

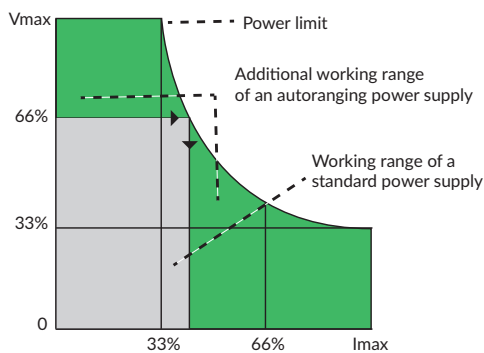
3kW BENCH MOUNT

AC-HVDC POWER SUPPLIES

The MCA3K0 series are a switch-mode power supplies with continuous automatic range adjustment. They provide the full output performance over a wide voltage and current range. Due to the automatic power limit, their working range compared to other power supplies is about three times wider.

The high switching frequency achieves a low residual ripple in the generated output voltage with high stability, good control dynamics, and at the same time only a low amount of stored energy.

Autoranging function



Dimensions

See mechanical details table

Features

- Output voltages 0-150VDC to 0-3kVDC
- For models up to 1.5kVDC: floating output
- Autoranging characteristic with fixed power limit
- 3 phase AC input
- Continuous operation at full rated power
- Voltage and constant current control with automatic transition
- Control mode display with LED's and power limit LED
- Digital, LAN and USB interface option
- Analog programming/interface option
- Manual voltage and current control with 10 turn potentiometer
- Set-point display via a button
- Set-point adjustment possible with disabled output
- Push-button switch for output voltage
- Short circuit & arc protection
- 2 year warranty

Benefits

- Provides maximum device control & flexibility.
- Safe operation ensures maximum protection to the power supply
- High voltage release included for safe operation at high voltage output
- User friendly controls
- Lighter than the leading brand products & easier to maintain
- Low cost of ownership

Applications

- Aerospace
- Capacitor testing
- Chemical/Biological research
- Inverter/Rectifier testing
- Ion sources
- Nuclear research
- Photomultiplier
- Plasma/Gas discharge
- Sputtering

Models & Ratings

Model Number	Polarity	Output Voltage	Output Current	Input Voltage	Frequency
MCA3K0-150	Floating	0 to 150V	0 to 60A	400VAC \pm 10% 3 phase	47 to 63Hz
MCA3K0-400	Floating	0 to 400V	0 to 24A	400VAC \pm 10% 3 phase	47 to 63Hz
MCA3K0-750	Floating	0 to 750V	0 to 12A	400VAC \pm 10% 3 phase	47 to 63Hz
MCA3K0-1500	Floating	0 to 1.5kV	0 to 6A	400VAC \pm 10% 3 phase	47 to 63Hz
MCA3K0-3000P	Positive	0 to +3kV	0 to 3A	400VAC \pm 10% 3 phase	47 to 63Hz
MCA3K0-3000N	Negative	0 to -3kV	0 to 3A	400VAC \pm 10% 3 phase	47 to 63Hz

Options

- Coarse/fine-potentiometers (99% / 1%) for more accurate adjustment of voltage and / or current
- Analog programming/interface
- Analog programming/interface, floating
- Power adjustment with additional DVM and potentiometer
- Computer interfaces -IEEE 488, RS 232, RS 422, Profibus DP, USB, LAN (more on request)
- Signal for output voltage <50V
- Supply voltages other than that shown in the models & ratings table may be specified

Please consult XP Power Sales

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	See models and ratings table				
Efficiency		85		%	
Overvoltage Category		II			
Protection Class		I			

