

A man with glasses and a dark polo shirt is shown in profile, focused on operating a hardness testing machine. The machine is mounted on a large, light-colored granite block. A digital display on the machine shows various test parameters. The background is a blurred industrial or laboratory setting.

**GAGE AMPLIFIERS, HARDNESS
TESTERS, SURFACE TESTERS**

GAGE AMPLIFIERS

717 ELECTRONIC GAGE AMPLIFIER

Starrett has made electronic gaging easier with the 717 Electronic Gage Amplifier. The large analog display is easy to read and shows real-time change in measurements.

The 717 Gage Amplifier is flexible and has an accuracy within $\pm 2\%$ of full scale. Ranges vary from $\pm .010"$ to $\pm .0001"$ ($\pm 0.200\text{mm}$ to $\pm 0.002\text{mm}$), with gage graduations from $.0005"$ to $.000005"$ (0.01mm to 0.0001mm).

717 Electronic Gage Amplifier		
Description	Cat. No.	EDP
Amplifier with Power Supply Charger	717	67001
Lever-Type Gaging Head Range $\pm .010"$ (0.25mm)	715-1Z	64479
Cartridge-Type Gaging Head Length 2-1/2" (64mm) Range $\pm .020"$ (0.50mm)	715-2Z	64480
Cartridge-Type Gaging Head Pneumatic-Push, Length 2-3/4" (70mm) Range $\pm .040"$ (0.100mm)	715-6	64186
Cartridge-Type Gaging Head Length 1-3/8" (35mm) Range $\pm .020"$ (0.50mm)	715-7	64187
Cartridge-Type Gaging Head Length 2-1/2" (64mm) Range $\pm .040"$ (0.100mm)	715-8	64188
Cartridge-Type Gaging Head Length 3-5/8" (92mm) Range $\pm .080"$ (0.200mm)	715-9	64189
Height Gage and Comparator Attachment 1/4" x 1/2" (6.3 x 13.5mm) (Adapts Gaging Heads to Height Gages, Magnetic Base Indicator Holders, Dial Comparators and Test Indicator Stands.) .375" (9.5mm) Snug Hole	PT99441	52991
Power Supply Charger for USA and Canadian Configuration – 115/120 Volts/60 Cycle	PT60636	63839
Power Supply Charger for United Kingdom Configuration – 100-240 VAC, 47-63Hz	PT99353	66456
Power Supply Charger for European Configuration – 100-240 VAC, 47-63Hz	PT99340	66455
Cable to Computer (9-Pin to 9-Pin)	PT60642	72499
Shop Floor Pro™ Software	728-3	66662
Software Wedge™ Program for Interfacing to Spreadsheets	719	66490

Ranges/Graduations	
Range	Each Gage Graduation
Inch	
$\pm .010"$.0005"
$\pm .002"$.0001"
$\pm .001"$.00005"
$\pm .0002"$.00001"
$\pm .0001"$.000005"
Millimeter	
$\pm 0.200\text{mm}$	0.01mm
$\pm 0.100\text{mm}$	0.005mm
$\pm 0.020\text{mm}$	0.001mm
$\pm 0.010\text{mm}$	0.0005mm
$\pm 0.002\text{mm}$	0.0001mm

FEATURES

- Dual inputs for cumulative/differential measurements
- Selectable inch or millimeter ranges
- Selectable digital or analog output
- Simple "push-button" calibration
- Mirrored gage display for parallax-free readability
- Rugged metal case can be used anywhere in the shop
- Uses standard Starrett lever and cartridge-type probes
- Remote zero using PC
- Front panel data send button
- Single and continuous data send modes
- Serial Data Output via front panel button, PC or optional foot switch

ACCURACY

- Within $\pm 2\%$ of full scale

POWER REQUIREMENTS

- 110 volt VAC/60Hz (AC adaptor furnished)

DATA OUTPUT

- Digital: ASCII serial data
- Analog: $\pm 2.5\text{VDC}$ /Full scale

SIZE

- Dimensions: 9-1/4" Height x 5-1/2" Width x 5-1/2" Depth (235 x 140 x 140mm)
- Weight: 6 lb (2.7kg)



717 Electronic Gage Amplifier with 252 Transfer Gage and 715-1Z Gaging Head



GAGE AMPLIFIERS

776 GAGE-CHEK™ MULTI-AXIS MEASURED VALUE DISPLAY

The Gage-Chek™ 776 is a multi-axis measured value display that accepts up to eight probe inputs. It features intuitive visual display, helpful audio cues and user-defined formulas. GAGE-CHEK also reports dynamic Min/Max measurements, provides SPC analysis from an integrated database, and includes connectivity to PCs and other Starrett tools.

FEATURES

Specifications 776 Gage-Chek Multi-Axis Measured Value Display	
LCD	6" color
Display Digit Size	.45"
Resolution Down To	.000004"/.0001mm
Operating Temperature	32° - 115 °F
Enclosure (W x H x D)	11.5" x 7.5" x 2.75"
Base Width (W x H x D)	10" x 2" x 7.5"
Enclosure Weight	3.5 lbs
Base Weight	7 lbs
Input Voltage Range	85 VAC - 264 VAC
Input Frequency	43 Hz - 63 Hz
Inputs	1-, 4- and 8-axis input available
External Connections	Foot Switch, Remote Keypad, Touch Probe, RS232C Serial Port, Parallel Port
Outputs	2 Relay Outputs



The 776 accepts multiple gage inputs simultaneously – invaluable for applications such as this Starrett special gage fixture

- Large (6") color flat-panel LCD screen built into a compact ergonomically designed case with an adjustable tilt base allows comfortable positioning for the operator
- Supports 1, 4 or 8 input channels. These can be mathematically combined to display dimensions such as flatness, volume or runout.
- Screens include individual readings with the capacity to display four lines simultaneously (each line 9/16" high), bar and dial position style displays, graphs and histograms of measurement statistics, and tables of measurement and SPC data
- Supports Starrett 776 LVTD probes and Heidenhain Spectro style 12mm and 30mm range digital probes
- Measurements can be taken by the operator or in a semi-automated manner
- Large comfortable buttons allow easy selection of measurement functions, display screen changes, data entry and zeroing the screen
- Speaker and external jack outputs can be adjusted to compensate for noisy work environments. Earphones can be plugged into speaker jack for silent operation.
- Two 3" x 1/2" keys placed over the screen can be programmed as hot keys for frequently used functions
- Optional foot switch available

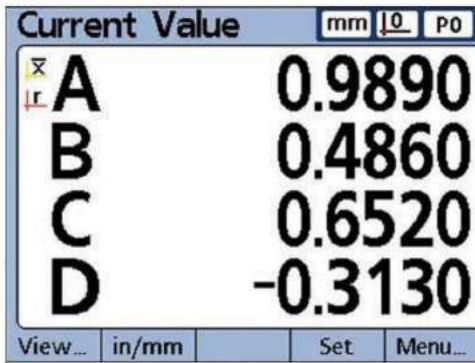


Check out our website for interactive features at starrett.com

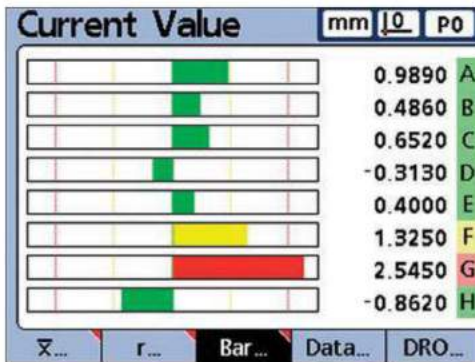




776 LVDT Probes



DRO View: Gage-Chek™ 776 features large, easy-to-read numerical display with custom dimension labels. Out of tolerance conditions are quickly identified by a change to red. Icons indicate that a process study has been performed, complete with in/out of tolerance alert. Mode switches include inch/metric, absolute/incremental, decimal degree/degrees, minutes, seconds.



