

UCI/Dynamic Hardness Tester

Non-Destructive!



Features:

- Non-Destructive hand held hardness tester
- Combines UCI and Leeb hardness testing in one state of the art device
- Test steel with min thickness of .08" and unlimited max thickness
- Blazing fast test results
- Rockwell, Brinell Vickers conversions shown on display
- Large Memory w/USB Output
- Choice of manual UCI probes: 1kg, 2kg, 5kg & 10kg
- Optional Motorized Probes: .30kg, .80kg, & 1kgf
- Available Impact Devices(Leeb) D, DC, D+15, G & DL

PHT-6000 Series

"Ultrasonic Contact Impedance" is based on a 136 degree diamond at the end of a vibrating rod being depressed into the test surface at a fixed load. The difference in Ultrasonic vibration frequency is then calculated into a hardness value. The UCI test procedure is slower than the Dynamic Impact style, however the "UCI" method of hardness testing is portable, easy and accurate. It also has its own advantages when utilized for certain testing applications. UCI testers are not restricted to large mass items like dynamic type testers. These units can test metals as thin as 1mm and at a hardness value as low as 20HRC (75HB). They also excel at performing hardness tests on larger, harder metals as well. Another reason for the rise in popularity is due to the fact that the UCI method is categorized as "Non-Destructive". That translates into less scrap parts/ lower mfg costs due to necessary inspections.

"Dynamic Impact" is based on the Leeb principle of hardness, developed by Dietmar Leeb in the 1970's. A spring loaded impact body is thrust to the test surface, effecting rebound. The speed of both the initial thrust and the rebound is measured in a non-contact mode. This is calculated as a Leeb hardness value and then automatically converted to Rockwell C, B, Brinell, Vickers and Shore Values. It has effectually brought easy, fast and accurate results to portable hardness testing.

UCI / Dynamic Hardness Tester

UCI

SCALES-UCI	MEASUREMENT RANGE	TOLERANCE
ROCKWELL C	20-70 HRC	+/- 1.5 HRC
ROCKWELL B	41-99 HR	+/- 1.5 HRB
ROCKWELL A	61-85 HRB	+/- 1.5 HRA
BRINELL	76-618 HB	+/- 3% HB
VICKERS	80-1599 HV	+/- 3% HV

LEEB

SCALES-UCI	MEASUREMENT RANGE	TOLERANCE
ROCKWELL C	25-67 HRC	+/- 1.5 HRC
ROCKWELL B	59-99 HRB	+/- 1.5 HRB
BRINELL	85-651 HB	+/- 10 HB
VICKERS	83-976 HV	+/- 12 HV
SHORE	26-99HS	+/- 10HL
Leeb	170-960HLD	+/- 6HL

Can also test in the following scales:
 HRN15 - HRN30 - HRN45 - HRT15 - HRT30 - HRT45
 HRF - HK - HD

UCI hardness tester w/manual probe

MODEL NO.	DESCRIPTION	MODEL NO. DESCRIPTION APPLICATION NOTES
PHT-6001	UCI Hardness Tester w/1kgf Probe	For use on polished surfaces. Below Ra 125µin
PHT-6002	UCI Hardness Tester w/2kgf Probe	For use on smooth surfaces. Below Ra 200µin
PHT-6005	UCI Hardness Tester w/5kgf Probe	For use on machined surfaces. Below Ra 400µin
PHT-6010	UCI Hardness Tester w/10kgf Probe	For use on rough surfaces. Below Ra 600µin

UCI hardness tester w/motorized probe

MODEL NO.	DESCRIPTION	MODEL NO. DESCRIPTION APPLICATION NOTES
PHT-6030	UCI Hardness Tester w/.30kgf Probe	Best for checking coating layer hardness; Finished thin parts
PHT-6080	UCI Hardness Tester w/.80kgf Probe	Best for smooth bearing type surfaces
PHT-6100	UCI Hardness Tester w/1kgf Probe	Best for machined surfaces

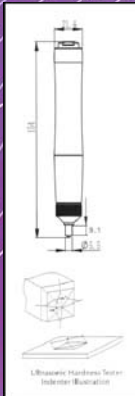
Specifications:

- **Hardness Range:** HRC:20-70, HRB: 55-100, HB: 100-739, HV: 100-2970
- **Scale Selection:** Rockwell C (HRC); Rockwell B (HRB); Rockwell A (HRA); Brinell (HB); Vickers (HV); Leeb (HLD) and many more
- **Tolerance:** +/- 3.0% deviation of average from the reference value of the test block with a minimum of 5 tests
- **Display Type:** LCD Color Screen w/Backlight, adjustable brightness
- **Language Selection:** English, German, Chinese, Spanish, etc.
- **Data Logger:** Letters, Numerals
- **Data Memory:** 2000 groups of measured data ; 20 groups of calibration data
- **Statistical Software:** Supplied-can be saved in Word or Excel
- **Data Output:** USB - cable supplied
- **Power Supply:** Rechargeable Lithium Battery: Voltage-4.2V, 4800mAh
- **Auto Power Off:** 5 minutes
- **Recharging Time:** Approx. 8 hours
- **Battery Usage:** Approx. 6 hours (no backlight)
- **Net Weight(base unit):** 2lbs (w/probe)
- **Gross Weight** 12 lbs
- **Unit Dimensions** 7.0 x 3.1 x 1.1" (160x80x30mm)
- **Gross Dimensions** 13.7 x 17.7 x 5.9" (350x450x150mm)

