

KERN & SOHN –  
The wide range of product champion  
that is situated in the Swabian Alb

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BALANCES & TEST SERVICE for laboratory, industry and food industry

2023

EN

EN

PROFESSIONAL MEASURING

# BALANCES & TEST SERVICE

for laboratory, industry and food industry



How do I quickly find the product I am looking for?

The tried and tested quick search system – “Quick-Finder”  
ahead of each product group allows you to base the search  
for a certain target group on weighing data you need such  
as readout, weighing capacity and main features for each model.

And it's as simple as that – find the product you want  
in 2 steps:

1. Goto the product group index on page 3
2. Pick the appropriate product group and find the product  
you want using the Quick-Finder.

... or use the model name and find the product quickly  
and efficiently using the A-Z model list:



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KERN Pictograms

**Internal adjusting:**  
Quick setting up of the balance's accuracy with internal adjusting weight (motordriven)

**Network interface:**  
For connecting the scale to an Ethernet network

**Suspended weighing:**  
Load support with hook on the underside of the balance

**Adjusting program CAL:**  
For quick setting up of the balance's accuracy. External adjusting weight required

**KERN Communication Protocol (KCP):**  
It is a standardized interface command set for KERN balances and other instruments, which allows retrieving and controlling all relevant parameters and functions of the device. KERN devices featuring KCP are thus easily integrated with computers, industrial controllers and other digital systems

**Battery operation:**  
Ready for battery operation. The battery type is specified for each device

**Easy Touch:**  
Suitable for the connection, data transmission and control through PC or tablet.

**Rechargeable battery pack:**  
Rechargeable set

**Memory:**  
Balance memory capacity, e.g. for article data, weighing data, tare weights, PLU etc.

**GLP/ISO log:**  
The balance displays weight, date and time, independent of a printer connection

**Universal plug-in power supply:**  
with universal input and optional input socket adapters for  
A) EU, CH, GB  
B) EU, CH, GB, USA  
C) EU, CH, GB, USA, AUS

**Alibi memory:**  
Secure, electronic archiving of weighing results, complying with the 2014/31/EU standard.

**GLP/ISO log:**  
With weight, date and time. Only with KERN printers.

**Plug-in power supply:**  
230V/50Hz in standard version for EU, CH. On request GB, USA or AUS version available

**KERN Universal Port (KUP):**  
allows the connection of external KUP interface adapters, e.g. RS-232, RS-485, SB, Bluetooth, WLAN, Analogue, Ethernet etc. for the exchange of data and control commands, without installation effort

**Piece counting:**  
Reference quantities selectable. Display can be switched from piece to weight

**Data interface RS-232:**  
To connect the balance to a printer, PC or network

**Recipe level A:**  
The weights of the recipe ingredients can be added together and the total weight of the recipe can be printed out

**RS-485 data interface:**  
To connect the balance to a printer, PC or other peripherals. Suitable for data transfer over large distances. Network in bus topology is possible

**Recipe level B:**  
Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display

**USB data interface:**  
To connect the balance to a printer, PC or other peripherals

**Totalising level A:**  
The weights of similar items can be added together and the total can be printed out

**Bluetooth® data interface:**  
To transfer data from the balance to a printer, PC or other peripherals

**Percentage determination:**  
Determining the deviation in % from the target value (100 %)

**WiFi data interface:**  
To transfer data from the balance to a printer, PC or other peripherals

**Weighing units:**  
Can be switched to e.g. nonmetric units. See balance model. Please refer to KERN's website for more details

**Control outputs (optocoupler, digital I/O):**  
To connect relays, signal lamps, valves, etc.

**Weighing with tolerance range:**  
(Checkweighing) Upper and lower limiting can be programmed individually, e.g. for sorting and dosing. The process is supported by an audible or visual signal, see the relevant model

**Analogue interface:**  
to connect a suitable peripheral device for analogue processing of the measurements

**Hold function:**  
(Animal weighing program) When the weighing conditions are unstable, a stable weight is calculated as an average value

**Interface for second balance:**  
For direct connection of a second balance

**Protection against dust and water splashes IPxx:**  
The type of protection is shown in the pictogram.

**Package shipment:**  
The time required for internal shipping preparations is shown in days in the pictogram

**Pallet shipment:**  
The time required for internal shipping preparations is shown in days in the pictogram

KERN— Measuring technology and testing services from a single source



Balances & Test service catalogue

Provides a complete overview of the KERN line of balances, test weights, and services such as verification, calibration, etc.

Medical scales catalogue

Complete line of medical scales, from infant scales to patient scales, chair scales and adiposity scales, as well as hand grip dynamometers, chemist's balances and veterinary scales.

Microscopes & Refractometers catalogue

Extensive range in the area of optical instruments, such as, biological microscopes, stereo microscopes, metallurgical microscopes, polarisation microscopes as well as analogue and digital refractometers.

SAUTER measuring equipment catalogue

Test instruments for industry and commerce, such as force, coating thickness, material thickness and calibration service.

Test service brochure

Detailed information on topics pertaining to the calibration and verification of balances, test weights, and force measuring devices.

Your advantages

fast

- 24 hours delivery service for products in stock – ordered today, on its way tomorrow
- Sales & service hotline available from 8:00 am to 6:00 pm

competent

- DAKkS accreditation DIN EN ISO/IEC 17025
- Certified QM system DIN EN ISO 9001
- Authorisation for initial verification by the manufacturer 2014/31/EU
- Medical certifications DIN EN ISO 13485 and 93/42/ EWG

versatile

- One-stop shopping: from pocket balances through to 12 t crane balance – everything from one supplier
- Find the product you want at lightning speed with the “Balance Quick-Finder” at [www.kern-sohn.com](http://www.kern-sohn.com)

reliable

- Up to 3 years warranty
- Precision in weighing technology for more than 175 years

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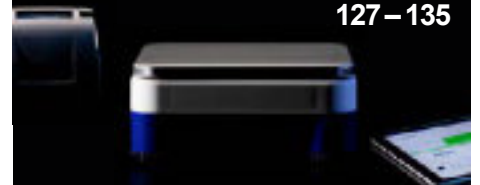
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Magnum, 4150-801 Porto

[Ambifood.com](http://Ambifood.com)

# WHEN DESIGN MEETS PERFORMANCE

May we introduce...? The new models from the KERNIoTLine are celebrating their debut.

Together we can enjoy the shared, advanced-looking KERNdesign, the consistent and simplified handling, the high connectivity level, and a persuasive performance that operates across all devices.



Dive into our new KERNbrand universe.



## Design

- + Trend-setting, high-quality KERN design
- + Recognisability through uniform product range
- + Reliable brand values are reflected visually and functionally in the product



## Performance

- + Cross-device functionality and protocols
- + Consistently reliable performance
- + The latest technologies
- + Cross-device functionality and protocols



## Philosophy

- + Sustainable due to high energy efficiency
- + Standardisation of design components across all units
- + Controlled value chain
- + Tested and monitored technology for maximum user safety



## Are you curious about the models in the KERN IoT range and what opportunities they offer?

Then take a look at pages 8/9, because thanks to new technologies such as KUP and KCP these models are perfectly equipped for the wide range of challenges of Industry 4.0



### User Interface

- + Uniform, simplified user guidance
- + Problem-free commissioning, use and expansion
- + Cross-model software



### Service

- + Fast and competent help from our IoT specialists
- + Even more efficient repair process
- + Accessories can be flexibly combined

**Note:** Our KERNIoT accessories can be easily combined with all our IoT models.

Find the right printer and other practical accessories on page 169 or in our online shop [www.kern-sohn.com](http://www.kern-sohn.com)

# ARE YOU READY?

With the KERNUniversal Port (KUP) and the KERN Communication Protocol (KCP) we ensure the perfect integration of your KERNbalance into production or process chains for a complete, simplified work process.

Our products will make sure you are prepared for the future of weighing in the Internet of Things. Get IoT ready – with the IoT models from KERN.

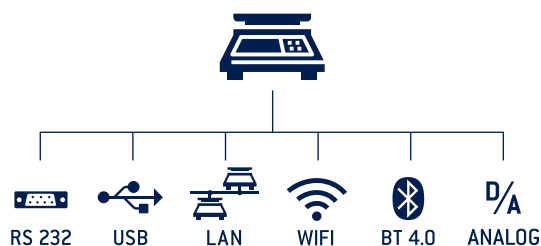


## KERN Universal Port (KUP)

The integrated KERNUniversal Port (KUP) allows the connection of external KUP interface adapters such as RS-232, USB, Bluetooth, WiFi, Analogue, Ethernet etc.

The outstanding advantage here is that the KUP interface adapters are simply plugged in, i.e. retrofitting interfaces is conveniently possible without opening the scale housing or complicated installation.

The interface adapters enable convenient transmission of weighing data to networks, PCs, smartphones, tablets, laptops, printers etc. In addition, control commands and data inputs can also be sent to the scale via the connected devices.



**Tip:** With the KERN KUP-13 extension box, up to three KUP interface adapters can be operated in parallel on the scale.



## KERN Communication Protocol (KCP)

The KERNCommunication Protocol (KCP) permits searching and remote control of the balance through external control devices or computers using the KERNCommunication Protocol. KCP is a standardised interface command structure for KERN balances and other measuring instruments which allows you to recall and manage all relevant parameters and device functions. You can therefore simply connect KERN models with KCP to computers, industrial control systems and other digital systems.

In a large number of cases the KERN Communication Protocol is compatible with the MT-SICS protocol. KCP is available through all KUPs, and on the KERNKIB-TM display device through the interfaces available.

### KCP – EXPORT („OUTBOUND“) – THE HIGHLIGHTS

- Stable, immediate weight
- Live transfer of weights
- Storing of gross weight, tare weight, net weight, stability, date, time etc., in the tamper-proof Alibi memory
- Output of the weighing result in percent
- Output of the weighing result in pieces (piece-counting function)
- Output of the weight at freely-definable timed intervals
- and much more

### KCP – IMPORT („INBOUND“) – THE HIGHLIGHTS

- Recall of the central device data
- Setup or recall of an individual device ID number
- Setting or searching for a tare value (pre-tare value) externally
- Recall of stored weighing results from the alibi memory
- Carrying out external adjustment/linearization
- Setting the reference values in the balance externally and outputting the weighing result in percent or in pieces
- Setting a network address for the balance (IP) – also for WiFi
- and much more

# NEW IN → 2023

Innovative technology, stunning performance, improved features – all in proven KERNquality. You can see all our new additions in 2023 here – come and be inspired.



## The born stacker – happily comes back to school

→KERN EFS SCHOOL BALANCE

The uncomplicated companion for all school laboratories and other educational institutions. Easy handling, durable and robust, it can cope well with changing users. With its tremendous weighing range, it is a typical nerd and without a doubt at the top of its class. For details, see page 15



## High-capacity precision balances with password-protected user administration

→KERN FES/FEJ PRECISION BALANCE

With this robust allrounder you are particularly well-equipped for the pharmaceutical industry. Here you can easily allocate and manage different users.

For details, see page 37



## Our Flagship – now with fully automatic doors

→KERN ABP-A ANALYTICAL BALANCE

Our KERN Showcase model now features a super practical innovation, making your daily laboratory life easier—singlehandedly. For details, see page 47/48



## First Class products in an IP-protected stainless steel housing

→KERN PWS PRECISION BALANCE

Resistant to fine particles and water splashes, withstands high loading. Let its high performance for reliable, high precision measurements impress you.

For details, see page 34



## Proven KERN models – now with a facelift!

Proven KERN models – now with a facelift! These KERN models feature plenty of improved technology (IoT, KUP) and a refreshed KERNlook:

→KERN PCB PRECISION BALANCE  
For details, see page 26/27

→KERN 572 PRECISION BALANCE  
For details, see page 30

→KERN CKE COUNTING BALANCE  
For details, see page 85

→KERN CDS COUNTING BALANCE  
For details, see page 87

→KERN IOC PLATFORM SCALES  
For details, see page 104/105

→KERN DS PLATFORM SCALES  
For details, see page 107



→IoT-ready models  
(with KUP) carry this icon

15

# HANGING SCALES/ CRANE SCALES



## TÜV-tested safety

KERN puts great emphasis on safety. For your safety, all KERN hanging and crane scales are subject to a stringent load test in accordance with EN 13155 and (Non-fixed load lifting attachments/breakage resistance) and EN 61010-1 (Electrical safety).

As well as the classic crane scales, we also have electronic tensile dynamometers which are extremely versatile thanks to their stable, compact construction. They can, for example, be fitted into testing machines, used for checking for overload, for bracing and tensile force measurement, etc.

This type of device is ideally suited for use between shackles or with a test bench. This is where the benefit of this construction comes to the fore, as the tensile force can be applied in both directions. These compact crane scales are also particularly suitable when weighing suspended loads where space is tight.

At the core of this construction is a robust load cell. Through the absence of moving parts, these scales are practical in maintenance and wear free.









## Note

DAkkS calibration and conformity evaluation for crane scales up to 12 t



Do you use your crane scales in ISO-certified processes or where verification is mandatory? Then we can produce the right calibration certificate or the relevant Declaration of Conformity for your measuring device. Thanks to a modern crane scale test unit, we can calibrate or verify crane scales and force-measuring devices from any manufacturer to a maximum load of up to 12 t or 120 kN. You can find all the important details on pages 214, 219 or directly from one of our test service specialists, we will be pleased to help you.