Displays all gages plugged into the gage chek at one time. It automatically displays marginal and error indications with multi-color display.

776 Gage-Chek Multi-Axis Measured Value Display

Description	Cat. No.	EDP
Gage-Chek – 140-SP with 4 Inputs, Specto	776A	68635
Gage-Chek – 180-SP with 8 Inputs, Specto	776B	68636
Gage-Chek – 110-ST with 1 Input, LVDT	776C	68761
Gage-Chek – 140-ST with 4 Inputs, LVDT	776D	68762
Gage-Chek – 180-ST with 8 Inputs, LVDT	776E	68763
Software Wedge RS232 for Windows	719	66490
Two-Function Foot Switch	PT99530	68637
Eight-Function Remote Keypad	PT62514	68638
Gage-Chek Instruction Manual	PT62515	68639
.472" (12mm) Length Probe, Specto	776-12	68640
.472" (12mm) Length Probe Radial Exit, Specto	776-12R	68796
1.180" (30mm) Length Probe, Specto	776-30	68641
1.180" (30mm) Length Probe Radial Exit, Specto	776-30R	68797
9.849" (3 meter) Extension Cable for Specto Probe	PT05713	68172
32.89" (10 meter) Extension Cable for Specto Probe	PT05727	68773
±.010" (0.25mm) Lever Type Probe, LVDT	776-1Z	68817
±.020" (0.50mm) Traditional Probe, LVDT	776-2	68818
±.020" (0.50mm) Short Probe, LVDT	776-7	68819
±.040" (0.100mm) Probe, LVDT	776-8	68820
±.100" (2.54mm) Probe, LVDT	776-9	68821
6' (1.82 meter) Extension Cable for LVDT	PT05414	68828
13' (4.5 meter) Extension Cable for LVDT	PT05415	68829



Heidenhain Specto Length Probes





715-1Z

715 ELECTRONIC GAGE AMPLIFIER GAGE HEADS

715-1Z LEVER-TYPE HEAD

- Mounts directly in place of dial indicators with dovetail or AGD lug-type backs
- .078" (2mm) diameter contact standard .031" (0.8mm) and .062" (1.6mm)
- Diameter carbide contacts are available



715-2Z

715-2Z* CARTRIDGE-TYPE HEADS

- Hardened steel contact with radius tip. Head will accept all standard AGD contact points.
- .375" (9.5mm) mounting diameter allows replacement of standard AGD dial indicators



715-6

715-6, 715-7, 715-8, AND 715-9 CARTRIDGE-TYPE HEADS

- Tungsten carbide ball contacts
- Head will accept any AGD style contact**
- Half-bridge construction, stainless steel body
- .375" (9.5mm) mounting diameter allows replacement of standard AGD dial indicators



715-7



715-8



715-9

715 Electronic Gage Amplifier Gage Heads

Spindle Range	Length	Contact Pressure	Cat. No.	EDP
±.010" (0.25mm) measuring range		8-12 grams	715-1Z	64479
±.020" (0.50mm)	2-1/2" (64mm)	25-35 grams	715-2Z*	64480
±.040" (1.02mm)	2-3/4" (70mm)	70 grams	715-6	64186
±.020" (0.51mm)	1-3/8" (35mm)		715-7	64187
±.040" (1.02mm)	2 -/2" (64mm)		715-8	64188
±.080" (2.03mm)	3-5/8" (92mm)		715-9	64189

715-1Z, -2Z, -6, -7, -8, -9 Gaging Heads come with a 6' (1.8m) cable and male connector.

* Longer range cartridge-type gaging heads are available, quoted on application.

** 715-9 head will accept all standard AGD contacts.



Check out our website for interactive features at starrett.com



BENCH HARDNESS TESTERS

3814 ANALOG BENCH HARDNESS TESTER

The 3814 Hardness Tester provides reliable Rockwell Hardness values on all types of metal and alloys, hard or soft, and in many shapes. This reliable bench hardness tester has a high quality casting, is ergonomically designed for easy operation and is engineered to ensure accurate results. It is an ideal basic hardness solution, economically priced to suit a variety of lab, workshop, toolroom and inspection department applications. The 3814 conforms to ASTM E-18 standard. The tester is furnished with a diamond indenter, a 1/16" (1.6mm) ball indenter, three certified test blocks, four test tables – 5.87" (149mm) and 2.5" (63.5mm) flat anvils, 5/8" (15.9mm) spot anvil and a standard vee anvil – and an accessory case.

FEATURES

- Ability to handle Rockwell Scales A through H and K

3814 Hardness Testers

Description	Cat. No.	EDP
Analog Hardness Tester	3814	67754
Hardness Tester Stand	PT06145	72519

Specifications

Minor Load	10Kgf
Major Load	A: 60Kgf, B: 100Kgf, C: 150Kgf
Test Force Application	(Dead weight applies test force)
Test Force Control	Hydraulic Dashpot System
Results Display	Analog – Dial Gage
Throat Depth	6.6" (168mm)
Maximum Test Height	6.69" (169.9mm) *
Unit Height/Width/Depth	30" x 8.5" x 20" (762 x 216 x 508mm)
Unit Weight	261lb (118kg)

* Requires bench alteration.

- Stable cast iron construction
- Ideal basic hardness testing for many typical applications



BENCH HARDNESS TESTERS

3816 DIGITAL BENCH HARDNESS TESTER

The 3816 Bench Hardness Tester offers easy, fully automated testing procedures and provides highly sensitive and accurate readings. The 3816 measures the full regular Rockwell Scales according to ASTM and SAE guidelines and accommodates all types of hard or soft metals and alloys, in numerous configurations. The tester is furnished with a diamond indenter, a 1/16" (1.6mm) ball indenter, three certified test blocks, four test tables – 5.87" (149mm) and 2.5" (63.5mm) flat anvils, 5/8" (15.9mm) spot anvil and a standard vee anvil and an accessory case.

