

METRAport® 32S Digital Multimeter

3-349-105-03
1/7.00

- Precision multimeter (V, A, Ω , F, Hz, °C/°F)
- Resolution: 10 μ V, 10 nA, 10 m Ω
- TRMS measurement for V AC and I AC up to 1 kHz
- Direct current measurement, or with transformer or current sensor with voltage output:
 - For measurement with current sensor: Transformation ratios ranging from 1:1 to 1:1000 can be taken into consideration for the display value
 - For measurement of current to 15 A: Resettable automatic circuit breaker
 - Indication of overload and blown fuse
- Temperature measurement with automatic Pt sensor recognition
- Automatic and manual measuring range selection
- Large digital display (20 mm) with additional analog scale
- Measured value storage and MIN-MAX recording
- DKD certificate, 3 year guarantee



DKD Calibration Certificate



Applications

The METRAport®32S digital multimeter is suited for universal use in general electrical engineering, electronics and automotive service applications.

The tilting display allows for selection of the ideal reading angle, and the neck strap frees up both hands for measuring tasks. The instrument is switched off automatically when folded closed, and the display and control elements are protected against damage as well.

Features

TRMS Values for Distorted Waveshapes

The integrated TRMS value converter allows for TRMS measurement of periodic quantities (AC) regardless of waveshape.

Automatic and Manual Measuring Range Selection

The desired measured quantity is selected with the rotary switch. The measuring range is automatically adapted to the measured value. The measuring range can also be manually selected with the help of the AUTO/MAN key.

Automatic Storage of Measured Values *

The DATA function allows for storage of the digitally displayed value to memory. A patented process assures that actual measured values rather than random values are saved, even with rapidly changing measured quantities. The saved value appears at the digital display. Indication of the current measured value continues at the analog display.

* Patented

Storage of MIN-MAX Values

In addition to displaying the current measured value, the minimum or the maximum value can be continuously updated and saved.

Diode and Continuity Testing

Diode polarity can be tested, and electrical circuits can be checked for short-circuiting or interruption. Resistance values within a range of 0 to 10 Ω are displayed, and are signalled acoustically as well.

Battery Saving Circuit

The instrument switches itself off automatically if the measured value remains unchanged for a period of approx. 10 minutes, and if none of the controls are activated during this time. Automatic shutdown can be disabled.

Applicable Regulations and Standards

IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN 43751	Digital measuring instruments
EN 60529 VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)
EN 61326	Electromagnetic compatibility (EMC), generic standard for interference emission
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VDI/VDE 3540	Reliability of measuring, control and regulating devices
DIN EN 60529 DIN VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)

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Characteristic Values

Meas. Function	Measuring Range	Resolution at Measuring Range Upper Limit		Input Impedance	
		30 000	3 000	≡	~
V	300 mV	10 μV		> 20 MΩ	5 MΩ // < 50 pF
	3 V	100 μV		11 MΩ	5 MΩ // < 50 pF
	30 V	1 mV		10 MΩ	5 MΩ // < 50 pF
	300 V	10 mV		10 MΩ	5 MΩ // < 50 pF
	600 V	100 mV		10 MΩ	5 MΩ // < 50 pF
Approximate voltage drop at MRUL					
A	300 μA	10 nA		160 mV	
	3 mA	100 nA		160 mV	
	30 mA	1 μA		200 mV	
	300 mA	10 μA		300 mV	
	15 A	1 mA		600 mV	
Open-circuit voltage Meas. current at MRUL					
Ω	300 Ω	10 mΩ		0.6 V	max. 250 μA
	3 kΩ	100 mΩ		0.6 V	max. 45 μA
	30 kΩ	1 Ω		0.6 V	max. 4.5 μA
	300 kΩ	10 Ω		0.6 V	max. 1.5 μA
	3 MΩ	100 Ω		0.6 V	max. 150 nA
	30 MΩ	1 kΩ		0.6 V	max. 15 nA
⚡)	300 Ω		0.1 Ω	max. 3 V	max. 1.2 mA
➔	3 V ¹⁾	100 μV		max. 3 V	max. 1.2 mA
F	30 nF		10 pF	10 MΩ	3 V
	300 nF		100 pF	1 MΩ	3 V
	3 μF		1 nF	100 kΩ	3 V
	30 μF		10 nF	11 kΩ	3 V
	300 μF		100 nF	2 kΩ	3 V
	3000 μF		1 μF	2 kΩ	3 V
	30000 μF	1 μF		2 kΩ	3 V
f _{min} ²⁾ Power limit					
Hz	300.00 Hz	0.01 Hz		1 Hz	3 x 10 ⁶ V x Hz
	3.0000 kHz	0.1 Hz		1 Hz	
	100.00 kHz	10 Hz		1 Hz	
°C/°F	-150.0 ... +100.0 °C	Pt100	0.1 °C		
	+100.0 ... +850.0 °C				
	-100.0 ... +100.0 °C	Pt1000	0.1 °C		
	+100.0 ... +850.0 °C				

