

# SIEMENS

# Measuring, testing and recording equipment

## Catalog ART 2 · 1999

The products and systems described in this catalog are manufactured and sold under application of a quality management system certified by DQS in accordance with ISO 9001 (Certificate Registration No.: 1784-04). The DQS Certificate is recognized in all EQNet countries (Reg. No.: 1784-04).



REG. NO. 1784-04

A number of products and systems can be combined as required. The essential data and standard configurations are provided for this purpose.

Should you not find the required instruments straight away please get in touch with us. You will find our contact addresses at the end of catalog.

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# NEW PRODUCTS

## SUMMARY OF NEW PRODUCTS

### 1 Chapter 1: Multimeters, clip-on measuring instruments

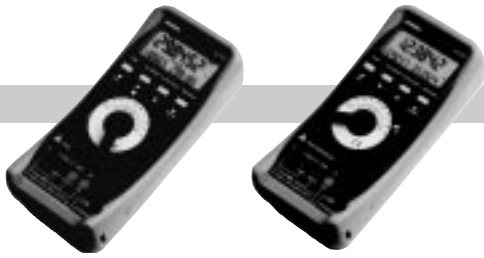
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#### Digital multimeters B1100/B1101

Handy low cost instruments with analog and digital display for universal use in the workshop and at home.



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#### Digital multimeter family B1102/03, B1105/06, B1108

Higher class multimeters. Outstanding for both accuracy and variation in measuring modes, more especially in the case of the precision models B1105 and B1106.

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#### Hand-held calibrator B1108

The B1108 hand-held calibrator is an extremely universal and precision calibrating and simulating instrument for many measuring technology parameters.



#### Milliohmmeter B1107

The B1107 milliohmmeter is a robust, precise and reliable instrument readily suitable for a wide range of work in the factory and when servicing on location and taking exact measurements in the laboratory. The milliohmmeter is the modern substitute for the known Thomson and Wheatstone measuring bridges.

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#### Clip-on current converter

All round converter in AC range up to 1000 A.



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#### Flexible current converter A1403

Easy, flexible measurements of alternate currents on multimeters, oscilloscopes and recorders with our A1403 current converter.

## Chapter 2: Factory and power measuring instruments

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**Tester B4116**

Essential instrument for technicians on location for checking protective measures to DIN VDE 0100 in installed TN, TT and IT networks. Transmission of saved measured data per IrDA interface to PC for possible further processing in measurement reports or similar.

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**Electrical instrument testers B4130/B4131**

Two "profis" for safety tests to DIN VDE 0701, DIN 0105 and repeating tests to DIN VDE 0702, CENELEC BTTF 77.

**Revitester 0701**

The Revitester 0701 low cost pointer instrument for testing electrical safety of mobile instruments after repair or servicing (DIN VDE 0701).

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**Insulation resistance meter ISOWID B4107**

The ISOWID B4107 for insulation measurements to IEC 61557-2 has fully automatic operator guidance to guard against wrong connections and damage.

**Tester B4117**

Small, light tester for protective measures with rubber protective sleeve for testing to DIN VDE 0100.

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**Earth resistance meter GEOWID B4155**

The small handy earth resistance tester in accordance with IEC 61557, outstanding more especially for its high capacity, low cost, easiest operation and fully automatic testing sequences.



# Workshop equipment for the electrical trade

## Summary

<b>Workshop equipment for the electrical trade</b>			
Recommendations in accordance with the directives of the Central Association of German Electrical Trade			
<b>Required types of instruments (extract)</b> (measuring instrument combinations are permissible)	<b>Our offer</b>	<b>Page</b>	
<b>Voltmeter</b> Measuring range up to min. 600 V	Analog: MULTIZET M05819-A1	1/10	
<b>Ammeter</b> Measuring range up to min. 15 A	Digital: Multimeter B1100 / B1101 / B1102/B1103 Multimeter B1105/B1106/B1108 in each case up to 200 A through mini clip-on ammeter 7KA1404-8AA	1/2, 1/3, 1/4, 1/5 1/12	
<b>Clip-on current transformer</b> Measuring range up to min. 300 A	Digital: 7KA1406-8AA (up to 500 A)	1/18	
	7KB4203-8AA (up to 1000 A)	1/13	
<b>Isolation meter</b> to DIN VDE 0413, Part 1	Isowid B4101 / B4103 / B4104 / B4107	Instrument for testing protective measures to DIN VDE 0701 Tester B4112 Tester B4115 (also for voltage and frequency measurement).	
<b>Isolation and resistance tester</b> to DIN VDE 0413, Part 1 and Part 4	Isowid B4102		2/12, 2/11, 2/13, 2/16
<b>Loop resistance tester</b> to DIN VDE 0413, Part 3	Measuring instrument B4113		2/12
<b>Fault current and e.l.b.c. safety circuit tester safety circuit tester</b> to DIN VDE 0413, Part 6	Fault current tester B4114		2/13
<b>Earth tester</b> to DIN VDE 0413, Part 7	Earth tester B4151 / B4152 / B4154 and B4155		2/17, 2/18 2/19
<b>Phase-sequence indicator</b> to DIN VDE 0413, Part 9	Phase-sequence indicator A1504		2/25
<b>Measuring instrument for testing protection measures</b> to DIN VDE 0701, Part 1 to Part 240 after repair • Multimeter functions • Power display • Temperature measurement • Capacity measurement	Testing instrument B4110 / B4130 / B4131		2/6, 2/9, 2/10
<b>Stationary test panels</b> to DIN VDE 0104 for setting up testing stations in the electrical trade and taking measurements to DIN VDE 0701.	Test panel A1515 / A1516 / A1517	2/20, 2/21, 2/22	

# Measured value acquisition and evaluation program, digital multimeters

## Summary

Previous multimeters are replaced by	B1013 B1014	B1013 B1014	B1024 B1025	B1025 B1026	B1027	B1028	B 1026 B 1027
Multimeter	B1100	B1101 TRMS	B1102	B1103 TRMS	B1105 TRMS	B1106 TRMS	B1108 TRMS
Measur. V DC modes	400 mV ... 600 V ±(0.5 % M.V. +2d.)		30 mV ... 1000 ±(0.25 % M.V. +1d.)	30 mV ... 1000V ±(0.1 % M.V. +1d.)	300 mV ... 1000V ±(0.02 % M.V. +0.005% v.B. +5d.)		300 mV ... 1000V ±(0.05 % M.V. +3d.)
V AC	400 mV ... 600 V ±(1 % M.V. +2d.)		3 V ... 1000V ±(0.75 % M.V. +1d.)	3 V ... 1000V ±(0.75 % M.V. +3d.)	300 mV ... 1000V ±(0.2 % M.V. +30d.)		300 mV ... 1000 V ±(0.3 % M.V. +30d.)
A DC	40 mA ... 10 A ±(0.8 % v.M. +2d.)		3 mA ... 10 A ±(10 % M.V. +2d.)	300 µA ... 10 A ±(1.0 % M.V. +2d.)	300 µA ... 10 A ±(0.05 % M.V. +0.01% v.B. +5d.)		300 mA ... 10 A ±(0.2 % M.V. +10d.)
A AC	40 mA ... 10 A ±(1% v.M. +5d.)		30 mA ... 10 A ±(15 % M.V. +2d.)	3 mA ... 10 A ±(15 % M.V. +4d.)	300 µA ... 10 A ±(0.5 % M.V. +30d.)		300 mA ... 10 A ±(0.5 % M.V. +30d.)
Ω	400 Ω ... 40 MΩ ±(0.8 % +2d.)		30 Ω ... 30 MΩ ±(0.4 % M.V. +1d.)	30 Ω ... 30 MΩ ±(0.2% M.V. +1d.)	300 Ω ... 30 MΩ ±(0.05 % M.V. +0,01% v.B. +5d.)		300 Ω ... 30 MΩ ±(0.1 % M.V. +6d.)
°C	-		-200,0 ... +850°C ±(1.0 %M.V. +5 digits)		-200.0 ... +1200.0°C ±(0.5 %v.M. +3d.)	-200.0 ... +1350.0°C ±(0.5 %v.M. +3d.)	-200.0...+850°C ±(0.5 % v.M. +3d.)
Hz	100 Hz ... 400 kHz ±(0.2 % M.V. +2d.)		-	300 Hz ... 100 kHz ±(0.5 % M.V. +1d.)	300 Hz ... 300 kHz ±(0.05 % M.V. +1Hz)		300 Hz ... 100 kHz ±(0.1% M.V. +3d.)
F	4 nF ... 400 µF ±(3 % M.V. +10d.)		-	30 nF ... 30 µF ±(1.0 % M.V. +3d.)	3 nF ... 30 mF ±(1.0 % M.V. +0.2%v.d.)		3 nF ... 1000 µF ±(1.0 % M.V. +3d.)
W	-		-	-	-	0,1 mW ... 10kW ±(0.2% M.V. +0.5%v.B.)	-
Continuity test	•		•	•	•	•	•
Diode test	•		•	•	•	•	•
Hold function	•		•	•	•	•	•
Selectable meas. rate	-		-	-	•	•	-
Autorange function	•		•	•	•	•	•
Limit value display	•		•	•	•	•	•
Interface	-		Talker (infrared) and RS 232 as option		Duplex (infrared) as standard and RS 232 as option		Talker and RS 232 as option
Automatic jack lock ABS	-		•	•	•	•	•
Count function	-		-	-	•	•	-
Digital display	3 3/4 digits		3 3/4 digits	3 3/4 digits	AC 4 3/4 + DC 5 3/4 digits	2 3/4 to 5 3/4 digits	4 3/4 digits
Additional digital display	40-division scale		35-division scale	35-division scale	-	-	35-division scale
<b>Including in delivery</b>	1 pair measuring leads with test prods, operating instructions, protective cap  2 x 1.5 V batteries   1 x 9 V batteries		1 pair measuring leads with test prods, operating instructions, protective cap.) 9 V battery, test report, rubber protective sleeve		1 pair measuring leads with test prods, operating instructions, protective cap, 2 x 1.5 V battery, DKD test report, rubber protective sleeve (in the case of B1106, 3 measurement connection cables instead of 1 pair)		1 pair measuring leads with test prods, operating instructions, 9V battery, operating instructions, test report, rubber protective sleeve

Accessories: see Catalog ART 2, Page 1/11

# multimeter

## Digital multimeter B1100 and B1101

- Effective value for distorted waveform (B1101)  
The built-in effective value transducer allows for effective value measurement (TRMS) independent of waveform for alternating magnitudes (AC).
- Automatic / manual measuring range selection
- Selection of input resistance for voltage measurement  
10 M $\Omega$  and 400 k $\Omega$
- Frequency and capacity measurement, dielectric and diode testing, min., max. and hold memory for increased measuring comfort and convenience
- Fast analog display facilitates trend analysis. The high resolution of the digital display permits 0.1 V resolution even at 380 V.
- Overload protection up to 500 V in all measurement functions and ranges: sophisticated protection technology prevent premature damage.



