

hbmnews

News in weighing technology



New products...



...Applications



... Information

Introduction



Dear Reader,

We have observed several trends in the market today for load cells and force transducers. At first glance, it seems that these trends actually contradict each other.

While demand for suitable sensors is growing worldwide, globalization is playing an increasingly greater role. On the one hand new, dynamic markets are appearing, particularly in Asian countries, and on the other, globally acting customers require increasingly identical services around the world. A large proportion of the weighing technology component market is characterized by standard products which are generally of average quality. In contrast, there are increasing demands for accuracy, innovation and integration in order to create product advantages and therefore greater usefulness for the end customer.

Successful, long term business relationships require, according to our understanding, that individual customer requirements are met. This includes consultancy competence, global presence, high and reliable product quality, optimization of entire measurement chains and innovative solutions, all of which are of equal importance. Measurement technology is and remains a matter of trust!

HBM has met these challenges. We develop and produce all components that belong in measurement chains and continuously improve them. The components include strain gages, measuring bodies, load cell electronics, amplifiers, DAQ electronics, software, calibrations and applicable services.

Mass production series are produced in our modern production workshops in Suzhou, China. High-tech products and key components are developed and built in Germany. As our customer, you profit globally from the service capability of our competence centers. Competent advice and appropriate local engineering support is ensured by our subsidiaries and sales offices, as well as the regional centers in Europe, America and Asia. This means you get fully "bundled attention" and "responsiveness" in the form of rapid reaction, advice, engineering and flexibility in the construction of prototypes and pilot series.

How we are planning to increase usefulness for you and which new products and applications we have in stock for you is summarized in this new issue of hbmnews.