FEATURES

- Automated routines reduce operator involvement and speeds measurements
- Large, easy-to-view LED panel displays proper load setting
- Programmable scale conversions, dwell times and sample counter
- Sample averaging is automatically calculated
- RS232C output
- Convenient mini-printer for outputting readings
- Quality base or superstructure castings provide stability and a large working area

3816 Hardness Testers		
Description	Cat. No.	EDP
Digital Bench Hardness Tester	3816	67755
Hardness Tester Stand	PT06145	72519
Accessories* for 3816 Digital Bench Hardness Tester		
"C" Regular	PT05245	67944
1/16" (1.6mm) Ball Unit	PT05249	67948
RA Test Block (Rockwell A Scale 80)	PT05069	67897
RB Test Block (Rockwell B Scale 90)	PT05059	67888
RC Test Block (Rockwell C Scale 63)	PT05050	67879
Master Block Set, Rockwell C Scale	PT05272	67969

* For additional listings of test blocks and accessories, refer to the following pages in this section.

Specifications	
Minor Load	10Kgf
Major Load	A: 60Kgf, B: 100Kgf, C: 150Kgf
Test Force Application	(Dead weight applies test force)
Test Force Control	Motorized
Results Display	Digital Readout
Throat Depth	6.6" (168mm)
Maximum Test Height	6.69" (169.9mm) **
Unit Height/Width/Depth	28" x 8.9" x 19.6" (711 x 226 x 498mm)
Unit Weight	187 lb (85kg)

** Requires bench alteration.



Check out our website for interactive features at starrett.com



HARDNESS TESTING

TEST BLOCKS AND ACCESSORIES FOR HARDNESS TESTERS

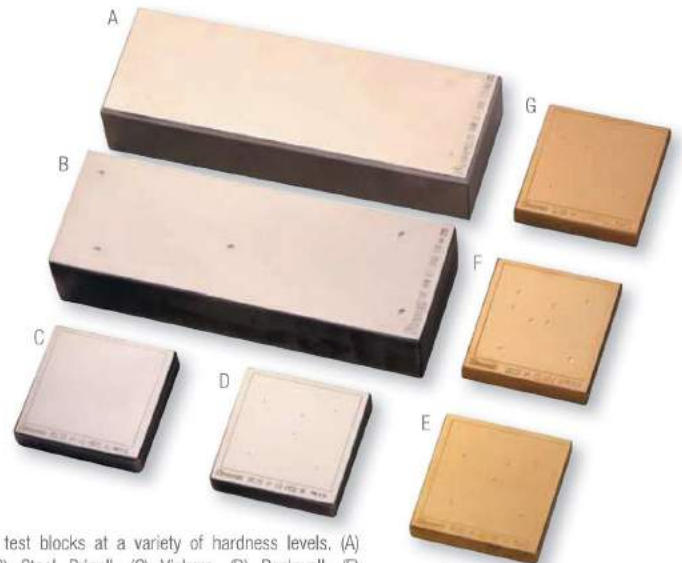
Starrett blocks can be used to test Rockwell, Brinell or Vickers scales. They are available in steel, brass and aluminum. Each block is serialized, with a certificate detailing the environmental conditions used to test the block.

Actual readings are given, with the averages of these readings: min. reading, max reading and a repeatability figure. The blocks are calibrated according to ASTM E-18 standards, ANSI (NCSL) Z540-1, (ISO) 10012-1, ISO/IEC 17025 and Mil-std 45662A.

Starrett hardness test blocks are manufactured from square steel or brass plates, as opposed to the more common round bar stock. The use of the plate gives a more accurate and consistent surface for inspection. Metallurgical tests have proven that during the production of round bar stock, suspended carbides in the mix migrate to the center of the rod. The scientific name for this condition is carbide segregation and results in different readings being found in the center of a rod rather than at its outer edges. Some manufacturers remedy this situation by removing the centers from their blocks.

Hardness test blocks are designed to be used only on one side and the indents should be more than .010" from the centers of two indents or no closer to the block's edge than .040".

Calibration kits are also available from Starrett. No facility with a hardness tester in use should be without a calibration kit. These kits come with from 3 to 20 calibrated test blocks and the serialized penetrator that was used to inspect each of the blocks in the set. When a discrepancy is detected in a tester, these kits allow you to determine the direction to proceed to resolve the issue.



Rockwell and Brinell test blocks at a variety of hardness levels. (A) Aluminum Brinell, (B) Steel Brinell, (C) Vickers, (D) Rockwell, (E) 187.5kg/2.5mm Brinell, (F) Extra-Soft Rockwell and (G) Brass Rockwell.

Rockwell Test Blocks			Rockwell Test Blocks		
Description †	Part No.	EDP	Description †	Part No.	EDP
RC63 Test Block	PT05050	67879	HR30N80 Test Block	PT05115	67912
RC60 Test Block	PT05051	67880	HG30N70 Test Block	PT05122	67913
RC55 Test Block	PT05052	67881	HR30N60 Test Block	PT05123	67914
RC50 Test Block	PT05053	67882	HR30N50 Test Block	PT05124	67915
RC45 Test Block	PT05054	67883	HR30N40 Test Block	PT05125	67916
RC40 Test Block	PT05055	67884	HR30T80 Test Block	PT05127	67917
RC35 Test Block	PT05056	67885	HR30T70 Test Block	PT05128	67918
RC30 Test Block	PT05057	67886	HR30T60 Test Block	PT05129	67919
RC25 Test Block	PT05058	67887	HR30T50 Test Block	PT05130	67920
RB90 Test Block	PT05059	67888	HR30T40 Test Block	PT05177	67921
RB80 Test Block	PT05060	67889	HR30T30 Test Block	PT05178	67922
RB70 Test Block	PT05061	67890	HR30T20 Test Block	PT05179	67923
RB60 Test Block	PT05062	67891	HR30T10 Test Block	PT05180	67924
RB50 Test Block	PT05063	67892	HR15N90 Test Block	PT05181	67925
RB40 Test Block	PT05064	67893	HR15N80 Test Block	PT05182	67926
RB30 Test Block	PT05065	67894	HR15N70 Test Block	PT05183	67927
RB20 Test Block	PT05067	67895	HR15T90 Test Block	PT05184	67928
RB10 Test Block	PT05068	67896	HR15T80 Test Block	PT05185	67929
RA80 Test Block	PT05069	67897	HR15T70 Test Block	PT05186	67930
RA70 Test Block	PT05091	67898	HR15T60 Test Block	PT05187	67931
RA60 Test Block	PT05092	67899	HR45T70 Test Block	PT05188	67932
RF100 Test Block	PT05100	67900	HR45T60 Test Block	PT05189	67933
RF90 Test Block	PT05101	67901	HR45T50 Test Block	PT05191	67934
RF80 Test Block	PT05102	67902	HR45T40 Test Block	PT05192	67935
RF70 Test Block	PT05103	67903	HR45T20 Test Block	PT05193	67936
RF60 Test Block	PT05104	67904	HR45T10 Test Block	PT05194	67937
RF50 Test Block	PT05105	67905	HRH90 Test Block	PT05195	67938
RE100 Test Block	PT05106	67906	HRH80 Test Block	PT05196	67939
RE90 Test Block	PT05107	67907	HRR120 Test Block	PT05197	67940
RE80 Test Block	PT05108	67908	HR30Y Test Block	PT05198	67941
RE70 Test Block	PT05112	67909	HRM Test Block	PT05199	67942
RE60 Test Block	PT05113	67910	HR15W Test Block	PT05200	67943
RE50 Test Block	PT05114	67911			

