

FORCES TO BE RECKONED WITH

Measurement components and system solutions Made in Germany





MEASURING TOOLS

THAT GET YOU THERE.

Precision engineering has a long tradition in sunny Baden. Black Forest cuckoo clocks had already conquered the world by the middle of the 19th century. The first German clockmaker school was established in Furtwangen in 1850 and electromechanics and precision engineering were taught there just a few years later. Today, the Furtwangen University (HFU) college is one of the leading German colleges for engineering sciences.

In neighbouring Switzerland, precision measuring instruments have even become the national flagship. To this day, precise as Swiss clockwork is still used to denote accuracy and smoothly running processes. By the middle of the 20th century, mechatronics had grown into an independent core discipline from the combination of precision engineering, electronics and computer sciences.

Karsten Herrmann and Heinz Knittel thus continued the long tradition of precision mechanics in the region when they established HKM-Messtechnik in Freiburg in 1988. They celebrated their first successes in the market with force transducers on the basis of strain gauges. With moderation and determination, they continued to further develop the company. Today, HKM-Messtechnik is a healthy medium-sized company and a first-rate address in force measurement and weighing technology. The excellent product quality and flexible development of individual solutions are the engines driving further continuous growth. Close cooperation with the regional colleges (Karlsruhe, Offenburg, Furtwangen) and taking on graduates from these renowned institutes ensure that HKM-Messtechnik will always remain up-to-date. In addition, the development orders from our customers not only demand further development here but requires us to develop ourselves further as well. That may well be challenging, but it is certainly quite enjoyable as well. Our sunny environment is also a contributing factor – it is one of Germany's most beautiful regions.





WE DO WHAT WE CAN. AND THAT'S QUITE A LOT.

Our products are developed and manufactured in Germany. Because quality Made in Germany is important to HKM-Messtechnik. And obviously important to our internationally active clients as well. 70% of all products are exported. They are flown or driven around the globe and are installed in machines and plants that are used worldwide. They do their work reliably, securely and precisely.

In medical engineering, you will find HKM sensors for force measurement in prostheses or in dental medicine equipment. Various orthopaedic and rehabilitation devices are also equipped with HKM products. Our force transducers provide valuable services, such as for dosing contrast media in injection cannulas.

engineering companies. Force and pressure measurement on milling/turning machines, sheet bending and other metal working machines as well as injection moulding machines are to the fore here.

In the construction sector, we mainly focus on overload protection and the stability of cranes, silos and portable construction machines. Manufacturers of agricultural machines like to work with us just as do large mechanical

Traditionally, we are active in suspension and brake testing of motor vehicles. In the field of logistics and aviation, we take on the weighing operations of lorries and aircraft. We are well positioned in other branches, such as robotics. We look forward to the tasks you assign to us.



A milestone in lower limb prosthetics is the microprocessor-controlled leg prosthesis system C-Leg® by the med-tech company Otto Bock which uses HKM-Messtechnik sensor technology.



BUILDING BLOCKS ALONE DO NOT MAKE A HOUSE. THEY ALWAYS NEED SOMEONE TO FIT THEM TOGETHER.

A solid house can only be developed if the matching building blocks are combined in the right way. HKM-Messtechnik has the necessary components and the corresponding know-how to build it.



And we are finely attuned to your requirements. We can provide the consultation for your project and also supply the development work. In any case, we are always your Original Equipment Manufacturer (OEM) whose manufacturing quality you can absolutely rely on.

We can supply you with individual components or a completely coordinated measurement system consisting of transducer and signal conditioning and evaluation. The three-component model at HKM-Messtechnik is broken down as follows:

There are various procedures of applying the strain gauge to the available metallic measuring bodies. We usually bond the strain gauge onto the measuring bodies as foil strain gauges. These foil gauges consist of a measuring grid that is laminated to a carrier material. Foil strain gauges are extremely accurate, very flexible and can be used on nearly all geometries. This procedure is excellently suited for the manufacture of individual items and small series as well as for the high-volume production of OEMs.

1st Component: The Transducer / Sensor

We define the technical parameters on the basis of the application and do an FEM calculation as necessary. If the requirements cannot be satisfied with a transducer from our standard program, we will design and manufacture a completely individual transducer. Depending on the application, we apply the strain gauge directly onto the customer's component.

