Contattateci per maggiori informazioni:

Volta S.p.A.
Authorized Reseller for Italy
Via del Vigneto, 23
39100 Bolzano (BZ) - Italy
Tel.: +39 0471 561 112
Fax: +39 0471 561 210
E-mail: pfi@volta.it
Web: www.volta.it

PRODUCTS

ABOUT FUG

FuG Elektronik GmbH has more than 40 years of experience in the development and production of high-precision power supplies for low- and high-voltage applications in research, development, industry and other special applications. With this product portfolio FuG is the worldwide market leader in many market segments. We have excellent know-how in development and production of customized solutions. As medium-sized enterprise with more than 100 employees we are based in the area of Rosenheim (Bavaria).

CONTENTS

Features and Options 4

Basic Series
- M-Power-Line 6

Professional Series
- High voltage power supplies 8
- Capacitor charging power supplies 10
- Medium voltage power supplies 12
- Low voltage power supplies 14

Customized Series 16

HIGH QUALITY
MADE IN GERMANY

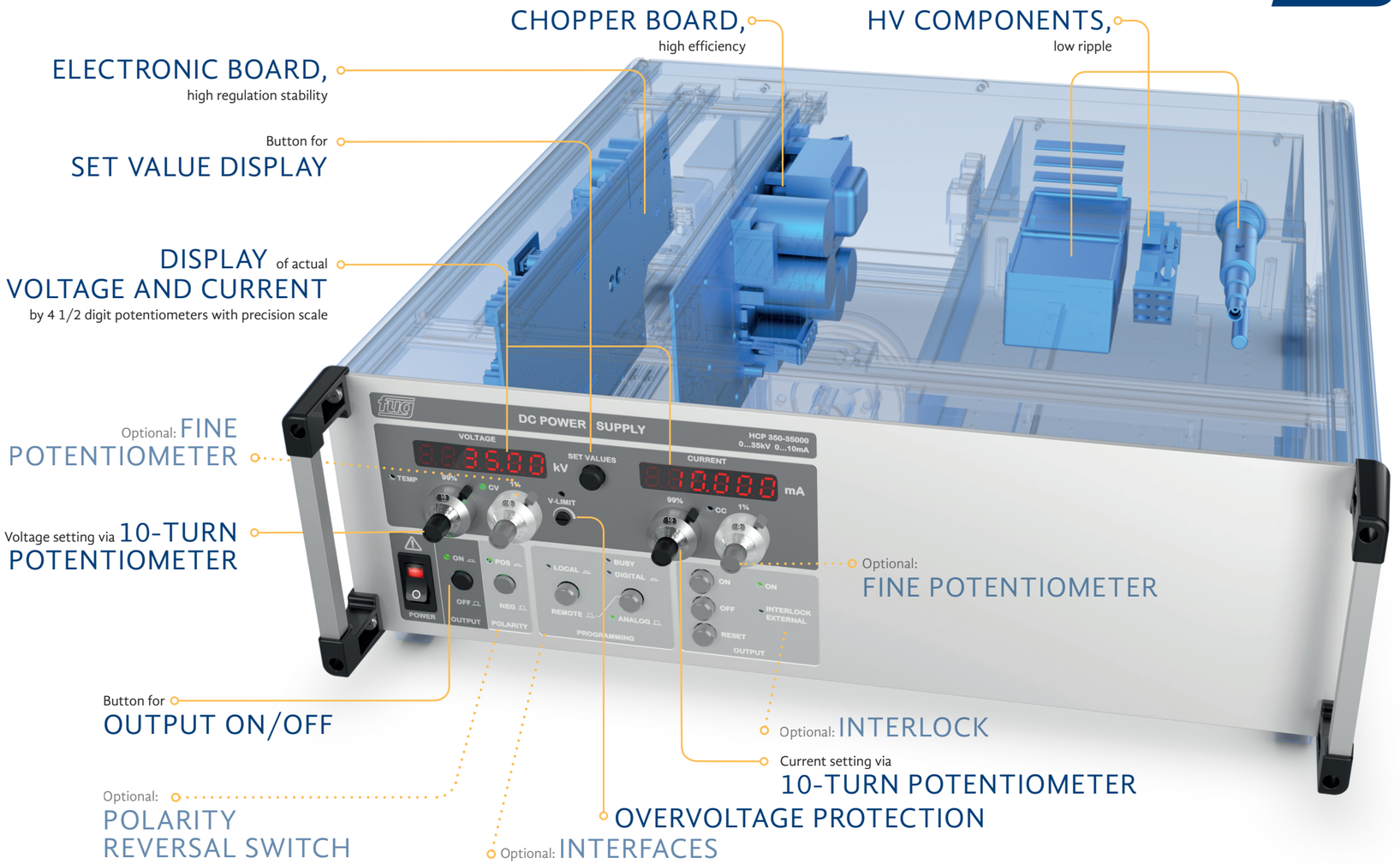
Product know-how since 1978

FEATURES

	Basic Series	Professional Series
Voltage and current setting via two 10-turn potentiometers with precision scale		●
Display of actual voltage and current by means of 4 ½-digit digital LED-displays		●
Display of actual voltage and current by means of multifunctional LCD-Display	●	
Button for set value display	●	●
Button for OUTPUT ON/OFF (allows adjustment in "OFF" mode)	●	●
Voltage and current regulation with automatic sharp transition	●	●
Control modes indicated by LEDs		●
Control modes indicated by LCD Display	●	
Low residual ripple: 1 x 10E-4		●
Voltage and current stability: 1 x 10E-4		●
Short-circuit and flash-over proof	●	●
Efficiency > 85%	●	●
Computer interface USB and LAN	●	

OPTIONS

	Basic Series	Professional Series
Polarity reversal switch for most of high voltage power supplies		●
Analog programming		●
Computer Interfaces [USB, LAN (Ethernet), IEEE 488, RS232, RS422, Profibus DP] and others on request		●
Coarse/fine potentiometers (99%/1%) for more accurate adjustment		●
Interlock circuit for automatic shut down		●
Lower ripple		●
Higher stability		●



Model MPL 1000-10000

NEGATIVE POLARITY

Output

- Power range available in 200W/500W/1000W
- Output voltage available in 10kV/30kV/50kV, continuously adjustable from zero to maximum

Description

M-Power-Line models feature flexible and easy to operate local controls combined with a multi-function digital display that simultaneously shows both, the output set points and actual measured output values.
HV outputs can be adjusted by means of voltage and current encoders with coarse and fine settings. Set point adjustment is possible even while the output is still shut down. Information about the unit, such as serial number, firmware version, operation hours, MAC address and internal status can be displayed locally. The IP address can be set by the user by means of the local interface. Other features include operating hours counter, unit history (fault memory), streaming of actual values and states with timestamp, arc counter, over temperature shutdown.
