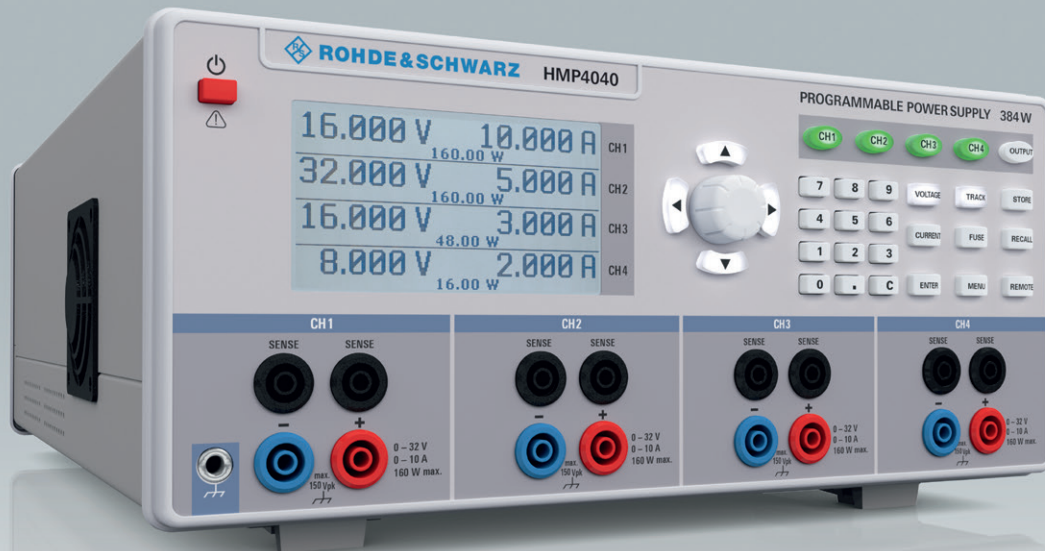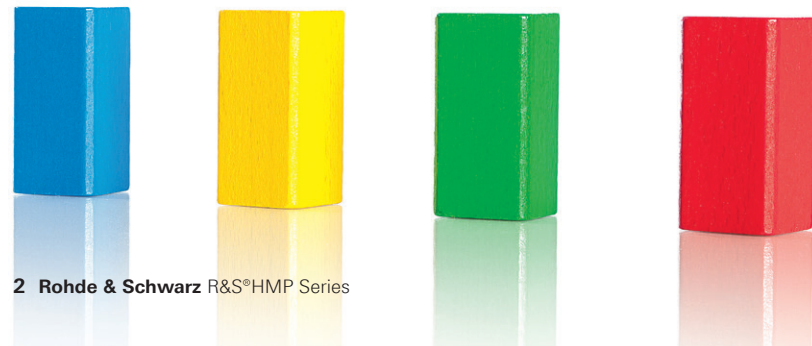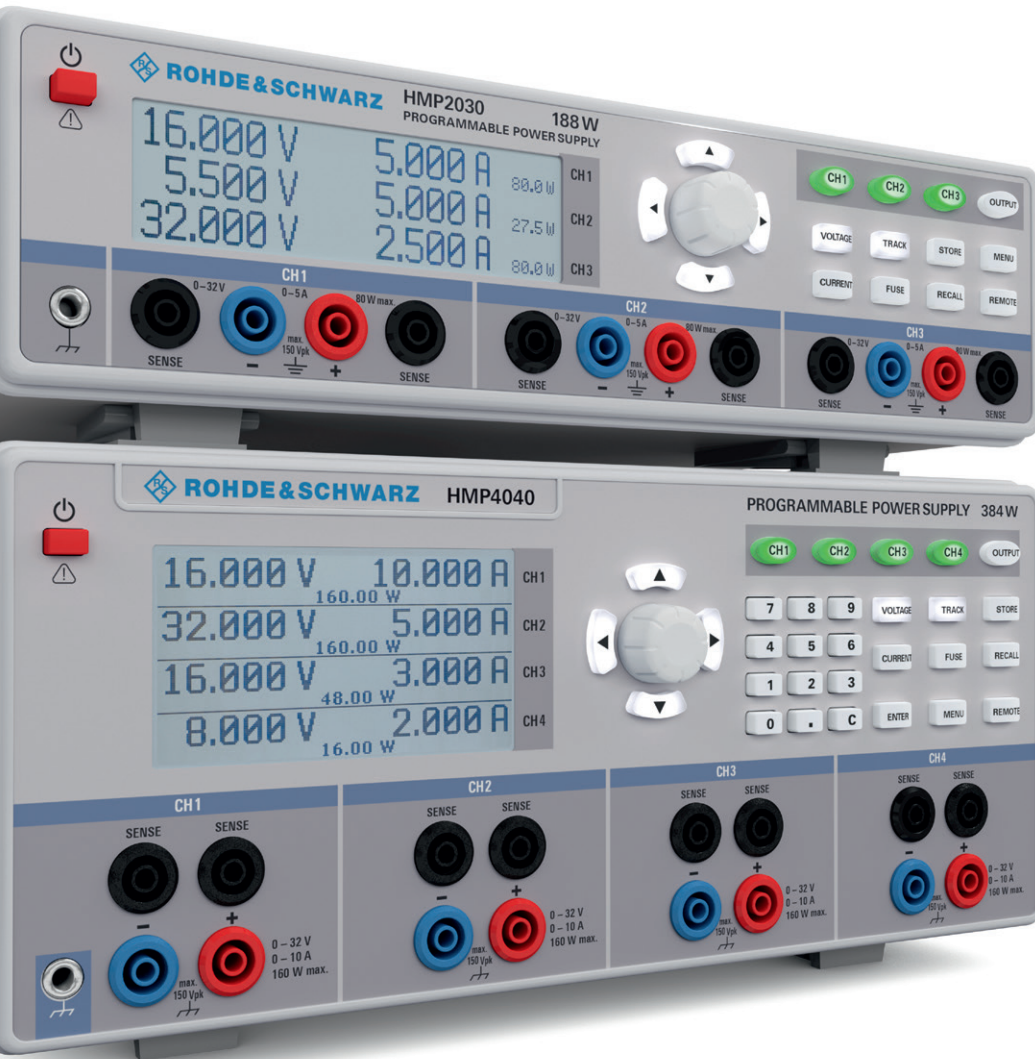# Programmable Power Supplies
188 W | 384 W
R&S®HMP Series

