

# CUSTOMIZED

Industry: Electric motors

## Stator testing system S 1800



Stators of electric motors must be subjected to an intensive test in production. Only then the stator with the rotor is assembled to an electric motor.

### Task

Electric drives are produced in large numbers every day worldwide. Here the 3-phase motor prevails in all performance classes. With the help of modern electronics the drives can be powered and controlled. Due to the power electronics the requirements in testing technology have increase significantly. The digital electronics do not produce a complete sine wave and therefore charges the insulation additionally. Apart from the usual high voltage measurement / insulation test therefore also a surge test and a partial discharge measurement (PD) are required.

Complex measurement systems for electric motors, stators and rotors must have a standard PC with standard software in WINDOWS technology. Other concepts are not state of the art and cannot be integrated in modern production lines. Also for the various measurement / test methods standard components have to be used. For integrated systems the supply of spare parts is difficult and a calibration often impossible. Since it is operated with high voltages and currents suitable cables, socket connectors and relays must be used. Reed relays are not suitable due to their technical structure and present a high safety risk (sticking when over-stressed by currents).

Since the workplace design is always customized the interface of the test voltage to the test system must be performed with high voltage / high current connectors. Then all options are open and it is still possible to convert the test system from manual assembly to fully automatic operation.

### Solution

The stator test system S 1800 consists of standard test plug-ins for the various test and measurement tasks. The standard PC is connected to the individual components only via a LAN interface. This way a replacement of the short-lived PC technology is possible at any time and at low cost. Depending on the request of the customer the PC or laptop can be integrated into the system cabinet or set up separately. The same applies to the monitor and the keyboard. Accessories such as barcode reader, printer, label printer etc. can be connected just like any other standard PC. The concept is of course network-compatible and can read from the server the test parameters as well as the test results or store them there. Also the connection to the company software

(e.g. SAP) is possible at any time. The interfaces to the DUT are high voltage connectors. From here customer-specific work station designs are possible in all variants. Even later the work station can be changed or automated. From the connection of the DUT with free cable-ends via conventional test hoods, with safety curtain protected test cages up to tandem test hoods all options are easily realisable. For the direct connection to the DUT various Kelvin terminals or DUT-specific adapters are available. The specialist from the mechanical design of the company SPS electronic will readily apply their decade-long experience.

## Advantages

- + Future-oriented solution by using a separate standard PC with standard test technique
- + Short cycle times through optimized test processes
- + Use of standard components
- + Turnkey solutions including workplace design (by separate control panel and separate connection desk freely designable)
- + 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 specific location / data base
- + Long service life and service-friendly design
- + All values and settings are available via software
- + Workplace safety according to EN 50191

## Specifications

### Safety test

- Ground bond (PE) test:  
1 – 30 A AC / 0 – 10  $\Omega$
- Insulation test:  
100 – 6,000 V DC / 0.25 M $\Omega$  – 10 G $\Omega$
- High voltage test AC:  
100 – 5,500 V AC / 0 – 100 mA
- High voltage test DC:  
100 – 6,000 V DC / 0 – 50 mA

### Function test

- Resistance measurement winding 1  $\mu\Omega$  – 3 M $\Omega$
- Surge test up to 5,000 V
- Direction of rotation
- Partial discharge
- Winding temperature
- Resistance DUT sensor

### Workplace

- Free cable ends
- Test hood
- Test cage with light curtain
- Tandem test hood
- Substructure for test hood / test cage

### Additional data

- 2-, 3-, 2 x 3-phase DUT
- Up to 8 sensors in the DUT
- Various Kelvin clamps for DUT connection
- DUT-specific adapters