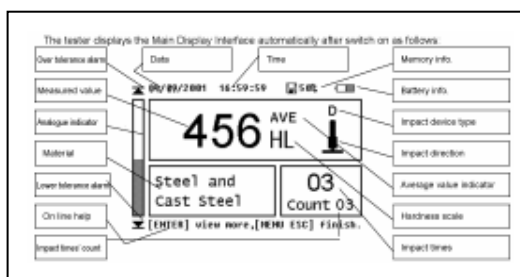


Hardness Tester TH160



- Developed model of TH140
- On-Board memory holds 240-1000 groups of data
- Automatic identification Impact Devices and test direction (Except G)
- Time and date setting; auto-clock
- Integral thermal printer, print all test results and histogram
- Li Battery , low voltage indication and sound alarm
- Dataview for PC operation
- Software data and upper / lower limits setting and sound alarm
- Software to connect with PC
- Large LCD with back-light, showing all functions and parameters
- Direct display of hardness scales HRB, HRC,HV, HB, HS, HL
- Conversion to tensile strength (U.T.S.)
- For all metallic materials
- Wide measuring range (see next page)
- Six Impact Devices are available for special applications



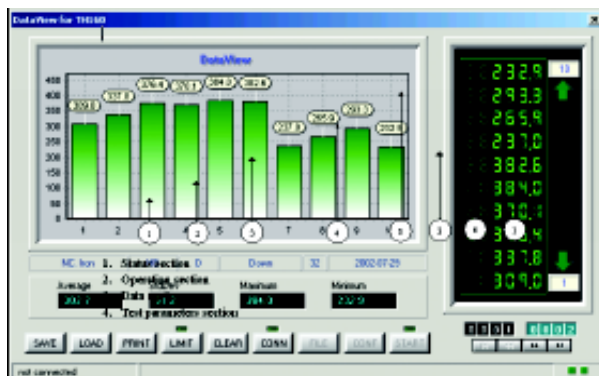
Technical specifications

Hardness scale	HL, HRC, HRB, HRA, HV, HB, HS
Memory	240-1000 groups (Impact times: 32-1)
Measuring range	See next page
Tensile strength U.T.S. range	374~2652 MPa
Accuracy	±6HLD (760±30HLD) error of displayed value 6HLD (760±30HLD) repeatability of displayed value
Statistics function	Average / Max / Min value calculation, limits setting and alarm
Standard Impact Device	D
Optional Impact Devices	DC/DL/C/D+15/G (see page 8)
Max. Workpiece Hardness	996HV(For Impact Devices D/DC/DL/D+15/C) 646HB(For Impact Device G)
Min. Radius of Workpiece (convex/concave)	Rmin = 50mm (with support ring Rmin= 10mm)
Min. Workpiece weight	2~5kg on stable support 0.05~2kg with compact coupling
Min. Workpiece thickness	5mm (Impact Device D/DC/DL/D+15) 1mm (Impact Device C) 10mm (Impact Device G)
Min. thickness of hardened surface	0.8mm
Power	Rechargeable Li Battery, pile for TH160
Continuous Working time	About 100h (no printing and backlight)
Charging time	2.5~4 hours
Operating temperature	0~40°C
Relative humidity	±90%
Overall dimensions	230×90×46.5mm
Weight	420g (including Impact Device and printer)

Hardness Tester TH160

Measuring range

Material	Hardness Scale	D/DC LD: 170-900	D+15 LD+15: 330-900	C LC: 350-960	DL LDL: 560-950	G LG: 200-750
Steel and cast steel	HRC	20-68.4	19.3-67.9	20-69.5	20.6-68.2	
	HRB	38.4 - 99.8			37-99.9	47.7-99.9
	HRA	59.1-85.8				
	HB	127-651	80-638	80-683	81-646	90-646
	HV	81-955	80-937	80-996	80-950	
	HS	32.5-99.5	33.3-99.3	31.8-102.1	30.6-96.8	
Stainless	HRB	46.5-101.7				
	HB	85-655				
	HV	85-802				
CWT/st	HRC	20.4-67.1	19.8-68.2	20.7-68.2		
	HV	80-898	80-935	100-941		
GC.Iron	HRC					
	HB	93-334				92-326
	HV					
NC.Iron	HRC					
	HB	131-387				127-364
	HV					
C.Alum	HB	19-164		23-210		32-168
	HRB	23.8-84.6		22.7-85.0		23.8-85.5
Brass	HB	40-173				
	HRB	13.5-95.3				
Bronze	HB	60-290				
Copper	HB	45-315				



Dataview for TH160



Standard delivery

- Main unit with removable printer 1
- Impact Device type D 1
- Test block with HLD value 1
- Charger 1
- Cleaning brush 1
- TIME certificate 1
- Instruction manual 1
- Warranty card 1
- Carrying case 1