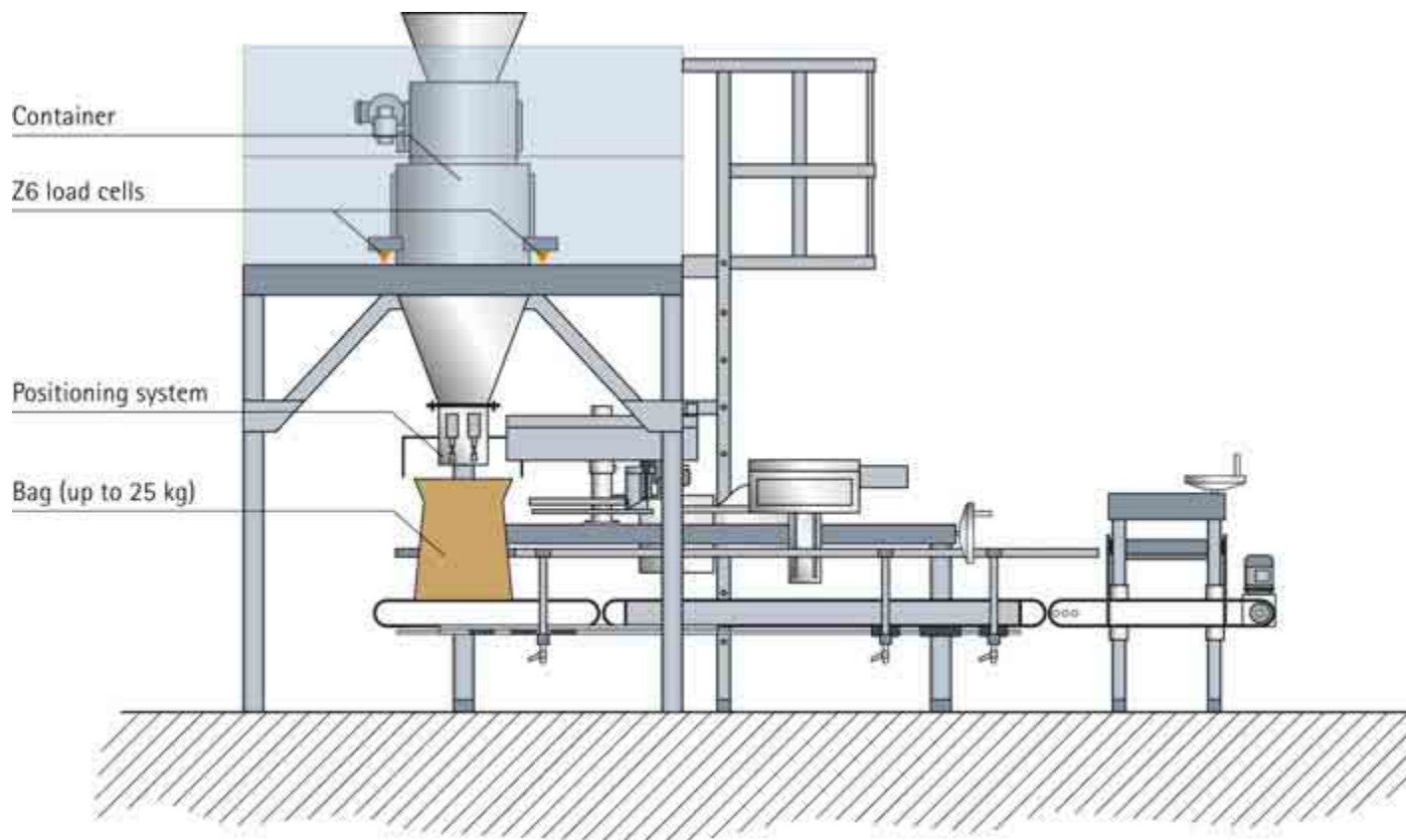
Karl-Heinz Haase*

* Dr.-Ing. Karl-Heinz Haase,
Executive Manager Sensors, HBM



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Weighing technology for...



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With HBM load cell to European-wide certification

Paul Doughty, Armitage Communications, UK

The British company Tascol Shore Engineering Ltd offers a wide range of bagging and weighing systems with belt and continuous weighing technology, as well as dosing technology and micro-dosing.

"Thanks to continuous investments in product development, Tascol Shore is maintaining its lead in the strongly competitive bagging scales market."

Peter Shore, Managing Director of Tascol Shore

OIMLR61 certification thanks to Z6 load cell

By integrating HBM's Z6 load cell in their automatic gravimetric weighing system, Tascol Shore obtained certifications to OIMLR61. With the high accuracy of the load cell, this system meets the requirements of the



*OIMLR61 certification with the highly accurate
Z6 load cell from HBM*

European standards for legal-for-trade bagging scales and can therefore be sold across Europe.

In the systems that Tascol Shore offers for automatic gravimetric determination of net weight, the product to be weighed is filled into a container placed on three Z6 load cells. Once the set weight is reached, the discharge valve on the container is opened via a controller and the bag is filled.

Z6 advantage: More efficiency

Because of the Z6 load cell accuracy, the permissible weight in the container can be increased to 12.5kg in the model with 1 kg to 10kg maximum capacity. This means an end customer can increase productivity by 50% when filling larger bags with weights of 25kg, as they now only need two container dumps. Previously this operation took three dumps from the hopper or 50% longer. The bagging system achieves between 6 and 8 working steps per minute.

„The certification to R61 gained thanks to the high accuracy of the Z6 load cell now means that the entire European market is open to us.“

Peter Shore

Utmost flexibility ...

The bagging and weighing system from Tascol Shore permits various configurations, i.e. any gravimetric-based filling systems, screw dosing units or dosing belts can be used. Even systems with multiple inputs can be connected, when using intermediate control elements that ensure that only one supply at a time is used.



... for various contents

The Tascol Shore weighing systems are suitable for a variety of materials that can be filled into bags, including fertilizers, additives, foodstuffs and feed. The systems are available in stainless steel and are equipped with automatic or manual positioning systems for the bags.



Dynamic weighing...



*Digital precision:
The FIT® load cell*

Efficient checkweighers thanks to a digital load cell

Paul Doughty, Armitage Communications, UK
Eckhard Akkermann, HBM

The world's most advanced range of checkweighers depend on HBM's FIT® (Fast Intelligent Transducer) load cells to handle products at the highest production line rates with very high accuracy and no performance degradation.

The FIT® load cell...

...is a key component of the AS range of checkweighers recently launched by Loma Systems of the UK to weigh both rigid and flexible packs of up to 45 kg.

The AS checkweighers from Loma have been awarded the European R51 accreditation for the high accuracy and rapid response demanded by food producers for improved performance and rapid production.

"We needed a high performance load cell for use in the food and pharmaceutical industries, which meant it had to be made of stainless steel and able to handle intensive wash downs. This means that neither water nor chemicals can ingress the load cell."

Andy Alexander, Product Support Manager, Loma Systems, UK



FIT® for dynamic weighing applications

HBM's FIT® load cell is specifically designed for dynamic weighing applications because it features high torsion and bending stiffness. Extensive signal processing is integrated into the digital load cell enabling access to all the functions needed for fast and accurate measurement of the weight. With its 20-bit resolution, FIT® produces an output rate of up to 600 measurements/sec.