### Technical data

Meas. function	Meas. range	Resolution	Input impedance 100pF // X $\Omega$		Dig. display inherent dev. at ref. conditions $\pm$ (...% of MV.+...digit)	
			V $\bar{\bar{=}}$ / $\sim$	V <sub>400<math>\Omega</math></sub>		
V $\bar{\bar{=}}$ V $\bar{\bar{=}}$ <sub>400k<math>\Omega</math></sub>	400.0 mV	100 $\mu$ V	>20 M $\Omega$	$\sim$ 400 k $\Omega$	0.75 + 2	
	4.000 V	1 mV	11 M $\Omega$	$\sim$ 400 k $\Omega$		
	40.00 V	10 mV	10 M $\Omega$	$\sim$ 400 k $\Omega$	0.5 + 2	
	400.0 V	100 mV	10 M $\Omega$	$\sim$ 400 k $\Omega$		
	600 V	1 V	10 M $\Omega$	$\sim$ 400 k $\Omega$		
V $\sim$ V $\sim$ <sub>400k<math>\Omega</math></sub>	400.0 mV	100 $\mu$ V	>20 M $\Omega$	$\sim$ 400 k $\Omega$	1.5 + 5	
	4.000 V	1 mV	11 M $\Omega$	$\sim$ 400 k $\Omega$		
	40.00 V	10 mV	10 M $\Omega$	$\sim$ 400 k $\Omega$	1 + 5	
	400.0 V	100 mV	10 M $\Omega$	$\sim$ 400 k $\Omega$		
	600 V	1 V	10 M $\Omega$	$\sim$ 400 k $\Omega$		
			Voltage Drop approx.			
A $\bar{\bar{=}}$	40.00 mA	10 $\mu$ A	450 mV		0.8 + 2	
	400.0 mA	100 $\mu$ A	1.5 V			
	10.00 A	10 mV	750 mV		1.5 + 5	
A $\sim$	40.00 mA	10 $\mu$ V	450 mV		1 + 5	
	400.0 mA	100 $\mu$ V	1.5 V			
	10.00 A	10 mA	750 mV		2 + 5	
			Open circ. voltage			
$\Omega$	400.0 $\Omega$	100 m $\Omega$	approx. 0.5 V		0.8 + 5	
	4.000 k $\Omega$	1 $\Omega$			0.8 + 2	
	40.00 k $\Omega$	10 $\Omega$				
	400.0 k $\Omega$	100 $\Omega$				
	4000 k $\Omega$	1 k $\Omega$				
	40.00 M $\Omega$	10 k $\Omega$				
$\rightarrow$	3.000 V	1 mV	approx. 3 V		2 + 10	
F	4.000 nF	1 pF	$f_{\min}$ V $\bar{\bar{=}}$		3 + 40 <sup>1)</sup>	
	40.00 nF	10 pF			3 + 10 <sup>1)</sup>	
	400.0 nF	100 pF			3 + 10	
	4.000 $\mu$ F	1 nF				
	40.00 $\mu$ F	10 nF				
Hz	100.0 Hz	0,01 Hz	10 Hz		0.2 + 2	
	1.000kHz	0,1 Hz				10 Hz
	10.00kHz	1 Hz				10 Hz
	100.0kHz	10 Hz				10 Hz
	400.0 kHz	100 Hz				100 Hz

### Ordering Data

Designation		Order No.
Analog Digital Multimeter	B1100	7KB1100-8AA
Analog Digital Multimeter w. TRMS	B1101	7KB1101-8AA

### General data

#### Power supply

B1100  
2 ea. 1.5 V mignon cell  
Alkaline manganese dry cell per IEC LR 6

B1101  
9 V flat cell battery;  
Alkaline manganese dry cell per IEC 6 LR 61

#### Electrical safety

Protection class II per  
IEC 1010-1/EN 61010-1/  
VDE 0411-1

Overvoltage classification	II	III
Nominal voltage	600 V	300 V
Contamination level	2	2
Test voltage	3.7 kV $\sim$ per IEC 1010-1/EN 61010-1/ VDE 0411-1	

#### Mechanical design

Protection Instruments: IP 50  
Connector sockets: IP 20  
VDE 0411-1

Dimensions W x H x D:  
92 mm x 154 mm x 25 mm

Weight Approx. 0.2 kg with battery

#### Display

LCD-Display field (50 mm x 30 mm) with analog and digital display, and with display of measurement unit, type of current and various special functions.

Measurement rate  
2 measurements for U, I, und  $\Omega$   
1 measurement for capacitive and frequency measurements

#### Ambient conditions

Operating temperature range	-10 $^{\circ}$ C ... + 50 $^{\circ}$ C
Storage temperature range	-25 $^{\circ}$ C ... + 70 $^{\circ}$ C (without battery)
Climate classification	2Z/-10/50/70/75 % in compliance with VDI/VDE 3540
Relative humidity	45 ... 75 %

<sup>1)</sup> With „REL“, zero setting, without zero setting +300 digits in the 4 nF range, +30 digits in the 40 nF range

Multimeter B1102 and Multimeter B1103

- Automatic Blocking System (ABS)  
The automatic blocking system prevents incorrect connection of the test leads and incorrect selection of the measured quantity.
- Interface and software WinDATA  
The multimeters are fitted with a serial RS-232 C interface through which the measured values are transmitted
- Root-mean-square value with distorted waveform
- Autoranging / manual range selection
- Continuity test
- Overload warning
- Protective holster for rough duty



Technical data							General data	
Meas. function	Meas. range		Resolution	Input impedance		Dig. display inherent dev. at ref. conditions ±(...% of MV+...digits)		
	MetraHit			B1102	B1103	B1102	B1103	
V <sub>DC</sub>	30.00 mV	• •	10 μV	>10 GΩ // <40 pF		0.5 + 3 <sup>5)</sup>	0.5 + 3 <sup>5)</sup>	<b>Display</b> LCD field (65 mm x 30 mm) with analog and digital display and annunciators for unit of measurement, function and various special functions  <b>Sampling rate</b> 2 readings/s, on Ω and °C: 1 reading/s  <b>Power supply</b> Battery 9-V flat cell battery, manganese-dioxide cell according to IEC 6 F 22, alkaline-manganese cell according to IEC 6 LR 61 or NiCd storage battery  <b>Electrical safety</b> Protection class II according to IEC 348/DIN VDE 0411 and IEC 1010-1/EN 61010-1/VDE 0411-1  Overvoltage category II III Nominal voltage 1000 V 600 V Degree of pollution 2 2 Test voltage 5.55 kV - according to IEC 348 / DIN VDE 0411  <b>Environmental conditions</b> Working temperature range -10 °C ... + 50 °C Storage temperature range -25 °C ... + 70 °C (excl. batteries) Climatic class 2z/-10/50/70/75 % with reference to VDI/VDE 3540 Relative humidity 45 ... 75 %  <b>Data interface</b> Data transmission Optical, with infrared light through the case  <b>Mechanical design</b> Protection Instruments: IP 50 Connector sockets: IP 20 Dimensions 84 mm x 195 mm x 35 mm Weight Approx. 0.35kg with battery  <b>Scope of delivery</b> 1 multimeter, 1 lead set KS17 1 copy of operating instructions 1 rubber holster with tilt stand and carrying strap
	300.0 mV	• •	100 μV	>10 GΩ // <40 pF		0.5 + 3	0.5 + 3	
	3.000 V	• •	1 mV	11 MΩ // <40 pF		0.25 + 1	0.1 + 1	
	30.00 V	• •	10 mV	10 MΩ // <40 pF		0.25 + 1	0.1 + 1	
	300.0 V	• •	100 mV	10 MΩ // <40 pF		0.25 + 1	0.1 + 1	
	1000 V	• •	1 V	10 MΩ // <40 pF		0.35 + 1	0.1 + 1	
V <sub>AC</sub>	3.000 V	• • <sup>1)</sup>	1 mV	11 MΩ // <40 pF		0.75+2(10..300digits)	0.75 + 3 (> 10 digits)	
	30.00 V	• • <sup>1)</sup>	10 mV	10 MΩ // <40 pF				
	300.0 V	• • <sup>1)</sup>	100 mV	10 MΩ // <40 pF				
	1000 V	• • <sup>1)</sup>	1 V	10 MΩ // <40 pF				
V <sub>DC</sub>	3.000 V	• • <sup>1)</sup>	1 mV	11 MΩ // <40 pF		0,75 + 3 (> 10 digits)		
	30.00 V	• • <sup>1)</sup>	10 mV	10 MΩ // <40 pF				
	300.0 V	• • <sup>1)</sup>	100 mV	10 MΩ // <40 pF				
	1000 V	• • <sup>1)</sup>	1 V	10 MΩ // <40 pF				
				Voltage drop approx.				
				B1102	B1103			
A <sub>DC</sub>	300.0 μV	• •	100 nA	—	15 mV	—	0.5 + 5 (>10 digits)	
	3.000 mA	• •	1 μA	15 mV	150 mV	1.0 + 5 (>10 digits)	0.5 + 2	
	30.00 mA	• •	10 μA	150 mV	650 mV	0.25 + 2	0.5 + 5 (>10 digits)	
	300.0 mA	• •	100 μA	1 V	1 V	1.0 + 2	0.5 + 2	
	3.000 A	• •	1 mA	100 mV	100 mV	1.0 + 5 (>10 digits)	1.0 + 5 (>10 digits)	
	10.00 A	• •	10 mA	300/270 mV	270 mV	1.0 + 2	1.0 + 2	
A <sub>AC</sub>	3.000 mA	• •	1 μA	—	150 mV	—	—	
	30.00 mA	• •	10 μA	150 mV	—	1.5 + 2 (>10 digits)	—	
	300.0 mA	• •	100 μA	1 V	1 V	1.5 + 2 (>10 digits)	—	
	10.00 A	• •	10 mA	300/270 mV	270 mV	1.5 + 2 (>10 digits)	—	
A <sub>DC</sub>	3.000 mA	• <sup>1)</sup>	1 μA	—	150 mV	—	1.5 + 4 (>10 digits)	
	300.0 mA	• <sup>1)</sup>	100 μA	—	1 V	—	1.5 + 4 (>10 digits)	
	10.00 A	• <sup>1)</sup>	10 mA	—	270 mV	—	1.75 + 4 (>10 digits)	
				Open Circ. Voltage				
Ω	30.00 Ω	• •	10 mΩ	max. 3.2 V		0.5 + 3 <sup>5)</sup>	0.4 + 3 <sup>5)</sup>	
	30.00 MΩ	• •	10 kΩ	max. 1.25 V		2.0 + 1	2.0 + 1	
				Dis-charge resistance	U <sub>0</sub> max			
F	30.00 nF	• •	10 pF	250kΩ	2.5 V	—	1.0 + 3 <sup>6)</sup>	
	30.00 μF	• •	10 nF	25kΩ	2.5 V	—	3.0 + 3	
				Sensor	f <sub>min</sub> V <sub>DC</sub>	f <sub>min</sub> V <sub>AC</sub>		
Hz	300.0 Hz	• •				0,5 + 1		
	100.0 kHz	• •						
°C	- 200.0 ... + 200.0 °C	• •	0.1 °C	Pt100/s		2 Kelvin + 5 digits <sup>10)</sup> /2 Kelvin + 2 digits <sup>10)</sup>		
	+ 200.0 ... + 850.0 °C	• •	0.1 °C	Pt1000		1.0 + 5 <sup>10)</sup> /1.0 + 2 <sup>10)</sup>		
<b>Ordering Data</b>								
Designation				Order No.				
Analog Digital Multimeter			B1102	7KB1102-8AA				
Analog Digital Multimeter w. TRMS			B1103	7KB1103-8AA				

