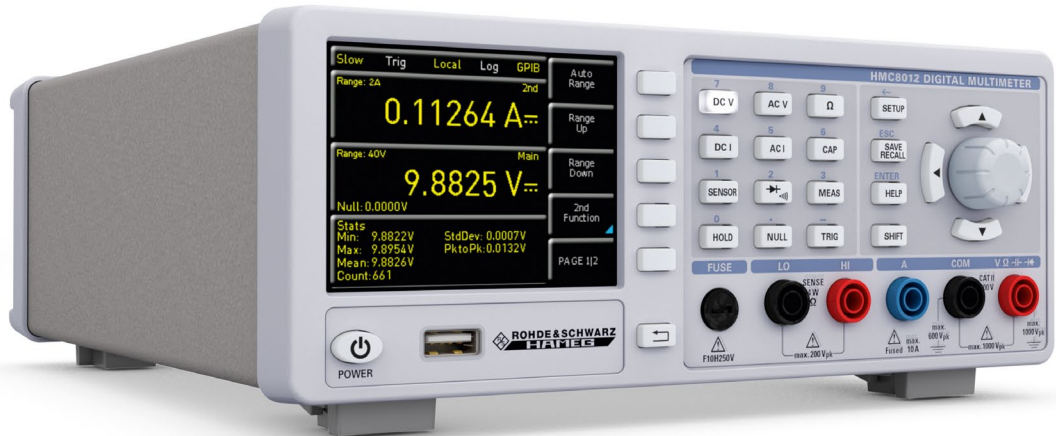


## Digital Multimeter HMC8012



HMC8012



HMC8012 - rear view of GPIB-version



HZC95 19" rackmount kit 2RU



HZ15 (included) Silicon test lead with safety connector and probe



- ✓ 5<sup>3</sup>/<sub>4</sub>-Digit Display (480,000 Counts)
- ✓ Simultaneous Display of 3 Measurements, e.g. DC + AC + Statistics
- ✓ Up to 200 Measurements per Second
- ✓ DC Basic Accuracy 0,015%
- ✓ 12 Measurement Functions: DCV, DCI, True RMS, ACV and ACI, Frequency, 2- and 4-Wire Resistance, Capacitance, Continuity, Diode Test, Temperature, Power
- ✓ Crisp color TFT display for excellent readability
- ✓ Resolution: 1 $\mu$ V, 100nA, 1m $\Omega$ , 1pF, 1Hz, 0,1 $^{\circ}$ C
- ✓ True RMS Measurement AC, AC + DC
- ✓ Mathematic Functions: Limit Testing, Minimum/Maximum, Average, Offset, DC Power, dB, dBm
- ✓ Temperature Measurements with Platinum Sensors (PT100/PT500/PT1000)
- ✓ Data Logging in .CSV-Format to Internal Memory or USB-Stick
- ✓ Interfaces: USB-TMC and Ethernet/LXI, optional IEEE-488 (GPIB)
- ✓ SCPI commands widely compatible with Agilent 34410A

## Digital Multimeter HMC8012

All data valid at 23°C ±5K after 90 minutes warm-up and with 5% digits.

DC Specifications DC Accuracy in ± [% of reading + % of range]:					
Function	Range <sup>1)</sup>	Test Current Voltage drop	Input Impedance	1 Year 23°C ±5 K	Temp. Coefficient 0-18°C, 28-55°C
DC Voltage	400,000 mV		10 MΩ/>10 GΩ	0,015+0,002	0,0010+0,0005
	4,00000V		10 MΩ/>10 GΩ	0,015+0,002	0,0008+0,0003
	40,0000V		10 MΩ	0,020+0,002	0,0010+0,0005
	400,000V		10 MΩ	0,020+0,002	0,0015+0,0005
	1000,00V		10 MΩ	0,025+0,002	0,0015+0,0005
Resistance (2/4-wire) <sup>2)</sup>	400,000 Ω	1 mA		0,050+0,005	0,0020+0,0005
	4,00000 kΩ	1 mA		0,015+0,002	0,0020+0,0002
	40,0000 kΩ	100 μA		0,015+0,002	0,0020+0,0002
	400,000 kΩ	10 μA		0,030+0,003	0,0020+0,0002
	4,00000 MΩ	1 μA		0,060+0,005	0,0020+0,0002
	40,0000 MΩ	100 nA		0,250+0,003	0,0080+0,0005
	250,000 MΩ	460 nA    10 MΩ (parallel)		2,000+0,010	0,200+0,0005
DC Current <sup>4)</sup>	20,0000 mA	<0,30V		0,05+0,010	0,008+0,0010
	200,000 mA	<0,27V		0,05+0,010	0,008+0,0010
	2,00000 A	<0,2V		0,25+0,070	0,012+0,0015
	10,0000 A <sup>3)</sup>	<0,60V		0,25+0,070	0,010+0,0010
Continuity	4000 Ω	1 mA		0,05+0,010	0,005+0,0005
Diode Test	5V	1 mA		0,05+0,010	0,005+0,0005

