AUTOMATED CONTROL SYSTEM
FOR SINGLE CRYSTAL GROWING PROCESS

Description
The Automated system carries out automatic control over a melting process under the given technological program, archives and documents acquired data, has a visual and sound operator interface and a sensor control in manual mode. System has highly reliable hardware components including controller and two industrial PCs. Automated system is equipped with sensitive drives and specialized sensors for measuring crystal diameter, melt level and melt contact, fuse position tie, melt and heater temperatures. Automated system enables remote monitoring of melt process from a technologist PC where technological program providing analysis and documentation of melt process parameters can be created and edited.

Technical appraisal and economic benefits
In comparison with leading foreign analogues the automated system has a number of advantages:
- essentially lower price;
- opportunity to combine the technological control and monitoring into production section with common center;
- opportunity to produce a flexible nomenclature of output types of single crystals with the help of different technological programs for growing process;
- opportunity to reconfigure automated system for different types of growing installations (the version of automated system for growing corundum single crystal has been developed).

Application areas
Crystal growing by the Czochralski method.

Development stage
The automated system as a part of single crystal growing furnace 221UMK090 (production of FGUP “Krasmarsh”, Krasnoyarsk) using the Czochralski method (diameter of crystal is up to 250 mm) has been successfully certified in the process of interdepartmental testing. Based on the results of implemented testing the experimental series are being produced.

Patent situation
No patent was obtained.

Commercial offers
Contracts for automated system production and shipment (up to 20 items per year) under the condition of 70% advance payment.

Estimated cost
69 900 euro.
Contacts
Tadeush N. Mantush, Ph.D., Scientific Secretary
Institute of Automation and Electrometry, Siberian Branch of the Russian Academy of Sciences
1, Prospekt Akademika Koptyuga, Novosibirsk 630090 Russia
Phone: (383) 333-35-86
Fax: (383) 333-38-63
E-mail: mantush@iae.nsk.su
http://www.iae.nsk.su