FIT® prevents seal failure

Using a digital load cell overcomes problems on earlier models of checkweighers that were fitted with analog load cells. These load cells were viscous damped and experienced a number of problems including seal failure resulting in oil leaks and measurement inaccuracies due to thermal instability.

No temperature compensation required

Unlike analog cells, HBM's FIT® does not need temperature compensation and its weighing range can easily be set by the user avoiding any pre-calibration.



*The AS 5000
checkweighers from
Loma Systems*



*AS Combo
checkweigher*



Nine digital filters protect from interference effects

The FIT® load cell gives additional advantages since it is easily calibrated at the start of a production run to ensure accuracy. In some cases external factors may still cause variations in weight to be indicated and the FIT® load cell has nine digital filters that can be applied easily to ensure that all unnecessary background static is removed without degrading the central measurement.

"The built-in programmable filters allow us to maximize the response time for different customers' applications."

Andy Alexander



*AS 5000
control panel*

There are five models in Loma's AS range ...

...including the AS Combo that features a combined metal detector and checkweigher. Four of the models weigh both rigid and flexible packs of up to 5kg while the AS Heavy Weight checkweigher is designed to weigh sacks and cases of up to 45kg.

The robust checkweighers are made of stainless steel and are available as stand-alone units or can be supplied with a metal detector head. The range benefits end users since each major component, such as the control unit or the conveyor feeds, are modular and can be located in alternative positions to provide the most suitable and functional layout required and to fully integrate with other equipment on the production line. The system also comes with a wide range of different weighing table and rejection mechanisms to ensure that customers are provided with a tailor-made machine.

FIT® provides programming functions

The Loma AS range incorporates the FIT® load cell programming functions into its central menu-driven membrane keyboard to ensure integrated access to all aspects of the machine. Loma's research shows that 90 per cent of users do not use the full capabilities of their checkweighers. To overcome this issue, Loma has made the use of its AS range as intuitive as possible and it can be programmed with the parameters for up to 100 different items in a core database.

"It is the load cells that weigh the product and this information is critical to the performance of the checkweighers."

"We have had excellent technical support from HBM throughout this project."

Andy Alexander



*FIT® load cell
incorporated into a
Loma checkweigher*



Cleaning up with the polluter-pays principle

Matthias Roess

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Waste weighing with the SSC load cell

AE Van de Vliet, a leading company in mobile weighing, uses HBM weighing technology

AE Weighing System, situated in Turnhout, Belgium, is a very successful company covering a wide range of applications in the field of mobile weighing and on-board weighing. The quality of the weighing systems offered by AE Van de Vliet is well-renowned all over Europe. The range of products sold comprises, among others, loader-weighing systems, garbage trucks, crane weighing systems, bin weighing, mobile weighbridges, etc.

Charging by weight

To better cope with the mountains of garbage it is a matter of public interest to record the weight of the waste in the bins according to the polluter pays principle.

It is exactly for this typical field of application that HBM now offers a reliable solution. The SSC load cell records the weight of bulk waste from each trash can.

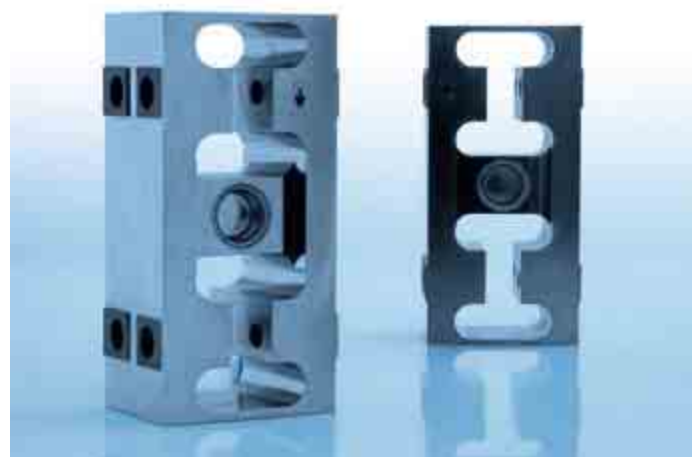
*For fair waste charges:
Weighing of individual waste bins directly
during emptying with the HBM SSC load cell*

SSC load cell characteristics:

- ___ Maximum capacities: 550 and 880 kg
- ___ Accuracy class: D1 and C1 as per OIML R60
- ___ Material: Stainless steel as per EN-10088
- ___ Degree of protection: IP 68, laser welded
- ___ Properties: Robust construction, high accuracy, insensitive to noise and transverse forces
- ___ Service: Easy to install

The SSC successful in operation

AE Van de Vliet has equipped eight garbage trucks with the SSC load cell that have been on the road for several months already, without any problems.



