

# CUSTOMIZED

Industry: Electric motors

## Test system for Pedelec motors



### Task

There is to be the possibility to carry out a fully automatic complete function test of the e-bike motors including communication and programming. The load simulation is to be made via a frequency controlled synchronous motor with a very accurate measurement resolution of the torques and number of revolutions to detect the smallest friction torques in the planetary gear of the DUT. In addition the technology has to be installed in the production with minimum space requirements in a compact unit (including belt connection).

### Solution

On the basis of the test specifications and development documents a flexible divided concept of the test devices and the mechanical contacting was selected. The system consists of a 19" mobile ESD test cabinet and a mobile adapter with belt connection. The adapter is docked to the test cabinet via a modular plug-in system. Thus it is possible to operate the test cabinet with different adapters.

The mechanical contacting is made fully automatically via an integrated control of all actuators in the adapter. For maintenance purposes all actuators can be controlled via a touch panel. Individual movements as well as complete sequences of the contacting can be run.

The regulation of the load machine was carried out as a dynamic PID control circuit with a torque measuring shaft.

### Advantages

- + Highly dynamic motor test system
- + Flexible test solution by means of adapter concept
- + Complete automatic test in one station
- + Ergonomic handling due to direct belt connection

### Specifications

- Dynamic load simulation on both pedal outputs, each with up to 80 Nm
- Speed range: 0 – 200 Rev./min
- Power measurement up to 2 kW
- Torque measurement 0 – 100 Nm
- Frequency generator for tachometer simulation
- QR code vision sensors for device identification
- Touch panel for actuator control
- CAN communication with programming of the DUT