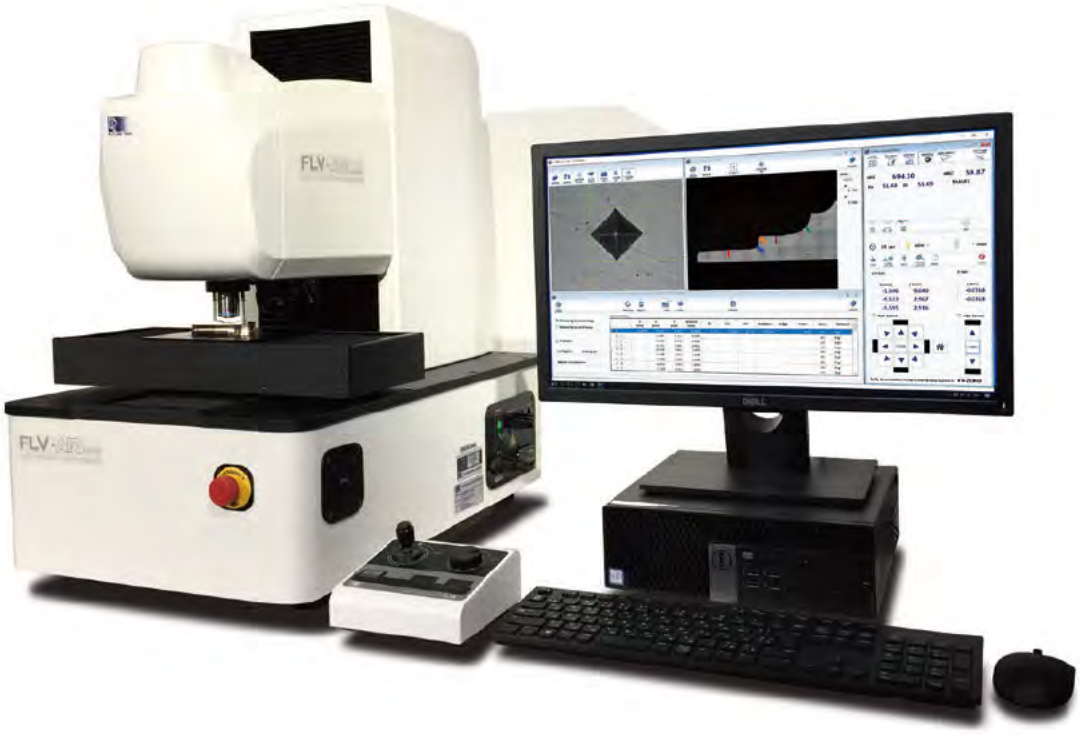
FUTURE-TECH

LOAD-CELL TYPE AUTOMATIC VICKERS HARDNESS TESTER

FLV-AR Series

Controlled by high performanace software FT-ZERO





FULLY-AUTOMATIC VICKERS HARDNESS TESTING SYSTEM

FLV-AR Series





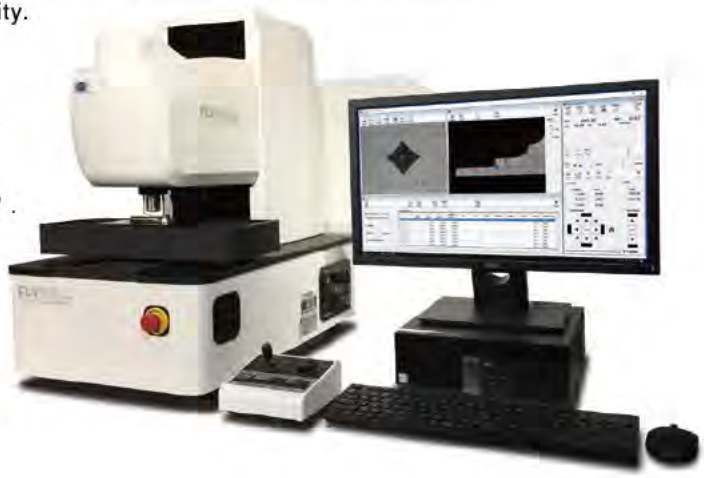
Fully-Automatic Microhardness / Vickers Hardness Testing System has been evolved!!