ROHDE & SCHWARZ

The R&S®HMP Series

Key facts
- Low residual ripple due to linear post-regulators
- Real-time voltage, current and watt values
- High setting and read-back resolution: 1 mV and 0.1 / 0.2 / 1.0 A (current output and model dependent)
- FuseLink (electronic fuse) freely combinable for all channels
- FuseDelay tunable up to 250 ms
- EasyArb function directly programmable at the device
- PC software (free of charge) to easily generate user-defined waveforms
- Independently adjustable over-voltage protection (OVP) for each channel
- Advanced parallel- and serial operation through V/I tracking
- Front connectors: 4 mm safety sockets
- Rear connectors for all channels including SENSE
- RS-232/USB dual interface, remote control via SCPI based commands

|	R&S®HMP4040	R&S®HMP4030	R&S®HMP2030	R&S®HMP2020
Output voltage per channel	0 V to 32 V			
Output current per channel	0 A to 10 A		0 A to 5 A	1 x 0 A to 10 A 1 x 0 A to 5 A
Maximum output power per channel	160 W		80 W	1 x 160 W 1 x 80 W
Total output power	384 W		188 W	
Channels	4	3	3	2

2, 3 or 4 Channels

The four power supply units R&S®HMP2020, R&S®HMP2030, R&S®HMP4030 and R&S®HMP4040 offer you the choice between 2, 3 and 4 channels with a total operating performance of 188 or 384 watt. Depending on the model, you have up to 80 or 160 watt available per channel.

In addition to the 80 watt channel the R&S®HMP2020 model also offers you a 160 watt channel.

In the R&S®HMP series, the measured output voltage and current as well as the resulting output power are displayed in real time.
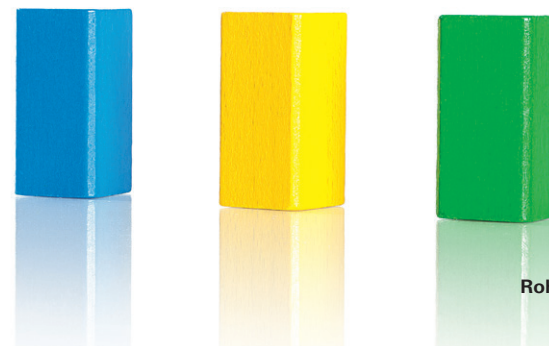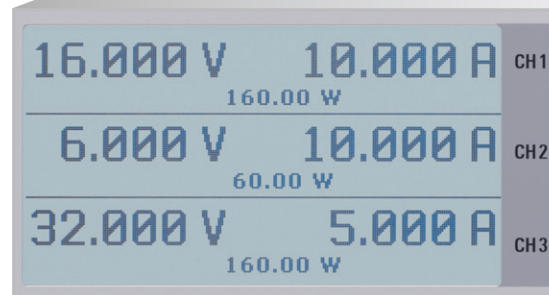
Easy to operate. Easy to explain.