1) Real effective value measurement (TRMS), 2) with zero setting: without + 50 digits, 3) without sensor

# multimeter

## multimeter B1105 and B1106

- Precision multimeter (V, dB, A, Ω, F, Hz, °C)  
Power meter (W, Var, VA, Wh, PF: only B1106)  
Triple display for simultaneous indication of 3 measurement values, Large 128 kB measurement value memory (metrahit 29S only), DKD calibration certificate provided, Accessory Windows software for measurement value processing and calibration via RS232 interface
- Effective value for distorted waveforms (TRMS)
- Additional functions:  
Continuity testing with acoustic signal, event counting, event duration measurement, overall time, stopwatch, data compare and wide-range capacitance measurement.



### Technical data

Meas. function	Meas. range	Resolution				Input impedance		Dig. display inherent dev. at ref. conditions		General data	
		300.000	30.000	3.000	300	-	∞	±(...% of MV, +... digits)	±(...% of MV, +... digits)		
V	300 mV <sup>1)</sup>	1 μV	10 μV	100 μV	1 mV	>20 MΩ	5MΩ // < 50 pF	0.02 + 0.005 + 5	0.5 + 30	<b>• Display</b> LCD display field (65 mm x 30 mm) with display of max. 3 measured values, unit of measurement, current type and various special functions  <b>• Power supply</b> Battery 2 ea. 1.5 V mignon cell, alkali manganese cell per IEC LR6  <b>• Electrical Safety</b> Protection class II per IEC 61010-1/ EN 61010-1/ VDE 0411-1  Overvoltage category II III Operating voltage 1000 V 600 V Contamination level 2 2 Test voltage 5.55 kV - per IEC 61010-1/ EN 61010 / VDE 0411-1  <b>• Ambient conditions</b> Operating temperature range -20 °C ... + 50 °C Storage temperature range -25 °C ... + 70 °C (without batteries) Climatic class 2z/-20/50/70/75 % in compliance with VDI/VDE 3540 relative humidity max. 75 %, without dew point  <b>• Data interface</b> Data transmission Optical transmission through housing with infrared light  <b>• Mechanical design</b> Protection Devices: IP 50 Connector jacks: IP 20 Dimensions 84 mm x 195 mm x 35 mm Weight Approx. 405 g mit batteries  <b>• Included equipment</b> 1 Multimeter, 1 cable set KS17 1 Operating instructions 1 Protective case for operation under adverse conditions 2 Batteries 1 DKD-calibration certificate (B1106 only)	
	3 V <sup>2)</sup>	10 μV	100 μV	1 mV	10 mV	11 MΩ	5MΩ // < 50 pF	0.02 + 0.005 + 5	0.5 + 30		
	30 V	100 μV	1 mV	10 mV	100 mV	10 MΩ	5MΩ // < 50 pF	0.02 + 0.005 + 5	0.5 + 30		
	300 V	1 mV	10 mV	100 mV	1 V	10 MΩ	5MΩ // < 50 pF	0.02 + 0.005 + 5	0.5 + 30		
	1000 V	10 mV	100 mV	1 V	10 V	10 MΩ	5MΩ // < 50 pF	0.02 + 0.005 + 5	0.5 + 30		
dB	300 mV- to 1000V-	0.01 dB				-	as V ∞	-	±0.1 dB		
A							Voltage drop approx.				
	300 μA	1 nA	10 nV	100 nA	100 μA	160 mV	160 mV	0.05 + 0.02 + 5	0.5 + 30		
	3 mA	100 nA	100 nV	1 μA	100 μA	160 mV	160 mV	0.05 + 0.01 + 5	0.5 + 30		
	20 mA	100 nA	1 μA	10 μA	100 μA	200mV	200mV	0.02 + 0.01 + 5	0.5 + 30		
	30 mA							0.05 + 0.01 + 5	0.5 + 30		
	300 mA	1 μA	10 μA	100 μA	100 mA	350 mV	350 mV	0.1 + 0.01 + 5	0.5 + 30		
	3 A	10 μA	100 μA	1 mA	100 mA	150 mV	150 mV	0.2 + 0.05 + 5	0.5 + 30		
10 A	100 μA	1 mA	10 mA	100 mA	400 mV	400 mV	0.2 + 0.05 + 5	0.5 + 30			
Ω							open circ. voltage	short circuit current	±(...% v.M.+...% v. B.+...D)		
	300 Ω	1 mΩ	10 mΩ			0.6 V	max. 300 μA	0.05 + 0.01 + 5			
	30 MΩ	100 Ω	1 kΩ			0.6 V	max. 60 nA	1 + 0,2 + 5			
→	3 V-		100 μV			max. 3V	max. 0.75 mA	0.2 + 0 + 3			
F							Discharge resistance	U <sub>0max</sub>	±(...% v.M.+...% v. B.+...D)		
	3 nF			1 pF		10 MΩ	3V	1.0 + 0.2			
	30 mF			10 μF		2 kΩ	3V	5.0 + 1			
						f <sub>min</sub> <sup>1)</sup>	±(...% v.M.+...Hz)				
300.000 Hz		0.01 Hz				1 Hz		0.05 + 0.001			
300.000 kHz		1 Hz				1 Hz		0.05 + 1			
°C/°F	Pt 100	-200,0... +100,0°C	0.1 °C					0.5 K + 3 <sup>3)</sup>			
	PT 1000 <sup>3)</sup>	+100,0... +850,0°C	0.1 °C					0.2% + 3 <sup>3)</sup>			
	K NiCr - Ni	-270,0... +1372 °C	0.1 °C					0.7 + 3 <sup>3) 4)</sup>			
	J Fe - CuNi	-210,0... +1200 °C	0.1 °C					0.8 + 3 <sup>3) 4)</sup>			
Zeit	100 min <sup>4)</sup>	10 ms							± 15 D		
Meas. function B1106	Meas. range	Switch setting		Resolution at measuring range upper limit	Inherent deviation (...% Mv + ... D)						
		mA	A		10.000	15 Hz ... 45 Hz	45 Hz ... 65 Hz	65 Hz ... 1 kHz	0.4 + 20	0.2 + 20	0.5 + 20
	1 mW	•		0,1 μW							
	1 W	•		0,1 mW							
	10 kW	•	•	1 W							
<b>Ordering data</b>											
Designation					Order No.						
Analog Digital Multimeter					B1105		7KB1105-8AA				
Analog Digital Multimeter w. TRMS					B1106		7KB1106-8AA				

<sup>1)</sup> Lowest measurable frequency / <sup>2)</sup> 45 ... 65 Hz, values < 300 digits are to be suppressed / <sup>3)</sup> plus sensor deviation / <sup>4)</sup> without installed comparison point



## Hand-held calibrator B1108-8CA/multimeter B1108-8CB/calibration set B1108/8CC

- Universal calibration source:  
mA/mV ... V/°C (Pt100/1000/Ni 100/1000,  
thermocouple J, L, T, U, K, E, S, R, B, N)/  
30 ... 2000 W
- Robust and EMC-safe design
- Automatic jack lockout
- Procedure and calibration value memory
- Easy operation
- Frequency and pulse group pulse generator
- Ramp and stair-step functions
- Modular extension to calibration system
- Traceable test report in extent of delivery
- Transmitter simulator (sink 0 ... 24 mA)
- Current measurement 0 ... 24 A

The B1108 hand-held calibrator is used as a universal and precision calibration and simulation instrument for many electrical measurement technique parameters. It is outstandingly versatile in function and is used for calibrating components and instruments used for measurement parameter acquisition in process technology. It fulfils the requirements laid down in DIN ISO 9000 and is provided as standard with a traceable works certificate. As a result of its battery and accumulator operation it is suitable for mobile use on location as well as for stationary calibration, repair and development tasks.

Technical data				
Function	MIN	MAX	Intrinsic error ±	Parameter
<b>Transmitter:</b>				
mV / V	0	150m ... 15	0.05% + 2 D	Rmin. 1 kΩ
Ω	30	2000.0	0.1% + 1 D	0.1 ... 1 mA
°C (RTD)	- 180	850.0	0.1% + 0,25 °C	0.1 ... 1 mA
°C (TC)	- 250	1800	0.1% + 15 μV	CJ ± 2 °C
mA Source	0	24.00	0.05% + 2 μV	max. 15 V
<b>Measurement:</b>				
mA	0	24.00	0.25%+0.05 mA	max. 3 V

### Further data for CALIBRATOR B1108

- Display  
Type of display: 99 999 digits LCD with symbols for operator guidance
- Interface:  
Type: RS232C, in accordance with DIN 19241  
Date transfer: optical with infrared light through the casing
- Temperature range:  
in operation: 0°C ... + 50°C
- Power supply:  
Batteries: Standard: 3 x alkaline manganese (IEC LR6)
- Electrical safety:  
Nominal installation voltage: 50 V  
Test voltage: 500 V  
Class of protection: II
- Mechanical construction:  
Degree of protection: IP40, connection IP20  
Dimensions: 84 mm x 195 mm x 35 mm  
Weight: 0.4 kg with batteries

Ordering Data		
Designation		Order No.
Calibrator	B1108	7KB1108-8CA
Multimeter	B1108	7KB1103-8CB



### Calibration set

Fully automatic calibration of measuring transducers, transmitters, insulation amplifiers and measurement drawers is possible in but a few seconds with the calibration set including issuing certificate. The calibration set incorporates everything required for an automatic calibration system: the B1108 calibrator with the BD232 interface adapter and WinDATA for automatic calibration value output including the B1108 multimeter with S1232 memory adapter and WinDATA 10 for exact measurement of output values of the calibration object.

