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More details or resources on request. Please consult [XP Power Sales](#) directly.

## Lower output ripple

Lower ripple can be achieved with improved smoothing.

Device	Power	Ripple
HCP	≤ 35W	$<1 \times 10^{-5} + 10\text{mVpp}$
	140W to 700W	$<1 \times 10^{-5} + 20\text{mVpp}$
	≥ 1.4kW	$<1 \times 10^{-5} + 100\text{mVpp}$
MCP	≤ 35W	$<1 \times 10^{-5} + 20\text{mVpp}$
	140W to 700W	$<1 \times 10^{-5} + 30\text{mVpp}$
	≥ 1.4kW	$<1 \times 10^{-5} + 100\text{mVpp}$

**Available for series:**

- ▶ HCP
- ▶ MCP

**Notes:**

Factory fit option only. Post-production modification is not possible.

## Higher stability

Voltage and/or current regulation with improved long-term stability and lower temperature coefficient.

- ▶ Stability over 8 hours under constant conditions:  $<\pm 1 \times 10^{-5}$
- ▶ Temperature coefficient  $<\pm 1 \times 10^{-5}/\text{K}$  within the specified temperature range

**Available for series:**

- ▶ HCP
- ▶ MCP
- ▶ MCA
- ▶ NTN
- ▶ HCK

**Notes:**

Factory fit option only. Post-production modification is not possible.

## Polarity reversal

### Up to 65kV

The POLARITY option allows the user to switch the high voltage output polarity between positive or negative.

It is possible to remote control the polarity change of HCP models that are equipped with an analog programming or digital interface.



**Available for series:**

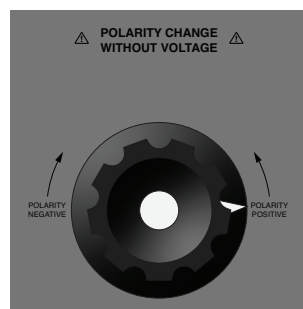
- ▶ HCP
- ▶ HCK
- ▶ NTN

**Notes:**

A polarity reversal switch can be retrofitted at the factory on most models. Please contact sales.

### Above 65kV

Manual switch for changing polarity.



**Available for series:**

- ▶ HCP
- ▶ HCK

**Notes:**

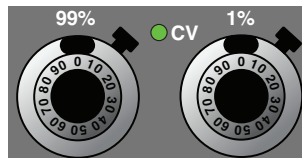
Factory fit option only. Post-production modification is not possible.

## Higher adjustment resolution

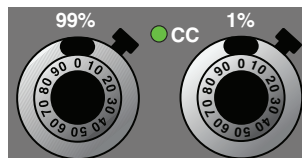
By the addition of a ten-turn fine potentiometer, set point resolution will be increased by a factor of 100 by fine adjustment of the current and/or voltage. The adjustment range is 0-99% with a 1% tolerance.

- Set point resolution  $< \pm 1 \times 10^{-5}$  of rated value with fine potentiometer.

### For voltage



### For current



### Available for series:

- HCP
- HCK
- MCA
- MCP
- NTN
- NLN

## Digital meters with higher resolution

### Digital meters with higher resolution $> 4\frac{1}{2}$ digit

Higher resolution 4% or 5 $\frac{1}{2}$  digit meters for voltage and current available as a factory fit option.

### Available for series:

- HCP
- MCP
- MCA
- HCK
- NTN

### Notes:

Applicable only to new units with  $> 4\frac{1}{2}$  digit resolution digital meters in combination with a higher stability.

### High precision current measurement

This option uses a picoampere meter with circuit protection.

### Available for series:

- MCP
- HCP

### Notes:

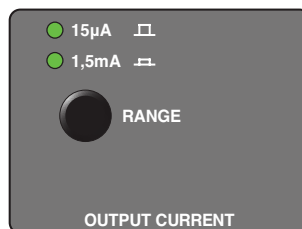
On request, please contact sales.

## Current measuring range

### Current measuring range switch

The range switch can be used to alter the current measuring range. For example, to resolve smaller currents more accurately.

The values shown are for example and can vary depending on the model.



### Available for series:

- HCP

## Interlock loop

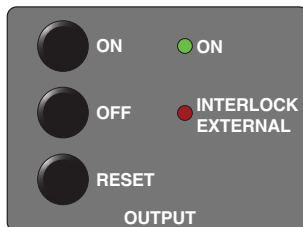
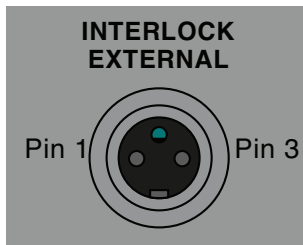
### Interlock loop for supervising the connected load (e.g. door contacts):

The Interlock loop is connected via a 3-pin Minicon connector on the rear panel. The interlock loop must be completed through a potential free wire link/contacts.

If the interlock loop is closed, the output voltage is switchable via the ON/OFF switch with output status indicated by the green LED.

