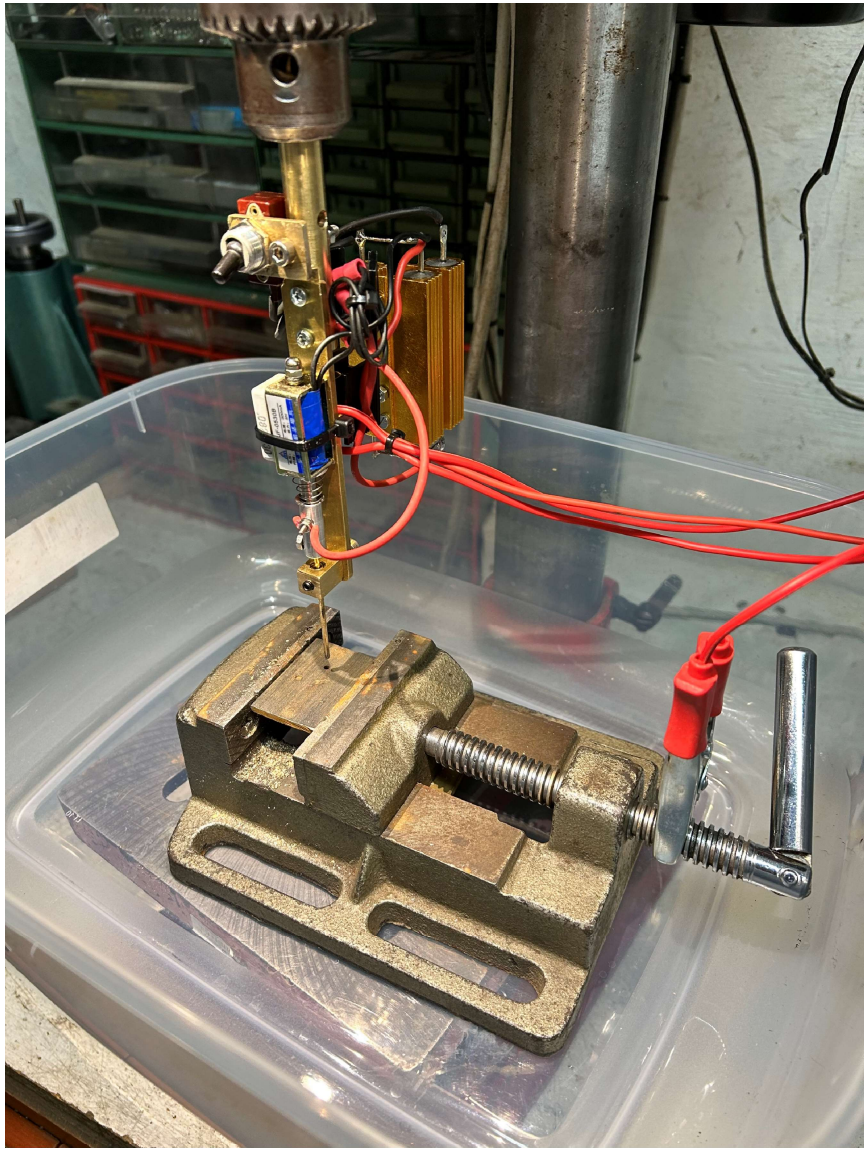
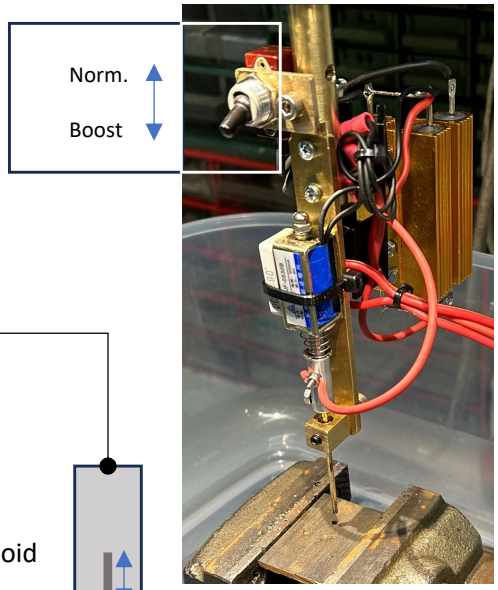
Mechanical EDM 30 V 60-90 W