*SSC load cell for use in off-center
container weighing*

HBM helps Qualipack meet weighing regulations

Paul Doughty, Armitage Communications, UK

Bag filling machines from Qualipack now available for legal for trade weighing tasks

The latest valve bag filling machines from UK manufacturer, Qualipack, have passed the UK's Weights and Measures certification tests allowing the machines to be used for legal for trade measurements. The machines feature HBM's PW12BC3 single point load cell and WE2110 digital weighing indicator for improved accuracy.



WE2110 digital weighing indicator



PW12BC3 single point load cell

Valve and open top bag filling machines are commonly used in industry for filling a wide range of bags with various products ranging from particles, granules through to fine powders

Qualipack's machines normally have a maximum capacity of 25kg per fill with 40 fills needed to fill a one tonne bag. By using HBM's equipment, Qualipack's machines now achieve accuracies of within 20g of the target weight.

"Speed and accuracy are very important for these machines."

Mike Lee, Qualipack's Managing Director



Valve bag filling machine from Qualipack

HBM's digital indicator WE2110...

... allows cut off points to be easily set. These enable the bag to be filled rapidly until the first set point is reached. This then reduces the machine's speed allowing the bag to be slowly topped-up until it reaches its final target weight at the second set point. Qualipack's machines are semi-automatic since the bag has to be manually positioned over the feeder tube.

"It would cost about three times as much to make a fully automatic machine since they are very complex and require considerable technical backup."

Mike Lee

User friendly

Qualipack's machines are maintenance free and can be stripped for cleaning without using any tools. The machines can be ordered in a wide range of capacities with various functions and painted in various colours.

"Once a customer has used a Qualipack machine they invariably come back to us if they need more machines."

Mike Lee



10] *Docon® – The new blood mixing scales generation from Möller MFF*



*Precise and economic:
The PW6 single point load cell from HBM*

PW6 load cell in the Docon® blood mixing scales

Hermann Merz

Blood mixing scales ...

...are used by blood donor services and clinics for blood donations. These devices monitor the amount taken over time (flow control) and the absolute amount taken (usually 500ml). The donated blood is mixed, by oscillating movements, with an anti-coagulant during removal to prevent premature coagulation.

Innovative: The Docon® blood mixing scales

The new Docon® device generation from the German company Möller MFF combines the options of data acquisition and transmission with user-friendly and safe operation. The product family optionally includes a radio scanner, memory card and sealing device, and for the first time allows the entire donation procedure to be recorded in a common database.

The heart of the Docon®: PW6 single point load cell

The sensor chosen for these scales was the PW6 single point load cell with a maximum capacity of 5kg. The compact precision load cell with single-point properties enables economic production technology and ensures precise measurement results, even under mobile application conditions.

The product program of HBM single-point load cells includes inexpensive aluminum and stainless steel versions for rough application conditions with maximum capacities between 0.3 kg and 600kg.



New Healthtech range features HBM load cells

Paul Doughty, Armitage Communications, UK

Healthtech, the UK's largest manufacturer of personal coin operated scales, is launching three new machines utilising HBM's PW10 load cells to give improved accuracy, better design and reduce manufacturing costs.

The new Healthtech scale models...

The range comprises the Datum, Fulcrum and Bio-Monitor models that have been introduced to update the company's existing stock of some 1,500 machines operating throughout the UK in gyms, leisure centers, shops and high street pharmacies. The new models can measure a number of health-related parameters such as weight, body mass index, and height. The Bio-Monitor also checks people's blood pressure. Customers can record their personal health data on a removable card similar to a credit card.



PW10 single point load cell meets EMC guidelines

...with the PW10 single point load cell

Healthtech selected HBM's PW10 load cell rated at 250 kg for all models. This gives the machines a nominal accuracy of 100g although the range is resolved electronically, using averaging techniques, into 10g intervals for calibration purposes.

"Choosing HBM's low profile PW10 250kg load cell has enabled us to reduce the platform height while increasing the accuracy and robustness of the machines."

John White, Technical Director, Healthtech, UK

Platform height is an important design criterion since a wide range of individuals, including elderly and disabled people, use the scales.

The design of the machines has been simplified because HBM's PW10 load cells feature an overload safety factor. This enabled the designers to remove an end stop that featured on older models preventing possible mechanical damage caused by very heavy loads on the platform.