The set also includes cable, test probes and terminals, a charger with NiMH accumulator as well as carrying case.

Extract of relevant measurement ranges for the use of the B1108 – 8CB multimeter in the calibration system:

Measurement function	Measuring range	Resolution
V ==	300.00 mV	10 μV
	3.0000 V	100 μV
	30.000V	1 mV
mA ==	...	...
	...	...
	30.000 mA	1 μA
	...	...

To the greatest extent the other measuring functions are identical to those of the B1103 multimeter, see Page 1/7. Please send for separate data sheet 7KB1108-8CB.

### Scope of delivery, calibration set

- 1 Calibrator B1108 including cable set and operating instructions
- 1 Multimeter B1108 including cable set and operating instructions
- 1 Interface adapter 7KB9102-8EM
- 1 Memory adapter 7KB9102-8EH
- 1 Carrying case F840
- 1 RS-232 bus cable, 2 m, 9 pole/9 pole
- 1 Software package WinDATA 10, 3 1/2" program diskette and operating manual
- 1 NiMH set (charger and 6 only NiMH accumulators)
- 1 Cable set comprising:
  - 4 instrument leads (2 black, 1 red, 1 yellow)
  - with angle and straight plugs, 4 insert alligator clips,
  - 4 insert adapters, 2 mm

Ordering Data	
Designation	Order No.
Calibration set	7KB1108-8CC

# Milliohmmeter

## Milliohmmeter B1107

### Features

- Ten measuring ranges from 20 mΩ ... 20 MΩ  
Only one meter for many applications
- Four-wire measurement  
Suppresses effects of line and contact resistances
- Compact and rugged  
For harsh applications in service and laboratory
- Overload protection  
Protects the instruments in the case of accidental connection to the line voltage
- Calibration certificate which can be traced back  
Reduces operating cost when used in ISO 9000 Quality Systems

### Applications

The milliohmmeter B1107 is a rugged, precise and reliable instrument which is suited for many a task in operation, service on the site, as well as for exact measurements in the laboratory:

- Adjustment of shunts in instrumentation  
Tests of electrical connections on bus bars in opencast mining in industry and household
- Testing of cable resistance, wiring, shunts of circuit boards and thick-film circuits
- Measurement of the contact resistance of relays, contactors and circuit breakers
- Measurement of the resistance of fuses as well as of the lead resistance in power circuits
- Testing of the winding resistance in transformers, coils, small motors etc.

The milliohmmeter B1107 is the modern replacement of the known measuring bridges TH2 (Thompson) and WH2 (Wheatstone) and offers an improved range span, higher measuring accuracy and easier reading. As wide-range resistance measuring instrument, it acquires the resistance value by passing a measuring current through the resistor, conductor or contact. The ratio measurement is used as measuring principle.

That is why its measuring accuracy is only defined by the installed precision resistors and the accuracy remains stable over the entire lifespan of the meter. The measuring current at a time is selected by the position of the range selector switch and is 0.1 A on the two lower ranges.



Technical data				
Measuring range	Resolution	Measuring current A	Inherent deviation % of rdg. + D	Voltage limit
20 m	10	100 m	0.1 % + 3	< 2 mV
200 m	100	100 m	0.1 % + 2	< 20 mV
2	1 m	10 m	0.1 % + 2	< 20 mV
20	10 m	10 m	0.1 % + 2	< 200 mV
200	100 m	1 m	0.1 % + 2	< 200 mV
2 k	1	100	0.1 % + 2	< 200 mV
20 k	10	100	0.1 % + 2	< 2000 mV
200 k	100	1	0.2 % + 2	< 200 mV
2 M	1 k	1	0.3 % + 2	< 2000 mV
20 M	10 k	100 n	0.5 % + 2	< 2000 mV

Ordering Data	
Designation	Ordering-No.
Milliohmmeter B1107	7KB1107-8AA

<ul style="list-style-type: none"> <li>• <b>Measuring principle</b> A/D conversion Sampling rate</li> </ul>	Ratio measurement Dual-slope integration 1 / sec
<ul style="list-style-type: none"> <li>• <b>Display</b></li> </ul>	LCD / 18mm / 1999 D
<ul style="list-style-type: none"> <li>• <b>Environmental conditions</b> Reference temperature Operating temperature Relative humidity</li> </ul>	18 ... +28 °C 0 °C ... +50 °C max. 70 %
<ul style="list-style-type: none"> <li>• <b>Power supply</b> Battery</li> </ul>	2 Mignon IEC LR6
<ul style="list-style-type: none"> <li>• <b>Electrical safety</b> Nominal insulation voltage Test voltage Protection class</li> </ul>	50 V 500 V II according to IEC 1010-1
<ul style="list-style-type: none"> <li>• <b>Electromagnetic compatibility</b> Generic emission Generic immunity</li> </ul>	EN 50081-1 EN 50082-1
<ul style="list-style-type: none"> <li>• <b>Mechanical configuration</b> Degrees of protection</li> </ul>	Case: IP 30, Sockets: IP 20 acc. to DIN VDE 0470 Part 1/ EN 60529
Dimensions Weight	84 mm x 195 mm x 35 mm approx. 0.45 kg including batteries
<ul style="list-style-type: none"> <li>• <b>Scope of delivery</b> 1 milliohmmeter B1107 1 protective rubber holster GH18 2 pairs of measuring leads (yellow and black) 2 pairs of alligator clips (yellow and black) 1 calibration certificate 2 batteries 1.5 V IEC LR6 1 copy of operating instructions</li> </ul>	

# Accessories for the complete family

## Accessories B1100 - B1103 / B1105 - B1107 / B1108-8CB

1

SIEMENS Product designation	Order No.	B1100 / B1101	B1102 / B 1103	B1105 / B1106	Multimeter B1108 - 8CB	Kalibrator B1108 - 8CB	B1107	
<b>Accessories</b>								
Carrying case with compartment	7 KB9102-8EA	X						
Carrying case	7 KB9102-8EB		X	X	X	X	X	
Cable set	7 KB9102-8EC	X						
Carrying case for multimeter case set	7 KB9102-8ED		X	X	X		X	
Cable set	7 KB9102-8EF		X	X	X	(X)		
Probe for voltage measurement in electrical power installations up to 1000 V	7 KB9102-8EG	X	X	X	X			
Memory adapter (SI232) 128 kB with integrated real time clock including batteries	7 KB9102-8EH		X	X	X			
RS232 - bus cable	7 KB9102-8EJ		X	X	X	X		
Single channel memory pack with memory adapter 7 KB9102-8EH, recording analysis software, 7KB9102-8EP, RS232 - cabel and installation instructions	7 KB9102-8EK		X	X	X			
Four-channel memory pack with 4 only memory adapters, 7KB9102-8EH, recording and analysis software, 7KB9102-8EP, RS232 - cable and installation instructions	7 KB9102-8EL		X	X	X			
BD232 bi-directional interface adapter, infrared interface, for infrared interface conversion to serial interface RS232 C	7 KB9102-8EM					X		
Mains adapter NA 4/500 for B1105-8AA, B1107-8AA and B1108-8CA	7 KB9102-8EN					X	X	
Software WINData 10 for the B1102 to B1106 multimeters for presentation and processing of measured data in the PC. The B1105 and B1106 multimeters can be programmed for part functions.	7 KB9102-8EP		X	X	X			
Single channel BD232 pack with 7KB9102-8EM bi-directional interface adapter, WINData 10 software 7KB9102-8EP, RS232 cable and installation instructions.	/ KB9102-8ER		X	X	X			
PT1000 immersion sensor for measurements in gase and liquids, - 50 °C to 220 °C	7 KB9402-8ES		X	X	X			
Standard PT100 temperature sensor for surface and immersion measurements, - 40 °C to 600 °C, Class A	7 KB9402-8ET		X	X	X			
High voltage probe 3kV / 3 V	7 KB9402-8EU	X	X	X	X			
High voltage probe 30kV / 30 V	7 KB9402-8EV	X	X	X	X			
KC2 Kelvin clips (1 pair) for normal objects	7 KB9102-8EW						X	
KC3 Kelvin clips (1 pair) for smaller objects for example coils, components	7 KB9102-8FA						X	
WinDATA 90 software for B1108 calibrator control and calibrator result evaluation	7KB9102-8FB					X		

# Digital multimeters

## B1036 graphical multimeter

1

- The multimeter dual display mode offers two high precision numerical displays with maximum 32,000 digits and an analog needle graph for easy readable presentation of dynamic signals in combination mode. The digital measured values and signal form are shown simultaneously.
- Direct measurements of AC and DC voltages and currents, resistance and conductivity, capacity, frequency, pulse duty factor, pulse width, period and dB can be taken in meter mode.
- Interference signals, noise, signal distortion as well as intermittent fields and pitch are quickly recognised. Signal form display to 1 MHz band width.
- TrendGraph registers the measured values at intervals of 1 second to 15 minutes and in this way can provide measured value records up to 30 hours.
- The logic activity test serves for locating interference in digital electric circuits. It shows status changes to 10 MHz or whether the circuit has "hung up" high or low.
- The integrated RS 232 interface ensures fast and easy data transmission to a printer or PC. It is also possible to load reference signal forms - or component signatures - in the graphical multimeter.
- Safety: 1000 V IEC-1010-1 Class III protection in all functions



A completely new class of universal hand-held multimeters has been made available with the B1036 graphical multimeter.

Most progressive multimeter functions combined with signal form and trend presentation.

A high-precision heavy-duty multimeter with analog, digital and graphic display.

