Combined Hardness tester TQ TKM-459CE combi plus

Combined Hardness tester TKM-459CE combi plus – portable precision device with brand-new software.
Device is intended for non-destructive testing of production quality in metallurgy, mechanical engineering, aircraft, shipbuilding, atomic industry, oil and gas industry.
Applying TKM-459CE combi plus you receive all advantages of UCI and Leeb methods of metals and alloys hardness control.

TQ TKM-459CE combi plus controls hardness of following:
• Carbon and structural steels as well as other fine-grained materials
• Hard-surfaced items (cementation, nitride hardening, high frequency current hardening)
• Heat-resistant, corrosion-resistant, stainless steels
• Non-ferrous metals and alloys (cast iron, aluminium, bronze, brass)
• Electroplated coating (chrome, copper, nickel, zinc, tin), overlaying
• Items of complex configuration (gear teeth, shafts, pipes of any diameter, grooves, blind holes)
• Thin-walled and small-sized items
• Large items and heavy-duty equipment (gas pipelines, rails, construction elements)

Exploitation advantages
• Wide range of metals and alloys.
• Stable measurements with no impact from force and time of pressing the probe to surface.
• Low sensitivity to curvature and roughness of surface.
• Hardness measurement in hard-to-reach areas (position of probe has no impact on the results of measurement).
• Wide range of accessories.

Features of TQ TKM-459CE combi plus
• Impact-, dust- and water-proof housing.
• Bright color display allows to make measurements at below zero temperature.
• Signalization about exceeding of prescribed measurement threshold.
• Unique statistical data processing system.
• Fast calibration of device scales with one or two standard test blocks.
• Flexible device memory for readings recording and analysis.
• Programming of additional calibrations for scales of hardness tester with one or two standard test blocks.
• Fast programming of additional scales with two to ten standard test blocks.

TEQTO

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Probes characteristics

Photo	Probe Type/Load	Weight/thickness/ surface roughness of the article under check	Length/ Diameter	Application
	UCI method			
	«A» 50H/5 kg	1 kg/3 mm/Ra 1,6	145/26 mm	Solving of main hardness testing tasks
	«H» 10H/1 kg	1 kg/2 mm/Ra 0,8	145/26 mm	Hardness testing of electroplated coating (chrome, copper, nickel, zinc, tin), thinwalled and small-sized items
	«C» 100H/10 kg	1 kg/4 mm/Ra 3,2	145/26 mm	Hardness testing of items with unprepared surface, large items and heavy-duty equipment
	«K» 50H/5 kg	1 kg/3 mm/Ra 1,6	76/33 mm	Hardness testing of inner surface of tubes, tanks and other hard-to-reach areas
	«AL» 50H/5 kg	1 kg/3 mm/Ra 1,6	190/26 mm	Hardness testing in hard-to-reach areas as pinholes, grooves, in-between gear teeth zones (length of tip 65 mm)
	Leeb method			
	«D»	3 kg/6 mm/Ra 3,2	138/21 mm	Solving of main hardness testing tasks with surface roughness less than 3.2 Ra
	«E»	3 kg/6 mm/Ra 3,2	138/21 mm	Probe with polycrystalline indenter made of cubic boron nitride to test materials with high hardness
	«G»	8 kg/55 mm/Ra 7,6	200/29 mm	Hardness testing of high structure inhomogeneity items with surface roughness more than 7.2 Ra

Explotation

Requirements for the objects of control

Preparation	UCI method	Leeb method
Need no additional preparation	Weight 1 kg or more Thickness 2 mm or more	Weight 5 kg or more Thickness 6 mm or more
Need to be fixed on the base plate	Weight less than 1 kg Thickness less than 2 mm	Weight less than 5 kg Thickness less than 6 mm
Roughness requirements	0.8 – 3.2 Ra (depending on probe)	3.2 – 7.2 Ra (depending on probe)

Hardness testers modes

Measurement mode	Readings	Using
By basic scales	Basic hardness units (HRC, HB, HV)	Hardness testing of the bulk of products
By additional calibrations to basic scales	By HRA, HRB, HSD scales and ultimate tensile strength	Hardness testing of high-alloy steels, special cast iron and nonferrous metals
By additional scales	Scales are programmed by the user	Special problems solving

The parameters of the statistical processing of measurements

- Maximum, minimum, mean value, standard deviation from the mean.
- The average deviation from the values set by a user, results are more/less the values, the maximum deviation in the large/smaller side of the value.
- Number of results outside the upper/lower limit of range (user specified), maximum deviation from the upper/lower border.
- Automatic garbage results, incorrect measurement.
- Comparison of results of measurements in the series (the comparison charts on the display of the hardness tester).

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Technical specifications

Characteristic	Values
Relative average error at regular calibration	3-5 %
Hardness testing ranges:	
Rockwell C	20-70 HRC
Brinell	90-450 HB
Vickers	240-940 HV
Quantity of possible additional scales calibrations	5 for each scale
Quantity of additional scales	3
Duration of the measurement	2 seconds
Quantity of measurements for average reading calculation	1-99
Memory capacity	12 400 readings
Maximum quantity of named blocks of readings generated in memory	100
PC connection	USB
Power supply	Li-ion accumulation battery
Dimensions of hardness tester electronic unit	121x69x41 mm
Weight of electronic unit	0.3 kg
Weight of A-probe	0.3 kg
Weight of D-probe	0.15 kg
Operating temperature range	-15...+35 °C
Warranty	1 year

Delivery set

Elements	Hardness tester TKM-459CE combi	Hardness tester TKM-459CE combi plus
Electronic unit with accumulation battery	+	+
A-type probe	+	+
D-type probe	+	+
Connecting cable for A-type probe	1 pcs	2 pcs
Special head "U-459"		+
Special head "Z-359"		+
Standard test block HRC		+
Standard test block HB		+
Standard test block HV		+
Charger	+	+
Operating manual	+	+
PC cable	+	+
Soft case	+	+
Cuff to fix device on arm	+	+
Bag for carrying and storing	+	+

ACCESSORIES

- Replaceable probes of different construction and load.
- Special heads to facilitate positioning of the probe on complex surfaces.
- Connection cables.