

# Test cages

## Standard test cages

### Special features

- conforms to CE, in accordance with EN 50 191
- enclosure made of grey PVC
- swivel acrylic glass lid with damping cylinder
- safety limit switch, automatic contact break

type	HB 3300	HB 3400
outside dimension	H=365 mm, W=540 mm, D=650 mm	H=365 mm, W=590 mm, D=780 mm
max. DUT size	H=330 mm, W=500 mm, D=390 mm	H=330 mm, W=550 mm, D=510 mm



test cages

## Test cage with integrated device plug-in compartment

### Special features

- conforms to CE, in accordance with EN 50 191
- enclosure made of grey PVC
- swivel acrylic glass lid with damping cylinder
- safety limit switch, automatic contact break
- integrated compartment for test device mounting

type	HB 2000	HB 2100
outside dimension	H=680 mm, W=500 mm, D=630 mm	H=725 mm, W=500 mm, D=800 mm
max. DUT size	H=200 mm, W=410 mm, D=410 mm	H=200 mm, W=410 mm, D=490 mm
plug-in	19" / 4 HU	19" / 5 HU



test cages

## Customized test cages

It goes without saying that we, upon request, develop also individual test cages. Depending on customer's requirements different safety concepts can be realised:

- light curtains / sliding doors
- pneumatic opening and closing
- drawers for easy insertion which go into the test room
- complete safety areas with individual work station protection
- tandem test cages for simultaneous component insertion and testing
- integration of production lines and holding fixtures for mobile goods carrier
- available in various sizes



test station

## System example

### Electric tools / hedge shears

system example



#### System example for electric tools

- PC remote controlled test system
- high voltage test:
  - safety insulation
  - operating insulation
- function test
- blocking current test
- braking time measurement

system example



#### System example for hedge shears

- fully automatic test run
- 16 burn-in stations
- test station, PC controlled:
  - high voltage test
  - rated current consumption
  - blocking current
- 115 V / 60 Hz and 230 V / 50 Hz supply
- safety light curtain as user protection

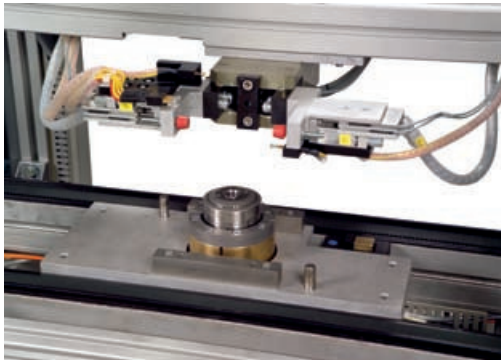


# System example

## Dryer motors / linear stators

### Test system for dryer motors

- communication with mobile data carrier (MOBY)
- earth bond and high voltage test
- resistance measurement
- load torque measurement
- measurement of rotation speed and direction



system example

### Test system for linear stators

- earth bond test up to 30 AAC
- high voltage test up to 5500 VAC and 6000 VDC
- inductance test of the windings
- resistance test of the windings and temperature sensor KTY
- test bench with integrated roller conveyor and safety light curtain
- direction of rotation recognition
- surge test



system example

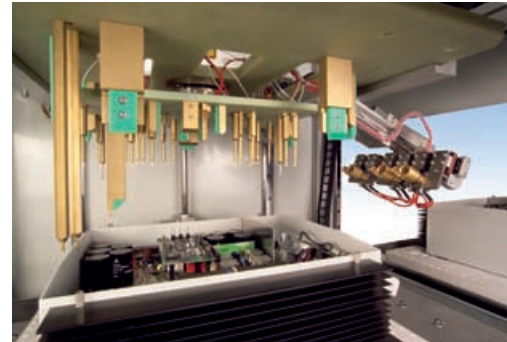


system example



### Test system for solar inverters

- test station with test hood for integration into a production line
- adaptation of PCB-boards and plug and socket connections with different interchangeable adapters



system example



### Test systems with turntable

- mobile work station for safety tests
- in one area components can be inserted while tests are performed in the other one
- the turntable takes the test object automatically into the test area
- test set-up in different sizes available
- high comfort and safety for the test employees