† Values expressed are not exact but will range within acceptable limits



HARDNESS TESTING

TEST BLOCKS AND ACCESSORIES FOR HARDNESS TESTERS

Brinell Test Blocks		
Description	Part No.	EDP
3000kg High Brinell Test Block	PT05257	67956
3000kg Low Brinell Test Block	PT05258	67957
500kg High Brinell Test Block	PT05259	67958
500kg Low Brinell Test Block	PT05260	67959



PT05272 HRC 3-Block Master Calibration Kit



Standard and special anvils

Anvils and Table			
Letter	Description	Part No.	EDP
A	Pedestal Anvil	PT05267	67964
B	2-1/2" Flat Anvil	PT05268	67965
C	Small "V" Anvil	PT05269	67966
D	Large "V" Anvil	PT05270	67967
E	8" Anvil Testing Table	PT05271	67968



Penetrators - Contact Starrett for more information

Master Calibration Kits		
Description	Part No.	EDP
HRC 3-Block Master Calibration Kit	PT05272	67969
HR30N 3-Block Master Calibration Kit	PT05273	67970
HRB 3-Block Master Calibration Kit	PT05276	67971
C&B Scale 20-Block Master Calibration Kit	PT05277	67972
C&30N Scale 6-Block Master Calibration Kit	PT05278	67973

Penetrators			
Letter	Description	Part No.	EDP
E	"C" Regular, No Thread	PT05245	67944
E	Indentron with Internal Thread	PT05246	67945
G	Versitron/New Age with External Thread	PT05247	67946
E	"N" Regular, No Thread	PT05248	67947
D	1/16" (1.6mm) Ball with Holder	PT05249	67948
C	1/8" (1.7mm) Ball Complete with Holder	PT05250	67949
B	1/4" (6.4mm) Ball Complete with Holder	PT05251	67950
A	1/2" (12.7mm) Ball Complete with Holder	PT05252	67951
	1/16" (1.6mm) Carbide Ball Only, with Certification	PT05253	67952
	1/8" (1.7mm) Carbide Ball, with Certification	PT05254	67953
	1/4" (6.4mm) Carbide Ball, with Certification	PT05255	67954
	1/2" (12.7mm) Carbide Ball, with Certification	PT05256	67955
	Heavy Load, Vickers 5kg Load	PT05261	67960
F	Heavy Load Indentor Vickers	PT05264	67961
	Min. Brinell 2 1/2mm Ball	PT05265	67962
	Min. Brinell Block 187 1/2kg, 2-1/2mm Ball	PT05266	67963

GRADE AMPS, HARDNESS AND SURFACE TESTERS



Check out our website for interactive features at starrett.com





Includes base instrument, impact device D, calibrated test block, custom carry case, cleaning brush and operation manual

3811A COMPACT HARDNESS TESTER

The 3811A is a state of the art, digital portable hardness tester, designed to test the hardness of large, hard metal parts.

The 3811A combines fast test speeds with ample memory and output. It performs tests that easily convert to most popular hardness scales such as Rockwell, Brinell, Vickers and Shore.

This compact hardness tester is loaded with useful functions usually found only on high priced models.

3811A Hardness Tester & Accessories

Cat. No.	EDP	Description
3811A	69881	Digital portable hardness tester with impact device D, calibrated test block, cleaning brush and carry case
HT-1800-110	20940	D+15 Impact Device
HT-1800-115	20941	DL Impact Device
HT-1800-125	20942	G Impact Device
HT-1800-130	20943	C Impact Device
HT-1800-120	20944	DC Impact Device
HT-1800-100	20945	Replacement D Impact Device
HT-1800-102	20946	Replacement Cable For All Impact Devices
HT-2500-105	20947	Replacement Impact Body
HT-1300-01	20948	Leeb D Test Block
HT-1100G-01	20949	Leeb G Test Block
S38R	67285	Support Ring Set

3811A Portable Hardness Tester with Integrated, Multi-functional Features

Style	Applications
D+15	Very narrow contact area with a set backed measurement coil. Measures hardness in grooves and recesses. Weight: 80g
DC	Extremely short impact device. Used for very confined spaces such as, holes, cylinders and internal measurements
C	Reduced impact energy probe (2 ft-lb) for measuring hardness of coatings, surface hardened, thin wall or impact sensitive components. Applies superficial indentation. Weight: 75g
G	Enlarged test tip and increased impact energy range (72 ft-lb – approx. 9 times the D). For lower quality finishes measuring in the Brinell range only (max. 650 HB). Designed for components like heavy castings, forgings. Weight: 250g
DL	Needle front section with 4mm diameter and 50mm length. Ideal for testing in confined spaces, the base of grooves and special components like gear wheels. Steel/Cast steel

HARDNESS TESTERS

SPECIFICATIONS

- Accuracy: $\pm 0.5\%$ (referred to L=800)
- Repeatability accuracy: $\pm 4L$ units (L=Leeb)
- Measuring range: 200-960 HL
- For steel and cast steel, alloy tool steel, stainless steel, grey cast iron, spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy
- Tool steel should be about 1" thick solid material or larger
- Operating temperature: 5-104 °F
- Dimensions: 5.96 x 2.938 x 1.270" (150 x 74 x 32mm)
- Weight: 8.6 oz. (245 grams)

FEATURES

- Leeb style tester designed for large, hard parts – load the impact body and place the impact device on your test piece
- Easy to use keypad operation – push the button to begin testing and obtain reading
- Auto identification of impact device
- Large LCD display with back light
- USB output
- Automatic conversions to Rockwell, Brinell, Vickers and Shore
- Automatic mean value as well as Min and Max values
- Uses two AA alkaline batteries with low power indicator
- Memory capacity (100 groups)
- Optional impact devices and special support rings



HARDNESS TESTERS

3810A DIGITAL PORTABLE HARDNESS TESTER

The 3810A is a state-of-the-art digital instrument designed to test the hardness of large hard metal parts. Loaded with useful functions such as USB output and a built in printer, the 3810A is an ideal choice for fast, accurate hardness testing.

This versatile tester can perform tests that easily convert to the most popular hardness scales, including Rockwell, Brinell, Vickers and Shore.

The tester is easy to use. Simply load the impact body, place the impact body on your test piece, then push the button to begin testing.

