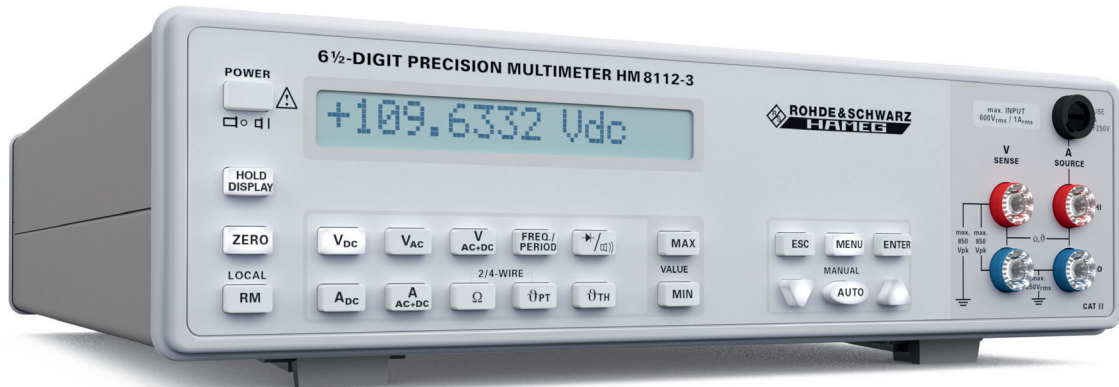
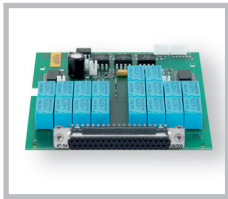


## 6½-Digit Precision Multimeter HM8112-3/HM8112-3S



HM8112-3

HM8112-3S:  
Multimeter with built-in  
scanner card (8+1 channels,  
2- and 4-Wire)



HZ42  
19" Rackmount kit 2RU



Precise temperature  
measurement with sensor



- ✓ Measurement range: DC to 300 kHz
- ✓ Resolution: 100 nV, 100 pA, 100 μΩ, 1 pF, 0,01 °C/F
- ✓ High accuracy: 0.003 % (DC), 0.08 % (AC)
- ✓ True RMS measurement, AC and AC+DC
- ✓ 6½-digit Display (1,200,000 counts)
- ✓ Measurement functions: voltage, current, resistance and temperature (PT100/PT1000 and Ni-Sensors) measurement, frequency and diode test (2- and 4-wire)
- ✓ Measurement intervals: 0.1 s to 60 s
- ✓ Mathematic functions: limit testing, Min/Max, average, offset
- ✓ Internal data logger for long-term acquisition
- ✓ Schnittstellen: RS-232/USB dual interface, IEEE-488 (GPIB) optional
- ✓ HM8112-3S: HM8112-3 with scanner card

## 6½-Digit Precision Multimeter HM8112-3/HM8112-3S

All data valid at 23 °C after 30 minutes warm-up.

### DC specifications

Ranges HM8112-3:	0.1V; 1V; 10V; 100V; 600V
Ranges HM8112-3S:	0.1V; 1V; 10V; 100V
Input impedance:	
0.1V, 1.0V	>1 GΩ
10V, 100V, 600V	10 MΩ
Accuracy:	Values given are in ±(% of reading (rdg.) + % of full scale (f.s.))

Range	1 year; % rdg.	23 °C ±2 °C % f.s.	Temp. coefficient 10 °C to 21 °C + 25 °C to 40 °C
0.1V	0.005	0.0006	0.0008
1.0V	0.003	0.0006	0.0008
10.0V	0.003	0.0006	0.0008
100.0V	0.003	0.0006	0.0008
600.0V	0.004	0.0006	0.0008

Integration time:	0.1 s	1 s to 60 s
Display range:	120.000 digit	1,200.000 digit
600V range	60.000 digit	600.000 digit
Resolution:	1 μV	100 nV
Zero point:		
Temperature drift	better than 0.3 μV/°C	
Long-term stability	better than 3 μV for 90 days	