Aside from electricity our power supply units in the R&S®HMP series provide many useful functions for practical use. For example, the output power is displayed in real time and a safety shutdown is available for any combination of channels.
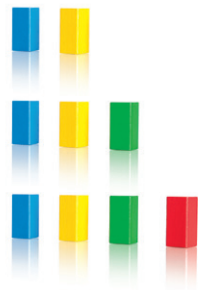
2, 3 and 4 channels
Depending on the application and your needs you can select our power supply units with 2, 3, or 4 channels.

Parallel operation mode
In the parallel operation mode you can bundle the channels to achieve higher currents. The integrated power management function also ensures an intelligent power distribution over each channel in this operation mode.

Serial operation mode
In the serial operation mode you can combine the channels for a maximum of up to 120 volt.
The V/I tracking function of the instrument is also available in this operation mode.

EasyArb
EasyArb is the time/current flow or time/voltage curve that is freely programmable by channel. Our instruments allow you to program the process either via remote software or directly on the instrument. Several different EasyArb curves can run at the same time - independently programmable.

FuseLink
Overcurrent or voltage surge protection can be set for each channel individually. In addition instruments of the R&S®HMP series also allow any combination of the overcurrent protection with other channels. For instance, a channel with a connected fan can continue to run while all other channels have been switched off.
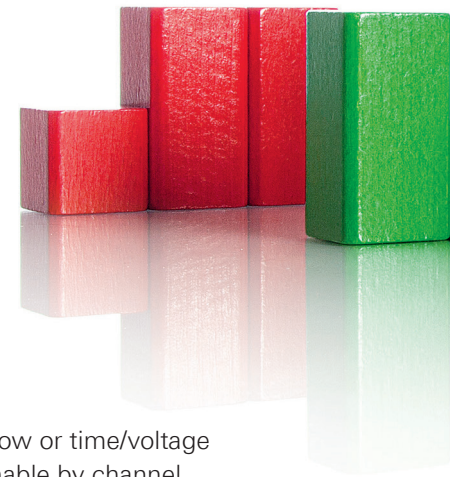
Industrial production environment

