

# HM8012

## 4<sup>3</sup>/<sub>4</sub>-Digit–Multimeter

### Technical Data

**HAMEG**<sup>®</sup>  
Instruments  
A Rohde & Schwarz Company

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#### Key facts

- 4<sup>3</sup>/<sub>4</sub> digit display with 50,000 counts
- Basic accuracy 0.05%
- Automatic and manual range selection
- Max. resolution 10 $\mu$ V, 0.01dBm, 10nA, 10m $\Omega$ , 0.1 $^{\circ}$ C/ $^{\circ}$ F
- Offset function/relative value measurement in basic measurement functions
- Input impedance  $\geq$ 1G $\Omega$  (0.5V and 5V DC range)
- RS-232 interface
- PC software for control and data logging
- Mainframe HM8001-2 required for operation

# Technical Data

## 4<sup>3/4</sup>-Digit Multimeter

### HM8012

Valid at 23 degrees C after a 30 minute warm-up period.

#### DC voltages

|                                         |                                                                                                                                                        |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement ranges:                     | 500mV, 5V, 50V, 500V, 600V                                                                                                                             |
| Resolution:                             | 10µV, 100µV, 1mV, 10mV, 100mV                                                                                                                          |
| Accuracy:                               | 5V, 500V, 600V: ±(0,05% of rdg. <sup>1)</sup> + 0,002% of fs. <sup>2)</sup><br>500mV, 50V: ±(0,05% of rdg. <sup>1)</sup> + 0,004% of fs. <sup>2)</sup> |
| Overload protection:                    |                                                                                                                                                        |
| V/Ω/T°/dB/◀ against COM and to chassis: | 850 Vp at max.60 Hz or 600 VDC                                                                                                                         |
| Low against chassis:                    | 250 Vrms at max. 60 Hz or 250 VDC                                                                                                                      |
| Input resistance:                       |                                                                                                                                                        |
| 50V-, 500V-, 600V:                      | 10MΩ  90pF                                                                                                                                             |
| 500mV-, 5V:                             | >1GΩ  90pF                                                                                                                                             |
| Input current:                          | 10A                                                                                                                                                    |
| CMRR <sup>3)</sup> :                    | ≥100dB (50/60Hz ± 0,5%)                                                                                                                                |
| SMRR <sup>4)</sup> :                    | ≥60dB (50/60Hz ± 0,5%)                                                                                                                                 |

#### dB Mode

|             |                                           |
|-------------|-------------------------------------------|
| Accuracy:   | ±(0,02dB + 2 digits) (display > -38,7dBm) |
| Resolution: | 0.01 dB above 18% of fs. <sup>2)</sup>    |

#### DC current

|                     |                                                                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement ranges: | 500µA, 5mA, 50mA, 500mA, 10A                                                                                                                 |
| Resolution:         | 10nA, 100nA, 1µA, 10µA, 1mA                                                                                                                  |
| Accuracy:           | 0,5 – 500mA: ±(0.2% of rdg. <sup>1)</sup> + 0.004% of fs. <sup>2)</sup> ,<br>10A: ±(0.3% of rdg. <sup>1)</sup> + 0.004% of fs. <sup>2)</sup> |
| Voltage drop:       |                                                                                                                                              |
| 10 A range:         | 0,2 V max.                                                                                                                                   |
| 500 mA range:       | 2,5 V max.                                                                                                                                   |
| other ranges:       | 0,7 V max.                                                                                                                                   |

#### AC voltage

|                                         |                                 |
|-----------------------------------------|---------------------------------|
| Measurement ranges:                     | 500mV, 5V, 50V, 500V, 600V      |
| Resolution:                             | 10µV, 100µV, 1mV, 10mV, 100mV   |
| Accuracy 0,5 - 50V:                     |                                 |
| 40Hz - 5kHz:                            | ±(0,4% v.M. + 0,07% v.E.)       |
| 20Hz - 20kHz:                           | ±(1% v.M. + 0,07% v.E.)         |
| 500V and 600V:                          |                                 |
| 40Hz - 1kHz:                            | ±(0,4% v.M.1) + 0,07% v.E.2)    |
| 20Hz - 1kHz:                            | ±(1% v.M.1) + 0,07% v.E.2)      |
| Overload protection:                    |                                 |
| V/Ω/T°/dB/◀ against COM and to chassis: | 850 Vs at max.60 Hz or 600 VDC  |
| Low against chassis:                    | 250 Vs at max. 60 Hz or 250 VDC |
| Input impedance                         |                                 |
| AC mode:                                | 1MΩ  90pF                       |
| AC + DC mode:                           | 10MΩ  90pF                      |
| Bandwidth at -3dB:                      | 80kHz typical                   |
| dB Mode:                                | 20Hz - 20kHz                    |
| Accuracy:                               | ±0,2dBm (-23,8 – 59,8dBm)       |
| Resolution:                             | 0,01 dB oberhalb 9mV            |
| CMRR <sup>3)</sup> :                    | 60dB (50/60Hz ± 0,5%)           |
| Crest factor:                           | 7 max.                          |

