

WORKING STANDARD



AP Applied Precision

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Working Standard

Multifunction hand-held Working Standard of power and energy for on site meter testing

The Working Standard is an accurate single-phase (WS 2110) and three-phase (WS 2310) meter for electrical power and energy measurement dedicated for electricity meter site testing. The device is manufactured in two accuracy classes and is designed for operation in a single- and three-phase systems. It evaluates and displays all individual quantities per phase and cumulative quantities as well.

The current inputs can be equipped with interchangeable low current sensors up to 6 (12) A, current clamp type sensors up to 120 A or flexible current probe up to 3000 A. The meter is based on precision A/D conversion and digital signal processing technology enabling accurate high-speed real time evaluation of all main and informative quantities. Beyond measurement of all powers, voltage, current and phases the meter can measure the wave-form parameters of the input signals. The device allows to set any value of the meter constant of the impulse output by the operator. This unique feature allows precision error evaluation with minimum integration period. The impulse output can be assigned to active, reactive or apparent energy or generate constant frequency for testing purposes.

The device is equipped with integrated error calculator and optical scanner capturing inductive meter disk mark or LED of electronic meters or state signal for error evaluation. Manual snap switch enables simple manual testing.

The device is equipped with internal rechargeable battery which excludes power consumption from the test voltage and eliminates accuracy degradation due to clamping.

The WINDOWS based PC software enables transfer and presentation of the test and database data.

⇒ Specifications

Basic Error	WS 2x10B	Measured Quantities
Voltage	0.1 %	<ul style="list-style-type: none"> Active Power Reactive Power Apparent Power Active Energy Reactive Energy Power Factor Voltage Current Phase Angle Frequency Distortion
Current	0.1 %	
Apparent Power	0.1 %	
Active Power *	0.1 %	
Reactive Power *	0.2 %	
Power Factor	0.002	
Frequency	0.01 Hz	
Distortion	0.5 %	
Phase angle	0.1 °	

* related to the Apparent Power

Basic Frequency	40 .. 70 Hz
Input Circuits	1-phase resp. 3-phase 4-wire / 3-wire
Voltage Range	50 .. 300 V
Current Range	1 mA .. 6 (12) A / 120 A, optionally up to 3000 A
Power Factor Range	0 .. 1
Phase Angle	0 .. 360 °
Communication	RS-232
Display	128 x 64 pixels (72 x 40 mm) with blue backlight
Memory for Data	min. 64 MB / 1000 load points
Oper. Temperature	0 .. 50 °C
Storage Temperature	-20 .. 60 °C
Operating Humidity	noncondensing @ 0 .. 10 °C, 95% @ 10 .. 30 °C, 75% @ 30 .. 40 °C, 45% @ 40 .. 50 °C
Power Consumption	Approx. 1.5 W External supply via Power Adapter 110/230 VAC Internal rechargeable accumulators
Overall Dimensions	Basic device: 235 x 125 x 41 mm Case: 406 x 330 x 174 mm
Weight	Basic device: approx. 450 g Total standard setup: approx. 5.5 kg

Impulse Output	
Impulses assigned to	Active Energy, Reactive Energy, Apparent Energy or any constant frequency
Meter constant of impulses	programmable
Max. impulse frequency	15 kHz

Current Transducer (3-phase)	
Current Range	1 mA .. 6 (12) A
Basic Error	0.1 %, 0.05 °
Dimensions	100 x 40 x 85 mm
Cable Length	1.5 m
Weight	approx. 250 g

Current Clamp	
Max. Current	120 A
Basic Error	0.2 %, 0.2 °
Dimensions	32 x 22 x 115 mm
Cable Length	1.5 m
Weight	approx. 200 g
Max. Cable Size in Jaws	12 mm

Standard Accessories	
• Current transducer 6 (12) A	• Snap switch
• Current clamp(s) 120 A	• Software for PC
• Optical scanner	• Power adapter
• Fixing clamp for scanner	• Transport case

Optional Accessories
• Flexible current probe 3000 A