue output: Linear voltage signal in dependence to the load (-2 to +2 V)
- Data interface USB standard

- Data interface RS-232 standard, only for connection to the printer
- Selectable measuring units: N, kN, kgf, ozf, lbf
- Delivered in a robust carrying case

**Technical data**

- Internal measuring frequency: 1000 Hz
- Transfer rate to PC: approx. 25 measured values per second
- Measuring precision: 0,2 % of [Max]
- Overload protection: 120 % of [Max]
- Overall dimensions: W×D×H 175×75×30 mm
- Dimensions load cell W×D×H 76,2×51×19 mm
- Thread: M12
- Rechargeable battery pack integrated, standard, operating time up to 10 h without backlight, charging time approx. 8 h
- Net weight approx. 1,5 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-1.0
- Data transfer software with graphic display of the measurement process, SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LD, SAUTER AFH LD  
Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- USB cable, as standard, can be reordered, SAUTER FL-A01
- RS-232 adapter cable, SAUTER FL-A04

STANDARD



OPTION



Model	Measuring range [Max] N	Readout [d] N	Option <b>DAKkS calibration certificate</b> (≤ 5 kN)/ <b>Factory calibration certificates</b> (> 5 kN)					
			Tensile force		Compressive force		Tensile/Compressive force	
			KERN		KERN		KERN	
SAUTER FL 2K	2500	1	963-162		963-262		963-362	
SAUTER FL 5K	5000	2	963-163		963-263		963-363	
SAUTER FL 10K	10000	5	961-164		961-264		961-364	
SAUTER FL 20K	20000	10	961-164		961-264		961-364	

Further calibration options on request

Order Hotline: Go to back page of catalogue



◀ **Note:** The shown measuring cell is not included in the scope of delivery! Combine the FL TM with a measuring cell suitable for your application from the SAUTER program, such as CR P1, CR Q1, CS P1 or CS Q1

## Digital Premium force gauge with graphics display for tensile and compressive force measurements, prepared for external measuring cells

### Features

- **1** Premium force-measuring for connection of external measuring cells (measuring cell, tension loops and pressure plates not included with delivery)
- Adjustable nominal loads: 5 N, 10 N, 25 N, 50 N, 100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 50 kN
- Maximum resolution 2500 d
- Peak-Hold function to capture peaks (measurement result will be “frozen” for a short time) or Track function mode for a continuous measurement indication
- Metal housing for durable usage in harsh environmental conditions
- Capacity display: A bar lights up to show how much of the measuring range is still available
- Measuring with tolerance range (liwith-setting function): Upper and lower liwithing can be programmed individually, in pull and push direction. The process is supported by an visual signal.

- Internal memory for up to 500 measurement values
- Continuous analogue output: Linear voltage signal in dependence to the load (-2 to +2 V)
- Data interface USB standard
- Data interface RS-232 standard, only for connection to the printer
- Selectable measuring units: N, kN, kgf, lbf, ozf

### Technical data

- Internal measuring frequency: 1000 Hz
- Transfer rate to PC: approx. 25 measured values per second
- Measuring precision: 0,2 % of [Max]
- Overload protection: 120 % of [Max]
- Overall dimensions: W×D×H 175×75×30 mm
- Rechargeable battery pack integrated, standard, operating time up to 10 h without backlight, charging time approx. 8 h
- Net weight approx. 0,5 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-1.0
- Data transfer software with graphic display of the measurement process, SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LD, SAUTER AFH LD  
Force-displacement only in combination with SAUTER LB, SAUTER AFH FD
- USB cable, as standard, can be reordered, SAUTER FL-A01
- RS-232 adapter cable, SAUTER FL-A04
- Option FL-C01: Solder connector for FL TM to measuring cell and adjusting the device, SAUTER

#### STANDARD



#### OPTION



<b>Model</b>	
<b>SAUTER</b>	
<b>FL TM</b>	

Option <b>DAkkS calibration certificate</b> (≤ 5 kN) / <b>Factory calibration certificates</b> (> 5 kN)						
Option	Measuring range optional load cell	Tensile force		Compressive force		Tensile/Compressive force
Load cell		KERN		KERN		KERN
Load cells see page S. 87-97	≤ 500 N	963-161		963-261		963-361
	≤ 2 kN	963-162		963-262		963-362
	≤ 5 kN	963-163		963-263		963-363
	≤ 20 kN	961-164		961-264		961-364
	≤ 50 kN	961-165		961-265		961-365

1 Further calibration options on request





# TIPS FROM THE EXPERTS

In addition to our range of microscopes and refractometers, we also offer you a comprehensive range of professional measuring and testing technology as well as a comprehensive range of medical scales.

We will offer you reliable quality at fair prices and with the shortest delivery times. Our product specialists will give you professional advice, will work with you to find the right product and will provide comprehensive support after the purchase too.

This ensures a high level of investment security and a good feeling – KERN, the nice balance manufacturer from the wilds of Southern Germany.

*Stephan Ade, Head of Sales Balances and test service*



## “Pure competence in balances”

KERN offers you a complete, carefully-designed range of laboratory balances, analytical balances, moisture analysers, industrial scales and test weights. And all this at an extremely attractive price with the same high level of quality.

**Browse and find products in the KERN 2021 catalogue for Balances & Test service.**





## Manual test bench for precise compressive force measurement in the range up to 100 N

### Features

- **1** The redesigned, superfine spindle enables exact testing in a force-measurement range up to 100 N in particularly fine steps and, in conjunction with the fine-dosing crank, ensures safe, reliable operation
- **2** Main areas of application: Testing of low levels of force with short distances, such as, for example, testing keyboard overlays, biological samples (e.g. strength of leaves, etc.), blister packs (e.g. force required to push tablets out, etc.)
- For vertical and horizontal use
- High level of security with repeated measurements
- Large base plate with various holes for fixture mountings
- Suitable for all SAUTER force measuring device up to 100 N (not included with the delivery)

### Technical data

- Travel distance per knob rotation (one turn): 2 mm
- Overall dimensions W×D×H 160×280×380 mm
- Net weight approx. 6 kg

STANDARD



Model	Measuring range	
SAUTER	[Max] N	
TVL-XS	100	



## Manual test stand for highly accurate tensile and compressive force measurements, with length measurement

### Features

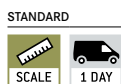
- For vertical and horizontal use
- Precise measurement result
- High level of security with repeated measurements
- Large base plate with high versatility of fastening objects
- Can be used for force gauges up to 500 N (not included)
- Hook with M6 thread as standard
- Digital length meter SAUTER LA standard:
  - Measuring range: max. 200 mm
  - Readout: 0,01 mm
  - Zero setting possible
  - Pre-length can be set manually
- **1** Model TVL and TVL with extension kit TVL-XL in size comparison

### Technical data

- Maximum travel distance: 230 mm
- Travel distance per knob rotation (stroke per one turn): 3 mm
- Extended work zone with TVL-XL: +250 mm
- Overall dimensions TVL: W×D×H 151×234×465 mm
- Net weight approx. 8,3 kg

### Accessories

- **2** Extension kit for SAUTER TVL, extends the working area by 250 mm, enabling larger test pieces to be measured. The travel distance (spindle height from base plate) remains the same: 230 mm. Overall dimensions W×D×H 200×300×250 mm, Net weight approx. 7 kg, can be retrofitted, SAUTER TVL-XL
- Digital length measuring device, measuring range 200 mm, readout 0,01 mm, details see page 45, SAUTER LB 200-2
- Mounting the length measuring device LB onto a SAUTER test stand at the factory, SAUTER LB-A02
- Data transfer software with graphical representation of the measuring process, Force-time SAUTER AFH FAST  
Force-displacement only in combination with SAUTER LB, SAUTER AFH FD



Model	Measuring range	
SAUTER	[Max] N	
TVL	500	



SAUTER TVP



SAUTER TVP-L

Manual test stands for compressive force measurements, also with digital length measurement

**Features**

- Provides quick and consistent testing
- High level of security with repeated measurements
- Provides maximum versatility and precise measuring results
- Slide construction for distance measurement
- Large base plate with high versatility of fastening objects
- Can be used for force gauges up to 500 N (not included)

**Technical data**

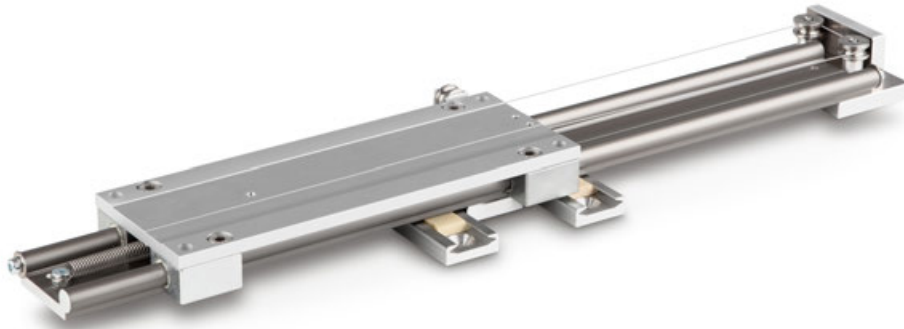
- Maximum work zone: 315 mm
- Maximum stroke length: 78 mm
- Overall dimensions W×D×H 150×233×420 mm
- Net weight approx. 10,5 kg

**TVP-L:**

- Digital length meter
  - Measuring range: 100 mm
  - Readout: 0,01 mm
  - Zero setting possible
  - Pre-length can be set manually

STANDARD

Model	Measuring range	
	[Max]	
SAUTER	N	
TVP	500	
TVP-L	500	



## Universal attachment for test benches for 90 degree peel tests

### Features

- **I** The attachment for peel tests, SAUTER TPE-N has been specially developed for peel testing up to 500 N. Typically this involves pulling a bonded material layer from a base material. As a general rule the significant value in this process is the force required to pull away the top layer from bonded material
- The attachment can be fitted onto all SAUTER force measuring test benches quickly and easily and thereby offers the highest level of flexibility in terms of travel path, measuring range, sample fixing ecc.
- The attachment has been designed so that a bonded material, e.g. adhesive tape, plasters, etc., or an appropriate basic medium can be applied to the moving carriage. The test item is fixed to the force measuring

device with a suitable clamp (both not included in the scope of delivery). Then the carriage is aligned such that the start of the test item is vertically immediately below the force measuring device. By moving the test bench upwards, the carriage is moved and the test item is peeled off at a 90-degree angle to the surface

- Suitable for all SAUTER force measuring devices up to 500 N (not included)
- Suitable for SAUTER test stands TVO 1000N500S, TVO 2000N500S, TVM 5000N230N, TVM 5000N230NL, TVS 5000N240, TVM 10KN120N, TVS 10KN100, (not included)

### Technical data

- Maximum stripping length: 200 mm
- Overall dimensions W×D×H 425×100×60 mm
- Net weight approx. 4 kg

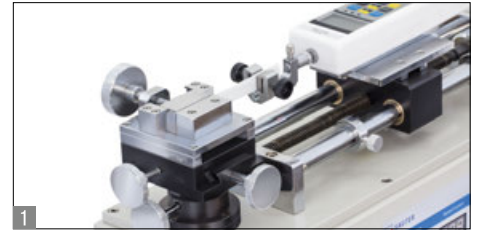
STANDARD



Model	Measuring range	
SAUTER	[Max] N	
TPE-N	500	



THM 500N500S



Motorised test stand with digital display for horizontal force measurement where highest standards are required

**Features**

- Step motor for greatest ease of use only at THM 500N500S
  - for constant speed from the smallest to the maximum load
  - allows testing at minimum speed and full load
  - for higher positioning accuracy. Precise starting and stopping, without follow-up movement, even at high speeds
  - precise adjustment of the process speed using the information shown on the display
- Easy to use
- Efficient working
- Robust design and heavy duty metal construction
- **1** Linear adjustable jaw vice
  - The clamping vice can be locked and finely adjusted sideways and up/down using the setting wheel (THM 500N500N)
- Repeat function for fatigue tests
- Digital speed display to read the process speed straightaway
- Premium operating panel:
  - Digital speed display
  - Digital repeat function display
  - Control of the test stand using PC software SAUTER AFH

- **2** Figure shows the premium operating panel of SAUTER THM 500N500N
- Solid and versatile fixing options of SAUTER force measuring devices, see accessory page 35 et seq.
- Suitable for all SAUTER force measuring devices up to 500 N (not supplied with the product)

**Technical data**

**3 THM-N:**

- Minimum distance between left and right object fastening: 30 mm
- Maximum travel distance: 220 mm (protected by electronic end switches)
- Overall dimensions WxDxH 550x170x345 mm
- Net weight approx. 35 kg

**THM-S:**

- Maximum travel distance: 240 mm (protected by electronic end switches)
- Overall dimensions WxDxH 695x235x300 mm
- Net weight approx. 48 kg

**Accessories**

- Digital length measuring device, measuring range 200 mm, readout 0,01 mm, details see page 45, SAUTER LB 200-2.
- Mounting the length measuring device LB onto a SAUTER test stand at the factory, SAUTER LB-A02
- Linear potentiometer for length measurement, measuring range: 300 mm, readout: 0.01 mm, for details see page 46, SAUTER LD 300
- Mounting the length measuring device onto a SAUTER test stand at the factory, SAUTER LD-A06
- Only THM-S:
  - Data transfer software with graphical representation of the measuring process, Force-time SAUTER AFH FAST
  - Force-displacement only in combination with SAUTER LD, SAUTER AFH LD
  - Force-displacement only in combination with SAUTER LB, SAUTER AFH FD

STANDARD		OPTION	
THM	THM-S		SOFTWARE

Model	Measuring range	Speed range	Motor
	[Max] N	mm/min	
SAUTER THM 500N500N	500	50-500	Electric motor
SAUTER THM 500N500S	500	1-500	Step motor



## Robust test stand for laboratory applications

### Features





- Motorised test stand for tension and compression tests
- Table-top design for comfortable operation
- Robust design for durable use
- Easy-to-access safety switch-off
- Upper and lower end point, can be set individually
- Automatic or manual operation mode
- Can be used for force gauges up to 500 N (e.g. SAUTER FH-S, not included, for details see page 12)

### Technical data

- Maximum tensile and compressive force: 500 N
- Maximum travel distance: 270 mm
- Speed accuracy: 2 % of [Max]
- Net weight approx. 25 kg

### Accessories

- Digital length measuring device, measuring range 300 mm, readout 0,01 mm, details see page 45, SAUTER LB 300-2.
- Mounting the length measuring device LB onto a SAUTER test stand at the factory, SAUTER LB-A02
- Data transfer software with graphic display of the measurement process, Force-time SAUTER AFH FAST  
Force-displacement, only in combination with SAUTER LB, SAUTER AFH FD

STANDARD		OPTION	
			

Model	Measuring range	Speed range	Maximum travel distance	Overall dimensions	
SAUTER	[Max] N	mm/min	mm	W×D×H mm	
TVO 500N300	500	15-300	270	236×428×570	



SAUTER TVO 1000N500S

Premium test stand in table-top version  
- with precise step motor



SAUTER TVO 2000N500S

Solid and flexible fixing options for many terminals and accessories from the SAUTER product range, see accessories on page 35 et seq.



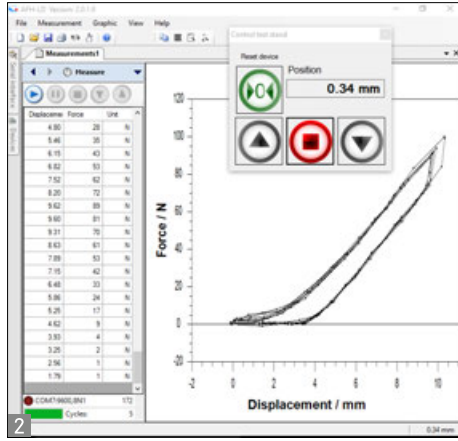
A wide range of application possibilities because of its large travelling distance



Interface for data transmission from SAUTER FH measuring device and for controlling the test stand with SAUTER AFH software



# Motorised vertical test stand SAUTER TVO-S



## Features

- Motorised test stand for tension/compression force testing
- Step motor for greatest ease of use
  - for constant speed from the smallest to the maximum load
  - allows testing at minimum speed and full load
  - for higher positioning accuracy. Precise starting and stopping, without overrun, even at high speeds
  - precise adjustment of the process speed using the information shown on the display
- Automatic or manual process mode
- **1** Premium operating panel
  - Digital speed display
  - Digital repeat function
  - **2** Control of the test stand using PC software SAUTER AFH
- Table-top version for easy operation
- Robust construction
- Fixation of SAUTER force measuring devices up to 2 kN possible
- The large diagram shows the TVO 1000N500S test stand with: SAUTER FH force measuring device, length measuring device SAUTER LD as well as mounts for the force measuring device and test objects (not supplied with the product)

## Technical data

- Speed accuracy: 0,5 % of [Max]
- Positioning accuracy when shutting down: ± 0,05 mm
- Dimensional drawing see on the internet

## Accessories

- Linear potentiometer for length measurement, measuring range: 300 mm, readout: 0.01 mm, for details see page 46, SAUTER LD 300
- Mounting the length measuring device onto a SAUTER test stand at the factory, SAUTER LD-A06
- Data transfer software with graphic display of the measurement process, Force-time SAUTER AFH FAST Force-displacement, only in combination with SAUTER LD, SAUTER AFH LD
- **3** Holder for force gauges on test stands, for comfortable reading of the measured value, SAUTER TVO-A01

STANDARD		OPTION	
STEPPER	2 DAYS	SCALE	SOFTWARE

Model	Measuring range [Max] N	Speed range mm/min	Maximum travel distance <b>2</b> mm	Overall dimensions W×D×H mm
SAUTER TVO 500N500S	500	1-500	300	236×428×570
SAUTER TVO 1000N500S	1000	1-500	500	265×405×980
SAUTER TVO 2000N500S	2000	1-500	700	300×465×1185

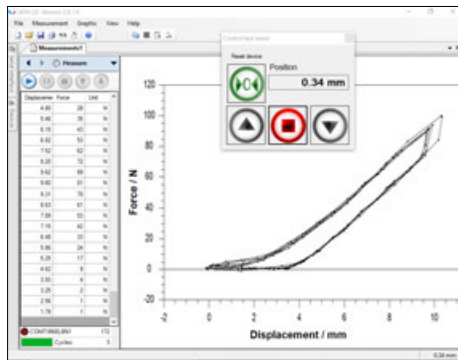
01



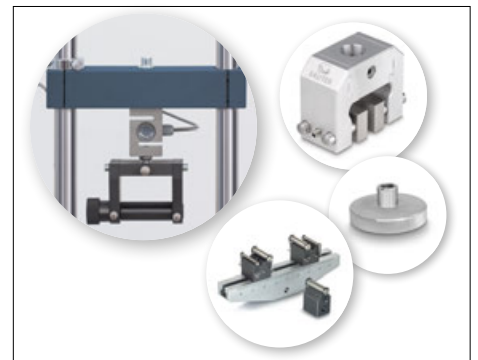
Test stand with electric motor for standard measurements



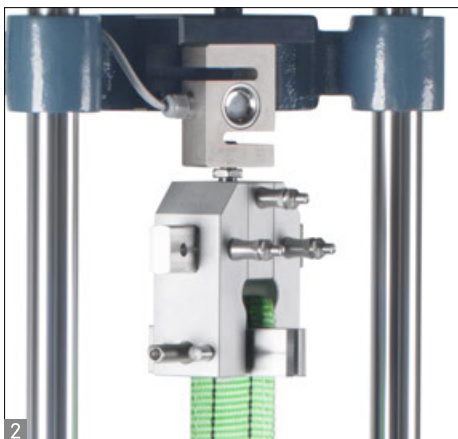
Premium operating panel  
 - Digital speed display  
 - Digital repeat function



Control of the test stand using SAUTER PC software AFH



Solid and flexible fixing options for many terminals and accessories from the SAUTER product range, see accessories on page 35 et seq.



**Features**

- Force controlled automatic switchoff, Teststop after achieving an adjusted limit load, only in combination with a SAUTER FH force gauge
- Maximum travel distance protected by electronic end switches
- SAUTER LA length measuring device as standard, to read the travel distance with a readout of 0.01 mm
- Particularly flexible mounting options for the most variable force measuring devices, such as, SAUTER FC, FH, FK, FL:
  - 1 Direct mounting of measuring devices with internal load cell up to [Max] of 500 N (only with TVM 5000N230N. and TVM 10KN120N.)
  - 2 Direct mounting of the external measuring cell on the traverse, from 1000 N measurement range and higher
  - 3 Mount for force-measuring devices from the SAUTER FH range with external measuring cell
- The large figure shows the TVM-N test stand with: SAUTER FH force measuring device, SAUTER LB length measuring device, longer guide columns as well as mount for force measuring device and test objects (not supplied with the product)





**Technical data**

- Speed accuracy: 3 % of [Max]
- Dimensional drawing see on the internet

**Accessories**

- Length measuring device SAUTER LB, SAUTER LB 300-2.
- Mounting the length measuring device LB onto a SAUTER test stand at the factory, SAUTER LB-A02
- Data transfer software with graphic display of the measurement process, Force-time SAUTER AFH FAST Force-displacement, only in combination with SAUTER LB, SAUTER AFH FD
- 3 Mount for force measuring devices from the SAUTER FH range with external load cell, SAUTER TVM-A01
- Longer columns with the same travel distance, up to 500 mm, SAUTER AFH 18

STANDARD      OPTION

Model	Measuring range [Max] N	Speed range mm/min	Maximum travel distance mm	Length of columns mm
<b>SAUTER</b>				
<b>TVM 5000N230N</b>	5000	10-230	210	635
<b>TVM 5000N230NL</b>	5000	10-230	210	1135
<b>TVM 10KN120N</b>	10000	30-120	210	1135
<b>TVM 20KN120N</b>	20000	30-120	210	1135
<b>TVM 30KN70N*</b>	30000	5-70	210	1135

1 \*ONLY WHILE STOCKS LAST!

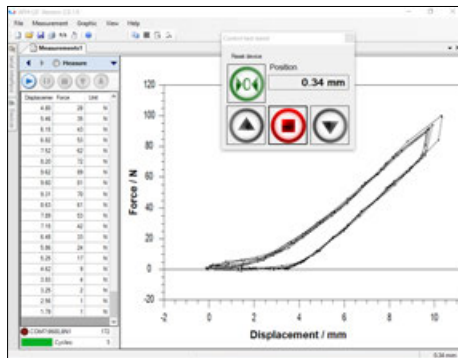


Premium test stand with step motor for precise testing up to 50 kN

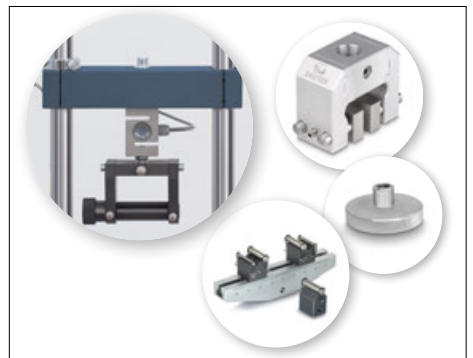


Premium operating panel

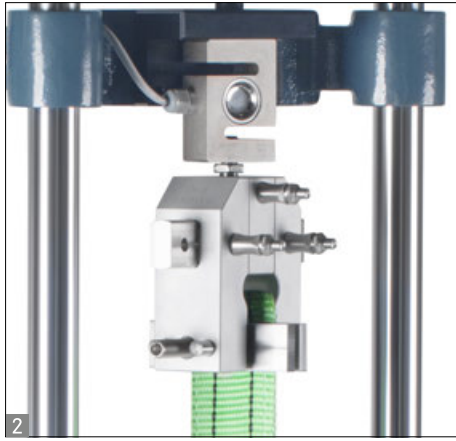
- Digital speed display: shows the displacement speed
- Digital repeat function for long-term stress test



Control of the test stand using SAUTER PC software AFH



Solid and flexible fixing options for many terminals and accessories from the SAUTER product range, see accessories on page 35 et seq.



