## Portable generator for the deep electromagnetic soundings and monitoring of seismically active zones with the use of industrial power transmission lines

M.B. Barannik<sup>1</sup>, V.V. Kolobov<sup>1</sup>, V.N. Selivanov<sup>1</sup>, D.V. Kuklin<sup>1</sup>, A.A. Zhamaletdinov<sup>1,2,3</sup>, A.N. Shevtsov<sup>3</sup>

 <sup>1</sup> Centre for Physical and Technological Problems of Energy in Northern Areas of the Kola Science Center of RAS, Apatity, Russia
<sup>2</sup> St.-Petersburg Branch of Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the Russian Academy of Sciences, St.-Petersburg, Russia
<sup>3</sup> Geological Institute of the Kola Science Center of RAS, Apatity, Russia

**Abstract.** The device and example of experimental use of the portable generator of extremely- and a super- low frequency band (0.1–200 Hz) of 2 kW are described. The generator is developed for problems of the deep sounding of the earth crust by searches of minerals and electromagnetic monitoring of focal zones of earthquakes in seismoactive areas. Settlement and theoretical works and numerical modeling for optimization of parameters and element base of the generator are performed. The basic constructive elements of the generator – the scheme of the proofreader of power factor, the driver scheme of management by power transistors, the inverter of the untying high-frequency converter, the multichannel pulse converter of a food, the output inverter, etc. are consistently described. The weight of the generator doesn't exceed 10 kg. It allows to deliver without effort it to a place of tests on any kind of transport, including by plane. The generator is powered by voltage of 220 V from a single-phase network. Natural tests of the generator for territories of the Yamalo-Nenets Autonomous Area by connection it to the high voltage transmission Industrial line of 220 kV "Urengoy–Pangody" 114 km long are executed. The maximum current in the line is 12 A. The maximum distance of signals registration thus made 110 km.

**Keywords:** portable generator, electromagnetic sounding, extremely- and superlow frequency band, seismicity zone, industrial transmission line.