Technical data			
Function	Range	Accuracy	Resolution
VDC	320 mV - 1000V	$\pm (0.025 \% + 2)$	0.01 mV
VAC	320 mV - 1000V	$\pm (0.5\% + 10)$	0.01 mV
True RMS AC coupled mean averaging display	50 Hz - 300 kHz	$\pm (0.5\% + 4)$	
ADC	320 $\mu$ A - 10A 32 mA - 10A	$\pm (0.05\% + 15)$	0.01 $\mu$ A 1 mA
AAC	320 $\mu$ A - 10A 32 mA - 10A	$\pm (0.75\% + 10)$	0.1 $\mu$ A 0.01 mA
Resistance	320 $\Omega$ - 32M $\Omega$	$\pm (0.07\% + 2)$	0.01 $\Omega$
Capacitance	10000 pF - 10000 $\mu$ F	$\pm (1.9\% + 2)$	10 pF
dB/dBm	2-1200 $\Omega$ reference value	$\pm 0.5$ dB	0.01 dB
Frequency	2 Hz to > 10 MHz 2 Hz to > 2 MHz	$\pm (0.05 + 1)$	0.01 Hz
Current ranges		6	
Multimeter AC band width		300 kHz	

Features	
Digital display range RMS measurement AutoDiode High impedance input Resistance, conductivity, capacitance Continuity test Pulse duty factor, pulse width, period, frequency Minimum, maximum and average value with time Relative mode Touch hold and peak value acquisition dB with selectable reference impedances Automatic and manual range switchover Smoothing Logic activity Component test LCD background illumination Internal battery charging Extra signal form memory RS 232 interface (visually isolated)	
<b>Included in delivery:</b>	
Set of industrial test cables, external power pack, NiCd accupack, RS 232 cable and VIEW software.	
<b>Current supply:</b>	external power pack, NiCd battery set
<b>Weight:</b>	without battery: 1.1 kg. with battery: 1.4 kg.
<b>Dimensions (h x b x d):</b>	246.4 mm x 137.2 mm x 69.9 mm

Ordering data			
Designation	kg	Order No.	
<b>Graphical Multimeter B1036 carrying case on request</b>		<b>7KB1036-8AA</b>	

## B1047 bench-top multimeters

- 4<sup>1</sup>/<sub>2</sub> to 6<sup>1</sup>/<sub>2</sub> digit display, selectable
- 1,200,000 measuring points (6<sup>1</sup>/<sub>2</sub> digits)
- Accuracy: 15 ppm (10V, 24 h), 35 ppm (10V, 1 year)
- Speed: 1850 measurements/s at 4<sup>1</sup>/<sub>2</sub> digits (DCV);  
850 measurements/h at 5<sup>1</sup>/<sub>2</sub> digits (DCV);  
40 measurements/s at 6<sup>1</sup>/<sub>2</sub> digits (DCV)
- High system throughput
- AC voltage range 3 Hz to 300 kHz
- True RMS measurement (periodic quantities) to the test factor 5
- Standards: fulfills all general safety and EMC standards
- High reliability: 3 year guarantee
- incl. test certificate, instrument leads, manuals, test report optional



1

Technical data							
<ul style="list-style-type: none"> <li>• DC voltage 0.1 <math>\mu</math>V to 1000 V</li> <li>• AC voltage 0.1 <math>\mu</math>V to 700 V</li> <li>• Resistance: 100 <math>\mu\Omega</math> to 100 M<math>\Omega</math></li> <li>• DC: 10 nA to 3 A</li> <li>• AC: 1 <math>\mu</math>A to 3 A</li> <li>• Frequency: 3 Hz to 500 kHz</li> <li>• Period duration: 300 ms to 2 <math>\mu</math>s</li> <li>• Temperature: Thermocouple - linearisation for Types J, K, T</li> <li>• Diode test: 2 measuring ranges 3V, 10V</li> <li>• Continuity test: adjustable threshold value 1<math>\Omega</math> - 1k<math>\Omega</math></li> <li>• dB measurement</li> <li>• dBm measurement</li> <li>• 2 and 4 wire resistance measurement</li> </ul>	<b>DC voltage</b> Accuracy: $\pm$ (% of measured value + % of meas. range)						
	Meas. range	Resolution	Input resistance	24 hours 23 °C $\pm$ 1 °	90 days 23 °C $\pm$ 5 °	1 year 23 °C $\pm$ 5 °	
	100.0000 mV	0.1 $\mu$ V	> 10 G $\Omega$	30 + 30	40 + 35	50 + 35	
	1.000000 V	1.0 $\mu$ V	> 10 G $\Omega$	15 + 6	25 + 7	30 + 7	
	10.00000 V	10 $\mu$ V	> 10 G $\Omega$	15 + 4	20 + 5	30 + 5	
	100.0000 V	100 $\mu$ V	10 M $\Omega$	15 + 6	30 + 6	45 + 6	
	1000.000 V	1 mV	10 M $\Omega$	20 + 6	35 + 6	45 + 6	
	<b>AC voltage</b> Accuracy: $\pm$ (% of measured value + % of meas. range), one year						
	Meas. range	Resolution	3 Hz-10Hz	10 Hz-20Hz	20 kHz-50 Hz	50 kHz-100 Hz	100 kHz-300 Hz
	100.0000 mV	0.1 $\mu$ V	0.35 + 0.03	0.05 + 0.03	0.11 + 0.05	0.60 + 0.08	4 + 0.5
1.000000 V	1.0 $\mu$ V	0.35 + 0.03	0.05 + 0.03	0.11 + 0.05	0.60 + 0.08	4 + 0.5	
10.00000 V	10 $\mu$ V	0.35 + 0.03	0.06 + 0.03	0.12 + 0.05	0.60 + 0.08	4 + 0.5	
100.0000 V	100 $\mu$ V	0.35 + 0.03	0.06 + 0.03	0.12 + 0.05	0.60 + 0.08	4 + 0.5	
750.000 V	1 mV	0.35 + 0.03	0.06 + 0.03	0.12 + 0.05	0.60 + 0.08	4 + 0.5	
Measuring rate SLOW and sine wave input voltage > 5% of meas.range							
<b>DC voltage</b> Accuracy: $\pm$ (% of measured value + % of meas.range)							
Meas. range	Resolution	Load voltage	24 hours 23 °C $\pm$ 1 °	90 days 23 °C $\pm$ 5 °	1 year 23 °C $\pm$ 5 °		
10.00000 mA	10 nA	< 0.15 V	60 + 15	300 + 40	500 + 40		
100.0000 mA	100 nA	< 0.03 V	100 + 40*	300 + 50*	500 + 50*		
1.000000 A	1 $\mu$ A	< 0.3 V	200 + 15	500 + 40	800 + 40		
3.00000 A	10 $\mu$ A	< 1 V	1000 + 10	1200 + 15	1200 + 15		
* After balance with REL key 5°C within one hour. Add 100ppm of meas. range for 24 hours or 350 ppm of meas. range for 90 days and 1 year.							
<b>Alternating current</b> Accuracy: $\pm$ (% of measured value + % of meas. range), 90 days							
Meas. range	Resolution	3 Hz-10Hz	10 Hz-5kHz				
1.000000 A	1 $\mu$ A	0.30 + 0.04	0.10 + 0.04				
3.00000 A	10 $\mu$ A	0.35 + 0.06	0.15 + 0.06				
<b>Resistance</b> Accuracy: $\pm$ (% of measured value + % of meas. range)							
Meas. range	Resolution	Meas. range	24 hours 23 °C $\pm$ 1 °	90 days 23 °C $\pm$ 5 °	1 year 23 °C $\pm$ 5 °		
100.0000 $\Omega$	100 $\mu\Omega$	1 mA	30 + 30	80 + 40	100 + 40		
1.000000 k $\Omega$	1 m $\Omega$	1 mA	20 + 6	80 + 10	100 + 10		
10.00000 k $\Omega$	10 m $\Omega$	100 $\mu$ A	20 + 6	80 + 10	100 + 10		
100.0000 k $\Omega$	100 m $\Omega$	10 $\mu$ A	20 + 6	80 + 10	100 + 10		
1.000000 M $\Omega$	1 $\Omega$	10 $\mu$ A	20 + 6	80 + 10	100 + 10		
10.0000 M $\Omega$	10 $\Omega$	700 nA	150 + 6	200 + 10	400 + 10		
100.000 M $\Omega$	100 $\Omega$	700 nA	800 + 30	1500 + 30	1500 + 30		
<b>General</b>							
<b>Power supply:</b> 100V / 120V / 220V / 240V							
<b>Mains frequency:</b> 45 Hz to 66 Hz and 360 Hz to 400 Hz							
<b>Power input:</b> 22 VA							
<b>Ambient conditions</b> Full accuracy at 0 °C to 50 °C and to 80 % air humidity at 35 °C							
<b>Storage conditions:</b> -40 °C to 70 °C							
<b>Temperature</b>							
Thermocouples, Type	Meas. range	Resolution	Accuracy				
J	-200 °C to + 760 °C	0.01 °	+ 0.65 °C				
K	-200 °C to + 1370 °C	0.01 °	+ 0.70 °C				
T	-200 °C to + 400 °C	0.01 °	+ 0.68 °C				
<b>Ordering data</b>			Order No.				
B1047 Bench-top multimeter			7KB1047-8AA				

# multimeter

## Analog multimeters

1



Analog multimeter A1003








- Only one measuring range selector
- Shockproof
- Electronic overload protection
- Only one linear double scale for all current and voltage ranges
- No conversion of scale values required
- Internal impedance up to 1000 k $\Omega$ /V in DC voltage ranges



Technical data	
Measuring ranges	
- DC voltage	0.15/0.5/1.5/5/15/50/150/500/1000 V
- Input resistance (for DC voltage)	20 k $\Omega$ /V in all ranges
- AC voltage	1.5/5/15/50/150/500 V
- Input resistance (for AC voltage)	4 k $\Omega$ /V in all ranges
- Direct current	0.05/1.5/15/50/150 mA / 1.5/15 A
- Alternating current	1.5/15/150 mA / 1.5/15 A
- Resistance	1/10/100 k $\Omega$ / 1 M $\Omega$
- Level measurement	-15 up to +56 dB
Frequency range	35...40...60...5000 Hz
Class	2.5
Power supply	1.5-V battery to IEC R6
Dimensions (w x h x d)	92 mm x 126 mm x 45 mm
Scale length	max. 150 mm
Weight	
- with ever-ready carrying case	0.7 kg
- without ever-ready carrying case	0.44 kg
Included in delivery	battery, 1 pair of connection leads with test prods; ever-ready carrying case (option)

Ordering data			
Designation	kg	Order No.	
<b>Analog multimeter A1003</b>			
- with ever-ready carrying case		<b>7KA1003-8AA</b>	
- without ever-ready carrying case		<b>7KA1003-8AB</b>	