**Features**

- Motorised test stand for tension/compression force testing
- Step motor for greatest ease of use
  - for constant speed from the smallest to the maximum load
  - allows testing at minimum speed and full load
  - for higher positioning accuracy: Precise starting and stopping, without follow-up movement, even at high speeds
  - precise adjustment of the process speed with indication on the display
- Maximum travel distance protected by electronic end switches
- Large working area by means of long guide columns as standard, which allows a wide range of fixing options
- SAUTER LA length measuring device as standard, to read the measurement range with a readout of 0.01 mm
- Particularly flexible mounting options for the most variable force measuring devices, such as, SAUTER FC, FH, FA, FK, FL:
  - 1 Direct mounting of measuring devices with internal load cell up to [Max] of 500 N (only at TVS 5000N240N and TVS 10KN100N)
  - 2 Direct mounting of the external measuring cell on the traverse, from 1000N measurement range and higher
  - 3 Mount for force-measuring devices from the SAUTER FH range with external measuring cell

- The large figure shows the TVS test stand with: SAUTER FH force measuring device, SAUTER LD length measuring device, longer guide columns as well as mount for force measuring device and test objects, not supplied with the product
- For force-displacement testing: Please order SAUTER LD length measuring device and software AFH LD as well as the factory fitting of the length measuring device with the product

**Technical data**

- Speed accuracy: 1 % of [Max]
- Positioning accuracy when shutting down: ± 0,05 mm
- Dimensional drawing see on the internet

**Accessories**

- Linear potentiometer for length measurement, measuring range: 300 mm, readout: 0.01 mm, for details see page 46, SAUTER LD 300
- Mounting the length measuring device LD onto a SAUTER test stand at the factory, SAUTER LD-A06
- Data transfer software with graphic display of the measurement process, Force-time SAUTER AFH FAST Force-displacement, only in combination with SAUTER LD, SAUTER AFH LD
- 3 Mount for force measuring devices from the SAUTER FH range with external load cell, SAUTER TVM-A01
- Longer columns with the same travel distance, up to 500 mm, SAUTER AFH 18

STANDARD      OPTION

STEPPER   
 2 DAYS   
 SCALE   
 SOFTWARE

Model	Measuring range [Max] N	Speed range mm/min	Maximum travel distance mm	Length of columns mm
<b>SAUTER</b>				
<b>TVS 5000N240</b>	5000	1-240	210	1135
<b>TVS 10KN100</b>	10000	1-200	210	1135
<b>TVS 20KN100</b>	20000	1-70	210	1135
<b>TVS 30KN80</b>	30000	1-70	210	1135
<b>TVS 50KN80</b>	50000	1-70	210	1135



Manual test stand for tensile and compressive testing of springs, medium version from 50 N up to 500 N

**Features**

- Spring tester for tension and compression tests
- Measuring device integrated in housing
- Integrated thermal printer
- Digital length measuring unit SAUTER LA standard:
  - Manual zero adjustment possible
  - Pre-length can be set manually
  - Readout: 0,01 mm
- 10 memories to print out the results or to calculate average values
- Measuring with tolerance range (limit-setting function): Upper and lower limit adjustable, in pull and push direction. The process is supported by an audible and visual signal
- Peak load display (peak hold)
- Selectable measuring units: N, lbf, kgf

**Technical data**

- Measuring precision: 0,5 % of [Max]
- Maximum stroke length: 100 mm
- Maximum work zone: 100 mm
- Overall dimensions W×D×H 300×235×620 mm

STANDARD



OPTION



Model	Measuring range [Max] N	Readout [d] N	Net weight kg	Option <b>Factory calibration certificates compression</b>	
				KERN	
SAUTER SD 50N100	50	0,01	21	961-2610	
SD 100N100	100	0,02	21	961-2610	
SD 200N100	200	0,05	21	961-2610	
SD 500N100	500	0,1	21	961-2610	



# TIPS FROM THE EXPERTS

As well as our balances and test services, we can offer you an extensive range of microscopes and refractometers.

We will offer you reliable quality at fair prices and with the shortest delivery times. Our product specialists will give you professional advice, will work with you to find the right product and will provide comprehensive support after the purchase too.

This ensures a high level of investment security and a good feeling – KERN, the nice balance manufacturer from the wilds of Southern Germany.



*Daniel Junger,  
Head of Product Management  
Optical devices*

## “No compromises with optical device”

KERN offers you a complete, carefully-designed range of biological microscopes, stereo microscopes, metallurgical microscopes, polarisation microscopes, especially flexible, preconfigured stereomicroscope sets, individually configurable stereomicroscope systems as well as microscope cameras and camera software

## “High-precision refractive index measurement for laboratories and industry”

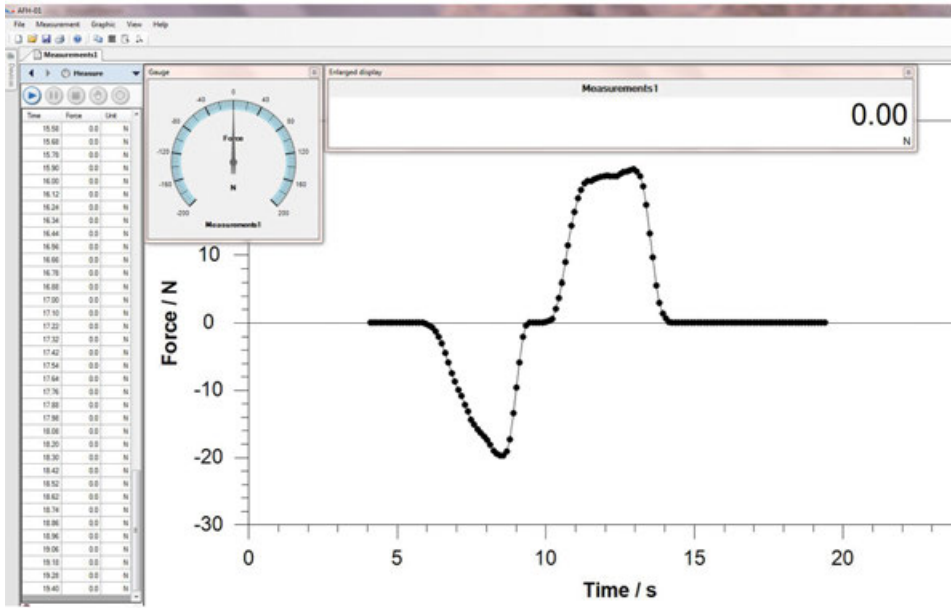
Quick and easy determination of measured values, whether on site, in production or in the laboratory, ensuring safety, consistent quality and accelerating processes. This is what KERN's analog and digital refractometers stand for and at an extremely attractive price in consistently high quality.

**All microscopes, microscope cameras, refractometers and a variety of practical accessories can be found in the new KERN Catalog of Microscopes & Refractometers 2021.**



**KERN OBE-13**

01



Time	Force	Unit
15.58	0.0	N
15.62	0.0	N
15.76	0.0	N
15.82	0.0	N
16.05	0.0	N
16.12	0.0	N
16.24	0.0	N
16.34	0.0	N
16.44	0.0	N
16.55	0.0	N
16.66	0.0	N
16.76	0.0	N
16.88	0.0	N
17.00	0.0	N
17.10	0.0	N
17.22	0.0	N
17.32	0.0	N
17.42	0.0	N
17.54	0.0	N
17.64	0.0	N
17.76	0.0	N
17.88	0.0	N
17.98	0.0	N
18.08	0.0	N
18.20	0.0	N
18.30	0.0	N
18.42	0.0	N
18.52	0.0	N
18.62	0.0	N
18.74	0.0	N
18.86	0.0	N
18.96	0.0	N
19.18	0.0	N
19.28	0.0	N
19.40	0.0	N



## Data transfer software for force-time-measurements


### Features

- Force measurements can be conducted over a very short period, i.e. seconds
- A high speed data transfer to a PC is possible (with a transfer of up to 20 data sets per second) when combining the AFH FAST with SAUTER FH, FC or FL
- AFH FAST shows the results in a Force-Time-Graph and can export the data to Microsoft Excel®
- Compatible with the following operating systems: Microsoft Windows 7/8.1/10

### Technical data

- Data recording rate approx. 20 measurements per second with SAUTER FH, FC and FL
- The following interface cables are supplied with the product
  - RS-232 für SAUTER FH (FH-A01)
  - RS-232 für SAUTER FL (FL-A04)
  - USB für SAUTER FL (FL-A01)

### Accessories

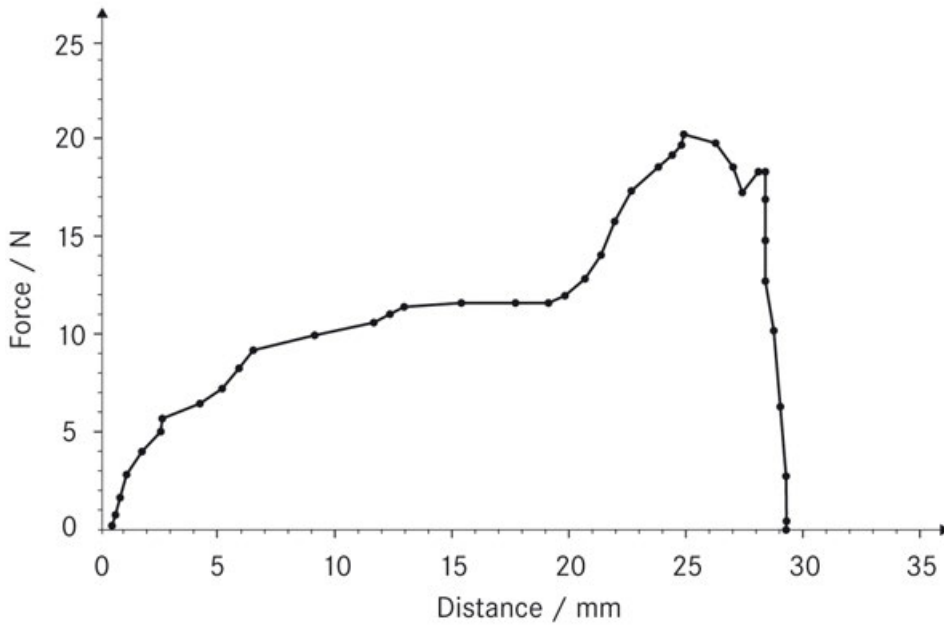
-  RS-232/USB adapter, to connect peripheral devices with USB connection, SAUTER AFH 12
- RS-232/Ethernet adapter, for connection to an IP-based Ethernet network, SAUTER YKI-01

STANDARD



<b>Model</b>	
<b>SAUTER</b>	
<b>AFH FAST</b>	





01

## Data transfer software for force-displacement-measurements

### Features

- AFH FD or LD software is designed for all applications that require the measurement of forces, depending on the displacement. Typically these are force progression graphs in penetration tests or pullout tests
- The program simultaneously requests the measurements from a force measuring device, e.g. SAUTER FH, as well as a length measuring device, e.g. 1 SAUTER LB resp. 2 SAUTER LD
- The measurements from both instruments are transferred continuously to the PC, synchronised by the AFH FD resp. AFH LD software and exported in the form of a graphic, as well as free data format for simple processing in Microsoft Excel®
- The software AFH FD resp. AFH LD is compatible with all instruments of series SAUTER FC, FH, FL
- These measuring instruments are usually used with SAUTER test stands, in particular those from the SAUTER TVM-N and TVS, range. However, it is also possible to use them with mechanical testing machines
- Further analysis functions:
  - extension of the test object
  - Tensile and compressive force
  - Endurance testing
  - Archiving the recorded data

- Scope of supply SAUTER AFH FD resp. AFH LD:
    - AFH FD resp. AFH LD software on DVD
    - User manual
    - Interface cable RS-232 for FH (FH-A01)
    - Interface cable RS-232 for FL (FL-A04)
    - Interface cable USB for FL (FL-A01)
    - AFH FD: Interface cable RS-232 for LB (LB-A01)
  - Compatible with the following operating systems: Microsoft Windows 7/8.1/10
  - 3 Order example for a complete test system:
    - FH 5K. (Digital force gauge)
    - LB 300-2. (Digital length measuring device)
    - AFH FD (Force-distance evaluation software)
    - TVM 5000N230N.\* (Test stand)
    - LB-A02\* (Mounting LB on test stand)
    - 2×AFH 12 (RS-232/USB adapter)
    - AC 04\* (Test object holder)
    - 963-163\* (Force calibration)
    - 961-150\* (Length calibration)
- \* not necessarily required for operating the AFH FD software

### SAUTER AFH LD

- Force-displacement software (like AFH FD), but only in combination with a length measuring device of SAUTER LD series

### Technical data

- Data recording rate max. 3 Hz (specially in combination with SAUTER FH and SAUTER LB)
- Data recording rate max. 25 Hz (in combination with SAUTER LD, depending on the force gauge)

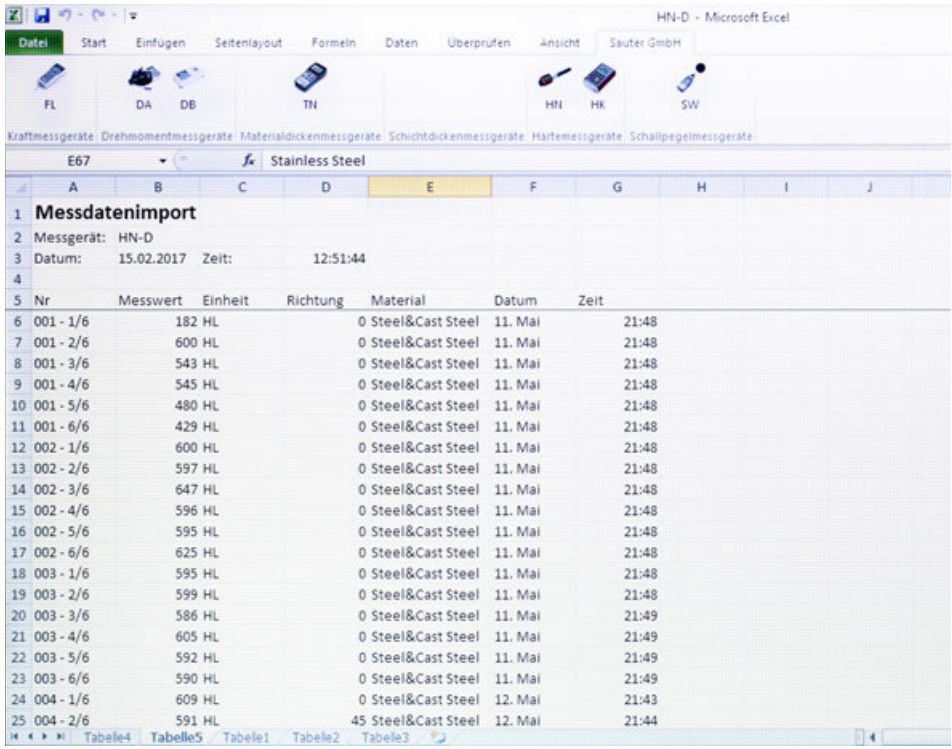
### Accessories

- Interface cable RS-232 for SAUTER FH: SAUTER FH-A01 for SAUTER LB: SAUTER LB-A01
- RS-232/USB adapter, to connect peripheral devices with USB connection, SAUTER AFH 12

STANDARD



<b>Model</b>	
<b>SAUTER</b>	
<b>AFH FD</b>	
<b>AFH LD</b>	



Plug-In for data transfer of measuring data from the measuring instrument and transfer to a PC, e.g. in Microsoft Excel®

**Features**

- Ideal for transferring measuring data from the internal data memory of the measuring instrument to Microsoft Excel®
- Solution: SAUTER AFI-1.0 plug-in for Microsoft Excel®. By doing this, an installation and learning yet another software can be avoided
- Compatible with Microsoft Excel® 2010 et seq.
- Easy handling: The measuring instrument is connected to the PC. At the push of a button, the SAUTER AFI-1.0 plug-in scans all the existing serial interfaces on the PC, finds the relevant measuring instrument and then reads the measuring data memory

**Technical data**

- Scope of supply: SAUTER AFI plug-in
- Suitable for SAUTER FL, DA, DB, HN-D, HK-D, SW series

**Accessories**










- RS-232/USB adapter to connect force measuring instruments with USB connector, SAUTER AFH 12
- RS-232/Ethernet adapter to connect force measuring instruments to an IP-based Ethernet network, SAUTER YKI-01
- RS-232/PC connection cable to connect models from the SAUTER FH range to a PC or a printer, SAUTER FH-A01
- RS-232/PC connection cable to connect models from the SAUTER FL range to a PC or a printer, SAUTER FL-A04
- USB/PC connection cable to connect models from the SAUTER FL series range to a PC or a printer, SAUTER FL-A01

STANDARD














<b>Model</b>	
<b>SAUTER</b>	
<b>AFI-1.0</b>	

## For tension tests ≤ 500 N

	<b>Long clamp</b> for tension and rupture tests up to 50 N, clamping width: 3 mm, thread: M6	<b>AC 17R</b> 1 piece <b>AC 17</b>
		2 pieces
	<b>Angle bracket</b> for tension and rupture tests up to 500 N (e.g. for cable tests), clamping width: 22 mm, thread: M6	<b>AC 01R</b> 1 piece <b>AC 01</b>
		2 pieces
	<b>Cable fixture</b> for tension and rupture tests up to 500 N	<b>AC 10S*</b> 1 piece
	<b>Fine point clamp</b> for tension and rupture tests up to 500 N, width 15 mm, clamping width: 4 mm, thread: M6	<b>AC 14R</b> 1 piece <b>AC 14</b>
		2 pieces
	<b>Fine point clamp</b> for tension and rupture tests up to 500 N, width 22 mm, clamping width: 4 mm, thread: M6	<b>AC 22R</b> 1 piece <b>AC 22</b>
		2 pieces
	<b>Ring fixture</b> for tension and rupture tests up to 500 N, diameter: 23 mm, thread: M6	<b>AC 15R*</b> 1 piece <b>AC 15*</b>
		2 pieces
	<b>Screw tension clamp</b> for 100 N for laboratory tensile force measurements, incl. jaws with pyramid grip, thread: M6	<b>AD 9001</b> 1 piece <b>PREMIUM</b> ★★★
	<b>Screw tension clamp</b> for 100 N for laboratory tensile force measurements, incl. jaws with pyramid grip <b>1</b> with adapter structure for AD-system, <b>2</b> with M6 thread	<b>AD 9005</b> 1 piece <b>PREMIUM</b> ★★★
	<b>Screw tension clamp</b> for 100 N for laboratory tensile force measurements with collar joint and jaws with pyramid grip	<b>AD 9016</b> 1 piece <b>PREMIUM</b> ★★★

## For tension tests ≤ 5000 N

	<b>Flat jaw attachment</b> for tension tests up to 5 kN (e.g. textile, paper etc.), clamping width: 4 mm, thread: M6	<b>AC 03R</b> 1 piece <b>AC 03</b>
		2 pieces
	<b>Parallel jaw grip</b> for tension and rupture tests up to 5 kN, clamping width: 5 mm, thread: M10	<b>AC 12R</b> 1 piece <b>AC 12</b>
		2 pieces
	<b>High capacity small clamp</b> for tension and rupture tests up to 5 kN, clamping width: 5 mm, thread: M10	<b>AC 16R</b> 1 piece <b>AC 16</b>
		2 pieces
	<b>2 wide jaw grip attachment</b> for tension and extraction tests up to 5 kN, clamping width: 33 mm, thread: M10	<b>AC 18R</b> 1 piece <b>AC 18</b>
		2 pieces
	<b>Rolling-clamp attachment</b> for tension and rupture tests up to 5 kN, thread: M10	<b>AC 11R</b> 1 piece <b>AC 11</b>
		2 pieces
	<b>1-jaw-clamp attachment</b> for tension and rupture tests up to 5 kN, clamping width: 3 mm, thread: M6	<b>AC 13R</b> 1 piece <b>AC 13</b>
		2 pieces
	<b>Eccentric roll clamp</b> in particular for cable tests up to 5 kN, clamping width: 9 mm	<b>AC 41</b> 1 piece
	<b>Drum clamp</b> typically for cable connector extraction tests up to 5 kN, for test objects with ∅ from 1,5 mm up to 8 mm, thread: M10	<b>AC 42</b> 1 piece
	<b>Screw-in tension clamp</b> for 1 kN, for tensile force tests, jaws with pyramid grip	<b>AD 9021</b> 1 piece <b>PREMIUM</b> ★★★
	<b>Wedge tension clamp</b> up to 5 kN, for tensile force tests, due to the wedge shape of the clamp the specimen is clamped automatically with increasing load, clamping width up to 10 mm, jaws with pyramid grip	<b>AD 9080</b> 1 piece <b>PREMIUM</b> ★★★
	<b>Rope and thread tension clamp</b> up to 1 kN, Suitable for wires up to a diameter of 2 mm, belts up to 7 mm width, incl. jaws with rubberised surface	<b>AD 9120</b> 1 piece <b>PREMIUM</b> ★★★

## For tension tests $\leq 5000$ N

01



### Rope and thread tension clamp

up to 5 kN, for clamping belts, ropes, wires, etc. Suitable for wires up to a diameter of 5 mm, belts up to 8 mm. jaws with pyramid grip

AD 9121

1 piece



### Roller tension clamp

up to 1 kN, can clamp on one side and eccentrically. suitable for tensile force tests with belts or any other soft, flexible, flat material with a maximum sample thickness of 7 mm, incl. rollers with pyramid grip, the opposite clamping surface is smooth.

Suitable for test objects up to 50 mm width

AD 9205

1 piece



### Roller tension clamp

up to 5 kN, symmetrisch und exzentrisch spannend. Suitable for tensile force tests with belts or any other soft, flexible, flat material with a maximum sample thickness of 7 mm, incl. rollers with pyramid grip

AD 9200

1 piece



### Roller tension clamp

up to 5 kN, can clamp on one side and eccentrically. Suitable for tensile force tests with belts or any other soft, flexible, flat material with a maximum sample thickness of 7 mm, incl. rollers with pyramid grip, the opposite clamping surface is smooth.