The 3810A is designed to test large hard parts that cannot be brought to a bench top machine. For example, tool steel should be close to 1" thick of solid material. The 3810A comes with a D impact device, calibration block, cleaning brush, manual and a carrying case.



NEW!

CASE AMPS, HARDNESS AND SURFACE TESTERS

SPECIFICATIONS

- Accuracy: $\pm 0.5\%$ (referred to L=800)
- Repeatability accuracy: $\pm 4L$ units (L=Leeb)
- Measuring range: 200-960 HL
- Materials: steel & cast steel, alloy tool steel, stainless steel, grey cast iron, spheroidal iron, cast aluminum, brass, bronze, wrought copper alloy
- Battery type: AA alkaline (4)
- Operating temperature: 5-104 °F
- Dimensions: 150 x 74 x 32mm
- Weight: 245 grams
- Includes 3810A tester, impact device D, calibration test block, cleaning brush, operation manual, custom carry case
- Available options include DC, D+15, DL, G, C impact devices, and special support rings

FUNCTIONS

- Easy to use keypad operation
- Auto identification of impact device
- Large LCD display with back light
- USB output
- Automatic conversions to: Brinell, Rockwell B & C, Vickers and Shore
- Automatic mean value as well as Min & Max values
- Battery indicator
- Memory capacity (100 groups)

3810A Hardness Tester & Accessories

Cat. No.	EDP	Description
3810A	69871	Tester, D impact device, calibration block, cleaning brush, operation manual, custom carry case
HT-1800-110	20940	D+15 impact device. Very narrow contact area with set backed measurement coil. Measures hardness in grooves and recesses.
HT-1800-115	20941	DL impact device. Needle front section with 4mm diameter and 50mm length. For testing in confined spaces such as groove bases and special components such as gear wheels.
HT-1800-125	20942	G impact device. For components such as heavy castings and forgings. Enlarged test tip and increased impact energy range. For lower quality finishes measuring in the Brinell range only. G block required.
HT-1800-130	20943	C impact device. Reduced impact energy probe for measuring hardness of coatings and surface hardened, thin wall or impact- sensitive components. Applies superficial indentation.
HT-1800-120	20944	DC impact device. Very short for confined areas such as internal bores for various inside measurements.
HT-1800-100	20945	Replacement D impact device. Universal standard probe for a wide variety of applications.
HT-1800-102	20946	Replacement cable for all impact devices
HT-2500-105	20947	Replacement impact body D
HT-1300-01	20948	Leeb D test block
HT-1100G-01	20949	Leeb G test block
S38R	67285	Support ring set



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HARDNESS TESTERS

TECHNICAL DATA FOR STARRETT HARDNESS IMPACT DEVICES

Technical Data for Impact Devices		D/DC/DL	D+15	C	G
Impact Energy		11 Nmm	11 Nmm	3 Nmm	90 Nmm
Mass of the Impact Body		5.5g	7.8g	3.0g	20g
Test Tip DL: 7.3 g	Hardness	1600 HV	1600 HV	1600 HV	1600 HV
	Diameter	3mm	3mm	3mm	5mm
	Material	Tungsten carbide	Tungsten carbide	Tungsten carbide	Tungsten carbide
Impact Device	Diameter	20mm	20mm	20mm	30mm
	Length	147/86mm	162mm	141mm	254mm
	Weight	75/50 g	80 g	75 g	250 g
Max. Hardness of Sample		940 HV	940 HV	1000 HV	650 HB
Preparation of Surface	Roughness class ISO	N7	N7	N5	N9
	Max. roughness depth Rt	10µm	10µm	2.5µm	30µm
	Average roughness Ra	2µm	2µm	0.4µm	7µm
Min. Weight of Sample	Of compact shape	5kg	5kg	1.5kg	15kg
	On solid support	2kg	2kg	0.5kg	5kg
	Coupled on plate	0.1kg	0.1kg	0.02kg	0.5kg
Min. Thickness of Sample	Coupled	3mm	3mm	1mm	10mm
	Min. thickness of layers	0.8mm	0.8mm	0.2mm	—
Indentation of Test Tip with 300 HV	Diameter	0.54mm	0.54mm	0.38mm	1.03mm
	Depth	24µm	24µm	12µm	53µm
Indentation of Test Tip with 600 HV	Diameter	0.45mm	0.45mm	0.32mm	0.90mm
	Depth	17µm	17µm	8µm	41µmC
Indentation of Test Tip with 800 HV	Diameter	0.35mm	0.35mm	0.30mm	—
	Depth	10µm	10µm	7µm	—

APPLICATION AND HARDNESS RANGES FOR STARRETT HARDNESS IMPACT DEVICES

Optional Impact Devices					
Material	HRC	HRB	HB	HV	HSD
Impact Device – D, DC Measuring Range 200-900†					
Steel	20.0-67.9	59.6-99.5	80-647	80-940	32.2-99.5
C.W. Tool Steel	20.4-67.1			80-898	
Gray Cast Iron			93-334		
Nodular Cast Iron			131-387		
Cast Aluminum			30-159		
Brass		13.5-95.3	40-173		
Bronze			60-290		
Copper			45-315		
Impact Device – D+15, Measuring Range 300-900† (not shown)					
Steel and Cast Steel	19.3-67.9		80-638	80-937	33.3-99.3
Impact Device – C, Measuring Range 350-950†					
Steel and Cast Steel	20.0-69.5		80-683	80-996	31.9-99.6
Impact Device – G, Measuring Range 300-750†					
Steel and Cast Steel		47.7-99.9	90-646		
Gray Cast Iron			92-326		
Nodular Cast Iron			127-364		
Impact Device – DL, Measuring Range 300-900†					
Steel and Cast Steel	20-68	37-100	80-650	80-940	30-97

† Leeb Measuring Range





ROUNDNESS TESTERS

RT500 ROUNDNESS TESTER



High speed roundness systems for bearings, automotive and precision industries. A range of roundness products robust enough for the shop floor but accurate enough for any inspection room.

The new RT500 offers a flexible solution for all your roundness and form requirements with a variety of systems and application specific accessories along with fixtures that can be tailored to your specific need. The most important benefit these systems offer is speed. As manufacturing volumes increases, in precision industries all too often the bottleneck is metrology. High measurement throughput systems ensure higher sampling rates are achieved while also supporting increased manufacturing volumes. Full ISO compliant measurements can be taken with $\pm 25\text{nm}$ accuracy and 30nm gage resolution. The X-sight touch screen software platform with intuitive navigation make the RT500 roundness system as easy to use as a Sat Nav or Smart Phone with everything you need at your fingertips.