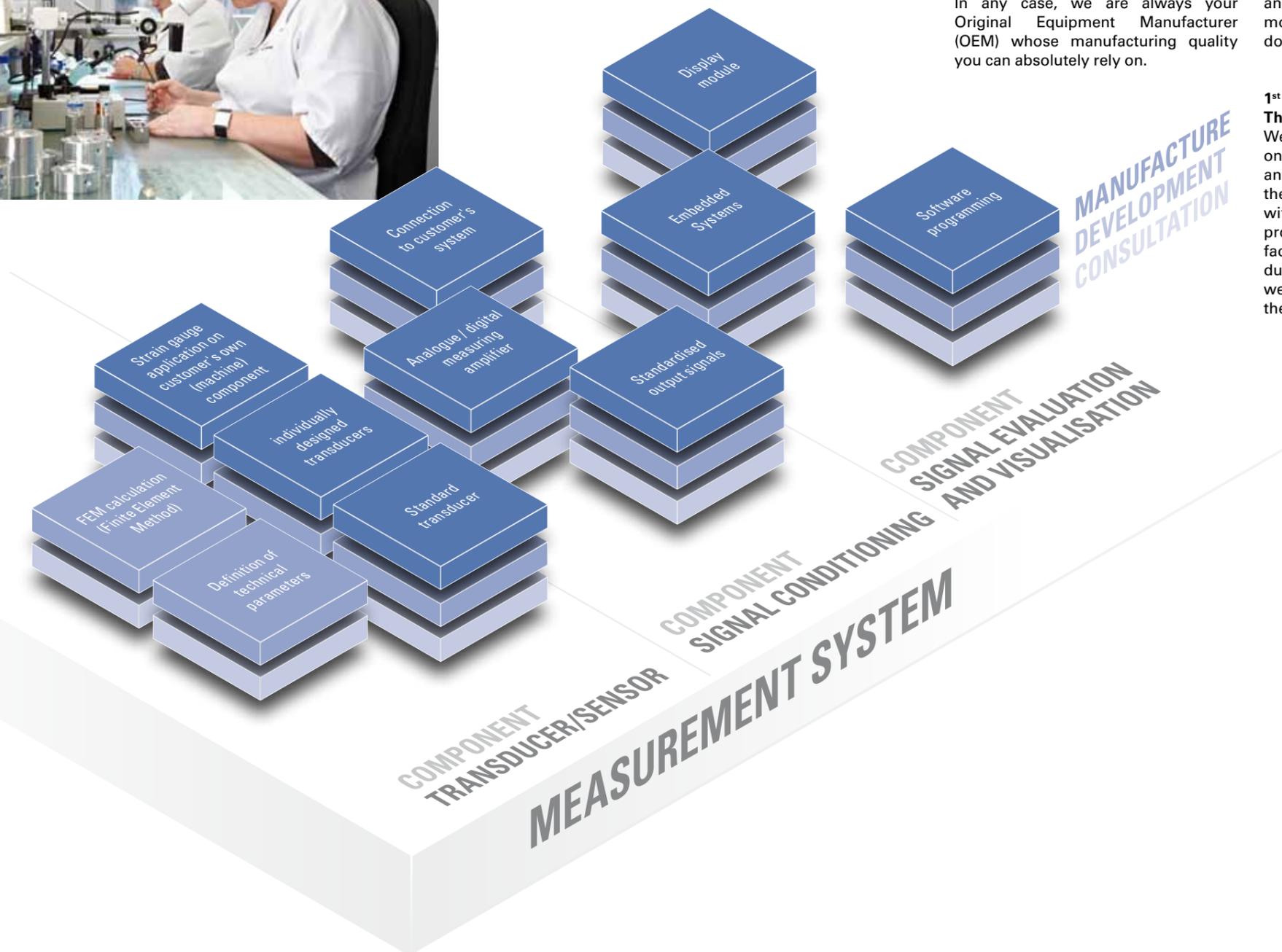
Thick-film and thin-film techniques are used alternatively for large-scale production. The thick-film strain gauges are applied directly onto the measuring body in an additive screen printing process. They are suited for applications without specific accuracy requirements. For thin-film strain gauges, the measuring grids are applied directly onto the measuring body in a subtractive process (sputtering). Both processes place specific requirements on the measuring body geometries.

2nd Component: Signal conditioning

We use integrated or external measuring amplifiers in analogue or digital execution. Connection to the existing customer's system can be made at any time.