Innovative elevating type head and wide test load range is adopted.

Advanced intelligent system of high speed sample profiling function.

Improvement of high speed, high accuracy, excellent in operability, reading efficiency and repeatability.

Reliable hardness test as close as human eyes and sensitivity.



Features

Load-cell type loading mechanism

- 15 steps test load and additional test load can be optionally set by "unit 10g" .
- There are 2 models. 10gf ~ 10kgf (FLV10) and 50gf ~ 50kgf (FLV50)

Load apply mechanism by elevating type head

- Large heavy sample and multiple samples can be set at once.
- Work table doesn't require a hole for elevation screw and do not need to choose the place to install the tester.

High resolution camera

- Equipped with a 1.3M pixel high resolution digital camera.

Sample surface inclination/slope correction function

- Z axis shall be controlled along with surface inclination by selecting 3 positions' angle setting. This function is to improve the accuracy of load apply and measurement position. Moreover to shorten the auto focus time, and prevent accidental contact of sample and lens/indenter. (Built- in safety device).

Measurement image saving function

- Measured indentation image can be checked quickly. Easily and quickly edit the data by re-measuring the saved image.

Large motorized XY stage

- Built-in large stage. It can be prevented the inclination of stage which shall be created by large heavy sample, and performs highly accurate load apply. It is also quiet.
- It is possible to move the stage to the center by double clicking and move the stage finely by dragging. Easy to align the sample's original position and it can drastically shorten the setting time.

Various measuring pattern

- Fully automated test cycle (indent, measuring, recoding data) by selecting measuring pattern.
- Random measuring combined with sample profiling function, and measuring function which traces edge of sample as standard feature.

Function which traces edge of sample as standard feature

- Straight · Zigzag · Circle · Arc · Line Set · Random · Matrix · Teaching etc···
  We will meet users' needs.

Image processing software

- Capability of reading unclear indents on un-mirror surface has been improved by more advanced image processing software.

Various data output format and statistical processing

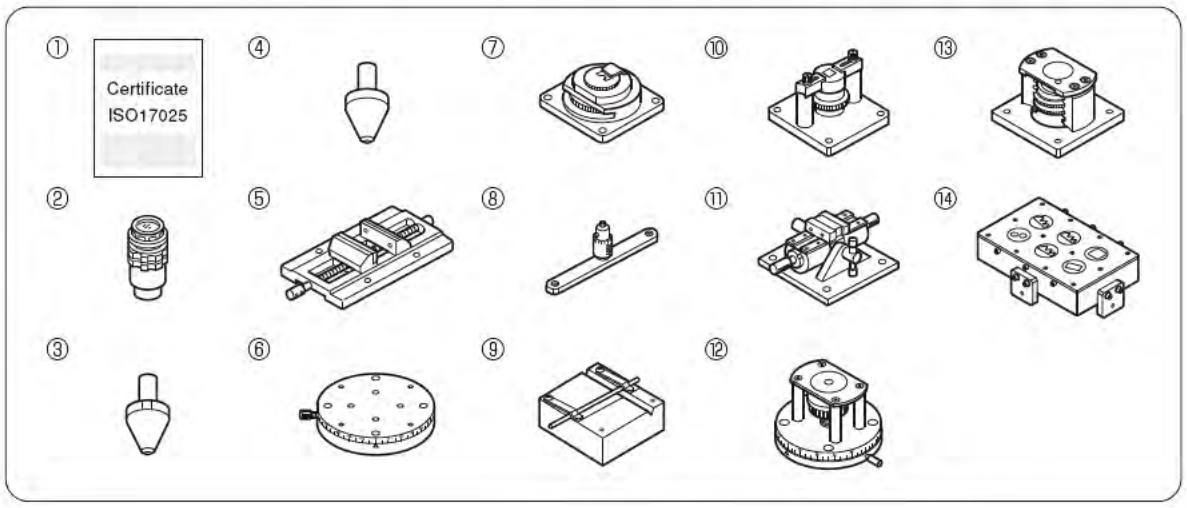
- For the measuring of carburizing / induction hardening, the selected hardness case depth shall be displayed and recorded on the chart once the multiple measuring is completed.
- Multiple measuring data, Hardness chart, Case depth, Max. value, Min. value, Mean value, Dispersion, Standard deviation, OK-NG criteria, Conversion data etc··· various data output shall be available.
- Display and output of color profile picture linked with hardness values are standard function.
- Excel data transfer function. Test result shall be exported to the original report Form.