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage Range	See models and ratings table				
Output Current Range	See models and ratings table				
Output Control	Continuous adjustment from 0 to rated voltage/current by front panel mounted encoder.				
Output Polarity /Isolation	<p>Depending on the output voltage and output power, the power supply units of the MCA series have either floating or unipolar output with one high-voltage carrying and one grounded pole.</p> <p>Versions:</p> <p>Up to 400VDC nominal voltage: Output floating, either the positive or the negative pole can be earthed. Insulation against earth ± 500VDC</p> <p>At 750VDC nominal voltage: output floating, either the positive or the negative pole can be earthed. Insulation against earth ± 1kVDC</p> <p>At 1.5kVDC nominal voltage and up to 3kW nominal power: output floating, either the positive or the negative pole can be earthed. Insulation against earth ± 2kVDC</p> <p>With 3kVDC nominal voltage (all power classes) and 1.5kVDC with 6kW or 9kW nominal power: One pole carries high voltage, the other is firmly grounded.</p> <p>Power supply units with optional built-in potential-bound analog programming in all voltage and power classes: One pole carries high voltage, the other is firmly grounded.</p>				
Set point resolution		$\pm 1 \times 10^{-3}$		%	Nominal value with potentiometer on front panel
		$\pm 1 \times 10^{-5}$			Nominal value with fine potentiometer
		1×10^{-4}			Nominal value with option interface
Power Range and Power Limitation	<p>Autoranging Factor 1:3:</p> <p>Three-times output voltage at 1/3 of output current or</p> <p>Three-times output current at 1/3 of output voltage</p>				
Voltage Setting Range	Using the VOLTAGE potentiometer, approx. 0.1% to 100% of the rated value				
Current Setting Range	Using the CURRENT potentiometer, approx. 0.1% to 100% of the rated value				
Reproducibility	$\pm 1 \times 10^{-3}$ of rated value with potentiometer on front panel $\pm 1 \times 10^{-4}$ of rated value with option interface				
Regulation Time Constant Voltage Mode	<1ms with load changes from 10% to 100% or 100% to 10% respectively				
Regulation Time Constant Current Mode	<10ms with load changes that effect a change of less than 10% in the output voltage				
Residual Ripple	$< 2 \times 10^{-4} \text{pp} + 200 \text{mVpp}$ (measuring bandwidth 30Hz to 10MHz) $< 6 \times 10^{-5} + 70 \text{mV}$ of rated value RMS				
Setting Time at Full Load	<300ms for changes in the output voltage from 10% to 90% or 90% to 10%, respectively				
Discharge Time Constant	With output free of load max. 10s Discharge time to <50V max. 60s				
Control Deviation	$\pm 10\%$ mains voltage variation: $< \pm 1 \times 10^{-5}$ of the rated value No load: 5×10^{-4} of the rated value Over 8 hours: $< \pm 2 \times 10^{-4}$ of the rated value Temperature deviations $< \pm 1 \times 10^{-4}/\text{K}$ of the rated value				
Short Circuit Protection	The power supply is short circuit and arc proof. The maximum current can be drawn at any output voltage, even in the event of a short circuit.				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Temperature Operation	0		+40	°C	
Storage Temperature	-20		+50	°C	
Temperature Coefficient		±0.1		°C	
Humidity Operating	0		+80	%	Up to +31°C, linearly decreasing down to 50% RH at +40°C, no precipitation and max
Storage Humidity			+80	%	No precipitation and max
Cooling	Heat generated in the power supply unit is dissipated by convection or, in the case of high-power units, by forced ventilation				
Operating Altitude			2000	m	Above sea level
Protection	IP20				

Signals & Controls

	Function
Front panel	Voltage and current encoders, power switch, HV ON/OFF switch
Operating Modes	The HV output's polarity is floating or unipolar (see models & ratings table). The power supplies can be operated in the LOCAL, ANALOG (optional) and DIGITAL (optional) operating modes.
Displays	DVM for voltage and current, range ±20000 LEDs for status messages voltage control / current control.

EMC: Emissions

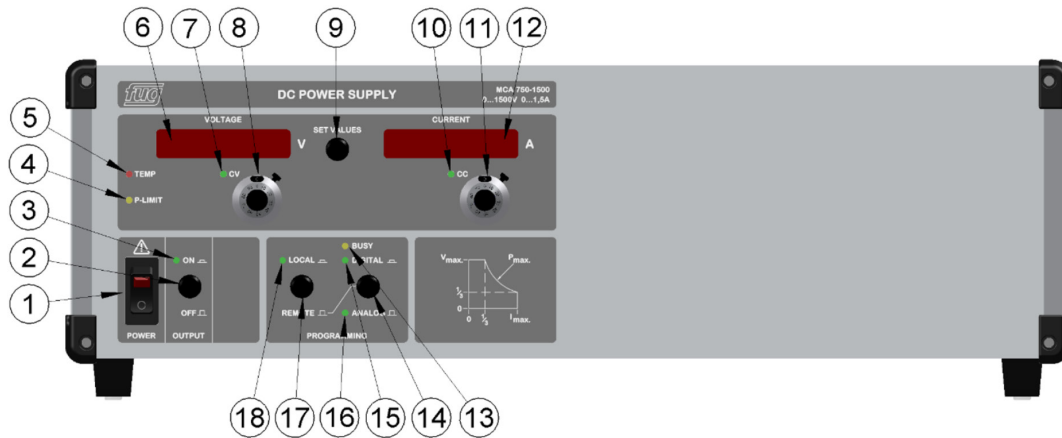
Phenomenon	Standard	Notes & Conditions
Harmonic Currents	EN61000-6-2	
Voltage Flicker	EN61000-6-3	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
EN	EN61010-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Mechanical Details