UCI/Dynamic Hardness Tester

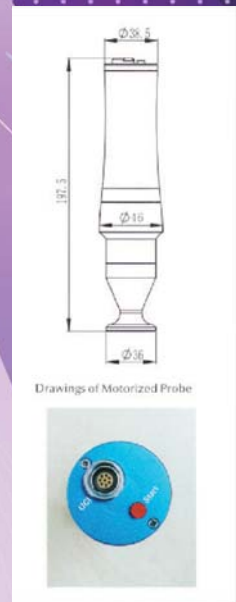
Manual UCI Probe Specifications:

PROBE TYPE/MODEL	PHT-6001	PHT-6002	PHT-6005	PHT-6010
LOADING FORCE	1kgf (10N)	2kg (20N)	5kg (50N)	10kg (98N)
PROBE DIAMETER	22mm	22mm	22mm	22mm
LENGTH	154mm	154mm	154mm	154mm
OSCILLATING ROD DIAMETER	2.4mm	2.4mm	3mm	3mm
SURFACE ROUGHNESS REQUIREMENTS $\mu\text{m}=\text{Metric}$ $\mu\text{in}=\text{Inch}$	$R_a < 3.2\mu\text{m}$ ($R_a < 125\mu\text{in}$)	$R_a < 5\mu\text{m}$ ($R_a < 197\mu\text{in}$)	$R_a < 10\mu\text{m}$ ($R_a < 393\mu\text{in}$)	$R_a < 15\mu\text{m}$ ($R_a < 590\mu\text{in}$)
MIN WEIGHT OF TEST SAMPLE	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)
MINIMUM THICKNESS OF SAMPLE	2mm (.08")	2mm (.08")	2mm (.08")	2mm (.08")



Motorized UCI Probe Specifications:

PROBE TYPE/MODEL	PHT-6030	PHT-6080	PHT-6100
LOADING FORCE	.30kg (3N)	.80kg (8N)	1kgf (10N)
PROBE DIAMETER	46mm	46mm	46mm
LENGTH	198mm	198mm	198mm
OSCILLATING ROD DIAMETER	3.7mm	3.7mm	3.7mm
SURFACE ROUGHNESS REQUIREMENTS $\mu\text{m}=\text{Metric}$ $\mu\text{in}=\text{Inch}$	$R_a < 3.2\mu\text{m}$ ($R_a < 125\mu\text{in}$)	$R_a < 5\mu\text{m}$ ($R_a < 197\mu\text{in}$)	$R_a < 8\mu\text{m}$ ($R_a < 314\mu\text{in}$)
MIN WEIGHT OF TEST SAMPLE	0.3kg (.66lbs)	0.3kg (.66lbs)	0.3kg (.66lbs)
MINIMUM THICKNESS OF SAMPLE	2mm (.08")	2mm (.08")	2mm (.08")



INDENTATION DEPTH (μm)

HARDNESS	.30KG MOTORIZED	.80KG MOTORIZED	1 KG MOTORIZED	1 KG MANUAL	2 KG MANUAL	5 KG MANUAL	10 KG MANUAL
800HV	4	5	7	7	10	15	22
600HV	4	5	8	8	11	18	25
500HV	5	6	9	9	12	19	27
300HV	6	8	11	11	16	25	35
100HV	10	13	19	19	27	43	61

UCI / Dynamic Hardness Tester

IMPACT DEVICES	D/DC/DL	D+15	C	G
IMPACT ENERGY	11Nmm	11Nmm	3Nmm	90Nmm
MASS OF THE IMPACT BODY	5.5g	7.8g	3.0g	20g
	DL: 7.3g			
TEST TIP				
* <i>Hardness</i>	1600HV	1600HV	1600HV	1600HV
* <i>Diameter</i>	3mm	3mm	3mm	5mm
* <i>Material</i>		Tungsten carbide	Tung carbide	
IMPACT DEVICE				
* <i>Diameter</i>	20mm	20mm	20mm	30mm
* <i>Length</i>	147/86mm	162mm	141mm	254mm
* <i>Weight</i>	75/50g	80g	75g	250g
MAX. HARDNESS OF SAMPLE	940HV	940HV	1000HV	650HB
PREPARATION OF SURFACE				
* <i>Roughness class ISO</i>	N7	N7	N5	N9
* <i>Max. roughness depth Rt</i>	10 mm	10 mm	2.5 mm	30 mm
* <i>Average roughness Ra</i>	2 mm	2 mm	0.4 mm	7 mm
MIN. WEIGHT OF SAMPLE				
* <i>Of compact shape</i>	5kg	5kg	1.5kg	15kg
* <i>On solid support</i>	2kg	2kg	0.5kg	5kg
* <i>Coupled on plate</i>	0.1kg	0.1kg	0.02kg	0.5kg
MIN. THICKNESS OF SAMPLE				
Suggested min. Thickness Range	12mm	10mm	10mm	12mm
* <i>Min. thickness of layers</i>	0.8mm	0.8mm	0.2mm	—
INDENTATION OF TEST TIP				
With 300 HV				
* <i>Diameter</i>	0.54mm	0.54mm	0.38mm	1.03mm
* <i>Depth</i>	24 m m	24 m m	12 m m	53 m m
With 600 HV				
* <i>Diameter</i>	0.45mm	0.45mm	0.32mm	0.90mm
* <i>Depth</i>	17 m m	17 m m	8 m m	41 mmC
With 800 HV				
* <i>Diameter</i>	0.35mm	0.35mm	0.30mm	—
* <i>Depth</i>	10mm	10mm	m7mm	—



