

MODEL FH-7

Micro/Macro-Vickers/Low Force Brinell Hardness Tester

Universal



HR



HV



The FH-7 series of Micro-Vickers, Vickers and Micro Brinell hardness testing machines use a unique, electronically controlled, closed loop system and advanced force sensor technology to achieve absolute accuracy, reliability and repeatability on each of the test forces. Horizon software allows file storing, test program setting and storing, image zoom, auto focus, limit settings, conversions to other hardness scales, system setup and (remote) control, pattern testing (CHD/Nht/Rht) to ensure high reproducibility of test results and limits operator error and interpretation.

Features and benefits

- Scales – All FH7 models can test Micro-Vickers, Vickers, Knoop and Low Force Brinell scales but the FH7-2 adds Rockwell and Superficial Rockwell, while the FH7-3 increases Brinell testing capacity to 250kgf. In its ultimate configuration, the FH7 has fully automatic advanced co-ordinate pattern, weld pattern and free style testing of metallic and plastic parts in any common hardness scale.
- Unparalleled test force range – The servo-driven force actuator allows test forces from 10gf up to 250kgf, a capability unique to Tinius Olsen, which uses its own precision load cells and force control electronics. The load actuator is able to position the test head, with sub-micron accuracy, in any required position, and at unsurpassed speed, allowing for greater testing throughput.
- Advanced high speed turrets – The high speed, eight-position turret, is the first hardness tester to incorporate a standard built-in laser positioning systems. The turret also contains two HD cameras, with auto focus and optical zoom system, allowing stage (over)viewing at indenter position.
- Quick change stage and anvil post – As an alternative to the standard ultra-fast motorized CNC stages, there is the option to install larger T-slot stages, fixed stages and a number of anvils. To save time exchanging the nearly unlimited choice of stage and anvil options, the tester features the quick change accessories post, which allows tester reconfiguration in seconds.
- Safety first/collision detection system – To ensure maximum user safety and protect the tester, all FH7 models have an advanced collision detection, warning and test head retraction system. This is triggered by any uncommon force on the turret and will stop and retract the test head in milliseconds, protecting the operator's hands and indenters, objectives and workpieces.
- Clamping device – An integrated clamping device will firmly hold the workpiece against the anvil or test table while performing Rockwell or other depth measuring tests (optional).

The standard high speed modular eight-position turret rotates into the correct position. The positions are automatically selected while the system checks which indenter and objective are most suitable for the test to be performed.



The turret can be configured with one or two indenter actuators, and combined with a maximum of four objectives. The second indenter can be added after installation.



The Z-axis height adjustment of the motorized or manual work table is provided by a high precision linear slide. In combination with a ball bearing spindle, this high quality ultra-precise system allows superfast focusing and guarantees unparalleled accuracy in workpiece positioning – all advantages of a moving test head and fixed surface testing height in one advanced solution.

Specifications

Universal

HR

HV



FH-7 SPECIFICATIONS

Hardness scale (model dependent)	(Micro-) Vickers, Knoop and Brinell, Rockwell and Superficial Rockwell
Load application	Load cell, force feedback, closed loop system
Load range	10gf up to 250kgf
Motorized turret	Eight positions: two indenter, four objectives, overview camera, laser pointer; one position for 3-250kgf
Optical system	High definition, 5MP machine vision system
Objectives	2.5x, 5x, 10x, 20x, 50x, 100x
Overview camera Camera 2	5MP optical ZOOM camera, field of view 50 x 37mm / 200 x 160mm
Electronic system	High performance embedded micro-system controller, MS Windows®, 15in full color industrial touchscreen, automatic and manual measurement
Test loads (depending on model)	10gf, 15gf, 20gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1kgf, 1.25kgf, 2kgf, 2.5kgf, 3kgf, 4kgf, 5kgf, 6.25kgf, 7.8125kgf, 10kgf, 15kgf, 15.625kgf, 20kgf, 30kgf, 31.25kgf, 40kgf, 50kgf, 60kgf, 62.5kgf, 80kgf, 100kgf, 120kgf, 125kgf, 150kgf, 187.5kgf, 250kgf
Vickers test range	HV0.010, HV0.015, HV0.020, HV0.025, HV0.050, HV0.1, HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV4, HV5, HV10, HV20, HV25, HV30, HV40, HV50, HV100, HV120
Brinell test range	HB1/1kgf, HB1/2.5kgf, HB1/5kgf, HB1/10kgf, HB1/30kgf; HB2.5/6.25kgf, HB2.5/15.625kgf, HB2.5/31.25kgf, HB2.5/62.5kgf, HB2.5/187.5; HB5/25kgf, HB5/62.5kgf, HB5/125, HB5/250; HB10/100, HB10/125, HB10/250
Knoop	HK0.01, HK0.02, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1, HK2, HK5, HK10, HK20, HK30, HK50
Test cycles	Automatic and manual
Standards	Complies to or exceeds, ISO, ASTM, JIS (Nadcap) standards
Test force accuracy	<0.5% for test force 100g to 62.5kg <1% for test force below 100g
Display resolution	0.1 HV, HK, 0.5 HB
Hardness conversion	Rockwell, Rockwell Superficial, Brinell, Leeb and Tensile
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Data storage capacity	Dual SSD 80GB, RAID system
Connectivity	Two USB ports, RJ45 Ethernet LAN, W-LAN, RS232, Bluetooth; five-axis CNC and motorized X-Y stage connector
Dwell time setting	0-99 seconds, user defined
Standard Motorized CNC XY stage dimensions	Stage 400 x 225mm, Travel: X axis 220mm, Y axis 120mm, Repeatability 0.002mm
Operating temperature	10-35°C, non-condensing
Humidity	10-90% non-condensing
Machine dimensions	695 x 425 x 1100mm
Machine weight	180kg
Power consumption	100W
Power supply	100VAC to 240VAC, 50/60Hz, single phase

MODEL DETAILS

- **FH-7-1** 10g-62.5kgf Vickers, Micro-Vickers, Knoop, Low Force Brinell, KiC
- **FH-7-2** 10g-150kgf Vickers, Micro-Vickers, Knoop, Low Force Brinell, KiC, Rockwell, Superficial Rockwell
- **FH-7-3** 10g-250kgf Vickers, Micro Vickers, Knoop, Low Force Brinell, Brinell, Rockwell, Superficial Rockwell KiC, HVT, HBT, ISO 2039 1/2

Standard features

- Load cell, closed loop force control
- Horizon™ operator workflow control and advanced report generator
- Auto brightness, contrast, sharpness
- Auto focus
- Automatic indent measurement
- Anti-collision system for objectives, indenters and illumination
- Calibrated step-less indent ZOOM system
- Autosave, program setup, data storage,
- Motorized Z-axis
- Z-axis intelli control
- Motorized CNC X-Y stage
- Click & Go software for random point testing
- Pattern testing for advanced pre-program test patterns
- CHD, Nht, Rht according to standard
- KiC fracture toughness measurement
- Stage overview camera
- Laser position system
- Best in class optical system
- 5Mpx HD indent viewing camera
- Powerful embedded micro-controller, MS Windows™, 80gb dual SSD data storage, keyboard and mouse
- 15in portrait mode, HD industrial touchscreen
- Connectivity: USB, RJ45 LAN, WLAN and HDMI

Super fast, high accurate motorized CNC X-Y stages:

	Surface Area	Travel limits
Standard	400 x 255mm	220 x 120mm
Optional	630 x 160mm	450 x 160mm



Note – Specifications subject to change without notice