The HV output is resistant to flashover and temporary as well as durable short circuit. The M-Power-Line supplies are suitable for both inductive and capacitive loads and for unlimited operation at both, full and no load.

Average Output Power	200W, 500W, 1000W
Output Voltage Range (kV)	See data sheet, variable from 0.1 to 100% of rated voltage
Output Current Range (mA)	See data sheet, variable from 0.1 to 100% of rated current
AC Input	Wide range 110-230VAC (± 10%) Single phase, 47-63Hz
AC Input Connector	IE C60320 C20 receptacle
Power Factor	> 0.95 at full load at nominal AC line
Efficiency	85 - 90% at full load

APPLICATIONS

- Laboratory power
- Photomultiplier / Secondary electron multiplier
- High-voltage test stands
- Gas discharge / Plasma
- Electrostatics
- Sputtering
- Capacitor / Insulation testing
- Ion sources
- Particle accelerators
- Nuclear fusion research

Model HCE 7-2000 with option
10-turn potentiometer for voltage setting

Model HCP 14-6500

Output

- Power range up to 50.000W
- Output voltage 125V up to 300.000V, continuously adjustable from zero to maximum
- For Bipolar power supplies: Output voltage ± 1.250V up to ±20.000V, adjustable with continuous zero crossing

Description

For the high voltage power supplies one output terminal has the output voltage, the other output is firmly connected to earth. For most of our high voltage power supplies we offer polarity reversal switches.

At the **HCP** power supplies the rectified line voltage drives a square wave generator of fixed frequency, whose AC voltage is transformed, rectified and filtered, producing the output voltage. For regulation, the square wave voltage is pulse width modulated.

A low residual ripple of the output voltage, together with a high stability, high regulation speed and a low stored energy are all achieved by the high switching frequency. For high output voltage the high voltage part is insulated with silicon moulding material.

At the **HCH** power supplies the output terminal is integrated in a specific oil container. The power part is easy to handle in case of service due to its modular structure.

For **HYN** power supplies the mains voltage is transformed to the appropriate level. Either on the primary or on the secondary side of the transformer is a thyristor controlled rectifier stage (phase cutting circuit). The rectified voltage is filtered by LC-filter.

The **HCE** cassette power supplies have a compact size with light weight and offer a modern insulation without partial discharge. The analog programming is a standard feature.

The bipolar power supplies **HCB** consist of 2 primary switched power supplies with pulse width modulation. The rectified line voltage is transformed to square-wave pulses of constant frequency, rectified and filtered. The outputs of the 2 switch mode power supplies are connected together and operated in push-pull mode.