3rd Component: Signal evaluation / Visualisation

HKM-Messtechnik develops individual processor units that are designed and programmed as Embedded Systems for specific tasks. We can easily supplement these units with display modules and prepare individual software solutions for you.





WHATEVER WE START, WE ALSO FINISH PROPERLY.

Tricky development projects are our speciality. Our qualified engineers accompany the entire process from set measurement tasks to complete system solutions.

Sometimes we can manage a project easily with our standard components. But usually HKM-Messtechnik steps in whenever individual measurement solutions are developed. This is where we can play all of our strong points. From transducers and signal conditioning up to signal evaluation and visualisation, we develop and manufacture individual systems that will completely satisfy all your requirements.

Depending on your needs, we can integrate our sensor technology to your application after defining a joint interface, or we can develop complete systems which you can use on the whole for yourself. In both cases you may rely on the highest quality Made in Germany. Both in development and in manufacture. And now we look forward to your project.



WHEN PEAK PERFORMANCE BECOMES THE STANDARD, HKM COMPONENTS AREN'T FAR.

To record forces and torques as well as to determine weights, HKM-Messtechnik has diverse standard transducers on offer. But standard only describes the availability. For naturally all of our products are in-house developments and can be adjusted individually. All sensors are based on the measurement principle of strain gauges.

Most of our sensors are bidirectional, meaning they are equally loadable in tension and compression. This includes the shear force and dual shear force transducers as well as the shear force load cells. They are all rugged and compact and insensitive to transverse forces. The load pins are also bidirectional and can measure very high loads. We can adapt the structural shape to commercially available standard pins to make replacement easy.

If only tensile forces will be measured, then our tension rods are the first choice. Because of their design they can be easily integrated in the power flow.

To measure pure compression loads, we offer diverse compression load cells which can also be used as portable measuring equipment. Thanks to their metallic sheathing they are especially useful under aggressive environmental conditions. And our torque transducers are highly suitable for static torque applications.

To amplify the output signal of the strain gauge transducer, we have analogue measuring amplifiers with current output or with voltage output. A digital measuring amplifier for failure-free intelligent signal conditioning is also included in the range. Furthermore, the amplifier can be directly

integrated in the sensor depending on the model and area of application. But the result of a measurement cannot be seen without a display. So we also provide various hand terminals and industrial digital displays.



IF FORCES ARE TO BE USED SENSIBLY, THEN THEY MUST BE MEASURABLE.

In the sector of force measurement and weighing technology, we are equipped for almost every task. A broad range of products leaves nothing to be desired. And if a customer's measuring task appears to overtax our standard range, we just quickly develop an individual system for that customer.