Suitable for test objects up to 50 mm width

AD 9207

1 piece



## For tension tests $> 5000$ N



### Wide jaw clamp with fixed jaws

with high-performance inner jaws out of steel, jaws with pyramid grip clamping width: 7 mm, thread: M10 up to 10 kN

AC 04

1 piece



### Wedge tension clamp

up to 10 kN, for tensile force tests, due to the wedge shape of the clamp the specimen is clamped automatically with increasing load, clamping width 10 mm, jaws with pyramid grip

AD 9085

1 piece



### Belt tension clamp

up to 20 kN, open at one end, suitable for tensile force tests with belts or any other soft, flexible, flat materials with a maximum sample thickness of 2,5 mm a test object width up to 22 mm

AD 9250

1 piece



### Belt tension clamp

up to 20 kN, suitable for tensile force tests with belts or any other soft, flexible, flat materials with a maximum sample thickness of 2,5 mm a test object width up to 80 mm

AD 9255

1 piece



## For compression tests > 500 N



**Concave force sensor** **AC 45**  
with optimised radius for the measurement particularly of arms and legs up to 1 kN, thread: M6  
1 piece



**Flat square-shaped sensor** **AC 46**  
for lateral power sensing of back, chest or arm up to 1 kN, thread: M6  
1 piece



**Round sensor** **AC 47**  
to measure particular muscle groups, such as, for example, the shoulder up to 1 kN, inner thread: M6  
1 piece



**Pressure disc** **AFH 06**  
out of aluminium, thickness 10 mm, for compression tests up to 5 kN, diam. 110 mm, outer thread: M12  
1 piece



**Pressure disc** **AC 08R**  
for compression tests up to 5 kN (e. g. plastics),  $\varnothing$  49 mm, inner thread: M10  
1 piece  
**AC 08**  
2 pieces



**Stainless steel ball-shaped head** **AC 02R**  
for compression and fracture tests up to 5 kN, (e.g. foam, glass), thread: M6/M10  
1 piece  
**AC 02**  
Ball radius: 5mm/8mm  
2 pieces



**Small 3-point bending device (steel)** **AD 9300**  
up to 10 kN, central scale 80-0-80 mm.  
1 piece  
Consisting of one support beam, two support brackets and a curved fin each with permanently fixed radii, radius of the fin 3,2 mm, radii of the support brackets 3,2 + 5 mm, other radii on request.  
Gap between the two support brackets 4-150 mm. Width of the brackets 30 mm

## For tension and compression tests



**Threaded adapters** **AFM 14**  
made of steel for SAUTER force measuring devices, clamps and test stands, external thread 1: M6, external thread 2: M12.  
1 piece  
**PREMIUM** **NEW**



**Reducing sleeve** **AFM 05**  
made of steel, for SAUTER force gauges, clamps and test stands, external thread: M10, internal thread: M6  
1 piece  
**PREMIUM** **NEW**



**Threaded pin** **AFM 20**  
made of steel for SAUTER force gauges and clamps, external thread: M6  
1 piece  
**PREMIUM** **NEW**



**Threaded pin** **AFM 22**  
made of steel for SAUTER force gauges and clamps, external thread: M6, internal thread: M8  
1 piece  
**PREMIUM** **NEW**

Numerous more adapters can be found at the Internet

## For tension tests ≤ 500 N

## For tension tests ≤ 500 N

01



### Standard small clamp

Opening width (inside the jaws): 0–7 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, the opening and closing of the jaws can be made with the rotary knob on the upper side. Presetting of the jaw opening via attached screws. Pretension due to built-in springs

AE 01

1 piece



### Cable removal clamp

Opening width (inside the jaws): 1,5–6 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, test item can simply be inserted into the appropriate recess and be tested

AE 06

1 piece



### Wide jaw clamp

Opening width (inside the jaws): 0–6 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, the opening and closing of the jaws can be made with the rotary knobs on the upper side

AE 02

1 piece



### Wedge tension clamp

Opening width (inside the jaws): 0–6 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, test item can simply be inserted into the open clamp. It closes automatically during a tensile test

AE 07

1 piece



### Belt tension clamps

Opening width (inside the jaws): 0–4 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, the opening and closing of the jaws can be made with the lever on the upper side

AE 03

1 piece



### Belt tension clamps

Opening width (inside the jaws): 0–6 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, the opening and closing of the jaws can be made with the lever on the upper side

AE 04

1 piece



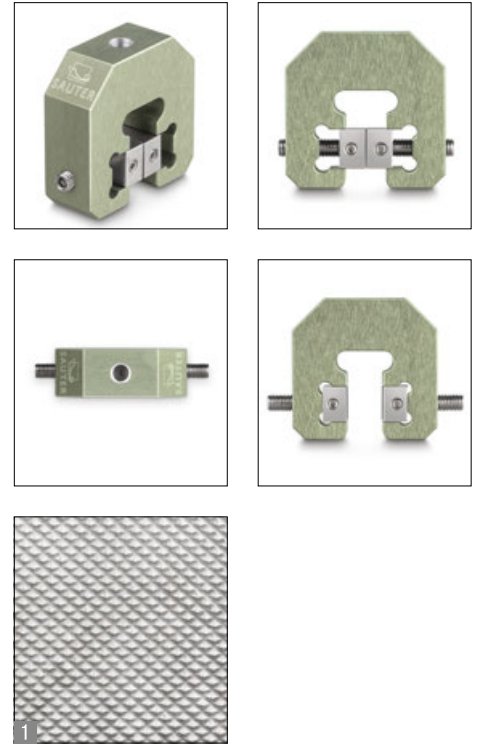
### Rope and thread tension clamps

Opening width (inside the jaws): 0–5 mm, for tensile tests up to 500 N, thread M6. Overload protection: 150 % of [Max]. Easy handling without tools, test item can simply be wrapped around the screw and fastened via the clamping screw

AE 05

1 piece





01

## Quickly fittable universal screw tension clamp for tension and compression testing for a force range up to 500 N

### Features

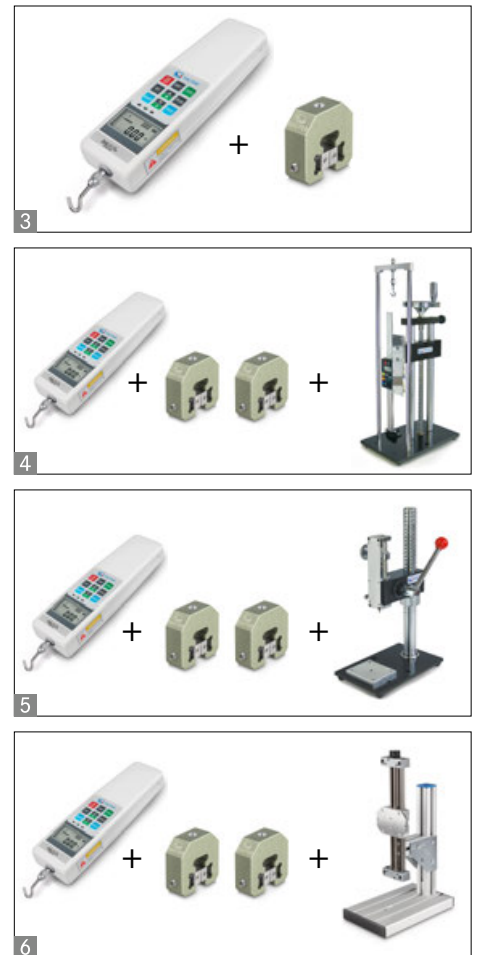
- High-quality screw tension clamp in the lower force range with an enormous flexibility for a fast adaptation to a wide variety of test objects
- Solid version for high clamp forces
- Flexible clamping width (width between the jaws) from 0-10 mm
- **1** Jaws with pyramid grip as standard, W×H 32×20 mm
- The modular construction enables a quick adaptation and cleaning of the clamp
- By means of the threaded rods with a hexagon socket, the clamp can quickly be adapted to someone's own requirements, test objects, operation environment, e.g. test stand or force gauge
- Can be used with all SAUTER force measuring devices or test stand systems
- To fix the clamp on a force gauge, there is a M6 thread on the upper side of the clamp
- For tension and compression testing up to 500 N
- Overload protection: 150 % of [Max]

- **2** Scope of supply: 1 clamp with 2 jaws with pyramid-shaped grip
- Dimensional drawings see our website

### Option

#### Bundles:

- **3** **AE 500-S01**, consisting of:
  - 1× FH 500 (further information, see page 12)
  - 1× AE 500
- **4** **AE 500-S02**, consisting of:
  - 1× FH 500 (further information, see page 12)
  - 2× AE 500
  - 1× TVL (further information, see page 19)
- **5** **AE 500-S03**, consisting of:
  - 1× FH 500 (further information, see page 12)
  - 2× AE 500
  - 1× TVP (further information, see page 20)
- **6** **AE 500-S04**, consisting of:
  - 1× FH 100 (further information, see page 12)
  - 2× AE 500
  - 1× TVL-XS (further information, see page 18)



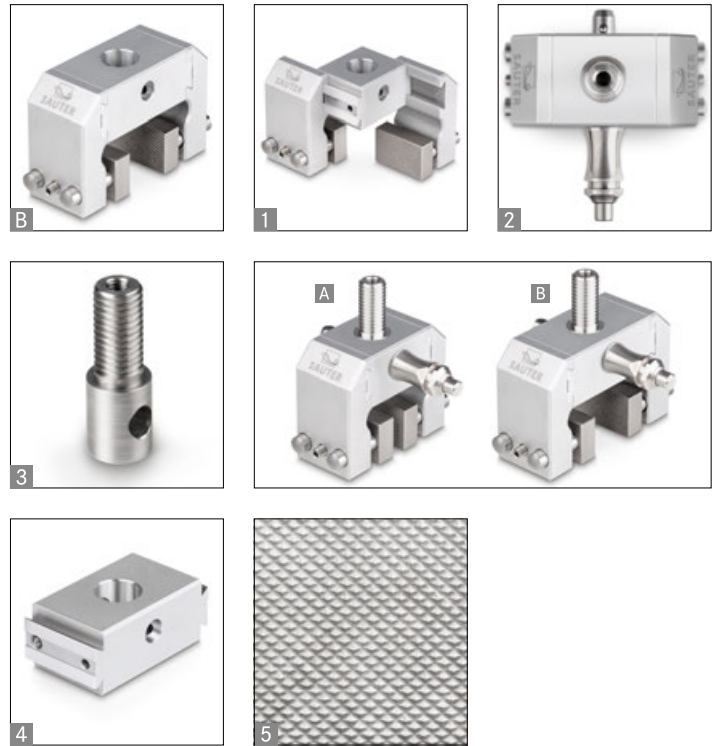
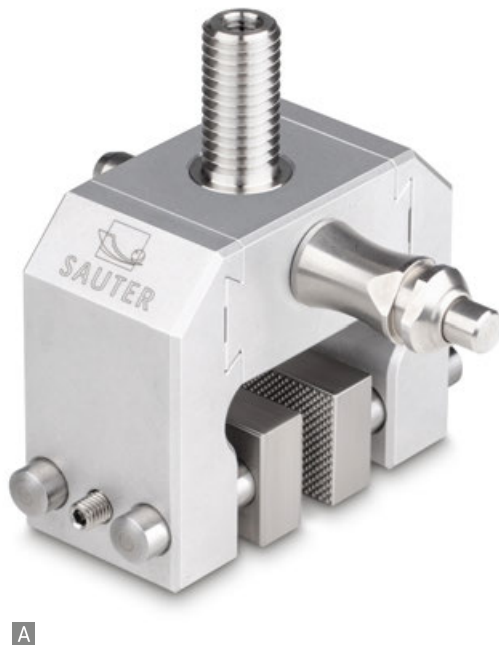
STANDARD



Model	Measuring range	Readability measuring device [d]	Scope of supplies
SAUTER	[Max] N	N	
AE 500	500	-	<b>2</b>
Bundles			
AE 500-S01 <small>NEW</small>	500	0,1	<b>3</b>
AE 500-S02 <small>NEW</small>	500	0,1	<b>4</b>
AE 500-S03 <small>NEW</small>	500	0,1	<b>5</b>
AE 500-S04 <small>NEW</small>	100	0,05	<b>6</b>

NEW New model





Quickly fittable universal screw tension clamp  
for tension and compression testing for a force range  
up to 2 kN

#### Features

- High-quality screw tension clamp in the middle force range with an enormous flexibility for a fast adaptation to a wide variety of test objects
- Solid version for high clamp forces
- Flexible clamping width (width between the jaws) from **A** 15-30mm (standard) and from **B** 15-30mm (in combination with the optional, wide central section: SAUTER AE 2K-A01)
- **5** Jaws with pyramid grip as standard, W×H 32×20 mm
- **1** The modular construction enables a quick adaptation and cleaning of the clamp
- **2** By means of the practical ball locking pin system, the clamp can be quickly adapted to ones' own demands, test objects, operational environment, e.g. test stand or force measuring device
- Can be used with all SAUTER force measuring devices or test stand systems
- For tension and compression testing up to 2 kN
- Overload protection: 150 % of [Max]
- Scope of supply: 1 clamp with middle section for widths from 0-15 mm, 1 adapter, 1 locking pin
- Dimensional drawings see our website

#### Accessories

- **3** Adapter, connection pin between clamp and load cell/measuring device as standard, M12 and M6 thread, max. load up to 10 kN, can be reordered at any time, SAUTER AE-A01
- Safety pin, stainless steel, with spring system to fix adjustable components, as standard, can be reordered at any time, SAUTER AE-A05
- **4** Wide central section for widths from 15-30 mm, SAUTER AE 2K-A01

STANDARD



1 DAY

Model	Maximum tensile/ compressive force	Range mm		Scope of supplies	
		<b>A</b>	<b>B</b> (Option)		
SAUTER AE 2K	N 2000	0-15	15-30	1 piece	↓







01

Quickly fittable universal screw tension clamp for tension and compression testing for a force range up to 10 kN

**Features**

- High-quality screw tension clamp with enormous flexibility which can be adapted quickly to a wide variety of test objects
- Solid version for high clamp forces
- Maximum clamping width (width between the jaws): 75 mm, triple lockable **A**, **B**, **C**, can be finely adjusted using threaded rods
- **5** Jaws with pyramid grip as standard, W×H 49×30 mm
- The modular design enables a quick fitting, expansion and cleaning of the clamp
- **1** By means of the practical ball locking pin system, the clamp can be quickly adapted to ones' own demands, test objects, operational environment, e.g. test stand or force measuring device.
- Can be used with all SAUTER force measuring devices or test stand systems
- For tension and compression testing up to 10 kN
- Overload protection: 150 % of [Max]
- Scope of supply: 1 clamp, 1 adapter, 2 safety pins
- Dimensional drawings see our website

**Accessories**

- **2** Adapter, connection pin between clamp and load cell/measuring device as standard, M12 thread, max. load up to 10 kN, can be reordered, SAUTER AE-A01
- **3** Safety pin, stainless steel, with spring system to fix adjustable components, as standard, can be reordered, SAUTER AE-A05
- **4** Long jaws, stainless steel, pyramid grip 2 pcs. W×H 100×30 mm, SAUTER AE-A02

STANDARD



Model	Maximum tensile/compressive force	Range mm			Scope of supplies	
		<b>A</b>	<b>B</b>	<b>C</b>		
SAUTER AE 10K	N 10000	43-75	10-43	0-10	1 piece	





Quickly adjustable wedge tension clamp for tensile tests for the force range up to 50 kN

**Features**

- Quality wedge tension clamp for safe holding of test specimens up to a force of 50 kN, due to the wedge shape of the clamp the test specimen is clamped automatically with increasing load. Thus, longer and protruding objects can be tested
- Thanks to the practical ball locking pin system, the clamp can be quickly adapted to your own requirements, test objects, operating environments, e.g. test bench or measuring device, etc.
- Solid version for high clamp forces
- Maximum clamping width (width between the jaws): 15 mm
- **4** Jaws with pyramid grip as standard
- Can be used with SAUTER TVS 50K70 and FH 50K
- For train search up to 50 kN
- Overload safety: 150 % of [Max]
- Scope of delivery: 1 clamp, 1 adapter, 1 locking pin
- Dimensional drawings see our website
- Net weight approx. 12 kg

**Accessories**

- **1** Adapter, connection pin between clamp and load cell/measuring device as standard, M18 × 1,5 thread, max. load up to 50 kN, SAUTER AE-A07
- **2** Adapter, connection pin between clamp and load cell/measuring device, M18 thread, max. load up to 50 kN, SAUTER AE-A08
- **3** Safety pin, stainless steel, with spring system to fix adjustable components, SAUTER AE-A06

STANDARD



Model	Maximum tensile/compressive force	Range	Scope of supplies
SAUTER	N	mm	
AE 50K-K*	50000	0-15	1 piece

**!** \*ONLY WHILE STOCKS LAST

## Attachments



**Standard attachments kit** **AC 43**  
for all force gauges FA, FH,  
FL and FC, thread: M6  
10-500 N  
6 items



**Standard attachments kit** **AC 430**  
for force gauge FK,  
thread: M8  
10-1000 N  
6 items



**Tensiometer attachment** **FK-A01**  
optional for all FK models from  
FK 10 up to FK 250  
1 piece



**Tensiometer attachment** **FK-A02**  
for high-capacity tensile strength  
tests up to FK 500 and FK 1K  
1 piece

## Special solutions



**Stainless steel handle bar** **AFH 04**  
with rubber grip for safe handling,  
AFH 04 suitable for FA, FH, FL  
AFK 02 suitable for FK, FC  
1 piece



**Stainless steel handle bar** **AFH 05**  
with rubber grip for FH, FL with  
external sensor, thread: M12  
1 piece



**Door tester** **AFH 03**  
Handle (length: 300 mm) and two round  
force receptor plates (ø 85 mm) as an  
option to FH 1K up to FH 5K for the safe  
testing of clamping forces (not approved  
to DIN 18650 or similar), up to 5 kN  
1 piece



**Tombstone tester** **FA 500G**  
for testing the stability of tombstones  
according to VSG 4.7 up to 500 N on  
the basis of FA (included),  
Option: Factory calibration  
961-261  
1 piece



**Tombstone tester** **FL 500G**  
for testing the stability of tombstones  
according to VSG 4.7 on the basis of FL  
(included), up to 500 N: FL 500G  
Option: DAkkS calibration for  
FL 500G: 963-261  
1 piece

## Interface cables



**RS-232/PC connection cable** **FH-A01**  
to connect models from the SAUTER FH  
range to a PC or a printer  
1 piece



**RS-232/PC connection cable** **FL-A04**  
to connect models from the SAUTER FL,  
DA and DB range to a PC or a printer  
1 piece



**USB/PC connection cable** **FL-A01**  
to connect models from the SAUTER FL,  
DA and DB range to a PC or a printer  
1 piece



**RS-232/PC connection cable** **LB-A01**  
to connect models from the SAUTER LB  
range to a PC  
1 piece



**RS-232/USB adapter** **AFH 12**  
to connect peripheral devices with  
USB interface, suitable for all balances  
and measuring instruments with RS 232  
output, length 0,95 m, scope of supply:  
adapter, CD with driver  
1 piece



**RS-232 connection cable** **FC-A01**  
to connect models from the SAUTER FC  
to a printer  
1 piece

## Other



**Carrying strap** **AC 35\***  
for easy and safe transportation  
of the tombstone tester during  
the testings  
1 piece

# 02



## Length measurement

Measuring geometric characteristics is one of the most common tests when carrying out material testing. The most well-known tool is the calliper gauge or the micrometer gauge (micrometer).

In this area of measurement, SAUTER confines itself to integrated calliper gauges which can be used in combination with deforming material testing.

Very often, the issue of material testing relates to a force which is exerted in connection with a specific deformation, i.e. expansion or compression of the test item.

In these cases, the force must be measured or recorded in relation to the distance travelled by the test item during the test.

Integrated calliper gauges serve to capture this distance. They are typically fitted in test stands, machines or plant.

As a guide, the following has been assembled as a sample system for a typical material test stand:

- Length measuring device, e.g. LB 300-2
- Calibration length measuring device, e.g. 961-150
- Test stand, e.g. TVM-N
- Fitting to test stand, e.g. LB-A02
- Data transfer software, e.g. AFH FD
- Force gauges, e.g. FH
- Calibration Force gauges, e.g. 961-162
- 2× RS-232/USB adapter, e.g. AFH 12

## Quick-Finder

Readout [d] mm	Measuring range [Max] mm	Model  SAUTER		Page
0,01	200	LB 200-2		45
0,01	300	LB 300-2		45
0,01	300	LD 300		46
0,01	500	LB 500-2		45



## Distance measurement directly in machines or sites with RS-232 interface

### Features

- Digital sliding calliper with a superior precision even at high operation speed
- Easy mounting to machine tools, conveyer, test stands etc.
- Zeroing, pre-added and pre-reduced length as well as switching the unit can be done manually
- Data interface RS-232, standard
- Selectable measuring units: mm, inch

### Technical data

- Dimensions housing W×D×H 77×43×34 mm
- Battery operation, batteries standard (3 V CR2032)

### Accessories

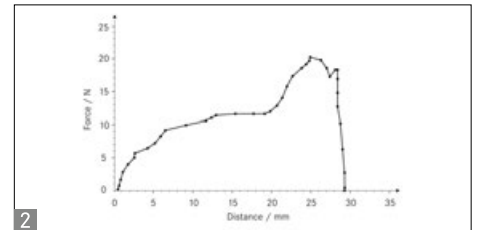
- RS-232/PC connection cable, SAUTER LB-A01
- Mounting the length measuring device LB onto a SAUTER test stand at the factory, SAUTER LB-A02

STANDARD				OPTION	
RS 232	ZERO	BATT	1 DAY	SOFTWARE	ISO +4 DAYS

Model	Measuring range [Max] mm	Readout [d] mm	Direction of measurement	Option Factory calibration certificate	
				KERN	
SAUTER					
LB 200-2	200	0,01	vertical	961-150	
LB 300-2	300	0,01	vertical	961-150	
LB 500-2	500	0,01	vertical	961-150	



PREMIUM  
★ ★ ★



## Linear potentiometer for length measurement

### Features

- This linear displacement sensor, with its lengthways coupling without rods, is specially constructed for accurate recording of distances
- By means of its compact design it is also suitable for high processing speeds
- 1 Can be used in all electrical SAUTER force testing systems to determine distances e.g. within the scope of tensile or pressure testing
- Long service life: on average up to  $100 \times 10^6$  cycles
- High data collection speed
- High-resolution linear position sensor with 65,000 points over the whole measuring range
- Data transfer box with 16-bit AD converter for high resolution and speed
- 2 You will need the SAUTER AFH LD software to read and evaluate data. This allows clear force-displacement analyses
- Scope of supply: Linear potentiometer, Data transfer box, mains adapter, USB cable

### Technical data

- Measuring precision:  $\pm 0,5 \%$  of [Max]
- Reproducibility  $< 0,03 \text{ mm}$
- Internal measuring frequency: 100 Hz
- Overall dimensions WxDxH 449x68x38 mm
- Cable length USB approx. 1,5 m
- Cable length mains adapter approx. 1,2 m
- Net weight approx. 0,7 kg

### Accessories

- Mounting the length measuring device LD onto a SAUTER test stand at the factory, SAUTER LD-A06
- 2 Force-displacement data transfer software with graphical representation of the measuring process, only in combination with SAUTER LD, SAUTER AFH LD

STANDARD



Model	Measuring range	Readout	Direction of measurement
SAUTER	[Max] mm	[d] mm	
LD 300	300	0,01	vertical/horizontal



## Torque measurement

There is a fundamental differentiation here between the measurement of static and dynamic rotary forces.

Dynamic rotary force measurement is typically carried out using torque sensors on test objects which are rotated – during the movement.

Static rotary force measurement, on the other hand, is always carried out when the item is at rest.

The SAUTER range includes static torque measuring devices for determining the force expended when opening rotary or screw caps of bottles.

Further typical applications of static torque measuring devices are testing of assembly tools for screws and nuts, in particular torque keys and mechanical assembly tools such as cordless electric screw drivers.

