

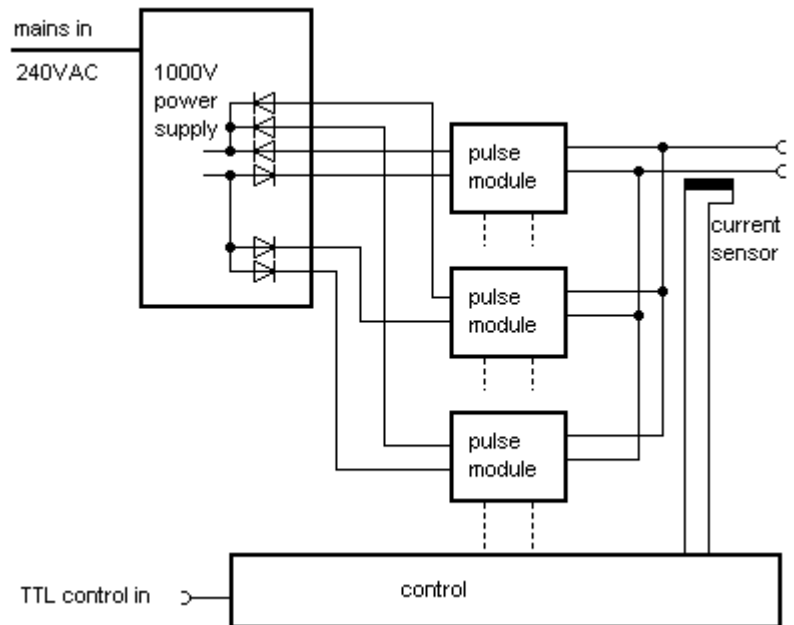
High power low impedance pulse generator RUP 7

The pulse generator RUP7 is designed to supply high power to low impedance (few ohms) or even complete inductive loads. It has also a high stored energy as to supply full pulse power for times in the millisecond range.

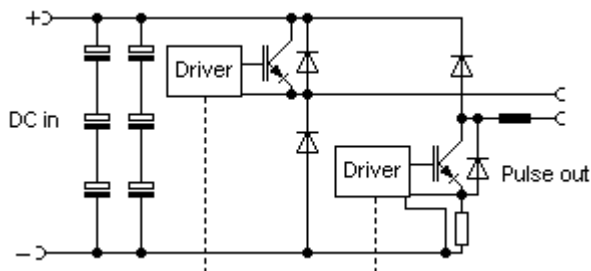
The pulse generator consists of 3 pulse modules with paralleled outputs which are powered separately.

The pulse modules itself consists of a capacitor bank of 3mF and a semi full bridge for switching the output power. The modular design has the advantage of scalability and partitions the energy storage, which is a safety advantage in case of failures.

The device is fully protected against arcs and overloading.



principal scheme RUP7



principal scheme of pulse module

Technical Data RUP7 version3

operation modes

Standard pulse

Control signal (>8V) switches both transistors on and off, remaining inductive energy will be fed back to the capacitor bank through the diodes.

An overcurrent event will also switch off both transistors and additionally inhibit pulse for 20 ms.

Switch mode supply mode

Is active if control signal is between 2V and 8V. Similar as standard pulse, but the upper transistor is switched on and off with a frequency of 15 kHz and a duty cycle depending on control signal, increasing linear from 0% to 100% with voltage from 2V to 8V. The phase between the modules is shifted to get a more smooth current and voltage waveform.

DC mode

Both transistors are allways on; an overcurrent event will switch off both transistors and inhibit operation for 20 ms.

Voltage and current

- Output voltage 1000V max., adjustable.
- Average output current 3A max.
- peak current 360A positive (adjustable limit)
- Output voltage is potential free, but any output should not be allowed to deviate more than 1kV from ground.

pulse shape and frequency

- Intrinsic switching times are in the range 0.1 - 0.5µs.
- square wave, rise and fall time depending mainly on inductance. Internal inductance is around 33µH, corresponding to 100µH per module. So for a 2 Ohm load, the rise time constant may be around 33µs, whereas for a high impedance load (as non ignited plasma) the rise may be in the order of the intrinsic switching time, eventually with an overshoot of up to factor 2.
- max. pulse width is limited by stored energy in the 9mF total capacitor bank. So a 360A, 5ms pulse will cause a 200V voltage drop during pulse.
- duty cycle may be varied from 0% to 100%.
- Frequency: up to 15kHz, as long as internal switching losses do not exceed limits.

means of control

- 10-turn potentiometers for adjustment of
 - voltage (0-1000V)
 - current limit (0-360A)
- Main power switch
- buttons for high voltage on / off
- switch for operation mode pulse/DC
- LED for pulse generation on
- LED for current threshold exceeded
- meters for voltage and average current

connectors

- CE connector for mains supply
- BNC for input control signal; 0-2V off, 2-8V switch mode supply mode, 8-10V pulse mode
- voltage monitor output 1:100
- current output monitor 10mV/A
- high current connectors for pulse output, 3m output cable 10mm² included

mechanical, environmental, included items

- 19" rack 1400*600*800 mm
- environmental temperature 5-35°C
- humidity 0-80%, the pulse generator is intended for the use in dry rooms.
- protection class I, IP20
- supply voltage 230-240VAC 16A, 50-60Hz
- manual, full schematics included

safety

- external interlock
- outputs are potential free
- The output and everything connected to it has dangerous voltages and must not be touched during operation.
- The device contains large capacitors which may stay charged significant time after switching off. This has to be considered when handling the inside of the device.
- The output currents must not be allowed to flow through protective grounding systems otherwise severe disturbances may result.
- This device is only for laboratory use by experts.

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