STANDARD ACCESSORIES

ITEM	SPECIFICATIONS	No.
HARDNESS STANDARD BLOCK	700HV / 800HV	1
PRECISION VISE	Max.Opening : 50mm	1
DIAMOND INDENTER (BUILT-IN)	For Vickers (HV)	1
OBJECT LENS (BUILT-IN)	×50	1
	×10	1
LEVEL ADJUSTING LEG	For Hardness Tester	4
LEVEL	For Level Adjustment	1
INDENTER COVER (BUILT-IN)	For Hardness Tester	1
MACHINE COVER	For Hardness Tester	1
POWER CORD	For Hardness Tester	1
ACCESSORY BOX	Screwdriver, Wrench, etc.	1
INSTRUCTION MANUAL	—	1

OPTIONAL ACCESSORIES

CODE No.	ITEM			MODEL / CONTENTS
M - 0 6 2	Calibration Certificate		①	ISO17025
L V - 0 0 1	Object Lens		②	× 100
L V - 0 0 4				× 20
L V - 0 0 6				× 5
L V - 0 0 7				× 2.5
L V - 0 0 8				× 1.25
M - 0 1 4	Knoop Indenter		③	Rhombic diamond indenter for Knoop Hardness (HK)
M - 0 6 3	For Brinell Hardness Test | Tungsten Carbide Ball Indenter		④	ϕ 1mm
M - 0 2 8	Precision Vise		⑤	Max. Opening : 100mm
M - 0 2 9	Rotary Table		⑥	Graduation of rotary angle : 5° Table dia : 128mm (Mounted onto X-Y stage)
M - 0 3 0	Thin Specimen Measuring Device		⑦	Specimen thickness : 5mm max.
M - 0 3 1	Fine Specimen Measuring Device		⑧	Specimen dia : ϕ 5mm max. (For measuring cross section)
M - 0 3 2		Vertical Type	⑨	Specimen dia : ϕ 5mm max. (For measuring cylindrical surfase)
M - 0 3 3	Specimen Inclining Device	Horizontal Type	⑩	Specimen height : 5~20mm. (For measuring mounted specimen)
M - 0 3 4	Universal Specimen Vise		⑪	Max. Opening : 45mm
M - 0 3 5	Rotary Mounted Specimen Inclining Device		⑫	Specimen height : 5~30mm
M - 0 3 6	Mounted Specimen Inclining Device		⑬	Specimen height : 5~30mm
M - 0 9 1	Fixing Jig for Six Mounted Specimens		⑭	For 32 ϕ, 38 ϕ, and 40 ϕ
L V - 0 5 7	Additional lens unit			For additional lens
L V - 0 5 8	Additional indenter unit			For additional indenter



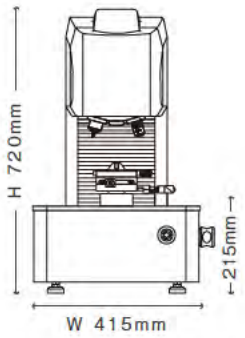
LOAD-CELL TYPE AUTOMATIC VICKERS HARDNESS TESTER