"The overall impact of these savings has been to reduce our manufacturing costs by about 5 per cent."

John White

Because the HBM load cell is waterproof, it also increased the reliability of the machines. This is because many of the company's machines are located in retail outlets, such as chemists, where the floors are regularly washed and ingress of water into the platform can cause a standard load cell to fail.

Healthtech writes its own software for the machines allowing tailor-made features to be included in addition to the standard offer. These include a cash counter for tracking the amount collected and a warning system that tells operators when the cash box needs emptying. The range can be tailored with any colour design to match customers' corporate identity.

NEW



ATEX 95 compliant junction box for load cells

Reiner Schrod

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The new VKK2R-8Ex EEx junction box from HBM enables 3 up to 8 analog strain gage (SG) load cells to be connected in an easy and EMC-compliant way.

Stainless steel

HBM has extended their range of junction boxes to include stainless steel versions for connecting up to 8 strain gage load cells in potentially explosive atmospheres. Thanks to an internal resistor network that has been approved for use in Ex areas this junction box version provides HBM's special, highly precise, tried and tested corner load balancing feature integrated in a scale.

This means that you get your result in three steps:

- load scale corners,
- read correction value from diagram,
- activate balancing resistor.

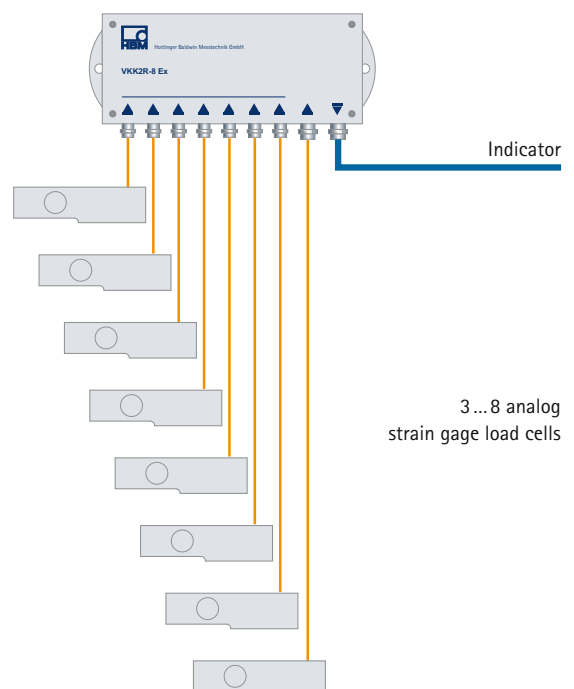
100% EMC safety

This new generation of junction boxes provides another special feature: EMC compliant metric M12 screwed cable glands for cable diameters from 4 to 6.5 mm and

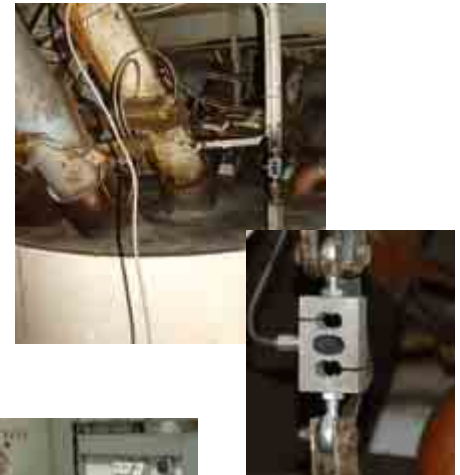
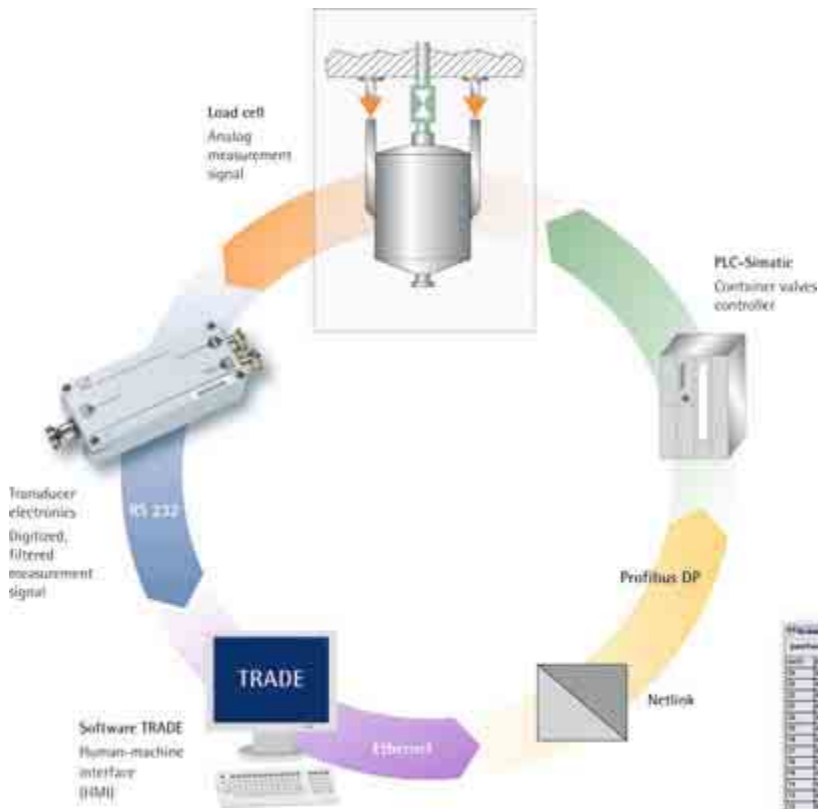
two EMC compliant M16 screwed cable glands for cable diameters from 5 to 9 mm. Thanks to HBM's shielding design, these ensure full EMC compliance per EN 45501.

