

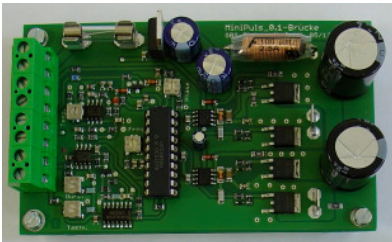
# Minipuls 0.1

Ultra light weight high voltage frequency generator for barrier discharge

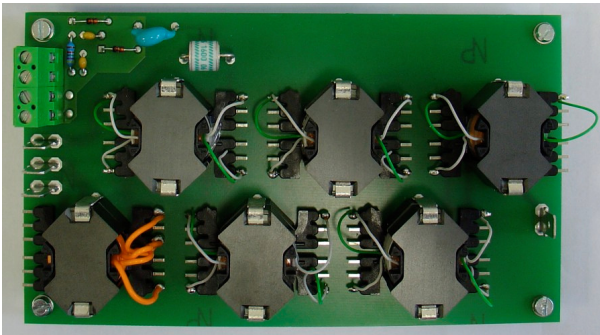
The assembly Minipuls 0.1 is an improved version of the Minipuls 0 and developed to generate high AC voltages up to 6 kV peak (=12kVpp or 4.2 kV RMS) with frequencies in the range 5 - 20 kHz.

The assembly consists of two boards, the control board with the full bridge converter and the transformer cascade.

Both boards are optimized for lowest total weight (around 340g for both boards). Power supply may be by a 26V Li battery. Burst frequency, duty cycle and output power (phase) may be controlled by external analog voltages as well as on board trimmers. The generator may be switched on and off by a TTL signal.



control board



transformer cascade RM10

## control board

- supply voltage 15 - 35 V
- Total input power < 30 W, within burst it may be higher.
- Supply fuse 1.6 A.
- Nominal frequency 10 kHz, adjustment in the range 5-20 kHz is possible
- Waveform: The full bridge delivers alternating positive and negative pulses with pauses in between, depending on settings.
- Monitors the temperature of the transformer cascade; has a connector for a temperature sensor and an adjustment for switch off threshold.

4 trimpots on the board are used to adjust the operational parameters:

- frequency 5 - 20 kHz

- phase 0 - 180 °, can be used to adjust the high voltage amplitude.
- burst frequency 10 - 230 Hz
- duty cycle 0 - 100 %

## Control, input, output, size

- all inputs with screw type connectors.
- connection for supply voltage 15 - 35 V
- analog inputs 0-5V for external control of burst frequency, duty cycle and phase.
- inhibit input:

operation enabled	U < 2 V
operation disabled	input open or U > 2 V

input current inhibit input < 0.5mA.  
board size: 64\*105mm, weight 83g.

## Transformer cascade RM10

- 5 output transformers, cascaded, RM10
- maximum output voltage 6 kV peak at 10 kHz; voltage depends on frequency and load.
- The saturation limit for the time-Voltage integral is 200 ... 250 kV $\mu$ s.
- Maximum voltage is limited by a spark gap to around 8 - 10 kV peak to protect the transformers.
- Output capacity of the transformer cascade around 5 - 10 pF.
- The generator is able to drive a load of 100pF (about 90cm actuator length) with 9-10 kHz and 12 kVss at 50% duty cycle.
- The transformer cascade has two possibilities to connect: One is for operation with nominal load of 100pF, the other is for half load with corresponding increased primary inductance.
- A temperature sensor is integrated within the 1<sup>st</sup> transformer.
- From the first transformer, a DC monitor voltage (0-5V) is generated for surveillance.
- board size 73\*153mm, weight 252g.

## Environmental conditions

- environmental temperature 0 - 35 °C
- humidity 0-80%, the assembly is intended for the use in dry rooms
- protection class III, IP 00

## Safety, EMC

The high voltage output connector is not protected against touching! The user has to ensure that they can't be touched during operation. Outputs of high frequency transformers have very little stored energy(<<100pF capacity). But the current may exceed allowed limits, touching may cause severe burns.

The most common application (barrier discharge in an open setup) 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.

10.08.12 Dr. Jörg Brutscher