

# CUSTOMIZED

Industry: Gardening devices

## Safety, function and leak testing system for electric pumps



### Task

The development was based on a short test duration, so that the testing system can operate concurrently with the production line. Moreover, operation should be automatic and as simple as possible, so as to allow semi-skilled assistants to carry out the test. The retooling times for different types of pumps should be kept very short, which is possible only with partial automation. The „PASS“ DUT should be marked with a hot stamping punch upon completion of the test.

### Solution

The testing system was divided into two parts as the leak test takes considerably more time than the safety and function test. One system for the leak test and another one for the safety and function test. The system for the leak test is equipped with a turntable and two DUT supports. This allows removal of the tested pump and insertion and connection of the next pump while performing the test. Thus, the downtime of the actual leak tester is minimised. The turntable also ensures that the actual testing area is closed, thus ensuring the safety of the testing personnel. The test results of the leak test are transferred to the second system, so that they are stored together with the other test results.

The testing system for the safety and function test is equipped with a drawer for the DUT support. The testing personnel can easily insert and plug the DUT. After closing the drawer, the test process will start automatically. Protective earth conductor test, high voltage test, insulation test and functional test will be successively executed. The switch of the pump is actuated by two cylinders to check the proper functioning of the switch. Finally, the pumps will be automatically marked as tested with a hot stamping punch.

A second leak test system may be connected to the safety and function testing system to reduce the average test duration. This is implemented by a PC network.

An arbitrary number of test programs can be stored in the testing system PC. This allows the customer to independently write new test programs when developing new types of pumps with similar housing shapes (for example, other output). However, for pumps with identical data, 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.

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
- + All values and settings can be made using software
- + Automatic dummy test
- + Workplace safety according to EN 50191
- + Automatic test program selection
- + Short cycle times are achieved by dividing the task into two separate testing systems that operate in the PC network
- + Optimisation of the test duration and handling by using a turntable in the leak test
- + Only minor retooling is necessary for the different versions

### Specifications

- Protective earth conductor test 10 – 30 A
- High voltage test 5.5 kV AC / 6.0 kV DC / 4 mA (safety-current-limited)
- Insulation test 6.0 kV DC / 4 mA
- Function test single-phase (measurement range 15 A) with measurement of voltage, current and power
- Leak test