### Quick-Finder

Measuring range [Max] Nm	Readout [d] Nm	Model		Page
		<b>SAUTER</b>		
0.5	0,0001	<b>DB 0.5-4</b>		49
1	0,0002	<b>DB 1-4</b>		49
1	0,0002	<b>DA 1-4</b>		48
5	0,001	<b>DB 5-3</b>		49
5	0,001	<b>DA 5-3</b>		48
10	0,002	<b>DB 10-3</b>		49
10	0,002	<b>DA 10-3</b>		48
20	0,005	<b>DB 20-3</b>		49
50	0,01	<b>DB 50-2</b>		49
100	0,02	<b>DB 100-2</b>		49
200	0,05	<b>DB 200-2</b>		49
500	0,05	<b>DA 500-2</b>		48



## Comfortable testing of screw tops, e.g. bottles, jars

### Features

- **1** Optimised for torque testing of bottles, jars and other packaging with screw tops with a minimum diameter of 15 mm and a maximum diameter of 160 mm, in the food industry and pharmaceutical industry, as well as in the manufacturing of cosmetics such as, for example, lipsticks, etc.
- **2** Quick pin system: The four bottle mounts (holders) are pushed in, instead of being screwed in, to save time. This allows you to reconfigure quickly for other bottle sizes
- Metal housing for continuous use in tough environmental conditions
- **3** Capacity display: A bar lights up to show how much of the measuring range is still available.
- **3** LCD graphics display with backlight
- Rubber feet with anti-slip feature
- Scope of delivery: four bottle mounts with rubber coat, sturdy carrying case
- Internal data memory saves up to 500 measurements. The memory contents can be transferred to the PC using optional software
- **4** USB and RS-232 data interfaces standard
- Peak hold function to capture the peak value or Track function for continuous display of measurement
- Can be used in both directions of rotation
- 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
- AUTO-OFF function

### Technical data

- Selectable units: Nm, lbf-in, kgf-cm, kgf-m, ft-lbf
- Measuring precision:  $\pm 0,5\%$  of [Max]
- Measuring frequency: 1000 Hz
- Usable measuring range: 5–100 % of [Max]
- Overload protection: 150 % of [Max]
- Rechargeable battery pack integrated, standard, operating time up to 18 h without backlight, charging time approx. 14 h
- Overall dimensions W×D×H 250×160×100 mm
- Net weight approx. 3 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-1.0
- Force-time data transfer software with graphic display of the measurement process, SAUTER AFH FAST
- USB/PC connection cable, standard, SAUTER FL-A01
- RS-232/PC connection cable, SAUTER FL-A04

#### STANDARD



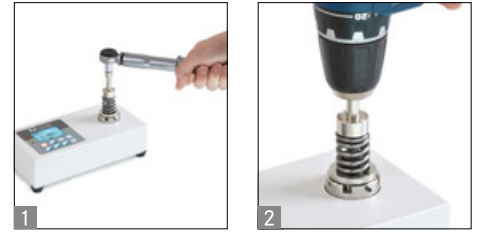
#### OPTION



Model	Measuring range [Max] Nm	Readout [d] Nm	Diameter test object mm		Option Factory calibration certificate	
					KERN	
SAUTER DA 1-4	1	0,0002	15–160	↓	961-120	
DA 5-3	5	0,001	15–160	↓	961-120	
DA 10-3	10	0,002	15–160	↓	961-120	







03

## Convenient way to test the torque of tools

### Features

- **1** Particularly suitable for testing torque wrenches, electric hand screwdrivers and cordless screwdrivers
- **2** Torque pick-up system for dynamic testing of electric screwdrivers (from SAUTER DB 0.5-4 to DB 50-2)
- Metal housing for continuous use in tough environmental conditions
- Capacity display: A bar lights up to show how much of the measuring range is still available.
- LCD graphics display with backlight
- Rubber feet with anti-slip feature at SAUTER DB 0.5-4 up to DB 10-3
- **3** Stable mounting plate for solid fixation at SAUTER DB 20-3 up to DB 500-2
- USB and RS-232 data interfaces standard
- Scope of delivery: Torque pick-up, sturdy carry case, mounting plate (models with [Max] ≥ 20 Nm)
- Internal data memory saves up to 500 measurements. The memory contents can be transferred to the PC using optional software
- Peak hold function to capture the peak value or Track-Funktion for continuous display of measurement
- Can be used in both directions of rotation
- 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
- AUTO-OFF function

### Technical data

- Backlit LCD graphics display
- Units can be selected: Nm, lbf-in, kgf-cm, kgf-m, ft-lbf
- Measuring precision: ± 0,5 % of [Max]
- Measuring frequency: 1000 Hz
- Usable measuring range: 5–100 % of [Max]
- Overload protection: 150 % of [Max]
- Rechargeable battery pack integrated, standard, operating time up to 18 h without backlight, charging time approx. 14 h
- Overall dimensions W×D×H 200×100×50 mm
- Net weight approx. 3 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-1.0
- Force-time data transfer software with graphic display of the measurement process, SAUTER AFH FAST
- USB/PC connection cable, standard, SAUTER FL-A01
- RS-232/PC connection cable SAUTER FL-A04

STANDARD

OPTION

Model	Measuring range [Max] Nm	Readout [d] Nm	Tool fitting mm/Inch	Option	
				Factory calibration certificate	KERN
SAUTER					
DB 0.5-4	0,5	0,0001	20 mm & 3/8"	↓	961-120
DB 1-4	1	0,0002	20 mm & 3/8"	↓	961-120
DB 5-3	5	0,001	20 mm & 3/8"	↓	961-120
DB 10-3	10	0,002	20 mm & 3/8"	↓	961-120
DB 20-3	20	0,005	20 mm & 3/8"	↓	961-120
DB 50-2	50	0,01	20 mm & 3/8"	↓	961-120
DB 100-2	100	0,02	3/8"	↓	961-120
DB 200-2	200	0,05	1/2"	↓	961-120
DB 500-2	500	0,05	3/4"	↓	961-120



# 04



## Coating thickness measurement

Measurement of coating thicknesses is known from, for example, the paint measurement for coating thickness at cars. In fact, these measurements are used much more widely in industrial applications. This is where the thickness of the surface finish is measured, such as galvanisation, zinc coating etc, or also lacquers.

Fundamentally there are two measuring principles for determining coating thickness:



**Typ F:** Non-magnetic coatings on magnetic metals, such as iron or steel (magnetic induction principle). Here are some sample material combinations:

- 1) [aluminium, chrome, copper, rubber, lacquer] on
- 2) [steel, iron, alloys, magnetic s tainless steel]

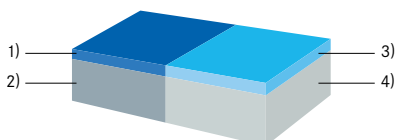


**Typ N:** Insulating coatings on non-magnetic metals, such as aluminium (eddy current principle). Here are some sample material combinations:

- 3) [lacquer, paints, enamel, chrome, plastics] on
- 4) [aluminium, brass, sheet metal, copper, zinc, bronze]



**Typ FN:** All coatings as for type F and N on all metals as for type F and N (combination of magnetic induction and eddy current principle)



## Quick-Finder

Readout [d] µm	Measuring range [Max] µm	Model  SAUTER	Page
0,1   1	100   1000	<b>TB 1000-0.1F</b>	51
0,1   1	100   1000	<b>TB 1000-0.1N</b>	51
0,1   1	100   1000	<b>TB 1000-0.1FN</b>	51
0,1   1	100   1250	<b>TC 1250-0.1F</b>	52
0,1   1	100   1250	<b>TC 1250-0.1N</b>	52
0,1   1	100   1250	<b>TC 1250-0.1FN</b>	52
0,1   1	100   1250	<b>TC 1250-0.1FN-CAR</b>	52
0,1   1	100   1250	<b>TE 1250-0.1F</b>	53
0,1   1	100   1250	<b>TE 1250-0.1N</b>	53
0,1   1	100   1250	<b>TE 1250-0.1FN</b>	53
0,1   1	100   1250	<b>TF 1250-0.1FN</b>	54
0,1   1	100   1250	<b>TG 1250-0.1FN</b>	54
0,1   1	100   2000	<b>TB 2000-0.1F</b>	51



## Practical measuring device for measuring the thickness of layers for daily use

### Features

- External sensor for difficult-to-access measuring points
- Base plate and calibration foils included
- **1** Delivered in a robust carrying case
- Offset-Accur: This function allows you to adjust the instrument precisely on the locally measured range by a two-point calibration. This results in a superior accuracy of approx. 1 % of the measured value
- Selectable measuring units: mm,  $\mu\text{m}$ , mil
- Auto-Power-Off
- SAUTER TB 2000-0.1F: Specifically designed for the automobile industry, Precision: Standard 5 % of measured value

### Technical data

- Measuring precision:
  - Standard: 3 % of measured value
  - Offset-Accur: 1 % of measured value
- Smallest sample surface (radius)
- Type F:
  - Convex: 1,5 mm
  - Flat: 6 mm
  - Concave: 25 mm
- Type N:
  - Convex: 3 mm
  - Flat: 6 mm
  - Concave: 50 mm
- Minimum thickness of base material: 300  $\mu\text{m}$
- Dimensions WxDxH 69x32x161 mm
- Battery operation, batteries standard  
4x 1.5 V AA
- Net weight approx. 0,26 kg

### Accessories

- **2** Calibration foils for increased measuring accuracy (covers the range from 20 up to 2000  $\mu\text{m}$ , with < 3 % tolerance), sim. to illustration, SAUTER ATB-US07
- **3** External sensor, Type F, SAUTER ATE 01
- **4** External sensor, Type N, SAUTER ATE 02



Model	Measuring range [Max] $\mu\text{m}$	Readout [d] $\mu\text{m}$	Test object	Option Factory calibration certificates	
				KERN	
<b>SAUTER</b>					
<b>TB 1000-0.1F</b>	100   1000	0,1   1	Non-magnetic coatings on iron, steel (F)	961-110	
<b>TB 2000-0.1F</b>	100   2000	0,1   1	Non-magnetic coatings on iron, steel (F)	961-110	
<b>TB 1000-0.1N*</b>	100   1000	0,1   1	Insulating coatings on non-magnetic metals (N)	961-110	
<b>TB 1000-0.1FN</b>	100   1000	0,1   1	Combination instrument: F/N	961-112	

**1** \*ONLY WHILE STOCKS LAST



Robust measuring device for layer thickness – compact and easy to use

**Features**

- Ergonomic design for easy handling
- Data interface RS-232, standard
- Base plate and calibration foils included
- **1** Delivered in a robust carrying case
- Offset-Accur: This function allows you to adjust the instrument precisely on the locally measured range by a two-point calibration. This results in a superior accuracy of approx. 1 % of the measured value
- Selectable measuring units:  $\mu\text{m}$ , mil

**2 SAUTER TC 1250-0.1FN-CAR:**

- Specifically designed for the automobile industry
- Automatic recognition of measuring mode (F or N): “point and shoot”
- Simple and convenient 1-key operation

**Technical data**

- Measuring precision:
  - Standard: 3 % of measured value or  $\pm 2,5 \mu\text{m}$
  - Offset-Accur: 1 % of measured value or  $\pm 1 \mu\text{m}$
- Smallest sample surface (radius)
- Type F:
  - Convex: 1,5 mm
  - Flat: 6 mm
  - Concave: 25 mm
- Type N:
  - Convex: 3 mm
  - Flat: 6 mm
  - Concave: 50 mm
- Minimum thickness of base material: 300  $\mu\text{m}$
- Dimensions WxDxH 65x28x131 mm
- Battery operation, batteries standard 4x 1.5 V AAA
- Net weight approx. 81 g

**Accessories**

- Data transfer software, interface cable included, SAUTER ATC-01
- Calibration foils for increased measuring accuracy (covers the range from 20 up to 2000  $\mu\text{m}$ , with < 3 % tolerance), SAUTER ATB-US07

STANDARD

CAL.BLOCK FOCUS RS 232 ZERO BATT 1 DAY

OPTION

SOFTWARE +4 DAYS ISO

Model	Measuring range [Max] $\mu\text{m}$	Readout [d] $\mu\text{m}$	Test object	Option Factory calibration certificates	
				KERN	
SAUTER TC 1250-0.1F	100   1250	0,1   1	Non-magnetic coatings on iron, steel (F)	961-110	
TC 1250-0.1N*	100   1250	0,1   1	Insulating coatings on non-magnetic metals (N)	961-110	
TC 1250-0.1FN	100   1250	0,1   1	Combination instrument: F/N	961-112	
TC 1250-0.1FN-CAR	100   1250	0,1   1	Combination instrument: F/N	961-112	

**1** \*ONLY WHILE STOCKS LAST



Ergonomic design and external sensor for highest ease of use

**Features**

- External sensor for difficult-to-access measurements
- Data interface RS-232, standard
- Base plate and calibration foils included
- **1** Delivered in a robust carrying case
- Offset-Accur: This function allows you to adjust the instrument precisely on the locally measured range by a two-point calibration. This results in a superior accuracy of approx. 1 % of the measured value
- Selectable measuring units:  $\mu\text{m}$ , mil
- Auto-Power-Off

**Technical data**

- Measuring precision:
  - Standard: 3 % of measured value or  $\pm 2,5 \mu\text{m}$
  - Offset-Accur: 1 % of measured value or  $\pm 1 \mu\text{m}$
- Smallest sample surface (radius)
- Type F:
  - Convex: 1,5 mm
  - Flat: 1,5 mm
  - Concave: 25 mm
- Type N:
  - Convex: 3 mm
  - Flat: 5 mm
  - Concave: 50 mm
- Minimum thickness of base material: 300  $\mu\text{m}$
- Dimensions WxDxH 65x28x131 mm
- Battery operation, batteries standard  
4x 1.5 V AAA
- Net weight approx. 81 g

**Accessories**

- Data transfer software, interface cable included, SAUTER ATC-01
- Calibration foils for increased measuring accuracy (covers the range from 20 up to 2000  $\mu\text{m}$ , with < 3 % tolerance), SAUTER ATB-US07
- **2** External sensor, TypeF, SAUTER ATE 01
- **3** External sensor, TypeN, SAUTER ATE 02

STANDARD

OPTION

Model	Measuring range [Max] $\mu\text{m}$	Readout [d] $\mu\text{m}$	Test object	Option Factory calibration certificates	
				KERN	
SAUTER					
TE 1250-0.1F	100   1250	0,1   1	Non-magnetic coatings on iron, steel (F)	961-110	
TE 1250-0.1N	100   1250	0,1   1	Insulating coatings on non-magnetic metals (N)	961-110	
TE 1250-0.1FN	100   1250	0,1   1	Combination instrument: F/N	961-112	



SAUTER TF

SAUTER TG

Premium coating thickness gauge for paint coating, lacquer coating etc.

**Features**

- **1** LCD display, backlit, display of all information at a glance
- Offset-Accur: This function allows you to adjust the instrument precisely on the locally measured range by a two-point calibration. This results in a superior accuracy of approx. 1 % of the measured value
- Scan mode for continuous measurement or single point measuring mode
- Mini Statistics Kit: displays the measured result, the average value and the max and the min value
- Internal memory up to 99 values
- Selectable measuring units: μm, mil
- Base plate and calibration foils included
- Data interface RS-232 standard
- **2** Delivered in a robust carrying case, figure shows SAUTER TF

**Technical data**

- Measuring precision:
  - Standard: 3 % of measured value or ± 2,5 μm
  - Offset-Accur: 1 % of measured value or ± 1 μm
- Minimum thickness of base material: 300 μm
- Dimensions W×D×H 65×35×126 mm
- Battery operation, batteries standard 2× 1.5 V AAA
- Net weight approx. 81 g

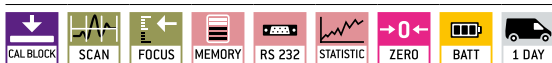
**Accessories**

- Data transfer software, interface cable included, SAUTER ATC-01
- Calibration foils for increased measuring accuracy (covers the range from 20 up to 2000 μm, with < 3 % tolerance), SAUTER ATB-US07
- SAUTER TG: External sensor, TypeFN, SAUTER ATG 01

**SAUTER TG:**

- External sensor for difficult-to-access measuring points

STANDARD



OPTION



Model	Measuring range [Max] μm	Readout [d] μm	Test object	Smallest sample surface (radius) mm	Option Factory calibration certificates	
					KERN	
SAUTER TF 1250-0.1FN	100   1250	0,1   1	Combination instrument: F/N	F: Convex: 1,5 Concave: 25	961-112	
TG 1250-0.1FN	100   1250	0,1   1	Combination instrument: F/N	N: Convex: 3 Concave: 50	961-112	



## Material thickness measurement

In cases, when the walls of the item to be measured are not accessible for traditional calliper gauges, the ultrasonic measuring equipment can be used.

This measurement is based on the following principle: Ultrasonic waves are directed onto one side of the material to be measured. They move with a defined speed through the material and are reflected on the other side. The measuring device measures the time required to do this and with this, calculates the thickness of the material.

In this way the wall thickness of, for example, ship's hulls, pipes, tanks and components in sites or machines can be determined.

Ultrasonic measuring equipment can be used to measure all hard and homogeneous materials, such as metal, glass and hard plastics. This method can not be used to measure materials as, e.g. concrete, asphalt, teflon or wood.

## Quick-Finder


Readout [d] mm	Measuring range [Max] mm	Model  SAUTER	Page
0,01	30	TN 30-0.01EE	60
0,01	60	TN 60-0.01EE	60
0,01	80	TN GOLD 80	58
0,01	80	TU 80-0.01US	62
0,01	80	TN 80-0.01US	59
0,01   0,1	100	TO 100-0.01EE	61
0,01   0,1	230	TU 230-0.01US	62
0,01   0,1	300	TU 300-0.01US	62
0,01   0,1	230	TN 230-0.01US	59
0,01   0,1	300	TN 300-0.01US	59
0,1	80	TN 80-0.1US	59
0,1	200	TB 200-0.1US	56
0,1	200	TB 200-0.1US-RED	56
0,1	225	TD 225-0.1US	57
0,1	230	TN 230-0.1US	59
0,1	300	TN 300-0.1US	59



05

## Reliable material thickness gauge for daily use

### Features

- External sensor for difficult-to-access measurements
- Base plate for adjustment incorporated
- Auto-Power-Off
- Selectable measuring units: mm, inch
- TB 200-0.1US-RED. can only analyse these materials: cast iron, aluminium, copper, brass, zinc, quartz glass, polyethylene, PVC, grey cast iron, nodular cast iron, steel
-  Delivered in a robust carrying case


### Technical data

- Measuring precision: 0,5 % of [Max]
- Dimensions W×D×H 161×69×32 mm
- Battery operation, batteries standard 4× 1.5 V AA
- Net weight approx. 0,3 kg

### Accessories

- External sensor, 5 MHz,  $\varnothing$  6 mm, for thin test materials: measuring range (steel) 1–50 mm, SAUTER ATB-US01
- External sensor, 5 MHz,  $\varnothing$  12 mm, for hot test materials: Measuring range (steel) 1–225 mm at temperatures up to approx. 300°C, 4–100 mm at temperatures up to approx. 300 °C, SAUTER ATB-US02
- External sensor, 5 MHz,  $\varnothing$  10 mm, SAUTER ATU-US09
- External sensor, 5 MHz,  $\varnothing$  8 mm, SAUTER ATB-US06
- Ultrasound contact gel, can be reordered, approx. 60 ml, SAUTER ATB-US03

STANDARD				OPTION	
					

Model	Measuring range [Max] mm	Readout [d] mm	Sensor	Sound velocity m/sec		Option Factory calibration certificates	
						KERN	
SAUTER							
TB 200-0.1US	1,5–200	0,1	5 MHz   $\varnothing$ 8 mm	500–9000		961-113	
TB 200-0.1US-RED	1,5–200	0,1	5 MHz   $\varnothing$ 8 mm	-		961-113	







## Compact pocket-sized material thickness gauge

05

### Features

- External sensor for difficult-to-access measuring points
- Data interface RS-232 included
- Base plate for adjustment incorporated
- Selectable measuring units: mm, inch
- **1** Delivered in a robust carrying case

### Technical data

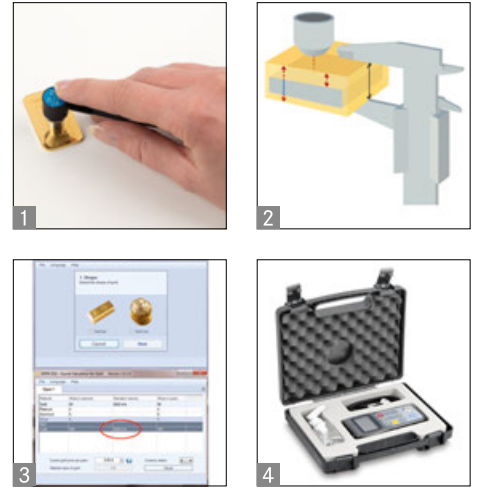
- Measuring precision: 0,5 % of [Max] + 0,1 mm
- Dimensions W×D×H 120×65×30 mm
- Battery operation, batteries standard 4× 1.5 V AAA, AUTO-OFF function to preserve batteries
- Net weight approx. 0,164 kg

### Accessories

- Data transfer software, interface cable included, SAUTER ATC-01
- External sensor, 5 MHz,  $\varnothing$  6 mm, for thin test materials: Measuring range (steel) 1–50 mm, SAUTER ATB-US01
- External sensor, 5 MHz,  $\varnothing$  12 mm, for hot test materials: Measuring range (steel) 1–225 mm at normal temperatures, 4–100 mm at temperatures of up to 300 °C, SAUTER ATB-US02
- External sensor, 5 MHz,  $\varnothing$  8 mm, SAUTER ATB-US06
- External sensor, 5 MHz,  $\varnothing$  10 mm, SAUTER ATU-US09
- External sensor, 5 MHz,  $\varnothing$  10 mm, transducer at an angle of 90°, SAUTER ATU-US10
- Ultrasound contact gel, can be reordered, approx. 60 ml, SAUTER ATB-US03



Model	Measuring range	Readout	Sensor	Sound velocity	Option	
					Factory calibration certificates	
SAUTER	[Max] mm	[d] mm	5 MHz   $\varnothing$ 8 mm	m/sec	KERN	
TD 225-0.1US	1,2–225	0,1	5 MHz   $\varnothing$ 8 mm	500–9000	961-113	



05

## Ultrasonic measuring instrument for checking the authenticity of gold bars and coins

### Features

- **1** You can use the TN-GOLD to determine whether gold or silver bars and coins are genuine or whether they contain a core of a different material
- The instrument measures the thickness of gold bars and gold coins using ultrasound
- **2** Process: Ultrasound waves are directed onto the test object using a sensor. The waves penetrate the test object, are then reflected from a surface opposite the object and then picked up again by the sensor. The measurement determined by this process will be compared with the material thickness as measured by a traditional calliper gauge. On the basis of the measurement given, false cores (Figure: grey) for example, those made of tungsten, lead, etc. can be easily identified, as the ultrasound reacts differently, compared with pure gold
- Selectable measuring units: mm, inch
- **3** SAUTER SSG software (included) can be used to calculate the sound velocity for various precious metal alloys. This makes it possible to determine whether coins or ingots contain false cores or whether they consist of one and the same material. Compatible with the following operating systems: Windows® 7/8/10
- Known additions in tested gold items – e.g. copper or silver – are compensated by the software
- In addition, the software determines the value of the gold item. The price of gold is polled on line continuously
- It is the only test process which measures right through the whole bar or the whole coin without interference and thereby guarantees the highest level of certainty
- Internal memory for up to 20 files (with up to 100 values per file)
- Base plate for adjustment incorporated
- **4** Delivered in a robust carrying case

### Technical data

- Measuring precision: 0,5 % of [Max] ± 0,04 mm
- Dimensions W×D×H 74×32×150 mm
- Battery operation, batteries standard 2× 1.5 V AA, AUTO-OFF function to preserve the batteries
- Net weight approx. 0,25 kg

### Accessories

- Ultrasound contact gel, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03
- External sensor, 7 MHz, Ø 6 mm, for thin test materials: Measuring range 0,75–80 mm (steel), SAUTER ATU-US02
- USB/PC connection cable, standard, SAUTER FL-A01
- Data transfer software, USB interface cable included, SAUTER ATU-04


STANDARD						OPTION	









Model	Measuring range	Readout	Sensor	Sound velocity	Option	
					Factory calibration certificates	
SAUTER TN GOLD 80	[Max] mm 0,75–80	[d] mm 0,01	7 MHz   6 mm	m/sec 1000–9999	KERN 961-113	



## Portable measuring device for ultrasonic material thickness testing

05

Features	Technical data	Accessories
<ul style="list-style-type: none"> <li>• External sensor</li> <li>• Data interface USB, standard (only for models with readout [d] = 0,01 mm)</li> <li>• Scan mode (10 measurements per sec.) or single point measuring mode possible</li> <li>• Internal memory for up to 20 files (with up to 100 values per file)</li> <li>• Selectable measuring units: mm, inch</li> <li>•  Delivered in a robust carrying case</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring precision: 0,5 % of [Max] ± 0,04 mm</li> <li>• Dimensions W×D×H 74×32×150 mm</li> <li>• Battery operation, batteries standard 2× 1.5 V AA, AUTO-OFF function to preserve batteries</li> <li>• Net weight approx. 245 g</li> </ul>	<ul style="list-style-type: none"> <li>• Data transfer software, USB interface cable included, SAUTER ATU-04</li> <li>• External sensor, 2,5 MHz, ø 14 mm, for thick samples, in particular cast iron with rough upper surfaces: Measuring range 3–300 mm (steel), SAUTER ATU-US01</li> <li>• External sensor, 7 MHz, ø 6 mm, for thin test materials: Measuring range 0,75–80 mm (steel), SAUTER ATU-US02</li> <li>• External sensor, 5 MHz, ø 6 mm, SAUTER ATB-US01</li> <li>• External sensor, 5 MHz, ø 10 mm, SAUTER ATU-US09</li> <li>• External sensor, 5 MHz, ø 10 mm, transducer at an angle of 90°, SAUTER ATU-US10</li> <li>• External sensor, 5 MHz, ø 12 mm, for hot test materials: Measuring range (steel) 3–200 mm at temperatures of up to 300 °C, SAUTER ATB-US02</li> <li>• Ultrasound contact gel, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03</li> </ul>