Front view with controls

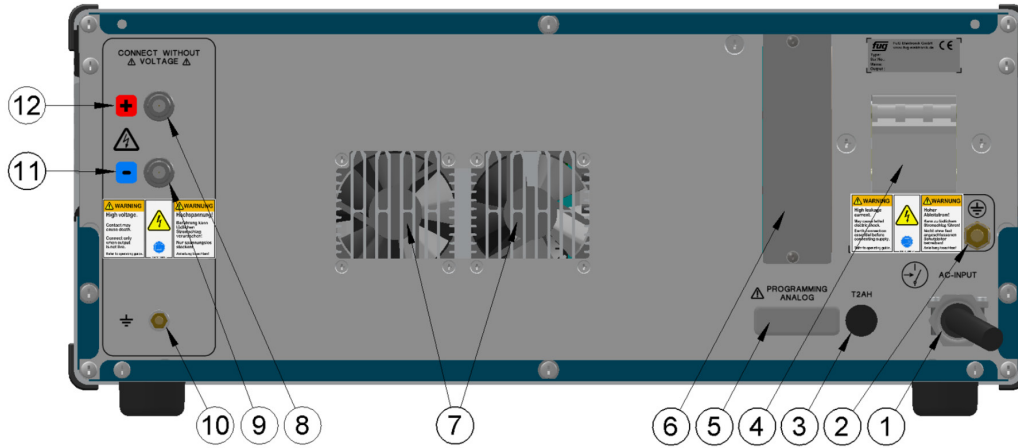


Front panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

Number	Function	Number	Function
1	AC power switch with indicator light. Disconnects the power supply from the mains, two-pole switching	10	LED for constant current control mode (Constant Current CC)
2	Release of DC output (OUTPUT) No isolation from mains	11	Ten-turn potentiometer with lockable precision dial for current adjustment
3	LED: DC output ON Green when control loop is closed and power stage is operating (OUTPUT ON)	12	Current display: flashing: Set point not flashing: Actual value
4	LED: P-LIMIT display for power limit	13	LED BUSY displays data traffic on the digital interface (Optional)
5	LED: TEMP for over-temperature; Internal temperature too high, fan failed or contaminated. (Use depends on type)	14	Switching the operation mode between REMOTE/ANALOG and REMOTE/DIGITAL (Optional)
6	Voltage display: flashing: Set point not flashing: Actual value	15	LED indicating digital programming active (Optional)
7	LED for constant voltage control mode (Constant Voltage CV)	16	LED indicating Analog programming/interface active (Optional)
8	Ten-turn potentiometer with lockable precision dial for voltage adjustment	17	Switching the operation mode set-point between LOCAL and REMOTE (Optional)
9	SET VALUES Switch displays between Set-point mode and Actual output mode, displays flashes when in set-point mode	18	LED LOCAL control mode active(Optional)

Mechanical Details

Rear view with 3 phase AC input



Rear panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

Number	Function	Number	Function
1	AC input with permanently installed cable for 3 phase mains connections.	7	Air outlet for the power output stage
2	Earthing bolt, only for units with 3 phase AC power connection. The DC power supply must be professionally earthed using 10mm ² cable to the earthing bolt provided	8	HV Output+ (positive) For power supplies with nominal voltage up to 750VDC: laboratory safety socket For power supplies with nominal voltage 1.5kVDC an 3kVDC: SHV (designated for screened output cable with grounded screen.)
3	Fuse holder for internal control fuse	9	HV Output- (negative) For power supplies with nominal voltage up to 750VDC: laboratory safety socket For power supplies with nominal voltage 1.5kVDC an 3kVDC: SHV (designated for screened output cable with grounded screen.)
4	Automatic circuit breaker, fuse holder	10	Earthing bolt: This connection must be connected to the ground of the load
5	15-pin Sub-D connector for analog programming (Optional)	11	Polarity indication: BLUE: NEGATIVE
6	Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...) (Optional)	12	Polarity indication: RED: POSITIVE

Mechanical Details

Model Number	Mounting	Width		Height		Depth	Weight
MCA3K0-150	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	37kg
MCA3K0-400	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	35kg
MCA3K0-750	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	33kg
MCA3K0-1500	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	32kg
MCA3K0-3000P	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	32kg
MCA3K0-3000N	Bench mount ⁽¹⁾	19"	443mm	4U	177mm	650mm	32kg

Notes:

- 1. Rack mount option

Cables

Mains input cable

3 phase mains: open end

Mating connectors

Mating connectors for control inputs and outputs (Excluded comm. available cables for digital interfaces)

For power supplies with output voltage 1.5kVDC or more: Set of one or two screened HV output cables, 3m with mating connectors assembled on one end, other end open (For delivery short circuited for safety reasons)