

HAMEG Power Supplies

Modern Power Supplies – an investment for the future

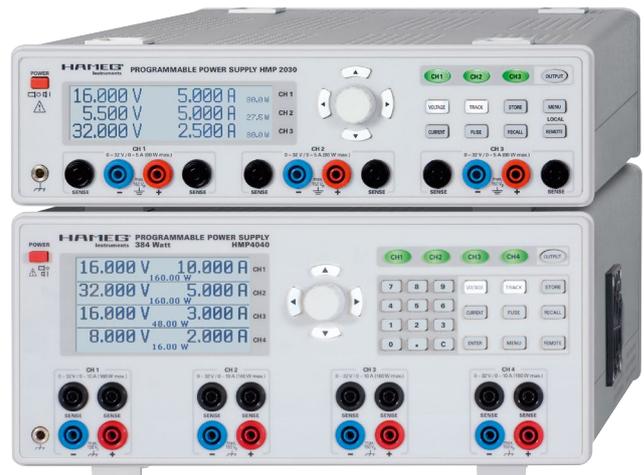
Power supplies are mainly destined to supply voltage and current to components or subassemblies. In laboratories and, in general, in any design area requirements change frequently, so do the requirements on power supplies. When selecting power supplies, the four most important criteria are:

- Voltage ranges
- Current ranges
- Number of channels
- Residual ripple

Quite naturally, mostly an instrument will be chosen which surpasses the requirements posed by the actual application regarding voltage and current ranges and the number of channels, because already the next application may need just these better specifications.

As a general trend, the components used in modern electronics require lower voltages at higher currents. However, in instruments, apparatus and installations such as in the automotive industry standard voltages (12 and 24V) remain. A universal power supply should hence be able to deliver high currents (often in excess of 5A) and provide a wide voltage range (at least 28V). High resolutions of mV and mA in these wide ranges are essential in order to meet the requirements at low voltages and especially tight tolerance specifications.

The high power supplies of the HMP series deliver up to 10A per channel at 0 to 32V and feature an adjustment and back reading resolution of up to 1mV/0.1mA and thus fulfill the most stringent requirements of applications. This high resolution was made possible by the use of a/d converters which are similar to those used in 4½ digit multimeters and offer an accuracy of 0.05%. In 4-channel applications thus up to 8 external multimeters become superfluous. In current measurements, an intelligent averaging procedure by the integrated processor and the firmware improves the readability and avoids time-consuming averaging in remote control applications. This is especially useful in all applications in which currents vary widely with time such as in pulsed battery charging, processor and telecom time-slot applications. The HMP series combines classical mains power transformers, secondary SMPS and linear post regulators and thus achieves the excellent residual ripple of $150\mu\text{V}_{\text{rms}}$.



In laboratory set-ups frequently several voltages are required because many circuits use diverse technologies with different supply voltages. Later, in the finished instrument, these different voltages will be supplied by the internal power supply. In the lab, they must be provided by individual lab power supplies. In the future, even 4-channel power supplies may reach their limits. At first sight, the use of several power supplies with a small number of channels each may offer a larger flexibility, but they require more space, they cost more, can not offer V/I tracking, also they cause various problems during turn-on and turn-off of the circuit under test.

The HMP series is stackable like all other HAMEG products which is advantageous considering the always limited space on lab benches. Depending on the requirements as well as the budget 2-, 3-, and 4-channel instruments in the 200 and 400 W classes are available.

Your requirements will increase...

The frequently changing applications in laboratories pose additional requirements on the power supplies such as:

- Programmable overvoltage protection
- Electronic fuses
- Synchronous voltage and/or current settings

- ❑ Arbitrary voltage and current waveforms
- ❑ Sense inputs for the compensation of conductor losses.
- ❑ Parallel and series connection of channels

The HMP series fulfills even these requirements as they are standard features.

The FuseLink function allows to link the electronic fuses of the individual channels. The user thus can define which channels should be switched off in the case of a malfunction. An application is, e.g., the control of 2 positioning motors. Assuming channel 1 powers the control circuit, channels 2 and 3 power the motors, it must be ensured that in case the control circuit malfunctions also both motors will be deenergized (i.e. channels 2 and 3 follow channel 1). Should, e.g., a motor exceed a freely definable current limit, this motor as well as the other one should be switched off but not the power to the control circuit. (I.e. channel 2 follows only channel 3, and channel 3 follows only channel 2.)

Arbitrary voltage or current waveforms can be easily generated with the implemented EasyArb function at the instrument or on a pc using a software available at no cost. 128 points may be defined. The voltage and current for each point can be set individually. The large step width between points from 10ms to 60s assures that almost truly arbitrary waveforms can be programmed. This allows to define the charging cycles of batteries or to simulate voltage drops in order to test the reaction of a circuit. Arbitrary waveforms once generated can be stored in the instrument and recalled any time. Of course, each channel has its own control such that all channels can be programmed totally independent of each other.

There are further requirements on power supplies used in production environments, especially in automated testing. Programmability is of utmost importance here. All HMP power supplies can be remotely controlled as a standard feature; they sport a galvanically isolated dual RS-232/USB interface plug-in card. This may be exchanged for a dual USB/Ethernet card or a GPIB card at a moderate price increase by the customer himself. The HMP series offers a set of commands which is very similar to the SCPI standard – as is customary in measurement and test set-ups. This enables efficient programming and minimizes the effort of substitution in an existing test program. Of course, also pertinent LabView and LabWindows CVI drivers are available for a download at no cost from the HAMEG homepage. ATE users appreciate the low-cost 19" (2 and 3 units) rack-mount kits as well as the rear panel outputs (including sense inputs).

In modern production, the requirements posed on test systems changed in the past years, especially concerning their flexibility with regard to changing customer requirements. In the past, subassemblies and systems were produced for several years; today, product life cycles, especially in the

consumer market, shrunk to several months. Production and test houses do not know today which test requirements they will have to meet tomorrow; thus the requirements on power supplies change continuously. In this environment the „exactly fitting power supply“ does not exist any more, as a rule. In order to fulfill ROI (return-on-investment) requirements, powerful and flexible power supplies are required when equipping test sites. The high power supplies of the HMP series excel by their combination of general applicability, available power, features, accuracy and price. In the laboratory as well as in production they offer longterm use at low investment costs in spite of varying requirements.

The HMP series consists of the 2-channel instrument HMP2020 (0 to 32V/0 to 10A, 0 to 5.5V/0 to 5A, 188W max.), the 3-channel instruments HMP2030 (2x 0 to 32V/0 to 5A, 1x 0 to 5.5V/0 to 5A, 188W max.) and HMP4030 (3x 0 to 32V/0 to 10A, 384W max.) and the 4-channel instrument HMP4040 (4x 0 to 32V/0 to 10A, 384W max.). All instruments are available from stock at list prices from 959€ to 1,559€.

For further information please consult our homepage at <http://www.hameg.com/HMP4040>