Zones

The electrical equipment for use in potentially explosive atmospheres has been marked II 2 G/D and II 3 G/D and is supplied with the requisite PTB 05 ATEX 2014 type examination certificate issued by PTB (German Metrology Institute). It can be used in Zones 1, 2, 21, 22 for different types of protection.



Weighing technology for mixing and filling systems



It's in the mixing

Hermann Merz

The company JZS-Softwareentwicklung in Weiden, Germany, had the task of modernizing the mixing scale of a fertilizer mixing system and to convert the control technology to a software-based PC solution.

Successful modernization of a fertilizer mixing system using HBM weighing technology

TRADE software, AED9101 transducer electronics...

The HBM TRADE software and AED9101 digital transducer electronics was used because its incorporation into the application software via DDE/DLL is extremely simple and all relevant legal for trade requirements are met in full. The existing PLC for controlling the hardware and mixer components was retained.

... and RSCAC3 load cells...

The scale construction itself consists of a suspended mixing container with the RSCAC3 load cell. The supply lines are mounted pipe-in-pipe without force shunt. The scale itself is designed as a non-automatic scale and can be read through a window from the control center. This includes the controller, PC and AED.

...ensures problem-free certification

The type approval and compatibility declaration were accepted immediately, i.e. the calibration by the Eichamt Bayreuth/Nürnberg (Weights and Measures Office Bayreuth/Nürnberg, Germany) was implemented without problems.

Characteristics:

In part, several components are weighed in compliance with legal for trade requirements and mixed in a separate mixer. The intermediate values and the total value to be calculated are then determined from the individual weights. A "dummy measurement" is implemented for this purpose in the TRADE calibration file and the intermediate or total weight value added as a comment. Traceability is provided by the corresponding batch and delivery note numbers. The total value then appears on the delivery note, together with the relevant signature.



*Hazardous areas:
The right selection of ATEX-certified
products saves money*

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Use HBM's know-how to reduce costs

Reiner Schrod

HBM offers load cells and accessories for various zones and degrees of protection:

- ___ Intrinsically safe load cells, which enable maintenance during operation
- ___ Flameproof encapsulated load cells that do not need Zener barriers (output limitation)
- ___ Load cells with "enclosure protection" for dust explosion zones 22 and 21 also do not need barriers
- ___ Zener barriers specifically for scale applications with low longitudinal resistances in the supply line and with PTB test certificate for scale class III
- ___ Junction boxes for scale applications with corner load adjustment and EC-type examination certification

Save money by choosing the right product – we can advise you

By the optimal selection of load cells, 300 EUR per installation can be saved easily and further savings can be made on the electronics side as well.

The selection of load cells is based on the ATEX zone separation specified by the user.

Example of zone separation

In the upper right schematic diagram you can see that HBM load cells or electronics can only realistically be located in zone 1, 21 or zone 2, 22.



Classification of hazardous areas into ATEX zones using a fuel station as an example

Summary:

Category, zone, typical applications

Category 1D for zone 20

Area where the potentially explosive atmosphere is present in the form of a cloud of combustible dust in the air constantly or for long periods.

