GOSSEN METRAWATT

METRAport 3A
Folding Analog Multimeter

3-349-302-03
3/7.11

- **9 voltage measuring ranges,** V≂ :
  100 mV, 300 mV, 1 V, 3 V, 10 V, 30 V, 100 V, 300 V and 600 V
- **7 current measuring ranges,** A≂ :
  10 µA, 100 µA, 1mA, 10 mA, 100 mA, 1A and 10 A
- **5 resistance measuring ranges**: 1 Ω ... 2 kΩ/ 10 Ω ... 20 kΩ/
  100 Ω ... 200 kΩ/ 1 kΩ ... 2 MΩ/ 10 kΩ ... 20 MΩ
- **9 level measuring ranges**: -40 dB ... +62 dB
- High input resistance of 10 MΩ
  for no-load voltage measurement
- Reflective scale in folding lid which can be tilted for easy reading and provides transport protection as well, accuracy class 1.5 =
- Overload protection: 600 V≂
  in all functions and range settings
- Automatic battery shutdown when instrument is folded closed

300 V CAT III
600 V CAT II
IEC/EN 61010-1, second edition

CE

Applications

The multimeter is equipped with an indicator display and an electronic amplifier. It can be used in a wide variety of practical electronics applications, for example in R&D, manufacturing, equipment operation, in the test lab and for service calls, as well as for training and vocational education.

Description

The multimeter has 46 measuring ranges for direct and alternating voltages of up to 600 V, alternating voltage levels from -40 to +62 dB, direct and alternating current of up to 10 A and resistances of up to 20 MΩ. It has a constant input resistance of 10 MΩ in all voltage measuring ranges.

The multimeter is calibrated in RMS values for periodic sinusoidal quantities. It makes use of full-wave rectification for the evaluation of the arithmetic mean value.

All measuring ranges can be selected with the central measuring range selector switch. The ranges are laid out in a clear-cut fashion around the selector switch.

The measuring device and the display unit are enclosed in two separate housing components which are connected to each other by means of a hinge which can be snapped into various positions. In this way, the ideal angle for ease of reading can be selected with the instrument in any position.

Several well coordinated safety devices protect the instrument against damage caused by incorrect operation and overloading within the specified overload limit values:

- Oversized precision resistors
- Fuse link in combination with protective rectifier diodes
- Overvoltage arrester / positive temperature coefficient resistors (PTCs)

The instrument can be operated independent of mains current with a commercially available 9 V flat cell battery. Long battery service life is assured thanks to the minimal current consumption of the instrument's electronic components.

The multimeter's rugged design provides for outstanding protection where harsh mechanical stressing prevails. When folded together, the instrument is provided with extra mechanical protection for the measuring device, as well as for the display unit. The connector jacks are protected against accidental contact. Suitable measurement cables with 4 mm test probes are included as standard equipment.

Applicable Regulations and Standards

IEC 61010–1 **DIN EN 61010–1** **VDE 0411 Part 1**	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements
DIN EN 61326-1 **VDE 0843-20-1**	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
EN 60529 **VDE 0470-1**	Test instruments and test procedures Protection provided by enclosures (IP code)

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Characteristic Values

Voltage [1]	Level [2]		Input Resistance R_i	Overload Protection to [3]
	Constant	Measuring Span		
100 mV≂	-20 dB	-40 ... ÷ 18 dB	10 MΩ / / 50 pF	600 V≂
300 mV≂	-10 dB	-30 ... ÷ 8 dB		600 V≂
1 V≂	0 dB	-20 ... + 2 dB		600 V≂
3 V≂	+10 dB	-10 ... + 12 dB		600 V≂
10 V≂	+20 dB	0 ... + 22 dB		600 V≂
30 V≂	+30 dB	+10 ... + 32 dB		600 V≂
100 V≂	+40 dB	+20 ... + 42 dB		600 V≂
300 V≂	+50 dB	+30 ... + 52 dB		600 V≂
600 V≂	+60 dB	+40 ... + 62 dB		600 V≂