# System example

## Drilling hammers / heated water bath

### Test system for drilling hammers

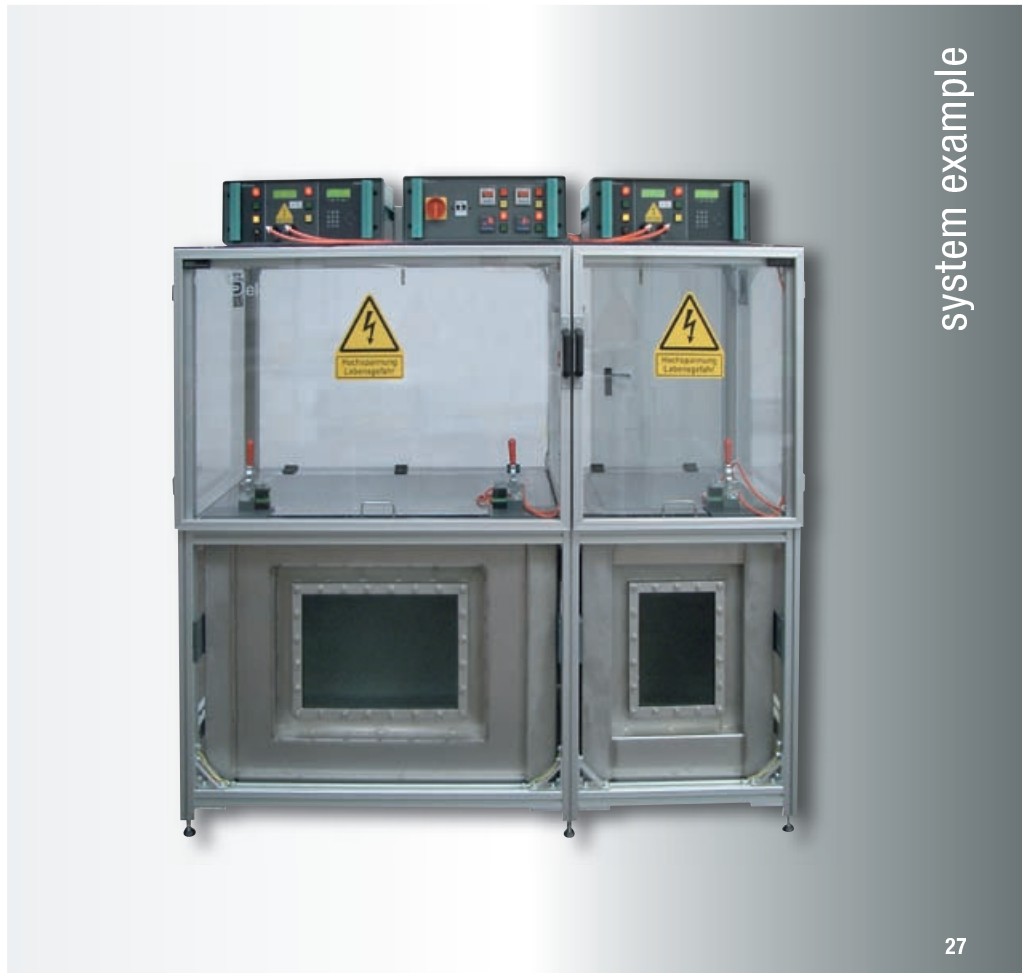
- function and high voltage test of drilling hammers
- cabin with noise reduction ( $< 75 \text{ dB(A)}$ ) for function test
- separate cabin for high voltage test with interchangeable adapter
- voltage, current, frequency and number of impacts test
- link to SAP



system example

### Cable test in heated water bath

- water basins, heatable up to  $85^\circ\text{C}$
- independent control of test voltage, test time and temperature of each water basin
- high voltage test up to  $5500 \text{ VAC} / 100 \text{ mA}$  and  $6000 \text{ VDC} / 100 \text{ mA}$
- insulation resistance test up to  $6000 \text{ VDC} / 1 \text{ GOhm}$



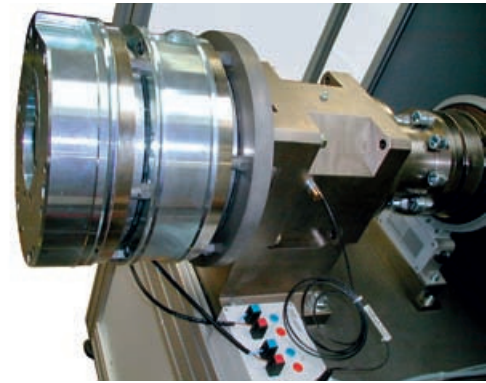
system example

system example



### Torque test station up to 2000 NM

- for testing of brakes and clutches
- supply voltage 0 – 500 V AC/DC
- recognition of torque and revolutions
- measurement of response time and air gap
- measurement of angle of twist
- PC controlled



system example



### Programming station

- in-factory programming of electronic modules
- PC equipped with WINDOWS
- 2 programming places
- complete programming of Flash and EEPROM
- interface for article data base
- multi language version (D, GB, F, I)
- barcode reader and label printer
- change-over adapters for several electronics