Optional accessories

- Special Impact Devices
- Support rings
- Dataview or Datalab and cable

Model choosing guide

Model Choosing Guide

Model	HLN-11A	TH140	TH160
Data memory	No	48-350 group (Impact times:32-1)	240-1000 group (Impact times:32-1)
Material	Steel and cast steel	Steel and cast steel	steel and cast steel
		Steel, stainless steel	Steel, stainless steel
		C.W.Tool steel	C.W.Tool steel
	C. W. Tool steel	Grey cast iron	Grey cast Iron
	Grey cast Iron	Nodular cast iron	Nodular cast iron
	Nodular cast iron	Cast aluminum	Cast aluminum
	Cast aluminum	Brass Bronze, Copper etc.	Brass, Bronze, Copper etc.
Battery	Rechargeable NiMH battery	Rechargeable NiMH battery	Rechargeable Li battery
Working time	Continuous working 50 hours (no printer)	Continuous working 50 hours (no printer and backlight)	Comtinuous working 100 hours (no printer and backlight)
Battery indicator	No	Software calibration±15HLD	Software calibration±15HLD
Calibration	Software calibration	Yes	Yes
Limit alarm	No	Yes	Yes
Backlight	No	Yes, automatically shut down after 5 minutes	Yes, automatically shut down
Automatically shut down	Yes, automatically shut down after 5 minutes	RS232 interface	after 5 minutes
Communication interface	No	Dot printer	RS232 interface
Printer	Dot printer	Yes	Thermal printer
Automatically identify impact device	Yes		Yes
Automatically identify test direction	No	Yes	Yes
Communication software	No	Data processing software used with computer	Data processing software used with computer
Measuring accuracy (Displayed value)	±6HLD HLD=760±30	±6HLD HLD=760±30	±6HLD HLD=760±30
	6HLD HLD=760±30	±6HLD HLD=760±30	6HLD HLD=760±30