# Quick-Finder Hanging scales/Crane scales

| Readability      | Weighing capacity   | Model         | Price<br>excl. of VAT<br>ex works | Page |  |  |  |  |  |  |  |  |
|------------------|---------------------|---------------|-----------------------------------|------|---|--|---|---|---|---|---|---|
| [d]<br>kg        | [Max]<br>kg         | KERN          | €                                 |      | For an explanation on the pictos, see front flap                                  |  |   |   |   |   |   |   |
| 0,005            | 5                   | HDB 5K5N      | 65,—                              | 160  | 1   | ●  |   |   |   |   | ●   |   |
| 0,005            | 6                   | HDB 6K-3XL    | 85,—                              | 160  | 1   | ●  |   |   |   |   | ●   |   |
| 0,01             | 10                  | HDB 10K10N    | 65,—                              | 160  | 1   | ●  |   |   |   |   | ●   |   |
| 0,01             | 15                  | HDB 10K-2XL   | 85,—                              | 160  | 1   | ●  |   |   |   |   | ●   |   |
| 0,01             | 20                  | HCB 20K10     | 120,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,01             | 50                  | HGA 50K-2S05  | 108,—*                            | 158  | 1   | ●  |   |   |   |   | ●   |   |
| 0,02             | 15                  | CH 15K20      | 80,—                              | 159  | 1   | ●  |   |   |   |   | ●   |   |
| 0,02             | 30                  | HDB 30K-2XL   | 85,—                              | 160  | 1   | ●  |   |   |   |   | ●   |   |
| 0,02             | 50                  | HCB 50K20     | 131,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,02             | 60                  | HCD 60K-2     | 210,—                             | 163  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,02   0,05      | 60   150            | HCD 100K-2D   | 220,—                             | 163  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,05             | 50                  | CH 50K50      | 85,—                              | 159  | 1   | ●  |   |   |   |   | ●   |   |
| 0,05             | 99                  | HCB 99K50     | 114,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,05             | 150                 | HCD 100K-2    | 210,—                             | 163  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,05   0,1       | 150   300           | HCD 300K-2D   | 220,—                             | 163  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,05   0,1   0,2 | 150   300   600     | HFD 600K-1    | 500,—                             | 166  | 1   | ●  |   | ○   |   |   | ●   |   |
| 0,05   0,1   0,2 | 150   300   600     | HFD 600K-1IP  | 590,—                             | 166  | 1   | ●  |   | ○   |   | ●   | ●   |   |
| 0,1              | 50                  | CH 50K100     | 75,—                              | 159  | 1   | ●  |   |   |   |   | ●   |   |
| 0,1              | 50                  | HCB 50K100    | 104,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,1              | 50                  | HCN 50K100IP  | 150,—                             | 162  | 1   | ●  |   |   |   | ●   | ●   |   |
| 0,1              | 200                 | HCB 200K100   | 131,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,1              | 300                 | HCD 300K-1    | 210,—                             | 163  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,1              | 1000                | HFM 1T0.1     | 1010,—                            | 168  | 1   | ●  |   |   |   |   | ●   |   |
| 0,1   0,2   0,5  | 300   600   1500    | HFD 1T-4      | 510,—                             | 166  | 1   | ●  |   | ○   |   |   | ●   |   |
| 0,1   0,2   0,5  | 300   600   1500    | HFD 1T-4IP    | 590,—                             | 166  | 1   | ●  |   | ○   |   | ●   | ●   |   |
| 0,2              | 100                 | HCB 100K200   | 114,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,2              | 100                 | HCN 100K200IP | 150,—                             | 162  | 1   | ●  |   |   |   | ●   | ●   |   |
| 0,2              | 600                 | HFA 600K-1    | 740,—                             | 164  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,2              | 600                 | HFC 600K-1    | 1180,—                            | 165  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,2              | 600                 | HFD 600K-1M   | 660,—                             | 166  | 1   | ○  | ●   | ○   |   |   | ●   |   |
| 0,2   0,5   1    | 600   1500   3000   | HFD3T-3       | 700,—                             | 166  | 1   | ●  |   | ○   |   |   | ●   |   |
| 0,2   0,5   1    | 600   1500   3000   | HFD3T-3IP     | 740,—                             | 166  | 1   | ●  |   | ○   |   | ●   | ●   |   |
| 0,5              | 200                 | HCB 200K500   | 109,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 0,5              | 200                 | HCN 200K500IP | 150,—                             | 162  | 1   | ●  |   |   |   | ●   | ●   |   |
| 0,5              | 1000                | HFA 1T-4      | 750,—                             | 164  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,5              | 1000                | HFC 1T-4      | 1180,—                            | 165  | 1   | ●  |   |   |   |   | ●   | ○   |
| 0,5              | 1500                | HFD 1T-4M     | 650,—                             | 166  | 1   | ○  | ●   | ○   |   |   | ●   |   |
| 0,5              | 3000                | HFM 3T0.5     | 1040,—                            | 168  | 1   | ●  |   |   |   |   | ●   |   |
| 0,5              | 5000                | HFM 5T0.5     | 1400,—                            | 168  | 1   | ●  |   |   |   |   | ●   |   |
| 0,5   1   2      | 1500   3000   6000  | HFD6T-3       | 870,—                             | 166  | 1   | ●  |   | ○   |   |   | ●   |   |
| 0,5   1   2      | 1500   3000   6000  | HFD6T-3IP     | 920,—                             | 166  | 1   | ●  |   | ○   |   | ●   | ●   |   |
| 1                | 500                 | HCB 0.5T-3    | 215,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 1                | 3000                | HFA 3T-3      | 820,—                             | 164  | 1   | ●  |   |   |   |   | ●   | ○   |
| 1                | 3000                | HFC 3T-3      | 1260,—                            | 165  | 1   | ●  |   |   |   |   | ●   | ○   |
| 1                | 3000                | HFD 3T-3M     | 860,—                             | 166  | 1   | ○  | ●   | ○   |   |   | ●   |   |
| 1                | 10000               | HFM 10T1      | 1860,—                            | 168  | 2**   | ●  |   |   |   |   | ●   |   |
| 1   2   5        | 3000   6000   12000 | HFD 10T-3     | 1020,—                            | 166  | 1   | ●  |   | ○   |   |   | ●   |   |
| 1   2   5        | 3000   6000   12000 | HFD 10T-3IP   | 1060,—                            | 166  | 1   | ●  |   | ○   |   | ●   | ●   |   |
| 2                | 1000                | HCB 1T-3      | 280,—                             | 161  | 1   | ●  |   |   |   |   | ●   |   |
| 2                | 5000                | HFA 5T-3      | 910,—                             | 164  | 1   | ●  |   |   |   |   | ●   | ○   |
| 2                | 5000                | HFC 5T-3      | 1350,—                            | 165  | 1   | ●  |   |   |   |   | ●   | ○   |
| 2                | 6000                | HFD 6T-3M     | 1050,—                            | 166  | 1   | ○  | ●   | ○   |   |   | ●   |   |
| 5                | 10000               | HFA 10T-3     | 1420,—                            | 164  | 1   | ●  |   |   |   |   | ●   | ○   |
| 5                | 10000               | HFC 10T-3     | 1860,—                            | 165  | 1   | ●  |   |   |   |   | ●   | ○   |
| 5                | 12000               | HFD 10T-3M    | 1200,—                            | 166  | 1   | ○  | ●   | ○   |   |   | ●   |   |

\* Price set of 5 units

\*\* Shipment via freight forwarder. Please ask for dimensions, gross weight, shipping costs

● = standard ○ = option



Ultra compact, digital luggage scale for fast weighing of luggage and other suspended loads

Features

- This ergonomically-optimised luggage scale is perfectly suited for rapid, accurate checking of cases, bags, sports baggage, etc. The high maximum load means that there is sufficient safety reserve and can therefore also be used for weighing other, suspended loads
- 1 Ergonomic design for easy handling
- Robust nylon fabric tape for secure fixing of the item to be weighed
- Simple and convenient 1-key operation
- Easy to toggle between units at the press of a button
- High mobility: thanks to battery operation, compact, lightweight construction, it is suitable for the use in several locations
- Automatic Hold function: When the weighing value remains unchanged the weight indicated on the display is automatically “frozen” for 10 sec. This leaves sufficient time to read the weight in peace

Technical data

- LCD display, digit height 9 mm
- Overall dimensions WxDxH 150x31x35 mm
- Ready for use: Batteries included, 3V CR2032, operating time up to 20 h, AUTO-OFF function to preserve the battery, Battery level indicator on display
- Net weight approx. 0,40 kg
- **Note:** The models are delivered in a set of 5 units. That means the prices given in the table refer to 5 units. Cannot be delivered individually. The calibration prices given here refer to calibration of a single balance

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| STANDARD |      |     |       | OPTION |         |
|----------|------|-----|-------|--------|---------|
|          |      |     |       |        |         |
| UNIT     | BATT | DMS | 1 DAY | DAKKS  | +3 DAYS |

| Model             | Weighing capacity [Max] kg | Readability [d] g | Quantity delivered (balances) | Price excl. of VAT ex works € | Option DAKKS Calibr. Certificate DAKKS KERN | Quantity delivered (DAKKS Calibr. Certificate) |
|-------------------|----------------------------|-------------------|-------------------------------|-------------------------------|---|--|
| KERN HGA 50K-2S05 | 50                         | 10                | 5                             | 108,-*                        | 963-128H 112,-                              | 1  |

ONLY WHILE STOCKS LAST!

\* Price set of 5 units



The classic among manual hanging scales – perfect for rapid weighing of higher loads

Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN 61010-1 (Electrical safety)
- Ideal for rapid control in goods-in and goods-out
- Also essential in the private sector to determine the weight of fish, game, fruits, bicycle parts, suitcases etc.
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when the weighing value remains unchanged or manually by pressing the Hold key
- Peak load display (peak hold)
- Hook made of Steel

Technical data

- LCD display, digit height 11 mm
- 2 Tape measure, extractable, length approx. 100 cm
- Ready for use: Batteries included, 9 V block, operating time up to 20 h
- Further weighing units: kg, lb, N
- Overall dimensions W×D×H  
90×30×176,5 mm (without load hook)  
90×30×270 mm (with load hook)
- Permissible ambient temperature 5 °C/35 °C

Accessories

- 3 Tare pan with pan beam, details see Accessories, KERNCH-A01N, € 93,-

STANDARD

CAL EXT

UNIT

MOVE

BATT

DMS

1 DAY

OPTION

DAkkS

+3 DAYS

| Model     | Weighing capacity | Readability | Dimensions housing<br>W×D×H | Net weight    | Price<br>excl. of VAT<br>ex works<br>€ | Option        |                          |
|-----------|-------------------|-------------|-----------------------------|---------------|--|---------------|--------------------------|
|           |                   |             |                             |               |  | DAkkS<br>KERN | Calibr. Certificate<br>€ |
| KERN      | [Max]<br>kg       | [d]<br>g    | mm                          | approx.<br>kg |  |               |                          |
| CH 15K20  | 15                | 20          | 90×30×176,5                 | 0,35          | 80,-                                   | 963-128H      | 112,-                    |
| CH 50K50  | 50                | 50          | 90×30×176,5                 | 0,35          | 85,-                                   | 963-128H      | 112,-                    |
| CH 50K100 | 50                | 100         | 90×30×176,5                 | 0,35          | 75,-                                   | 963-128H      | 112,-                    |



Practical hanging scale for rapid, mobile weighing

Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN61010-1 (Electrical safety)
- HDB-XL: High-capacity XL-version. The larger design creates space for a large handle, which enables even better handling especially with heavier loads
- Ideal for rapid control in goods-in and goods-out
- Also essential in the private sector to determine the weight of fish, game, fruits, bicycle parts, suitcases etc.
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when the weighing value remains unchanged or manually by pressing the Hold key
- Hook, steel, can be hinged
- Peak load display (peak hold)

Technical data

- LCD display, digit height 12 mm
- Ready for use: Batteries included, 2x1.5 V AAA, operating time up to 180 h
- Further weighing units: kg, lb, N
- Overall dimensions WxDxH (without load hook)  
HDB-N: 72x25x105 mm  
HDB-XL: 101x25x107 mm
- Overall dimensions WxDxH (with load hook)  
HDB-N: 72x25x188 mm  
HDB-XL: 101x25x203 mm
- Net weight approx. 0,20 kg
- Permissible ambient temperature 5 °C/35 °C

Accessories

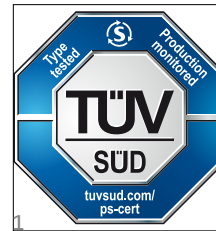
- 2 Tare pan with pan beam, details see Accessories, KERNCH-A01N, € 93,-

15

STANDARD

OPTION

| Model       | Weighing capacity | Readability | Dimensions housing | Net weight | Price        | Option        | Certificate |
|-------------|-------------------|-------------|--------------------|------------|--------------|---------------|-------------|
|             | [Max]             | [d]         | WxDxH              | approx.    | excl. of VAT | DAKKS Calibr. |             |
|             | kg                | g           | mm                 | kg         | ex works     | DAKKS         | €           |
| KERN        |                   |             |                    |            | €            | KERN          |             |
| HDB 5K5N    | 5                 | 5           | 72x25x105          | 0,20       | 65,-         | 963-127H      | 93,-        |
| HDB 10K10N  | 10                | 10          | 72x25x105          | 0,20       | 65,-         | 963-128H      | 112,-       |
| HDB 6K-3XL  | 6                 | 5           | 107x25x101         | 0,20       | 85,-         | 963-128H      | 112,-       |
| HDB 10K-2XL | 15                | 10          | 107x25x101         | 0,20       | 85,-         | 963-128H      | 112,-       |
| HDB 30K-2XL | 30                | 20          | 107x25x101         | 0,20       | 85,-         | 963-128H      | 112,-       |



## Handy hanging scale for higher loads

### Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN 61010-1 (Electrical safety)
- Ideal for rapid control in goods-in and goods-out
- Also essential in the private sector to determine the weight of fish, game, fruits, bicycle parts, suitcases etc.
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when the weighing value remains unchanged or manually by pressing the Hold key
- Peak load display (peak hold), Measuring frequency 5 Hz
- [Max] ≤ 200 kg: Snap link (stainless steel) with safety catch as standard

- [Max] ≤ 200 kg: Hook (stainless steel) as standard
- 2 [Max] ≥ 500 kg: Reinforced version for heavy loads. Snaplink and Hook not included

### Technical data

- LCD display, digit height 12 mm
- Hole diameter of load support, model with [Max] ≤ 200 kg: approx. 14 mm [Max] ≥ 500 kg: approx. 16 mm
- Further weighing units: kg, lb, N
- Overall dimensions W×D×H ca. 82×43×153 mm (without load hook)
- Ready for use: Batteries included, 3×1.5 V AA, operating time up to 300 h
- Permissible ambient temperature 5 °C/35 °C

### Accessories

- 3 Hook with safety catch, galvanised and lacquered cast steel, not rotatable, scope of delivery: 2 shackles, 1 connecting link, 1 hook, KERNYHA-06, € 130,-
- 4 High-strength shackle, hot-dipped galvanised cast steel bracket, curved edge. Scope of delivery: 2 shackles, KERNYSC-04, € 65,-

Suitable for model HCB 20K10

- 5 Tare pan with pan beam, details see Accessories, KERNCH-A01N, € 93,-

Accessories for models with [Max] ≤ 200 kg

- Snap link (stainless steel) with safety catch, opening approx. 15 mm, KERNHCB-A01, € 38,-
- Hook (stainless steel), opening approx. 25 mm, KERNHCB-A02, € 24,-

#### STANDARD



#### OPTION



| Model      | Weighing capacity | Readability | Net weight | Price excl. of VAT ex works € | Option DAKKS Calibr. Certificate | DAKKS KERN | € |
|------------|-------------------|-------------|------------|-------------------------------|----------------------------------|------------|---|
| KERN       | [Max] kg          | [d] g       | approx. kg |                               |                                  |            |   |
| HCB20K10   | 20                | 10          | 0,30       | 120,-                         | 963-128H                         | 112,-      |   |
| HCB50K20   | 50                | 20          | 0,30       | 131,-                         | 963-128H                         | 112,-      |   |
| HCB50K100  | 50                | 100         | 0,30       | 104,-                         | 963-128H                         | 112,-      |   |
| HCB99K50   | 99                | 50          | 0,30       | 114,-                         | 963-129H                         | 131,-      |   |
| HCB100K200 | 100               | 200         | 0,30       | 114,-                         | 963-129H                         | 131,-      |   |
| HCB200K100 | 200               | 100         | 0,30       | 131,-                         | 963-129H                         | 131,-      |   |
| HCB200K500 | 200               | 500         | 0,30       | 109,-                         | 963-129H                         | 131,-      |   |
| HCB0.5T-3  | 500               | 1000        | 0,40       | 215,-                         | 963-130H                         | 235,-      |   |
| HCB 1T-3   | 1000              | 2000        | 0,60       | 280,-                         | 963-130H                         | 235,-      |   |



Robust, compact hanging scale with high level of protection against dust and water spray

Features

- 1 With the TÜV certification mark, the scale meets the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN 61010-1 (Electrical safety)
- Housing Stainless steel, IP65-protected against dust and water splashes
- Ideal for rapid control in goods-in and goods-out
- Also essential in the private sector to determine the weight of fish, game, fruits, bicycle parts, suitcases etc.
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when the weighing value remains unchanged or manually by pressing the Hold key
- Peak load display (peak hold)
- Internal measuring frequency: 5 Hz
- Snap link (stainless steel) with safety catch as standard
- Hook (stainless steel) as standard

Technical data

- LCD display, digit height 12 mm
- Hole diameter of load support ca. 14 mm
- 2 Second display on the back of the balance
- Ready for use: Batteries included, 2x1.5 V AA, operating time up to 200 h

Accessories

- Snap link (stainless steel) with safety catch, opening approx. 15 mm, KERNHCB-A01, € 38,-
- Hook (stainless steel), opening approx. 25 mm, KERNHCB-A02, € 24,-

15

STANDARD

CAL EXT

UNIT

MOVE

IP 65

BATT

DMS

1 DAY

OPTION

DAKKS

+3 DAYS

| Model         | Weighing capacity | Readability | Dimensions housing<br>WxDxH | Net weight    | Price<br>excl. of VAT<br>ex works<br>€ | Option<br>DAKkS Calibr. Certificate |       |
|---------------|-------------------|-------------|-----------------------------|---------------|--|-------------------------------------|-------|
|               |                   |             |                             |               |  | DAKkS<br>KERN                       | €     |
| KERN          | [Max]<br>kg       | [d]<br>g    | mm                          | approx.<br>kg |  |                                     |       |
| HCN 50K100IP  | 50                | 100         | 96×48×179                   | 0,85          | 150,-                                  | 963-128H                            | 112,- |
| HCN 100K200IP | 100               | 200         | 96×48×179                   | 0,50          | 150,-                                  | 963-129H                            | 131,- |
| HCN 200K500IP | 200               | 500         | 96×48×179                   | 0,50          | 150,-                                  | 963-129H                            | 131,- |