FLV-AR Series

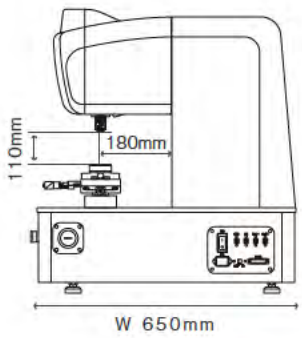
- A super-wide range from 10gf to 10kgf (from 50gf to 50kgf)
- Auto-Focus
- Auto-Reading
- Auto-Stage (ARS-F)



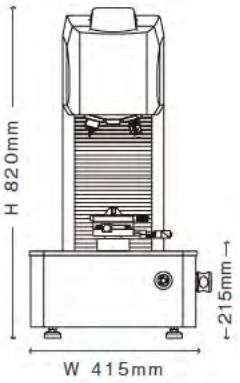
MODEL		FLV-10AR	FLV-10ARS-F
ITEM		SPECIFICATIONS	
TEST LOAD	VICKERS	HV 0.01、0.02、0.025、0.05、0.1、0.2、0.3、0.5、1、2、2.5、3、4、5、10 kgf	
	KNOOP	HK 0.01、0.02、0.025、0.05、0.1、0.2、0.3、0.5、1、2 kgf	
	BRINELL	HBW 1/1、1/2.5、1/5、1/10、1/30、2.5/6.25 mm/kgf	
	OPTIONAL LOAD SETTING	Possible to set max 64 kinds of test load in a range of 0.01～10kgf by min 0.01kgf.	
LOADING SYSTEM		0.01～10kgf Test Load : Automatic Direct Loading System with Load-Cell closed-loop feedback	
LOAD-CELL TYPE		0.01～10kgf : by Double Load-Cell (Apply Test Load by 10gf)	
FOCUSING METHODS		Automatic Operation (by integrated Auto-Reading Software) / Manual Operation (by motorized Positioning System)	
TURRET ROTATION		Automatic-Motorized (by integrated Auto-Reading Software)	
MEASUREMENT OF INDENTATION		Automatic Reading / Manual Reading (by integrated Auto-Reading Software)	
LOAD APPLYING SPEED		Initial Descending Speed (to 0.15mm level on specimen surface) : Approx. 180 μm/s Effective Loading Speed : Approx. 30 μm/s for under 1kgf Test Load and Approx. 80 μm/s for over 1kgf Test Load	
DWELL TIME		5～99sec	
INDENTER		For Vickers Test (HV) : 1pc	
		For Knoop Test (HK) and Brinell Test (HBW) : Tungsten Ball φ1mm、φ2.5mm (OPTION)	
OBJECTIVE LENS		Infinity Corrected Long Working Distance (LWD) Lens 2pcs : X10 & X50	
		Infinity Corrected LWD Lenses / Max. 5pcs : X1.25、X2.5、X5、X20、X100 (OPTION)	
INDENTATION MEASUREMENT SYSTEM	CAMERA	Automatic measurement by Built-in Type 1.3M pixel	
SYSTEM CONTROL	SOFT WARE	FT-ZERO (Windows 10 / 64bit) / Display Size 23"	
	OUTPUT SIGNAL	2 USB cables and 1 RS232C cable	
	DIMENSIONS	Manual 110×110 mm	Auto 150×150 mm
	X-Y STAGE MOVEMENT	Manual (X)50× (Y)50mm	Auto (X)180× (Y)110mm with joystick controller
MAX. HEIGHT OF SPECIMEN		110mm From Manual Stage Top	110mm From Auto Stage Top
MAX. DEPTH OF SPECIMEN		180mm	
LIGHT SOURCE	BULB	LED Illumination	
	FILTER	Manual Adapting / Removing	
	APERTURE DIAPHRAGM	Flexible Type Aperture (OPTION)	
ACCURACY		For Vickers Test : Conforming to JIS B-7725、JIS B-7734、ASTM E-384 and ISO/ DIN6507-2	
SAFETY DEVICE		Protection Cover on Turret for Indenter & Each Objective Lens	
DIMENSIONS		H720 × W415 × D650 mm	
WEIGHT		Approx 115kg	
POWER SUPPLY		1P AC100 ～ 230V（50/60Hz）	