1) Up to 1.8 V diode voltage, OL (overload) is displayed for greater than 1.8 V.
 2) Smallest measurable frequency for sinusoidal measurement signals symmetric to the zero point

Key: d = digit(s), rdg. = reading, MRLU = measuring range upper limit

Meas. Range	Intrinsic Error for Maximum Resolution under Reference Conditions		Overload Capacity ¹⁾	
	±(... % rdg. + ... d)	±(... % rdg. + ... d)	Value	Duration
300 mV	0.1 + 3 ⁴⁾	0.5 + 30	600 V	continuous
	0.1 + 3	0.5 + 30	≡ (DC)	
	0.1 + 3	0.5 + 30	~ (AC)	
	0.1 + 3	0.5 + 30	eff	
	0.1 + 3	0.5 + 30	sine	
300 μA	0.2 + 5	0.5 + 30	0.36 A	continuous
	0.2 + 5	0.5 + 30		
	0.2 + 5	0.5 + 30		
	0.2 + 5	0.5 + 30		
	0.5 + 5	0.75 + 30	10 A ³⁾	
300 Ω	0.1 + 5 ⁴⁾		600 V	5 min.
	0.1 + 5 ⁴⁾		≡ (DC)	
	0.1 + 5		~ (AC)	
	0.1 + 5		eff	
	0.1 + 5		sine	
	2 + 5			
	0.5 + 3			
➔ 3 V	0.5 + 3			

30 nF	1 + 6 ⁴⁾		600 V	5 min.
	1 + 6		≡ (DC)	
	1 + 6		~ (AC)	
	1 + 6		eff	
	1 + 6		sine	
	5 + 6			
	5 + 60			
300.00 Hz	0.1 + 1 ⁶⁾	Max. measuring voltage	600 V	continuous
		600 V		
		100 V		
		30 V		
Pt 100	Measuring range	±(... % rdg. + ... d)	600 V	5 min.
		-150.0 ... +100.0 °C	≡ (DC) /	
		+100.0 ... +850.0 °C	~ (AC)	
		+100.0 ... +850.0 °C	eff, sine	

1) At 0 ° ... + 40 °C
 2) Values < 50 digits are suppressed.
 3) 15 A - 5 min.
 4) ZERO is displayed if the "zero balancing" function is active.
 5) Plus sensor deviation
 6) Sinusoidal input voltage up to 3 kHz > 50 mV, 3 kHz to 300 kHz > 200 mV

Reference Conditions

Ambient Temperature	+ 23 °C ± 3 K
Relative Humidity	45 ... 55%
Meas. Quantity Frequency	45 ... 65 Hz
Meas. Quantity Waveshape	sine
Battery Voltage	3 V ± 0.1 V

Response Time (after manual range selection)