FuG offers the following high voltage power supply series:

HCP – Switch mode regulation

HCH – Switch mode regulation for high power (with air or oil insulation)

HYN – Thyristor regulation

HCE – Switch mode regulation as cassette

HCB – Bipolar switch mode regulation

APPLICATIONS

- Electron beam and ion beam generation
- Electrostatic applications
- Mass Spectrometry
- Electron Microscopy
- Electron Lithography
- Electron beam welding
- Test and manufacturing of semi-conductor materials and electron tubes

CAPACITOR CHARGING POWER SUPPLIES

Model
HCK 800-2000

Output

- Charging Power range up to 20.000 J/s
- Output voltage 2.000V up to 65.000V, continuously adjustable from zero to maximum

Description

This type of power supplies has been optimized for fast loading of high capacities with a robust output and fast regulation.

Capacitor charging high voltage power supplies have been developed to fulfil the requirements of capacitor charging and the conditioning of capacitors. They are equipped with a robust output resistor to withstand the electrical stress by a pulsed load. The power supplies are constructed for fast switchover from constant current to constant voltage mode.

At the capacitor charging power supplies the rectified line voltage drives a square wave generator of fixed frequency, whose AC voltage is transformed, rectified and filtered, producing the output voltage. For regulation, the square wave voltage is pulse width modulated.

APPLICATIONS

- Test and forming of capacitors
- Pulsed applications
- Material crushing
- Kicker Magnets
- Electromagnetic fields

MEDIUM VOLTAGE POWER SUPPLIES

Model
MCP 5000-2000
with optional features

Output

- Power range up to 70.000W
- Output voltage 125V up to 2.000V, continuously adjustable from zero to maximum
- For autoranging: Output voltage 150V up to 3.000V (automatic adjustment) continuously adjustable from zero to maximum

Description

For the medium voltage power supplies the output voltage is floating.

At the **MCP** power supplies the rectified line voltage drives a square wave generator of fixed frequency, whose AC voltage is transformed, rectified and filtered, producing the output voltage. For regulation, the square wave voltage is pulse width modulated. A low residual ripple of the output voltage, together with a high stability, high regulation speed and a low stored energy are all achieved by the high switching frequency.

For the **MYN** power supply series a transformer is used to transform the mains supply to high voltage. Either on the primary or on the secondary side of the transformer is a thyristor controlled rectifier stage (phase cutting circuit). The rectified voltage is filtered by LC-filter.

The **MCA** series is an auto ranging power supply design with continuous automatic adjustment of working area. The power supplies are capable to deliver full output power over a wide range of output voltage and current. This results in an operating range which is up to 3-times higher than at a more conventional power supply. When fitted with the optional computer interface, the **MCA** series become versatile programmable power supplies. In principle, the rectified line voltage drives as square wave generator, whose AC voltage is transformed, rectified and filtered, producing the output voltage. For regulation, the square wave voltage is pulse width modulated.

FuG offers the following medium voltage power supply series:

MCP – Switch mode regulation

MYN – Thyristor regulation

MCA – Autoranging characteristics

APPLICATIONS

- Ion Sources
- Plasma / Gas discharge applications
- Sputtering
- Photomultiplier
- Nuclear research
- Chemical / Biological Research
- Aerospace industry
- Test benches for inverter rectifier and capacitors

LOW VOLTAGE POWER SUPPLIES

Model
NTN 700-35

Output

- Power range up to 100.000W
- Output voltage 6,5V up to 350V, continuously adjustable from zero to maximum
- For bipolar power supplies: Output voltage ±6,5V up to ±350V, adjustable with continuous zero crossing

Description

For the **NTN** and **NYN** power supplies the mains voltage is transformed to the appropriate level. On the secondary side of the transformer is a thyristor controlled rectifier stage (phase cutting circuit). The thyristors switch on after each zero-crossing of the sinusoidal voltage. This rectified voltage is used to charge a capacitor bank of an intermediate circuit.

With the **NYN** power supplies this voltage will be transferred to the output. With the **NTN** power supplies the voltage will be transferred to the output via a final serial transistor stage with a defined value of voltage drop across the serial transistor (pre-regulation).

The performance of the final serial transistor stage defines the final stability of the output voltage (main regulation). By this method the double stabilized **NTN** power supplies provide high performance of regulation and low ripple. The thyristor stabilized **NYN** power supplies are robust and with high reliability.

For the **NTN** and **NYN** the output voltage is floating.

NLN power supplies provide a fast regulation and can also be designed to include the current sink functionality for 2-quadrant operation.

NLB power supplies provide fast regulation and bipolar adjustable output voltages or output current with instantaneous zero crossing. Bipolar power supplies operate as 4-quadrant power amplifier (as option also for active loads).

