UNIVERSAL SYSTEM “GRAD-2” FOR MEASUREMENT OF GEOMETRIC PARAMETERS OF PLUGS

Description
The «Grad-2» system is designed for non-contact measurement of geometric parameters of articles of body-of-revolution type.

Technical specifications
- Automatic tuning for measurement of geometric parameters of an article from its drawing designed with standard computer-aided design facilities (for instance, AutoCAD)
- Automatic inspection of geometric dimensions of an article and indication of measured parameters in a form suitable for the operator
- Manual measurement of geometric dimensions
- Accumulation of statistical information in the SUBD format, Access, Microsoft Office 97; information processing (e.g., the measured lot, daily or monthly output, etc.) and issuing the protocol of inspection results and statistical data
- System self-testing

<table>
<thead>
<tr>
<th>Measurement range, mm</th>
<th>Admissible error, µm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside diameter 1 … 13</td>
<td>± 4</td>
</tr>
<tr>
<td>Length 0.5… 60</td>
<td>± 40</td>
</tr>
</tbody>
</table>

The inspection time for one article (≈ 30 parameters) is not more than 15 sec.
Similar systems with different specifications can be manufactured upon agreement with the customer.

Technical appraisal and economic benefits
The system is designed with four automatic workplaces, including quality inspector, designer, production engineer, and instrument measurement inspector.
The system is able to extend the list of measured articles by drawing components with computer-aided design facilities. The drawing is processed using a special program and is used for the development of the measurement algorithm.
Explicit information on the inspected product parameters makes the system an indispensable tool of a production engineer in adjusting and inspecting production technologies.
**Application area**
The multifunctional information and measuring optoelectronic system for the inspection of geometric parameters of articles such as bodies of revolution is designed to be used in software programs of several automated workplaces. The system provides measurement of cylindrical parts (diameter range from 1 to 13 mm, with error of no more than 4 µm) and lengths (range from 0.5 to 60 mm, with error of not more than 40 µm), and cone angles (error of no more than 0.5°).
The system was designed for the Ministry of Nuclear Industry of the Russian Federation.

**Development stage**
The system is under trial operation at one of the enterprises of the Ministry of Nuclear Industry. A pilot sample and technical documentation are available.

**Patent situation**
The system is registered in the State Register of Measuring DEvices (# 24546-03). The RF certificate has been obtained (RU.E.27.007.A #14425).

**Commercial offers**
Investment agreement for commercialization of the product; license agreement; production and procurement contract; sales agreement; etc.

**Estimated cost**
As of January 12, 2003, the cost of the system is US$ 25,000 or more, depending on the set of equipment.

**Contacts**
Prof. Yuri Chugui, Director
Technological Design Institute of Scientific Instrument Engineering, Siberian Branch of the Russian Academy of Sciences,
41, Russkaya St., Novosibirsk, 630058, Russia
Phone: 7 (383) 330-27-60
Fax: (383) 332-93-42
E-mail: chugui@tdisie.nsc.ru
http://www.tdisie.nsc.ru