[1] The 100 mV to 10 V measuring ranges can also be used for current measurement in accordance with the following table (e.g. reverse current or insulation current). These measuring ranges are rated at accuracy class 5. Frequency range at ~: 15 ... 100 Hz.
Same overload protection as for voltage measuring ranges.
[2] Measured value = displayed value + constant, 0 dB ≙ 0.775 V, i.e. 1 mW at 600 Ω
[3] Protected with PTC resistor

Range	Current at Upper Range Limit	R_i
100 mV≂	10 nA	10 MΩ
300 mV≂	30 nA≂	
1 V≂	100 nA≂	
3 V≂	300 nA≂	
10 V≂	1 µA≂	
30 V≂	3 µA≂	

Current	Input Resistance R_i	Voltage Drop ΔU	Overload Protection to
10 µA≂	10.0 kΩ	100 mV	600 V≂ [3]
100 µA≂	1.0 kΩ	100 mV	600 V≂ [3]
1 mA≂	100.0 Ω	100 mV	600 V≂ [3]
10 mA≂	10.0 Ω	100 mV	600 V≂ [3]
100 mA≂	1.4 Ω	140 mV	600 V≂ [3]
1 A≂	480 mΩ	0.480 V	600 V≂ [3]
10 A≂	26 mΩ	260 mV	600 V≂ [4]

Resistance Range	Reading Range	Value at Scale Middle (R_i)	Open-Circuit Voltage U_0	Short-Circuit Current I_K	Overload Protection to
Ω x 1	1 Ω ... 2 kΩ	45.6 Ω	100 mV	2.2 mA	600 V≂ [3]
Ω x 10	10 Ω ... 20 kΩ	456.0 Ω	100 mV	0.22 mA	600 V≂ [3]
Ω x 100	100 Ω ... 200 kΩ	4.56 kΩ	100 mV	22 µA	600 V≂ [3]
kΩ x 1	1 kΩ ... 2 MΩ	45.6 kΩ	1 V	22 µA	600 V≂ [3]
kΩ x 10	10 kΩ ... 20 MΩ	456.0 kΩ	1 V	2.2 µA	600 V≂ [3]

[3] Protection by means of FF 1.6A/600V AC fuse link in combination with rectifier diodes.
[4] FF 16A/600V fuse link, 10 A: max. 10 minutes

Accuracy under Reference Conditions per IEC 60051/EN 60051

Class 1.5 for zero-frequency quantities, class 2.5 for periodic sinusoidal quantities and class 1.5 for resistance (intrinsic error relative to 69 mm scale length) corresponding to max. 10% intrinsic error of the measured value within the range of the exaggerated scale arc.

Reference Conditions

Ambient temperature	+23° C ±2 K
Relative humidity	40 ... 60%
Normal position of use	Instrument and scale horizontal ±1°
Measured quantity frequency	45 ... 65 Hz
Measured quantity waveshape	Sine
Battery voltage	7.5 V ±0.1 V
Other influencing quantities	per IEC 60051/EN 60051

Influencing Quantities and Nominal Ranges of Use

Temperature	+5 ... +23 ... +35° C
Limiting temperatures	For accuracy +5 ... +35° C For operation 0 ... +40° C For storage -25 ... +65° C (without batteries)
Position	Additional influence error of max. ±1% of the scale length if the scale is tilted between 0 and ±120° relative to horizontal
Frequency	Additional influence error of max. ±5% of full scale value in the following ranges: 100 mV, 3 V ... 600 V: 15 Hz ... 1 kHz 10 µA ... 10 A: 15 Hz ... 1 kHz 300 mV, 1 V: 15 Hz ... 200 Hz
Auxiliary voltage	No additional influence error. The upper limit must be set with the potentiometer for all measuring ranges in the case of resistance measurement.
Series-mode interference voltage damping	For V⎓: > 60 dB, AC 50 Hz For V~: > 120 dB, DC
Common-mode interference voltage damping	> 120 dB, DC and 50 Hz AC
Other influencing quantities	per IEC 60051/EN 60051

Power Supply

Battery operation	Nominal voltage: 9 V⎓, 9 V flat cell battery per IEC 6LR61 (6F22), alkaline manganese or NiMH rechargeable battery.
Battery service life	With alkaline manganese: approx. 1000 hours, with NiCd: approx. 200 hours, in the Ω x 1 range: ¼ of specified service life
Battery test	Pointer must be within the battery test field.

