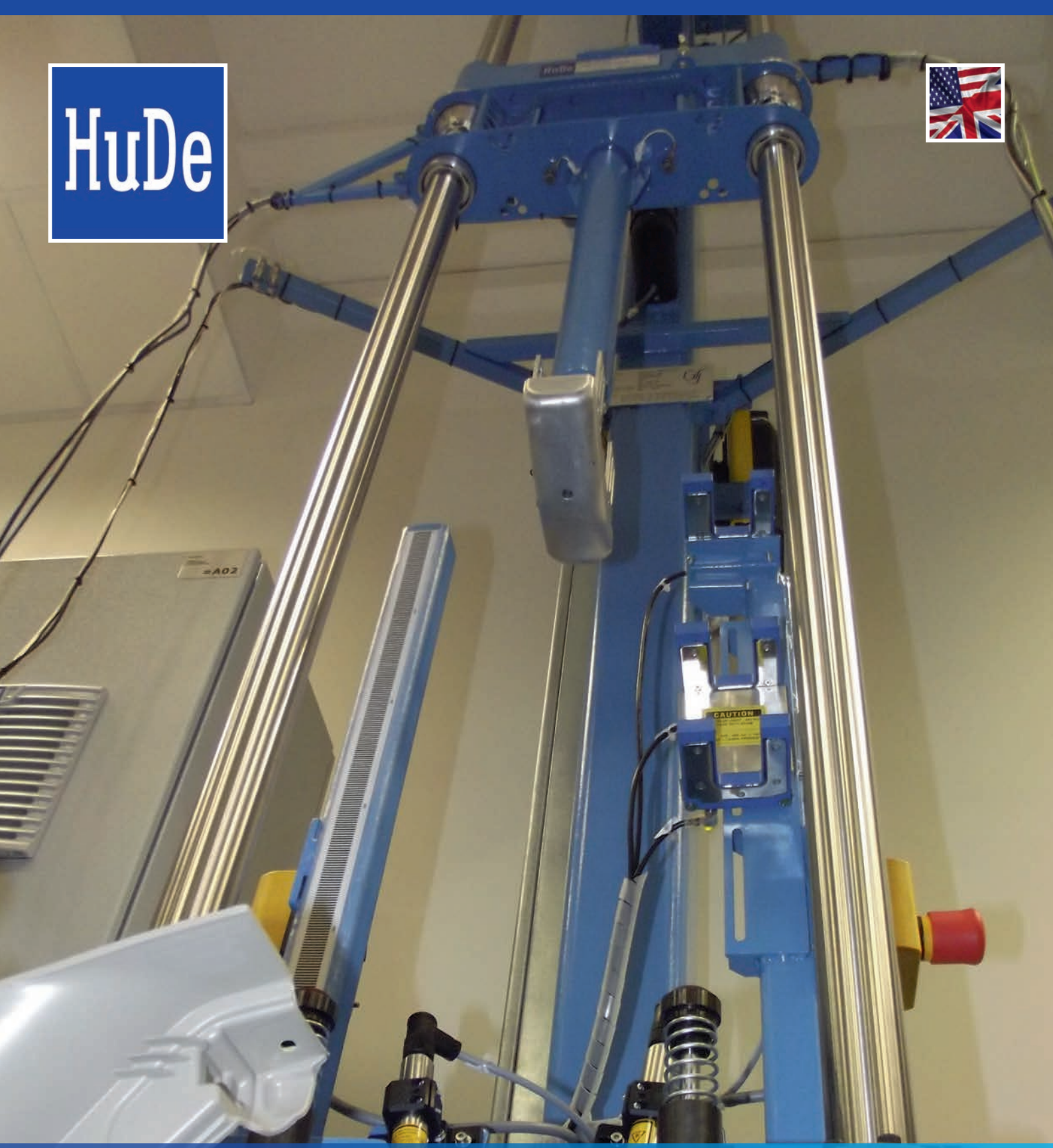
HuDe



DROP TOWER TEST SYSTEM

complexity made simple.

HuDe GmbH

Since 1981 HuDe stands for highest quality and best service. Either in coke oven machinery or in test and measurement technology HuDe is firmly established around the world. The products are developed and produced with special attention to best performance, newest technology, adherence of schedules and customer satisfaction. Our project teams and partners are using leading technology in design, construction, manufacturing and support to provide the best client satisfaction.