Order No.	M05819-	VA $\Omega$ -MULTIZET S		$\pm\mu$ A-MULTIZET	
		-A1	-A31	-A9	-A39
Protective devices					
Fuse	x	x	x	x	x
Electronic protection		x		x	
Tripping factor			approx. 5		approx. 5
Cut-out time in ms			approx. 6		approx. 6
Class	DC I, U (DIN VDE 0410) AC I, U R	1	1.5; 2 at 3 V and 10 V	1	-
No. of measuring ranges		33	1,5	23	-
Battery	1.5 V IEC R6 15 V IEC 10 F15	1	-	1	-
Voltage		Internal impedance $R_i$ in k $\Omega$ /V, DC		freq. range 15 Hz to 50 Hz bis $f_0$ in kHz	
3 mV		-	-	-	-
10 mV		-	-	-	$R_i$
30 mV		-	-	-	-
100 mV		$R_i$	-	-	-
300 mV		-	-	-	-
1 V		-	-	-	100
3 V		1	$R_i$ 0,33 20	-	-
10 V		-	-	-	-
30 V		-	1 20	-	-
100 V		-	-	-	-
300 V		-	-	-	33,3
1000 V		-	1 8	-	10
Current		Voltage drop $U$ in mV, DC		DC	
1 $\mu$ A		-	-	-	-
3 $\mu$ A		-	-	-	$U$
10 $\mu$ A		-	-	-	-
30 $\mu$ A		-	-	-	-
100 $\mu$ A		-	-	-	-
300 $\mu$ A		$U$	-	$U$ $f_0$	-
1 mA		-	-	-	-
3 mA		-	-	-	30
10 mA		100 to 50	-	-	to 420
30 mA		to 50	-	-	-
100 mA		to 250	550 to 25	20	-
300 mA		-	to 190	-	-
1 A		-	-	-	-
3 A		-	-	-	-
10 A		-	-	-	-
Resistance		Last numbered graduation scale			
$\Omega$ x 1		-	50 k $\Omega$ /1.25 k $\Omega$ /1.25 mA	-	-
$\Omega$ x 10		-	-	-	-
$\Omega$ x 10 <sup>2</sup>		-	-	-	-
$\Omega$ x 10 <sup>3</sup>		-	-	-	-
$\Omega$ x 10 <sup>4</sup>		-	-	-	-

Technical and ordering data					
		B1100 - B1106	μA-MULTIZET	kg	Ordering No.
	<b>Fuse probe</b> For voltage measurement up to 1500 V Voltage range max. 1500 V Test voltage 5 kV Fuse 125 mA, $R_i \approx 80 \Omega$ Dimensions 33 mm dia. 170 mm long			0,05	<b>7KA1513-8AA</b>
	<b>Fuse insert</b> F 0.125 A/3000V			0,01	<b>7KA1513-8BA</b>
	<b>Mini clip-on cur. transf.</b> AC 10 and 100 A			0,16	<b>7KA1412-8BA</b>
	<b>Mini clip-on cur. transformer</b> AC 150 A			0,1	<b>7KA1404-8AA</b>
	<b>Mini clip-on cur. transformer</b> AC 100 A				<b>7KA1410-8AA</b>
	<b>Clip-on current trans.</b> AC 4 to 500 A			0,45	<b>7KA1406-8AA</b>
	<b>Clip-on current transformer</b> AC/DC 1 to 1100 A			0,4	<b>7KA1407-8BA</b>
	<b>Clip-on current transformer</b> AC 1 to 1000 A			0,65	<b>7KA1408-8BA</b>
	<b>Plug-in shunt</b> AC/DC 2 and 20 A (200 mV) class 0.2; 15 Hz to 1 kHz, continuously loadable up to 16 A, up to 20 A for max. 20 s			0,1	<b>M05025-A109-A13</b>
	<b>High-voltage probe</b> > 1 kV to 30 kV Meas. range DC 30 kV/300 V; 5 % of meas. value, $R_i = 990 \text{ M}\Omega$ , $R_a = 10 \text{ M}\Omega$			0,12	<b>M05025-A109-A11</b>
	<b>Ft2 surface sensor</b> 0,07 Pt 100. Class B, -50 to +500 °C 0,6 % of meas. value +0,5 °C, sensor length 140 mm, total length 280 mm, supply lead 1,5 m long with 2 Siemens earthing pin plugs				<b>7KB9402-8ED</b>
	<b>Ft1 surface sensor</b> Mo 1000. Class A, -50 to +250 °C 0,5 % of meas. value +0,6 °C, sensor length 150 mm, total length 270 mm, supply lead 1,5 m long with 2 Siemens earthing pin plugs			0,07	<b>7KB9402-8EB</b>
	<b>Temperature probe,</b> for surface, air and immersion measurements, Meas. range -60 to +800 °C, Error limits: 1% of meas. value +2 mV Output voltage DC 1 mV/°C, with 9-V battery IEC 6LF22			0,2	<b>7KB9102-8DE</b>
	<b>Surface sensor</b> 50 to +500 °C, 150 mm				<b>7KB9401-8AV</b>
	<b>Knife-edge sensor</b> -50 to +800 °C, 150 mm				<b>7KB9401-8AW</b>
	<b>Gas and air sensor</b> -50 to +250 °C, 150 mm				<b>7KB9401-8AX</b>
	<b>Flexible sensor</b> -50 to +1000 °C, 1 m				<b>7KB9401-8AY</b>



# multimeter

## Multimeter accessories, clip-on measuring instruments

### Technical and ordering data

		B1100 - B1106	μA-MULTIZET	kg	Ordering No.
	<b>Safety test prods</b> 1 pair, red and black			0,05	<b>7KB9102-8BE</b>
	<b>Safety clamp-type test prods</b> 1 pair, red and black			0,05	<b>7KB9102-8BF</b>
	<b>Safety cable lugs</b> 1 pair, black			0,01	<b>7KB9102-8BJ</b>
	<b>Safety clips</b> 1 pair, isolated, red and black			0,03	<b>7KB9102-8BH</b>
	<b>Safety test leads</b> 1 pair, 1.5 m long, red and black test voltage 2 kV with test prods			0,14	<b>7KB9102-8BC</b>
	<b>Safety connector adapters</b> 1 pair, red			0,01	<b>7KB9102-8BG</b>
	<b>Everready carrying case for MULTIZET (a)</b> Dimensions: 135 mm x 90 mm x 205 mm			0,5	<b>M05859-A1</b>
	<b>Ever-ready carrying case (b)</b> with strap and compartment for leads			0,4	<b>7KB9102-8AB</b>

### Mini clip-on ammeter, current converter

				
Technical data	7KA1404-8AA	7KA1404-8BA	7KA1404-8CA	7KA1412-8BA
Measuring range	15A - 180 A ~	0.01A - 100 A ~	0.001 - 15 A ~ 1 A - 150 A ~	0.1 A .. 24 A ~ 0.5 A .. 240 A ~
Crest factor at in				3
Band with	30 - 45 - 65 - 400 Hz	50 ... 500 Hz	50 ... 500 Hz	40 Hz ... 10 kHz
Output/load	$I < 5 \Omega$	$V \sim / > 1 M\Omega$	$V \sim / > 1 / 10 M\Omega$	$V \sim$
Transformation ratio	1000 : 1	1 mV ~ / 10 mA ~	1 mV ~ / 1 mA ~ 1 mV ~ / 1 A ~	100 mV~/ 1 A ~ 10 mV~/ 1 A ~
Typical accuracy	3 %	1.5 % o. MV ± 0.1 mA	± 3 % o. MV ± 0.15 mA ± 2 % o. MV ± 0.05 A	2 %
Connection	Cable + Plug	Cable + Plug	Cable + Plug	Cable + Plug
Length of connection cable				1.5 m
Clip-on capacity	15 mm dia.	15 mm dia.	15 mm dia.	20 mm dia. or 20 x 5 mm
Dimensions/weight	115 mm x 33 mm x 22 mm / 120 g			135 x 50 x 30 mm / 180 g
Ambient conditions	in operation: -10 ... +40 °C, in storage: -20 ... +70 °C			operation: -10 ... +55 °C / rel. humidity < 85 %
Electrical safety	Type of protection II to IEC 1010-1 / EN 61010-1 / VDE 0411-1			Equivalent to IEC 1010-1 and IEC 1010-2-032 600V CAT III 2



- Direct currents from 0.1 to 1000 A with maximum value memory
- Alternating currents from 0.1 to 1000 A with maximum value memory
- DC/AC voltages from 0.1 to 750 V
- Active power from 10 W to 199.9 kW
- Apparent power from 10 VA to 199.9 kVA
- Power factor 0.3 ind ... 1 ... 0.3 cap
- Frequency from 0.1 to 999 Hz
- Analog output (real time waveform or RMS value)
- Display: LCD, 13 mm high, 3 $\frac{1}{2}$ -digit (1999 digits)



Technical data			
<b>Direct current/alternating current measurements</b>			
Measuring principle		DC-coupled RMS meas. (true RMS)	
Meas. range	Resolution	Frequency range	Error limits
0...200 A 0...1000 A	0.1 A 1 A	DC, AC, 15...1000 Hz	1 % of m. range + 1 digit
Crest factor		Max 7	
Measurement rate		Approx. 2 measurements/s	
<b>DC/AC voltage measurements</b>			
Measuring principle		DC-coupled RMS meas. (true RMS)	
Meas. range	Resolution	Frequency range	Error limits
0...200 V 0...750 V	0.1 V 1 V	DC, AC, 15...1000 Hz	0.5 % o.m.range + 1 digit
Crest factor		maximal 7	
Measurement rate		Approx. 2 measurements/s	
<b>Active power measurements</b>			
Meas. range	Resolution	Frequency range	
0...20 kW 0...200 kW	10 W 100 W	DC, AC, 15...66 Hz	
Error limits		Type 2 % of m. range	
Measurement rate		Approx. 1.5 measurements/s	
<b>Apparent power measurements</b>			
Meas. range	Resolution	Frequency range	
0...20 kVA 0...200 kVA	10 VA 100 VA	DC, AC, 15...1000 Hz	
Error limits		Type 2 % of m. range	
Measurement rate		Approx. 1 measurements/s	

<b>Power factor measurements</b> (for sinusoidal signals)			
Meas. range	Resolution	Frequency range	Error limits
ind 0.3...1...0.3 cap	0.01	10...66 Hz	1.5 % o.m. range + 1 digit
Measurement rate		Approx. 2 measurement/s	
<b>Frequency measurements</b>			
Meas. range	Resolution	Voltage range	Error limits
5...200 Hz 200...550 Hz 550...775 Hz 775...999 Hz	0.1 Hz 1 Hz 2 Hz 3 Hz	20...750 V	0.5 % o.m.range + 1 digit
Measurement rate		Approx. 2 measurement/s	
<b>Analog output</b>			
Output voltage		Switchable between real time waveform and RMS value 5 mV/A at 0...200 A 1 mV/A at 0...1000 A	
Reference conditions		23 °C ± 1 °C, 50 Hz (sinusoidal), conductor in center of clip	
Working temperature range		0 to 45 °C	
Opening		60 mm dia. for round conductors, 60 mm x 25 mm for flat conductors	
Dimensions (w x h x d)		90 mm x 65 mm x 250 mm	