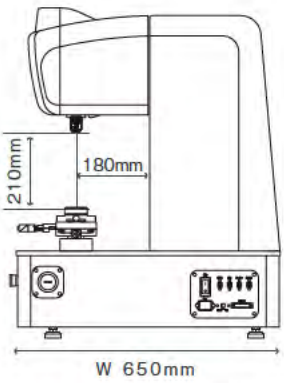
□FLV-10AR Front view



□FLV-10AR Side view



□FLV-50AR Front view



□FLV-50AR Side view

MODEL		FLV-50AR	FLV-50ARS-F
ITEM		SPECIFICATIONS	
TEST LOAD	VICKERS	HV 0.05、0.1、0.2、0.25、0.3、0.5、1、2、2.5、3、4、5、10、20、30、50 kgf	
	KNOOP	HK 0.05、0.1、0.2、0.3、0.5、1、2 kgf	
	BRINELL	HBW 1/1、1/2.5、1/5、1/10、1/30、2.5/6.25、2.5/15.6、2.5/31.25 mm/kgf	
	OPTIONAL LOAD SETTING	Possible to set max 64 kinds of test load in a range of 0.05~50kgf by min 0.01kgf.	
LOADING SYSTEM		0.05~50kgf Test Load : Automatic Direct Loading System with Load-Cell closed-loop feedback	
LOAD-CELL TYPE		0.05~50kgf : by Double Load Cell (Apply Test Load by 10gf)	
FOCUSING METHODS		Automatic Operation (by integrated Auto-Reading Software) / Manual Operation (by motorized Positioning System)	
TURRET ROTATION		Automatic-Motorized (by integrated Auto-Reading Software)	
MEASUREMENT OF INDENTATION		Automatic Reading / Manual Reading (by integrated Auto-Reading Software)	
LOAD APPLYING SPEED		Initial Descending Speed (to 0.15mm level on specimen surface) : Approx. 180 μm/s Effective Loading Speed : Approx. 30 μm/s for under 1kgf Test Load and Approx. 80 μm/s for over 1kgf Test Load	
DWELL TIME		5~99sec	
INDENTER		For Vickers Test (HV) : 1pc	
		For Knoop Test (HK) and Brinell Test (HBW) : Tungsten Ball φ1mm、φ2.5mm (OPTION)	
OBJECTIVE LENS		Infinity Corrected Long Working Distance (LWD) Lens 2pcs : X10 & X50	
		Infinity Corrected LWD Lenses / Max. 5pcs : X1.25 X2.5、X5、X20、X100 (OPTION)	
INDENTATION MEASUREMENT SYSTEM	CAMERA	Automatic measurement by Built-in Type 1.3M pixel	
SYSTEM CONTROL	SOFT WARE	FT-ZERO (Windows 10 / 64bit) / Display Size 23"	
	OUTPUT SIGNAL	2 USB cables and 1 RS232C cable	
	DIMENSIONS	Manual 110×110 mm	Auto 150×150 mm
	X-Y STAGE MOMENT	Manual MAX MOVEMENT : (X)50× (Y)50mm	AUTO MAX MOVEMENT : (X)180× (Y)110mm with joystick controller
MAX. HEIGHT OF SPECIMEN		210mm From Manual Stage Top	210mm From Auto Stage Top
MAX. DEPTH OF SPECIMEN		180mm	
LIGHT SOURCE	BULB	LED Illumination	
	FILTER	Manual Adapting / Removing	
	APERTURE DIAPHRAGM	Flexible Type Aperture (OPTION)	
ACCURACY		For Vickers Test : Conforming to JIS B-7725、JIS B-7734、ASTM E-384 and ISO/ DIN6507-2	
SAFETY DEVICE		Protection Cover on Turret for Indenter & Each Objective Lens	
DIMENSIONS		H820 × W415 × D650 mm	
WEIGHT		Approx 120kg	
POWER SUPPLY		1P AC100 ~ 230V (50/60Hz)	

