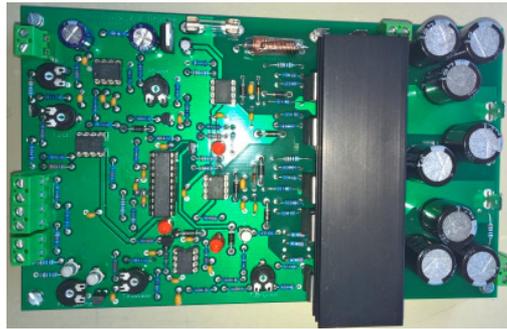


# Minipuls 2.2

## kit for efficiently generating high frequency high voltage

The assembly Minipuls 2.2 is designed for generating high AC voltages with frequencies in the range 5-20 kHz and amplitudes up to 10 kV peak (=20 kVpp or 7 kV<sub>RMS</sub>). The assembly consists of two boards, the full bridge converter and the transformer cascade. Supply can be by a standard laboratory power supply. Control can be by an external control signal as well as internal.



- Primary current limit 10A, corresponding to an output current limit of about 60 mA peak or 40mA<sub>RMS</sub>.
- Power transistors and cascade are under temperature surveillance. Board size 116\*193mm with mounting bolt in the edges; weight around 360g.

### Transformer cascade

- Output transformers in 5-fold cascaded circuit, RM14 ferrite cores.
  - Transformer ratio selectable 1:102, 1:121 and 1:148
  - Primary resonance inductor selectable 81µH, 100µH and 121µH.
  - Output signal: Approximate sinusoidal.
  - Time-Voltage product for saturation of the output transformers around 0.45Vs, corresponding to 10 kV peak at 7 kHz.
  - Maximum output voltage 10 kV peak, depending on load and frequency.
  - The cascade is designed for capacitive loads up to 300 pF and resistive loads >100 kΩ; however full output voltage cannot be guaranteed for all loads.
- Overvoltage limit around 12 kV by spark gap.
  - Voltage monitor output 1:1000
  - Current monitor output 10 V/A
  - Input by screw contacts, voltage and current monitor BNC, output by 6.3 mm terminal.
  - extra screw contact for temperature surveillance.
  - board size 160\*190 mm with mounting bolts in the edges; weight around 0.8 kg.

### Full bridge converter

#### Internal control

- Frequency 5-20 kHz, adjustable.
- Phase 0-180° adjustable for setting the output power
- Additionally, it is possible to adjust burst frequency 0-400 Hz and duty cycle in the range 0-100%.

#### External control possibilities

Control voltages are designed for the range 0-5V:

- Inhibit input (input current <0.5 mA):

operation possible	input open or U>2V
shut down	0V<U<2V

- Frequency control input: Any voltage applied there will increase frequency, the internal setting will serve as minimum frequency. Additionally, the internal +5.0V reference voltage is available, so that it is easily possible to add here an external potentiometer.
- External clock: The operation frequency can alternatively be set by an external TTL signal, the output frequency is then half the clock signal frequency.
- The phase input can be used to regulate the output power.
- Supply 15-40 V, 4A max. Total input power <140W. Optionally, by changing the position of the fuse, the power part may be powered separately by 0...45V, 4A max.
- Supply fuse 4A
- max. average output power 120W, for short periods even higher.
- All inputs by screw contacts, outputs by 6.3 mm terminals.

### Environmental

- Environmental temperature 0 - 35 °C
- Humidity 0 - 80%, the assembly is intended for use in dry rooms.
- Protection class III, IP 00.

### Safety, EMC

The high voltage output does not have any special protection against touching! The user has to ensure that the transformer cascade and anything connected to the output cannot be touched during operation. Outputs of high frequency transformers have very little stored energy. But the current may exceed allowed limits, touching may cause severe burns. The likely use of the device (open connection, barrier discharge) is a possible source of high frequency noise emissions, which may influence nearby electronics devices. This has to be considered by the user and appropriate measures taken.

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