Power supply units in industrial production environments are often found in 19" racks. The R&S®HMP series instruments are very suitable for this use as all models can be integrated into 19" racks with the rack mounting kits R&S®HZ42 (for R&S®HMP20x0 instruments) and R&S®HZP91 (for R&S®HMP40x0 instruments). Additionally, all front panel connectors, including SENSE lines, are also located at the back panel of the instrument. And last but not least, the existing USB and serial connector card (R&S®HO720) in all R&S®HMP models can alternatively be replaced by an Ethernet/USB (R&S®HO732) or GPIB card (R&S®HO740) for remote control capability purposes.
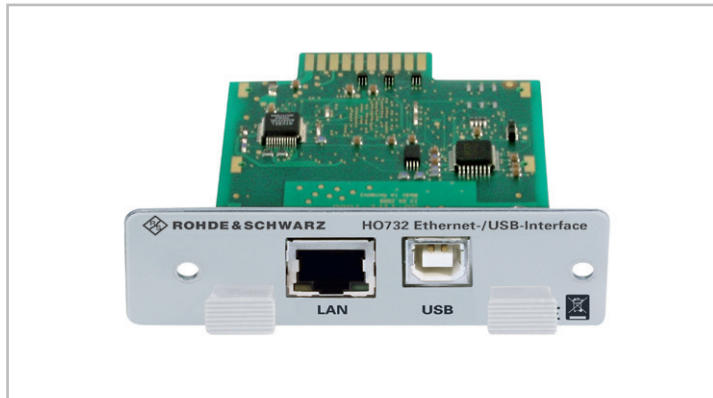
Rear connectors for all channels including SENSE
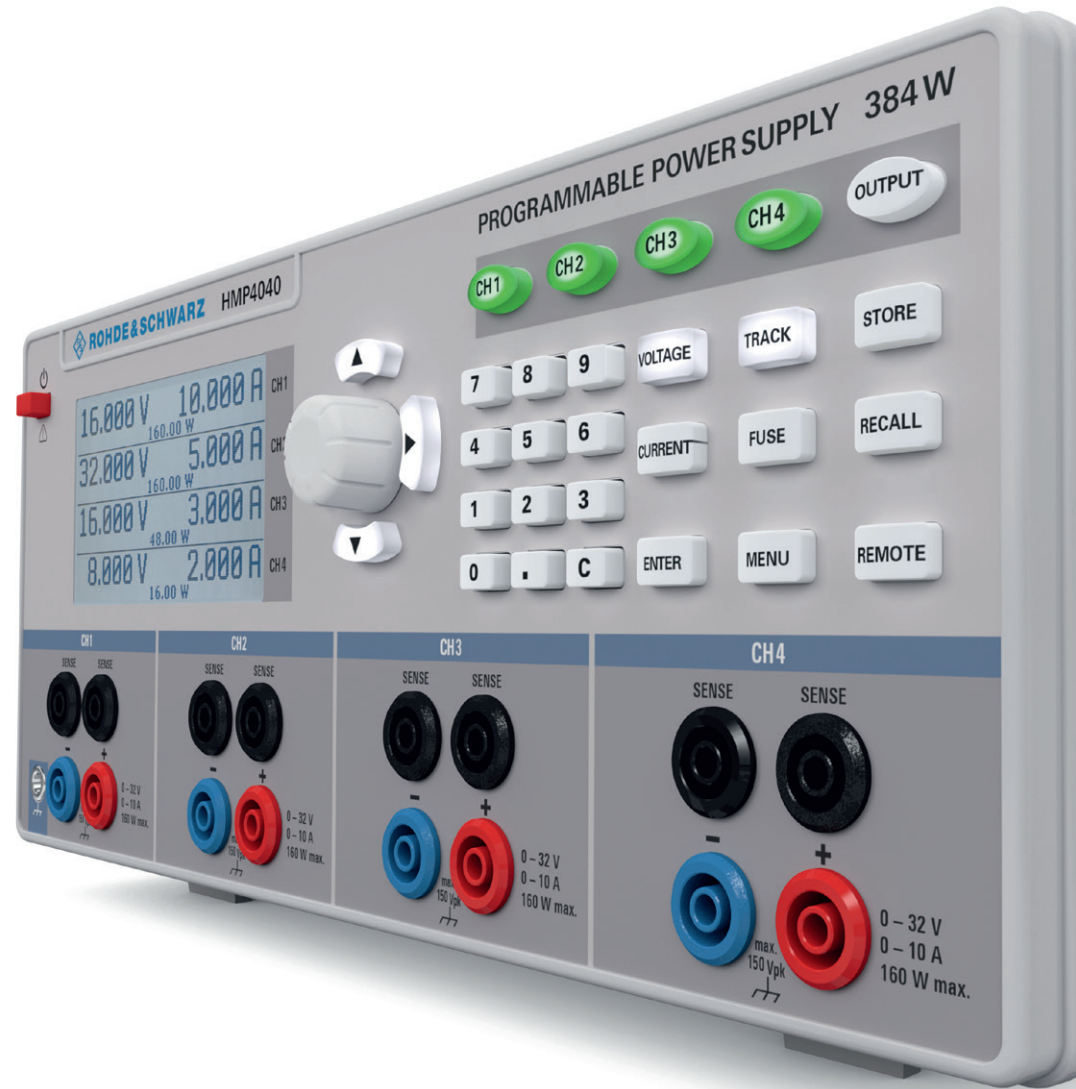
Recommended Accessories
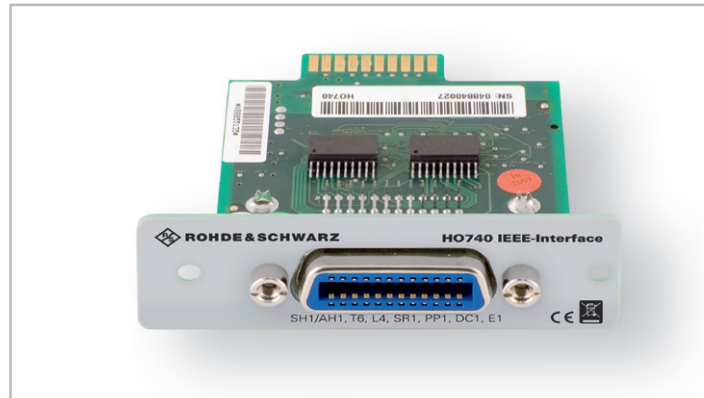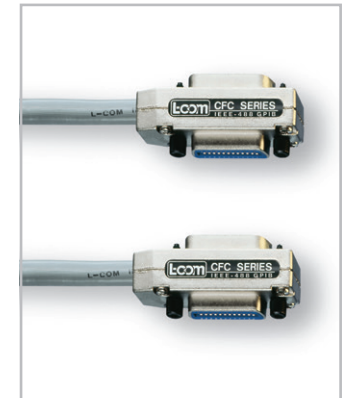
R&S®HO732
Ethernet/USB dual interface card