- Notes:**
- 1) 240.000 / 480.000 counts except in 1000V and 10A range
  - 2) Specifications are for 4-wire measurement; 2-wire measurement using NULL function.
  - 3) Maximum current load at >5A is 30 seconds, followed by a pause of >30 seconds
  - 4) At 250V maximum

AC Specifications AC Accuracy in ± [% of reading + % of range]:					
Function	Range <sup>1)</sup>	Frequency	1 Year 23°C ±5 K	Temp. Coefficient 0-18°C, 28-55°C	
AC Voltage <sup>2)</sup>	400,000 mV	} 10 Hz–20 Hz 20 Hz–45 Hz 45 Hz–20 kHz 20 kHz–50 kHz 50 kHz–100 kHz	3,0+0,05	0,01+0,01	
	4,00000V		1,5+0,05	0,01+0,01	
	40,0000V		0,3+0,05	0,01+0,01	
	400,000V		1,0+0,05	0,02+0,01	
	750,00V <sup>4)</sup>		3,0+0,05	0,05+0,01	
AC Current <sup>5)</sup>	20,0000 mA	} 20 Hz–40 Hz 40 Hz–1 kHz 1 kHz–5 kHz 5 kHz–10 kHz <sup>3)</sup>	1,5+0,05	0,01+0,01	
	200,000 mA		0,5+0,05	0,01+0,01	
	2,00000 A		1,5+0,05	0,01+0,01	
	10,0000 A <sup>4)</sup>		2,5+0,05	0,01+0,01	

- Notes:**
- 1) 240.000 / 480.000 counts except in 750V and 10A range
  - 2) Specifications are for sinusoidal curves. Input impedance is 1 MΩ parallel <100 pF
  - 3) Except 10A range
  - 4) Maximum current load at >5A is 30 seconds, followed by a pause of >30 seconds
  - 5) At 250V maximum
  - 6) For ACV measurements and frequencies above 50 kHz the user is required to choose an appropriate measurement range.

Frequency Counter Specifications Frequency Accuracy in ± [% of reading]:				
Function	Range <sup>1)</sup>	Frequency	1 Year 23°C ±5 K	Temp. Coefficient 0-18°C, 28-55°C
AC Voltage <sup>2)</sup>	all ranges	5 Hz–700 kHz	0,01	0,005
AC Current <sup>2)</sup>	20 mA, 200 mA	5 Hz–10 kHz	0,01	0,005
	2 A, 10 A	5 Hz–5 kHz	0,01	0,005

- Notes:**
- 1) Display of frequency available as 2nd measurement for main functions ACV and ACI
  - 2) Input sensitivity: >7,5% of full scale (5 Hz–400 kHz) resp. >20% (400–700 kHz)

Frequency Counter Resolution			
Setting	Measurement time	Display range	Resolution
Slow	1 s	999,999 kHz	1 Hz
Medium	100 ms	999,99 kHz	10 Hz
Fast	10 ms	999,9 kHz	100 Hz

Capacitance Specifications Capacitance Accuracy in $\pm$ (% of reading + % of range):			
Function	Range	1 Year 23°C $\pm$ 5K	Temp. Coefficient 0-18°C, 28-55°C
Capacitance	5,000 nF	2,0 $\pm$ 2,5	0,02 $\pm$ 0,002
	50,00 nF	1,0 $\pm$ 2,0	0,02 $\pm$ 0,002
	500,0 nF	1,0 $\pm$ 0,5	0,02 $\pm$ 0,002
	5,000 $\mu$ F	1,0 $\pm$ 0,5	0,02 $\pm$ 0,002
	50,00 $\mu$ F	1,0 $\pm$ 0,5	0,02 $\pm$ 0,002
	500,0 $\mu$ F	2,0 $\pm$ 1,0	0,02 $\pm$ 0,002