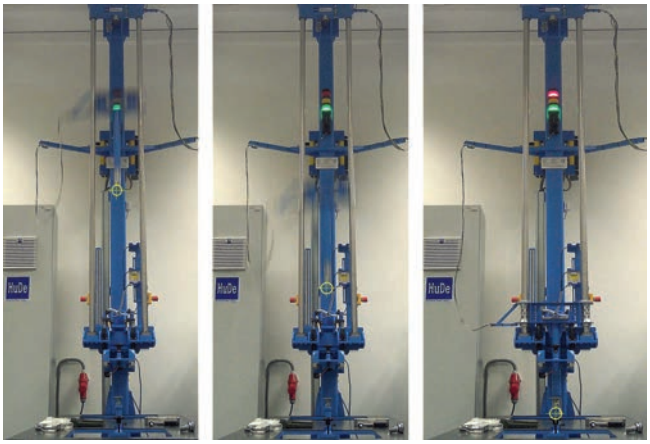
Our Values

Our business philosophy is providing high-tech products made by outstanding people. To secure this target we permanently check and improve our processes and skills. Continuous training of our creative engineers is one of the key points of success.

Contents

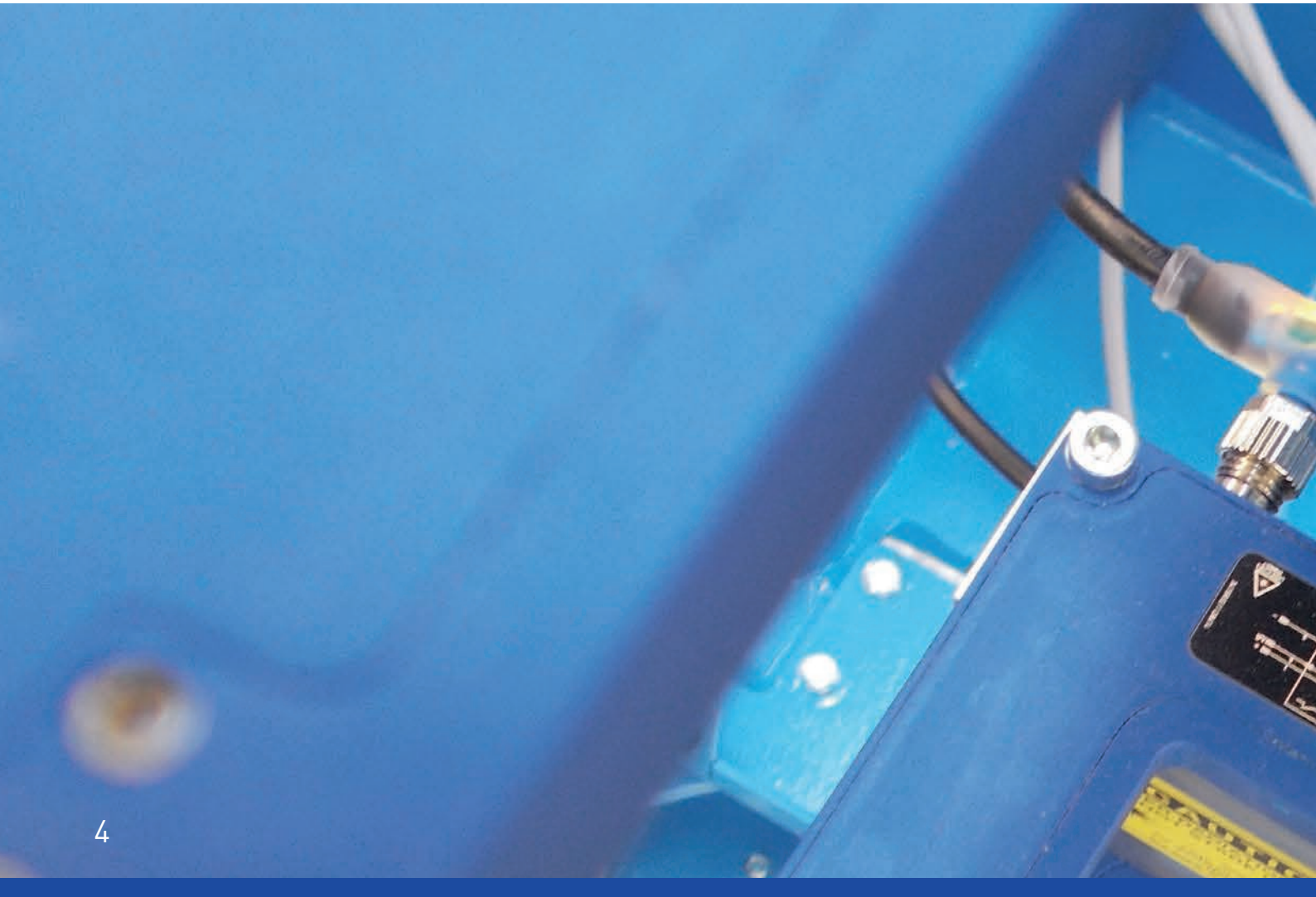
Drop Tower Test System

The HuDe Drop Tower Test System (DTTS) is perfectly suitable for the integration in test facilities. It´s mainly used for impact testing the airbag cover scoring of instrument panels (IPs) without a deploying procedure of airbags.
All instrument panel suppliers and manufacturers can have an end of line quality check. In general a sample of lot can be directly tested and confirmed before the upcoming processes are proceeded. With the system it´s possible to control the production and reduce testing costs.
There are different variations for IP fastening available. The IP is mounted with its original A- or B-sided fastening.
The measurement equipment provides test data like acceleration, speed, force, deformation during impact and room- as well as surface temperature of the IP. The data can be evaluated with the HuDe Software.