The **NTS** power supplies for superconducting coils are specially used to charge and discharge high-inductive, superconducting magnetic coils (2-quadrant operation). For the **NTS** series the design and production is always customer specific. The performance is mostly similar to the double stabilized **NTN** power supplies.

FuG offers the following low voltage power supply series:

NTN – Double stabilization with thyristor pre-regulation and linear regulation

NYN – Thyristor regulation

NLN – Linear regulation

NLB – Bipolar linear regulation

NTS – Double stabilization for superconducting magnets

APPLICATIONS

- Supply of magnets – normal or superconducting
- Lighting tests/Photometry
- Test benches
- Semiconductor Tests

FuG is the word leading specialist to implement your customer specific requirements and develop and manufacture your customer specific power supply to cover a wide range of applications.

HCV 190M-12000

- The HCV 190M-12000 is a series of up to ten high voltage sources which are operated on a high voltage potential of up to 12kV.
- Residual ripple and stability of the sources are in the range of 10E-5 of the end value
- Customer specific control unit based on Probus V system
- Modular integrated system with floating hotbox in double 19" rack 9U high
- Flexible equipped with up to ten floating sources
- Application: Special scanning electron microscope (SEM) with pulsed electron beam for testing of semi-finished products

HCD 40000-7000MOD

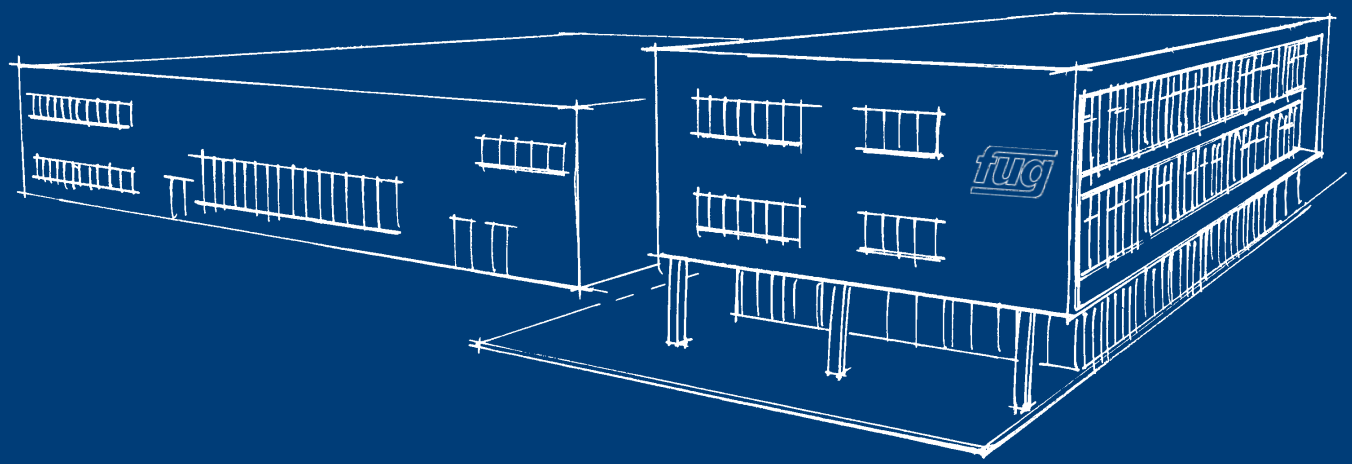
- The HCD 40000-7000MOD is a stable, dual DC power supply with two outputs – Master and Slave. Each output delivers a high voltage up to 7kV and a maximum output current of 7,15A; power limited to 20kW/output.
- Both high voltage sources with identical target values (Master-Slave) can be operated in parallel and in serial mode

HCK 50000-50000MOD

- The HCK 50000-50000MOD is a series of capacitor charging power supplies with output 0 - 50kV, 0 - 3A at voltage up to 25kV, decreasing to 2A at 50kV.
- The units power a pulse forming network (PFN) which is part of the klystron modulator of an acceleration structure for free electron laser (FEL).
- Very high reproducibility (10ppm)
- Fast regulation for high repetition rate: The unit withstands repeated fast discharges at the output from full voltage to zero within 1µs with subsequent recharging to 50kV, 50 times per second.

HCV 600000-65200MOD

- The unit is used for initial acceleration of a pulsed proton beam in a linear accelerator.
- Output Klystron power supply: 0... - 65,2kV; 0... - 9,2A (max. 600kW)
- Four auxiliary power supplies with different output voltage: partially floating on HV-output
- Stored energy: <20J (0,2 mm copper wire must not burn at short circuit)
- The whole system is controlled by a central PLC with sophisticated interlock and safety measures.


fug