FEATURES

- Easy to use software
- Large color display, easy viewing of results
- Touch screen operation
- Measures: Roundness/Flatness, Coaxiality, Eccentricity; Concentricity, Radial Runout, Squareness, and Parallelism

RT500 Roundness Tester

Cat. No.	EDP
RT500	37215

Specifications

Measuring Capacity	
Max Diameter (in)	11.8"
Max Diameter (mm)	300mm
Height (in)	11"
Height (mm)	280mm
Weight (lb)	44lb
Weight (kg)	20kg
Work Table	
Diameter (in)	4.9"
Diameter (mm)	125mm
Centering (in)	± 0.149 "
Centering (mm)	$\pm 1.25\text{mm}$
Leveling	30 arc minutes
Height of Neutral Plane (in)	2"
Height of Neutral Plane (mm)	51mm
Spindle	
Speed of Rotation	15RPM Max
Gage	
Range (in)	0.079"
Range (mm)	2mm
Resolution	30nm
Filter	
Type	None, Gaussian, Robust Gaussian
Standard Filter Cut-Offs	1-15upr, 1-50upr, 1-150upr, 15-150upr, 1-500upr, 15-500upr
Special Filters	User Selectable and Bandpass

NEW!

GAGE AMPS, HARDNESS AND SURFACE TESTERS



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247



NEW!

GAGE AMPS, HARDNESS AND SURFACE TESTERS

ROUNDNESS TESTERS

RT800 ROUNDNESS TESTER



Working closely with manufacturers across a wide range of industries including bearings, automotive and aerospace engineering, Starrett has focused on the key attributes that are most important for quality control in today's precision industries.

The new RT800 offers a flexible solution for all your roundness and form requirements with a variety of systems and application-specific accessories along with fixtures that can be tailored to your specific need.

FEATURES

- Easy to use software
- Large color display, easy viewing of results
- Touch screen operation
- Measures: Roundness/Flatness, Coaxiality, Eccentricity; Concentricity, Radial Runout, Squareness, Parallelism, Interrupted Surfaces and Thickness

RT800 Roundness Tester	
Cat. No.	EDP
RT800	3720

Specifications	
Measuring Capacity	
Max Diameter (in)	11.8"
Max Diameter (mm)	300mm
Height (in)	11"
Height (mm)	280mm
Weight (lb)	44lb
Weight (kg)	20kg
Work Table	
Diameter (in)	4.9"
Diameter (mm)	125mm
Centering (in)	±0.049"
Centering (mm)	±1.25mm
Leveling	30 arc minutes
Height of Neutral Plane (in)	2"
Height of Neutral Plane (mm)	51mm
Spindle	
Speed of Rotation	15RPM Max
Gage	
Range (in)	0.079"
Range (mm)	2mm
Resolution	30nm
Filter	
Type	None, Gaussian, Robust Gaussian
Standard Filter Cut-Offs	1-15µpr, 1-50µpr, 1-150µpr, 15-150µpr, 1-500µpr, 15-500µpr
Special Filters	User Selectable and Bandpass



248

Starrett®



ROUGHNESS TESTERS

SR100 SURFACE ROUGHNESS TESTER



The SR100 portable surface roughness tester is powerful, accurate and easy to use. With the SR100, you can measure roughness almost anywhere. It is ideal for checking large components, structures, auditing batch production prior to shipment and production line process control.

The innovative SR100 separates into two pieces to measure surface roughness. The bottom half of the SR100 contains the traverse mechanism and stylus pickup assembly which is placed on the surface to be measured. Its wide base ensures stability. The upper half includes a large LCD display, start button, mode and parameter buttons, comfortably hand-held for easy operation and clear viewing.

FEATURES

- Large LCD window
- Measures Ra at the touch of a button
- In addition to basic roughness parameters Ra and Rz, also measures advanced Rp, Rv and Rt parameters
- Five second cycle time
- Result saved until the next measurement is taken
- Switches between inch and metric mode without remeasuring
- Use right out of the box – little or no operator training required
- Automatic shut-off after five minutes of inactivity
- Configured with the most common industrial settings to ensure correlation between multiple operators (see specifications)
- Simple and reliable calibration routine
- Uses standard off-the-shelf calculator type batteries with a minimum life of 5,000 measurements
- Includes SR100 two-piece assembly, calibration standard, batteries, operation guide and a carrying case

SR100 Surface Roughness Tester & Accessories

Cat. No.	EDP	Description
SR100	20950	SR100 two-piece surface roughness tester assembly, calibration standard, batteries, operation guide and a carrying case



SR100 uses an infra-red (IrDA) link between the upper and lower units to provide remote, cable free operation up to a distance of 40" (one meter).

Technical Specifications

Gage range	0.008"/200µm
Accuracy	5% of reading + 4µin/+ 0.1µm
Pick up type	Piezoelectric
Gage force	.007 oz/200mg
Stylus	Diamond, Radius 200µin/5µm
Cut off value	0.03"/0.8mm ±15%
Filter	2CR
Traverse length	0.2"/5mm
Traverse speed	0.08"/sec, 2mm/sec
Display units	µin/µm
Battery life	5,000 operations minimum

Parameter results

Parameters	Range	Resolution
Ra, Rz, Rv, Rp, Rt		
Ra:	1600µin/40µm	0.4µin/0.01µm
Rz, Rv, Rp, Rt:	7800µin/199µm	4µin/0.1µm

Dimensions

Overall dimensions	4.92 x 3.15x 1.5"/125 x 80 x 38mm
Weight	7oz/200gm

Component dimensions and condition

Min bore	2.6"/65mm
Min diameter	1.0"/25mm
Max temperature	95 °F/35 °C

Nominal operating conditions

Temperature	68 °F/20 °C
Humidity	0 to 80% non condensing

Storage conditions

Temperature	32 °F to 122 °F/0 to 50 °C
Humidity	0 to 80% non condensing



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ROUGHNESS TESTERS

SR300 AND SR400 SURFACE ROUGHNESS TESTER

The SR300 and SR400 instruments offer a versatile solution for all your roughness requirements with a variety of systems and application specific accessories along with fixtures that can be tailored to your specific need.

ANY SURFACE, ANY HEIGHT

The inclusion of a 50mm stylus lift with right angle attachment and more than 70mm stylus reach means that even the most challenging surfaces can be measured without the need for expensive riser blocks, stands or fixtures. The anti-slip V-feet also mean the system can be used on flat or curved surfaces. The stylus can even measure upside down!

USB CONNECTIVITY

Through its industry standard Type A USB port and mini USB port the SR300 and SR400 Surface Roughness Testers provide extensive connectivity options to many standard devices.