Measured Quantity / Measuring Range	Digital Display Response Time	Measured Quantity Step Function
V ≡, V ~, A ≡, A ~	1.5 s	from 0 to 80% of the measuring range upper limit
300 Ω ... 3 MΩ	2 s	from ∞ to 50% of the measuring range upper limit
30 MΩ	5 s	
Continuity	< 50 ms	
➔	1.5 s	from 0 to 50% of the measuring range upper limit
30 nF ... 300 μF	max. 2 s	
3 000 μF	max. 7 s	
30 000 μF	max. 14 s	
> 10 Hz	max. 1.5 s	
°C	max. 3 s	

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Influencing Quantities and Influence Error

Influencing Quantity	Sphere of Influence	Measured Quantity / Measuring Range ¹⁾	Influence Error (... % + ... d) / 10 K
Temperature	0 °C ... +21 °C und +25 °C ... +40 °C	V $\overline{=}$	0.2 + 10
		V \sim	0.4 + 10
		300 μ A ... 300 mA $\overline{=}$ + \sim	0.5 + 10
		3 A / 10 A $\overline{=}$ + \sim	1 + 10
		300 Ω ... 300 k Ω	0.2 + 10
		3 M Ω	0.2 + 10
		30 M Ω	1 + 10
		30 nF ... 30 μ F	0.5 + 10
		Hz	0.5 + 10
°C (Pt100)	0.5 + 10		

Influencing Quantity	Sphere of Influence (max. resolution)	Frequency	Intrinsic Error ²⁾ \pm (... % rdg. + ... d)
Frequency V \sim (AC)	300.00 mV 3.0000 V 30.000 V 300.00 V 600.00 V	> 15 Hz ... 45 Hz	2 + 30
		> 65 Hz ... 1 kHz	1 + 30

Influencing Quantity	Sphere of Influence (max. resolution)	Frequency	Intrinsic Error ²⁾ \pm (... % rdg. + ... d)
Frequenz I \sim (AC)	300.00 μ A ... 15.000 A	> 15 Hz ... 45 Hz	1 + 30
		> 65 Hz ... 1 kHz	

Influencing Quantity	Sphere of Influence	Measured Quantity / Measuring Range	Influence Error ³⁾
Measured Quantity Waveshape	Crest Factor CF	1 ... 3	\pm 1% rdg.
		> 2 ... 4	\pm 5% rdg.
		> 4 ... 5	\pm 7% rdg.

Influencing Quantity	Sphere of Influence	Measured Quantity / Measuring Range	Influence Error
Relative Humidity	75% 3 days device off	V, A, Ω F, Hz °C	1 x intrinsic error

1) With zero balancing

2) Specified error values are valid as of a display value of 10% of the measuring range.

3) Except for sinusoidal waveshape

Influencing Quantity	Sphere of Influence	Measuring Range	Damping
Common-Mode Interference Voltage	Interference quantity: max. 600 V \sim $\overline{=}$ Interference quantity: max. 600 V \sim 50 Hz, 60 Hz sinusoidal	V $\overline{=}$	> 90 dB
		300 mV ... 30 V \sim	> 60 dB
		300 V \sim	> 60 dB
		600 V \sim	> 60 dB
Series-Mode Interference Voltage	Interference quantity: V \sim nominal value of the respective measuring range, max. 600 V \sim , 50 Hz, 60 Hz sinusoidal	V $\overline{=}$	> 40 dB
		V \sim	> 50 dB

Display

LCD window (95 mm x 40 mm) with analog and digital display, including display of unit of measure, type of current and various special functions.