HLN-11A

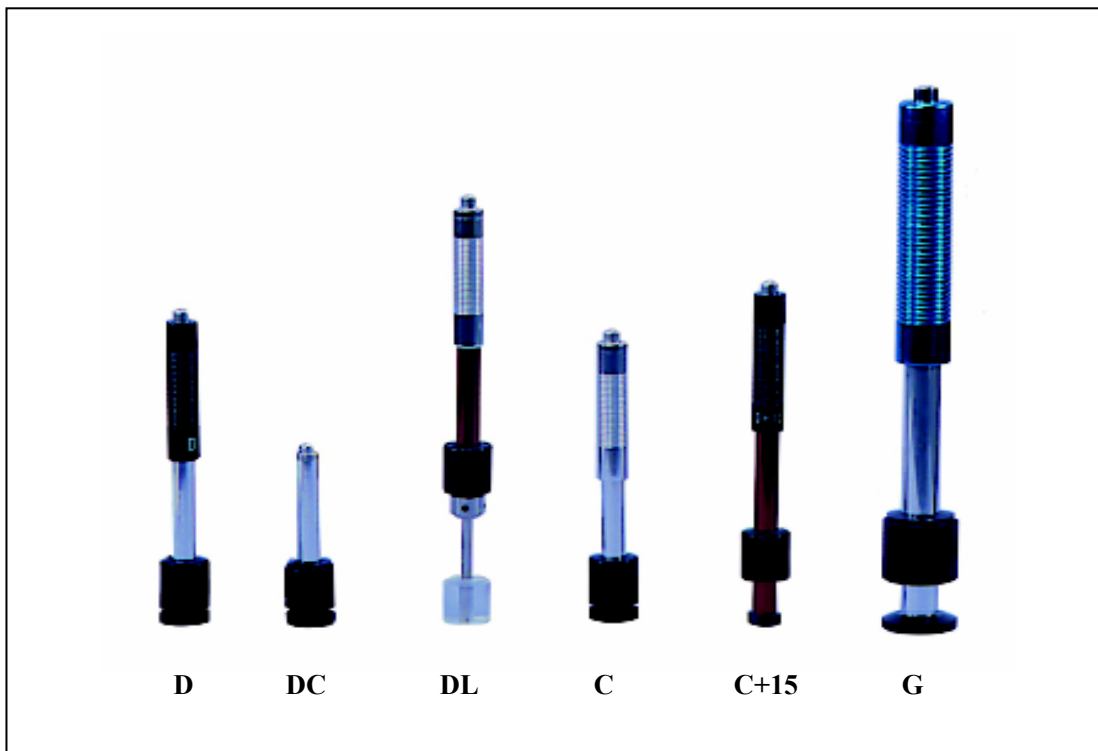


TH140



TH160

Optional Impact Devices

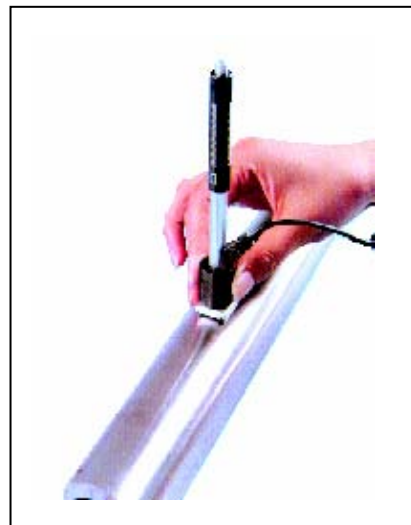
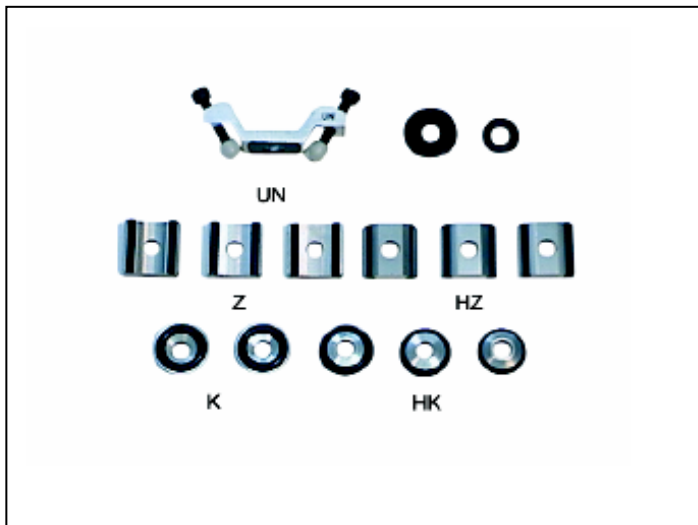


Optional Impact Devices

Technical specifications

Application range of Impact Devices		D type for general pieces DC type for hole or cylinder DL type for long and narrow channel or hole	D+15 type for measuring in grooves or recessed surfaces	C type for measuring light and small piece and surface hardened layer	G type for measuring heavy and rough cast and forged pieces
Impact Device		D/DC/DL	D+15	C	G
Impacting energy		11mj	11mJ	2.7mJ	90mJ
Mass of impact body		5.5g/5.5g/7.3g	7.8g	3.0g	20g
Hardness of spherical test tip		1600HV	1600HV	1600HV	1600HV
Diameter of spherical test tip		3mm	3mm	3mm	5mm
Material of spherical test tip		Tungsten carbide	Tungsten carbide	Tungsten carbide	Tungsten carbide
Diameter of Impact Device		20mm	20mm	20mm	30mm
Length of Impact Device		147/86/75mm	162mm	141mm	254mm
Weight of Impact Device		50g	80g	75g	250g
Max. hardness of workpiece		940/940/950HV	940HV	1000HV	650HB
Average surface roughness of the test piece		Ra: 1.6 μm	Ra: 1.6μm	Ra: 0.4μm	Ra: 6.3μm
Min. weight of test piece	Direct measuring	5kg	5kg	1.5kg	15kg
	On stable support	2kg	2kg	0.5kg	5kg
	With compact coupling	0.05kg	0.1kg	0.02kg	0.5kg
Min. thickness of test piece	Compact coupling	5mm	5mm	1mm	10mm
	Min. case hardened depth	0.8mm	0.8mm	0.2mm	1.2mm
Size of indentation of spherical test tip					
Hardness 300HV	Indentation diameter	0.54mm	0.54mm	0.38mm	1.03mm
	Indentation depth	24μm	24μm	12μm	53μm
Hardness 600HV	Indentation diameter	0.54mm	0.54mm	0.32mm	0.90mm
	Indentation depth	17μm	17μm	8μm	41μm
Hardness 800HV	Indentation diameter	0.35mm	0.35mm	0.35mm	
	Indentation depth	10μm	10μm	7μm	

Optional Support Rings



Support Rings

No.	Type	Sketch of non-conventional supporting ring	Remarks
1	Z10-15		For testing cylindrical outside surface R10~R15
2	Z14.5-30		For testing cylindrical outside surface R14.5~R30
3	Z25-50		For testing cylindrical outside surface R25~R50
4	HZ11-13		For testing cylindrical inside surface R11~R13
5	HZ12.5-17		For testing cylindrical inside surface R12.5~R17
6	HZ16.5-30		For testing cylindrical inside surface R16.5~R30
7	K10-15		For testing spherical outside surface SR10~SR15
8	K14.5-30		For testing spherical outside surface SR14.5~SR30
9	HK11-13		For testing spherical inside surface SR11~SR13
10	HK12.5-17		For testing spherical inside surface SR12.5~SR17
11	HK16.5-30		For testing spherical inside surface SR16.5~SR30
12	UN		For testing cylindrical outside surface, radius adjustable R10~∞
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