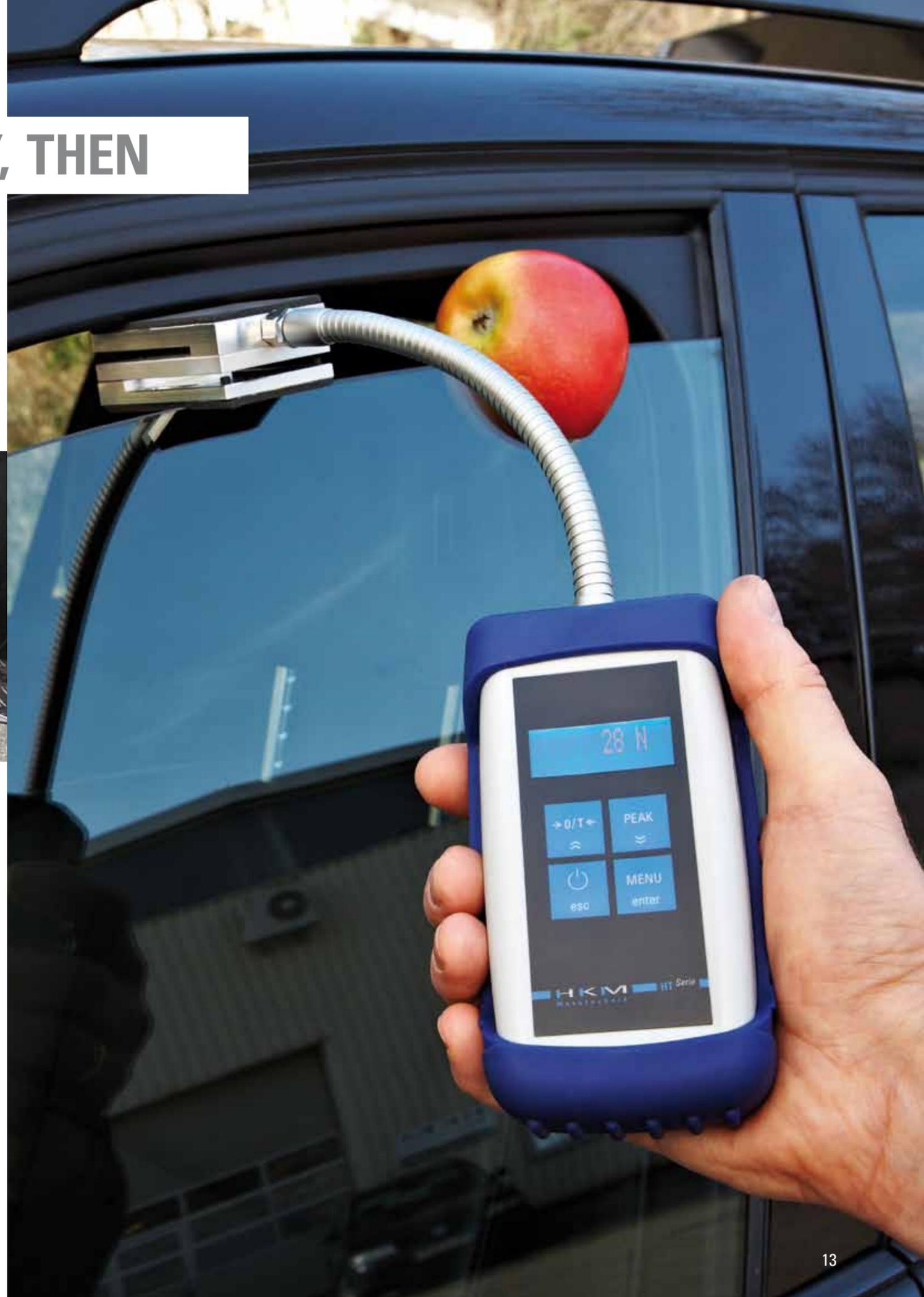
Force measurement offers many application possibilities. That is why we develop individual force gauges and systems for various fields of application that consist of our force transducers and displays which satisfy all customer requirements. Examples of use can be found in motor vehicle test engineering, overload detection for building cranes and rope winches as well as in monitoring press-fit procedures.