R&S®HO740
Interface IEEE-488 (GPIB), galvanically isolated

R&S®HZ72
IEEE-488 (GPIB), cable 2 m

R&S®HZ42
2 RU 19" rackmount kit

R&S®HZP91
4 RU 19" rackmount kit

Programmable power supplies 2/3/4 channels
R&S®HMP2020 / R&S®HMP2030
R&S®HMP4030 / R&S®HMP4040

Outputs

Advanced parallel and series operation: simultaneous switching on/off of active channels via "output" button, common voltage- and current control using tracking mode (individual channel linking), individual mapping of channels which shall be affected by FuseLink overcurrent protection (switch-off), all channels galvanically isolated from each other and the protective earth

R&S®HMP4040	4 x 0…32 V/0…10 A
R&S®HMP4030	3 x 0…32 V/0…10 A
R&S®HMP2030	3 x 0…32 V/0…5 A
R&S®HMP2020	1 x 0…32 V/0…10 A 1 x 0…32 V/0…5 A
Output terminals	4 mm safety sockets frontside, screw-type terminal rear side (4 units per channel)
Output power	188 W max.
R&S®HMP4030/HMP4040	384 W max.
R&S®HMP2020/HMP2030	188 W max.
Compensation of lead resistances (SENSE)	1 V
Overvoltage/overcurrent protection (OVP/OCP)	Adjustable for each channel
Electronic fuse	Adjustable for each channel, may be combined using FuseLink
Response time	<10 ms

32 V channels

Output values	
R&S®HMP4040	4 x 0…32 V/0…10 A, (5 A at 32 V, 160 W max.)
R&S®HMP4030	3 x 0…32 V/0…10 A, (5 A at 32 V, 160 W max.)
R&S®HMP2030	3 x 0…32 V/0…5 A, (2.5 A at 32 V, 80 W max.)
R&S®HMP2020 10A	1 x 0…32 V/0…10 A, (5 A at 32 V, 160 W max.)
5A	1 x 0…32 V/0…5 A, (2.5 A at 32 V, 80 W max.)
Resolution	
Voltage	1 mV
Current	
R&S®HMP4030/HMP4040	<1 A: 0.2 mA; ≥1 A: 1 mA
R&S®HMP2030	<1 A: 0.1 mA; ≥1 A: 1 mA
R&S®HMP2020 10A	<1 A: 0.2 mA; ≥1 A: 1 mA
5A	<1 A: 0,1 mA; ≥1 A: 1 mA

Setting accuracy	
Voltage	<0.05 % + 5 mV (typ. ±2 mV)
Current	
R&S®HMP4030/HMP4040	<0.1 % + 5 mA (typ. ±1 mA at I <500 mA)
R&S®HMP2030	<0.1 % + 5 mA (typ. ±0.5 mA bei I <500 mA)
R&S®HMP2020 10A	<0.1 % + 5 mA (typ. ±1 mA at I <500 mA)
5A	<0.1 % + 5 mA (typ. ±0.5 mA at I <500 mA)
Measurement accuracy	
Voltage	<0.05 % + 2 mV
Current	
R&S®HMP4030/HMP4040	<500 mA: <0.05 % + 0.5 mA, typ. ±0.5 mA ≥500 mA: <0.05 % + 2 mA, typ. ±2 mA
R&S®HMP2030	<500 mA: <0.05 % + 0.5 mA, typ. ±0.2 mA ≥500 mA: <0.05 % + 2 mA, typ. ±1 mA
R&S®HMP2020 10A	<500 mA: <0.05 % + 0.5 mA, typ. ±0.5 mA; ≥500 mA: <0.05 % + 2 mA, typ. ±2 mA
5A	<500 mA: <0.05 % + 0.5 mA, typ. ±0.2 mA; ≥500 mA: <0.05 % + 2 mA, typ. ±1 mA
Residual ripple	3 Hz…100 kHz 3 Hz…20 MHz
Voltage	<150 μV_{rms} typ. 1,5 mV_{rms} typ. <250 μV_{rms}
Current	<1 mA_{rms}
Residual deviation after a load change (10 to 90%):	
Voltage	<0.01 % + 2 mV
Current	<0.01 % + 250 µA
Residual deviation after a line voltage change (±10 %)	
Voltage	<0.01 % + 2 mV
Current	<0.01 % + 250 µA
Recovery time after a load step from 10 to 90 % for return within a ±10 mV window	<1 ms