Mechanical EDM

With self-priming solenoid



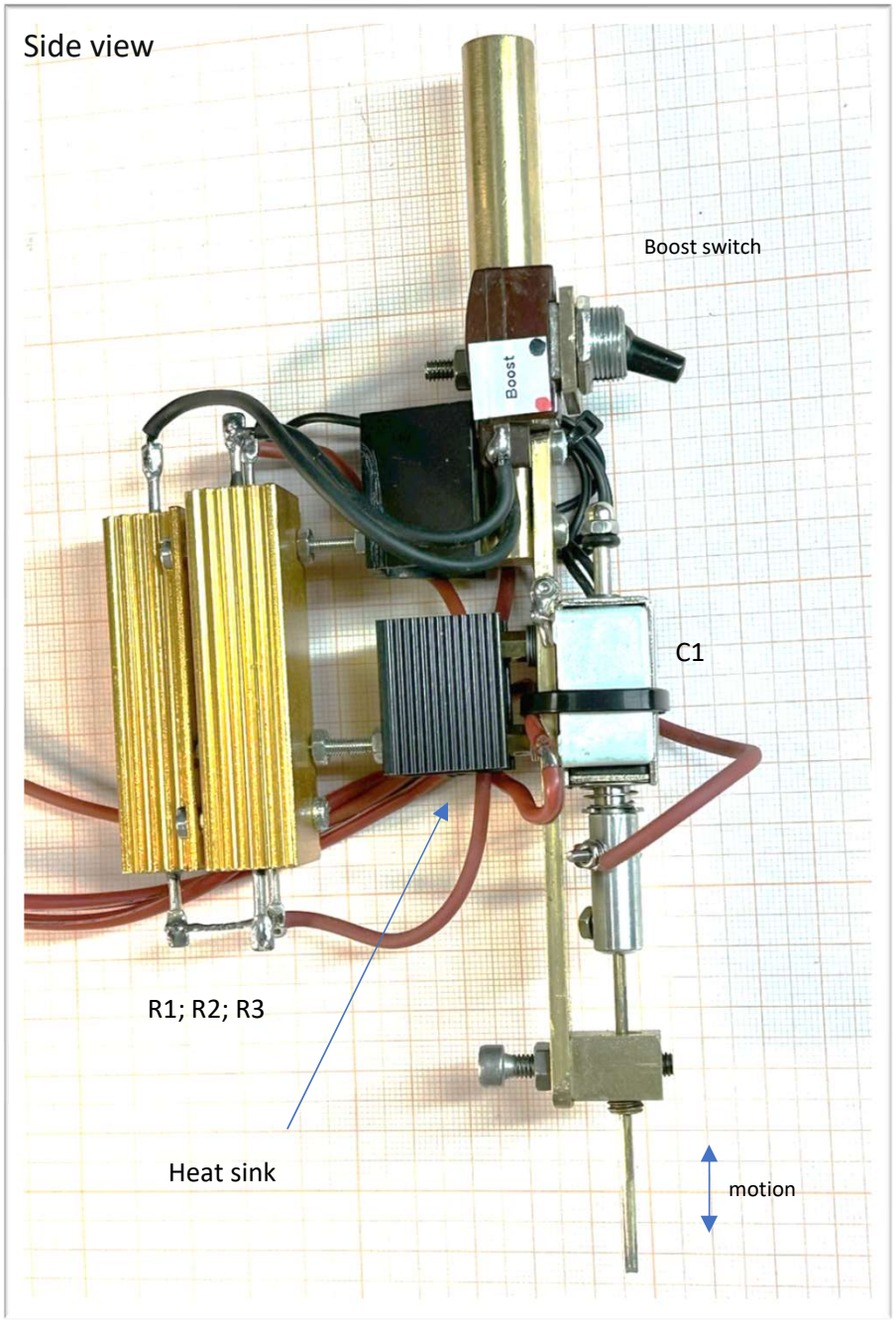
Solenoid:
Tyenaza DC Electromagnet,
DC 12V 300mA DC
Automation Control Pull
Linear Actuator 5N
Stroke [Retractable] 10mm