Ordering data			
Designation	kg	Order No.	
<b>B4203 clip-on multimeter</b> with battery, 1 pair of safety test leads and measurement leads for analog output	0.5	<b>7KB4203-8AA</b>	
<b>Ever-ready carrying case</b>	0.1	<b>7KB4203-8BA</b>	
<b>Star-point resistor</b> for measurement in three-wire three-phase networks without neutral conductor, $U_{eff} = 3 \times 750$ V, test voltage 6 kV, protection class II to DIN VDE 0411	0.1	<b>7KB4203-8BB</b>	

# Clip-on measuring instruments

## Clip-on current converter

1



Clip-on current converter  
A1410



Clip-on voltmeter  
Type F11, F13

### Clip-on voltmeter F11:

- Alternating currents from 0.1 to 700 A
- DC/AC voltages from 0.1 to 600 V
- Maximum value memory (MAX)
- Measured value memory (HOLD)
- Display: LCD 12.5 mm, high
- 3<sup>1</sup>/<sub>2</sub>-digit (4000 digits)

### In addition with F13:

- RMS measurements with non-sinusoidal curves
- Frequency measurement

Technical data	
Rated current	AC 100 A
Measuring range	50 mA to 100 A
Transformation ratio	1000: 1 ( 1 mA/1 A)
Frequency range	45 Hz bis 10 kHz
Load	max. 10 Ω
Error limits	1 % of measured value ± 10 mA (at ≤ 10 Ω)
Operating voltage U <sub>eff</sub>	–
Test voltage	3 kV/50 Hz/1 min
No-load voltage	–
Opening	12 mm dia. for round conductors
Dimensions (W x H x D)	32 mm x 22 mm x 115 mm
Weight	0.1 kg

Technical data			
<b>AC measurement</b>			
Meas. range	Resolution	Frequency range	Error limits
0 ... 400 A	0.1 A	45 ... 450 Hz	±2 % of meas. val. ±0.5 A ±2 % of meas. value
0 ... 700 A	1 A		
<b>DC/AC voltage measurements</b>			
Meas. range	Resolution	Frequency range	Error limits
0 ... 400V	0.1V	DC, AC 45 ... 450 Hz	DC: ±0.5% of meas. value AC: ±1% of meas. value
0 ... 600V	1V		
Input impedance 1 MΩ			
<b>Resistance measurement</b>			
Meas. range	Resolution		Error limits
0 ... 400 Ω	0.1 Ω		±1% of meas. value
0 ... 4 kΩ	1 Ω		
Continuity test			
Continuous audible signal with resistance < 40 Ω			
In addition for clip-on voltmeter F13:			
<b>Frequency measurement</b>			
Meas. range	Resolution		Error limits
0 ... 4 kHz	1 Hz		±0.1% of meas. val. + 1 D
Power supply	9-V battery to IEC 6LR61 (E-Block)		
Operating temperature	0 to 50 °C		
Opening	42 mm dia. for circular conductors 50 x 10 mm for flat conductors		
Dimensions (w x h x d)	44 mm x 37 mm x 252 mm		

Ordering data			
Designation	kg	Order No.	
<b>Current transducer</b>	0,1	<b>7KA1410-8AA</b>	

Ordering data			
Designation	kg	Order No.	
<b>Clip-on voltmeter F11</b> with 1 pair of connection leads with test prods, battery, instructions and ever-ready carrying case	0.6	<b>5VW7150-6</b>	
<b>Clip-on voltmeter F13</b> for RMS measurement (AC): Included in delivery : See above	0.6	<b>5VW7153</b>	

## Clip-on voltmeters

1

### Clip-on voltmeter LH630

- Direct currents up to 1000 A  
Alternating currents up to 600 A
- DC/AC voltages up to 600 V
- Resistance measurement, diode and continuity test
- Automatic range and zero setting
- High accuracy
- Satisfies ICE 1010 and EMC standards according to CE

### In addition for clip-on voltmeter LH635:

- True RMS measurements with distorted and non-sinusoidal alternating currents and voltages (peak factor 6)
- Hold function for display of maximum measured value



Technical data			
<b>DC/AC measurements</b> (automatic range selection)			
Meas. range	Resolution	Measurement mode	Error limits
0 ... 400 A	0.1 A	DC (1000 A)	± 1.3 % of m. v.
0 ... 600 A	1 A	DC, AC (15 Hz to 1 kHz)	± 3 digits
Max. overload 10 000 A			
<b>DC/AC measurements</b> (automatic range selection)			
Meas. range	Resolution	Measurement mode	Error limits
0 ... 400 V	0.1 V	DC, AC (15 Hz to 1 kHz)	± 1 % of m. v.
0 ... 600 V	1 V		± 3 digits
Max. overload 1000 V			
Input impedance 1 MΩ			
<b>Resistance measurement</b> (automatic range selection)			
Meas. range	Resolution		Error limits
0 to 400 Ω	0.1 Ω		± 1 % of m. v.
0 to 4 kΩ	1 Ω		± 3 digits
<b>Continuity test</b> Continuous audible signal with resistance < 50 Ω			
<b>Diode test</b> Indicates conducting-state voltages up to 2 V or diodes Open circuit (max. 3.2 V): Error limits ± 1 % of meas. value ± 2 digits 0.3 mA short-circuit			
Display	4-digit, digital LCD display		
Cable diameter	1 x 35 mm or 2 x 20 mm		
Operating temperature	0 to 50 °C		
Included in delivery	Battery, case, measurement leads and instructions		

Ordering data			
Designation	kg	Order No.	
<b>Clip-on voltmeter</b> LH630 LH635		<b>7KB4204-8AA</b> <b>7KB4204-8AB</b>	

### Clip-on voltmeter LH1020:

- Alternating currents /pp up to 1000 A
- DC/AC voltages up to 600 V
- Resistance measurement, diode and continuity test
- Automatic range and zero setting
- Hold function for measured values
- High accuracy
- Satisfies the ICE 1010 and EMC standards according to CE

### In addition for clip-on voltmeters LH1025:

- True RMS measurement (TRMS) with distorted and non-sinusoidal alternating currents and voltages (peak factor 6)
- Hold function for display of maximum measured value



Technical data			
<b>AC measurements</b> (automatic range selection)			
Meas. range	Resolution	Frequency range	Error limits
0 ... 400 A	0.1 A	LH1020: AC (45...400 Hz)	± 1.3 % of m. v.
0 ... 1000 A	1 A	LH1025: AC (15 Hz...1 kHz)	± 3 digits
Max. overload 10 000 A			
<b>DC/AC measurements</b> (automatic range selection)			
Meas. range	Resolution	Measurement mode/Frequen.	Error limits
0 ... 400 V	0.1 V	LH1020: AC (45...400 Hz), DC	± 1 % of m. v.
0 ... 600 V	1 V	LH1025: AC (15...1 kHz), DC	± 3 digits
Max. overload 1000 V			
Input impedance 1 MΩ			
<b>Resistance measurement</b> (automatic range selection)			
Meas. range	Resolution		Error limits
0 to 400 Ω	0.1 Ω		± 1 % of m. v.
0 to 4 kΩ	1 Ω		± 3 digits
<b>Continuity test</b> Continuous audible signal with resistance < 50 Ω			
<b>Diode test</b> Forms continuity voltages from diodes to 2 V Open circuit (max. 3.2 V): Error limits ± 1 % of meas. value ± 2 digits 0.3 mA short-circuit			
Display	4-digit, digital LCD display		
Cable diameter	1 x 50 mm or 2 x 30 mm		
Operating temperature	0 to 50 °C		
Included in delivery	Battery, case, measurement leads and instructions		

Ordering data			
Designation	kg	Order No.	
<b>Clip-on voltmeter</b> LH1020 LH1025		<b>7KB4205-8AA</b> <b>7KB4205-8AB</b>	

# Clip-on measuring instruments

## B4206 clip-on multimeters

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### Accurate, rugged, versatile, reliable

- Three versions: 200 A, 1000 A and 2000 A
- AC and DC amps, volts,  $\Omega$ , diode and continuity test
- Jaw accommodates 50 mm dia. or 2 x 30 mm dia. cables
- True RMS measuring of complex waveforms and analysis of AC and DC components
- Auto-ranging and auto-zeroing
- Excellent accuracy, even with distorted and sinusoidal currents and voltages
- Display hold mode and max. value storage (surge)
- Analog output for recorders, loggers or oscilloscopes
- Satisfies IEC 1010 and EMC standards (CE)



### Technical data, part 1

Model	LH240	LH1040	LH2040
<b>Contactless current measurement</b>			
Measuring ranges (autom. range selection)	40 A, 200 A	400 A, 1000 A	400 A, 2000 A
Measurement mode	DC or AC true RMS value or only DC		
Resolution	10 mA (40 A range) 100 mA (200 A range)	100 mA (400-A range) 1 A (1000-A range)	100 mA (400-A range) 1 A (2000-A range)
Accuracy	$\pm 1.3$ % of measured value + 3 digits <sup>1)</sup>		
Crest factor	max. 6 for true RMS value measurement		
Max. measurable value	200 A DC or AC peak	1000 A DC or AC peak	2000 A DC or AC peak
Max. overload	10000 A		
<b>Analog output <sup>2)</sup></b>			
Switchable actual or RMS value (100 ms) output	5 mV / A	1 mV / A	0.5 mV / A
Accuracy	$\pm 1.3$ % of measured value $\pm 1$ mV <sup>1)</sup>		

### Technical data, part 2 (common data)

<b>Voltage measurement</b>	
Measurement mode	AC true RMS or DC <sup>4)</sup>
Max. overload	1000 V
Measuring ranges (autom. range selection)	400 V, 600 V
Accuracy	$\pm 1$ % of measured value $\pm 3$ digits <sup>1)</sup>
Resolution	100 mV (400 V range); 1 V (600 V range)
Crest factor	6 for V < 1000 V surge
Input impedance	1 M $\Omega$
<b>Resistance, continuity and diode test</b>	
$\Omega$ -measuring ranges (autom. range selection)	400 $\Omega$ , 4 k $\Omega$
$\Omega$ -resolution	0.1 $\Omega$ (400- $\Omega$ range), 1 $\Omega$ (4-k $\Omega$ range)
$\Omega$ -accuracy	$\pm 1$ % of measured value $\pm 3$ digits <sup>1)</sup>
Continuity buzzer (only $\Omega$ range)	with ))) key, on and off; buzzes when resistance < 50 $\Omega$
Input protection $\Omega$ and diode test (sinusoidal form)	To 600 V, DC or effective value
Diode test max. 3.2 V	Displays continuity voltages from diodes up to 2 V
Open circuit 0.3 mA short-circuit	
Diode test accuracy	$\pm 1$ % of measured value $\pm 2$ digits
<b>Frequency range</b> (measurement and analog output)	
Only AC true RMS V and A	15 Hz ... 1 kHz <sup>3) 4)</sup>
DC RMS A	DC + 15 Hz ... 1 kHz <sup>3) 4)</sup>
DC V and A	only DC
<b>Display</b>	
Dimensions and type	4-digit, liquid-crystal display, 12 mm character
Status display	weak battery, measured value holding function, surge (max. value), AC, DC diode test, $\Omega$ , ))) (continuity test)
Refresh rate	3 times/s

### Power supply

Battery type

9-V alkaline battery: MN1604, PP3. IEC 6LR61 or similar

Battery service life

Approx. 40 hours

### Mechanical data

Dimensions (h x w x d):

251 mm x 98 mm x 52 mm

Weight

500 g

Cable diameter

1 x 50 mm dia. or 2 x 30 mm dia.