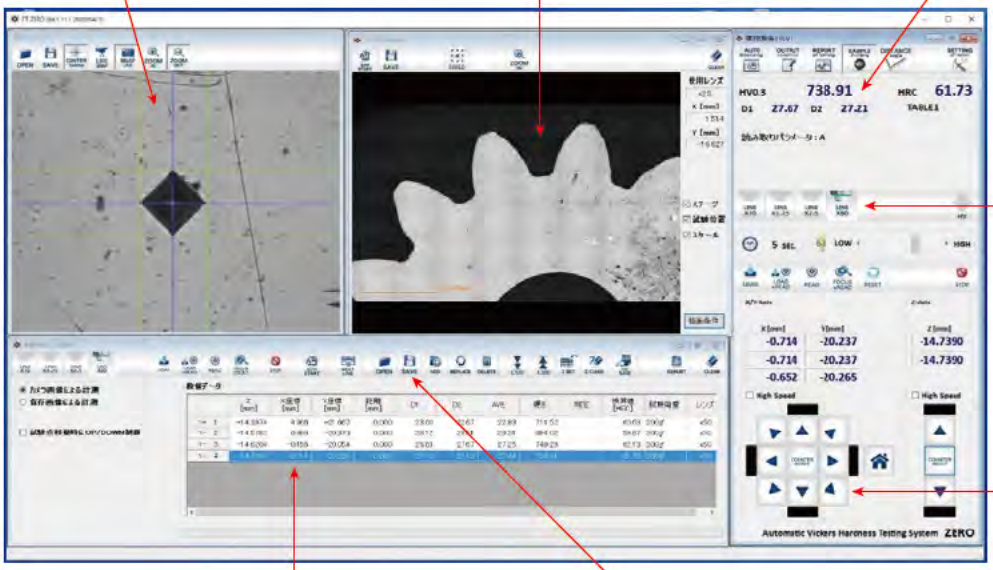
FT-ZERO Series

～Software FT-ZERO Function Introduction～

The observation position is displayed with high image quality. The measurement line position can be easily fine-tuned using a mouse. (Common to each model)

Display the entire sample recognized by sample profiling. Easily move the observation position by simply clicking on the desired position. (ARS・ARS-F)

Display measurement data in real time. The converted value to the desired scale can be displayed at the same time. (Common to each model)



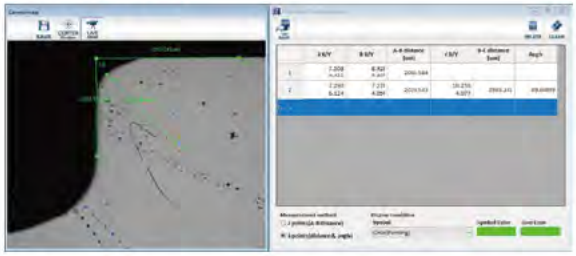
You can switch to the desired lens/indenter axis by clicking the icon. (Common to each model)

Moving operation of motorized stage. (ARS・ARS-F)

Display multiple test results. (Common to each model)

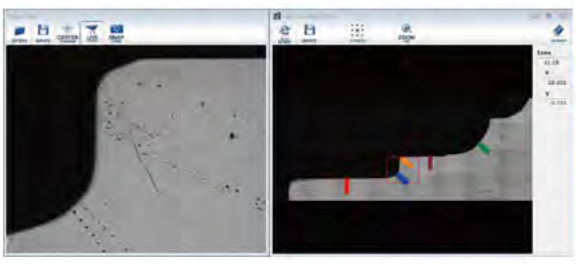
Automatically start, stop, re-measure, save data, recall, replace etc. easily by clicking icons. (Common to each model)