High-resolution crane scale for loads up to 300 kg

Features

- Fully-equipped crane scale for low to medium load ranges. The solid design guarantees that extra level of safety (TÜV tested). Thanks to the large LCD display and the remote control which is delivered as standard, it can also be operated safely from a distance and results can be read off
- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN61010-1 (Electrical safety)
- High level of mobility: thanks to battery pack operation, compact construction and low weight, it is suitable for use in several locations (production, warehouse, dispatch department, etc.)
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when

- the weighing value remains unchanged or manually by pressing the Hold key
- Tare: Resets the display to „0“ when there is a load on the scale. Now removed or added loads are directly displayed
- Battery level indicator, LED visual display
- Large high-contrasted display that is easy to read
- Standby function: display automatically switched off after 5 min without a change of load. Automatic activation with the touch of a key
- Hook with safety catch, revolving
- Shackle and safety catch made of nickel-plated steel
- 2 Infrared remote control standard. Range up to 20 m. All functions can be selected. WxDxH65x24x100 mm. Batteries included

Technical data

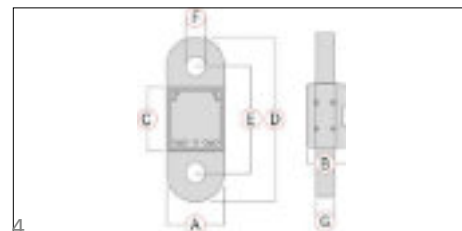
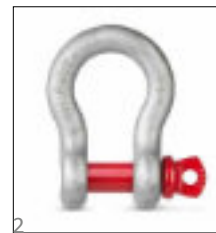
- Backlit LCD display, digit height 28 mm
- Ready for use: Batteries standard, 4x1.5 V AA, operating time approx. 100 h
- Precision: 0,2 % of [Max]
- Permissible ambient temperature 5 °C/40 °C

Accessories

- Internal rechargeable battery pack for load receptor, operating time up to 50 h without backlight, charging time approx. 12 h. Weighing is not possible during the charging process, KERNHCD-A01, € 54,-

| STANDARD |      |      |     |       | OPTION |               |
|----------|------|------|-----|-------|--------|---------------|
|          |      |      |     |       |        |               |
| CAL EXT  | UNIT | BATT | DMS | 1 DAY | ACCU   | DAKKS +3 DAYS |

| Model   | Weighing capacity [Max] kg | Readability [d] g | Net weight approx. kg | 3 Dimensions |      |      |       |       |      |      | Price excl. of VAT ex works € | Option DAKKS Calibr. Certificate |       |
|---|----------------------------|-------------------|-----------------------|--------------|------|------|-------|-------|------|------|-------------------------------|----------------------------------|-------|
|   |                            |                   |                       | A mm         | B mm | C mm | D mm  | E mm  | F mm | G mm |                               | DAKKS KERN                       | €     |
| KERN  |                            |                   |                       |              |      |      |       |       |      |      |                               |                                  |       |
| HCD 60K-2   | 60                         | 20                | 1,2                   | 150          | 79,3 | 97,7 | 276,5 | 246,5 | 26   | 23,5 | 210,-                         | 963-129H                         | 131,- |
| HCD 100K-2  | 150                        | 50                | 1,2                   | 150          | 79,3 | 97,7 | 276,5 | 246,5 | 26   | 23,5 | 210,-                         | 963-129H                         | 131,- |
| HCD 300K-1  | 300                        | 100               | 1,2                   | 150          | 79,3 | 97,7 | 276,5 | 246,5 | 26   | 23,5 | 210,-                         | 963-129H                         | 131,- |
| Multi-range balance, with increasing load it switches automatically to the next largest weighing range [Max] and readout [d] and when the load is fully removed, the balance switches back to the lower range |                            |                   |                       |              |      |      |       |       |      |      |                               |                                  |       |
| HCD 100K-2D   | 60   150                   | 20   50           | 1,2                   | 150          | 79,3 | 97,7 | 276,5 | 246,5 | 26   | 23,5 | 220,-                         | 963-129H                         | 131,- |
| HCD 300K-2D   | 150   300                  | 50   100          | 1,2                   | 150          | 79,3 | 97,7 | 276,5 | 246,5 | 26   | 23,5 | 220,-                         | 963-129H                         | 131,- |



Compact crane scale with integrated display can also be used for tensile force measurement

### Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN 61010-1 (Electrical safety)
- With its high-quality finish, low weight and compact dimensions, this crane scale (tensile force gauge) is an essential device for industrial use, on building sites, in freight centres, ports etc.
- Because of its compact design it is also ideally suited for installation in systems where space is limited, etc.
- Ideally suited for determining weight quickly while loading and unloading
- Peak load display (peak hold)
- Hold function: For easy reading of the weighing result, the display can be „frozen“ in different ways. Either automatically when the weighing value remains unchanged or manually by pressing the Hold key
- Tare: Resets the display to „0“ when there is a load on the scale. Now removed or added loads are directly displayed

### Technical data

- Large backlit LCD display, digit height 23 mm
- Material and design of housing/load support, models with  
[Max] ≤ 3 t: Aluminium/Stainless steel bushing  
[Max] > 3 t: Steel/Steel
- Rechargeable battery pack integrated, as standard, operating time up to 30 h without backlight, charging time approx. 12 h
- Optional battery operation, 3×1.5 V AA not included in scope of delivery, operating time up to 40 h
- Precision: 0,2% of [Max]
- Internal measuring frequency: 60 Hz
- Further weighing units: kg, lb, N
- Permissible ambient temperature 5 °C/35 °C

### Accessories

- 2 High-strength shackle, hot-dipped galvanised cast steel bracket, bow shaped. Scope of delivery: 2 shackles with lacquered screw bolts, suitable for models with  
[Max] ≤ 5 t: KERNYSC-01, € 100,-  
[Max] > 5 t: KERNYSC-02, € 230,-
- 3 Hook with safety catch, cast steel, galvanised and lacquered, non-revolving. Scope of delivery: 2 shackles, 1 lacquered screw bolt, 1 hook, suitable for models with  
[Max] ≤ 1 t: KERNYHA-01, € 185,-  
[Max] = 3 t: KERNYHA-02, € 210,-  
[Max] = 5 t: KERNYHA-03, € 250,-  
[Max] > 5 t: KERNYHA-04, € 450,-

STANDARD



OPTION



| Model             | Weighing capacity<br>[Max]<br>kg | Readability<br>[d]<br>g | Net weight<br>approx.<br>kg | 4 Dimensions |         |         |         |         |         |         | Price<br>excl. of VAT<br>ex works<br>€ | Option<br>DAKKS Calibr. Certificate |       |
|-------------------|----------------------------------|-------------------------|-----------------------------|--------------|---------|---------|---------|---------|---------|---------|--|-------------------------------------|-------|
|                   |                                  |                         |                             | A<br>mm      | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm |  | DAKKS<br>KERN                       | €     |
| <b>KERN</b>       |                                  |                         |                             |              |         |         |         |         |         |         |  |                                     |       |
| <b>HFA 600K-1</b> | 600                              | 200                     | 1,8                         | 90           | 62      | 100     | 255     | 165     | 32      | 30      | <b>740,-</b>                           | 963-130H                            | 235,- |
| <b>HFA 1T-4</b>   | 1000                             | 500                     | 1,8                         | 90           | 62      | 100     | 255     | 165     | 32      | 30      | <b>750,-</b>                           | 963-130H                            | 235,- |
| <b>HFA 3T-3</b>   | 3000                             | 1000                    | 2,0                         | 90           | 62      | 100     | 255     | 165     | 32      | 30      | <b>820,-</b>                           | 963-132H                            | 590,- |
| <b>HFA 5T-3</b>   | 5000                             | 2000                    | 4,0                         | 90           | 62      | 100     | 255     | 165     | 30      | 30      | <b>910,-</b>                           | 963-132H                            | 590,- |
| <b>HFA 10T-3</b>  | 10000                            | 5000                    | 6                           | 90           | 72      | 100     | 275     | 185     | 40      | 40      | <b>1420,-</b>                          | 963-133H                            | 830,- |



Compact crane scale for use in harsh environmental conditions or where space is limited, with convenient hand-held terminal

### Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN61010-1 (Electrical safety)
- With its high-quality finish, low weight and compact dimensions, this crane scale (tensile force gauge) is an essential device for industrial use, on building sites, in freight centres, ports etc.
- Because of its compact design it is also ideally suited for installation in systems where space is limited, etc.
- Peak load display (peak hold)
- Hold function: When the weighing value remains unchanged the weight indicated on the display is automatically "frozen" until the Hold key is pressed
- Tare: Resets the display to „0“ when there is a load on the scale. Now removed or added loads are directly displayed

- 2 Display device with integrated radio module, which the user can carry around with him, thanks to the convenient hand strap 3, standard. In this way the weighing data can always be read off the display device by the user, even when the user is a long way from the load receptor (force gauge) or under poor lighting conditions. Range up to 20 m. All functions can be selected (Can be ordered separately)

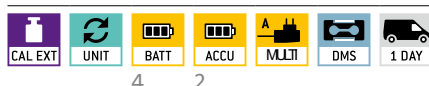
### Technical data

- Material and design of housing/load support, models with  
[Max] ≤ 3 t: Aluminium/Stainless steel bushing  
[Max] > 3 t: Steel/Steel
- Precision: 0,2% of [Max]
- Internal measuring frequency: 10 Hz
- Further weighing units: kg, lb, N
- Permissible ambient temperature 5 °C/35 °C

### Display device

- Large backlit LCD display, digit height 23 mm
- Rechargeable battery pack integrated, as standard, operating time up to 30 h without backlight, charging time approx. 12 h

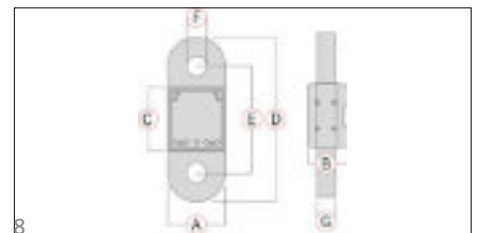
#### STANDARD



#### OPTION



| Model      | Weighing capacity<br>[Max]<br>kg | Readability<br>[d]<br>g | Net weight<br>approx.<br>kg | 8 Dimensions |         |         |         |         |         |         |  | Price<br>excl. of VAT<br>ex works<br>€ | Option<br>DAkkS Calibr. Certificate |       |
|------------|----------------------------------|-------------------------|-----------------------------|--------------|---------|---------|---------|---------|---------|---------|--|--|-------------------------------------|-------|
|            |                                  |                         |                             | A<br>mm      | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm |  |  | DAkkS<br>KERN                       | €     |
| KERN       |                                  |                         |                             |              |         |         |         |         |         |         |  |  |                                     |       |
| HFC 600K-1 | 600                              | 200                     | 1,8                         | 90           | 62      | 100     | 255     | 165     | 32      | 27      |  | 1180,-                                 | 963-130H                            | 235,- |
| HFC 1T-4   | 1000                             | 500                     | 1,8                         | 90           | 62      | 100     | 255     | 165     | 32      | 32      |  | 1180,-                                 | 963-130H                            | 235,- |
| HFC 3T-3   | 3000                             | 1000                    | 2,2                         | 90           | 62      | 100     | 255     | 165     | 32      | 32      |  | 1260,-                                 | 963-132H                            | 590,- |
| HFC 5T-3   | 5000                             | 2000                    | 4,0                         | 90           | 62      | 100     | 255     | 165     | 30      | 30      |  | 1350,-                                 | 963-132H                            | 590,- |
| HFC 10T-3  | 10000                            | 5000                    | 6                           | 90           | 72      | 100     | 275     | 185     | 40      | 40      |  | 1860,-                                 | 963-133H                            | 830,- |



- Dimensions of display device WxDxH  
88×64×256 mm
- Net weight 0,5 kg

### Load receptor

- 4 Optional battery operation, 3×1.5 V AA not included in scope of delivery, operating time up to 40 h

### Accessories

- 5 Load receptor: Rechargeable battery pack internal, operating time up to 30 h, without backlight, charging time approx. 12 h, KERNHFA-A01, € 44,-
- Display device: Rechargeable battery pack internal, KERNHFC-A01, € 70,-
- 6 High-strength shackle, hot-dipped galvanised cast steel bracket, bow shaped. Scope of delivery: 2 shackles with lacquered screw bolts, suitable for models with  
[Max] ≤ 5t: KERNYSC-01, € 100,-  
[Max] > 5t: KERNYSC-02, € 230,-
- 7 Hook with safety catch, cast steel, galvanised and lacquered, non-revolving. Scope of delivery: 2 shackles, 1 lacquered screw bolt, 1 hook, suitable for models with  
[Max] ≤ 1t: KERNYHA-01, € 185,-  
[Max] = 3t: KERNYHA-02, € 210,-  
[Max] = 5t: KERNYHA-03, € 250,-  
[Max] > 5t: KERNYHA-04, € 450,-



KERN HFD-M



KERNHFD/HFD-IP

Robust, high-resolution crane scale up to 12 t, also with EC type approval [M] or protection type IP67



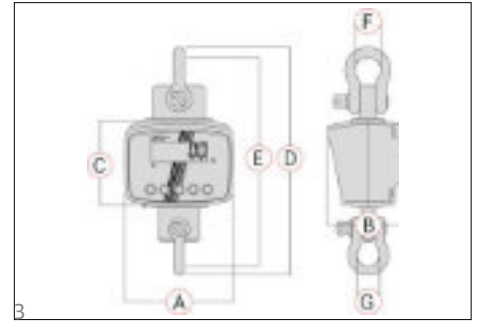
High mobility: thanks to rechargeable battery operation, compact, lightweight construction, it is suitable for the use in several locations (production, warehouse, dispatch department etc.)