Measurement Capability		SR300	SR400
Gage	Range	200µm, 100µm, 10µm	400µm, 100µm, 10µm
	Resolution	100nm, 20nm, 10nm	50nm, 10nm, 5nm
	Noise Floor (Ra)	250nm, 150nm, 100nm	150nm, 100nm, 50nm
	Repeatability (Ra)	1% of value + noise	
	Pickup Type	Inductive	
	Gage Force	150 - 300mg	
	Stylus Tip Radius	5µm (200µin) default/2µm (80µin) or 10µm (400µin) optional	
Calibration	Measurement Type	Skidded	
	Process	Automated software calibration routine	
Analysis	Standards	Able to calibrate to ISO 4287 roughness standards	
	Filter Cut-Off	0.25mm/0.8mm/2.5mm	
	Filter Type	2CR/Gaussian	
	Evaluation Length	0.25 - 12.5mm (0.01 - 0.49in)	0.25 - 25.0mm (0.01 - 0.98in)
Speed	Max. X Axis Range	17.5mm	25.5mm
	Measuring Speed	1mm/sec (0.04in/sec)	
	Returning Speed	1.5mm/sec (0.06in/sec)	
Analysis Capability		SR300	SR400
Parameters	Standards	ISO 4287, ISO 13565-1, ISO 13565-2, ASME 46.1, JIS 0601, N31007	
	ISO Basic	Ra, Rv, Rp, Rz, Rt, Rq, Rsk, Rmr, Rdq, Rpc, RSm, Rz1max	
	ISO Advanced	Optional Rk, A1, A2, Mr1, Mr2, Rpk, Rvk	
	ASME	Ra, Rv, Rp, Rz, Rt, Rq, Rsk, Rdq, RSm, Rpm, Rda	
	JIS	Ra, Rv, Rp, Rz, Rt, Rq, Rsk, Rmr, Rdq, RSm, RzJIS, Rc, Rku, Rdc	
	Other	R3z (Daimler Benz)	
	ISO Primary	Optional	Pa, Pv, Pp, Pz, Pt, Pq, Psk, Pmr, Pdq, Ppc, PSm, Pz1max
	Units	µm/µin	

FEATURES

- Large screen display
- Many application specific parameter options
- Comprehensive selection of optional accessories and pickups
- Long traverse length and extended pickup reach
- Stores up to 100 readings
- Anti-slip feet perfect for mounting on flat or curved surfaces
- Rubberized molding adds protection and better grip in the hand; invaluable in shop floor environments
- Orientation - fix the display in 1 of 4 orientations; perfect for awkward measurements
- Simple Set Up - shortcuts provided for all the key settings to give instant access with just a single touch
- Profile Graph - detailed graph shows measured area to help identify problem areas
- Measure - tactile measurement button, great when device is being used overhead or inside pipes
- Includes traverse unit, TalyProfile Lite software, stylus lift, calibration standard, manual and carrying case

SR300 and SR400 Surface Roughness Tester and Accessories

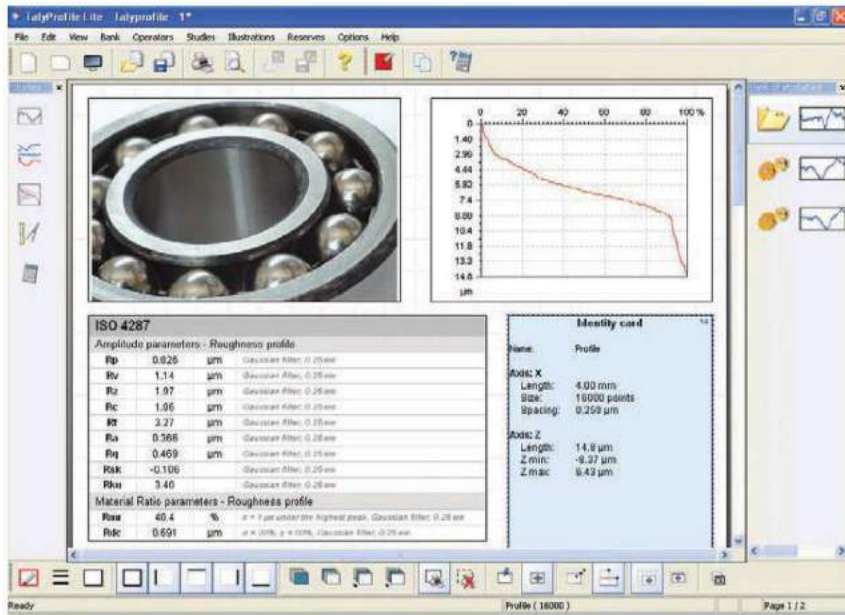
Cat. No.	EDP	Description
SR300	21000	SR300 display and 17.5mm traverse unit
SR400	21001	SR400 display and 25mm traverse unit
SR-112-1510	20961	7.875"/200mm extension rod with lead
SR-112-1534	20962	Reference standard
SR-112-1517	20963	Support stand
SR-112-2693	20964	Column and standard
SR-112-1502	20965	Standard pickup with 200µ"/5µmm stylus
SR-112-1503	20957	Standard pickup with 400µ"/10µm stylus
SR-155-P28495	20129	Small bore pickup
SR-112-1505	20959	Right angle pickup
SR-112-1506	20960	Recess Pickup
SR-112-3680	20952	TalyProfile Gold - 2D analysis software with cable
SR-112-3681	20953	TalyProfile Silver - 2D analysis software with cable
SR-K509-1578	20954	TalyProfile 8'/2.5m cable
SR-K509-1820	20955	TalyProfile 5'/1.5m cable
SR-112-4570	20998	USB thermal printer
SR-112-4571	20999	Thermal paper
SR-112-4545	20220	Plug adaptors
252Z-14	55890	252 height transfer gage
PT99560	72796	Clamp to attach SR300 and SR400 to 252 height transfer gage



TALYPROFILE

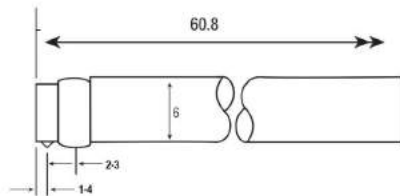
ADVANCED SURFACE FINISH ANALYSIS

TalyProfile is a dedicated PC based software package designed for use with the SR300 and SR400 instruments. Three versions are available. TalyProfile "Lite" has all functions typically used for a shopfloor inspection. TalyProfile "Silver" has enhanced features for R&W parameters, a statistics module and full report printing. TalyProfile "Gold" has complete laboratory analysis functions.

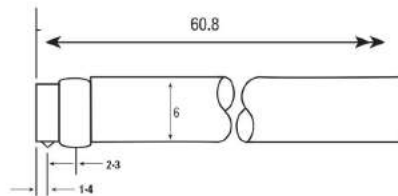


TalyProfile	Lite	Silver	Gold
Surtronic S-series acquisition	x	x	x
Desktop publishing templates	x	x	x
Multi-language support	x	x	x
EN, FR, DE, ES, IT, PL, CN, KR	x	x	x
Leveling	x	x	x
Symmetries	x	x	x
Zoom	x	x	x
ISO 4287	x	x	x
Material Ratio Curve	x	x	x
Area of a hole/peak	x	x	x
Profile parameters and curves	x	x	x
Roughness and waviness curves	x	x	x
Distance measurement	x	x	x
Multiple file format reports		x	x
Report printing		x	x
Form Talysurf data import		x	x
Tolerance limits (pass/fail)		x	x
Data file explorer		x	x
ISO 13565 Automotive		x	x
Interactive Mr curve		x	x
Step height measurement		x	x
Form removal			x
Filtering by FFT			x
Thresholding			x
Frequency spectrum			x
Power spectrum density			x
Retouch profile point			x
Rk parameters			x
Rk parameters curves			x
ISO 12085 R&W motifs			x