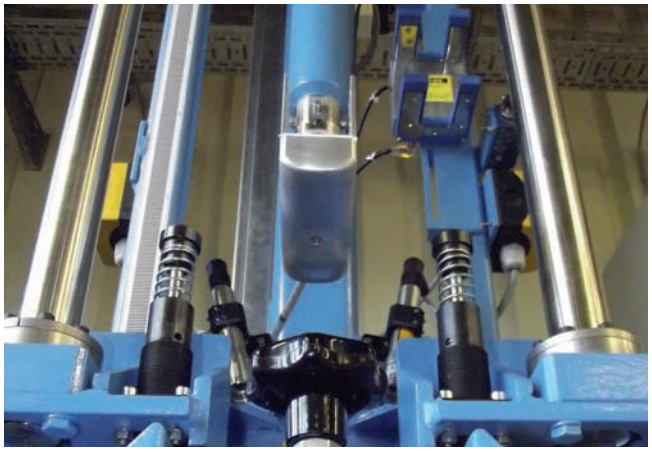


Free Fall

The sophisticated free fall system, offers reproducible values.
By application of highly durable shafts and the slide bearings, the DTTS achieve a high efficiency of about 97 %.
The fall height of up to 2,200 mm related to impact point provides a wide range of impact energy.

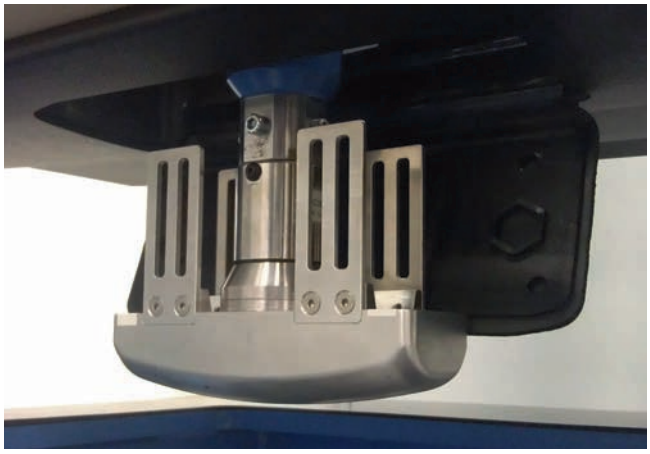


Drop Tower Test System



Impact Energy

The HuDe system provides the evaluation and energy calculation via either the 1-axis load cell or the integrated acceleration sensors. With an adjustable drop height up to 2,200 mm to the impact point and corresponding weight adjustment from 8 kg to max. 20 kg, energies from 50 J up to 400 J can be realized with this system.



Impact Heads

For the test of different airbag covers in an instrument panel like passenger or knee bags a variation of fast locking impact heads are available.
The attachment of the right head is double checked by software and indicators.

Development

In order to improve the development of new dashboards, the tests can be recorded and evaluated with high-speed cameras. The results show the weak points of the test objects. We offer the suitable hardware for the test experiments. Benefit from our many years of experience in the automotive testing sector.

Drop Tower Test System

The flexible Drop Tower Test System offers a wide range of testing opportunities.
With the adjustable payload from 8 kg up to 20 kg it simulates different forces of airbags. The impact heads are easy to change and the form can be customized for individual specifications. The HuDe System measures acceleration, real force, displacement and calculates velocity at the impact point and kinetic energy. For automatic PASS/FAIL result display the energy relief during the impact process is evaluated by software.