### AC specifications

Ranges HM8112-3:	0.1V; 1V; 10V; 100V; 600V	
Ranges HM8112-3S:	0.1V; 1V; 10V; 100V	
Measurement method:	true rms, DC or AC coupled (not in 0.1V range)	
Input impedance:		
0.1V, 1V	1 GΩ    <60 pF	
10V to 600V	10 MΩ    <60 pF	
Response time:	1.5 sec to within 0.1 % of reading	
Accuracy:	For sine wave signals >5% of full scale	
	Values given are in ±(% of reading + % of full scale); 23 °C ±2 °C for 1 year	

Range	20 Hz to 1 kHz	1 kHz to 10 kHz	10 kHz to 50 kHz	50 kHz to 100 kHz	100 kHz to 300 kHz
0.1V	0.1+0.08	5+0.5 [5kHz]			
1.0V	0.08+0.08	0.15+0.08	0.3+0.1	0.8+0.15	7+0.15
10.0V	0.08+0.08	0.1+0.08	0.3+0.1	0.8+0.15	4+0.15
100.0V	0.08+0.08	0.1+0.08	0.3+0.1	0.8+0.15	
600.0V	0.08+0.08	0.1+0.08			

Temperature coefficient 10 °C to 21 °C and 25 °C to 40 °C; (% rdg. + % f.s.)		
at 20 Hz to 10 kHz	0.01 + 0.008	
at 10 kHz to 100 kHz	0.08 + 0.01	
Crest factor:	7:1 (max. 5x range)	
Integration time:	0.1 s	1 s to 60 s
Display range:	120.000 digit	1,200.000 digit
600V range	600.00 digit	600.000 digit
Resolution:	1 μV	100 nV
Overload protection:		
(V/Ω-HI to V/Ω-LO) and to chassis		
Measurement ranges	all	
all the time	850 V <sub>peak</sub> or 600 V <sub>dc</sub>	
Maximum input voltage LOW against chassis/safety earth	250 V <sub>rms</sub> at max. 60 Hz or 250 V <sub>dc</sub>	

### Current specifications

Ranges:	100 μA; 1 mA; 10 mA; 100 mA; 1 A		
Integration time:	0.1 s	1 s to 60 s	
Display ranges:	120.000 digit	1,200.000 digit	
1 A range	100.000 digit	1,000.000 digit	
Resolution:	1 nA	100 pA	
Accuracy:	DC	45 Hz to 1 kHz	1 kHz to 5 kHz
(1 year; 23 °C ±2 °C)	0.02 + 0.002	0.1 + 0.08	0.2 + 0.08
Temperature coefficient/°C: (%rdg. + %f.s.)	10 °C to 21 °C	25 °C to 40 °C	
	0.002+ 0.001	0.01+ 0.01	
Voltage:	<600 mV to 1.5V		
Response time:	1.5 s to within 0.1 % of reading		
Crest factor:	7:1 (max. 5x range)		
Input protection:	fuse, FF 1A 250V		

### Resistance

Ranges:	100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ	
Integration time:	0.1 s	1 s to 60 s
Display ranges:	120.000 digit	1,200.000 digit
Resolution:	1 mΩ	100 μΩ
Accuracy:	Values given are in ±(% of reading + % of full scale)	

Range	1 year; %rdg	23 °C ±2 °C %f.s.	Temp. coefficient/°C	
			10 °C to 21 °C	25 °C to 40 °C
100 Ω	0.005	0.0015	0.0008	0.0008
1 kΩ	0.005	0.001	0.0008	0.0008
10 kΩ	0.005	0.001	0.0008	0.0008
100 kΩ	0.005	0.001	0.0008	0.0008
1 MΩ	0.05	0.002	0.002	0.002
10 MΩ	0.5	0.02	0.01	0.01