Analog:

Display

LCD scale with pointer

Scale Length

80 mm for V $\overline{=}$ and A $\overline{=}$,
67 mm in all other ranges

Scaling

\pm 5 ... 0 ... \pm 30 with 35 graduations for $\overline{=}$,
0 ... 30 with 30 graduations in all other
ranges

Polarity Display

with automatic switching

Overload Display

triangle symbol

Measuring Rate

20 measurements per second

Digital:

Display / Char. Height

7-segment characters / 20 mm

Number of Places

4 $\frac{3}{4}$ places \cong 31,000 steps

Overload Display

"OL" is displayed

Polarity Display

"-" sign is displayed if plus pole is
connected to "L"

Measuring Rate

2 measurements per second

Display Refresh Rate

V $\overline{=}$ (DC), V \sim (AC), A, Ω , \rightarrow , °C (Pt100, Pt1000): twice per sec.

Hz: once per sec.

Power Supply

Batteries

2 ea. 1.5 V mignon cell
alkaline manganese cells per IEC LR6
zinc carbon cells per IEC R6

Battery Service Life

with alkaline manganese approx. 100 hrs.
with zinc carbon: approx. 50 hrs.

Battery Test

\rightarrow is displayed automatically when battery
voltage drops to below 2.3 V.

Battery Saving Circuit

The device is switched off automatically if
the measured value remains unchanged
for approximately 10 minutes, and if none
of the controls are operated during this
time. Automatic shutdown can be
disabled.

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Fuses

A resettable automatic circuit breaker (15A/240V AC /50V DC) is active in all current measuring ranges to protect against sudden overload due to incorrect connection to the mains, or short-circuiting at the measurement input:

Ranges to 30 mA	PTC and T2.5H250V with damping diodes
300 mA range	T2.5H250V slow-blow fuse and damping diodes
15 A range	resettable automatic circuit breaker

Electrical Safety

Safety Class	II per IEC 61010-1/EN 61010-1/ VDE 0411-1
Overvoltage Category	II
Operating Voltage	300 V
Contamination Level	2
Test Voltage	2.3 kV~ per IEC 61010-1/EN 61010-1/ VDE 0411-1

Electromagnetic Compatibility (EMC)

Interference Emission	EN 61326: 1997, class B
Interference Immunity	EN 61326: 1997/A1: 1998 IEC 61000-4-2: 1995/A1: 1998 8 kV atmospheric discharge 4 kV contact discharge IEC 61000-4-3: 1995/A1: 1998 3 V/m IEC 61000-4-4: 1995 1 kV

Ambient Conditions

Operating Temp.	-10 °C ... +50 °C
Storage Temperature	-25 °C ... +70 °C (without batteries)
Relative Humidity	max. 75%, no condensation allowed
Climatic Category	3z/-10/50/75% in compliance with VDI/VDE 3540
Elevation	to 2000 m
Deployment	indoors only

Mechanical Design

Protection	housing: IP 40, connector jacks: IP 20
Dimensions	146 mm x 118 mm x 44 mm
Weight	approx. 450 gr. with batteries

Standard Equipment

- 1 multimeter
- 2 1.5 V batteries
- 1 T2.5H250V replacement fuse
- 1 KS17-2 measurement cable
- 1 carrying strap
- 1 operating instructions
- 1 condensed operating instructions
- 1 DKD certificate

Order Information

Description	Type	Article Number
Digital Multimeter ^{D)}	METRAport® 32S	M234A
Clip-on current sensor 10 mA ... 100 A, 0.1 mV/mA	WZ12B ^{D)}	Z219B
Clip-on current sensor, active, with battery (service life: 50 hrs.) AC measuring ranges: 20 A/200 A DC measuring ranges: 30 A/300 A DC frequency range ... 10 kHz Output: 10 mV/A or 1 mV/A Clip jaw opening: max. 19 mm cable diameter	Z202A	Z202A
Clip-on current sensor with selectable current measuring ranges and zeroing key 60/600 A DC and 40/400 A DC	Z13B ^{D)}	Z213B
Pt100 temperature sensor for sur- face and immersion measurements, -40 ... +600 °C	Z3409	GTZ 3409 000 R0001
Carrying bag	F822	GTY 3172 095 P01

^{D)} Data sheet available



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