Special Requests

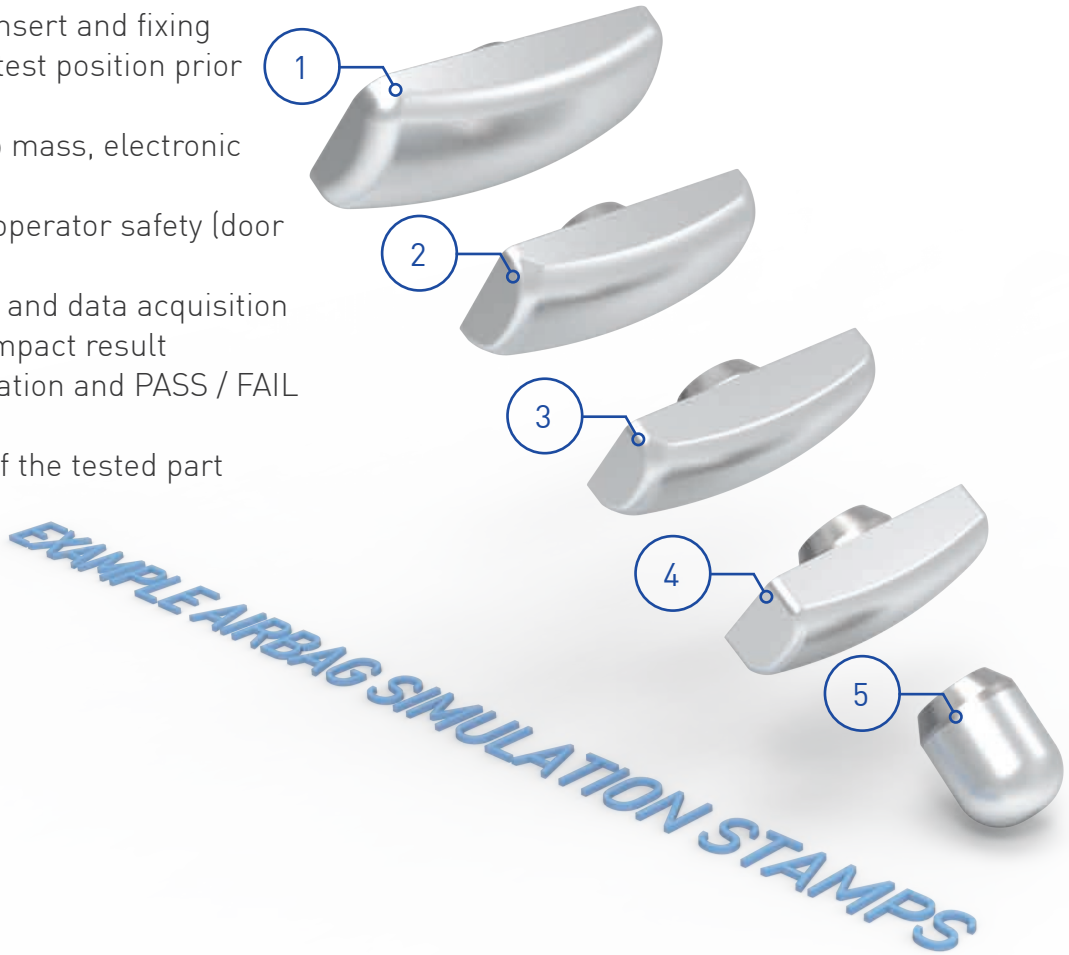
The drop tower can be customized according to your requirements. You need different heads or more features? Just contact us!

Technical Data

Drop Mass:	8 ... 20 kg
Height:	approx. 4,000 mm
Drop Height:	up to 2,200 mm (adjustable +/- 2.5 mm)
Speed:	vmax ≈ 6.2 m/s
Energy:	approx. 50 J - 400 J
Efficiency:	97 % (Free Fall)
Used Area:	3,500 mm x 3,500 mm height min. 4,500 mm
Enviroment	temp. 20 °C – 25 °C,no aggressive media and dust e.g. closed heated warehouse or workshop
Regulations:	FMVSS 201 ECE R21

Process Description

- Manual test sample insert and fixing
- Visual check of right test position prior test
- Electric lifting of drop mass, electronic height adjustment
- Electronic control of operator safety (door lock)
- Drop process, trigger and data acquisition
- Visual check of IP's impact result
- Automatic data evaluation and PASS / FAIL result display
- Manually unloading of the tested part