Measurement current:	Range	Current
	100 Ω, 1 kΩ	1 mA
	10 kΩ	100 μA
	100 kΩ	10 μA
	1 MΩ	1 μA
	10 MΩ	100 nA

Max. measurement voltage: approx. 3V

Overload protection: 250V<sub>p</sub>

### Temperature measurement

PT100/PT1,000 (EN60751):	2- and 4-wire measurement
Range	-200 °C to +800 °C
Resolution	0.01 °C; measurement current 1 mA
Accuracy	±(0.05 °C + sensor tolerance + 0.08 K)
Temperature coefficient	
10 °C to 21 °C and	
25 °C to 40 °C	<0.0018 °C/°C
NiCr-Ni (K-type):	
Range	-270 °C to +1,372 °C
Resolution	0.1 °C
Accuracy	±(0.7 % rdg. + 0.3 K)
NiCr-Ni (J-type):	
Range	-210 °C to +1,200 °C
Resolution	0.1 °C
Accuracy	±(0.7 % rdg. + 0.3 K)

### Frequency and period specifications

Range:	1 Hz to 100 kHz
Resolution:	0.00001 Hz to 1 Hz
Accuracy:	0.05 % of reading
Measurement time:	1 s to 2 s

### Specification Scanner Card H0112

Channels:	8 (4-wire)
Switching:	bistable, floating relays
Thermal voltage:	typ. 500 nV, max. 1 μV <sup>1</sup>
Max. voltage between 2 contacts:	125 Vpk
Max. measuring voltage:	125 Vpk – also V/Ω-input –
Volt-hertz-product:	≤1 x 10 <sup>6</sup> V x Hz
Max. switching current:	1 A <sub>rms</sub>
Max. contact resistance:	approx. 1 Ω (each wire)
Life time:	2 x 10 <sup>8</sup> switches (0.1 A; 10V <sub>dc</sub> )
Insulating resistance:	3 GΩ <sup>†1</sup>
Capacity:	>100 pF, between contacts
Switching delay:	20 ms
Measurement delay:	between 50 ms and 300 ms

### Interface

Interface:	Dual interface USB/RS-232 (H0820), IEEE-488 (GPIB) (optional)
Functions:	Control/Data fetch
Inputs:	Function, range, integration time, start command
Outputs:	Measurement results, function, range, integration time (10 ms to 60 s)

## Miscellaneous

### Time to change range or function:

approx. 125ms with DC voltage, DC current,  
resistance approx. 1 s with AC voltage,  
AC current

<b>Memory:</b>	30,000 readings/128 kB
<b>Safety class:</b>	Safety class I (EN 61010-1)
<b>Power supply:</b>	105 to 254V~; 50 Hz to 60 Hz, CAT II
<b>Power consumption:</b>	approx. 8W
<b>Operating temperature:</b>	+5 °C to +40 °C
<b>Storage temperature:</b>	-20 °C to +70 °C
<b>Rel. humidity:</b>	5% to 80% (non condensing)
<b>Dimensions (W x H x D):</b>	285 x 75 x 365 mm
<b>Weight:</b>	approx. 3 kg

<sup>1)</sup> max. 1 µV after a warm-up of 1.5 h

<sup>\*\*1)</sup> at rel. humidity <60%

**Accessories supplied:** Line cord, printed operating manual,  
PVC test lead (HZ15), interface cable (HZ14), CD

### Recommended accessories:

H0112	Scanner card (installation only ex factory) as HM8112-3S
H0880	Interface IEEE-488 (GPIB), galvanically isolated
HZ10S	5 x silicone test lead (measurement connection in black)
HZ10R	5 x silicone test lead (measurement connection in red)
HZ10B	5 x silicone test lead (measurement connection in blue)
HZ13	Interface cable (USB) 1.8 m
HZ33	Test cable 50 Ω, BNC/BNC, 0.5 m
HZ34	Test cable 50 Ω, BNC/BNC, 1.0 m
HZ42	19" rackmount kit 2RU
HZ72	GPIB-cable 2 m
HZ887	Temperature probe