STANDARD						OPTION	
							
<small>[d]=0,01 mm</small>							

Model	Measuring range	Readout	Sensor	Sound velocity	Option	
					Factory calibration certificates	
<b>SAUTER</b>	[Max] mm	[d] mm		m/sec	KERN	
TN 80-0.1US	0,75–80	0,1	7 MHz   ø 6 mm	1000–9999	961-113	
TN 230-0.1US	1,2–230	0,1	5 MHz   ø 10 mm	1000–9999	961-113	
TN 300-0.1US	3–300	0,1	2,5 MHz   ø 14 mm	1000–9999	961-113	
TN 80-0.01US	0,75–80	0,01	7 MHz   ø 6 mm	1000–9999	961-113	
TN 230-0.01US	1,2–200   230	0,01   0,1	5 MHz   ø 10 mm	1000–9999	961-113	
TN 300-0.01US	3–200   300	0,01   0,1	2,5 MHz   ø 14 mm	1000–9999	961-113	

PREMIUM  
★★★



05

## Hand-held measuring device for ultrasonic material thickness testing in Echo-Echo principle

### Features

- External sensor
- Data interface USB, standard
- Scan mode (10 measurements per sec.) or single point measuring mode possible
- Internal memory for up to 20 files (with up to 100 values per file)
- Selectable measuring units: mm, inch
- Two measuring modes to determine material thickness:
  - Pulse-Echo mode
  - Echo-Echo mode
- Echo-Echo measuring: Determining the actual thickness of materials irrespective of any coating which might be present. In this way, the wall thickness of pipes, for example, can be determined in a non-destructive manner, without having to remove the coating and the measurement can be shown on the display, with the adjustment for the coating thickness already taken into account
- Echo-Echo measurements are only possible with the measuring head included as part of the delivery (ATU-US12, see accessory)
- Delivered in a robust carrying case

### Technical data

- Measuring precision: 0,5 % of [Max] ± 0,04 mm
- Dimensions W×D×H 74×32×150 mm
- Battery operation, batteries standard 2× 1.5 V AA, AUTO-OFF function to preserve batteries
- Net weight approx. 245 g
- Maximum thickness of coating (paints, lacquers or similar coatings which shall be eliminated): 3 mm

### Accessories

- Data transfer software, USB interface cable included, SAUTER ATU-04
- External sensor, 5 MHz, Ø 10 mm, for echo-echo measuring, SAUTER ATU-US12
- Ultrasound contact gel, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03  
Note: All following Pulse-Echo sensors can only be used in Pulse-Echo mode, not in Echo-Echo mode
- External sensor (Pulse-Echo), 2,5 MHz, Ø 14 mm, for thick samples, in particular cast iron with rough upper surfaces: Measuring range 3–300 mm (steel), SAUTER ATU-US01
- External sensor (Pulse-Echo), 7 MHz, Ø 6 mm, for thin test materials: Measuring range 0,75–80 mm (steel), SAUTER ATU-US02
- External sensor (Pulse-Echo), 5 MHz, Ø 10 mm, SAUTER ATU-US09
- External sensor (Pulse-Echo), 5 MHz, Ø 10 mm, transducer at an angle of 90°, SAUTER ATU-US10

STANDARD



OPTION



Model	Measuring range Echo-Echo	Measuring range Pulse-Echo	Readout [d] mm	Sensor	Sound velocity m/sec	Option Factory calibration certificates	
						KERN	
SAUTER TN 30-0.01EE	mm 3–30	mm 0,65–600	0,01	5 MHz   Ø 10 mm	1000–9999	961-113	
TN 60-0.01EE	mm 3–60	mm 0,65–600	0,01	5 MHz   Ø 10 mm	1000–9999	961-113	



## Material thickness gauge for ultrasonic material thickness testing in Echo-Echo principle

05

### Features

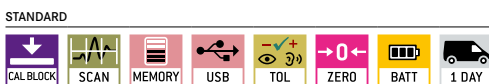
- Premium thickness gauge device using ultrasonic technology: New NT measuring technology generation with automatic sensor adjustment (V-path correction for improved accuracy and more rapid display speed)
- Dual measuring modes to determine material thickness:
  - Pulse-Echo mode (up to 600 mm)
  - Echo-Echo mode (up to 100 mm)
- Echo-Echo measurements: Determining the actual thickness of materials regardless of any existing coating, such as, for example, paint or an anti-corrosion coating on the base metal. In this way, the wall thickness of pipes, for example, can be determined in a non-destructive manner, without having to remove the coating and the measurement can be shown on the display, with the adjustment for the coating thickness already taken into account
- Can be used on these materials, as well as others: Metals, plastics, ceramics, composite materials, epoxy, glass and other materials
- High-precision mode: Readout accuracy can be switched from 0.1 mm to 0.01 mm
- **1** Premium display with colour TFT display (320×240) with adjustable brightness so that it can be read easily in any environmental conditions
- Large internal data memory for up to 100 data sets each with 100 individual values
- Energy-saving operation with 2× AA batteries and an operating time of at least 30 hours, adjustable power-off time (sleep mode) and adjustable display switch-off (standby mode)
- **2** USB data output for easy data download from the device memory to the PC, as standard
- Adjustment options: 0-point adjustment, 1-point adjustment, 2-point adjustment by measuring material of different thicknesses
- 3 different measurement modes with standard measuring (single measurement), scan mode (for continuous measurement and display of the ACTUAL value, the MIN and MAX value of the measuring sequence) and DIFF mode with calculation of the difference between the ACTUAL measured value and a manually defined nominal thickness
- Limit alarm function: Upper and lower limit adjustable. The measurement process is supported by an audible and visual signal
- Menu languages: GB, DE, FR, ES, IT
- Date and time can be adjusted. It is possible to store the measurement values with a time stamp
- Standard measuring probe ATU-US12 included with delivery
- **3** Delivered in a robust carrying case

### Technical data

- Measuring precision: 0,4 % of [Max] ± 0,04 mm
- Dimensions W×D×H 70×31×130 mm
- Battery operation, batteries standard 2× 1.5 V AA, AUTO-OFF function to preserve batteries
- Net weight approx. 245 g
- Maximum thickness of coating (paints, lacquers or similar coatings which shall be eliminated): 3 mm

### Accessories

- External sensor, 5 MHz, Ø 10 mm, for echo-echo measuring, SAUTER ATU-US12
- Ultrasound contact gel, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03
- Software BalanceConnection, flexible recording or transfer of measurements, particularly to Microsoft® Excel or Access as well as transfer of this data to other Apps and programs. The displayed result can therefore be converted to any format for communication with the different user programs, such as, for example, e.g. SAP, for details see internet, KERN SCD-4.0
- Further sensors on request
- **Note:** Further details and plenty of further accessories see internet



Model	Measuring range Echo-Echo	Measuring range Pulse-Echo	Readout [d] mm	Speed of sound m/s	Sensor	Option	
						Factory calibration	certificates
SAUTER TO 100-0.01EE	mm 3-100	mm 0,7-600	0,1/0,01	100-19999	5 MHz   Ø 10 mm	KERN 961-113	



05 Premium ultrasonic thickness gauge

**Features**

- External sensor for difficult-to-access measurements
- Base plate for adjustment included
- 1 Data interface USB
- 2 Delivered in a robust carrying case
- Scan mode (10 measurements per sec.) or single point measuring mode possible
- Internal memory for up to 20 files (with up to 100 values per file)
- 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.
- Selectable measuring units: mm, inch
- Robust metal housing

**Technical data**

- Measuring precision: 0,5 % of [Max] ± 0,04 mm
- Dimensions W×D×H 76×32×132 mm
- Battery operation, batteries standard 2× 1.5 V AA
- Net weight approx. 345 g

**Accessories**

- Data transfer software, interface cable included, SAUTER ATU-04TU
- External sensor, 2,5 MHz, Ø 14 mm, for thick samples, in particular cast iron with rough upper surfaces: Measuring range 3–300 mm (steel), SAUTER ATU-US01
- External sensor, 7 MHz, Ø 6 mm, for thin test materials: Measuring range 0,75–80 mm (steel), SAUTER ATU-US02
- External sensor, 5 MHz, Ø 12 mm, for hot test materials: Measuring range (steel) 3–200 mm at temperatures of up to 300 °C, SAUTER ATB-US02
- External sensor, 5 MHz, Ø 10 mm, SAUTER ATU-US09
- External sensor, 5 MHz, Ø 10 mm, transducer at an angle of 90°, SAUTER ATU-US10
- Ultrasound contact gel, standard, can be reordered, approx. 60 ml, SAUTER ATB-US03

STANDARD

OPTION

Model	Measuring range [Max] mm	Readout [d] mm	Sensor	Sound velocity m/sec	Option Factory calibration certificates	
					KERN	
SAUTER						
TU 80-0.01US	0,75–80	0,01	7 MHz   Ø 6 mm	1000–9999	961-113	
TU 230-0.01US	1,2–200   230	0,01   0,1	5 MHz   Ø 10 mm	1000–9999	961-113	
TU 300-0.01US	3–200   300	0,01   0,1	2,5 MHz   Ø 14 mm	1000–9999	961-113	



## Hardness testing of plastics (Shore)

To determine the hardness of plastics, in 1915 Albert Shore developed an extremely simple process: A pin made of hardened metal and of a defined shape is held by a spring and is then pushed into the test item. Depending on the depth of the penetration, the material tested is either harder or softer. This procedure is described in DIN ISO 7619-1.

Currently, there are two types of devices used for this test: Mechanical measuring devices with drag indicator and electronic measuring devices.

Both types of measuring devices can be operated with test stands (such as the SAUTER TI series). With a test stand, measurements can be carried out more consistently and accurately.

At this time, KERN does not calibrate Shore hardness testing instruments. As an alternative, we recommend that the measuring device is operated with a calibrated kit of hardness comparison plates (such as SAUTER AHBA 01).


### Quick-Finder

Readout [d] HS	Measuring range [Max] HS	Hardness type	Model  <b>SAUTER</b>		Page
1,0 HA	100 HA	A	<b>HBA 100-0</b>		64
1,0 HA0	100 HA0	A0	<b>HBO 100-0</b>		64
1,0 HD	100 HD	D	<b>HBD 100-0</b>		64
0,1 HA	100 HA	A	<b>HDA 100-1</b>		65
0,1 HO	100 HO	O	<b>HDO 100-1</b>		65
0,1 HD	100 HD	D	<b>HDD 100-1</b>		65
-	-	A/A0	<b>TI-AC</b>		66
-	-	D	<b>TI-D</b>		66
-	-	A/O	<b>TI-ACL</b>		66
-	-	D	<b>TI-DL</b>		66



## Compact handheld durometer with drag indicator



### Features

- Typical application: measurement of penetration (Shore)
- Particularly recommended for internal comparison measurement. Standard calibrations e. g. to DIN 7619-1 are not possible because of very narrow standard tolerances
- Shore A rubber, elastomers, neoprene, silicone, vinyl, soft plastics, felt, leather and similar material
- Shore D plastics, formica, epoxides, plexiglass etc.
- Shore A0 foam, sponge etc.
- Max mode: Records the peak value indication by drag pointer
- Can be attached to the test stands SAUTER TI-AC (for Shore A and A0), TI-D. (for Shore D)
-  Delivery in a plastic box
- The measuring tips are not interchangeable

### Technical data

- Measuring precision: 3 % of [Max]
- Dimensions W×D×H 60×25×115 mm
- Net weight approx. 160 g
- Screws to screw on to the TI: M7 fine thread
- Material thickness of the sample, min. 4 mm

### Accessories

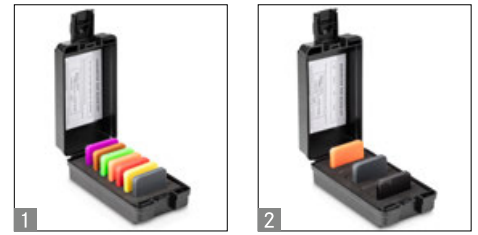
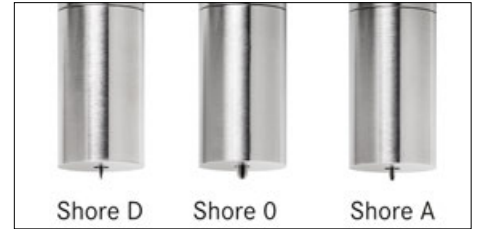
- Shore comparison plates for testing and calibration of Shore hardness testing devices. By regular comparison, the measuring accuracy increases significantly.
-  7 hardness comparison plates for Shore A, tolerance up to ± 2 HA, SAUTER AHBA-01
  -  3 hardness comparison plates for Shore D, tolerance up to ± 2 HD, SAUTER AHBD-01
  - Factory calibration of the comparison plates, SAUTER 961-170
  - Test stand for HBA and HBO, SAUTER TI-AC.
  - Test stand for HBD, SAUTER TI-D.

#### STANDARD



Model	Hardness type	Measuring range	
		[Max] HS	[d] HS
<b>SAUTER</b>			
<b>HBA 100-0</b>	Shore A	100 HA	1,0 HA
<b>HBO 100-0</b>	Shore A0	100 HA0	1,0 HA0
<b>HBD 100-0</b>	Shore D	100 HD	1,0 HD





## Professional Shore hardness tester

### Features

- Shore A, 0 and D to measure the hardness of plastics through penetration measurement
- Shore A rubber, elastomers, neoprene, silicone, vinyl, soft plastics, felt, leather and similar material
- Shore 0 foam, sponge
- Shore D plastics, formica, epoxides, plexiglass etc.
- Delivered in a robust carrying case
- Particularly recommended for internal comparison measurement. Standard calibrations e. g. to DIN 7619-1 are not possible because of very narrow standard tolerances
- Can be attached to the test stands TI-ACL (for Shore A and 0), TI-DL (for Shore D) to improve measuring uncertainty
- Large display with backlight
- Selectable: AUTO-OFF function or continuous operation, battery level indicator

### Technical data

- Tolerance: 1 % of [Max]
- Overall dimensions W×D×H 65×38×162 mm
- Net weight approx. 173 g
- Transfer via RS-232 to the PC, e.g. to Microsoft Excel®
- Battery operation, batteries standard 2× 1.5 V AAA
- Material thickness of the sample, min. 4 mm

### Accessories

- 7 hardness comparison plates for Shore A, tolerance up to ± 2 HA, SAUTER AHBA-01
- 3 hardness comparison plates for Shore D, tolerance up to ± 2 HD, SAUTER AHBD-01
- Factory calibration of the comparison plates, SAUTER 961-170
- Test stand for HDA and HD0, SAUTER TI-ACL
- Test stand for HDD, see page 66, SAUTER TI-DL

#### STANDARD



#### OPTION



Model	Hardness type	Measuring range		Readout	
		[Max] HS	[d] HS	[d] HS	
<b>SAUTER</b>					
<b>HDA 100-1</b>	Shore A	100 HA	0,1 HA		
<b>HD0 100-1</b>	Shore 0	100 HO	0,1 HO		
<b>HDD 100-1</b>	Shore D	100 HD	0,1 HD		



## Lever operated test stand for hardness testing with base plate made of glass

### Features

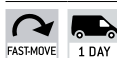
- For Shore hardness testing of plastics, leather etc.
- **1** Glass plate: high measurement accuracy by means of superior hardness of the glass plate
- **2** Mechanical construction: Robust design for precise measuring
- **3** Level adjustment: For the precise levelling of the base plate, e.g. for the correction of inhomogeneous test objects
- **4** Test stand TI-DL, with exchangeable longer column for use with digital hardness tester HD
- Hardness tester not included in delivery

- Operation:
  1. The SAUTER hardness testing device HB or HD is fitted in a suspended position
  2. The test object is placed on the round testing table right under the durometer measuring tip
  3. By pressing the lever down, the test weight will be released, and this then presses the measuring tip into the test object with its own weight (see table)
- The accuracy of the displayed result is approx. 25 % higher than in a manual operated test

### Technical data

- Stroke length: 15 mm
- Maximum test object height: 63 mm
- Base plate  $\varnothing$  75 mm
- Overall dimensions WxDxH
  - TI-AC: 150x110x330 mm
  - TI-D: 150x110x400 mm
  - TI-ACL: 150x110x380 mm
  - TI-DL: 150x110x450 mm

STANDARD



Model	Suitable for	Length of column	Poids de contrôle	Net weight approx.
<b>SAUTER</b>		mm	kg	kg
TI-AC	HBA, HBO	245	1	4,5
TI-D	HBD	245	5	8,5
TI-ACL	HDA, HDO	300	1	4,5
TI-DL	HDD	300	5	8,5



## Hardness testing of metals (Leeb)

Determining the hardness of metals is of particular significance during the preparation and use of metallic materials. Usually, hardness is determined using test machines in accordance with Vickers, Rockwell or Brinell.

For mobile measurements, the rebound method according to Dietmar Leeb, which was first used in 1978, has prevailed. To do this, a standardised impact body (such as SAUTER AHMO D01) is shot against the item to be tested. The rebound of the impact body leads to a deformation of the upper surface, which results in a loss of kinetic energy. This loss of energy is determined by measuring the speed and herefrom the Leeb hardness value (HL) is calculated.

These measuring devices can be used in any location. Usually they are equipped with a large internal data memory, which allows to record the measurements at goods receipt or in production.

Our range is equipped with compact measuring devices of the so-called "Pen Type" shape (HN-D) or measuring devices with external sensors connected by cables.

### Quick-Finder

Readout	Sensor	Model		Page
[d] HL		<b>SAUTER</b>		
1	D	<b>HK-D</b>		68
1	D	<b>HK-DB</b>		68
1	D	<b>HMM</b>		69
1	D	<b>HMO</b>		71
1	D	<b>HN-D</b>		70
1	D	<b>HMM-NP</b>		69



## Premium Leeb hardness tester – now 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
- **2** Delivered in a sturdy carrying case
- 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

### Technical data

- Measuring precision: ± 1 % at 800 HLD
- Minimum sample radius (concave/convex): 50 mm (with support ring: 10 mm)
- Minimum sample material thickness: 3 mm with coupling on fixed base
- The lowest weight of the test item on solid support unit: 2 kg with fixed coupling
- Dimensions W×D×H 132×82×31 mm
- Permissible ambient temperature -10 °C/40 °C
- Battery operation, batteries not standard 2× 1.5 V AA, 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-1.0
- Data transfer software, KERN SCD-4.0
- Support rings for secure positioning, SAUTER AHMR 01
- Impact body Type D, net weight approx. 5,5 g, hardness ≥ 1600 HV, tungsten carbide, Impact ball Ø 3 mm, in accordance with the standard ASTM A956-02, SAUTER AHMO D01
- 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
- External impact sensor Type D, SAUTER AHMR D
- External impact sensor Type D+15. Slim front section for holes, grooves or re-entrant surfaces, SAUTER AHMR D+15
- External impact sensor Type DL, for very narrow surfaces (Ø 4,5 mm), SAUTER AHMR DL
- External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMR G
- Connection cable impact sensor SAUTER HMO-A04
- **3** 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
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132

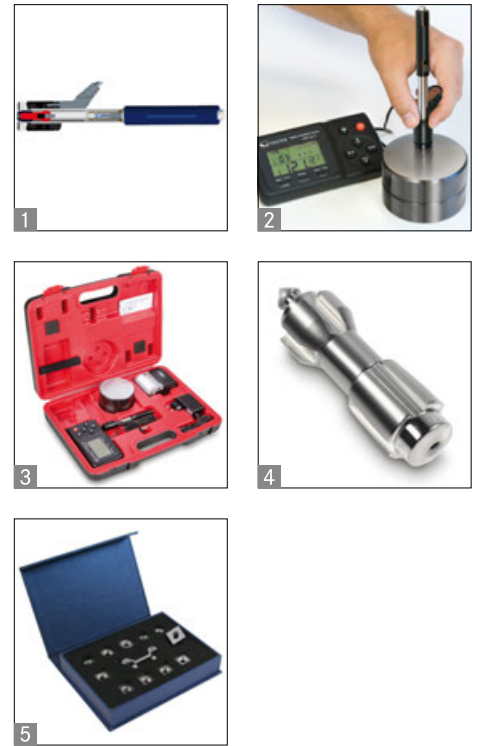
#### STANDARD



#### OPTION



Model	Sensor	Measuring range	Readout	Test block	Option	
					Factory calibration certificates	
SAUTER		[Max] HL	[d] HL	Typ D/DC approx. 800 HL	KERN	
HK-D	Typ D	170-960	1	not standard	961-131	
HK-DB	Typ D	170-960	1	standard	961-131	



## 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** Standard block for calibration included (790 ± 40 HL)
- **3** Delivered in a robust carrying case
- Internal memory for up to 9 measured values
- Mini statistics function: displays the measured result, the average value, the impact direction, date and time
- SAUTER HMM-NP: identical product features as the SAUTER HMM. model, but comes without the printer

- Measurement value display: Rockwell (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

### Technical data

- Measuring 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)
- Dimensions W×D×H 80×30×150 mm
- SAUTER HMM.: External mains adaptor for printer, as standard
- Ready for use: Batteries included, 3× 1.5 V AAA, block, operating time up to 30 h, AUTO-OFF function to preserve battery life
- Net weight approx. 0,2 kg

### Accessories

- Connection cable, without impact sensor, SAUTER HMM-A02
- **5** Attachment rings for secure positioning, SAUTER AHMR 01
- **4** Impact body, 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



Model	Sensor	Measuring range [Max] HL	Readout [d] HL	Option Factory calibration certificates	
				KERN	
SAUTER HMM	Typ D	170-960	1	961-131	
HMM-NP	Typ D	170-960	1	961-131	



## “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: Rockwell (B & C), Vickers (HV), Brinell (HB), Leeb (HL)  
Hardness comparison block not included
- 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  $\pm 4$  HLD
- Minimum sample weight on a solid and stable support: 2 kg
- Minimum sample material thickness: 3 mm with coupling on fixed base
- Dimensions WxDxH 35x25x145 mm
- Operation by rechargeable battery, standard, operating time without backlight 16 h, charging time 3 h
- Mains adapter, external, standard
- Net weight approx. 0,07 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-1.0
- **2** Test block Type D/DC,  $\varnothing 90$  mm ( $\pm 1$  mm), Net weight < 3 kg, hardness range 790  $\pm$  40 HL, SAUTER AHMO D02 630  $\pm$  40 HL, SAUTER AHMO D03 530  $\pm$  40 HL, SAUTER AHMO D04
- Factory calibration certificates for SAUTER AHMO D02, AHMO D03, AHMO D04, SAUTER 961-132

#### STANDARD



#### OPTION



Model	Sensor	Measuring range	Readout	Option	
				Factory calibration certificates	
SAUTER		[Max] HLD	[d] HL	KERN	
HN-D	Typ D	170-960	1	961-131	





## Advanced features for professional applications

### Features

- Innovative touchscreen
- Automatic recognition of the impact (rebound) sensor connected to the HMO
- Mobility: In comparison with stationary table-top devices and hardness testing devices with internal sensor, 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 bearing for connection to the printer and charging the batteries
- **1** Standard block for calibration included
- Internal memory 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: Rockwell (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

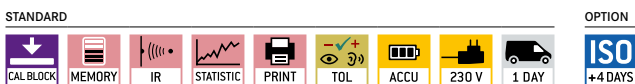
### Technical data

- Measuring precision: 1 % at 800 HLD ( $\pm 6$  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)
- Dimensions W×D×H 83×24×135 mm
- Rechargeable battery pack internal, operating time up to 50 h
- Mains adapter included
- Net weight approx. 228 g

### Accessories

- Operation by rechargeable battery pack, operating time up to 50 h, SAUTER HMO-A03
- External impact sensor Type D, as standard, can be reordered, SAUTER AHMO D
- **3** External impact sensor Type DC. Short impact sensor for tests in holes or hollowed objects, SAUTER AHMO DC
- **4** External impact sensor Type G. High energy sensor: 900 % impact energy compared to type D, SAUTER AHMO G
- Support rings for bended testing samples available on request, SAUTER AHMR 01
- **5** Impact body, SAUTER AHMO D01
- Connection cable impact sensor, SAUTER HMO-A04
- Test block Type D/DC, 90×50 mm ( $\pm 1$  mm), net weight < 3 kg, hardness range 790  $\pm$  40 HL, SAUTER AHMO D02 630  $\pm$  40 HL, SAUTER AHMO D03 530  $\pm$  40 HL, SAUTER AHMO D04
- Paper roll, 1 piece, SAUTER ATU-US11

07



Model	Sensor	Measuring range	Readout	Option	
				Factory calibration certificates	
SAUTER HMO	Typ D	[Max] HL 170-960	[d] HL 1	KERN	961-131

# 08



## Hardness testing of metals (UCI)

Ultrasonic contact impedance (UCI) hardness testing devices are filling wisely a void in the area of hardness testing.