On interruption of the interlock loop, the output will shutdown via mains disconnect and the INTERLOCK EXTERNAL LED will illuminate red indicating an open interlock loop. To resume operation it is then necessary to press the RESET button.

The RESET button and status LEDs are located on the front panel.



### Available for series:

- ▶ HCP
- ▶ HCK
- ▶ MCA
- ▶ MCP
- ▶ NTN
- ▶ NLN
- ▶ HCB

### Notes:

Please note this is not suitable for personal safety protection.

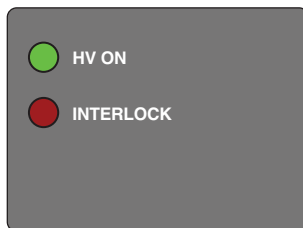
Optional control via digital interface: The RESET command can be sent via the remote interface and used to switch the device ON again.

### Interlock loop for Programmable Logic Controller (PLC):

Interlock operation and reset are connected via the 9 pin D-sub connector on the rear panel.

A live output is indicated by the LED showing green.

An open interlock loop is indicated by the LED showing red and the HV output is switched off.



### Available for series:

- ▶ HCP
- ▶ HCK
- ▶ MCA
- ▶ MCP
- ▶ NTN
- ▶ NLN

### Notes:

Please note this is not suitable for personal safety protection.

## Arc detection

Sensitivity level setting optionally with shut down.

### Optimized arc (flashover) protection

Protection of the device in the event of a short circuit by adapting the dielectric strength of the output capacitors to a higher externally applied voltage.

Available for series:

- HCP

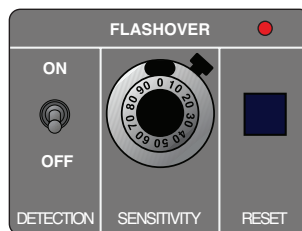
### Arc sensor

Monitoring for over-current/high voltage arc with indication, shut down or arc counter.

Different versions are available:

#### Version 1

The arc detection isolates the HV output, indicated by the red LED. The sensitivity level is adjusted by the potentiometer. The isolated HV output can be reactivated using the RESET button.

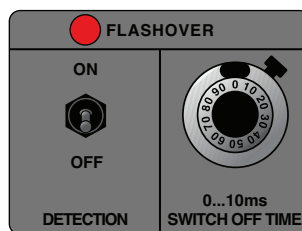


Available for series:

- HCP
- MCP

#### Version 2

The arc detection isolates the HV output, indicated by the red LED, for an adjustable time range (0 to 10ms) controlled by the potentiometer. The function can be switched off via the detection toggle switch.



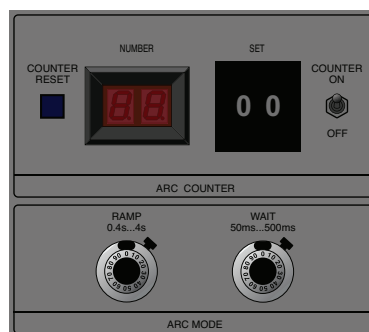
Available for series:

- HCP
- MCP

## Arc mode & arc counter

Arcs are detected and counted. The HV output is isolated when the set counter value is reached. The number of arcs are shown on the display for 1 minute. During this time, the device can output a message via an optional interface. The counter reading can be reset to 00 at any time using the RESET button. The arc counter can be switched off.

Arc mode has an adjustable delay and ramp function. Arc delay sets the time range (50ms to 500ms) after which the HV output is isolated following the flashover. The arc ramp potentiometer sets the time (0.4s to 4s) for the HV output to reach its full setpoint, following isolation triggered by a flashover event. Following the delay time, arc ramp increases the output from zero to the predefined voltage.



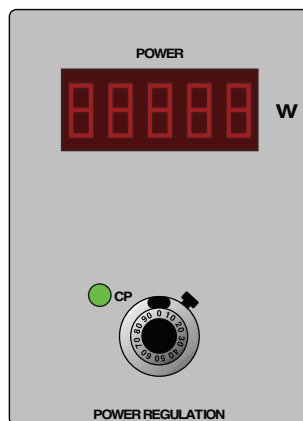
Available for series:

- HCP

## Power regulation

### Power regulation with display and adjustment

In addition to voltage and current control, the output power can be controlled. The control mode gives priority to the lowest value setting. The power output can be set between zero and the rated device power using the power regulation potentiometer. The digital meter indicates the output power delivered, reading accuracy is approximately 2% of final value. The green LED illuminates once the set power is reached.



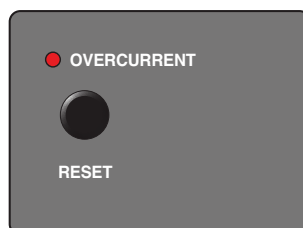
### Available for series:

- HCP
- MCP

## Adjustable overcurrent trip

### Overcurrent trip with RESET

The overcurrent trip isolates the output when the current limit is reached, indicated by the red LED, and is restored via the RESET button. The value of the current limit is set using the current setting potentiometer.