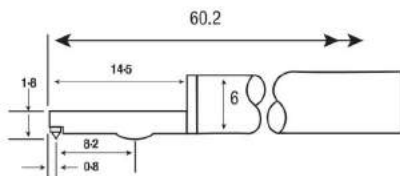
GAGE AMPS, HARDNESS AND SURFACE TESTERS



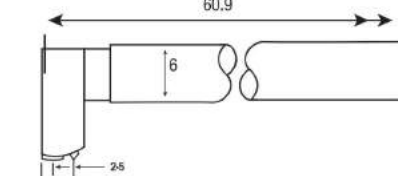
Standard Pick-Up
for general surface roughness measurement
Code SR-112-1502 (5µm tip radius)
Code SR-112-1503 (10µm tip radius)



Right Angle Pick-Up
for measurement at right angles to the direction of traverse
Code SR-112-1505



Small Bore Pick-Up
for general use in small bores, grooves and on narrow surfaces
Code SR-155-P28495



Recess Pick-Up
for measuring into deep recess
Code SR-112-1506 recess 5.7mm (0.23")

TALYPROFILE PARAMETERS

Roughness parameters obtained by filtering:
Ra, Rq, Rt, Rp, Ry, Rku, Rsk, RSm, Rz, RΔq, RTP, RHTp, Rlo, RPC, RzJIS, R3z

Parameters on the raw profile (unfiltered): Pa, Pq, Pt, Pp, Pv, Pku, Psk, PSm, Pz, PΔq, PTp, PHTp, PLo, PPc

Parameters obtained by double filtering (DIN 4776): Rk, Rpk, Rvk, MR1, MR2, A1, A2, Rpk,

Parameters obtained by the motifs method ("R&W"): R, AR, Pt, Rx, SR, SAR, Nr, Kr, W, AW, Wte, Wx, SW, SAW, Nw, Kw, Rke, Rpkc, Rvkc, Trc, HTrc

* Only with gold or silver versions



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NEW!

GAGE AMPS, HARDNESS AND SURFACE TESTERS



ELECTRONIC DUROMETERS

3805B ELECTRONIC DUROMETER

The 3805B is designed to fit comfortably and firmly in your hand. Its large LED display and simple three button control make the 3805B Durometer easy to use.

The 3805B measures Shore A values for a wide variety of soft materials including: rubber: soft vulcanized (i.e. tire), natural nitrile; elastomeric materials (rubber and rubber-like): GR-S, GR-1, neoprene, thiokol, flexible polyacrylic esters; other softer materials including wax, felt, leather, etc. (materials that would normally yield under fingernail pressure).

FEATURES AND SPECIFICATIONS

- Extra large LED display
- Simple 3-button control
- Auto Hold feature
- Measuring range: 0-100 HSA
- Deviation: <1% H
- Resolution: 0.5 H
- Accurate and repetitive deviation = 20~90HSA
- HSA ± 1 grade
- Custom carrying case

3805B Electronic Durometer

Description	Cat. No.	EDP
3805B Electronic Durometer in plastic case	3805B	69882
3 Rubber Test Block Certified Set	SRB-3	68200



252

Starrett®



THICKNESS GAGES

3812 ULTRASONIC THICKNESS GAGE

The 3812 Ultrasonic Thickness Gage is a state-of-the-art digital ultrasonic thickness gage packed with features typically found only on high end models.

It measures the thickness of metallic and non-metallic materials such as steel, aluminum, titanium, plastics, ceramics, glass and any other good ultrasonic wave conductor that has parallel top and bottom surfaces.

This dynamic ultrasonic thickness gage accurately displays readings in either inch or millimeter units after a simple calibration to a known thickness or sound velocity.

3812 Ultrasonic Thickness Gage and Accessories		
Description	Cat. No.	EDP
3812 Ultrasonic Thickness Gage, software, USB cable, couplant gel and carry case	SRB-3	68200

FEATURES AND SPECIFICATIONS

- 4 digit LCD display with back light
- Upper/Lower limit preset alarm
- Measurement and scanning capabilities
- Adjustable sound velocity
- Extended memory
- 20 memory groups (100 files/group)
- Minimum display unit: 0.001" (0.01mm) selectable
- .040-12.0" measuring range (in steel with standard probe)
- 3280-32805ft/s (1000-9999m/s) sound velocity range
- 32-122 °F operating temperature
- 5MHz Frequency
- 4Hz update range
- USB output
- Power supply: Two 3V AA alkaline batteries with approximately 100 hours of life (with the backlight off)
- Power consumption: Working current is less than 3V
- Accuracy: $\pm (0.5\% \text{ thickness} + .001")$
- Dimensions: 5.90" x 2.91" x 1.30" (150 x 74 x 33mm)
- Weight: 8.6oz (245g)
- Includes tester and cables, software, USB cable, couplant gel and a rugged, form fit carrying case



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NEW!

GAGE AMPS, HARDNESS AND SURFACE TESTERS

THICKNESS GAGES

3813 COATING THICKNESS GAGE

The 3813 Coating Thickness Gage is a state-of-the-art coating thickness gage that utilizes the characteristics of both eddy current and magnetic induction to perform two types of thickness calculation.

The gage uses an integrated probe to automatically determine whether the substrate is ferrous or non-ferrous. Then, it either detects the thickness of non-magnetic coating on a magnetic substrate (ferrous) or the insulating coating on a non-magnetic conductive substrate (non-ferrous).

Testing performance is non-destructive and extremely accurate. The 3813 is ideal for a broad range of applications in manufacturing, engineering and commercial inspection.

3813 Thickness Gage

Cat. No.	EDP	Description
3813	69883	Coating Thickness Gage with steel and aluminum substrate samples, four calibrated thickness samples, batteries, manual and case

FEATURES AND SPECIFICATIONS

- Measuring range: 0-40mils (0-1000µm) max.
- Resolution: 0.1µm/0.1mils (0-99µm) or 1µm (over 100µm)
- Guaranteed tolerance (after one-point calibration): ±1-3% or 2µm (whichever is greater)
- 4-digit display, .40" (10mm) height,
- Minimum measuring area: .20" x .20" (5 x 5mm)
- Minimum radius of curvature: Convex: .12" (3mm), Concave: 1.2" (30mm)
- Minimum substrate thickness: Ferrous: 20 mils (0.5mm), Non-ferrous: 2 mils (50µm)
- Zero calibration
- Foil calibration
- Maximum surface temperature of test object: 302 °F (maximum contact time 2 seconds)
- Power source: Four AA batteries
- Includes steel and aluminum substrate samples
- Includes four calibrated thickness samples
- Dimensions: 6.39" x 2.74" x 1.27" (161 x 69 x 32mm)
- Weight: 9oz. (260g)