Category 1G for zone 0

Area in which a potentially explosive gas atmosphere is present constantly or for long periods.

This condition is generally only found within containers or pipes.

Please note:

In these zones, the presence of workers and implementation of work is not possible.

Category 2D for zone 21, zone 22

(conductive and non-conductive dust)

Area where a potentially explosive atmosphere in the form of a cloud of combustible dust in the air occasionally occurs during normal operation.

Category 2G for zone 1

Area where it can be assumed that a potentially explosive atmosphere can occur during normal operation. This includes the direct surroundings of e.g. discharge or filling stations.

Category 3D for zone 22

(non-conductive dust)

Area in which, under normal operation, it is not expected that potentially explosive atmospheres in the form of combustible dust clouds occur in the air; if this is the case, then only briefly. This includes areas where the dust can escape from leaks, e.g. milling rooms. Exceptions see above: If the dust is conductive, then the requirements for zone 21 must be met.

Category 3G for zone 2

Area where it is not expected that potentially explosive gas atmospheres occur during normal operation or, if this is the case, only rarely and briefly. This includes e.g. areas in which gas can escape from leaks.

NEW

The PW20i digital load cell

Eckhard Akkermann

HBM's range of FIT® digital load cells has just been extended:

A new load cell generation has been developed to increase the options for digital measuring and weighing processes. It is a single point load cell with integrated electronics from the proven FIT® family.

The PW20i ...

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...is particularly suitable for weighing and sorting processes that require a small design with high overload protection and is an excellent choice for checkweighers, multi-head combination scales and sorting systems. Thanks to an innovative strain gage technology and a special measuring body design, the weighing sensor has achieved a high intrinsic resonance frequency.



Digital filters make attenuation elements redundant

In combination with electronic oscillation suppression, implemented with various fast digital filters, mechanical or viscous attenuation elements are not necessary. The known disadvantages of these units are therefore a thing of the past.

Integral overload protection

In addition, an overload protection (patent pending) with bi-direction effect is integrated in the measuring body. The load cells are therefore optimally protected against thermal overloads in rough industrial applications.

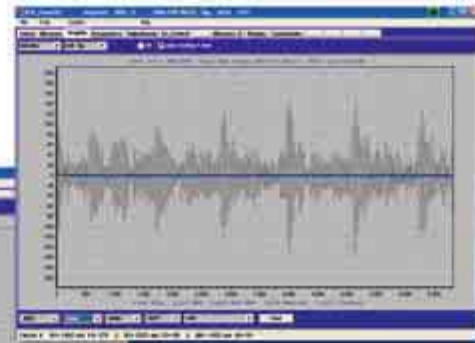
600 measurements per second and up to 90 participants per bus system

All relevant data can be transferred directly to the controller via an RS232 or RS485 4-wire interface as filtered, scaled and digitized output signals with a sampling rate of up to 600 measurements per second. Up to 90 participants can be operated in a bus system in the unit with the RS485 4-wire design.

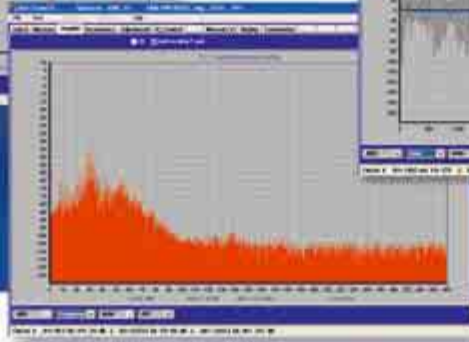
PW20i digital load cell



*AEDpanel32:
Unfiltered signals from an
operating checkweigher*



Filtered signal



The frequency spectrum

Specifically for your requirements

Regardless of what your dynamic weighing process requires, the PW20i load cells, together with the integrated trigger function and the setting options of 2 limit values with hysteresis, means that you can optimally adapt the machine functions to meet your customer requirements.

A load cell family with the normal passive output (2mV/V) and identical mechanical features is being developed for those users who prefer to create electronic modules tailored to their own applications.

AEDpanel32 – Complex measurement tasks made simple

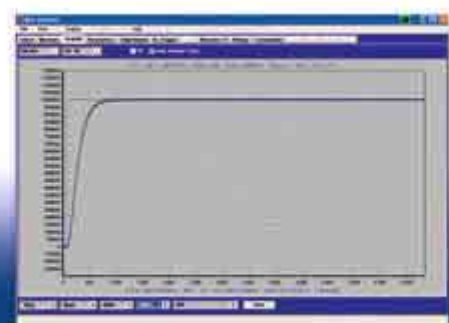
The specially developed Windows®-based panel software "AEDpanel32" enables the setting of all weighing technique parameters, calibration of the scales, selection of bus address and baud rate as well as the input of two limit values with hysteresis.