Drop Tower Test System

1 Stamp 80 x 180 mm

2 Stamp 60 x 150 mm

3 Stamp 50 x 150 mm

4 Stamp 50 x 130 mm

5 Stamp Ø50 mm

6 Height Measuring

7 Guide Rail

8 Tower

9 Winch

10 Ambient Temp. Measuring Sensor

11 Drop Mass

12 Acceleration Sensor

13 Displacement Sensor

14 Velocity Sensor

15 Force Sensor

16 Impact Head

17 Emergency Stop

18 Laser for Impact Point

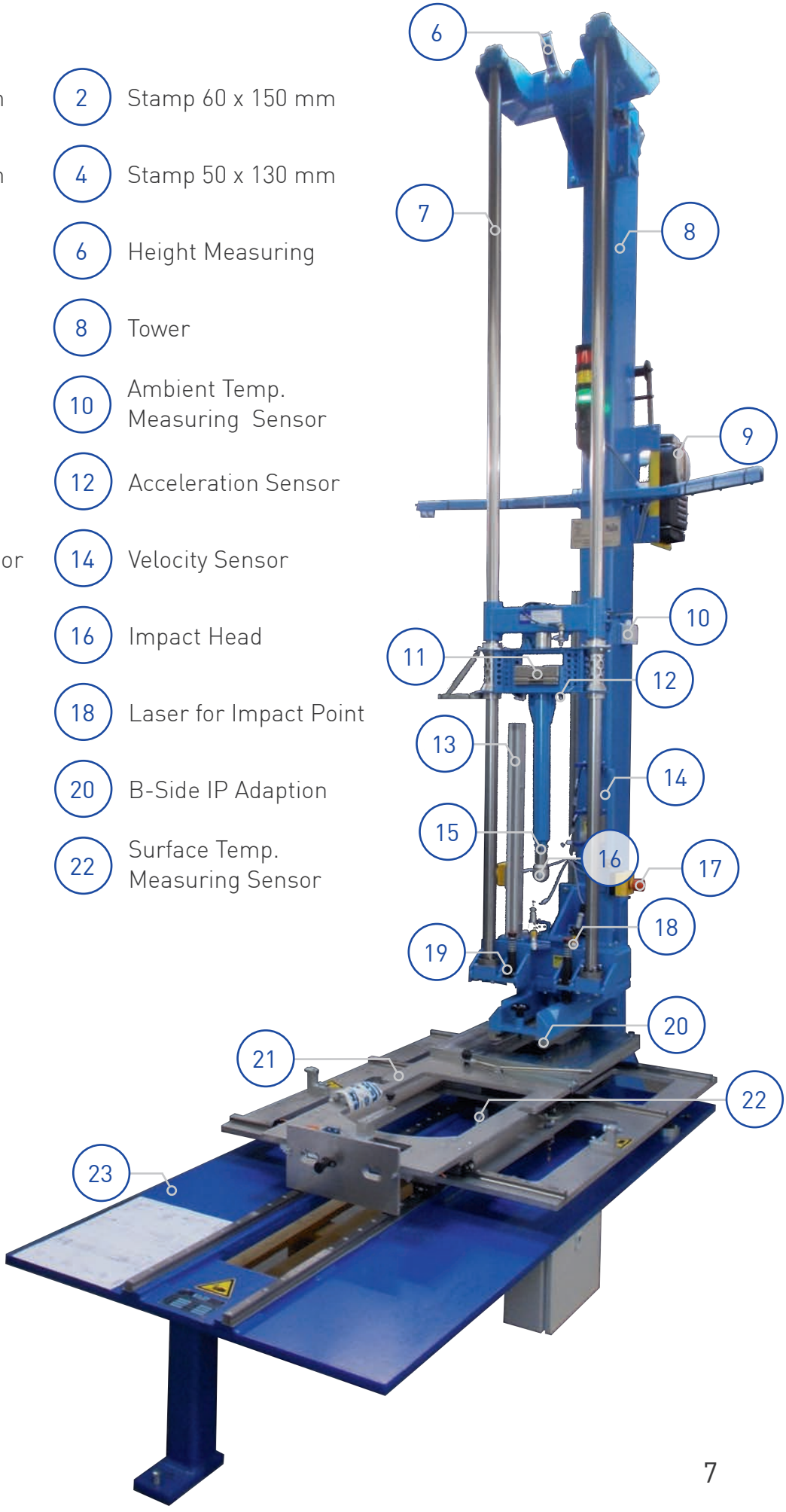
19 Shock Absorber

20 B-Side IP Adaption

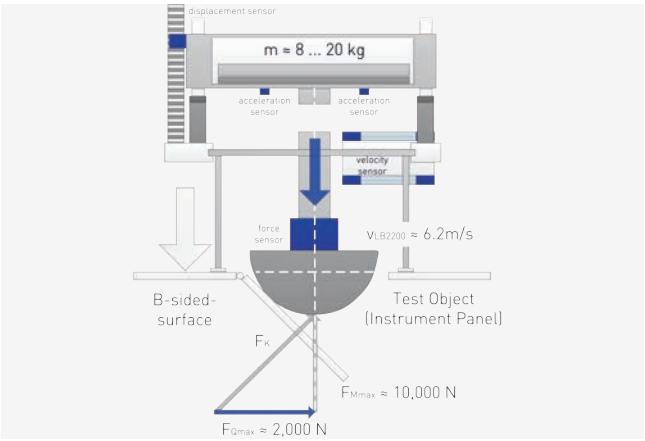
21 A-Side IP Adaption

22 Surface Temp. Measuring Sensor

23 Table

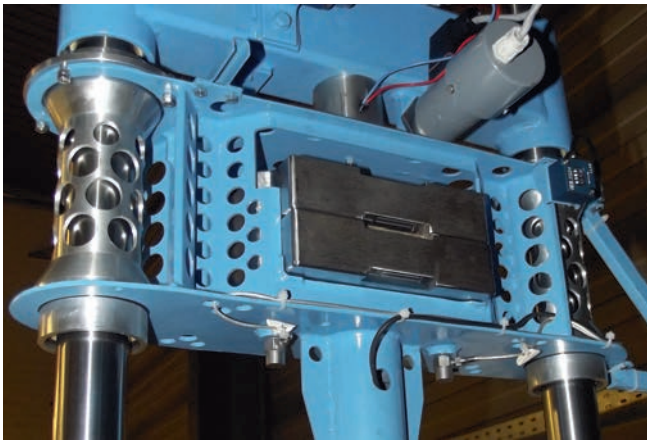


Sensors



Evaluation

For optimal test evaluation, the right choice of sensors is very important. A combination of the different applied sensor types is necessary to calculate the test results.
The HuDe software offers to choose the needed sensors and integrates all measured values. The data is presented in a user-friendly way in diagrams.