Fuses

Ranges to 1 A and Ω	FF 1.6A/600V, 6 mm x 32 mm in combination with rectifier diodes for the 10 µA ... 1 A and Ω x1 ... kΩ x10 ranges, switching capacity: 50 kA at 600 V~
10 A range	FF 16A/600V AC, 6 mm x 32 mm, switching capacity: 50 kA at 600 V~

Electrical Safety

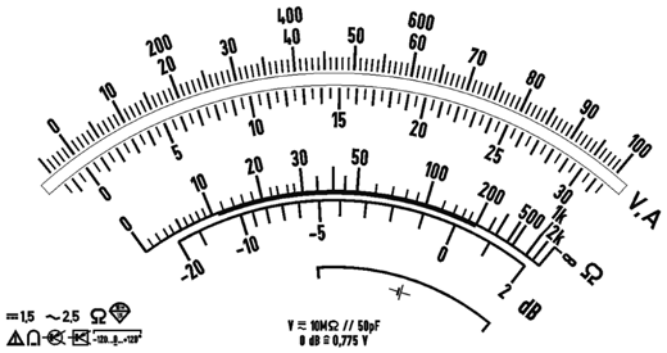
Safety class	II per IEC/EN 61010-1:2001/VDE 0411-1:2002	
Measuring category	II	III
Operating voltage	600 V	300 V
Fouling factor	2	
Test voltage	3.5 kV~ per IEC/EN 61010-1:2001/ VDE 0411-1:2002	

Electromagnetic Compatibility (EMC)

Interference emission	EN 61326:2006 class B
Interference immunity	EN 61326-1: 2006 EN 61326-2-1: 2006

Mechanical Design

Protection	Housing: IP 40, connector jacks: IP 20
Dimensions	146 x 118 x 44 mm (folded closed)
Weight	approx. 0.45 kg without battery



Standard Equipment

1 multimeter
1 9 V battery
1 KS17 measurement cable
1 set operating instructions

Order Information

Description	Type	Article Number
Folding analog multimeter for demanding requirements	METRAport 3A	M113A
Consumable Materials		
Fuse link (shipped in package of 10)	FF(UR)1.6A/700V AC	Z109E
Fuse link (shipped in package of 10)	FF(UR)16A/600V AC	Z109A
Accessories		
Carrying pouch	F822	GTY3172095P01
Current measuring adapter for safe, trouble-free measurement of current consumption via the mains plug of connected power consumers	SM16	GTM9070190E0002
Temperature probes with integrated or plug-on sensors (see Measuring Instruments and Testers catalog)	Z3431...	GTZ3431...

For additional information regarding accessories please see:

- *Measuring Instruments and Testers catalog*
- *www.gossenmetrawatt.com*

Accessories

SM16 Current Measuring Adapter

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Current Measuring Accessories All current sensors and transformers are equipped with a connector cable (1.2 to 1.5 m long) with 4 mm safety banana plugs									Suitable for METRAport		
Type	**Designation**	**Measuring Range**	**Meas. Category**	**Max. Wire Dia.**	**Transformation Factor**	**Frequency Range**	**Intrinsic Uncertainty ±(% rdg. + ...)**	**Article Number**	**3A**		
DC/AC Current Sensors with Voltage Output											
CP30	DC/AC clip-on current sensor, with battery mode (30 h)	5 mA ... 30 A	300 V / CAT III	25 mm	100 mV/A	DC...20 kHz (-1dB)	1 % +2 mA	Z201B	▼		
CP330	DC/AC clip-on current sensor, with 2 measuring ranges, battery mode (30 h)	0,5 ... 30 A 5 ... 300 A	300 V / CAT III	25 mm	10 mV/A; 1 mV/A	DC...20 kHz (-3 dB)	1 % + 50 mA 1 % + 100 mA	Z202B	▲		
CP1100	DC/AC clip-on current sensor, with 2 measuring ranges, battery mode (30 h)	0,5 ... 100 A 5 ... 1000 A	300 V / CAT III	32 mm	10 mV/A; 1 mV/A	DC...20 kHz (-1dB)	1 % + 100 mA 1 % + 500 mA	Z203B	▲		
Z13B	DC/AC clip-on current sensor, with 2 measuring ranges, battery mode (50 h)	0.2 ... 40 A~/60 A–; 0.5 ... 400 A~/ 600A–	300 V / CAT IV	50 mm	10 mV/A, 1 mV/A	DC...65 Hz ... 10 kHz	1,5 % 2,0 %	Z213B	▲		
AC Current Sensors with Voltage Output											
WZ12B	AC clip-on current sensor	10 mA~ ... 100 A~	300 V / CAT III	15 mm	100 mV/A	45 ... 65 ... 500 Hz	1.5% +0.1 mA	Z219B	●		
WZ12C	AC clip-on current sensor, with 2 measuring ranges	1 mA~ ... 15 A~, 1 ... 150 A~	300 V / CAT III	15 mm	1 mV/mA, 1 mV/A	45 ... 65 ... 400 Hz	3% + 0.15 mA, 2% + 0.1 A	Z219C	●		
WZ11B	AC clip-on current sensor, with 2 measuring ranges	0.5 ... 20 A~, 5 ... 200 A~	600 V / CAT III	20 mm	100 mV/A, 10 mV/A	30...48 ... 65 ... 500 Hz	1 ... 3%	Z208B	●		
Z3512A	AC clip-on current sensor, with 4 measuring ranges	1 mA ... 1/10/100/ 1000 A~	600 V / CAT III	52 mm	1 V/A, 100 mV/A, 10 mV/A, 1 mV/A	10...48 ... 65 ... 3 kHz	0.5 ... 3%, 0.2 ... 1%	Z225A	●		
METRAFLEX 3000	Flexible AC current sensor with 3 measuring ranges, battery mode (2000 h)	0,5 ... 30 A, 0,5 ... 300 A, 5 ... 3000 A	1000 V CAT III 600 V CAT IV	Circum-ference: 610 mm	100 mV/A, 10 mV/A, 1 mV/A	10 Hz ... 20 kHz	1% + 0.1 A 1% + 0.1 A 1% + 1 A	Z207E	●		
METRAFLEX 3000M	Flexible AC miniature current sensor with 3 measuring ranges, battery mode (150 h)	0,5 ... 30 A, 0,5 ... 300 A, 5 ... 3000 A	1000 V CAT III 600 V CAT IV	Circum-ference: 160 mm	100 mV/A, 10 mV/A, 1 mV/A	10 Hz ... 100 kHz	1% + 0.2 A 1% + 0.2 A 1% + 1 A	Z207J	●		
AC Current Transformer with Current Output											
WZ12A	AC clip-on current transformer	15 ... 180 A~	300 V / CAT III	15 mm	1 mA/A	45 ... 65 ... 400 Hz	3%	Z219A	●		
WZ12D	AC clip-on current transformer	30 mA ... 150 A~	300 V / CAT III	15 mm	1 mA/A	45 ... 65 ... 500 Hz	2.5% +0.1 mA	Z219D	▲		
WZ11A	AC clip-on current transformer	1 ... 200 A~	600 V / CAT III	20 mm	1 mA/A	48 ... 65 ... 400 Hz	1 ... 3%	Z208A	●		
Z3511	AC clip-on current transformer	4 ... 500 A~	600 V / CAT III	30 x 63 mm	1 mA/A	48 ... 65 ... 1 kHz	3% +0.4 A	GTZ3511 000R0001	◆		
Z3512	AC clip-on current transformer	0.5 ... 1000 A~	600 V / CAT III	52 mm	1 mA/A	30...48 ... 65 ... 5 kHz	0.5% ... 0.7%	GTZ3512 000R0001	◆		
Z3514	AC clip-on current transformer	1 ... 2000 A ~	600 V / CAT III	64 x 150 mm	1 mA/A	30...48 ... 65 ... 5 kHz	0.5% +0.1 A	GTZ3514 000R0001	■		

● Without restriction ▼ As of 0,1 A ▲ As of 1 A ◆ As of 10 A ■ As of 100 A

CP30 CP1100 Z13B Z3512A METRAFLEX 3000 WZ12A/D WZ11A Z3512 Z3514

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