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CUSTOMIZED

Industry: Medical technology

Testing system for surgical instruments

Task

To obtain a reproducible test with a short test duration, the customer's manual test station should be replaced by an automated testing system. The high number of versions to be tested must be considered. When contacting, it should also be noted that the DUT work in a very fine manner. Thus, contacting must be automatic without damaging the DUT. Nevertheless, a safe contact with low transition resistance must be achieved.

Solution

Referring to the accompanying documents, the correct test program is selected by scanning a bar code, so that the real test can also be performed by semi-skilled staff. Electrical continuity is checked with up to two continuity tests per instrument. The insulation between the electrodes and the integrity of the plastic wrap are checked by applying a high voltage. To test the wrap, the entire DUT is inserted into a narrow metal pipe. This metal pipe acts as a potential for the high voltage test.
It is possible to cover the high number of versions using various test adapters that are also adjustable in their length. Contacting is partially by spring contact pins and by pneumatic pins in case of hypersensitive DUT; these pins are also used to fix the DUT.

The testing system PC software allows storage of an arbitrary number of test programs, so that the necessary scope of testing and the test data can be specified for each DUT. However, for products with similarly mounted DUT, it is also possible to use the same test program, which is then allocated to the respective DUT over the product list. The test results are stored automatically in XML or Access format on an arbitrary place on the network.

Up to ten DUT can be inserted into the test adapter at once. They are tested in parallel in the high voltage test. If an error occurs, they are individually retested to select the defective DUT. Following this, the testing personnel is asked to remove the defective instruments, which is automatically controlled by a further step. By performing a 4-wire measurement, the correct contacting of the DUT is monitored in the high voltage test.

A light curtain was used to protect the user. Thus, it is possible to shorten the cycle time further as no safety door must be closed and and reopened. In the selection of faulty DUT, the user has to intervene several times to remove the corresponding DUT in case of failure, and therefore would have to open the safety door repeatedly.

A separate test dummy is used to check the functionality of the testing system fully automatically. During the daily start of the testing system, the testing personnel is asked to include this dummy and start the corresponding program. The testing system does not allow further testing without a passed dummy test.

Advantages

+ Turnkey solution including DUT support, adaptation and workplace design
+ Simple, intuitive operation for semiskilled personnel
+ The DUT needs to be connected only once, then the whole test process occurs automatically
+ In network operation, all test data is automatically saved at the specified location / database
+ Long service life and service-friendly design
+ Short cycle times through efficient workplace design with light curtain
+ All values and settings can be made using software
+ Automatic dummy test
+ Workplace safety according to EN 50191
+ Automatic test program selection
+ Simple and quick retooling for different versions
+ Short test duration by parallel testing of up to ten DUT and use of a light curtain for securing the area
+ 100% process safety by 4-wire technique in the high voltage test

Specifications

- High voltage test 5.5 kV AC / 6.0 kV DC / 100 mA (non-safety-current-limited) in 4-wire technique
- Continuity test 5 V

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