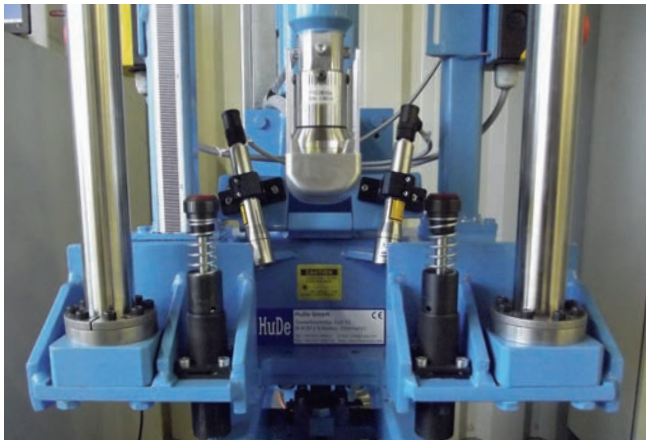
Acceleration Measurement

The sensors acquire accelerations and decelerations. The entire signal curve reflects the energy consumption by time of the experiment.
By the use of two acceleration sensors changes in load due to tilting of the test object can be compensated by averaging.

Turnkey Solutions

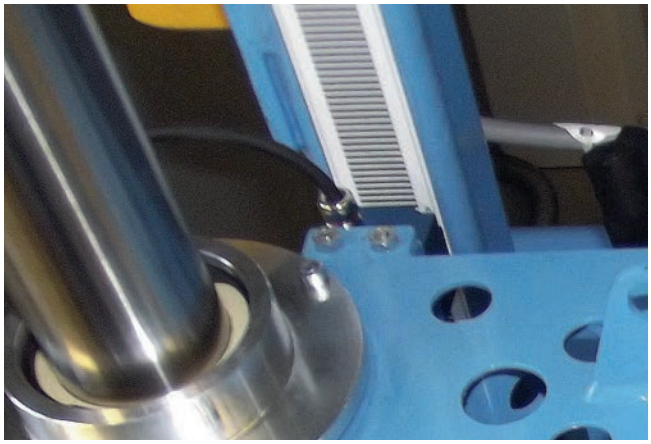
With HuDe you receive turnkey solutions from a single source. In addition to installation and training, HuDe offers you annual maintenance contracts.
Thus, you can concentrate on your core competencies and rely on a proven system. During the project phase, especially the concept phase, the experienced project team stands by their side with advises.
For HuDe is the customer satisfaction and implementation of your individual wishes and adjustments very important.