Solid shackles, non-revolving



Radio remote control standard. Range up to 20 m. All functions can be selected. W×D×H 65×24×100 mm. Batteries included, 1× 12 V 23A



## Features

- 1 With the TÜV certification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN61010-1 (Electrical safety)
- Because of its stable construction and robust design, it is ideal for continuous use in industrial environment
- Hold function: the weight display is „frozen“ when the Hold button is pressed (Not usable with HFD-M)
- Tare: Resets the display to „0“ when there is a load on the scale. Now removed or added loads are directly displayed

## KERN HFD-IP

- The models with IP add-on have special spray and dust protection to IP67 and because of this they are ideal for use in harsh environments

## KERN HFD-M

- The models with M add-on have EC type approval and because of this they are ideal for use in verified applications such as, for example, calculation of a total price, based on weight
- Will support you when weighing freight in a SOLAS compliant manner
- Sleep function: when the sleep button is pressed, the weight display is switched off, but the value remains stored. This can extend the battery life

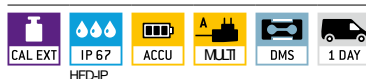
## Technical data

- Superior display size: digit height 30 mm, bright backlight for easy reading of weighing results, even in poor lighting conditions
- Rechargeable battery pack integrated, as standard, operating time up to 70 h without backlight, charging time approx. 12 h, Battery pack accessible from the outside, which means it is easy to replace
- Precision: 0,2% of [Max]
- Permissible ambient temperature -10 °C/40 °C

## Accessories

- Internal rechargeable battery pack for load receptor, operating time up to 70 h without backlight, charging time approx. 12 h, Internal rechargeable battery pack, operating time up to 70 h without backlight, charging time approx. 12 h, KERNHFD-A04, € 98,-
- Charging station for external battery charging, scope of delivery: charging station, exchangeable battery, mains adapter, KERNHFD-A07, € 120,-
- 2 Hook with safety catch, cast steel, galvanised and lacquered, non-revolving, suitable for models  
HFD 600, HFD 1T: KERNHFD-A01, € 50,-  
HFD 3T: KERNHFD-A02, € 73,-  
HFD 6T, HFD 10T: KERNHFD-A03, € 130,-
- Bluetooth data interface for wireless data transfer to PC or tablets, must be ordered at purchase, KERNHFD-A06, € 255,-

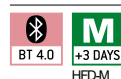
### STANDARD




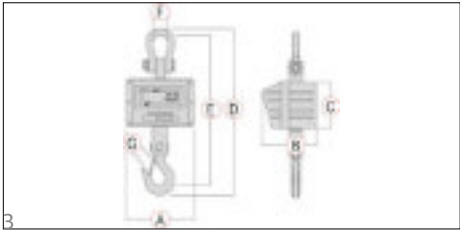
### OPTION



### FACTORY



| Model   | Weighing capacity   |      |       |      |      |      | Readability |     |     | Net weight approx. kg | 3 Dimensions |         |         |         |         |             |          | Price excl. of VAT ex works €   | Verification | Option            |  |  |
|---|---|------|-------|------|------|------|-------------|-----|-----|-----------------------|--------------|---------|---------|---------|---------|-------------|----------|---|--------------|-------------------|--|--|
| KERN  | [Max]<br>kg   |      |       |      |      |      | [d]<br>g    |     |     |                       | A<br>mm      | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F = G<br>mm |          |  | €            | DAkkS Certificate |  |  |
|   | Multi-range balance, with increasing load it switches automatically to the next largest weighing range [Max] and readout [d] and when the load is fully removed, the balance switches back to the lower range |      |       |      |      |      |             |     |     |                       |              |         |         |         |         |             |          |   |              |                   |  |  |
| HFD 600K-1  | 150   | 300  | 600   | 50   | 100  | 200  | 9           | 194 | 129 | 160                   | 422          | 384     | 50,8    | 500,—   | —       | —           | 963-130H | 235,—   |              |                   |  |  |
| HFD 1T-4  | 300   | 600  | 1500  | 100  | 200  | 500  | 9           | 194 | 129 | 160                   | 422          | 384     | 50,8    | 510,—   | —       | —           | 963-130H | 235,—   |              |                   |  |  |
| HFD 3T-3  | 600   | 1500 | 3000  | 200  | 500  | 1000 | 10          | 194 | 129 | 160                   | 457          | 413     | 58      | 700,—   | —       | —           | 963-132H | 590,—   |              |                   |  |  |
| HFD 6T-3  | 1500  | 3000 | 6000  | 500  | 1000 | 2000 | 15          | 194 | 129 | 160                   | 518          | 467     | 68,3    | 870,—   | —       | —           | 963-132H | 590,—   |              |                   |  |  |
| HFD 10T-3   | 3000  | 6000 | 12000 | 1000 | 2000 | 5000 | 20          | 194 | 129 | 160                   | 584          | 521     | 82,5    | 1020,—  | —       | —           | 963-133H | 830,—   |              |                   |  |  |
| Protection against dust and water splashes IP67   |   |      |       |      |      |      |             |     |     |                       |              |         |         |         |         |             |          |   |              |                   |  |  |
| HFD 600K-1IP  | 150   | 300  | 600   | 50   | 100  | 200  | 9           | 194 | 129 | 160                   | 422          | 384     | 50,8    | 590,—   | —       | —           | 963-130H | 235,—   |              |                   |  |  |
| HFD 1T-4IP  | 300   | 600  | 1500  | 100  | 200  | 500  | 9           | 194 | 129 | 160                   | 422          | 384     | 50,8    | 590,—   | —       | —           | 963-130H | 235,—   |              |                   |  |  |
| HFD 3T-3IP  | 600   | 1500 | 3000  | 200  | 500  | 1000 | 10          | 194 | 129 | 160                   | 457          | 413     | 58      | 740,—   | —       | —           | 963-132H | 590,—   |              |                   |  |  |
| HFD 6T-3IP  | 1500  | 3000 | 6000  | 500  | 1000 | 2000 | 15          | 194 | 129 | 160                   | 518          | 467     | 68,3    | 920,—   | —       | —           | 963-132H | 590,—   |              |                   |  |  |
| HFD 10T-3IP   | 3000  | 6000 | 12000 | 1000 | 2000 | 5000 | 20          | 194 | 129 | 160                   | 584          | 521     | 82,5    | 1060,—  | —       | —           | 963-133H | 830,—   |              |                   |  |  |
| Note: For applications that require verification, please order verification at the same time, initial verification at a later date is not possible. |   |      |       |      |      |      |             |     |     |                       |              |         |         |         |         |             |          |   |              |                   |  |  |
| Verification at the factory, we need to know the full address of the location of use.   |   |      |       |      |      |      |             |     |     |                       |              |         |         |         |         |             |          |   |              |                   |  |  |
| HFD 600K-1M   | 600   |      |       |      |      |      | 200         | 9   | 194 | 129                   | 160          | 422     | 384     | 50,8    | 660,—   | 965-130H    | 143,—    | 963-130H  | 235,—        |                   |  |  |
| HFD 1T-4M   | 1500  |      |       |      |      |      | 500         | 9   | 194 | 129                   | 160          | 422     | 384     | 50,8    | 650,—   | 965-130H    | 143,—    | 963-130H  | 235,—        |                   |  |  |
| HFD 3T-3M   | 3000  |      |       |      |      |      | 1000        | 10  | 194 | 129                   | 160          | 457     | 413     | 58      | 860,—   | 965-132H    | 225,—    | 963-132H  | 590,—        |                   |  |  |
| HFD 6T-3M   | 6000  |      |       |      |      |      | 2000        | 15  | 194 | 129                   | 160          | 518     | 467     | 68,3    | 1050,—  | 965-132H    | 225,—    | 963-132H  | 590,—        |                   |  |  |
| HFD 10T-3M  | 12000   |      |       |      |      |      | 5000        | 20  | 194 | 129                   | 160          | 584     | 521     | 82,5    | 1200,—  | 965-133H    | 340,—    | 963-133H  | 830,—        |                   |  |  |



Robust industrial crane scale with bright LEDdisplay for optimum reading in unfavourable ambient conditions

Features

- 1 With the TÜVcertification mark, the scales meet the requirements of the standard EN 13155 (Non-fixed load lifting attachments/ Breakage resistance) and EN61010-1 (Electrical safety)
- Professional device for robust applications in production, quality control, logistics etc. Because of its stable construction and robust design, it is ideal for continuous use in industrial environment
- High mobility: thanks to rechargeable battery operation, compact, lightweight construction, it is suitable for the use in several locations (production, warehouse, dispatch department etc.)

- Adaptation to unstable environmental conditions by changing the readability
- Hold function: the weight display is „frozen“ when the Hold button is pressed
- Tare: Resets the display to „0“ when there is a load on the scale. Now removed or added loads are directly displayed
- Hook with safety catch, revolving
- 2 Radio remote control standard. Range up to 20 m. All functions can be selected (excl. ON/OFF). W×D×H48×10×95 mm. Batteries included, 2×1.5 V AAA

Technical data

- Superior display size: digit height 30 mm, bright backlight for easy reading of weighing results, even in poor lighting conditions
- Rechargeable battery pack integrated, as standard, operating time up to 50 h without backlight, charging time approx. 14 h
- Precision: 0,2 % of [Max]
- Permissible ambient temperature 0 °C/40 °C

15

STANDARD

OPTION

| Model     | Weighing capacity<br>[Max]<br>kg | Readability<br>[d]<br>g | Net weight<br>approx.<br>kg | 3 Dimensions |         |         |         |         |         |         | Price<br>excl. of VAT<br>ex works<br>€ | DAKKS Calibr. Certificate |       |
|-----------|----------------------------------|-------------------------|-----------------------------|--------------|---------|---------|---------|---------|---------|---------|--|---------------------------|-------|
|           |                                  |                         |                             | A<br>mm      | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm |  | DAKKS<br>KERN             | €     |
| KERN      |                                  |                         |                             |              |         |         |         |         |         |         |  |                           |       |
| HFM 1T0.1 | 1000                             | 100                     | 14                          | 270          | 200     | 175     | 610     | 540     | 68      | 40      | 1010,-                                 | 963-130H                  | 235,- |
| HFM 3T0.5 | 3000                             | 500                     | 16                          | 270          | 200     | 175     | 610     | 540     | 74      | 40      | 1040,-                                 | 963-132H                  | 590,- |
| HFM 5T0.5 | 5000                             | 500                     | 24                          | 300          | 230     | 190     | 730     | 650     | 74      | 55      | 1400,-                                 | 963-132H                  | 590,- |
| HFM 10T1  | 10000                            | 1000                    | 34                          | 300          | 230     | 190     | 840     | 750     | 92      | 60      | 1860,-                                 | 963-133H                  | 830,- |

# 18

## DAKKS CALIBRATION SERVICE/ VERIFICATION SERVICE

### The DAkkS (German accreditation body)

The DAkkS is the national accreditation body of the Federal Republic of Germany. According to Regulation (EC) No. 765/2008 and the Accreditation Body Act (AkkStelleG), the DAkkS acts in the public interest as the sole service provider for accreditation in Germany.

In order to be able to fulfil its sovereign accreditation tasks, the DAkkS was entrusted by the Federal Government. As an entrusted body, the DAkkS is subject to federal supervision.

Only an accredited calibration laboratory can issue a DAkkS calibration certificate. This defines not only the measuring method as well as the measuring result, but also gives information on tracing the test medium to national standards and the relevant uncertainty of measurement.

- 
- > **You are certified to ...**  
ISO 9001, QS 9000, GLP, GMP, TS 16949
  - > **You need ...**  
to control your measuring equipment
  - > **Our solution ...**  
DAkkS calibration certificate; (traceability, measuring uncertainty, internationally recognised)
- 

### KERN – Precision is our business

The KERN calibration laboratory for electronic balances and weights has been accredited by DKD since 1994 and today is one of the most modern and best-equipped DAkkS calibration laboratories for balances, test weights and force measurement in Europe.

Thanks to the high level of automation, we can carry out DAkkS calibration of balances, test weights and force-measuring devices 24 hours a day, 7 days a week.

Do you have any further requests or questions on this matter? We would be pleased to help you or visit us on the web at [www.kern-lab.com](http://www.kern-lab.com)

### DAkkS calibration

**Why?** DAkkS calibration is always necessary when checking equipment (balance or test weight) is to be used in a QM process (e.g. to ISO 9000ff, GS 9000, TS 16949, VDA 6.1, FDA, GLP, GMP, GMP etc.)

**What?** Any checking equipment in proper condition can be DAkkS calibrated

**How?** Determination of accuracy throughout the world by a laboratory which is accredited to DIN EN ISO 17025. Traceability to internationally recognised standards. The DAkkS calibration certificate confirms both the measurement characteristics of the checking equipment and the general requirements for the control of checking equipment.

**Where?** Internationally recognised – this is monitored by ILAC (International Laboratory Accreditation Cooperation) and e.g. DAkkS (German calibration service) in Germany

**When?** The operator controls the use of checking equipment and periodic recalibration time intervals themselves

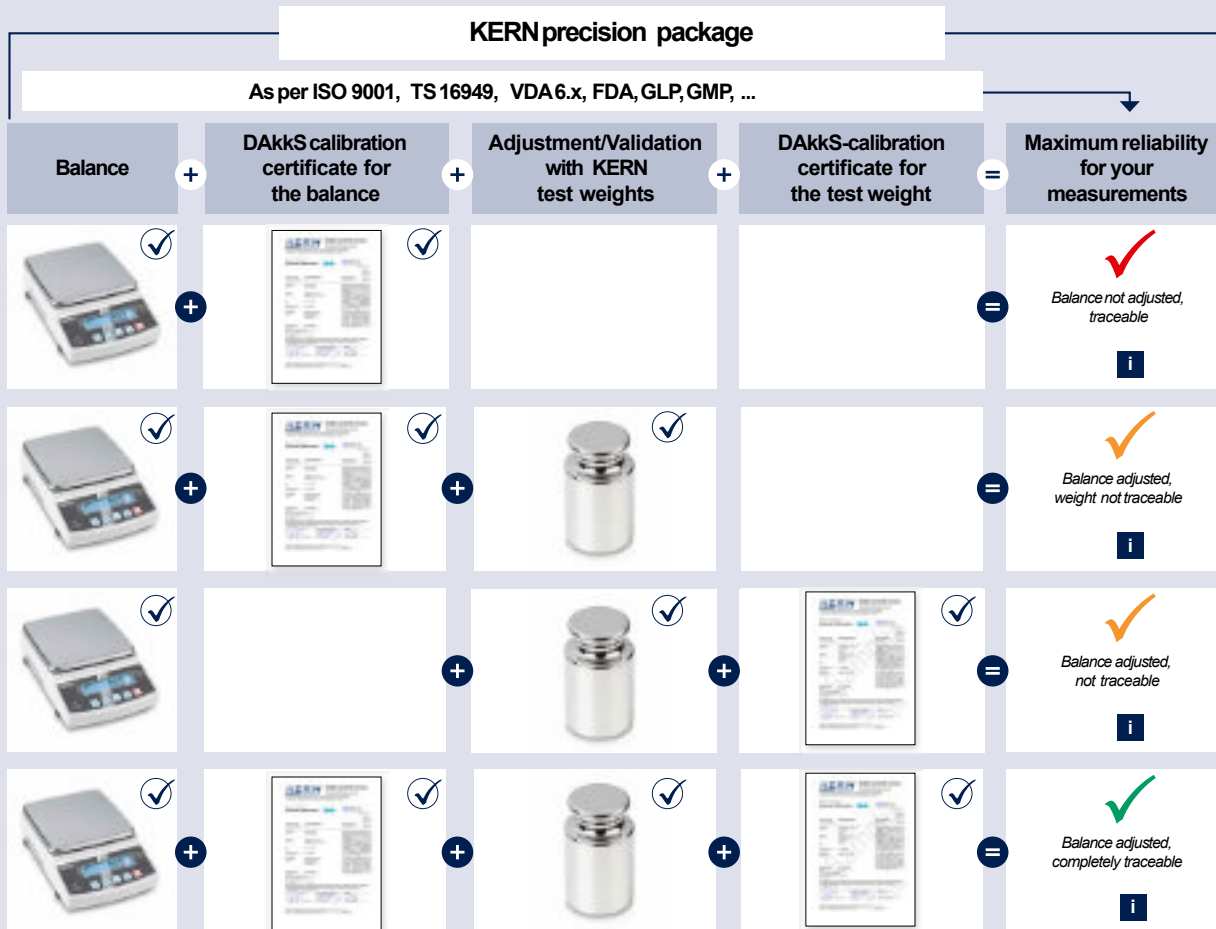
### Range of services:

- DAkkS calibration of balances with a maximum load of up to 50.000 kg
- DAkkS calibration of weights in the range of 1 mg – 2.500 kg. Calibrations can be carried out in the following classes: E1, E2, F1, F2, M1, M2, M3
- DAkkS calibration of force gauges and force transducers
- Volume determination for weights of accuracy class E1
- Measuring of sensitivity (magnetic characteristics)
- Factory calibration in various sizes:
- Force (sensors and measuring devices), hardness (Shore, UCI, Leeb, etc.), thickness of coatings and walls, torque wrench testing devices, and much more
- Conformity assessments and recalibration of balances and weights at the KERN verification point, working closely with the verification authorities

And on top of all these services, we also offer additional services – see page 212/213.

## Balance & weight in the quality management system

Do you already use all the modules of the KERNprecision package for maximum accuracy and reliability of your balance?



Information & ordering:  
kern-sohn.com/qmb

## The KERNcalibration laboratory (D-K-19408-01-00)

KERN has a highly-automated DAkkS laboratory with accreditation to DIN EN ISO/IEC 17025 in the field of balances, test weights and force measurement. By using the most modern calibration technology with high-end calibration robots in fully air-conditioned laboratories, the measurement uncertainty and process times are reduced to a minimum, and also the quality of the calibration is increased.