The integrated graphic function ...

...clearly displays the progress over time of the weighing procedure. In addition, the user can use a Fourier transformation (FFT) for frequency analysis. Statements on vibration behavior of mechanical interference sources, trigger parameters and optical filter selections are possible without complex analyzers. In addition to storage and printing options for the generated measured values and data, an integrated multi-channel measuring function is also available.

Despite the complexity of weighing technology measurement data, the "AEDpanel32" is characterized by its user-friendly help functions for all variable input parameters and simple operation.

Filter settling time



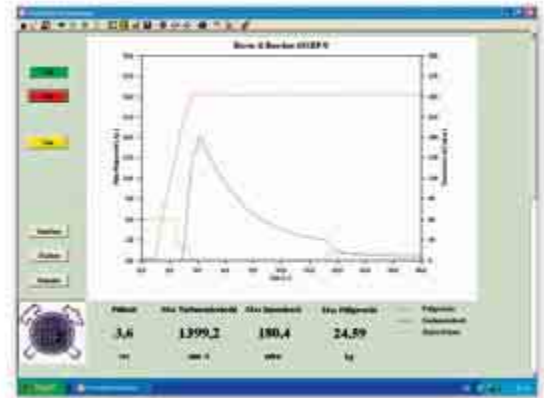
Weighing technology for mixing and filling systems



Haver & Boecker:

Complete solution with HBM measurement chain:

- Z6 load cells
- Spider8 measuring amplifier
- catman® 4.5 software



Haver & Boecker: Decision for a complete measurement chain from HBM

Haver & Boecker project team:

Oliver Entrup, Uwe Lembeck, Franz-Josef Schröder, Jan Vogelpohl

As a specialist for packaging and preparation machines for fill and bulk materials, the company Haver & Boecker, located in Oelde, Germany, has a research and development center where machines from their product range are available for tests and customer presentations. The filling and flow behavior of various products are determined here for the further development and optimization of the filling machines.



ter to display all measured values. These should be saved to a database and be accessible to every computer (measured data export into Excel files). In addition, filling machine-dependent measured values should also be recorded.

Z6 load cell, pressure transducer and Spider8 measuring amplifier

The filling curve of the machine had to be recorded and for this purpose the Z6FC3 200kg load cells and the Spider8 measuring amplifier were used. In addition, the speed was recorded and the filling pressure measured with an HBM pressure transducer. This measurement data and various status signals (+24V) were processed and displayed by the Spider8 measuring amplifier.

catman® 4.5 enables more accurate analysis and better customer presentations

Once an engineering team was trained to use the catman® software, the specification requirements could be met. Analysis and customer presentations at the Haver & Boecker R&D center were significantly improved by the additional measurement functions and optimized operation.

18] HBM data acquisition systems from sensor to software

Haver & Boecker began to use a data acquisition system some years ago for these tests. As HBM load cells are used in the packaging machines, they decided to use the Spider8 measuring amplifier and the corresponding catman® Version 2.1 software from HBM. The issue now was to simplify handling and archiving as well as optimize the investigation procedures.

A standardized user interface for all machines with catman® 4.5.

The aim was to upgrade the existing catman® Version 2.1 software to version 4.5. A standardized user interface was intended for all the machines in the R&D cen-

NEW

Two new strain gage catalogs from HBM

Strain gage (SG) catalog with the entire standard range of SGs and SG accessories.

HBM presents its entire SG standard program over 100 pages, including adhesives, cover materials and further accessories. We look at selection criteria as well as applications in experimental stress analysis and transducer design. New and experienced SG engineers can find the theoretical background required to determine the mechanical stress from the measured strain.



Catalog with strain gages for the manufacture of transducers

44 pages of SGs with one measuring grid up to sophisticated full bridge circuits – HBM produces standard models available ex stock and customer-specific models on request.

The SGs are available with various creep compensation values that are specially tailored to the manufacture of transducers.



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Imprint

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Weighing technology from HBM the right solution for your application



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___ Profit from our leading weighing technology system
solutions for numerous applications

___ Find the optimal load cell for your application

___ Use the know-how of the market leader –
with our technical articles and seminars

Your advantage:

All information is collected together in one place with
the focus on weighing technology. All the information is
a maximum of two mouse clicks away.



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measurement with confidence