This area of testing is, on one hand, dominated by mobile hardness testing devices which are using the Leeb procedure and, on the other hand, by stationary hardness testing devices which are predominantly carrying out destructive tests.

Because of the high demands required by this system on the minimum weight and thickness of the test object, the Leeb procedure is not suitable for the majority of tests for small test objects. A good example of this is hardness testing of the flanks of gear wheels. Often in this test, the question is whether the flanks have been hardened or whether the hardened layer has already been removed.

UCI hardness testing devices therefore are offering significantly better measurement performance at small test objects in comparison with Leeb hardness testing devices.

One advantage of the UCI hardness testing devices compared with stationary hardness testing machines is, that the test object does not have to be cut out of the whole object.

By using the optional support rings, the minimum weight of the test object can even be reduced from 300 g to 100 g.

By means of optional ISO calibration, SAUTER UCI hardness testing devices can be used not only for internal testing purposes but also for measurements where the results have to be changed externally.

## Quick-Finder

Model	Hardness scale		Page
<b>SAUTER</b>			
HO 1K	HV 1		73
HO 2K	HV 2		73
HO 5K	HV 5		73
HO 10K	HV10		73





PREMIUM  
★★★



## Premium UCI hardness testing device for Rockwell, Brinell and Vickers

### Features

- Application: This ultrasound hardness testing device is ideally suited for mobile hardness testing, where the main emphasis is on obtaining rapid and precise results.
- Principle: The SAUTER HO measures by using a vibrating rod which vibrates at ultrasonic frequency and is pressed onto the sample at a defined test force. At the lower end there is a Vickers indenter. Its resonant frequency increases as soon as an indentation is created when it comes into contact with the sample. Through appropriate adjustment of the device, the resulting change in resonant frequency is matched with the corresponding Vickers hardness.
- Examples: The HO ultrasound hardness testing system is primarily used for measuring small forgings, castings, welding points, punched parts, casting tools, ball bearings and the flanks of gear wheels as well as for measuring the influence of warmth or heat
- Advantages compared with Rockwell and Brinell: Means that the testing is almost nondestructive, small penetrations means that the testing is less destructive
- Advantages compared with Vickers: Demanding optical measuring is not required. You can therefore carry out measurements directly on-site, for example, on a permanently installed workpiece
- Advantages compared with Leeb: The high requirements on the weight of the test object can be widely omitted
- Standards: The device meets following technical standards: DIN 50159-1; ASTM-A1038-2005; JB/T9377-2013
- Measurement data memory saves up to 1000 measurement groups each with 20 individual values
- 2 Mini statistics function: Display of the measuring result, the number of measurements, the maximum and minimum value as well as the average value and the standard deviation
- Calibration: The device can be set to both standard hardness test blocks and also to up to 20 reference calibration values. When doing this it is possible to measure different materials quickly, without having to re-adjust the device to the individual materials
- 1 Scope of delivery: Standard block for calibration (approx. 61 HRC), USB cable, Display unit, UCI sensor unit, transport case, software to transfer the saved data to the PC, accessories

### Technical data

- Measuring ranges: HRC: 20,3–68; HRB: 41–100; HRA: 61–85,6; HV: 80–1599; HB: 76–618; Tensile strength: 255–2180 N/mm<sup>2</sup>
- Measuring precision: ± 3 HV; ± 1,5 HR; ± 3 % HB
- Measuring time: adjustable from 1-5 sec.
- Display units: HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB.
- Rechargeable battery integrated, standard, operating time up to 12 h without backlight, charging time approx. 8 h
- Minimum weight of the test object: 300 g for direct measurement with the sensor (included); 100 g with support ring (optional)
- Minimum thickness of the test object: 2 mm
- Minimum dimensions the test surface size around: approx. 5×5 mm (recommended)
- Overall dimensions W×D×H 160×83×28 mm
- Permissible ambient temperature -10 °C/40 °C
- Net weight approx. 0,93 kg

# Mobile ultrasound hardness testing device SAUTER HO



## Accessories

- External impact sensor Type D, Leeb standard sensor, can be reordered at any time, SAUTER AHMO D
- **3** Support ring, flat, SAUTER HO-A04
- **4** Support ring, small cylinder,  $\varnothing$  8-20 mm, SAUTER HO-A05
- **5** Support ring, large cylinder,  $\varnothing$  20-80 mm, SAUTER HO-A06
- **6** Deep-hole protective cover, SAUTER HO-A07
- **7** Calibration and adjustment plate (hardness test blocks) with defined and tested steel hardness for regular testing and adjustment of hardness testing devices. The hardness values are indicated. A key feature of the plates is the low-granular, homogenous finish of the steel,  $\varnothing$  90 mm, including calibration certificate  
 28 to 35 HRC: SAUTER HO-A09  
 38 to 43 HRC: SAUTER HO-A10  
 48 to 53 HRC: SAUTER HO-A11  
 58 to 63 HRC: SAUTER HO-A12
- **8** Test stand for repeatable movements during testing. In this way you can avoid errors which could occur with manual handling of the sensor. This ensures even more stable measurements and more precise measuring results. Smooth-running mechanical system, stroke length 34 mm, maximum height of the test object within the test bench 240 mm, swivel probe device for measurements outside the base plate, very robust construction, net weight approx. 9 kg, SAUTER HO-A08
- Motorised probe. Enables testing at the touch of a button while maintaining the same procedure (while stocks last)  
 HV 0,3, SAUTER HO-A15  
 HV 0,5, SAUTER HO-A16  
 HV 0,8, SAUTER HO-A17  
 HV 1, SAUTER HO-A18

### STANDARD



### OPTION



Model	Hardness scale	Min. weight of test item	Min. thickness of test item	Option	
				Factory calibration certificates	
<b>SAUTER</b>		g	mm	KERN	
HO 1K	HV 1	300	2	961-270	
HO 2K	HV 2	300	2	961-270	
HO 5K	HV 5	300	2	961-270	
HO 10K	HV10	300	2	961-270	



## Occupational safety/Environment

Prevention of accidents as well as modern health care have got the same operational starting point in many countries. With industrialisation and the formation of conurbations, transport infrastructures and large companies, regular preventive medical examinations were introduced for wide sections of the population.

In addition to preventive medical examinations, monitoring of working conditions with defined limits was also introduced. To date, the regular checking of these limits as part of safety and accident prevention measures is domiciled as a business responsibility up till now.

For this purpose, SAUTER provides a targeted selection of the most commonly-used instruments in general measuring technology. They can be used to measure environmental influences such as noise (acoustic pressure) or light.

For regular calibration, our pick-up and return service can be used, which will save you a lot of efforts and expenses.


### Quick-Finder

Readout	Measuring range	Model	P.
[d] lx/dB	[Max] lx/dB	<b>SAUTER</b>	
0,1 1 10 100 lx	200 2000 20000 200000 lx	<b>SO 200K</b>	76
0,1 1 10 100 lx	200 2000 20000 200000 lx	<b>SP 200K</b>	77
0,1 dB	130 dB	<b>SU 130</b>	78
0,1 dB	134 dB	<b>SW 1000</b>	79
0,1 dB	136 dB	<b>SW 2000</b>	79



## Photometer for precise light measurement up to 200,000 Lux

### Features

- Helps to determine if workplace lighting meets standard requirements, e.g. DIN EN 12464-1 "Lighting of workplaces indoors"
- Photo sensor: silicon diode
- Cosine correction for angular incident light
- Sturdy protective cover for the photo sensor
- Increased service life: Impact protection by means of a protective casing
-  Delivery in a robust box
- Track function for continuous recording of changing environmental conditions
- Peak Hold Mode to capture peaks
- Selectable measuring units: fc (foot-candle), lx

### Technical data

- Measuring frequency: 2 Hz
- Cable length (Photo sensor) approx. 1 m
- Dimensions W×D×H 100×60×28 mm
- Battery operation, battery not standard (9 V Block), AUTO-OFF function for battery conservation
- Net weight approx. 250 g

09

STANDARD			OPTION
			
PEAK	BATT	1 DAY	ISO +10DAYS

Model	Measuring range	Readout	Option	
			Factory calibration certificates	
SAUTER	[Max] lx	[d] lx	KERN	
SO 200K	200	0,1	961-190	
	2000	1		
	20000	10		
	200000	100		



## Compact photometer, optimised for accurate light measurement, including LED light measurement

### Features

- For measuring illumination of office workstations, production workstations, etc.
- Photo sensor: Silicon diode, filtered
- Cosine correction for incidence of light at an angle
- Data-hold function, to freeze the current measurement
- **1** Rotatable sensor unit (+90 and -180°) for optimum alignment to the light source
- Sturdy protective cover for the photo sensor
- **2** Increased service life: Impact protection by means of delivery in a soft box with light protection
- TRACK function for continuous recording of variable environmental conditions
- By pressing the key, the current measured value can be frozen until the key is pressed again
- Selectable units: fc (foot-candle), lux
- Easy to toggle between units by a keypress
- Option of fitting a stand on the rear of the housing, 1/4" thread

### Technical data

- Measuring precision up to 20.000 Lux: ± (4 % of the result + 10 scale intervals)
- Measuring precision from 20,000 Lux: ± (5 % of the result + 10 scale intervals)
- Repeatability: ± 2 % of [Max]
- Temperature error: ± 0,1 % of [Max]/°C
- Measuring frequency: 2 Hz
- Dimensions W×D×H 185×68×38 mm
- Ready to use: Battery included, 9 V block, operating time up to 200 hours
- Net weight approx. 130 g



Model	Measuring range	Readout	Option	
			Factory calibration certificates	
SAUTER	[Max] lx	[d] lx	KERN	961-190
	0-200	0,1		
SP 200K	200-2000	1	KERN	961-190
	2000-20000	10		
	2000-200000	100		



## Professional sound level meter

### Features

- Professional sound level meter for measuring noise in areas such as, environment, mechanical applications, car industry and much more
- Measures the sound intensity in the workplace
- Helps in differentiating between normal noise influences, and excessive noise, nuisances e.g. in a production hall
- 1 Data interface RS-232, included
- 2 Delivered in a robust carrying case
- Multi measuring functions:
  - Lp: Standard sound level measuring function
  - Leq: Energy equivalent sound level measuring mode (type A)
  - Ln: Shows the deviation from a pre-defined limit in %
- Selectable methods of evaluation:
  - A: As sensitive as the human ear
  - C: Sensitive for noisier environmental conditions, where there are machines, plant, motors etc.
  - F: For areas with constant sound intensity
- Limit value function: programmable value for the maximum level value
- Track function for continuous recording of changing environmental conditions
- Peak Hold Mode to capture peaks
- Internal memory for 30 measured values, transferable to PC with SAUTER ATC-01

### Technical data

- Measuring precision: 3 % of [Max]
- Dimensions W×D×H 236×63×26 mm
- Battery operation, batteries standard 4× 1.5 V AAA
- Net weight approx. 170 g

### Accessories

- Data transfer software, interface cable included, SAUTER ATC-01
- Adjustment device for regular adjustment of the sound level meter, SAUTER ASU-01
- Foam windshield, SAUTER ASU-02

#### STANDARD



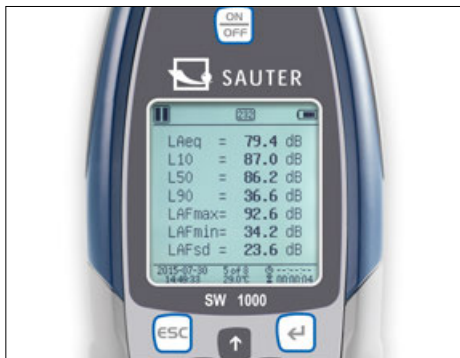
#### OPTION



Model	Type	Measuring range	Readout	
SAUTER		[Max] dB	[d] dB	
SU 130	Lp A	30-130	0,1	
	Lp C	35-130		
	Lp F	35-130		



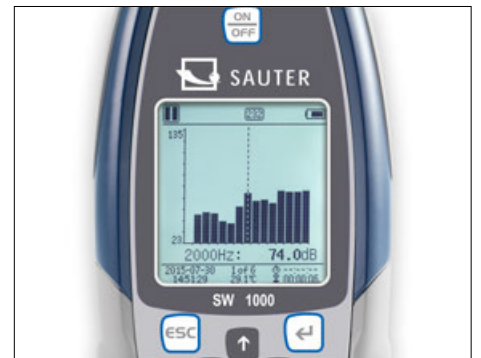
First-class professional Class I, Class II sound level meter



Data logging function with date and time in the device...



... and data transfer using MicroSD (4G) memory card (included in delivery), RS-232 or USB



Different sound pressure levels can be selected, such as, LAeq, LcPeak, LaF, LaFMax, LaFMin, SD, SEL, E

09



**Features**

- Ideal for measurements for workplaces outdoor, e.g. at airports, on building sites, in road traffic etc. with broad access to spectrum thanks to the highly-accurate 24-Bit A/D converter
- Floating point evaluation for higher level of accuracy and better stability
- The optimised analogue frontend switch reduces the ambient noise and increases the linear measuring range
- A specially-developed algorithm permits a compliant dynamic range of more than 120 dB! (SW 1000: > 123 dB; SW 2000: > 122 dB)
- Three profiles and 14 user-defined measurements can be calculated in parallel with different frequency and time weighting
- LN statistics and display of the graph showing the progression of time
- User-defined integral interval measurement up to a maximum of 24 hours is possible
- Frequency weighting (filter) A, B, C, Z
- Time interval during measurement: F (fast), S (slow), I (pulse)
- Freely-definable limits for the output of an optical alarm signal
- Peak hold function to capture the peak value
- Octavo function for targeted sound analysis
- TRACK function with graphic display of a measurement

- Calibration mode (with optional calibrator)
- Trigger mode: external start/stop of measurement via 3.5 mm connector
- Automatic measurement for timer function is possible
- Selectable frequency for recording measurements: 10, 5, 2 Hz
- Operating languages: GB, DE, FR, ES, PT
- 1 Delivery in robust transport case
- 2 Option of fitting a stand on the rear of the housing, 1/4" thread

**Technical data**

- Applicable standards: IEC61672-1:2014-07 GB/T3785.1-2010 1/1 Octave in accordance with IEC 61260:2014
- 1/2" microphone
- Permissible ambient temperature range -10 °C/50 °C
- Output (direct or alternating current) AC (max 5 VRMS), DC (10 mV/DB)
- Mains operation as standard
- Battery operation, 4x 1.5 V AA, not included, operating time up to 10 h
- Dimensions WxDxH 80x36x300 mm
- Net weight approx. 400 g

**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-1.0
- 2 Stand, WxDxH 430x90x90 mm, 1250x750x750 mm (moved out), SAUTER SW-A05
- SD-memory card, storage capacity 4 GB, SAUTER SW-A04
- Foam windshield, SAUTER SW-A03
- 3 Calibrator for regular adjustment of the sound level meter, class 1, as well as testing the linearity of sound level meters
  - Applicable standards: IEC60942:2003 Class 1, ANSI S1.40-1984, GB/T 15173-1994.
  - Output frequency 1 kHz (+/- 0,5 %)
  - Output of acoustic pressure, can be selected at 94 dB or 114 dB (± 0.3 dB)
  - Distortion factor < 2 %
  - Stabilisation time < 10 s
  - Permissible ambient temperature range -10 °C/50 °C
  - The calibrator is designed for 1/2" as well as 1/4" microphones (adapter included in the delivery) in accordance with the IEC 61094-4 standard
  - Battery operation, 2x 1.5 V AA, not standard, operating time up to 40 hours
  - Dimensions WxDxH 70x70x48 mm
  - Net weight approx. 137 g
  - SAUTER BSWA-01
  - Factory calibration certificate for calibrator, SAUTER 961-291
  - DAKKS-Calibration certificate for calibrator, SAUTER 963-291

STANDARD



OPTION



Model	Accuracy class	Measuring range Linear dB	Frequency range kHz	Sensitivity mV/Pa	Option	
					DAKKS calibration certificate	Factory calibration certificates
SAUTER					DAKKS KERN	KERN
SW 1000	1	20-134	0,01-20	50	963-281	961-281
SW 2000	2	25-136	0,02-12,5	40	963-281	961-281





## System solutions Industry 4.0 (IoT)/Display devices

**FORCE MEASUREMENT**  
Load cell + SAUTER FL + Software



**BALANCE MANUFACTURE**  
Load cell + Junction Box + KERN YKV



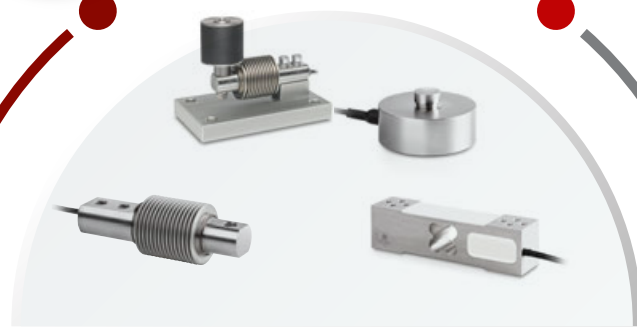
**BALANCE MANUFACTURE**  
Load cell + display device



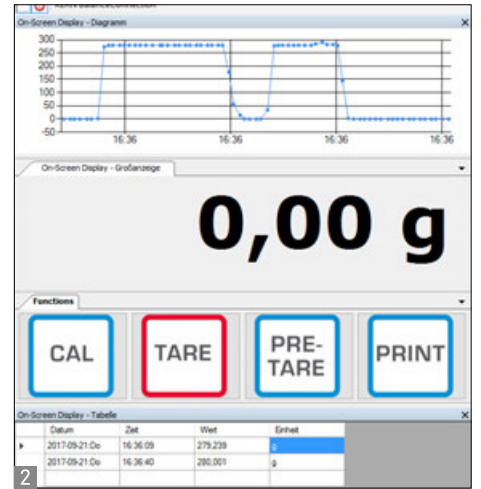
**BALANCE MANUFACTURE**  
Load cell + KERN YKV +  
KERN Software BalanceConnection



**BALANCE MANUFACTURE**  
Load cell + Junction Box +  
display device



We help to dovetail industrial production with state-of-the-art information and communication technology with the aim of increasing quality, using costs, time and resources more efficiently and being able to react more flexibly to the demands of the future. You can benefit from our standardized data protocols in conjunction with our BalanceConnection 4.0 data software, for details see Internet.



Modern A/D converter for the rapid recording of weighing data and forwarding it to the most varied output channels such as tablets, networks, SPS controllers, etc. – ideal for operating balances in systems or conveyors

**Features**

- With this A/D converter box your weighing processes are ready for the requirements of Industry 4.0. Simply connect a weighing platform or measuring cell, integrate the A/D converter box into the network and start weighing
- For rapid transfer of weighing data to connected networks, computers, etc.
- USB and RS-232 data interface standard, Power supply via USB interface
- Transfer formats are freely configurable
- Functions: Weighing, taring
- Internal resolution 16 million divisions
- Measuring frequency 10 Hz
- Easy configuration using the software supplied
- Robust plastic die-cast housing
- **1** Suitable for wall mounting and DIN track mount
- Compatible with all KERN weighing platforms

- Included with delivery:
  - Industrial platform KERN KFP
  - USB cable incl. mains plug
  - DIN rail mounting bracket
  - **2** Configuration software for adjusting and managing the KERN YKV-01, for large-format display of the values collected on the PC as well as transfer of this data to other Apps and programs. The displayed result can therefore be converted to any format for communication with the different user programs, such as, for example, e.g. SAP, Oracle etc.