As an accredited and certified calibration service provider with decades of experience, KERN offers you an extensive range of services, which will leave no demand unfulfilled. The accreditation applies to the extent specified in the appendix to the certificate D-K-19408-01-00.

## We offer the following services:

### Waagen:

- ▶ DAkkS calibration up to 50 t
- ▶ Minimum sample weight (in use)
- ▶ Usage accuracy
- ▶ Adjustment at the location of installation
- ▶ Certificate of conformity
- ▶ Equipment qualification:
  - > Design qualification (DQ)
  - > Installation qualification (IQ)
  - > Function qualification (OQ)
  - > Performance qualification (PQ)
  - > Maintenance qualification (MQ)
- ▶ Verification

### Weights:

- ▶ DAkkS calibration up to 2.5 t (OIML classes E1 – M3)
- ▶ Volume determination for OIML class E1
- ▶ Measuring of sensitivity (magnetic characteristics)
- ▶ Verification

### Force measuring devices and force transducers:

- ▶ DAkkS calibration up to 5 kN

### Factory calibration for:

- ▶ Force measuring devices and force transducers ≤ 250 kN
- ▶ Hardness
- ▶ Layer thickness
- ▶ Material thickness
- ▶ Temperature of moisture analysers

Our commitment to satisfy our customers never stops. Perhaps this is one of the reasons why our roots can perhaps be traced so far back in history. **Discover the KERN route to success: fast - competent - reliable - versatile!**

## The order process

- 1 You will receive a **reminder** that your test equipment is due or you will generate online a quotation for new or existing test equipment
- 2 Submission or collection of your test equipment
- 3 Initial inspection of your goods, to check that they are suitable for calibration, and are complete, etc.
- 4 You will get a detailed order confirmation
- 5 Our experts will carry out initial calibration
- 6 Checked for conformity with required tolerances and if required, any necessary actions which arise from this are carried out
- 7 Before these actions are carried out, we will contact you (in so far as no individual processing has been agreed with you beforehand)
- 8 After your approval the necessary actions will be implemented and the calibration will be completed
- 9 After that your test equipment will be returned to you without delay, together with the appropriate calibration certificates
- 10 We will monitor your recalibration periods and will send you a reminder about your next calibration, free of charge

## Our service



### ►Reminder service

The continuous cyclic recalibration of your checking equipment is an integral part of the reliable management of test equipment. You can rely on us to support you, and we will remind you in time, free of charge, when the next recalibration is due. In addition, you have the option of managing your test equipment online by yourself (cf. 1, 10).

### ►Quote generator

You will be impressed by our price-to-performance ratio. Request a non-binding quotation or create it yourself to suit your specifications at [www.kern-lab.com](http://www.kern-lab.com) (cf. 1)

### ►Collection service

We will be pleased to arrange a pick up by our forwarding agent the goods from your premises. You only need to tell us the weight and dimensions of your package and leave the rest to us (cf. 2)

### ►Repair and reconditioning of balances and weights

KERN will get your weights back up to standard, regardless of the manufacturer. Whether it is adjustment, marking, sand blasting or lacquering - the aim here is compliance and long-term stability. Any repairs of balances and instruments which may be necessary can be carried out quickly and easily (cf. 5, 6)

### ►Individual processing

In order to avoid delays with future orders, we would be pleased to incorporate your individual requirements for future processing of such calibration results. Even for smaller issues such as the printing of calibration certificates (stapling, punching, double-sided) we can work to your requirements (cf. 8).

### ►Express service and dispatch

If you need a particularly fast service, you can use your DAKK S express service. You will receive your test equipment after only 2 days (cf. 9).

## www.kern-lab.com – the central portal for everything you need to know about the extensive KERNcalibration services

On our website you will always find the latest news and useful information about testing and measuring devices, calibration, legal metrology and expansions to our range of services. You will also find numerous online services on the website.

### Database supported management of test equipment

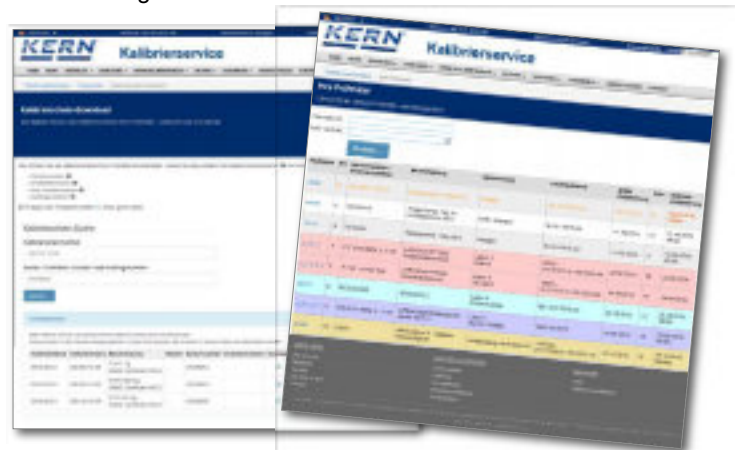
Information on your test equipment which has been calibrated by us is stored in our database. In this way it is possible to make trend calculations. You will therefore get an overview about the long-term stability and trend behaviour of your test equipment as well as the necessary recalibration period can easily be determined and specified.

### Paperless documentation

So there is no administrative effort, we can handle all calibration documentation in a paperless process. From quotation, through to order confirmation, delivery note and invoice right up to calibration certificate, you will receive all documents by e-mail or you can retrieve them online. Would you prefer to receive your certificate or your invoice in paper form, for example? Of course this is not a problem either. We will send you everything you require by post.

### Calibration certificate download

By using our download service you can easily download your calibration certificates as soon as the calibration work is complete and you will have access to them at any time in the future. Simply create your user account on [www.kern-lab.com](http://www.kern-lab.com) and you will never have to look for your certificates again.



## DAkkS Calibration of balances

Any balance will only give correct results if it is checked regularly, i.e. calibrated correctly and adjusted when required. A balance is only a reliable measuring and checking tool if it is calibrated and this calibration is documented. The issued DAkkS calibration certificates are proof of the metrological traceability to national and international standards, as required by the DIN EN ISO 9000 and DIN EN ISO/IEC 17025 standards, amongst others. KERN recommends a recalibration period of one year. The standard does not give a defined recalibration period. KERN recommends that, with intensive (daily) use, you to recalibrate your balance every 6 months and at normal (weekly) use, every 12 months.

### THE ADVANTAGES OF USING THE KERN ON-SITE CALIBRATION:

- + **Calibration on-site** at your premises in the field of use
- + **No risk of damage** during transportation
- + **Low downtime**
- + **Cross-brand servicing**, basic inspection and adjustment by a specialist
- + You tell us **when you would like us to come**
- + **Device training** for qualified users



#### a) KERN on-site calibration (we visit you)

In Germany, KERN has a close-knit network of KERN DAkkS calibration laboratory employees, who can carry out on-site calibration of balances up to 50 tonnes.

This on-site testing service is metrologically recommended, as your balance is in its field of use and can be calibrated without any possible transportation problems.

Lower downtime and personal contact with our expert are the major benefits of this service.

Preparatory maintenance work by agreement. Prices for on-site calibration on request.

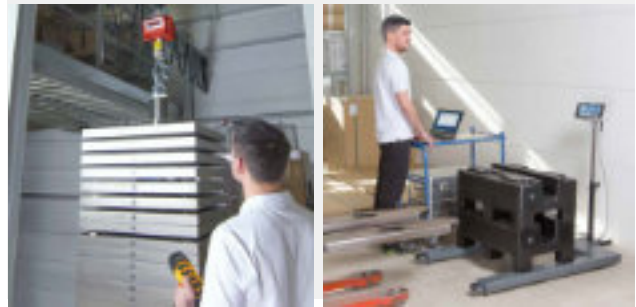
You tell us when you would like us to come, giving us details of the balances to be tested. Our on-site DAkkS calibration team will then get in touch with you immediately and will discuss the process with you at your premises – it's straight forward and professional.

**This KERN calibration service is also independent of the brand.**

Please feel free to contact us at Phone +49 7433 9933-400 or E-Mail: [testservices-onsite@kern-sohn.com](mailto:testservices-onsite@kern-sohn.com)

### THE ADVANTAGES OF USING THE KERN IN-HOUSE CALIBRATION:

- + **Short calibration time:** Test time in the laboratory is only four working days
- + **Competence:** Calibration laboratory, which complies with the highest standards in the area of metrology
- + **Independent management** of the recalibration calendar for your individual measuring instrument is possible
- + **Cross-brand service:** Measuring devices from any manufacturer can be calibrated independently
- + **Repair:** Any necessary repairs can be carried out immediately, if you wish



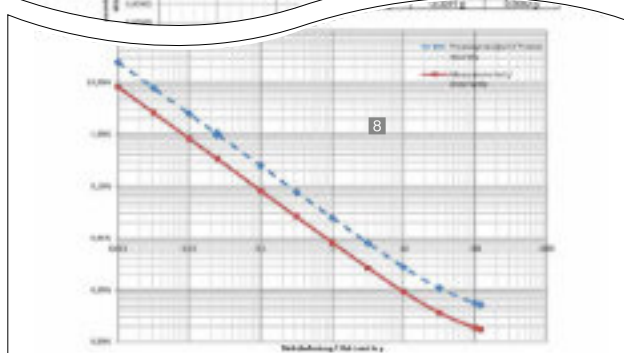
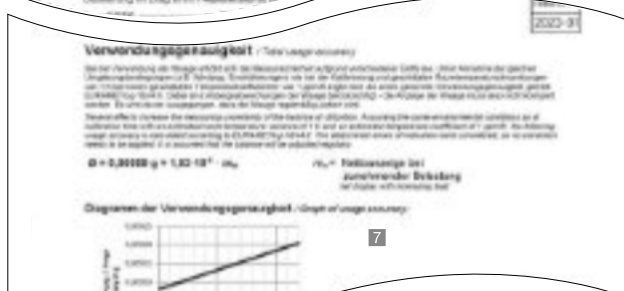
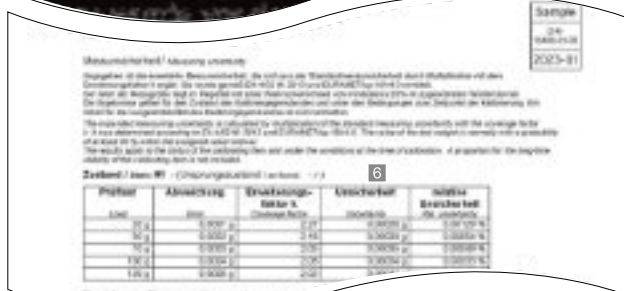
#### b) Calibration at the KERN factory (you send your balance to us)

Recommended for new devices and for balances which can be affordably transported, as then there is no need for us to travel to carry out the calibration on-site. Repairs can be carried out at the same time, quickly and in full.

##### The process would be as follows:

- Day 1: Send your balance to the KERN calibration laboratory in Balingen.
- Day 2 to 3: Evaluation and calibration of your balance by our specialists.
- Day 4: After positive validation, your balance is returned.

Please feel free to contact us at Phone +49 7433 9933-400 or E-Mail: [recalibration-balances@kern-sohn.com](mailto:recalibration-balances@kern-sohn.com)



DAkkScalibration certificate for balances (extract)

To get reliable weighing results you need to have calibrated balances.  
KERN offers you an extensive calibration service for your balances  
– You have the choice:

### Recalibration

- The recalibration schedule depends on the frequency of use, the conditions of use and the safety requirements.
- We would recommend that you recalibrate your balances every 6 months if they are used intensively, and every 12 months with normal use.
- The KERN calibration service is independent of the brand.



Initial calibration and recalibration of balance at the KERN factory

KERN

Price  
excl. of VAT  
ex works  
€

| Weighing capacity   |  |  |
|---|--|--|
| <b>Analytical balances</b>  |  |  |
| [Max] ≤ 5 kg  | 963-101  | 182,-                                      |
| [Max] > 5 kg  | 963-102  | 230,-                                      |
| <b>Precision balances/Industrial scales</b>   |  |  |
| [Max] ≤ 5 kg  | 963-127  | 93,-                                       |
| [Max] > 5 kg – 50 kg  | 963-128  | 112,-                                      |
| [Max] > 50 kg – 350 kg  | 963-129  | 139,-                                      |
| [Max] > 350 kg – 1500 kg  | 963-130  | 196,-                                      |
| [Max] > 1500 kg – 2900 kg <sup>1)</sup>   | 963-131  | 260,-                                      |
| [Max] > 2900 kg – 6000 kg <sup>1)</sup>   | 963-132  | 520,-                                      |
| [Max] > 6000 kg – 12000 kg <sup>1)</sup>  | 963-133  | 590,-                                      |
| <b>Hanging scales/Crane scales</b>  |  |  |
| [Max] ≤ 5 kg  | 963-127H   | 93,-                                       |
| [Max] > 5 kg – 50 kg  | 963-128H   | 112,-                                      |
| [Max] > 50 kg – 350 kg  | 963-129H   | 131,-                                      |
| [Max] > 350 kg – 1500 kg  | 963-130H   | 235,-                                      |
| [Max] > 1500 kg – 2900 kg   | 963-131H   | 355,-                                      |
| [Max] > 2900 kg – 6000 kg   | 963-132H   | 590,-                                      |
| [Max] > 6000 kg – 12000 kg <sup>3)</sup>  | 963-133H   | 830,-                                      |
| <b>Preparation for recalibration</b><br>(cleaning, adjustment, function test)   | 969-003R   | 24,-                                       |
| <b>Additional services</b>  |  |  |
| <b>Minimum weight of sample (for details see page 215)</b>  | 969-103  | 10,-                                       |
| Additional measurement points (as part of the) weighing test  | 963-140  | 5,20/<br>measurement<br>point              |
| Additional measurement points (as part of the)<br>repeatability testing   | 963-140  | 5,20/<br>each further<br>measurement point |
| DAkkS Express service with delivery time 48 hours<br>(only on initial purchase, details see p. 210)                               | 962-116  | 52,-/<br>scale                             |
| Express shipping: Express supplement for guaranteed delivery<br>on the next working day (if ready for shipment before 12:00 noon) | 962-115<br>in GER only<br>(other countries on request) | 21,-/<br>parcel                            |

<sup>1)</sup> Floor scales & axle load scales only (Price per weighing panel). Please ask for further details.

<sup>2)</sup> On request

<sup>3)</sup> Processing time 4 working days

<sup>4)</sup> Processing time 15 working days

- Official document
- Item to be calibrated
- Traceability, see page 225

- Identification/Applicant
- Metrological component
- Uncertainty of measurement, see page 225

- Application accuracy, see page 223
- Minimum weight of sample  
(additional price)

## Minimum weight of sample (in use)

**What is the lightest item you can weigh on your balance, while still achieving accurate and reliable weighing results? What exactly is the limit?**

The KERN minimum sample weight protocol accounts for the established minimum sample weight of your balance and its location of installation and use with the relative measuring uncertainty. With various safety coefficients and required weighing accuracy (process accuracy), depending on standard or quality-related requirements on the balance being used.

The higher the selected safety coefficient, the higher the safety when using the balance in a particular process. Typical perturbations when using the balance e.g. small fluctuations in temperature are taken into account. In easily predictable conditions in a professional environment of use, KERN recommends a safety coefficient of 3. For critical processes, a correspondingly higher factor should be selected. The minimum sample weight protocol contains a diagram as well as a table, from which you can ascertain the minimum sample weight for your balance, depending on the process.

## Adjustment at the location of installation

### Why?

Adjustment at the location of installation is necessary, as the measuring results of balances depend on the local gravitational force (gravitational acceleration) and therefore depend on the location of use. KERN can carry this out just before shipping at the factor, individually to suit the location of installation.

### What are the advantages of carrying out adjustment at the location of installation?

- The balance gives reliable measurement results at the location of installation.
- No time-consuming on-site adjustment necessary.
- You do not need a Service Engineer or any additional weights.
- The balance is ready for immediate use.