Arbitrary function EasyArb

Parameters of points	Voltage, current, time
Number of points	128
Dwell time	10 ms to 60 s
Repetition rate	Continuous or burst mode with 1 to 255 repetitions
Trigger	Manually via keyboard or via interface

Maximum ratings

Reverse voltage	33 V max.
Reverse polarized voltage	0.4 V max.
Max. permitted current in case of reverse voltage	5 A max.
Voltage to earth	150 V max.

Miscellaneous

Temperature coefficient/°C	
Voltage	0.01 % + 2 mV
Current	0.02 % + 3 mA
Display	
R&S®HMP4030/HMP4040	240 x 128 pixel LCD (full graphical)
R&S®HMP2020/HMP2030	240 x 64 pixel LCD (full graphical)
Memory	Non volatile memory for 3 arbitrary functions and 10 device settings
Interface	Dual interface USB/RS-232 (R&S®HO720)
Processing time	<50 ms
Protection class	Safety class I (EN61010-1)
Power supply	115/230 V±10 %; 50 to 60 Hz, CAT II
Mains fuses	
R&S®HMP4030/HMP4040	115 V: 2 x 10 A slow blow 5 x 20 mm 230 V: 2 x 5 A slow blow 5 x 20 mm
R&S®HMP2020/HMP2030	115 V: 2 x 6 A slow blow 5 x 20 mm 230 V: 2 x 3.15 A slow blow 5 x 20 mm
Power consumption	
R&S®HMP4030/HMP4040	550 VA max.
R&S®HMP2020/HMP2030	350 VA max.
Operating temperature	+5…+40°C
Storage temperature	-20…+70°C
Rel. humidity	5…80 % (non condensing)
Dimensions (W x H x D)	
R&S®HMP4030/HMP4040	285 x 125 x 365 mm
R&S®HMP2020/HMP2030	285 x 75 x 365 mm
Weight	
R&S®HMP4030/HMP4040	approx. 10 kg
R&S®HMP2020/HMP2030	8.5 kg

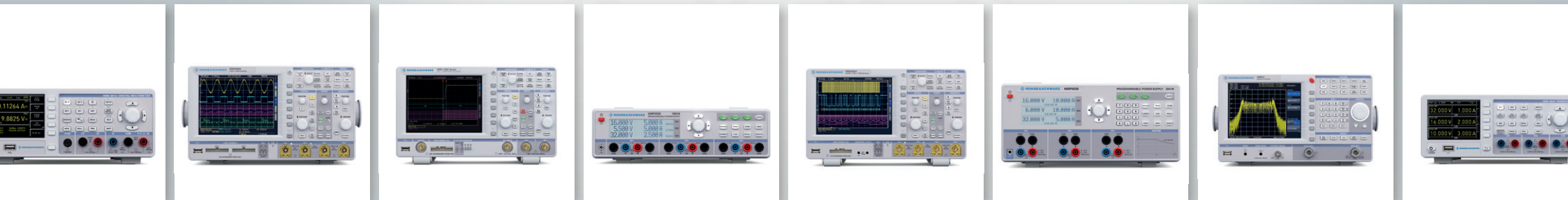**Accessories included:**
Line cord, operating manual, CD, software

Recommended accessories:

R&S®HO732	Dual interface ethernet/USB
R&S®HO740	Interface IEEE-488 (GPIB), galvanically isolated
R&S®HZ10S	5 x silicone test lead (measurement connection in black)
R&S®HZ10R	5 x silicone test lead (measurement connection in red)
R&S®HZ10B	5 x silicone test lead (measurement connection in blue)
R&S®HZ42	2RU 19" rackmount kit
R&S®HZ72	GPIB-cable 2 m
R&S®HZP91	19" rackmount kit 4RU