PKV/M5A DEVICE FOR TESTING HIGH-VOLTAGE SWITCHES

Description
The device is designed for testing vacuum and oil switches of all types and voltage classes without their disassembling.

The testing is performed by measuring the parameters of time, velocity, and displacement of the contacts. Connection of the device to the switch and installation of a sensor take no more than 5 minutes; then, the switch and device are started, and in 6 seconds the LCD shows digitally all 32 measured parameters. Additional information on the switch state is provided by the graphical representation of the recorded processes. The graphical representation makes it easier to diagnose faults in the guiding mechanism or oil buffer, contact misalignment, etc. The measured results are stored in the internal nonvolatile memory and can be either printed on a printer or fed to a computer.

Technical specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of time measurement, sec</td>
<td>0.002 – 5.2</td>
</tr>
<tr>
<td>Error of time measurement, msec</td>
<td>± 0.1</td>
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<tr>
<td>Ranges of displacement measurement (range M), mm</td>
<td>0 – 900</td>
</tr>
<tr>
<td>(range B), mm</td>
<td>0 – 50</td>
</tr>
<tr>
<td>Error of displacement measurement (range M), mm</td>
<td>± 0.5</td>
</tr>
<tr>
<td>(range B), mm</td>
<td>± 0.05</td>
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<tr>
<td>Range of velocity measurement, m/sec</td>
<td>0.002 – 20</td>
</tr>
<tr>
<td>Weight of the device and packing box, kg</td>
<td>5 and 11</td>
</tr>
</tbody>
</table>

The complete set includes the device itself, a case for transportation, a packing box with cables, sensors of linear and angular displacements for vacuum and oil switches, and fasteners to fasten the sensors on any switch.

Technical appraisal and economic benefits
The PKV/M5A device has the following advantages over similar domestic and foreign instruments:

- lower cost (by a factor of 1.5 as compared to domestic devices and 7.5 as compared to foreign devices) and maximum simplicity due to application of an internal processor rather than an additional notebook, which makes the device affordable for a greater number of enterprises;
- this is the only domestic device that allows testing of vacuum switches;
- higher accuracy (by a factor of 2-4) of measurement of contact displacement and velocity;
- adaptation to all domestic switches, which allows the user to avoid personal adaptation of the device to a particular switch;
- cold resistance down to – 30ºС, whereas the use of notebook-based devices is restricted to temperatures above zero only;
- mobility and portability facilitating transportation to the operation point.

Application area
Potential consumers of PKV/M5A are all electric power systems, hydro-, pumped-storage, cogeneration, and nuclear power plants, railway, oil- and gas-production enterprises, metallurgical, chemical and other enterprises, i.e., electric power consumers. The potential demand by the NIS countries is more than 5000 devices.
**Development stage**
Initial stage of production at the small enterprise “Design Bureau of Electronic Instruments” (Irkutsk).

**Patent situation**
Know-how.

**Commercial offers**
Joint production with an instrument-making company, production and procurement contract.

**Estimated cost**
The estimated cost of the PVK/M5A system on the domestic market is ~ 3200 USD.

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