### Pricing table for adjustment at the location of installation

| Weighing capacity       | KERN    | Price<br>excl. of VAT<br>ex works<br>€ |
|-------------------------|---------|--|
| [Max] ≤ 5 kg            | 961-247 | 39,-                                   |
| [Max] > 5 – 50 kg       | 961-248 | 48,-                                   |
| [Max] > 50 – 350 kg     | 961-249 | 56,-                                   |
| [Max] > 350 – 1500 kg   | 961-250 | 90,-                                   |
| [Max] > 1500 – 2900 kg  | 961-251 | 119,-                                  |
| [Max] > 2900 – 6000 kg  | 961-252 | 240,-                                  |
| [Max] > 6000 – 12000 kg | 961-253 | 270,-                                  |

For adjustment to the location of installation you need the value for gravitational acceleration at the location of installation, which KERN can calculate using the point of use. The procedure is suitable for balances with a resolution of <60,000 d. For higher resolutions we recommend a balance with an internal adjusting weight or adjustment with a calibrated adjusting weight at the location of installation.

## Certificate of conformity

With a certificate of conformity you get a statement about whether the balance meets your defined requirements.

In conjunction with a DAkkS calibration certificate it serves as documented proof that the balance fulfils the required process demands. When doing this the process owner for the balance can select from different temperature specifications – depending on its individual requirements:

| Conformity evaluation on the basis of the:             | KERN  | Price<br>excl. of VAT<br>ex works<br>€ |
|--|---|--|
| Usage accuracy*  | relative<br>absolute  | 969-511<br>969-512                     |
| Calibration results*                                   | relative<br>absolute  | 969-513<br>969-514                     |
| Measurements as manufacturer or customer specification | Foreign device<br>Customer specifications<br>KERN devices   | 969-515<br>969-516<br>969-517          |
| relative = %/ absolute = g                             | *as attachment to the DAkkS calibration certificate (Details see <a href="http://www.kern-lab.com">www.kern-lab.com</a> ) |  |

### Example for absolute customer tolerance (absolute) (Item no. 969-511):

| No. | Tare | Load   | Display   | Deviation | Uncertainty | Customer tolerance | Conformity <sup>1)</sup> |
|-----|------|--------|-----------|-----------|-------------|--------------------|--------------------------|
| 1   | 0 g  | 500 g  | 500,00 g  | 0,00 g    | ± 0,013 g   | ± 0,05 g           |                          |
| 2   | 0 g  | 1000 g | 1000,00 g | 0,00 g    | ± 0,015 g   | ± 0,05 g           |                          |
| 3   | 0 g  | 1500 g | 1500,01 g | 0,01 g    | ± 0,017 g   | ± 0,05 g           |                          |
| 4   | 0 g  | 2000 g | 2000,01 g | 0,01 g    | ± 0,020 g   | ± 0,10 g           |                          |
| 5   | 0 g  | 3000 g | 3000,02 g | 0,02 g    | ± 0,022 g   | ± 0,10 g           |                          |

1) Evaluation criteria:  $||[\text{Deviation}]|| + [\text{extended measuring uncertainty}] \leq [\text{tolerance}]$

## Documented quality of your balances in the log book

Consistently high product quality requires the use of measuring and test equipment that provides comprehensible, consistent and reproducible results. Hence, quality management systems require that measuring and test equipment produces a detailed traceable description and documentation of calibration results and conformity statements. Work not documented is work not done.

Equipment qualification is documentary evidence that a equipment is suitable for the intended purpose and is working faultlessly. A balance log book is used to record all activities and results required for the qualification and monitoring of balances during routine operation. This includes the installation and commissioning of the balances, routine tests, maintenance as well as the recording of special events (failures, repairs, change of location).

The structure of the balance log book is based on the qualification process of the balance. The requirements for the qualification system such as DIN EN ISO 9001, DIN EN ISO/IEC 17025, GLP/GMP, VDA must be taken into account. The log book supports the user in his/her daily work with the balance and is meant to serve as necessary evidence during inspections and audits. The responsibility for maintaining the log book and its appropriate use is to be borne by the user.

### Our proposal: Count on our support!

KERN offers this qualification concept throughout. Our validation services are carried out on the spot by technicians of our calibration laboratory and comprise among other things: installation, measurement test inclusive DAkkS calibration certificate as well as records in your qualification log book.

We give you advice already when selecting a new device, for example KERN ADJ, ALS/ALJ, ABS/ABJ, ACJ, ABT, ABP, PLS/PLJ, PNS/PNJ, EG-N, PBS/PBJ, PES/PEJ, about the options of device qualification, as required and will be happy to set up an appointment for qualification at the place of installation. We offer individual calibration and maintenance agreements for the periodically required requalification.

Further information can be found at [www.kern-lab.com](http://www.kern-lab.com)



## Important elements of equipment qualification:



### Design qualification (DQ)

With the design qualification, all requirements on which you as a user depend are defined. The purchase decision is made on the basis of the design specifications and the available devices. Careful selection in the DQ can prevent subsequent deficiencies.



### Installation qualification (IQ)

All steps to be taken for the installation and commissioning of the equipment are described in detail in the installation qualification. These include among others:

- checking for completeness of delivery and assurance that the delivered equipment meets the required specifications
- a description of the ambient conditions at the place of installation
- proper installation and assurance that the equipment is ready for operation after installation
- documentation of equipment configuration and equipment settings
- Recording and installation of connected peripherals units



### Function qualification (OQ)

The operational qualification describes the metrological test performed for the balance at the place of installation. In the course of this all parameters that define the efficiency of a measurement will be checked. Functional qualification is carried out with the help of a standard operating procedure (SOP) and recorded in a calibration certificate. The OQ must be carried out by trained staff with the help of qualified aids (such as certified weights that are traceable to an approved standard). Briefing / training of users must be assured and recorded in the OQ.



### Performance qualification (PQ)

The PQ represents documented evidence that the balance or weighing system functions in the selected application as intended. This will be assured by a qualification test of the equipment under real conditions with respect to its surroundings and the problem definition (such as traceable data transmission). If the balance or weighing system is "merely" to be used for weighing it will not be necessary to carry out a PQ as the ability to function has already been proven during the metrological test (OQ).



### Maintenance qualification (MQ)

The periodical maintenance, cleaning work and complete metrological test of the balance/weighing system is documented in the MQ by a trained authorised engineer. The results are documented on a DAkkS calibration certificate. Maintenance is carried out with the help of a maintenance schedule.

**KERN & SOHN GmbH**  
KERN CALIBRATION  
Authorized Calibration Laboratory since 1994.  
Authorized calibration laboratory since 1994.

Member of the  
**Deutscher Kalibrierdienst** **DKD** **ILAC** **EA**

Sample: 2023-01/1

Kalibrierzeichen: 2023-01/1

Kalibrierzeichen: 2023-01/1

Bestandteil: Overhaul, 1 kg

Hersteller: KERN & SOHN GmbH

Typ: 1 kg

Fabrikations-Nr.: 123456789

Auftraggeber: Musterfirma GmbH

Auftragsnummer: 2023-01/1

Ort der Kalibrierung: Musterfirma GmbH

Umgebungsbedingungen: Temperatur 22.0 °C, Luftfeuchtigkeit 34.1 %

Messergebnisse:

| Bestandteil | Bestandteil | Bestandteil | Bestandteil | Bestandteil |
|-------------|-------------|-------------|-------------|-------------|
| 1 kg        | 1 kg        | 1 kg        | 1 kg        | 1 kg        |

DAkS Calibration certificate for test weights (extract).

## Traceable KERNtest weights –

## Calibration of test weights

Calibrated measuring equipment requires calibrated checking equipment. For balances, these are calibrated test weights, also called “standard weights”.

## KERNwill calibrate your test weights

- In all classes with permissible error limits E1–M3 according to OIML R111:2004 (for tolerance tables, see page 180), in sizes 1 mg to 2500 kg.
- With free nominal value
- Newton (N)
- Independent of design (special designs)

## The advantages of using the KERNin-house calibration

You send your test weights to us.

- Excellent price performance ratio
- The quickest processing time
  - DAkS standard service: 4 working days
  - DAkS express service: 48 hrs (new weights)
- The most modern calibration methods with robot controlled comparators allow the most accurate calibration results and fastest throughput time
- KERNDakS calibration certificates are internationally recognised
- A calibration service which is independent of the brand
- KERN also reconditions existing customer weights (e.g. cleaning or readjustment)
- On request, we can also provide a pick-up and collection service with our parcel service

## The advantages of using the KERNon-site calibration

We visit you.

We would be pleased to visit you within Germany and carry out the calibration of your reference standards to OIML classes M1–M3, 10 kg–2500 kg with permissible error limits, using our mobile MACOS system. Minimized downtime of your checking equipment and direct contact with our expert are the major benefits of this service. Price on request.

## Recalibration

- The recalibration schedule depends on the frequency of use, the conditions of use and the safety requirements
- In terms of standardisation, no particular recalibration interval is specified
- We would recommend that you recalibrate your test weights every six months if they are used intensively, and every 12 months with normal use
- We would be pleased to monitor your recalibration schedule

## DAkS calibration certificate for test weights (extract).

For more details on our calibration service and other useful information, please see the internet at [www.kern-lab.com](http://www.kern-lab.com)

- 1 Official document
- 2 Item to be calibrated
- 3 Traceability, see page 225
- 4 Identification/Applicant
- 5 Environmental conditions
- 6 Metrological component
- 7 Conventional mass
- 8 Uncertainty of measurement, see page 225

# Recalibration price of test weights (DAkkScalibration)

| Class acc.         | → E1<br>with volume determination | E1 without volume<br>determination  | E2       | F1/F2<br>* F2 only                  | M1/M2/M3 |                                     |           |                                     |          |                                     |
|--------------------|-----------------------------------|-------------------------------------|----------|-------------------------------------|----------|-------------------------------------|-----------|-------------------------------------|----------|-------------------------------------|
| Nominal value<br>↓ | KERN                              | Price €<br>excl. of VAT<br>ex works | KERN     | Price €<br>excl. of VAT<br>ex works | KERN     | Price €<br>excl. of VAT<br>ex works | KERN      | Price €<br>excl. of VAT<br>ex works | KERN     | Price €<br>excl. of VAT<br>ex works |
| 1 mg               | –                                 | –                                   | 962-251R | 72,-                                | 962-351R | 32,-                                | 962-451R  | 21,-                                | 962-651R | 17,-                                |
| 2 mg               | –                                 | –                                   | 962-252R | 72,-                                | 962-352R | 32,-                                | 962-452R  | 21,-                                | 962-652R | 17,-                                |
| 5 mg               | –                                 | –                                   | 962-253R | 72,-                                | 962-353R | 32,-                                | 962-453R  | 21,-                                | 962-653R | 17,-                                |
| 10 mg              | –                                 | –                                   | 962-254R | 72,-                                | 962-354R | 32,-                                | 962-454R  | 21,-                                | 962-654R | 17,-                                |
| 20 mg              | –                                 | –                                   | 962-255R | 72,-                                | 962-355R | 32,-                                | 962-455R  | 21,-                                | 962-655R | 17,-                                |
| 50 mg              | –                                 | –                                   | 962-256R | 72,-                                | 962-356R | 32,-                                | 962-456R  | 21,-                                | 962-656R | 17,-                                |
| 100 mg             | –                                 | –                                   | 962-257R | 72,-                                | 962-357R | 32,-                                | 962-457R  | 21,-                                | 962-657R | 17,-                                |
| 200 mg             | –                                 | –                                   | 962-258R | 72,-                                | 962-358R | 32,-                                | 962-458R  | 21,-                                | 962-658R | 17,-                                |
| 500 mg             | –                                 | –                                   | 962-259R | 72,-                                | 962-359R | 32,-                                | 962-459R  | 21,-                                | 962-659R | 17,-                                |
| 1 g                | 963-231                           | 235,-                               | 962-231R | 72,-                                | 962-331R | 32,-                                | 962-431R  | 21,-                                | 962-631R | 17,-                                |
| 2 g                | 963-232                           | 235,-                               | 962-232R | 72,-                                | 962-332R | 32,-                                | 962-432R  | 21,-                                | 962-632R | 17,-                                |
| 5 g                | 963-233                           | 235,-                               | 962-233R | 72,-                                | 962-333R | 32,-                                | 962-433R  | 21,-                                | 962-633R | 17,-                                |
| 10 g               | 963-234                           | 235,-                               | 962-234R | 72,-                                | 962-334R | 32,-                                | 962-434R  | 21,-                                | 962-634R | 17,-                                |
| 20 g               | 963-235                           | 235,-                               | 962-235R | 72,-                                | 962-335R | 32,-                                | 962-435R  | 21,-                                | 962-635R | 17,-                                |
| 50 g               | 963-236                           | 235,-                               | 962-236R | 72,-                                | 962-336R | 32,-                                | 962-436R  | 21,-                                | 962-636R | 17,-                                |
| 100 g              | 963-237                           | 235,-                               | 962-237R | 72,-                                | 962-337R | 40,-                                | 962-437R  | 23,-                                | 962-637R | 19,-                                |
| 200 g              | 963-238                           | 235,-                               | 962-238R | 72,-                                | 962-338R | 40,-                                | 962-438R  | 23,-                                | 962-638R | 19,-                                |
| 500 g              | 963-239                           | 235,-                               | 962-239R | 72,-                                | 962-339R | 40,-                                | 962-439R  | 23,-                                | 962-639R | 19,-                                |
| 1 kg               | 963-241                           | 235,-                               | 962-241R | 72,-                                | 962-341R | 40,-                                | 962-441R  | 23,-                                | 962-641R | 19,-                                |
| 2 kg               | 963-242                           | 520,-                               | 962-242R | 89,-                                | 962-342R | 49,-                                | 962-442R  | 29,-                                | 962-642R | 20,-                                |
| 5 kg               | 963-243                           | 520,-                               | 962-243R | 89,-                                | 962-343R | 49,-                                | 962-443R  | 29,-                                | 962-643R | 20,-                                |
| 10 kg              | 963-244                           | 520,-                               | 962-244R | 89,-                                | 962-344R | 49,-                                | 962-444R  | 29,-                                | 962-644R | 20,-                                |
| 20 kg              | 963-245                           | 1280,-                              | 962-245R | 720,-                               | 962-345R | 64,-                                | 962-445R  | 33,-                                | 962-645R | 25,-                                |
| 50 kg              | 963-246                           | 1500,-                              | 962-246R | 800,-                               | 962-346R | 74,-                                | 962-446R  | 45,-                                | 962-646R | 27,-                                |
| 100 kg             | –                                 | –                                   | –        | –                                   | –        | –                                   | 962-591R* | 134,-                               | 962-691R | 72,-                                |
| 200 kg             | –                                 | –                                   | –        | –                                   | –        | –                                   | 962-592R* | 134,-                               | 962-692R | 72,-                                |
| 500 kg             | –                                 | –                                   | –        | –                                   | –        | –                                   | 962-593R* | 134,-                               | 962-693R | 72,-                                |
| 1000 kg            | –                                 | –                                   | –        | –                                   | –        | –                                   | –         | –                                   | 962-694R | 158,-                               |
| 2000 kg            | –                                 | –                                   | –        | –                                   | –        | –                                   | –         | –                                   | 962-695R | 290,-                               |
| 1 mg–500 mg        | –                                 | –                                   | 962-250R | 465,-                               | 962-350R | 220,-                               | 962-450R  | 116,-                               | 962-650R | 72,-                                |
| 1 mg–50 g          | 963-201                           | 1330,-                              | 962-201R | 770,-                               | 962-301R | 360,-                               | 962-401R  | 193,-                               | 962-601R | 123,-                               |
| 1 mg–100 g         | 963-202                           | 1450,-                              | 962-202R | 790,-                               | 962-302R | 395,-                               | 962-402R  | 205,-                               | 962-602R | 129,-                               |
| 1 mg–200 g         | 963-203                           | 1670,-                              | 962-203R | 870,-                               | 962-303R | 455,-                               | 962-403R  | 230,-                               | 962-603R | 145,-                               |
| 1 mg–500 g         | 963-204                           | 1770,-                              | 962-204R | 910,-                               | 962-304R | 485,-                               | 962-404R  | 240,-                               | 962-604R | 151,-                               |
| 1 mg–1 kg          | 963-205                           | 1890,-                              | 962-205R | 980,-                               | 962-305R | 520,-                               | 962-405R  | 250,-                               | 962-605R | 159,-                               |
| 1 mg–2 kg          | 963-206                           | 2460,-                              | 962-206R | 1040,-                              | 962-306R | 570,-                               | 962-406R  | 290,-                               | 962-606R | 175,-                               |
| 1 mg–5 kg          | 963-207                           | 2750,-                              | 962-207R | 1080,-                              | 962-307R | 610,-                               | 962-407R  | 305,-                               | 962-607R | 185,-                               |
| 1 mg–10 kg         | 963-208                           | 3130,-                              | 962-208R | 1120,-                              | 962-308R | 650,-                               | 962-408R  | 330,-                               | 962-608R | 193,-                               |
| 1 g–50 g           | 963-215                           | 960,-                               | 962-215R | 340,-                               | 962-315R | 149,-                               | 962-415R  | 78,-                                | 962-615R | 48,-                                |
| 1 g–100 g          | 963-216                           | 1050,-                              | 962-216R | 370,-                               | 962-316R | 178,-                               | 962-416R  | 89,-                                | 962-616R | 57,-                                |
| 1 g–200 g          | 963-217                           | 1280,-                              | 962-217R | 445,-                               | 962-317R | 235,-                               | 962-417R  | 113,-                               | 962-617R | 70,-                                |
| 1 g–500 g          | 963-218                           | 1390,-                              | 962-218R | 490,-                               | 962-318R | 270,-                               | 962-418R  | 126,-                               | 962-618R | 79,-                                |
| 1 g–1 kg           | 963-219                           | 1520,-                              | 962-219R | 520,-                               | 962-319R | 300,-                               | 962-419R  | 138,-                               | 962-619R | 85,-                                |
| 1 g–2 kg           | 963-220                           | 2130,-                              | 962-220R | 600,-                               | 962-320R | 370,-                               | 962-420R  | 174,-                               | 962-620R | 103,-                               |
| 1 g–5 kg           | 963-221                           | 2500,-                              | 962-221R | 620,-                               | 962-321R | 415,-                               | 962-421R  | 192,-                               | 962-621R | 111,-                               |
| 1 g–10 kg          | 963-222                           | 2910,-                              | 962-222R | 670,-                               | 962-322R | 450,-                               | 962-422R  | 210,-                               | 962-622R | 120,-                               |