DISTANCE &ANGLE MEASUREMENT FUNCTION



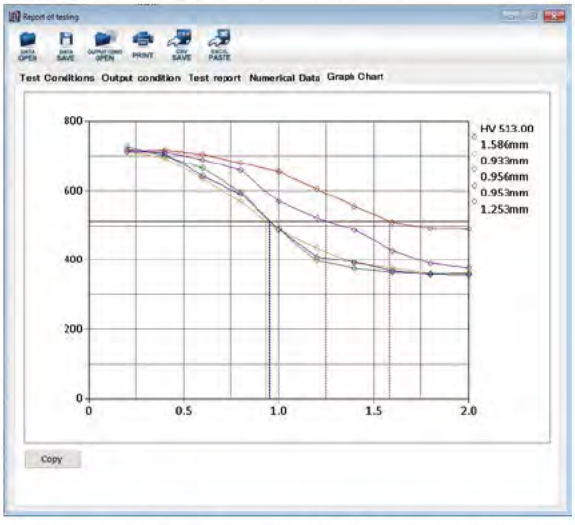
Only click between two points can measure the distance and click three points can measure the angle easy. (ARS・ARS-F)

IMAGE OF PROFILING FUNCTION



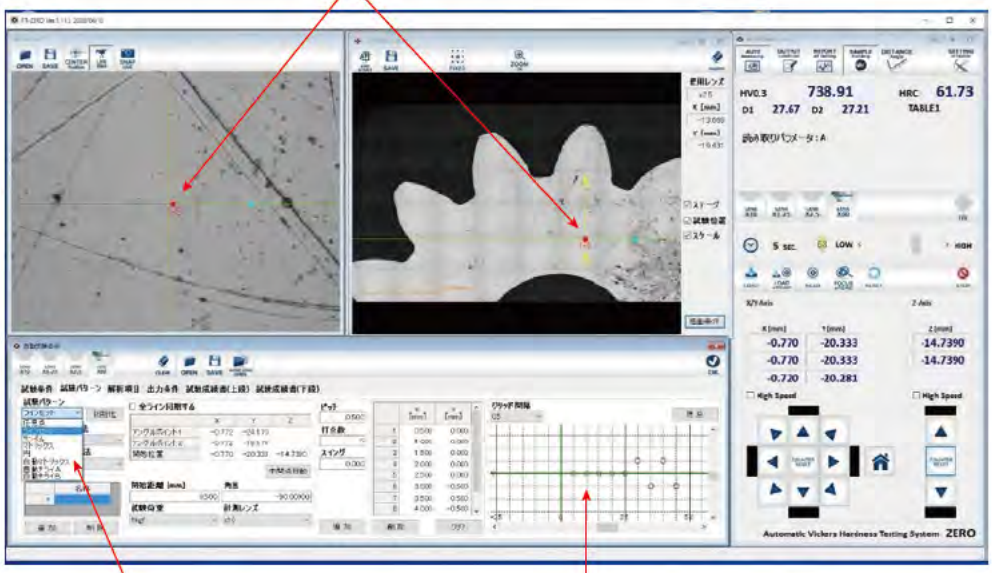
The original position set is very simple by this function to recognize a shape of sample automatically. (ARS・ARS-F)

REPORT GRAPH CHART



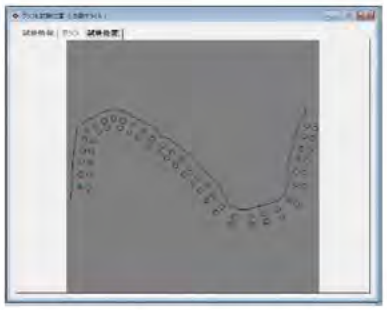
Measurement data can save it in CSV form and transfer it to an original report. (Common to each model)