# System example

## Motor test system with parameter identification

### Special features

- high voltage test up to 5500 VAC / 100 mA
- inductivity test of windings
- resistance measurement of windings and of temperature sensors
- DC supply source 60 V / 500 A for the armature
- mechanical adaptation no longer required
- only an incremental encoder is connected to the DUT
- test technique for the complete acquisition of static or dynamic characteristics of the motor (direction of rotation, speed, torque, friction torque, unbalance recognition, etc.) within seconds
- deviations from reference values indicate errors and are to be identified easily by means of the measured results



system example

### Test operation

- within seconds the complete static and dynamic characteristics of an electro motor are acquired
- an electric motor is accelerated from zero to full speed whereby the load is only its own moment of inertia
- very quick measurement acquisition of:
  - current
  - voltage
  - speed
- speed measurement is performed by:
  - an external speed sensor
  - an internal motor encoder or
  - the machine control supplying the speed signals
- graphic and tabular presentation of the data from the measurement values and storage for statistic evaluations or trend tracing

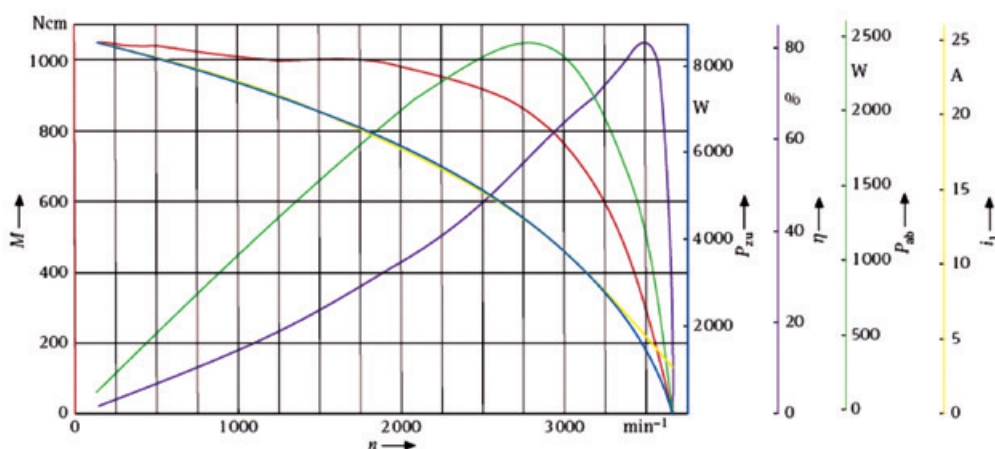




### Advantages of the motor test technique

- By means of this test method all characteristics from simple electric drives, geared motors and complete machines with multi-axle drive can be recorded.
- Goal: to make a comprehensive statement about possible problems quickly, exactly, effortlessly when measuring motors – of static as well as of dynamic nature.
- With this test method all electrical and mechanical defects can be found during in-process inspection.
- Foresighted tests (system monitoring) can be especially easily and elegantly performed with all machines with several driving axes and an open machine control.
- Consequence: unnecessary services as well as considerable costs of a failure in operation are prevented and the operating safety is increased.

### Characteristic motor curves



### Static characteristics

- supplied power, speed
- effective power, speed
- efficiency, speed
- torque, speed
- friction torque, speed
- voltage, speed
- current, speed, integral of amplitudes of oscillation
- current, torque
- direction of rotation
- stator temperature
- motor output at different temperatures
- determination of moment of inertia

### Dynamic characteristics

- speed, time when accelerating
- torque, time when accelerating
- moment of unbalance
- torque, via speed oscillations
- frequency analysis of speed oscillations
- angle analysis of friction torque
- height of cogging torque



# System example

## for tests of more than 10.000 V

### Application possibilities of the devices

- voltages up to 150 KVAC and 300 KVDC
- current up to 2000 A
- hand-operated test devices or automatic test systems
- standard-conform work station set-ups



system example

### System example cable reels

- automatic test system
- tandem test cabin
- simultaneous equipping and testing possible
- doors for letting cable reels in and out
- voltage up to 12 KVAC
- current up to 6 A