**Technical Data**

- Overall dimensions W×D×H 100×127×28 mm
- Net weight approx. 1,2 kg
- Permissible ambient temperature -10 °C/40 °C

**Accessories**

- Bluetooth data interface, KERN YKV-A02
- WiFi data interface, KERN YKV-A01
- DIN rail mounting bracket for KERN YKV, KERN YKV-A03
- Software BalanceConnection, flexible recording or transfer of measurements, particularly to Microsoft® Excel or Access as well as transfer of this data to other Apps and programs. The displayed result can therefore be converted to any format for communication with the different user programs, such as, for example, e.g. SAP, for details see Internet, KERN SCD-4.0

10

STANDARD	FACTORY

<b>Model</b>	Standard interfaces	
<b>SAUTER</b>		
<b>YKV-01</b>	RS-232, USB	
<b>YKV-02</b>	RS-232, USB, Ethernet	

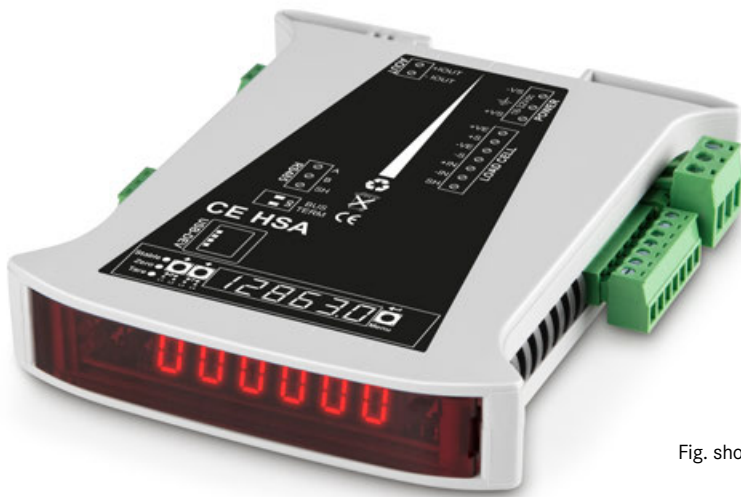


Fig. shows KERN CE HSA



## Super compact display device (rail-mounted module) for installation in switch cabinets for DMS sensors

### Features

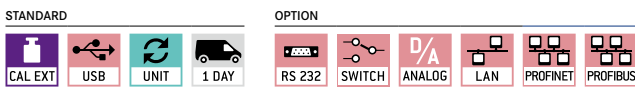
- Compact display unit for recording weighing data using strain gauge load cells, e.g. in industrial applications
- **A** Due to its small size, it is particularly space-saving to install in switch cabinets
- Thanks to the many interface variants, the modules can be ideally integrated into existing infrastructures and systems
- The modules can be used either individually or as a Buslink system with a total of up to 332 DIN rail modules
- The configuration of the module can be carried out conveniently via a connected PC with the suitable software (Download see Internet)
- Bright LED display for optical control and settings
- Time-saving G-Cal™ (Geographic Calibration) technology for fast and accurate calibration without weights conveniently over a network or the Internet worldwide
- Convenient communication via remote devices
- Backup and restore function via USB port
- Can handle various industrial protocols such as Ethernet IP, Modbus TCP, Modbus RTU, FINS, PROFIBUS DP and PROFINET (according to model)
- Extremely high measurement frequency possible, up to 1600 data records/s
- Internal resolution 24 Bit

### Technical Data

- LCD display, digit height 7,6 mm
- Overall dimensions W×D×H  
101×120×22,5 mm
- Permissible ambient temperature  
-10 °C/40°C

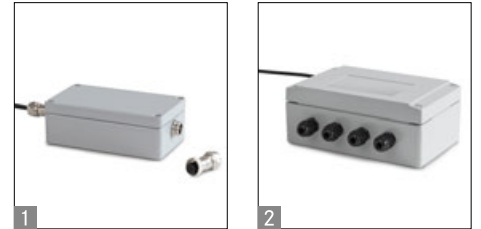
### Accessories

- Mains adapter for power supply of the KERN CE HSx, mountable on DIN rail, KERN CE HSS
- Large display, display size 7,6 cm (only for CE HSR), KERN YKD-A02
- For further accessories, such as load and load cells, torque sensors and weighing platforms (strain gauge based only) from the SAUTER and KERN range, see internet
- Further accessories such as DIN rail, housing as well as individual assembly, configuration, adjustment, etc. on request



Features	Model KERN				
	CE HSA	CE HSE	CE HSP	CE HSR	CE HSN <small>NEW</small>
<b>Power supply</b>	18-32 Vdc; 4 W max.	18-32 Vdc; 4 W max.	18-32 Vdc; 4 W max.	18-32 Vdc; 4 W max.	18-32 Vdc; 4 W max.
<b>Load cell power supply</b>	5 Vdc	5 Vdc	5 Vdc	5 Vdc	5 Vdc
<b>Sensitivity</b>	0,1 µV/d	0,1 µV/d	0,1 µV/d	0,1 µV/d	0,1 µV/d
<b>Adjustable nominal sensitivity</b>	1; 1.5; 2; 2.5; 3 mV/V	1; 1.5; 2; 2.5; 3 mV/V	1; 1.5; 2; 2.5; 3 mV/V	1; 1.5; 2; 2.5; 3 mV/V	1; 1.5; 2; 2.5; 3 mV/V
<b>Input voltage Unipolar @3mV/V</b>	-1 mV to +16 mV	-1 mV to +16 mV	-1 mV to +16 mV	-1 mV to +16 mV	-1 mV to +16 mV
<b>Input voltage Bipolar @3mV/V</b>	-16 mV to +16 mV	-16 mV to +16 mV	-16 mV to +16 mV	-16 mV to +16 mV	-16 mV to +16 mV
<b>A/D Conversion speed</b>	1600/s	1600/s	1600/s	1600/s	1600/s
<b>Max. load cell impedance</b>	1200Ω	1200Ω	1200Ω	1200Ω	1200Ω
<b>Min. load cell impedance</b>	43,75 Ω	43,75 Ω	43,75 Ω	43,75 Ω	43,75 Ω
<b>Max. no. of load cells 350 Ω</b>	8	8	8	8	8
<b>Max. no. of load cells 1000 Ω</b>	22	22	22	22	22
<b>Max. number of d</b>	10.000	10.000	10.000	10.000	10.000
<b>Display steps</b>	1,2,5, 10,20,50,100,200	1,2,5, 10,20,50,100,200	1,2,5, 10,20,50,100,200	1,2,5, 10,20,50,100,200	1,2,5, 10,20,50,100,200
<b>Communication/Interfaces</b>	USB	USB, Ethernet	USB, PROFIBUS	USB, RS232/422	USB, PROFINET
<b>Analog output</b>	0/4-20/24mA	-	-	-	-
<b>Dimensions W×D×H</b>	120×110×22 mm	120×110×22 mm	120×110×22 mm	120×110×22 mm	120×110×22 mm
<b>Net weight g</b>	150	150	150	150	150

NEW



## Analogue weighing transmitter to amplify the DMS signal with current or voltage output

### Features

- Voltage supply 12V or 24V
- Output signal voltage or current
- Suitable for transfer to SPS, analogue measuring card etc.
- Integrated overvoltage protection
- Polarity reversal protection at the input and protection of the output
- CE WT1-Y4 and CE WT2-Y4: up to 4 sensors connectable without junction box
- Scope of delivery: weighing transmitter, connection plug for sensor, cable incl. plug for output signal and power supply
- 12V DC or 24V DC voltage source (depending on model) required (e.g. for 24V voltage source CE is HSS compatible)
- Compatible with all analogue SAUTER load cells and analogue KERN weighing platforms

### Technical Data

- Measuring range: 0 to 20 mV
- Accuracy:  $\leq \pm 0.1\%$  F.S.
- Ambient temperature: -20 to +85°C
- Overall dimensions W×D×H  
 CE WT1: 112×45×33 mm, see larger picture  
 1 CE WT2: 110×64×37 mm  
 2 CE WT4: 158×100×65 mm

### Accessories

- Mains adapter for power supply of the KERN CE (only for models with 24 V), KERN CE HSS

10

STANDARD



Model	Sensor connections	Supply voltage	Output signal	Housing	Class of protection	
<b>SAUTER</b>						
CE WT1-Y1	1	12 V	Analog (4 - 20 mA)	Steel plate	IP54	
CE WT2-Y1	1	24 V	Analog (4 - 20 mA)	Steel plate	IP54	
CE WT3-Y1	1	12 V	Analog 0 +/-5V	Steel plate	IP54	
CE WT4-Y1	1	24 V	Analog 0 +/-5V	Steel plate	IP54	
CE WT1-Y2	1	12 V	Analog (4 - 20 mA)	Aluminium	IP65	
CE WT2-Y2	1	24 V	Analog (4 - 20 mA)	Aluminium	IP65	
CE WT1-Y4	4	12 V	Analog (4 - 20 mA)	Aluminium	IP65	
CE WT2-Y4	4	24 V	Analog (4 - 20 mA)	Aluminium	IP65	



## Load cells

Various Accuracy classes with nominal loads from 300 g to 100 t and protection classes up to IP69K are available to you in the SAUTER product range. Whatever the project – whether it's the development of customised weighing systems, installation in silos and storage tanks or in shelving for continuous inventory, for special application in mechanical engineering or in any type of test bench – SAUTER can offer you just the right measuring cell.

Of course, we can also supply you with the appropriate accessories such as load corners, pivot heads, display devices, junction boxes or the relevant calibration certificate at the same time.

Any special requests? Do you need special load cells, other capacities or cable lengths, individual force test benches or a special mount for your test item? No problem, our product specialist for force-measuring cells Mr Stefan Herrmann is available at any time to help you further and will work with you to develop a customised concept for your application.

### ! Note

Individual scale construction according to your individual requirements, also possible with third-party components.

Accuracy class	Combined error
C5	≤ 0,01 %
C4	≤ 0,015 %
C3	≤ 0,02 %
C2	≤ 0,03 %
C1	≤ 0,05 %
G1	≤ 0,1 %
G2	≤ 0,2 %
G3	≤ 0,3 %
G5	≤ 0,5 %
G10	≤ 1,0 %



NEW



NEW

**! Note**

Analogue torque sensors are compatible with the SAUTER CE HSx display device (rail-mounted module) (see page 83)

**DC Y1**

Alloy steel static torque sensor

STANDARD  1 DAY

OPTION  +4 DAYS

- High precision (comprehensive Error 0,5 % F.S.)
- RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- For monitoring or measurement of static torques, tests of manual torque wrenches or transfer of static load torques
- Nominal sensitivity 1.0~1.5 mV/V (depending on nominal load)
- Supply voltage max. 10 V DC
- 4-wire connection
- Simple and quick installation
- High torsional stiffness
- Other designs and nominal loads on request

**DC Y2**

Alloy steel static torque sensor

STANDARD  IP 65  1 DAY

OPTION  +4 DAYS

- High precision (comprehensive Error 0,3 % F.S.)
- RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- For monitoring or measurement of static torques, tests of manual torque wrenches or transfer of static load torques
- Nominal sensitivity 1,5 mV/V
- Supply voltage max. 15 V DC
- 4-wire connection
- High torsional stiffness
- Other designs and nominal loads on request

Modell	Nominal load	
<b>SAUTER</b>	Nm	
<b>DC 5-Y1</b>	5	
<b>DC 10-Y1</b>	10	
<b>DC 20-Y1</b>	20	
<b>DC 50-Y1</b>	50	
<b>DC 100-Y1</b>	100	
<b>DC 200-Y1</b>	200	
<b>DC 500-Y1</b>	500	

Modell	Nominal load	
<b>SAUTER</b>	Nm	
<b>DC 200M-Y2</b>	0,2	
<b>DC 1-Y2</b>	1	
<b>DC 10-Y2</b>	10	
<b>DC 20-Y2</b>	20	
<b>DC 50-Y2</b>	50	



Tip: Further details and technical data sheet as well as extensive accessories see internet



### CP P4 · CP Y4

Single-point load cells made of anodised aluminium

STANDARD: IP 65, 1 DAY  
 OPTION: DAKKS, ISO, +3 DAYS, +4 DAYS

- CP P4: Accuracy in accordance with OIML R60 C3
- CP Y4: Accuracy in accordance with OIML R60 C2
- CE and RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- Aluminium, anodised
- Suitable for price-computing scales, bench scales, platform scales, etc.
- Maximum platform size 200×200 mm
- 4-wire connection
- Nominal sensitivity: 0,9 mV/V

Model	Nominal load	
SAUTER	kg	
CP 300-0P4	0,3	
CP 600-0P4	0,6	

Model	Nominal load	
SAUTER	kg	
ECO design (without EC type approval)		
CP 300-0Y4 <small>NEW</small>	0,3	
CP 1500-0Y4 <small>NEW</small>	1,5	
CP 3000-0Y4 <small>NEW</small>	3	

NEW New model

### CP P1 · CP Y1

Single-point load cells made of anodised aluminium

STANDARD: IP 65, M, 1 DAY  
 OPTION: DAKKS, ISO, +3 DAYS, +4 DAYS  
CP P1

- CP P1: Accuracy in accordance with OIML R60 C3
- CP Y1: Accuracy in accordance with OIML R60 C2
- CE and RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- Aluminium, anodised
- Suitable for price-computing scales, bench scales, platform scales, etc.
- Maximum platform size 250×350 mm
- 4-wire connection
- Nominal sensitivity: 2 mV/V
- Note: Version in accordance with OIML R60 C4 or C5 on request

Model	Nominal load	
SAUTER	kg	
CP 3-3P1	3	
CP 5-3P1	5	
CP 6-3P1	6	
CP 8-3P1	8	
CP 10-3P1	10	
CP 15-3P1	15	
CP 20-3P1	20	
CP 30-3P1	30	
CP 35-3P1	35	
CP 40-3P1	40	
CP 50-3P1	50	

Model	Nominal load	
SAUTER	kg	
ECO design (without EC type approval)		
CP 3-2Y1 <small>NEW</small>	3	
CP 5-2Y1 <small>NEW</small>	5	
CP 10-2Y1 <small>NEW</small>	10	
CP 15-2Y1 <small>NEW</small>	15	
CP 20-2Y1 <small>NEW</small>	20	
CP 30-2Y1 <small>NEW</small>	30	

NEW New model

### CP P3

Single-point load cells made of anodised aluminium

STANDARD: IP 65, 1 DAY  
 OPTION: DAKKS, ISO, +3 DAYS, +4 DAYS

- Accuracy in accordance with OIML R60 C3
- CE and RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- Suitable for price-computing scales, bench scales, platform scales, etc.
- Maximum platform size 350×400 mm
- 4-wire connection
- Nominal sensitivity: 2 mV/V
- Note: Version in accordance with OIML R60 C4 on request

Model	Nominal load	
SAUTER	kg	
CP 50-3P3	50	
CP 75-3P3	75	



Tip: Further details and technical data sheet as well as extensive accessories see internet



**CP P2**

Single-point load cell of aluminium

STANDARD

IP 65 1 DAY

OPTION

DAKKS ISO +3 DAYS +4 DAYS

- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP65 (in accordance with EN 60529)
- Aluminium, anodised
- Suitable for price-computing scales, bench scales, etc.
- Maximum platform size 100–300 kg: 400×400 mm
- Maximum platform size 400–500 kg: 450×450 mm
- Nominal sensitivity: 2 mV/V
- Note: Version in accordance with OIML R60 C4 or C5 on request

**CP P9**

Single-point load cells of stainless steel

STANDARD

IP 68 IP 69K M 1 DAY

OPTION

DAKKS ISO +3 DAYS +4 DAYS

- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP68/IP69K (in accordance with EN 60529), welded to create a hermetic seal
- Stainless steel
- Area of application: Weight measurement as well as compressive force in harsh environments
- Suitable for platform scales, checkweighers
- Maximum platform size 10–50 kg: 400×400 mm
- Maximum platform size 100–500 kg: 800×800 mm
- 4-wire connection (10–50 kg)
- 6-wire connection (100–500 kg)
- Nominal sensitivity: 2 mV/V
- Note: Version in accordance with OIML R60 C4 or C5 on request

Model	Nominal load	
<b>SAUTER</b>	kg	
CP 100-3P2	100	
CP 150-3P2	150	
CP 200-3P2	200	
CP 300-3P2	300	
CP 400-3P2	400	
CP 500-3P2	500	

Model	Nominal load	
<b>SAUTER</b>	kg	
CP 10-3P9	10	
CP 20-3P9	20	
CP 50-3P9	50	
CP 100-3P9	100	
CP 200-3P9	200	
CP 300-3P9	300	
CP 400-3P9	400	
CP 500-3P9	500	



Tip: Further details and technical data sheet as well as extensive accessories see internet



NEW



Fig. shows optional accessory, mounting kit  
**■** SAUTER CE P4136

**CD P1**

Load cells made of stainless steel

STANDARD

IP 68 M 1 DAY

OPTION

ISO +4 DAYS

- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP68 (in accordance with EN 60529), hermetically encapsulated
- Stainless steel
- Area of application: Weight measurement as well as compressive force
- Suitable for vehicle scales, weigh hoppers, vehicle testing equipment, test benches
- Note: EX version or accuracy class C4 on request
- Nominal sensitivity: 2 mV/V

**Accessories CD P1:**

- Pressure piece, steel, rustproof, suitable for CD 10-3P1, CD 20-3P1, SAUTER CE P10330
- Pressure piece, steel, rustproof, suitable for CD 40-3P1, CD 50-3P1, SAUTER CE P10350
- **■** Mounting kit, steel, rustproof, suitable for CD 10-3P1, CD 20-3P1, SAUTER CE P41430
- Mounting kit, steel, rustproof, suitable for CD 40-3P1, CD 50-3P1, SAUTER CE P4150

Model	Nominal load	
<b>SAUTER</b>		
CD 10-3P1	10 t/ 100 kN	
CD 20-3P1	20 t/200 kN	
CD 40-3P1	40 t/400 kN	
CD 50-3P1	50 t/500 kN	

\* up to max. 12 t/120 kN

**CD P2**

Load cells made of stainless steel

STANDARD

IP 68

OPTION

ISO +4 DAYS

- Accuracy in accordance with OIML R60 C2
- RoHS compliant
- Dust and spray protection to IP68 (in accordance with EN 60529), hermetically encapsulated
- Stainless steel
- Area of application: Tensile and compressive force measurement
- Suitable for vehicle scales, weigh hoppers, vehicle testing equipment, test benches, suspended scales
- Nominal sensitivity: 1,5 mV/V
- Please ask for delivery time

Model	Nominal load	
<b>SAUTER</b>		
CD 10-2P2	10 t/ 100 kN	
CD 20-2P2	20 t/200 kN	
CD 30-2P2	30 t/300 kN	
CD 50-2P2	50 t/500 kN	
CD 100-2P2	100 t/1000 kN	

\* up to max. 12 t/120 kN

**CR Y1**

Load cells made of alloyed steel

STANDARD

IP 68 1 DAY

OPTION

ISO +4 DAYS

- High precision (comprehensive Error 0,05 % F.S.)
- Accuracy in accordance with OIML R60 C1
- RoHS compliant
- Dust and spray protection to IP68 (in accordance with EN 60529), hermetically encapsulated
- Stainless steel
- Area of application: for weight, tensile and compressive force measurement
- Suitable for Weight measurement as well as force and force test benches
- Force transmission via pressure piece or threaded hole
- Nominal sensitivity: 2 mV/V
- Pressure piece included with delivery
- Thread for pressure piece or other force application: up to 5000 kg M16×1,5, from 10000 kg M32×1,5

Model	Nominal load	
<b>SAUTER</b>		
CR 500-1Y1	0,5 t/5 kN	
CR 1000-1Y1	1 t/10 kN	
CR 5000-1Y1	5 t/50 kN	
CR 10000-1Y1	10 t/100 kN	
CR 20000-1Y1	20 t/200 kN	

\* up to max. 12 t/120 kN



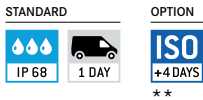
Tip: Further details and technical data sheet as well as extensive accessories see internet



Fig. shows accessories, load corner SAUTER CE Q42901, for further accessories please visit our online shop

### CR Q1

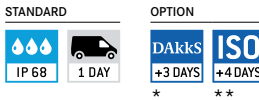
Load cells made of stainless steel



- Accuracy in accordance with OIML R60 C1
- RoHS compliant
- Dust and spray protection to IP68 (in accordance with EN 60529), hermetically encapsulated
- Stainless steel
- Area of application: Weight measurement as well as compressive force
- Suitable for vehicle scales, weigh hoppers, vehicle testing equipment, test benches
- Nominal sensitivity: 2 mV/V

### CR P1

Load cells made of stainless steel



- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP68 (in accordance with EN 60529), hermetically encapsulated
- Stainless steel
- Area of application: Weight measurement as well as compressive force
- Suitable for truck scales, suspended scales, silo scales and other diverse scales, test benches, etc.
- Nominal sensitivity: 1–2 mV/V

### Accessories CR Q1:

- Load corner, steel, galvanised, suitable for CR Q1 with nominal load ≤ 10 t, SAUTER CE Q42901
- Load corner, steel, galvanised, suitable for CR Q1 with nominal load ≥ 20 t, SAUTER CE Q42902
- Load corner, steel, rustproof, suitable for CR Q1 with nominal load ≤ 10 t, SAUTER CE RQ42901
- Load corner, steel, rustproof, suitable for CR Q1 with nominal load ≥ 20 t, SAUTER CE RQ42902

### Accessories CR P1:

- Load corner for CR 1000-3P1, CR 250-3P1, CR 500-3P1 Steel, incl. pressure piece, SAUTER CE P244011
- Pressure piece for CR 1000-3P1, CR 250-3P1, CR 500-3P1 steel, SAUTER CE P244012
- Load corner for CR 2000-3P1 steel, rustproof, incl. pressure piece, SAUTER CE P244021
- Pressure piece for CR 2000-3P1 steel, rustproof SAUTER CE P244022

Model	Nominal load	
<b>SAUTER</b>		
CR 2500-1Q1	2,5 t/25 kN	
CR 5000-1Q1	5 t/50 kN	
CR 10000-1Q1	10 t/100 kN	
CR 20000-1Q1	20 t/200 kN	
CR 30000-1Q1	30 t/300 kN	

\*\* up to max. 12 t/120 kN

Model	Nominal load	
<b>SAUTER</b>		
CR 60-3P1	60 kg/0,6 kN	
CR 130-3P1	130 kg/1,3 kN	
CR 250-3P1	250 kg/2,5 kN	↓
CR 500-3P1	500 kg/5 kN	↓
CR 1000-3P1	1000 kg/10 kN	↓
CR 2000-3P1	2000 kg/20 kN	↓

\* up to max. 500 kg/5 kN

\*\* up to max. 12 t/120 kN



Tip: Further details and technical data sheet as well as extensive accessories see internet



Fig. shows accessories, base plate 1 SAUTER CE Q30903 and bearings 2 SAUTER CE Q30904, for further accessories please visit our online shop



Fig. shows optional accessory load corner 3 SAUTER CE P4022

### CB Q1 · CB Q2

Bending beam and shear beam measuring cells made from stainless steel

STANDARD			OPTION	
IP 68	IP 69K	1 DAY	+3 DAYS	+4 DAYS

- Accuracy in accordance with OIML R60 C3
- CE and RoHS compliant
- Dust and spray protection to IP68/IP69K (in accordance with EN 60529), welded to create a hermetic seal
- Stainless steel
- Area of application: Weight measurement as well as compressive force in harsh environments
- Suitable for platform scales, weigh hoppers, floor scales and other weighing devices
- 4-wire connection
- Nominal sensitivity: 2 mV/V
- Note: Accuracy class OIML R60 C6 or EX version on request

### CT P1

Measuring cells made from stainless steel

STANDARD			OPTION	
IP 67	M	1 DAY	+3 DAYS	+4 DAYS

- Accuracy in accordance with OIML R60 C3
- CE and RoHS compliant
- Dust and spray protection to IP67 (in accordance with EN 60529), hermetically encapsulated
- Nickel-plated steel
- Area of application: Weight measurement as well as compressive force in harsh environments
- Suitable for platform scales, silo scales, bed scales and other diverse scales
- 4-wire connection
- Nominal sensitivity: 3 mV/V

### Accessories CB Q1 · CB Q2:

- Traction device, steel, galvanised, suitable for CB Q1, SAUTER CE Q30901
- Traction device, steel, rustproof, suitable for CB Q2, SAUTER CE Q34905
- 1 Base plate, steel, galvanised, suitable for CB Q1, SAUTER CE Q30903
- Base plate, steel, rustproof, suitable for CB Q1, SAUTER CE RQ30903
- Base plate, steel, rustproof, suitable for CB Q2, SAUTER CE Q34903
- 2 Bearing, steel, rustproof, suitable for CB Q1 (nominal load 5 kg–50 kg), SAUTER CE Q30904
- Bearing, steel, rustproof, suitable for CB Q1 (nominal load 75 kg–300 kg), SAUTER CE Q30905
- Bearing, steel, rustproof, suitable for CB 500-3Q1, SAUTER CE Q30906
- Bearing, steel, rustproof, suitable for CB 750-3Q2, CB 1000-3Q2, CB 1500-3Q2, SAUTER CE Q34906
- Load corner, steel, galvanised, suitable for CB Q1, SAUTER CE Q30907
- Load corner, steel, rustproof, suitable for CB Q1, SAUTER CE RQ30907
- Adjustable foot, steel, rustproof, suitable for SAUTER CE Q34901

Model	Nominal load	
SAUTER	kg	
CB 5-3Q1	5	
CB 10-3Q1	10	
CB 20-3Q1	20	
CB 30-3Q1	30	
CB 50-3Q1	50	
CB 75-3Q1	75	
CB 100-3Q1	100	↓
CB 150-3Q1	150	
CB 200-3Q1	200	
CB 250-3Q1	250	
CB 300-3Q1	300	
CB 500-3Q1	500	
CB 750-3Q2	750	
CB 1000-3Q2	1000	
CB 1500-3Q2	1500	

\* up to max. 500 kg ↓

Model	Nominal load	
SAUTER	kg	
CB 100-3P1	100	
CB 250-3P1	250	

### Accessories CB P1:

- Adjustable foot, steel, nickel-plated, load base M12 for CT 500-3P1, CT 1000-3P1 and CT 1500-3P1, SAUTER CE P2012
- 3 Load corner, steel, nickel-plated for CT 500-3P1, CT 1000-3P1 and CT 1500-3P1, SAUTER CE P4022
- Spacer plates for bending beam CB P1 made from steel, SAUTER CE P3012

Tip: Further details and technical data sheet as well as extensive accessories see internet



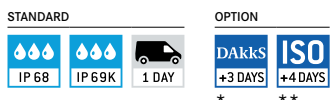
Fig. shows optional accessory load corner 1 SAUTER CE RQ35903



Fig. shows optional accessory load corner 2 SAUTER CE P4022

### CT Q1

Shear beam made from stainless steel



- Accuracy in accordance with OIML R60 C3
- CE and RoHS compliant
- Dust and spray protection to IP68/IP69K (in accordance with EN 60529), welded to create a hermetic seal
- Stainless steel
- Area of application: Weight measurement as well as compressive force in harsh environments
- Suitable for platform scales, weigh hoppers, flush-mounted floor scales and other weighing devices
- 6-wire connection
- Nominal sensitivity: 2 mV/V
- Note: EX version on request