Sensors



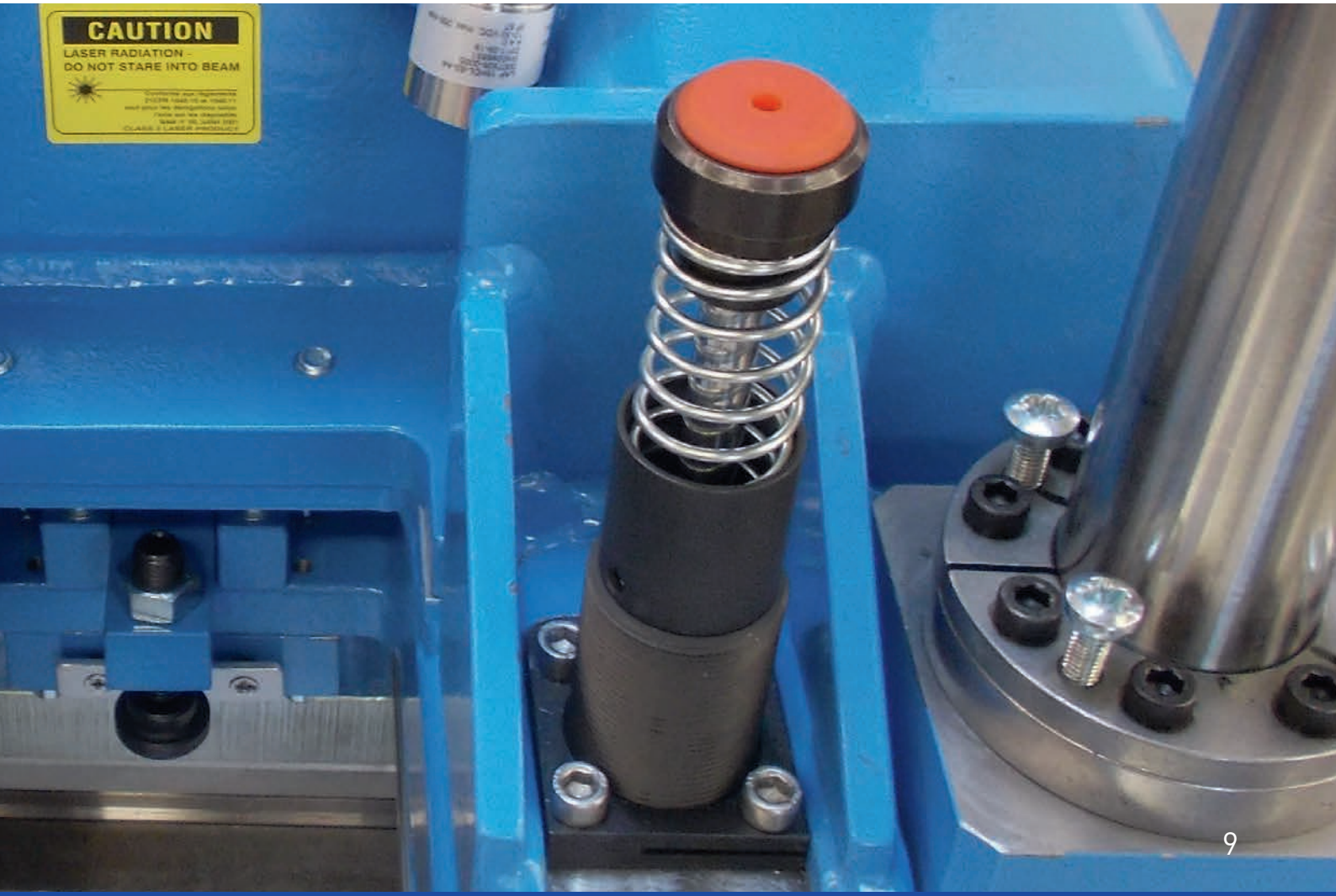
Force Measurement

The force sensor of strain gauge type is integrated next to the impact head. An advantage is the near position to the impact and the low sensitivity to vibrations. Filter application is not mandatory.
The calibration is cross checked by a simple weight load. The second force sensor also checks the drop weight.



