Southern federal University

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SCTB “Piezopribor”

HOT PRESSURE EQUIPMENT LUGP-10

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The hot pressing unit consists of a frame assembled from a structural aluminum profile, a countertop made of heat-resistant material, a press, a pneumatic unit, a furnace, an automation unit, and a control panel. The main components of the installation are a press designed to create the required pressure on the workpiece and a furnace designed to heat the workpiece to the desired temperature. The press is driven by compressed air, the furnace contains a spiral heating element inside which the matrix of the pressing mechanism with the workpiece is located. For the convenience of the operator, there is a mode for moving the pressing mechanism from the loading position to the pressing position and back. The pressure on the sample is stabilized during the pressing process by a proportional regulator. Operation modes are controlled using the touch screen, which simultaneously displays the current values of temperature, time, and shrinkage of the workpiece under the influence of pressure and temperature. To expand the technological capabilities of the plant, it is possible to create a specific gas environment in the area of pressing the workpiece.

The LUGP-10 hot pressing unit is a laboratory research equipment. It can be used in research, production, and educational institutions to synthesize ceramic materials with new physical properties, as well as to quickly determine the mode of sintering materials based on complex oxides.

Pre-pressed blanks with semi-dry molding are subject to hot pressing. The preform is loaded into the matrix mounted on the lower punch. To prevent the workpiece from sticking to the punches and the matrix, a backfill of aluminum dioxide is used. Further operations are performed when the movable door of the furnace is open. The loaded matrix is mounted on a movable part of the pressing mechanism and moved to the inner area of the furnace heating coil using the buttons on the control panel. When the upper punch closes with the backfill-turn on the duty cycle, close the movable door of the furnace and control the hot pressing process on the screen of the control panel according to the current temperature and shrinkage values and their schedules.

Technical parameters.

- Maximum heating temperature of the furnace,	1200 ºC
- Error in maintaining the temperature at the point location of the thermocouple, %	not more than ± 1.5
- The law of change of temperature programmable	
- Power consumed from the network, kW,	no more than 3
- Overall dimensions of the sample	
diameter, mm,	no more than 11
height, mm,	not more than 5
- The range of power load, kgf	25 - 500
- Force setting error, %	±10
- The range of shrinkage of the specimen, mm	from 0 to 5