#### AC current

|                     |                              |
|---------------------|------------------------------|
| Measurement ranges: | 500µA, 5mA, 50mA, 500mA, 10A |
|---------------------|------------------------------|

|             |                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resolution: | 10nA, 100nA, 1µA, 10µA, 1mA                                                                                                                          |
| Accuracy:   | 0,5 - 500mA: ±(0,7% of rdg. <sup>1)</sup> + 0,07% of fs. <sup>2)</sup> for 40Hz-5kHz<br>10A: ±(1% of rdg. <sup>1)</sup> + 0,07% of fs. <sup>2)</sup> |

#### AC + DC measurements

Same as AC + 25 Digits

#### Resistance

|                                  |                                                                                                                                                                 |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement ranges:              | 500Ω, 5kΩ, 50kΩ, 500kΩ, 5MΩ, 50MΩ                                                                                                                               |
| Resolution:                      | 10mΩ, 100mΩ, 1Ω, 10Ω, 100Ω, 1kΩ                                                                                                                                 |
| Accuracy:                        | 500Ω bis 500kΩ: ±(0,05% of rdg. <sup>1)</sup> + 0,004% of fs. <sup>2)</sup> + 50mΩ)<br>5MΩ und 50MΩ: ±(0,3% of rdg. <sup>1)</sup> + 0,004% of fs. <sup>2)</sup> |
| Input protected to max. 300 Veff |                                                                                                                                                                 |
| Measurement current              |                                                                                                                                                                 |
| 500Ω – 5kΩ-range:                | 1 mA                                                                                                                                                            |
| 50kΩ-range:                      | 100 µA                                                                                                                                                          |
| 500kΩ-range:                     | 10 µA                                                                                                                                                           |
| 5 - 50MΩ-range:                  | 100 nA                                                                                                                                                          |
| Measurement voltage:             | 10V typical for open inputs, depending on the value of resistance to be measured. Negative polarity of measurement voltage is across common terminal.           |

#### Temperature

2-wire resistance measurement with linearization for PT100 sensors as per standard EN60751

|                      |                                                                                                                            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------|
| Range:               | -200°C to +500°C                                                                                                           |
| Resolution:          | 0,1°C                                                                                                                      |
| Measurement current: | ca. 1 mA                                                                                                                   |
| Display:             | in °C, °F                                                                                                                  |
| Accuracy:            | -200°C to +200°C ± 0,4°C + 0,0005 x T<br>+200°C to +500°C ± 0,5°C + 0,0005 x T<br>(T in °C, sensor tolerance not included) |

#### Temperature coefficient

|     |                  |            |
|-----|------------------|------------|
| V = | 500mV, 50V       | 30 ppm/°C  |
|     | 600V range       | 80 ppm/°C  |
|     | other ranges     | 20 ppm/°C  |
| V~  | 600V range       | 80 ppm/°C  |
|     | other ranges     | 50 ppm/°C  |
| mA  | all ranges       | 200 ppm/°C |
| mA- | all ranges       | 300 ppm/°C |
| Ω   | 5 MΩ, 50 MΩ-rang | 200 ppm/°C |
|     | other ranges     | 50 ppm/°C  |

#### Miscellaneous

|                                                       |                                  |
|-------------------------------------------------------|----------------------------------|
| Operating temperature:                                | + 5°C to + 40°C                  |
| Storage temperature:                                  | -20°C to + 70°C                  |
| Max. relative humidity:                               | 5% to 80% (without condensation) |
| Power supply (from HM8001-2):                         |                                  |
| + 5 V                                                 | 300 mA                           |
| ~26 V                                                 | 140 mA                           |
| Size (W x H x D):<br>(without flat 22-pole connector) | 135 x 68 x 228 mm                |
| Weight:                                               | approx. 500g                     |

<sup>1)</sup> rdg. = reading; <sup>3)</sup> = Common mode rejection ratio;  
<sup>2)</sup> fs. = full scale;

#### Included in delivery:

User Manual, HZ14 Interface cable, HZ15 PVC Test Leads

#### Accessories:

|             |                     |
|-------------|---------------------|
| HZ10S/R/B   | Silicone Test Leads |
| HZ812 PT100 | Temperature Sensor  |