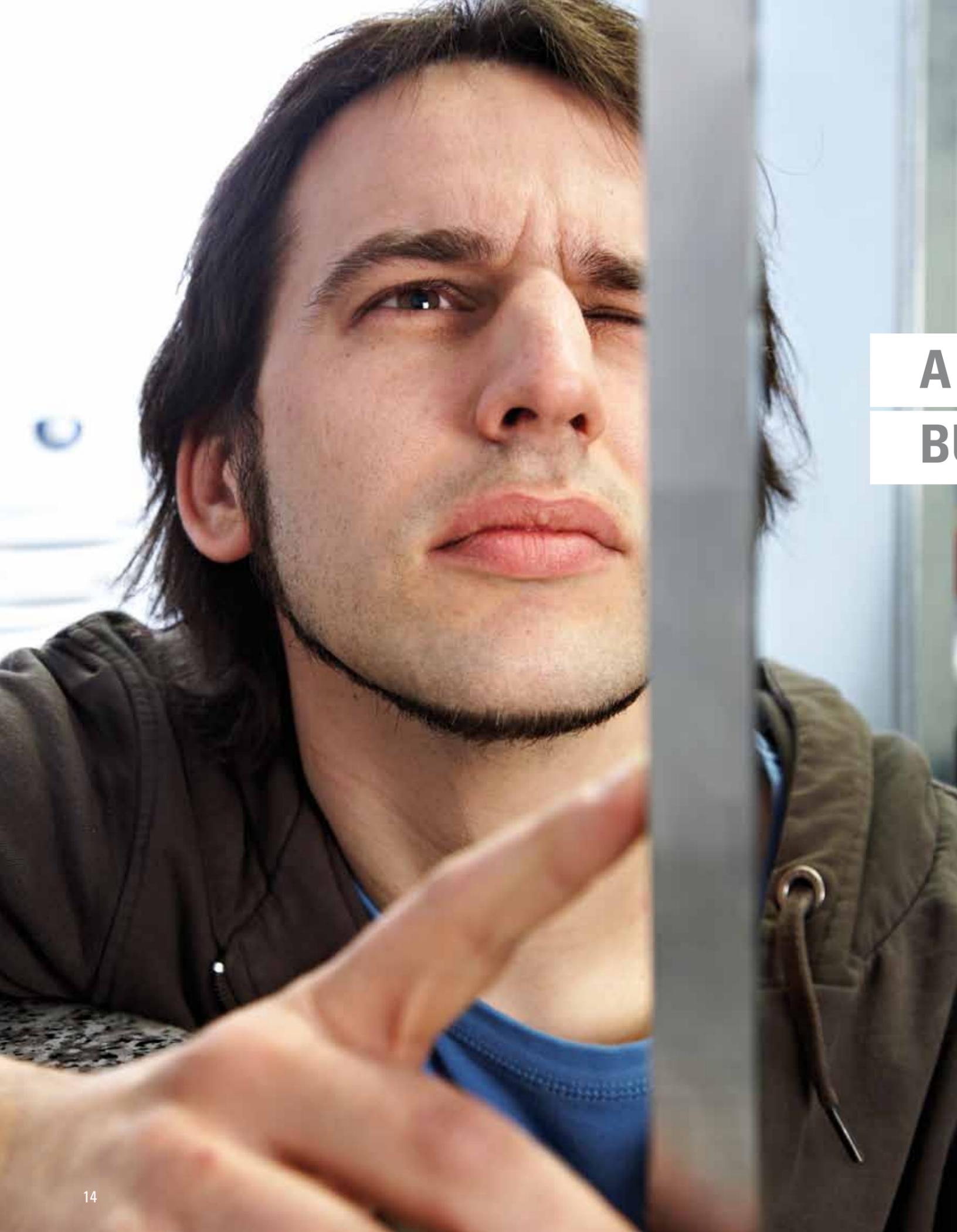
HKM pedal force meters for measuring occurring forces at hand brake levers and brake pedals as well as the HKM closing force meters for inspecting the closing edges on windows should be emphasised here.

Our portable wheel load scales are available in numerous designs for diverse applications. Next to the total load, the individual loads can be used

to determine weight distribution and centres of gravity. With software developed by HKM-Messtechnik, the weighing data are displayed, evaluated, stored and logged on the computer. Combinations of up to 20 wheel load scales of various executions and load ranges are possible.

HKM wheel load scales are used by automobile manufacturers and forwarding agencies and are also used in racing. The police, the DEKRA and the TÜV use it to perform vehicle inspections and technical tests. The different load ranges even allow use in the aircraft industry, from ultralight aircraft to wide-body aircraft. They are also valuable assistants in determining the column load for portable systems and machines.





A HUMAN IS NOT A FACTOR BUT A HUMAN BEING.

At HKM-Messtechnik, a human being is not an economic factor but an employee whose performance is recognised. Fluctuation is low, the hierarchies are flat, and work is enjoyable. For us it is simply important to get along well. Because our commitment and motivation to work hand in hand for you depends on that.

We are fortunate in that we can always attract highly qualified employees, whom we consistently train further, thanks to our close collaboration with renowned regional colleges. That is why your contacts are usually engineers and technicians who are experts in their field and can communicate with you on equal terms.

Development, manufacture, warehouse and dispatch are under the same roof. This lets us respond quickly and flexibly to possible changes during order processing.

Quality Made in Germany is a tradition at HKM-Messtechnik. That is why we develop and manufacture exclusively in Germany. Only here can we find the optimal general conditions and qualified specialists we need to consistently supply you with first-class work.



Concept and layout

Axel Schwerda | www.asdesign-inc.de

Text

Stefan Klotter, Markenberatung, Konzept & Text

Print

Poppen & Ortmann Druckerei und Verlag KG

Origin of photo material verification

Ralf Killian | Fotografie

Karl-Heinz Raach

iStockphoto LP – artist-unlimited

ImagePoint.biz, John E. Cubly, Lutz Haack,

Robert Schlaug, Michael Kessler - profifoto.ch

Otto Bock HealthCare

HKM-Messtechnik GmbH

Ziegelhofstraße 228

79110 Freiburg

Germany

Phone: +49 (0) 761 89 607-0

Telefax: +49 (0) 761 89 607-66

info@hkm-messtechnik.de

www.hkm-messtechnik.com

Issue 09/2011