## Additional costs for preparation, overhaul and adjustment before the calibration

### KERN

Price  
excl. of VAT  
ex works  
€

#### Preparation of weights (e.g. cleaning, etc.)

|               |          |      |
|---------------|----------|------|
| Single weight | 969-001R | 5,-  |
| Weight set    | 969-002R | 20,- |

#### Subsequent services are carried out after confirmation

|   |          |                |
|---|----------|----------------|
| Continued overhaul of weights<br>(e.g. wet-cleaning, markings, repair, special packaging, adjustment E1 (DAkkS only), E2 ...) | 969-005R | T & M<br>basis |
|---|----------|----------------|

|  |          |      |
|--|----------|------|
| Adjustment, per weight<br>only available for weights with adjustment chamber (F1–M3) | 969-010R | 15,- |
|--|----------|------|

#### Second calibration after adjustment or substitution, per weight

|                                     |          |       |
|-------------------------------------|----------|-------|
| Class E1                            | 969-210R | 63,-  |
| Class E1 incl. volume determination | 969-211R | 230,- |
| Class E2                            | 969-310R | 30,-  |
| Class F1/F2                         | 969-410R | 20,-  |
| Class M1–M3                         | 969-610R | 16,-  |

|  |            |      |
|--|------------|------|
| Testing of magnetic properties according to OIML R111:2004, per weight | 961-115(R) | 15,- |
|--|------------|------|

|   |   |     |
|---|---|-----|
| Calibration of NON-OIML test weights, additional price per weight | — | 8,- |
|---|---|-----|

## KERN DAkkS Express Service

**DAkkS standard service** Class E2–M3 4 working days

**DAkkS standard service** Class E1,  
1 mg–500 mg, and recalibration 10 working days  
1 g–10 kg with a known volume

Class E1, ≥ 1 g,  
incl. volume determination (new weights) 15 working days



**DAkkS Express service in 48 hours**  
except for class E1

- Urgent order is received at KERN by 12:00 noon at the latest
- Ready for shipping at KERN within two working days, at 12:00 noon
- Return by standard parcel service or express shipping (Costs and processing time on request)
- Additional cost for DAkkS Express Service, for each KERN test weight KERN 962-115 € 21,-
- For Express shipping, see page 214

## Verification prices for test weights and (crane) scales

| Class acc.<br>OIML R111:2004 | → E2 with verification<br>certificate | F1 with verification<br>certificate    | M1 with verification<br>certificate |  |         |  |
|------------------------------|---------------------------------------|--|-------------------------------------|--|---------|--|
| Nominal value<br>↓           | KERN                                  | Price<br>excl. of VAT<br>ex works<br>€ | KERN                                | Price<br>excl. of VAT<br>ex works<br>€ | KERN    | Price<br>excl. of VAT<br>ex works<br>€ |
| 1 mg                         | 952-351                               | 51,-                                   | 952-451                             | 44,-                                   | 952-651 | 30,-                                   |
| 2 mg                         | 952-352                               | 51,-                                   | 952-452                             | 44,-                                   | 952-652 | 30,-                                   |
| 5 mg                         | 952-353                               | 51,-                                   | 952-453                             | 44,-                                   | 952-653 | 30,-                                   |
| 10 mg                        | 952-354                               | 51,-                                   | 952-454                             | 44,-                                   | 952-654 | 30,-                                   |
| 20 mg                        | 952-355                               | 51,-                                   | 952-455                             | 44,-                                   | 952-655 | 30,-                                   |
| 50 mg                        | 952-356                               | 51,-                                   | 952-456                             | 44,-                                   | 952-656 | 30,-                                   |
| 100 mg                       | 952-357                               | 51,-                                   | 952-457                             | 44,-                                   | 952-657 | 30,-                                   |
| 200 mg                       | 952-358                               | 51,-                                   | 952-458                             | 44,-                                   | 952-658 | 30,-                                   |
| 500 mg                       | 952-359                               | 51,-                                   | 952-459                             | 44,-                                   | 952-659 | 30,-                                   |
| 1 g                          | 952-331                               | 51,-                                   | 952-431                             | 44,-                                   | 952-631 | 30,-                                   |
| 2 g                          | 952-332                               | 51,-                                   | 952-432                             | 44,-                                   | 952-632 | 30,-                                   |
| 5 g                          | 952-333                               | 51,-                                   | 952-433                             | 44,-                                   | 952-633 | 30,-                                   |
| 10 g                         | 952-334                               | 51,-                                   | 952-434                             | 44,-                                   | 952-634 | 30,-                                   |
| 20 g                         | 952-335                               | 51,-                                   | 952-435                             | 44,-                                   | 952-635 | 30,-                                   |
| 50 g                         | 952-336                               | 51,-                                   | 952-436                             | 44,-                                   | 952-636 | 30,-                                   |
| 100 g                        | 952-337                               | 57,-                                   | 952-437                             | 44,-                                   | 952-637 | 30,-                                   |
| 200 g                        | 952-338                               | 57,-                                   | 952-438                             | 46,-                                   | 952-638 | 30,-                                   |
| 500 g                        | 952-339                               | 57,-                                   | 952-439                             | 46,-                                   | 952-639 | 30,-                                   |
| 1 kg                         | 952-341                               | 57,-                                   | 952-441                             | 46,-                                   | 952-641 | 30,-                                   |
| 2 kg                         | 952-342                               | 65,-                                   | 952-442                             | 51,-                                   | 952-642 | 32,-                                   |
| 5 kg                         | 952-343                               | 65,-                                   | 952-443                             | 51,-                                   | 952-643 | 32,-                                   |
| 10 kg                        | 952-344                               | 65,-                                   | 952-444                             | 51,-                                   | 952-644 | 40,-                                   |
| 20 kg                        | 952-345                               | 75,-                                   | 952-445                             | 53,-                                   | 952-645 | 46,-                                   |
| 50 kg                        | -                                     | -                                      | 952-446                             | 64,-                                   | 952-646 | 48,-                                   |
| 1 mg–500 mg                  | 952-350                               | 255,-                                  | 952-450                             | 134,-                                  | 952-650 | 84,-                                   |
| 1 mg–50 g                    | 952-301                               | 420,-                                  | 952-401                             | 220,-                                  | 952-601 | 140,-                                  |
| 1 mg–100 g                   | 952-302                               | 455,-                                  | 952-402                             | 240,-                                  | 952-602 | 149,-                                  |
| 1 mg–200 g                   | 952-303                               | 510,-                                  | 952-403                             | 265,-                                  | 952-603 | 166,-                                  |
| 1 mg–500 g                   | 952-304                               | 550,-                                  | 952-404                             | 275,-                                  | 952-604 | 174,-                                  |
| 1 mg–1 kg                    | 952-305                               | 570,-                                  | 952-405                             | 290,-                                  | 952-605 | 183,-                                  |
| 1 mg–2 kg                    | 952-306                               | 660,-                                  | 952-406                             | 330,-                                  | 952-606 | 200,-                                  |
| 1 mg–5 kg                    | 952-307                               | 710,-                                  | 952-407                             | 355,-                                  | 952-607 | 215,-                                  |
| 1 mg–10 kg                   | 952-308                               | 750,-                                  | 952-408                             | 380,-                                  | 952-608 | 220,-                                  |
| 1 g–50 g                     | 952-315                               | 168,-                                  | 952-415                             | 97,-                                   | 952-615 | 64,-                                   |
| 1 g–100 g                    | 952-316                               | 200,-                                  | 952-416                             | 103,-                                  | 952-616 | 68,-                                   |
| 1 g–200 g                    | 952-317                               | 260,-                                  | 952-417                             | 131,-                                  | 952-617 | 81,-                                   |
| 1 g–500 g                    | 952-318                               | 300,-                                  | 952-418                             | 145,-                                  | 952-618 | 90,-                                   |
| 1 g–1 kg                     | 952-319                               | 325,-                                  | 952-419                             | 159,-                                  | 952-619 | 99,-                                   |
| 1 g–2 kg                     | 952-320                               | 405,-                                  | 952-420                             | 200,-                                  | 952-620 | 118,-                                  |
| 1 g–5 kg                     | 952-321                               | 450,-                                  | 952-421                             | 220,-                                  | 952-621 | 129,-                                  |
| 1 g–10 kg                    | 952-322                               | 495,-                                  | 952-422                             | 245,-                                  | 952-622 | 138,-                                  |

### KERN verification delivery time

Standard verification service  
Class E2–M1 6 working days

**Additional costs** KERN **Price**  
for preparation, overhaul  
and adjustment before the  
verification excl. of VAT  
ex works  
€

#### Preparation of weights (e.g. cleaning, etc.)

Single weight 969-008R 5,-

Weight set 969-009R 19,-

#### Subsequent services are carried out after confirmation

Continued overhaul  
of weights  
(e.g. wet-cleaning, markings,  
repair, special packaging,  
adjustment E2 ...) 969-005R **T & M  
basis**

Adjustment, per weight  
only available for weights  
with adjustment chamber  
(F1/F2–M1) 969-010R 15,-

#### Verification after adjustment or substitution, per weight

Class E2 969-310R 30,-

Class F1/F2 969-410R 20,-

Class M1 969-610R 16,-

### Verification prices for balances

| Accuracy class I (precision balances) <sup>1)</sup>     | Reverification | Price<br>excl. of VAT<br>ex works<br>€ |
|---|----------------|--|
| [Max] ≤ 5 kg <sup>1)</sup>                              | 950-101R       | 225,-                                  |
| [Max] > 5 kg <sup>1)</sup>                              | 950-102R       | 290,-                                  |
| Accuracy class II (precision balances) <sup>1)</sup>    |                |  |
| [Max] ≤ 5 kg <sup>1)</sup>                              | 950-116R       | 114,-                                  |
| [Max] > 5 kg–50 kg <sup>1)</sup>                        | 950-117R       | 139,-                                  |
| [Max] > 50 kg–350 kg <sup>1)</sup>                      | 950-118R       | 215,-                                  |
| Accuracy class III-IV <sup>1)</sup>                     |                |  |
| Bench scales and industrial scales (excl. crane scales) |                |  |
| [Max] ≤ 5 kg <sup>1)</sup>                              | 950-127R       | 109,-                                  |
| [Max] > 5 kg–50 kg <sup>1)</sup>                        | 950-128R       | 109,-                                  |
| [Max] > 50 kg–350 kg <sup>1)</sup>                      | 950-129R       | 175,-                                  |
| [Max] > 350 kg–1500 kg <sup>1)</sup>                    | 950-130R       | 255,-                                  |
| [Max] > 1500 kg–2900 kg <sup>1)</sup>                   | 950-131R       | 355,-                                  |
| [Max] > 2900 kg–6000 kg <sup>1)</sup>                   | 950-132R       | 550,-                                  |
| Crane scales  |                |  |
| [Max] > 50 kg–350 kg <sup>1)</sup>                      | 950-129HR      | 190,-                                  |
| [Max] > 350 kg–1500 kg <sup>1)</sup>                    | 950-130HR      | 315,-                                  |
| [Max] > 1500 kg–2900 kg <sup>1)</sup>                   | 950-131HR      | 455,-                                  |
| [Max] > 2900 kg–6000 kg <sup>1)</sup>                   | 950-132HR      | 690,-                                  |
| [Max] > 6000 kg–12000 kg <sup>1)</sup>                  | 950-133HR      | 1100,-                                 |

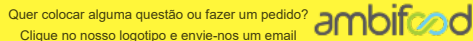
<sup>1)</sup> Processing time 4 working days, <sup>2)</sup> Processing time 15 working days, <sup>12)</sup> Preparation of reverification of balances, 969-006R, € 24,-

From the transducer to the full measuring chain, we are happy to take care of traceable calibration of your test equipment for you. Our accreditation includes the calibration of tensile and pressure force up to 5 kN according to the standards DIN EN ISO 376 and DKD-R3-3, each with the Newton (N) display unit for a complete measuring chain (situation A) or voltage ratio/transmission coefficient (mV/V, situation B).

|                           | ISO 376   | DKD-R 3-3   |
|---------------------------|---|---|
| Standardization           | ISO standard (internationally standardized)                     | Standard of the DKD (Germany)   |
| Measuring equipment       | Force transducers and complete measuring chains                 | Force transducers and complete measuring chains   |
| Area of application       | Specifically force gauges for the testing of testing equipment  | General force gauges  |
| Number of power stages    | 8   | 5   |
| Classification/Assessment | Classification in classes 00; 0,5; 1 and 2                      | None in standard  |
| Test sequences            | Fixed procedure   | Sequences A, B, C, D possible<br>Standard is sequence A<br>B, C and D are reduced sequences, relevant previous knowledge is necessary |
| Summary                   | Higher-quality calibration,<br>as 8 force levels are calibrated | High-quality calibration, reduced sequences<br>with less effort possible  |

Figure 1 consists of two parts. Part (A) shows a force transducer, which is a metal device with two circular ports on opposite sides, connected by a cable. Part (B) shows a data logger, a handheld electronic device with a screen displaying '0.00' and several buttons, also connected by a cable to the force transducer.