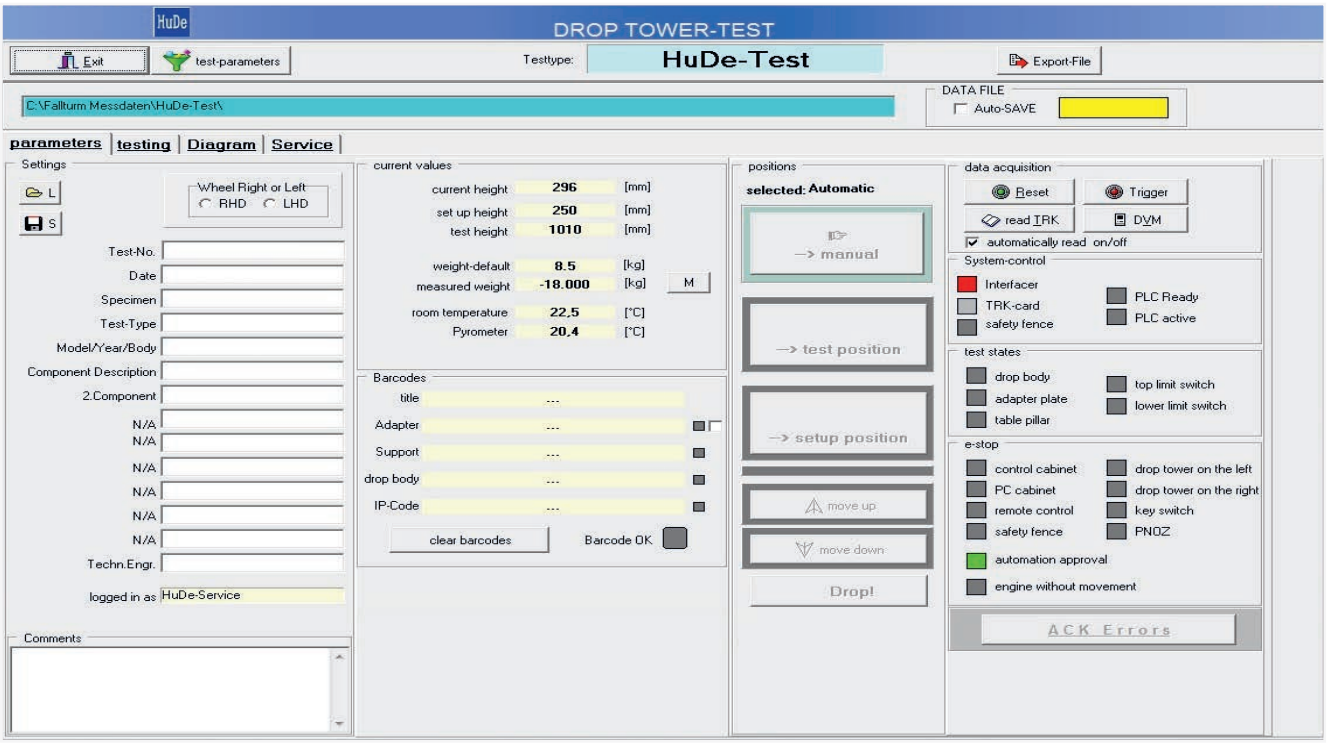
Speed Measurement

For the impact speed measurement two different sensor types are used. To measure the spot velocity directly before instrument panel contact and to trigger the data recording system a light barrier is used.
For real intrusion and deformation measurement an optical incremental sensor is applied.



Technical Specifications

Software



HMI

The status and operation of the DTTS system is clearly shown at the user interface.

Results

The results are provided for analysis purposes. Data export and protocol printout is available.

Graphical analysis

The measurement results are displayed clearly and user friendly in diagrams and tables.

Logfiles

Any kind of events and messages are stored in appropriate log files for quick system analysis.

Customization

For upcoming and modified test regulations the software can be easily customized.

Settings

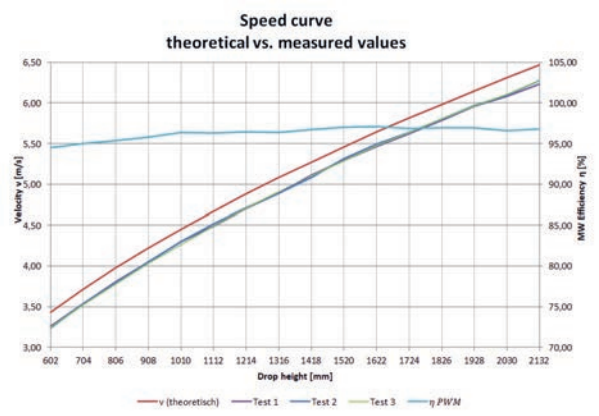
The operation, control and settings of the light and video system are integrated part of the HuDe software.

Technical Specifications

Features

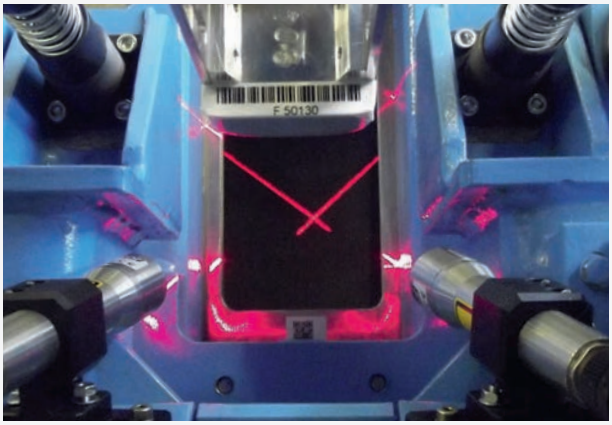
Bearings

The used bearings contribute to a high efficiency. On average, the HuDe Drop Tower achieves a friction coefficient of <3 % at a drop of 1 m.
The low-maintenance components provide a high level of reliability.



Positioning

For the correct positioning of the test object e.g. dashboards a laser cross is used. It indicates to the operator the impact point of the drop mass. Correct positioning of the airbag opening is essential for correct test execution and reproducible measurement results. In addition the laser significantly reduces the assembly and test cycle time.



Safety System

The safety system consist the usual safety components such as emergency stop, safety fence, door locks and alarm bells. The test table also has detents and sensors to check the correct position of the test object. Only after successful plausibility check it is possible to start the test. This increases the operator safety.

HuDe Mission Statement

We have realized projects in more than 25 countries and are represented around the world in all major regions of automotive development and manufacturing. Contact us today and convince yourself of our service and extensive project experience. Customer satisfaction and product quality are always our top priority.

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