General Information	
Power supply:	115V / 230V $\pm$ 10%, adjustable voltage selector on rear panel; Frequency 50Hz / 60Hz
Power consumption:	25W max., 12W typ.
Ambient temperature:	0...+55°C (operating); -40...+70°C (storage)
EMC compliance:	DIN EN 61326-1, DIN EN 55011
Safety compliance:	DIN EN 61010-1, CAN/CSA-C22.2 No. 61010-1-12
Measuring Category:	CAT II, 600V; CAT I, 1000V <sub>DC</sub> , 750V <sub>AC RMS</sub>
Dimensions (W x H x D):	222 x 88 x 280 mm
Weight:	approx. 2.7 kg
Warm-up time:	90 minutes

All data valid at 23°C  $\pm$ 5K after 90 minutes warm-up and with 5 ½ digits

Additional Specifications	
<b>DC voltage</b>	
Measuring Method	Sigma Delta analog/digital converter
Input Resistance	>10 G $\Omega$ (selectable for ranges 400 mV / 4 V 10 M $\Omega$ (on all ranges)
CMRR	120 dB for VCM <500V, 1 k $\Omega$ unbalance in the LO-line and 5 measurements/second
SMRR	>60 dB for 50 or 60Hz $\pm$ 0,1% and 5 measurements/second
Input current	60 pA for 25°C
Overload protection	1000V for all ranges
<b>AC voltage</b>	
Measuring Method	AC coupled True RMS measurement
Input Resistance	1 M $\Omega$ parallel <100 pF (on all ranges)
Crest Factor	Max. 10 (0,5% additional measurement uncertainty)
CMRR	>60 dB 1 k $\Omega$ in the LO-line and frequency <60 Hz
Overload protection	750 V <sub>rms</sub> (for all ranges)
<b>AC current / DC current</b>	
Shunt Resistance	13,75 $\Omega$ for 20 mA; 1,25 $\Omega$ for 200 mA; 25 m $\Omega$ for 2 A, 10 A
Overload protection	Fuse: F10H250V on the front panel
<b>Resistance</b>	
Measuring Method	2-wire and 4-wire
Overload protection	1000V for all ranges
<b>Continuity</b>	
Measuring Method	1 mA constant current
Threshold value	Adjustable in 1 $\Omega$ steps
Response Time	200 measurements/second
Overload protection	1000V
<b>Diode Test</b>	
Measuring Method	1 mA constant current
Threshold value	Adjustable in 10 mV steps
Response time	10 measurements/second
Overload protection	1000V
<b>Temperature</b>	
Measurement method	Resistance measurement with platinum sensor
Sensor types	PT100, PT500, PT1000
Connection	2-wire, 4-wire
Overload protection	1000V
<b>Math Functions</b>	
Statistics	Min/Max/Average/Standard deviation
Relative measurement	NULL key, offset via keyboard
Logarithmic functions	dB: Reference level via keyboard or NULL key dBm: Reference impedance 50/75/600 $\Omega$ or freely selectable
<b>Data logging</b>	
Number of measuring counts	Internal: 50,000; external: defined by USB stick capacity.
Rate Log	Min.: 5 ms typ. (in accordance to measuring function and resolution) Max: 3.600 s
Duration Log	Internal: 250 s...50.000 h; external: defined by USB stick capacity
Data Log	Main, 2nd, Time-Stamp
<b>Interfaces</b>	
	USB 2.0 (TMC and CDC/VCP), Ethernet 10/100 (LXI), IEEE-488/GPIB optional
<b>Programming</b>	
	SCPI, compatible with Agilent 34401A and 34410A

Reading Rates				
Function	Setting	Resolution	Display	Reading Rates (per sec.)
AC Voltage	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	200
DC Voltage	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	200
AC Current	Slow	5 3/4	200,000	5
	Medium	4 3/4	20,000	10
	Fast	4 3/4	20,000	200
DC Current	Slow	5 3/4	200,000	5
	Medium	4 3/4	20,000	10
	Fast	4 3/4	20,000	200
Resistance (2-wire)	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	50
Resistance (4-wire)	Slow	5 3/4	400,000	5
	Medium	4 3/4	40,000	10
	Fast	4 3/4	40,000	25
Frequency	Slow	6	999,999	1
	Medium	5	99,999	10
	Fast	4	9,999	100
Diode		4 3/4	40,000	10
Continuity		4 3/4	40,000	200
Temperature		4	999,9	10

**Accessories supplied:** Line cord, printed operating manual, HZ15 Silicon test lead with safety connector and test probe, 1m (black + red), Software-CD

**Recommended accessories:**

HZ812	PT100 Temperature probe 2-wire
HZ887	PT100 Temperature probe 4-wire
HZC95	19" rackmount kit 2RU for HMC series