Jaw opening

55 mm

### Ambient data

Operating temperature

0 °C ... 50 °C

Temperature coefficient (current)

$\pm 0.1$  % of measured value per °C

Storage temperature

-20° ... 60°

### Protection class

All versions fulfill IEC 1010-1. 600-V operation, installation category III, contamination degree 2.

### Max. permissible voltages

Current measurements (non-isolated conductor)

600 V AC RMS or DC between non-insulated conductor and earth

Voltage measurement

600 V AC RMS without DC between input terminals or between current conductor and local earth

### Ordering data

Designation	kg	Order No.
<b>Clip-on multimeter</b>		
LH240		7KB4206-8AA
LH1040		7KB4206-8AB
LH2040		7KB4206-8AC

Note:

- 1) All given accuracies are valid at 23 °C  $\pm 1$  °C
- 2) Analog output of plug-in adapter with normal BNC output jack
- 3) At given accuracy: 5 kHz (-3dB)
- 4) True RMS each 100 ms

## Clip-on ammeters and clip-on current transformers

### Clip-on current transformer B4202



Dimensions (h x w x d) 196 x 71 x 31 mm / 7.71 x 2.80 x 1.20 "  
 Weight 295 g / 0.65 lbs.  
 Jaw 1 x 30 mm / 1.16 inch diameter cable  
**Maximum permissible voltages**  
 measurement (bare conductor) 300 V AC effective or DC between non-isolated earth conductor and earth

Technical data	
<b>Non-evasive current measurement</b> ranges (automatic range adjustment) Measuring principle	400 A , 1000 A Effective value of AC or DC
Resolution	100 mA (range 400 A), 1 A (range 1000 A)
Basic accuracy	± 1.3 % of display, ± 5 digits
Measurable maximum load	1000 A DC or AC current, peak value
Maximum overload	10,000 A
<b>Frequency</b> AC A DC A	40 to 400 Hz only DC
<b>Display</b> Size and type	LCD with 4000 elements Digit size 10 mm/0.4 inch
Status display	weak battery, polarity
Display change frequency	3 times per second
<b>Power supply</b> Battery type	9 V alkaline: MN1604, PP3 IEC 6LR6 1 or equivalent
Battery service life	50 hours, typical

Ordering data			
Designation	kg	Order No.	
<b>Clip-on current transformer B4202</b>		<b>7KB4202-8AB</b>	

### Clamp-on ammeter range A1407



PR30

PR20

PR200

Technical data				
Model	PR30	PR20	PR200	
Parameter	Oscilloscope sensor	Multimeter/sensor probe	Multimeter/sensor probe	Multimeter/sensor probe
Current ranges	20 A ~/30 A -	20 A ~/30 A -	20 A ~/30 A -	200 A ~/300 A -
Resolution	± 1 mA	± 1 mA	± 10 mA	± 100 mA
Output range	100 mV/A	100 mV/A	10 mV/A	1 mV/A
Measurement accuracy	± 1 % ± 2 mA	± 1 % ± 2 mA	± 1 % ± 0.03 mA	± 1 % ± 0.3 mA
Frequency range	Direct current to 100 kHz	Direct current to 20 kHz	Direct current to 10 kHz	Direct current to 10 kHz
Response time	< 1 µs	< 1 µs	< 10 µs	< 10 µs
Dielectric strength	3.7 kV <sub>eff</sub> - 50 Hz, 1 min.	3.7 kV <sub>eff</sub> - 50 Hz, 1 min.	3.7 kV <sub>eff</sub> - 50 Hz, 1 min.	3.7 kV <sub>eff</sub> - 50 Hz, 1 min.
Opening in mm	19	19	19	19

### AC/DC Clip-on current transformer PR2000



The PR 2000 current transformer was developed as clip-on tool for multimeters, oscilloscopes and recorders. The application of sophisticated hall effect technology permits highly accurate measurement of AC and DC to 2000 A. The large jaw also permits measurements on current rails.

Technical data	
Meas. range	2000 A DC or AC peak
Conductor dielectric strength	50 mm diameter
Accuracy	1 % ± 0.5 A
Frequency range	DC - 10 kHz
Output	1 mV/A
Connection	2 m connection cable with 4 mm banana plugs
Battery service life	75 h in continuous operation
International safety (IEC 1010) and EMC standards are kept, of course.	

Ordering data			
Designation	kg	Order No.	
<b>Clip-on current transformer PR30</b>		<b>7KA1407-8BD</b>	
<b>Clip-on current transformer PR20</b>		<b>7KA1407-8BB</b>	
<b>Clip-on current transformer PR200</b>		<b>7KA1407-8BC</b>	
<b>Clip-on current transformer PR2000 AC/DC</b>		<b>7KA1407-8CA</b>	

# Clip-on measuring instruments

## Clip-on current converter

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### Clip-on current converter A1406



Technical data	
Nominal current	500 A
Measuring range	4 to 500 A
Transformation ratio	1000: 1 ( $U_{AC}$ 1 mA/1 A)
Frequency range	48...1000 Hz
Load	max. 5 $\Omega$
Error limits	3% of meas. value + 0.4 A (at $\leq 5 \Omega$ )
Working voltage $U_{eff}$	max. 660 V
Testing voltage	4 kV
No-load voltage	max. 40 V, no risk disconnection of secondary circuit possible
Passage opening	
- for round lead	30 mm dia.
- for flat lead	63 mm x 5 mm
Measurements (w x h x d)	66 x 34 x 195 mm
Connection	4 mm jack
Weight	0.45 kg

### Clip-on current converter A1407



Technical data	
Parameters	Multimeter and pick-up measuring sensor
Current measuring range	200 A AC / 300 A DC 1000 A AC peak / 1000 A DC
Resolution	100 mA
Output sensitivity	1 mV/A
Measuring accuracy	$\pm 1\% \pm 0.5 A$
Frequency range	DC to 10 kHz
Response time	< 10 $\mu S$
Dielectric strength	3.7 kW - 50 Hz, 1 minute
Opening	31 mm max.

### Clip-on current converter A1408



Technical data	
Parameters	Multimeter and pick-up measuring sensor
Nominal current	1000 A AC
Measuring range	0.1 ... 1200 A AC
Transformation ratio	1000 : 1
Frequency range	30 ... (48..65) ... 5000 Hz
Load	< 5 Ohm
Measuring accuracy	< 0.75% at 100% h
Opening	54 mm max.

Ordering data			
Designation	kg	Order No.	
Clip-on current converter A1406	0.45	7KA1406-8AA	
Clip-on current converter A1407	0.4	7KA1407-8BA	
Clip-on current converter A1408	0.65	7KA1408-8BA	



**The flexible current transducer A1403  
for multimeters, recorders and oscilloscopes**

**The flexible current transducer A1403 II  
for multimeters, recorders and oscilloscopes**

Technical data	A1403	A1403 II
Measuring ranges ① / ②	30/300 A; 300/3000 A AC	30 / 300 / 3000 A AC
Output sensitivity	Measuring range ① = 100 mV/A and 10 mV/A ② = 10 mV/A and 1mV	100 mV / 10 mV / 1 mV pro A
Maximum output signal	3 VAC RMS or 4.2 V pK	3 VAC RMS or 4.2 V pk
Accuracy	Amplitude Phase angle	
	± 1% of measuring range > ± 0.5°, 50 ... 60 Hz	± 1% of measuring range > ± 0.5°, 45 ... 65 Hz
Reproducibility	± 0.1%	± 0.1%
Frequency response, (-3 dB point)	8 Hz ... 100 kHz	1 Hz ... 20 kHz
DC voltage offset	1 mV	1 mV
Temperature sensitivity	Amplification change, ± 0.08% / °C DC voltage offset, ± 0.006 mV / °C	
Position sensitivity	to conductor from adjacent cond. ± 1%	< ± 2% of measuring range at 2.5 cm distance
Isolation	5 kV rms/60 Hz/1 minute	5550 VAC 1 minute
Load impedance	> 500 Ω	> 1000 Ω
Physical properties		
Working temperature range	-20 °C ... 85 °C	-20 °C ... 70 °C
Current transducer	Circumference 61 cm (24 inch); 91 cm (36 inch); 122 cm (48 inch) minim. bending radius 38,1 mm Connection cable length 2 m, weight 180 g	Circumference 61 cm (24 inch); minim. bending radius 38,1 mm Connection cable length 2 m, weight 180 g
Electronic box	Dimensions (h x w x d) 26 x 61 x 97 mm Weight 45 g, batteries 2 x 1.5 V AA cells, Connection plug BNC female	Dimensions (h x w x d) 38.1 x 50.8 x 190.5 mm, 2 x 9 V block batteries
Control elements	Switch: ① / off / ② LED blinks once in three seconds	Switch: range selection and "on / off"
Accessories	BNC cable male/male 30 cm Adapter BNC female / 4 mm banana plug	
External voltage (option)	3 V = /100 mA	
Ordering Data	Order No.	Order No.
<b>Current transducer A1403</b> 61 cm circum. meas. range 30/300 61 cm circum. meas. range 300/3000 61 cm circum. meas. range 30/300/3000 A	<b>7KA1403-8AA</b> <b>7KA1403-8AB</b> —	— — <b>7KA1403-8BA</b>