SPECIAL APPLICATION IMPACT DEVICES

Impact Device D Part No. PHT1800-100

Universal standard device.

Use for the majority of hardness testing assignments

Impact Device DL Part No. PHT1800-115

Needle front section .109" diameter x 1.96" length
Measurements in extremely confined spaces

Impact Device G Part No. PHT1800-125

Enlarged test tip: For use on solid heavy components such as; rough castings and forgings. Brinell only.

Impact Device DC Part No. PHT1800-120

Extremely short impact device

Used for very confined spaces such as holes, cylinders, internal measurements

Impact Device D+15 Part No. PHT1800-110

Slim front section with coil set back.

Hardness measurements in grooves, recessed surface.

Impact Device C

A reduced energy impact device for measuring the hardness of Case Hardened Steel only. Applies a small superficial indentation.

Weight: 2.6oz²

Part No. PHT1800-130

Probe Support Stand MET-1000



Small Cylinder Support Ring (8-22mm diameter)
Part No. PHT6000-521

Large Cylinder Support Ring (16-80mm diameter)
Part No. PHT6000-531

Deep Hole Probe Cap (5.53mm diameter/15.5 deep)
Part No. PHT6000-541



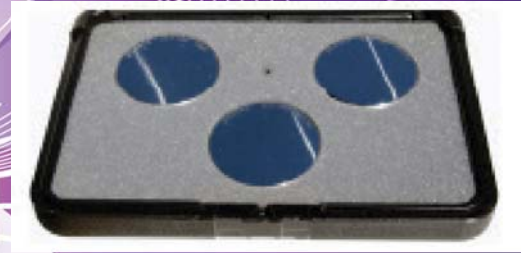
UCI/Dynamic Hardness Tester

Optional Test Blocks for 6000 Series

NIST Certified Test Block Kit

Part No. 900330-9410

Includes: 1pc HRC 20's
1pc HRC 40's
1pc HRC 60's



Aluminum/Brass Rockwell Blocks

PART NO.	DESCRIPTION	SHAPE	RANGE	COMMENTS
900330-9414AH	Rockwell B	Square	80's	Made in USA Aluminum
900330-9414AL	Rockwell B	Square	50's	Made in USA Aluminum
900330-9418H	Rockwell E	Square	90's	Made in USA Aluminum
900330-9418L	Rockwell E	Square	60's	Made in USA Aluminum
900330-9414BH	Rockwell B	Square	80's	Made in USA Brass
900330-9414BL	Rockwell B	Square	50's	Made in USA Brass



Leeb Test Blocks

PART NO.	DESCRIPTION	SHAPE	RANGE	COMMENTS
PHT1300-01	Leeb "D" Test Block	Round	750-800(HRC 50's)	Phase II std.
PHT130001-CERT	Leeb "D" Test Block	Round	750-800(HRC 50's)	NIST Certified
PHT1300-02	Leeb "D" Test Block	Round	590-670(HRC40's)	Phase II std.
PHT130002-CERT	Leeb "D" Test Block	Round	590-670(HRC40's)	NIST Certified
PHT130003-CERT	Leeb "D" Test Block	Round	490-570(HRC20's)	Phase II std.
900330-9414BL	Leeb "D" Test Block	Round	490-570(HRC20's)	NIST Certified
PHT1100G-01	Leeb "G" Test Block	Round	480-670	For use with "G" impact devices
PHT1100G-01C	Leeb "G" Test Block ASTM Certified to Brinell	Round	480-670 (HB200's)	For use with "G" impact devices



Brinell Test Blocks

PART NO.	DESCRIPTION	SHAPE	RANGE	COMMENTS
900355-1000/150	3000kg	Round	150-250	Phase II std. (Steel)
900355-1000/250	3000kg	Round	250-500	Phase II std. (Steel)
900355-3010	3000kg	Rectangle	Low	Aluminum (USA)
900355-3020	3000kg	Rectangle	High	Aluminum (USA)
900355-3030	3000kg	Rectangle	100-200HB	Steel (USA)
900355-3040	3000kg	Rectangle	250-350HB	Steel (USA)
900355-3050	3000kg	Rectangle	500+HB	Steel (USA)

