Voltage Monitoring:

Voltage can be measured using voltage sensors or probes. These sensors are connected to the power supply that provides electrical energy to the wire or electrode used in the WAAM process. By monitoring the voltage, you can assess the stability and consistency of the power supply, as well as detect any fluctuations or abnormalities that may affect the deposition process.

Methodology: Voltage of the system is measured across the substrate and the electrode of the CNC table with electrode as anode and substrate as cathode. The high voltage is then passed through the voltage sensing circuitry. The voltage sensing circuitry is primarily based on a specific differential amplifier INA117. The circuit also contains voltage dividers and capacitors for smoothing/decoupling of the signal. These signals are then acquired by NI6001 and read using a dedicated LabView code. [20]

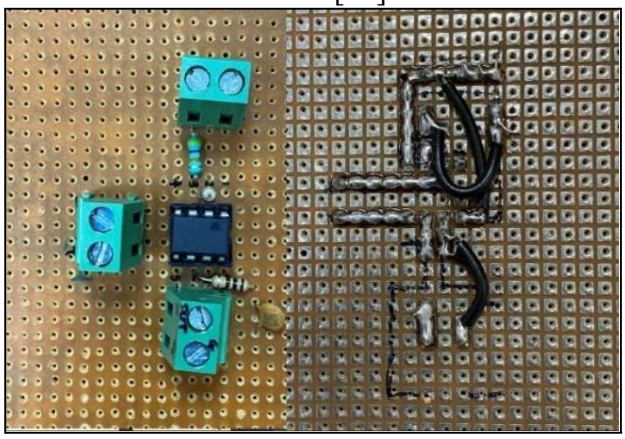

Fig . Voltage Monitoring setup

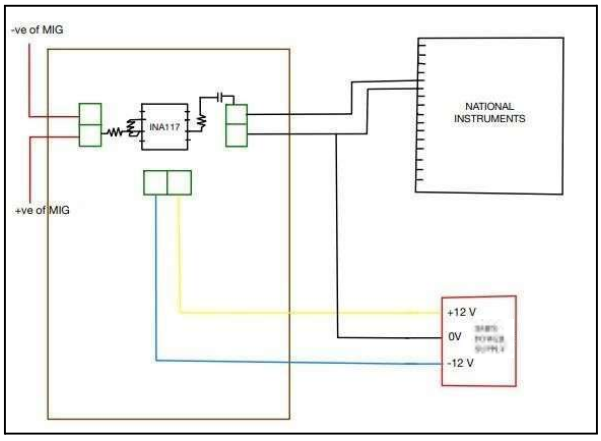

Fig . Voltage Monitoring Circuitry

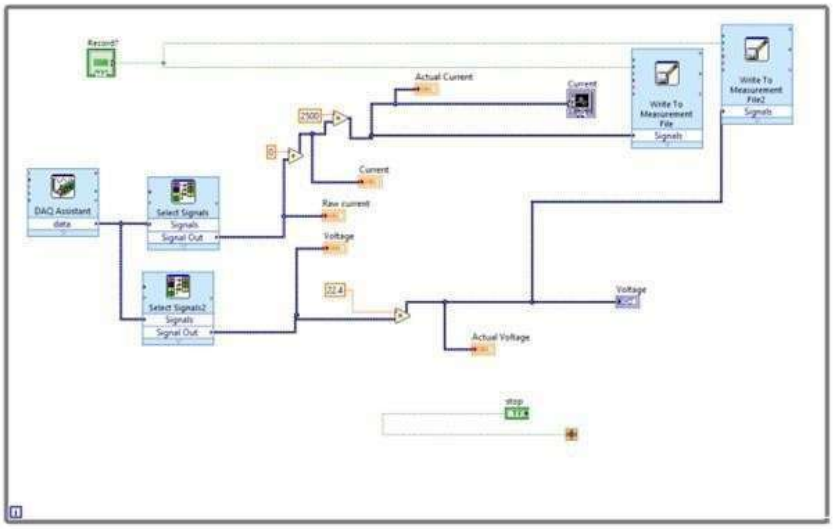

Fig . LabView program for recording voltage and current