The test starting position and direction of various patterns can be easily set and changed by simply clicking on an arbitrary position on the image. (ARS・ARS-F)

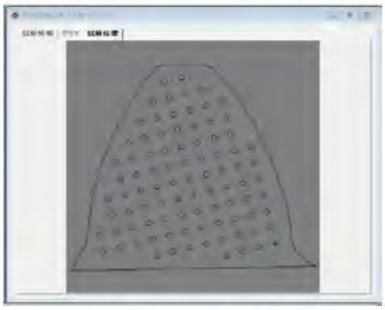


Various test patterns can be selected.
Line setting, Random, Matrix, Circle, Automatic end face tracing and etc.
(ARS・ARS-F)

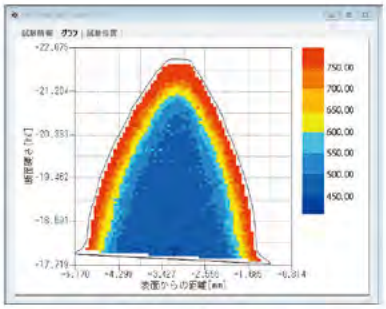
Complex pattern settings are possible just by clicking the graph.
It is possible to set and save the measurement conditions such as loading and measurement lens for each line together with the measurement pattern.
Measurement conditions are automatically changed by simply calling a pattern from the list. (ARS・ARS-F)



Test pattern: Automatic end face tracing (ARS・ARS-F)



Test pattern: matrix（ARS・ARS-F）



Color conversion data display example (ARS・ARS-F)

AUTOMATIC INDENTATION MEASUREMENT /AUTOMATIC X-Y STAGE / AUTOMATIC FOCUS SYSTEM(FULLY-AUTOMATIC MEASURING SYSTEM)

ARS-F

By adopting automatic indentation measurement, automatic stage, and automatic focus system, highly accurate automatic measurement is possible in a wide variety of patterns.
All steps of indentation formation, focus adjustment, and indentation measurement after the sample set are performed unattended.



FLV-50ARS-F



FM-810ARS-F

AUTOMATIC INDENTATION MEASUREMENT / AUTOMATIC X-Y STAGE SYSTEM

ARS

By adopting automatic indentation measurement and automatic stage system, it is possible to reduce the reading error and individual error by the operator. Achieved a significant reduction in work time.



FM-810ARS

AUTOMATIC INDENTATION MEASURING SYSTEM

AR

By adopting an automatic indentation measurement system, it is possible to reduce reading errors and individual errors by workers. Achieved a reduction in work time.



FLV-50AR



FM-810AR

SPECIFICATIONS

SYSTEM CONFIGURATION		**(Common to each model)** exclusive control and data processing software (FT-ZERO), 1.3M pixel camera, camera attachment, PC, 23-inch LC monitor, connecting cable, **(ARS・ARS-F)** Automatic X-Y Stage, control box **(ARS-F)** Joy-Stick controller, sample contact accident prevention safety mechanism
MIN, MEASUREMENT UNIT		0.1μm
MEASUREMENT SCALE		HV (Vickers), HK (Knoop)
REPEATABLITY		±0.5% / approx. HV500 Load:500gf
AUTOMATIC X-Y STAGE (ARS・ARS-F)	FM・FV SERIES	(DIMENSIONS) 110mm ×110mm (MOVEMENT) MAX : X50mm × Y50mm / MIN : 1μm
	FLV SERIES	(DIMENSIONS) 150mm ×150mm (MOVEMENT) MAX : X180mm × Y110mm / MIN : 1μm
MIN, READ INDENTATION DIAMETER		16μm
DATA PROCESSING		Graph display, color conversion data, maximum value, minimum value, average, conversion, hardened layer depth, etc.

Applicable models ——— ●FM-110 ●FM-310 ●FM-810 ／ ●FV-110 ●FV-310 ●FV-810 ／ ●FLV-10 ●FLV-50

※FLV series is available only for AR and ARS-F. ARS is not possible.