

Product Information

ZHV10 Vickers hardness testing machine

CTA: 46125 46129



ZHV10 Vickers hardness testing machine, analog version



ZHV10 Vickers hardness testing machine, PC version

Applications

The ZwickRoell ZHV10 Vickers hardness testing machine has a proven track record, particularly for determining the following values:

- Vickers hardness
- Knoop hardness
- Brinell hardness
- case hardening, hardness penetration and nitriding depth.
- Ritz hardness (analog version)

The ZHV10's various load stages (HV0,2; HV0,3; HV0,5; HV 1; HV 2; HV3; HV5 and HV10) are attained by the use of multiple load-weights (200g basic weight; can be upgraded with 100 g, 200 g, 500 g, 2 x 1 kg, 2 kg, 5 kg). The Optics unit with up to 5 interchangeable lenses for different magnifications and image ranges is available for both versions.

- With the **analog version** (Item No. 311814) the hardness value is evaluated using hardness tables.
- The **PC version** (Item No. 353439) uses testXpert testing software "hardness edition". As well as being simple to operate, testXpert adapts to varying test conditions with great flexibility. The indentation is measured on-screen via manual or automatic application of the measuring lines and is evaluated automatically. A Master test program for series measurement for Vickers, Knoop and Brinell hardness testing is available and can be expanded to include hardness traverse tests and automatic indentation measurement. A wide range of accessories is available, in addition to manual and digital X-Y tables.

Advantages and Features

- Simple operation
- Flexible test area height, can be swivelled by 180°
- Direct mass (weight) loading with low friction guided indenter
- Hand crank for starting the loading procedure at generation of an indentation, as well as for load removal
- Various prisms and clamping devices as well as a parallel vice for fixing the specimens are optional extras

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Technical data

Basic instrument

Item No.	311814	353439
Type	Hardness tester to Vickers, analog, for manual evaluation	Vickers hardness testing machine, PC version
Load stages	HV 0.2 ... HV 10	HV 0.2 to HV 10
Load changes	Manual	manual
Included in delivery:	<ul style="list-style-type: none"> • LED illumination 	<ul style="list-style-type: none"> • LED illumination • GigE camera, high-resolution, 1.4 megapixels • Software licenses
Required:	<ul style="list-style-type: none"> • Indenter (see below) • Objective (see below) 	<ul style="list-style-type: none"> • indenter (see below) • lenses (see below) • graphics card for optical hardness test method (075270)¹⁾ • testXpert II testing software • PC and monitor

1) Compatibility of the PC card is guaranteed only in conjunction with PCs from ZwickRoell's range with Windows 10. In the case of use of customer's own PC, this must be sent to ZwickRoell in the event of an order.

Lenses (1 x required)

Item No.	1075268	1075269	1075270	1075271	1075272	
Inherent magnification	5 : 1	10 : 1	20 : 1	40 : 1	60 : 1	
Total magnification, version for 311814	50 : 1	100 : 1	200 : 1	400 : 1	600 : 1	
Measurement range, version for 311814	0 = 2.4	0 = 1.2	0 = 0.6	0 to 0.3	0 to 0.18	mm
Horizontal field of view, max., version for 353439	1760	880	440	220	147	µm ¹⁾²⁾
Vertical field of view, max., version for 353439	1320	660	330	166	110	µm ¹⁾²⁾
Resolution, version for 353439	1.5	0.8	0.4			µm/ pixels

- 1) A video adapter with a high level of inherent magnification is integrated in this version in the measurement microscope in front of the GigE camera.
- 2) The permissible measurement ranges are described in detail in the corresponding standards. For example, according to DIN EN ISO 6507-2, in order to achieve a resolution of 0.2 µm ($d < 40 \mu\text{m}$) or 0.5% of d ($d \geq 40 \mu\text{m}$), a Vickers indentation must equal at least 1/3 of the vertical field of view.

Indenters (1 x required)

Type	Indenter as per hardness test method	Hardness test method	Item No.
Indenter	Vickers, with pyramidal diamond point 136°	Vickers	318061
Indenter	Knoop, with diamond pyramid to Knoop, 172° 30'/130°	Knoop	318845
Indenter, one-piece	Brinell, with hard metal ball, 1 mm	Brinell HBW 1/...	320900
Indenter	Ritz hardness test, with diamond cone, 120°	Ritz hardness test ¹⁾	311990

1) analog version only)

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X-Y tables

Type	Force, max. (Fmax) [kN]	Table dimensions [mm]	Distance of travel [mm]	Included in delivery	Item No.
X-Y table, manually	0.5	135 x 135	50 x 50	• Micrometer screws	353448
X-Y table, manually	0.5	135 x 135	25 x 25	• Micrometer screws • Digital display • Position transfer via RS232	353449

Accessories for x-y tables

Description	Item number
Specimen grips including angled stop for X-Y tables, Fmax 20N, for 3 round specimens (Ø 40 mm)	029548
Specimen grips including angled stop for X-Y tables, Fmax 20 Nm, for 6 round specimens (Ø 30 mm)	029547
Specimen grips for 4 round specimens (Ø 40 mm), with positioning on X-Y table	369472

Testing software *testXpert*[®] hardness edition

Description	Item number
testXpert basic program for ZHV10, German	056148
testXpert basic program for ZHV10, English	056149
Master Test Program for ZHV10 hardness testing machines for optical hardness testing methods, German: <ul style="list-style-type: none"> • Vickers hardness to EN ISO 6507, Knoop hardness to ISO 4545, Brinell hardness to EN ISO 6506 • Options included: Hardness Traverse, Auto-measurement, Autofocus, software integration X-Y table 	1002310
Master Test Program for ZHV10 hardness testing machines for optical hardness testing methods, as 1002310, English	1002312

Supplementary weights

Description	Item number
Device for tests in the micro range (test force levels: 0.294/0.49/0.98/1.47 N) only for ZwickRoell ZHV10, analog version (311814) When used with the ZHV10 PC version, please note that standard-compliant indentation measurement via a computer screen requires an indentation size of at least 1/3 of the overall screen size to achieve the necessary accuracy. This is not always possible for measurements in the Vickers range.	312024
Device for tests in the macro range (test force levels: 196/294 N)	312034

Clamping tools and fixtures (with or without x-y table)

Description	Item number
Clamping device for tools and fixtures	312070
Clamping device for round specimens	312080
Clamping device for metal sheets	312082
Clamping device for flat specimens	312084
Parallel vice (jaws, Item Nos. 312088, 312090, 312092 or 312094 , required)	312086
Pair of jaws for specimen diameter 4 to 14 mm	312090

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Description	Item number
Pair of jaws for specimen diameter 14 to 40 mm	312092
Pair of jaws for specimen diameter 40 to 70 mm	312094
Pair of jaws for specimens up to 80 mm thick	312088
Quick-action vice (for 500N x-y table only)	312096

Prisms

Description	Item number
Prism for specimen diameter 1 to 20 mm	312106
Prism for specimen diameter 5 to 70 mm	312108
Prism for specimen diameter 30 to 150 mm	312110

Other accessories

Description	Item number
Ball and socket joint for swivel clamping of parallel vise and quick vice	312098
Support block	312102
Clamping device for lead screws	312104
Grindstone	312054
Rubber/air spring isolators for ZHV10 for minimizing influence of external vibrations (mount on machine base)	006707

Accessories for tests on gear wheels

To test gears with the ZHV10, the extended lens is required in addition to the special indenter (long).

Description	Item number
Indenter (long) for Vickers hardness test	311970
Lens, 20x (extended)	1075273
Mounting fixture for gear wheels	312100