### CT P1 · CT P2

Measuring cells made from stainless steel



- Accuracy in accordance with OIML R60 C3
- CE and RoHS compliant
- Dust and spray protection to IP67 (in accordance with EN 60529), welded to create a hermetic seal
- Nickel-plated steel
- Area of application: Weight measurement as well as compressive force in harsh environments
- Suitable for platform scales, weigh hoppers, flush-mounted floor scales and other weighing devices
- 4-wire connection
- Nominal sensitivity: 3 mV/V
- Note: EX version, 6-wire connection and accuracy class C4 or C5 on request
- **CT P2:** Delivery with calibrated characteristic value, if several cells are ordered, this means significantly less effort when aligning the corners of a platform

### Accessories CT Q1:

- Base plate, steel, rustproof, suitable for CT Q1, SAUTER CE RQ35911
- Base plate, steel, rustproof, suitable for CT 3000-3Q1, CT 5000-3Q1, SAUTER CE RQ35912
- Base plate, steel, rustproof, suitable for CT 7500-3Q1, CT 10000-3Q1, SAUTER CE RQ35919
- Bearing, steel, rustproof, suitable for CT Q1, SAUTER CE RQ35909
- Bearing, steel, rustproof, suitable for CT 3000-3Q1, CT 5000-3Q1, SAUTER CE RQ35910
- Bearing, steel, rustproof, suitable for CT 7500-3Q1, CT 10000-3Q1, SAUTER CE RQ35918
- Load corner, steel, rustproof, suitable for CT Q1, SAUTER CE RQ35902
- 1 Load corner, steel, rustproof, suitable for CT 3000-3Q1, CT 5000-3Q1, SAUTER CE RQ35903

### Accessories CT P1:

- Load corner, steel, rustproof, suitable for CT 10000-3P1, CT 10000-3P2, SAUTER CE P40210
- 2 Load corner, steel, nickel-plated, suitable for CT 500-3P1, CT 1000-3P1, CT 1500-3P1, SAUTER CE P4022
- Load corner, steel, nickel-plated, suitable for CT 2500-3P1, CT 3000-3P1, CT 5000-3P1, SAUTER CE P4025
- Adjustable foot, steel, rustproof, suitable for CT 500-3P1, CT 1000-3P1, CT 1500-3P1, SAUTER CE P2012
- Adjustable foot, steel, rustproof, suitable for CT 2500-3P1, CT 3000-3P1, CT 5000-3P1, SAUTER CE P2018
- Adjustable foot, steel, rustproof, suitable for CT 10000-3P1, SAUTER CE P2024
- Spacer plate for CT 500-3P1, CT 500-3P2, CT 1000-3P1, CT 1000-3P2 and CT 1500-3P1, SAUTER CE P3012
- Spacer plate for CT 2500-3P1, CT 3000-3P1, CT 3000-3P2, CT 5000-3P1 and CT 5000-3P2 SAUTER CE P3015
- Spacer plate for CT 10000-3P1 and CT 10000-3P2 SAUTER CE P30110

Model	Nominal load	
<b>SAUTER</b>	kg	
CT 300-3Q1	300	
CT 500-3Q1	500	
CT 750-3Q1	750	
CT 1000-3Q1	1000	
CT 1500-3Q1	1500	
CT 2000-3Q1	2000	
CT 3000-3Q1	3000	
CT 5000-3Q1	5000	
CT 7500-3Q1	7500	
CT 10000-3Q1	10000	

\* up to max. 500 kg

\*\* up to max. 12 t

Model	Nominal load	
<b>SAUTER</b>	kg	
CT 500-3P1	500	
CT 1000-3P1	1000	
CT 1500-3P1	1500	
CT 2500-3P1	2500	
CT 3000-3P1	3000	
CT 5000-3P1	5000	
CT 10000-3P1	10000	
CT 500-3P2	500	
CT 1000-3P2	1000	
CT 3000-3P2	3000	
CT 5000-3P2	5000	
CT 10000-3P2	10000	

\* up to max. 500 kg

\*\* up to max. 12 t



Tip: Further details and technical data sheet as well as extensive accessories see internet



Fig. shows optional accessory **1** SAUTER CE R20, for further accessories please visit our online shop



Fig. shows optional accessory traction device **2** SAUTER CE Q12, for further accessories please visit our online shop

\*\*\* With 6-wire measuring circuits, the cable can be shortened without affecting the temperature compensation and the actual characteristic value. For 4-wire measuring circuits the cable length should not be changed

**Accessories CT P1:**

- Traction device, steel, galvanised, suitable for CS P1, SAUTER CE Q12
- Rod end, steel, galvanised, suitable for CS 25-3P1, CS 50-3P1, SAUTER CE R8
- Rod end, steel, rustproof, suitable for CS 25-3P1, CS 50-3P1, SAUTER CE RR8
- Rod end, steel, rustproof, suitable for CS 100-3P1, CS 150-3P1, SAUTER CE RR10
- Rod end, steel, galvanised, suitable for CS 100-3P1, CS 150-3P1, SAUTER CE R10
- Rod end, steel, galvanised, suitable for CS P1, CS P2 with 50 kg ≥ nominal load ≤ 1 t, SAUTER CE R12
- Rod end, steel, rustproof, suitable for CS P1, CS P2 with 50 kg ≥ nominal load ≤ 1 t, SAUTER CE RR12
- **1** Rod end, steel, galvanised, suitable for CS 2000-3P1, CS 2500-3P1, CS 5000-3P1, SAUTER CE R20
- Rod end, steel, rustproof, suitable for CS 2000-3P1, CS 2500-3P1, CS 5000-3P1, SAUTER CE RR20

**CS P1**

4-wire “S” measuring cells made of nickel-plated steel for force and mass measurement

STANDARD	OPTION
	* **

- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP67 (in accordance with EN 60529), welded to create a hermetic seal
- Nickel-plated steel
- Scope of application: for tensile and compressive force measurement
- Suitable for handing scales, weigh hoppers and other weighing devices as well as force measurement devices and test benches
- 4-wire connection\*\*\*
- Note: EX version and accuracy class C4 on request
- Nominal sensitivity: 2 mV/V

**CS Q1**

6-wire “S” measuring cells made of nickel-plated steel for force and mass measurement

STANDARD	OPTION
	* **

- Accuracy in accordance with OIML R60 C3
- RoHS compliant
- Dust and spray protection to IP67 (in accordance with EN 60529), hermetically encapsulated
- Nickel-plated steel
- Scope of application: for tensile and compressive force measurement
- Suitable for handing scales, weigh hoppers and other weighing devices as well as force measurement devices and test benches
- 6-wire connection\*\*\*
- Nominal sensitivity: 2 mV/V

**Accessories CT Q1:**

- **2** Traction device, steel, galvanised, suitable for CS P1, SAUTER CE Q12
- Traction device, steel, galvanised, suitable for CS 1500-3Q1, CS 2000-3Q1, SAUTER CE Q16
- Traction device, steel, galvanised, suitable for CS 3000-3Q1, CS 5000-3Q1, CS 6000-3Q1, SAUTER CE Q24
- Rod end, steel, galvanised, suitable for CS P1, CS P2 with 50 kg ≥ nominal load ≤ 1 t, SAUTER CE R12
- Rod end, steel, rustproof, suitable for CS P1, CS P2 with 50 kg ≥ nominal load ≤ 1 t, SAUTER CE RR12
- Rod end, steel, galvanised, suitable for CS 1500-3Q1, CS 2000-3Q1, SAUTER CE R16
- Rod end, steel, rustproof, suitable for CS 1500-3Q1, CS 2000-3Q1, SAUTER CE RR16
- Rod end, steel, galvanised, suitable for CS 3000-3Q1, CS 5000-3Q1, CS 6000-3Q1, SAUTER CE R24
- Rod end, steel, rustproof, suitable for CS 3000-3Q1, CS 5000-3Q1, CS 6000-3Q1, SAUTER CE RR24

Model	Nominal load	
<b>SAUTER</b>		
<b>CS 25-3P1</b>	25 kg/250 N	
<b>CS 50-3P1</b>	50 kg/500 N	
<b>CS 100-3P1</b>	100 kg/1 kN	
<b>CS 150-3P1</b>	150 kg/1,5 kN	
<b>CS 250-3P1</b>	250 kg/2,5 kN	
<b>CS 500-3P1</b>	500 kg/5 kN	
<b>CS 600-3P1</b>	600 kg/6 kN	
<b>CS 750-3P1</b>	750 kg/7,5 kN	
<b>CS 1000-3P1</b>	1 t/10 kN	
<b>CS 1500-3P1</b>	1.5 t/15 kN	
<b>CS 2000-3P1</b>	2 t/20 kN	
<b>CS 2500-3P1</b>	2.5 t/25 kN	
<b>CS 5000-3P1</b>	5 t/50 kN	
<b>CS 7500-3P1</b>	7.5 t/75 kN	
<b>CS 10000-3P1</b>	10 t/100 kN	
<b>CS 15000-3P1</b>	15 t/150 kN	
<b>CS 20000-3P1</b>	20 t/200 kN	
<b>CS 30000-3P1</b>	30 t/300 kN	

Model	Nominal load	
<b>SAUTER</b>		
<b>CS 50-3Q1</b>	50 kg /500 N	
<b>CS 100-3Q1</b>	100 kg /1 kN	
<b>CS 150-3Q1</b>	150 kg /1,5 kN	
<b>CS 200-3Q1</b>	200 kg /2 kN	
<b>CS 300-3Q1</b>	300 kg /3 kN	
<b>CS 500-3Q1</b>	500 kg /5 kN	
<b>CS 750-3Q1</b>	750 kg /7,5 kN	
<b>CS 1000-3Q1</b>	1 t /10 kN	
<b>CS 1500-3Q1</b>	1.5 t /15 kN	
<b>CS 2000-3Q1</b>	2 t /20 kN	
<b>CS 3000-3Q1</b>	3 t /30 kN	
<b>CS 5000-3Q1</b>	5 t /50 kN	
<b>CS 6000-3Q1</b>	6 t /60 kN	

\* up to max. 500 kg/5 kN,  
 \*\* up to max. 12 t/120 kN

\* up to max. 500 kg/5 kN,  
 \*\* up to max. 12 t/120 kN



Tip: Further details and technical data sheet as well as extensive accessories see internet



CS P2 0,5-7,5 t



CS P2 50-250 kg



CS Y1



CO Y1



CO Y2/CO Y3



CO Y4

**CS P2**

“S” measuring cells/load cells made of stainless steel

STANDARD: IP 68, 1 DAY  
 OPTION: DAKKS +3 DAYS, ISO +4 DAYS

**CS P2:**

- Accuracy in accordance with OIML C3
- RoHS compliant
- Dust and spray protection to IP68
- Stainless steel
- Scope of application: Weight measurement as well as force
- Suitable for hanging scales, silo scales, force test benches and other diverse scales
- Nominal sensitivity: 2.0 ± 0.004

**CS Y1**

Miniature “S” measuring cells/load cells made of stainless steel

STANDARD: IP 65, 1 DAY  
 OPTION: ISO +4 DAYS

**CS Y1:**

- High precision (comprehensive Error 0,05 % F.S.)
- RoHS compliant
- Dust and spray protection to IP65
- Stainless steel
- Scope of application: for tensile and compressive force measurement, Weight measurement as well as force
- Suitable for force test benches, hanging scales, silo scales and other diverse scales
- Nominal sensitivity: 1,3 – 2 mV/V

**CO Y1 – Y4**

Miniature button-type measuring cells made of stainless steel

STANDARD: IP 65, IP 66, IP 67, 1 DAY  
 OPTION: DAKKS +3 DAYS, ISO +4 DAYS

**CO Y1/CO Y4:**

- RoHS compliant
- Dust and spray protection to IP65/IP67
- Scope of application: compressive force applications
- Suitable for Weight measurement as well as force and force test benches
- Nominal sensitivity: 1.0 – 1.5 mV/V

**CO Y2/Y3:**

- RoHS compliant
- Dust and spray protection to IP65/IP66
- Scope of application: for tensile and compressive force measurement
- Suitable for Weight measurement as well as force and force test benches
- Nominal sensitivity: 1,5 – 2 mV/V

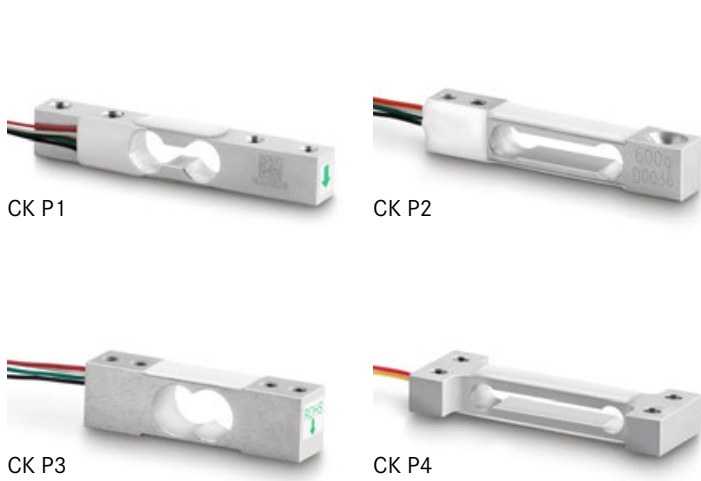
Model	Nominal load	
<b>SAUTER</b>		
CS 50-3P2	50 kg (≈500 N)	
CS 100-3P2	100 kg (≈1 kN)	
CS 250-3P2	250 kg (≈2,5 kN)	
CS 500-3P2	500 kg (≈5 kN)	
CS 1000-3P2	1 t (≈10 kN)	⚠
CS 2000-3P2	2 t (≈20 kN)	
CS 5000-3P2	5 t (≈50 kN)	
CS 7500-3P2	7.5 t (≈75 kN)	

\* up to max. 500 kg/5 kN

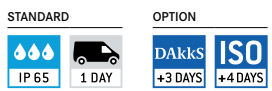
Model	Nominal load	
<b>SAUTER</b>		
CS 1-Y1	1 kg (≈10 N)	
CS 2-Y1	2 kg (≈20 N)	
CS 5-Y1	5 kg (≈50 N)	
CS 10-Y1	10 kg (≈100 N)	
CS 20-Y1	20 kg (≈200 N)	

Model	Nominal load	
<b>SAUTER</b>		
CO 10-Y1	10 kg (≈100 N)	
CO 20-Y1	20 kg (≈200 N)	
CO 50-Y1	50 kg (≈500 N)	
CO 100-Y1	100 kg (≈1 kN)	
CO 200-Y1	200 kg (≈2 kN)	
CO 500-Y1	500 kg (≈5 kN)	
CO 1000-Y1	1000 kg (≈10 kN)	
CO 2000-Y1	2000 kg (≈20 kN)	
CO 10-Y2	10 kg (≈100 N)	
CO 20-Y2	20 kg (≈200 N)	
CO 50-Y2	50 kg (≈500 N)	
CO 100-Y2	100 kg (≈1 kN)	
CO 200-Y2	200 kg (≈2 kN)	
CO 500-Y2	500 kg (≈5 kN)	
CO 1000-Y2	1000 kg (≈10 kN)	
CO 2000-Y2	2000 kg (≈20 kN)	
CO 5-Y3	5 kg (≈50 N)	
CO 10-Y3	10 kg (≈100 N)	
CO 5-Y4	5 kg (≈50 N)	
CO 10-Y4	10 kg (≈100 N)	

\*\* up to 500 kg/5 kN



**CK P1-4**  
Miniature load cells made of aluminium

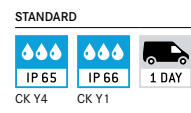


- Dust and spray protection to IP65 (in accordance with EN 60529)
- Aluminium
- High level of accuracy
- Suitable for small scales and kitchen scales and force-measuring devices
- 4-wire connection

Model	Nominal load	Comprehensive Error
<b>SAUTER</b>	kg	
CK 600-0P1	0,6	0,03 %
CK 1-0P1	1	0,03 %
CK 2-0P1	2	0,03 %
CK 3-0P1	3	0,03 %
CK 5-0P1	5	0,03 %
CK 6-0P1	6	0,03 %
CK 300-0P2	0,3	0,03 %
CK 600-0P2	0,6	0,03 %
CK 1000-0P3	1	0,1 %
CK 100-0P4	0,1	0,05 %
CK 120-0P4	0,12	0,05 %
CK 300-0P4	0,3	0,05 %
CK 500-0P4	0,5	0,05 %



**CK Y1 · Y4**  
Flat miniature alloy steel load cells



- Accuracy class in accordance with OIML C1
- RoHS compliant
- High precision (comprehensive Error 0,05 % F.S.)
- Very low design
- Suitable for e.g. personal scales, kitchen scales, post scales or other scales with lowest installation height

- CK Y1:**
- Protection against dust and water splashes IP66
  - Scope of delivery: 1 piece
  - Full-bridge circuit (Junction box required for connecting several measuring cells)

- CK Y4:**
- Protection against dust and water splashes IP65
  - Scope of delivery: 1 set (4 pieces)
  - Quarter-bridge circuit: 4 load cells are connected to a full-bridge
  - No junction box required
  - Corner adjustment not possible

Model	Nominal load
<b>SAUTER</b>	kg
CK 10-Y1	10
CK 30-Y1	30
CK 10-Y4	10
CK 30-Y4	30
CK 50-Y4	50

**!** Tip: Further details and technical data sheet as well as extensive accessories see internet

NEW

NEW



CJ P4



CJ X467



CJ X468



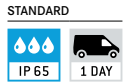
CJ P6



CJ P4PG

**CJ P**

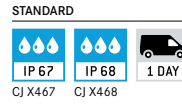
Junctionbox for connecting several measuring cells to one evaluation unit



- Prepared for 4-wire and 6-wire measuring cells
- Models available for 2, 4, 6 or 8 load cells
- Robust aluminium die-cast housing
- Protection against dust and spray

**CJ X**

Junctionbox for connecting several measuring cells to one evaluation unit



- Prepared for 4-wire and 6-wire measuring cells
- Models available for 2, 4, 6 or 8 load cells

**CJ X467:**

- Robust housing made from stainless steel with protection against dust and water splashes IP67

**CJ X468:**

- Robust aluminium diecast housing with protection against dust and water splashes IP68

Model	Number of connection options	
SAUTER		
CJ P2	2	
CJ P4	4	
CJ P4PG	4	
CJ P6	6	
CJ P8	8	

Model	Number of connection options	
SAUTER		
CJ X467	4	
CJ X468	4	



# Ahlborn ALMEMO® measuring connectors

## NEW at SAUTER and in the KERN calibration laboratory:

We can optionally supply measuring cells with a digital D7 or analogue ALMEMO® measuring connector for your Ahlborn measuring device. In addition, you can choose between numerical, two-point or multi-point adjustment. We can also supply the required calibration certificate (up to 120 kN tension/compression) <sup>2)</sup>

### Example:



CR Q1



analog measuring connector ALMEMO® D26 <sup>1)</sup>



Calibration certificate <sup>2)</sup>

or



CD P1



digital measuring connector ALMEMO® D7 <sup>1)</sup>



Calibration certificate <sup>2)</sup>

In order to be able to calibrate your electrode with analog measuring connector ALMEMO® D26 according to your requirements, please inform us when ordering and send us your Ahlborn device. This is not necessary for digital measuring connector ALMEMO® D7!

- 1) Measuring device is not included with the delivery, measuring connector only !
- 2) Possible calibration services please see table on page 16

STANDARD	OPTION
CAL EXT UNIT 3 DAYS	DAKkS +3 DAYS ISO +4 DAYS * **

Calibration	Measuring range  [Max] kN	analog measuring connector ALMEMOR D26 TEDS +/-26mV, mounted on measuring cell		Digital connector D7 ALMEMO® mounted on measuring cell	
		Model		Model	
		SAUTER		SAUTER	
Numerical		CE D26401		CE D7401	
	0,5	CE D26402		CE D7402	
	2	CE D26403		CE D7403	
	5	CE D26404		CE D7404	
	20	CE D26405		CE D7405	
Two-point adjustment	50	CE D26406		CE D7406	
	120	CE D26407		CE D7407	
	0,5	CE D26408		CE D7408	
	2	CE D26409		CE D7409	
	5	CE D26410		CE D7410	
Multi-point adjustment	20	CE D26411		CE D7411	
	50	CE D26412		CE D7412	
	120	CE D26413		CE D7413	

\* up to max. 500 kg/5 kN, \*\* up to max. 12 t/120 kN

Order Hotline: Go to back page of catalogue

# Accredited calibration with DAkkS calibration certificate for force gauges

The KERN calibration laboratory is at your side when you need to calibrate DAkkS reliably.

From the transducer to the full measuring chain, we are happy to take care of traceable calibration of your test equipment for you. Our accreditation includes the calibration of tensile and pressure force up to 5 kN according to the standards DIN EN ISO 376 and DKD-R 3-3, each with the Newton (N) display unit for a complete measuring chain (situation A) or voltage ratio/transmission coefficient (mV/V, situation B). Below you will find a comparison of which standard meets which criteria:

Comparison of DIN EN ISO 376 and DKD-R 3-3		
	ISO 376	DKD-R 3-3
<b>Standardization</b>	ISO standard (internationally standardized)	Standard of the DKD (Germany)
<b>Measuring equipment</b>	Force transducers and complete measuring chains	Force transducers and complete measuring chains
<b>Area of application</b>	Specifically force gauges for the testing of testing equipment	General force gauges
<b>Number of power stages</b>	8	5
<b>Classification/Assessment</b>	Classification in classes 00; 0,5; 1 and 2	None in standard
<b>Test sequences</b>	Fixed procedure	Processes A, B, C and D possible. Standard is A; B, C and D are reduced processes, corresponding previous knowledge is necessary
<b>Summary</b>	Higher-quality calibration, as 8 force levels are calibrated	High-quality calibration, reduced sequences with less effort possible

## Prices for DAkkS calibration of force gauges and force transducers

Situation A: Force transducer (voltage ratio, in mV/V)*1,2					
ISO 376 (8 stages)			DKD-R 3-3 (5 stages, sequence A)		
KERN	Measuring range		KERN	Measuring range	
<b>Tensile force:</b>					
963-161IV (R)	≤ 500 N		963-161V (R)	≤ 500 N	
963-162IV (R)	≤ 2 kN		963-162V (R)	≤ 2 kN	
963-163IV (R)	≤ 5 kN		963-163V (R)	≤ 5 kN	
<b>Compression force:</b>					
963-261IV (R)	≤ 500 N		963-261V (R)	≤ 500 N	
963-262IV (R)	≤ 2 kN		963-262V (R)	≤ 2 kN	
963-263IV (R)	≤ 5 kN		963-263V (R)	≤ 5 kN	
<b>Tensile and Compression force:</b>					
963-361IV (R)	≤ 500 N		963-361V (R)	≤ 500 N	
963-362IV (R)	≤ 2 kN		963-362V (R)	≤ 2 kN	
963-363IV (R)	≤ 5 kN		963-363V (R)	≤ 5 kN	

Situation B: Complete force gauge (in N)*2					
ISO 376 (8 stages)			DKD-R 3-3 (5 stages, sequence A)		
KERN	Measuring range		KERN	Measuring range	
<b>Tensile force:</b>					
963-161I (R)	≤ 500 N		963-161 (R)	≤ 500 N	
963-162I (R)	≤ 2 kN		963-162 (R)	≤ 2 kN	
963-163I (R)	≤ 5 kN		963-163 (R)	≤ 5 kN	
<b>Compression force:</b>					
963-261I (R)	≤ 500 N		963-261 (R)	≤ 500 N	
963-262I (R)	≤ 2 kN		963-262 (R)	≤ 2 kN	
963-263I (R)	≤ 5 kN		963-263 (R)	≤ 5 kN	
<b>Tensile and Compression force:</b>					
963-361I (R)	≤ 500 N		963-361 (R)	≤ 500 N	
963-362I (R)	≤ 2 kN		963-362 (R)	≤ 2 kN	
963-363I (R)	≤ 5 kN		963-363 (R)	≤ 5 kN	

(R): Recalibration

For each force gauge without interface or from other manufacturers we charge a surcharge

\*1 Compatibility with our amplifiers required

\*2 Installation in our measuring equipment required