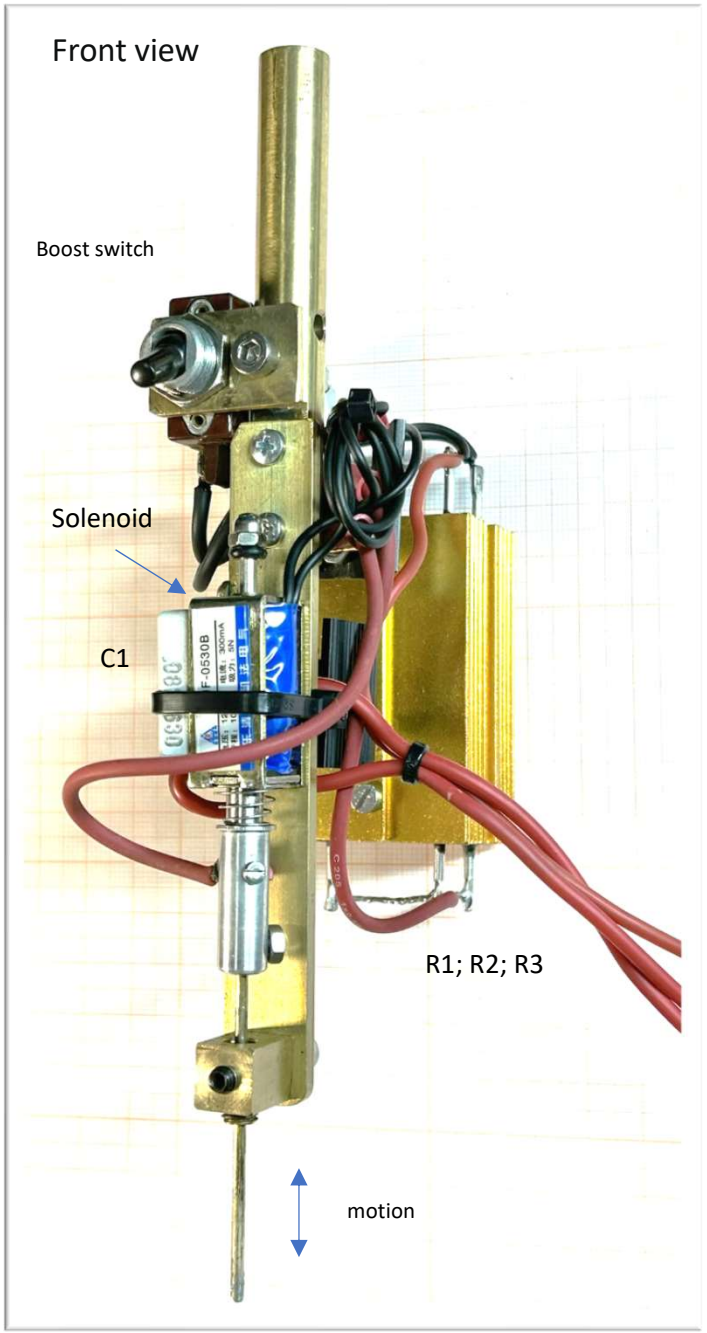
The operating principle is based on the electro-erosion of a metal when, immersed in a dielectric liquid, it is subjected to electrical discharges.
The contact point between the tip of the drill T and the workpiece P to be drilled acts as a switch for the circuit.
When the tip and the workpiece touch, the solenoid is powered and pulls the tip upwards, opening the circuit. The spring on the solenoid then brings the tip back into contact with the workpiece, and the cycle repeats...
At the moment of closing or opening, a high-temperature discharge is generated that is capable of melting and tearing away tiny portions of metal. With the appropriate polarity, this action is gentler on the tip and more intense on the workpiece, thereby allowing for its perforation.
The workpiece can be made of any metal, even extremely hard ones such as tungsten.
The tip can be made of copper or brass.

The described equipment is low-power, so it can support tips of 2 or 3 mm.

The power supply is 0–30 V 10 A with voltage and current control.
The resistor R1 acts as a bypass for the solenoid coil, which would otherwise not allow the current of about 2 A required to flow through, and it also serves to limit the voltage across the solenoid to about 4 Volts. Besides protecting the coil, by operating the solenoid below its rated voltage, it produces small lifts of the tip, thereby allowing the frequency of opening and closing cycles to be increased, which improves the drilling speed. The capacitor C1 helps to regulate the electrical discharges.
With the parameters described, using a 2 mm brass tip, the erosion speed on iron is 2 mm per hour.

07/12/2024


Side view
Boost switch
Boost
C1
R1; R2; R3
Heat sink
motion


Front view
Boost switch
Solenoid
C1
R1; R2; R3
motion