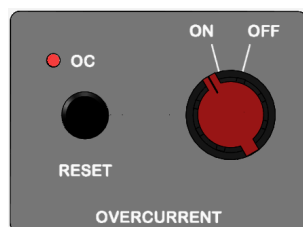


### Available for series:

- HCP
- MCP

### Overcurrent trip switchable with RESET

The overcurrent trip isolates the output when the current limit is reached, indicated by the red LED, and is restored via the RESET button. The value of the current limit is set using the current setting potentiometer. This function is selectable via the ON/OFF switch.



### Available for series:

- HCP
- MCP
- MCA

### Notes:

Optional control via interface:

The corresponding commands and the message also work via the interface.

### Overcurrent trip switchable

The overcurrent trip isolates the output when the current limit is reached, indicated by the red LED, and is restored via the ON/OFF switch. The value of the current limit is set using the current setting potentiometer.



### Available for series:

- HCP
- MCP

### Notes:

Optional control via interface:

The corresponding commands and the message also work via the interface.

## Message/Detection

### Message/Detection "Output voltage <50V"

The yellow LED on the front panel illuminates when the output voltage is <50V.

The status is available remotely via a potential-free signal on the 4-pole minicon socket mounted on the rear panel.

 V-OUT <50V

#### Available for series:

- ▶ HCP
- ▶ MCP

### Message/Detection "Output voltage <50V"

The yellow LED on the front panel illuminates when the output voltage is <50V.

The status is available remotely via a potential-free signal on the 6-pole minicon socket mounted on the rear panel.

 V-OUT <50V  
  TRIGGER  
 CONTINUOUS

CHARGING PROCESS

#### Available for series:

- ▶ HCK

## Slew rate

### Slew rate

The speed at which the voltage rises from zero to the maximum output voltage is limited by the hardware to a few seconds. Longer ramp-up times can be set via the potentiometers or via the Digital interface option.

#### Available for series:

- ▶ HCP
- ▶ HCK
- ▶ MCP
- ▶ MCA
- ▶ NTN

### Electronic slew rate control

The slew rate control adjusts the time for the voltage or current to rise from zero to the setpoint and vice versa. The ramp time for a change in current can only be adjusted with a tool. Each setpoint change (on the front panel or via the interface) is determined by the slew rate setting.

SLEW-RATE

1sec...15min



#### Available for series:

- ▶ MCP
- ▶ HCP

### Hardware slew rate control

The duration of the slew rate for a change in current can be set via the potentiometers or via the digital interface option.

#### Available for series:

- ▶ MCP
- ▶ HCP



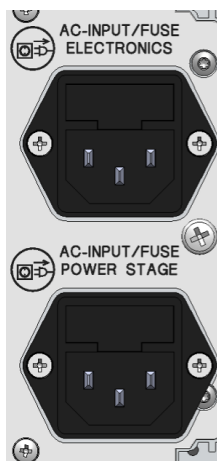
## Mains options

### Mains voltage & frequency options

As a standard, our units are designed for a  $230V \pm 10\%$ , 50Hz or a three-phase  $400V \pm 10\%$ , 47 to 63Hz mains supply. Most units can be modified in production for country specific mains values.

### Two mains input

Separate mains inputs for the power stage and the control electronics.



### Notes

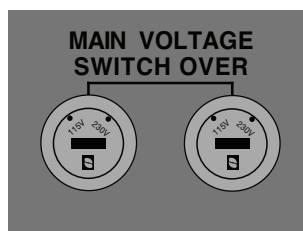
On request, please contact sales.

### Available for series:

- ▶ HCE
- ▶ MCP
- ▶ HCP
- ▶ MCA
- ▶ NTN

### Switchable mains voltage

The mains voltage is switchable between two different values (e.g.  $115V \pm 10\%$  and  $230V \pm 10\%$ ).



### Available for series:

- ▶ HCP
- ▶ MCP
- ▶ NTN
- ▶ NLN

### Notes:

A switchable mains input between 115V and 230V is only possible for devices with an output power of up to 140W.

### 24VDC/48VDC input supply

The supply voltage with  $24VDC \pm 10\%$  /  $48VDC \pm 10\%$ .

### Available for series:

- ▶ MCP
- ▶ HCP

### Notes

Only possible for devices with an output power of up to 140W. On request, please contact sales.

### Mains input with higher isolation

For special applications (e.g. the operation at a high voltage platform), the standard isolation of the unit may be not sufficient. Units can be ordered with isolation up to  $>200kV$ .

### Notes

On request, please contact sales.



## Lockable mains plug

Some customers prefer a lockable mains plug.



### Notes

On request, please contact sales.

## Alternative output sockets

Non-standard output sockets are available on customer request, provided they meet the safety requirements.

### Notes

On request, please contact sales.

More details or resources on request. Please consult [XP Power Sales](#) directly.