**Complete force gauge (N),**  
consisting of transducer,  
amplifier and display,  
display unit N



## Prices for DAkkS calibration of force gauges and force transducers

Situation A: Force transducer (voltage ratio, in mV/V)\*1,2

| ISO 376 (8 stages)                    |                 |                               | DKD-R3-3 (5 stages, sequence A) |                 |                               |
|---------------------------------------|-----------------|-------------------------------|---------------------------------|-----------------|-------------------------------|
| KERN                                  | Measuring range | Price € ex works excl. of VAT | KERN                            | Measuring range | Price € ex works excl. of VAT |
| <b>Tensile force:</b>                 |                 |                               |                                 |                 |                               |
| 963-161IV (R)                         | ≤ 500 N         | 225,-                         | 963-161V (R)                    | ≤ 500 N         | 210,-                         |
| 963-162IV (R)                         | ≤ 2 kN          | 270,-                         | 963-162V (R)                    | ≤ 2 kN          | 250,-                         |
| 963-163IV (R)                         | ≤ 5 kN          | 350,-                         | 963-163V (R)                    | ≤ 5 kN          | 325,-                         |
| <b>Compression force:</b>             |                 |                               |                                 |                 |                               |
| 963-261IV (R)                         | ≤ 500 N         | 225,-                         | 963-261V (R)                    | ≤ 500 N         | 210,-                         |
| 963-262IV (R)                         | ≤ 2 kN          | 270,-                         | 963-262V (R)                    | ≤ 2 kN          | 250,-                         |
| 963-263IV (R)                         | ≤ 5 kN          | 350,-                         | 963-263V (R)                    | ≤ 5 kN          | 325,-                         |
| <b>Tensile and Compression force:</b> |                 |                               |                                 |                 |                               |
| 963-361IV (R)                         | ≤ 500 N         | 375,-                         | 963-361V (R)                    | ≤ 500 N         | 350,-                         |
| 963-362IV (R)                         | ≤ 2 kN          | 450,-                         | 963-362V (R)                    | ≤ 2 kN          | 420,-                         |
| 963-363IV (R)                         | ≤ 5 kN          | 600,-                         | 963-363V (R)                    | ≤ 5 kN          | 550,-                         |

Situation B: Complete force gauge (in N)\*2

| ISO 376 (8 stages)                    |                 |                               | DKD-R3-3 (5 stages, sequence A) |                 |                               |
|---------------------------------------|-----------------|-------------------------------|---------------------------------|-----------------|-------------------------------|
| KERN                                  | Measuring range | Price € ex works excl. of VAT | KERN                            | Measuring range | Price € ex works excl. of VAT |
| <b>Tensile force:</b>                 |                 |                               |                                 |                 |                               |
| 963-161I (R)                          | ≤ 500 N         | 186,-                         | 963-161 (R)                     | ≤ 500 N         | 168,-                         |
| 963-162I (R)                          | ≤ 2 kN          | 225,-                         | 963-162 (R)                     | ≤ 2 kN          | 205,-                         |
| 963-163I (R)                          | ≤ 5 kN          | 310,-                         | 963-163 (R)                     | ≤ 5 kN          | 285,-                         |
| <b>Compression force:</b>             |                 |                               |                                 |                 |                               |
| 963-261I (R)                          | ≤ 500 N         | 186,-                         | 963-261 (R)                     | ≤ 500 N         | 168,-                         |
| 963-262I (R)                          | ≤ 2 kN          | 225,-                         | 963-262 (R)                     | ≤ 2 kN          | 205,-                         |
| 963-263I (R)                          | ≤ 5 kN          | 310,-                         | 963-263 (R)                     | ≤ 5 kN          | 285,-                         |
| <b>Tensile and Compression force:</b> |                 |                               |                                 |                 |                               |
| 963-361I (R)                          | ≤ 500 N         | 335,-                         | 963-361 (R)                     | ≤ 500 N         | 305,-                         |
| 963-362I (R)                          | ≤ 2 kN          | 415,-                         | 963-362 (R)                     | ≤ 2 kN          | 375,-                         |
| 963-363I (R)                          | ≤ 5 kN          | 560,-                         | 963-363 (R)                     | ≤ 5 kN          | 500,-                         |

## Factory calibration for force

Situation A: Force transducer (voltage ratio, in mV/V)\*1,2

Situation B: Complete force gauge (in N)\*2

| KERN                                  | Measuring range | Price € ex works excl. of VAT | KERN        | Measuring range | Price € ex works excl. of VAT |
|---------------------------------------|-----------------|-------------------------------|-------------|-----------------|-------------------------------|
| <b>Tensile force:</b>                 |                 |                               |             |                 |                               |
| 961-161V (R)                          | ≤ 500 N         | 210,-                         | 961-161 (R) | ≤ 500 N         | 168,-                         |
| 961-162V (R)                          | ≤ 2 kN          | 250,-                         | 961-162 (R) | ≤ 2 kN          | 205,-                         |
| 961-163V (R)                          | ≤ 5 kN          | 325,-                         | 961-163 (R) | ≤ 5 kN          | 285,-                         |
| 961-164V (R)                          | ≤ 20 kN         | 415,-                         | 961-164 (R) | ≤ 20 kN         | 370,-                         |
| 961-165V (R)                          | ≤ 50 kN         | 415,-                         | 961-165 (R) | ≤ 50 kN         | 370,-                         |
| 961-166V (R)                          | ≤ 250 kN        | 445,-                         | 961-166 (R) | ≤ 120 kN        | 410,-                         |
| <b>Compression force:</b>             |                 |                               |             |                 |                               |
| 961-261V (R)                          | ≤ 500 N         | 210,-                         | 961-261 (R) | ≤ 500 N         | 168,-                         |
| 961-262V (R)                          | ≤ 2 kN          | 250,-                         | 961-262 (R) | ≤ 2 kN          | 205,-                         |
| 961-263V (R)                          | ≤ 5 kN          | 325,-                         | 961-263 (R) | ≤ 5 kN          | 285,-                         |
| 961-264V (R)                          | ≤ 20 kN         | 415,-                         | 961-264 (R) | ≤ 20 kN         | 370,-                         |
| 961-265V (R)                          | ≤ 50 kN         | 415,-                         | 961-265 (R) | ≤ 50 kN         | 370,-                         |
| 961-266V (R)                          | ≤ 250 kN        | 445,-                         | 961-266 (R) | ≤ 120 kN        | 410,-                         |
| <b>Tensile and Compression force:</b> |                 |                               |             |                 |                               |
| 961-361V (R)                          | ≤ 500 N         | 350,-                         | 961-361 (R) | ≤ 500 N         | 305,-                         |
| 961-362V (R)                          | ≤ 2 kN          | 420,-                         | 961-362 (R) | ≤ 2 kN          | 375,-                         |
| 961-363V (R)                          | ≤ 5 kN          | 550,-                         | 961-363 (R) | ≤ 5 kN          | 500,-                         |
| 961-364V (R)                          | ≤ 20 kN         | 590,-                         | 961-364 (R) | ≤ 20 kN         | 550,-                         |
| 961-365V (R)                          | ≤ 50 kN         | 590,-                         | 961-365 (R) | ≤ 50 kN         | 550,-                         |
| 961-366V (R)                          | ≤ 250 kN        | 650,-                         | 961-366 (R) | ≤ 120 kN        | 600,-                         |

(R): Recalibration

For each force gauge without interface or from other manufacturers we charge a surcharge of € 10,- for the additional effort.

\*1 Compatibility with our amplifiers required

\*2 Installation in our measuring equipment required

## Factory calibration certificates

As DAkkS calibration certificates cannot be offered for all measuring devices or measurement sizes, or where it is not customary, we then offer factory calibration certificates. These calibration certificates meet international standards and are particularly suitable as proof of exacting calibration in the monitoring of your checking equipment, for example:

- Mechanical balances (spring balances, etc.)
- Force-measuring devices up to 250 kN (see also page 221)
- Measuring devices for layer thickness 0 µm – 2000 µm
- Hardness testing devices in accordance with Leeb tests
- Ultrasonic material thickness testing device 25 mm - 300 mm

**We carry out calibrations independent of brand.** In order to avoid any unnecessary delays when processing your order, please send us the technical documents and necessary accessories with the checking device. Calibration time 4 working days.

**For up-to-date information on test services for further measuring variables please see p. 221 or visit our website [www.kern-lab.com](http://www.kern-lab.com)**

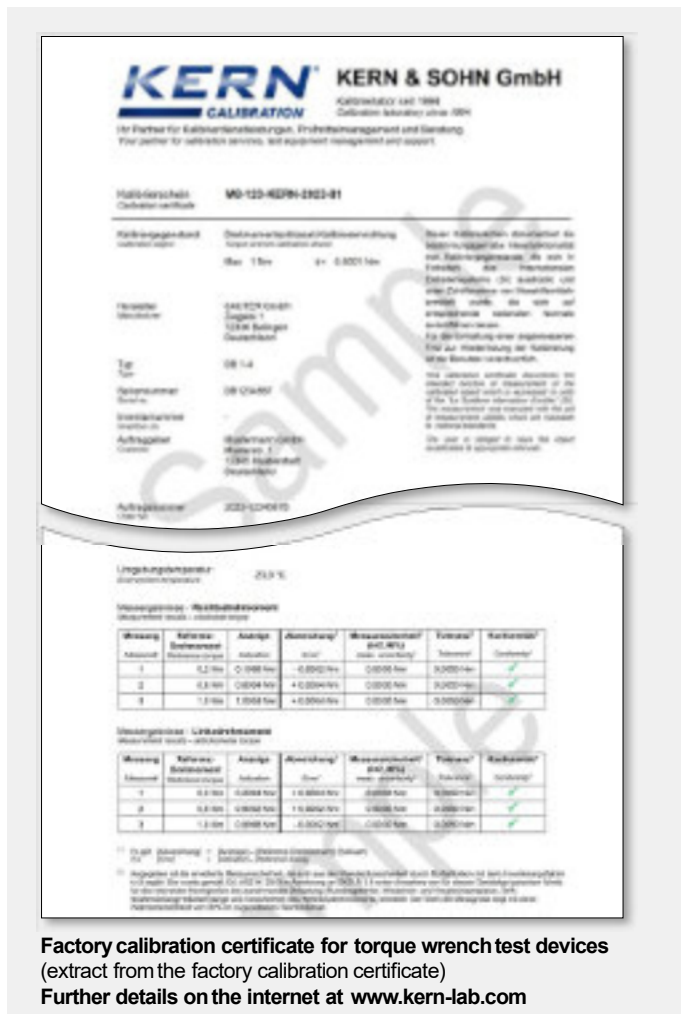
| KERN                       | Measuring device                               | Measuring range                                | Price excl. of VAT ex works € |
|----------------------------|--|--|-------------------------------|
| <b>Factory calibration</b> |  |  |                               |
| 961-110                    | Coating thickness                              | ≤ 2000 µm F or N                               | 150,-                         |
| 961-112                    | Coating thickness                              | ≤ 2000 µm FN                                   | 210,-                         |
| 961-113                    | Wall thickness (ultra sound)                   | ≤ 300 mm (in stainless steel)                  | 150,-                         |
| 961-114                    | Wall thickness (Test blocks)                   | ≤ 300 mm                                       | 187,-                         |
| 961-170                    | Hardness comparison plate (Shore)              | For sets up to 7 plates                        | 119,-                         |
| 961-131                    | Hardness tester (Leeb)                         | 400–800 HLD                                    | 150,-                         |
| 961-132                    | Hardness comparison plate (Leeb)               | Hardness comparison plate (for Leeb durometer) | 150,-                         |
| 961-270                    | Hardness (UCI)                                 | 200 - 800 HV                                   | 325,-                         |
| 961-150                    | Length   | ≤ 300 mm                                       | 150,-                         |
| 961-190                    | Light  | ≤ 200000 lx                                    | 205,-                         |
| 961-100                    | Mechanical balances/spring balances            | ≤ 5 kg   | 89,-                          |
| 961-101                    | Mechanical balances/spring balances            | > 5–50 kg                                      | 110,-                         |
| 961-102                    | Mechanical balances/spring balances            | > 50–350 kg                                    | 131,-                         |
| 961-103                    | Mechanical balances/spring balances            | > 350–1500 kg                                  | 205,-                         |
| 961-102K                   | Digital dynamometer KERN MAP                   | ≤ 130 kg                                       | 150,-                         |
| 961-120 (R)                | Torque wrench test devices                     | 1 Nm - 200 Nm                                  | 210,-                         |
| 964-305                    | Temperature calibration for moisture analyzer* |  | 174,-                         |
| <b>Additional services</b> |  |  |                               |
| 962-116                    | Express service with 48 hour delivery          |  | 52,-/instrument               |

(R): Recalibration

For each force gauge without interface or from other manufacturers we charge a surcharge of € 10,- for the additional effort.

\*Calibration available for the following models:

DAB 100-3, DAB 200-2, DBS-60-3, DLB 160-3A, MLS 150-2A, MLS 65-3A, MLB 50-3N, MLB 50-3C, MLB 50-3, DLT 100-3N, MLS 50-3D, MLS 50-3C



## A

### Accuracy classes for test weights

E, F, M ▶ **Error limit classes**

### Adjusting of measurement equipment

Precise setting of a measurement value via a professional intervention in the measurement system.

### Adjusting the weighing range of a balance



Either with the external test weight via the **adjusting program CAL**, or with the **internal automatic adjustment** resp. **adjusting switch**. It is necessary with variations in temperature, a change of environmental conditions, change of location, etc.

**Recommended as a daily check routine.**

### Alibi memory

For weighings where verification is mandatory, and which are to be analysed and processed by a PC (e.g. printing out a packing list using a PC instead of a printer connected directly to the balance) electronic archiving is required by the metrological authorities by a verifiable data memory which cannot be manipulated. Alibi memories from KERN fulfil this requirement. They are for paperless archiving of weighing results. For KERN products the alibi memory is fitted inside the balance, right between where the weight is determined and the output to the PC.

All data transferred to the PC is stored with date, time and all important weights for at least three months. These stored data strings can be displayed on the balance at any time. The data in the alibi memory can be deleted, but not changed.

### Application accuracy

Allowance for measuring uncertainty during practical use of a balance. Is given in the appendix to the DKD calibration certificate.

### ATEX

Derived from **AT**mosphère **EX**plosibles. (explosive atmosphere). A synonym for EU guidelines, which controls the quality and use of equipment in hazardous industrial environments, where there is explosion danger, e.g. by handling of flammable substances, which are present in high concentrations in the form of gas, mist, vapour or dust. Therefore see also directives 2014/34/EU as well as 1999/92/EU.

## B

### Balances which are verified/not approved for verification

Metrologically almost identical. For verified balances certain details are regulated by law, e.g. software changes and additional markings.

## C

### CAL

Adjusting the balance is triggered with an external test weight by using the CAL key on the key pad or on the touch display of the display device or the CAL menu option. This will guarantee the consistent high accuracy of the balance.

### Calibration of measurement equipment

Determination of the precision of a measurement value without intervention in the measurement system. Example: to check a balance you load a **test weight** upon it. The term "Calibrating" was formerly also used for **Adjusting**.

### Calibration Certificate DKD/DAkS

See product group 18 "Calibration service"

### Calibration or verification



**DAkS-Calibration** is possible for every balance in perfect condition. DAkS calibration (DKD) is a private service monitored by the state for ensuring high quality requirements according to ISO 9000 ff. and others, e.g. in production or research. **Verifying (conformity assessment)** is only possible for type-approved balances marked with the green **M** ▶ **Verification**

### Commercial error limit

Permitted tolerance (plus and minus) of measuring devices where verification is mandatory when used within their verification validity period. This tolerance is double the permissible error limit, in so far as this is not specified otherwise in the Weights and Measures Act).

### Conformity assessment

Procedure for confirming warranted characteristics in accordance with recognised rules. For balances this relates to verification.

### Conformity declaration from the manufacturer

The manufacturer declares that the product fulfils the applicable EU directives. With electronic balances this is always in conjunction with the CE mark.

### Control of measuring equipment in the QM system in conjunction with quality standards

An organisation certified to a quality standard such as DIN EN ISO 9001 ff. e.g. a production plant is obliged to adhere to a defined quality standard within the framework of its quality management system. To do this, it is imperative to have a measurement equipment which is working accurately. Chapter 7.1.5 "Resources for monitoring and measuring" of DIN EN ISO 9001:2015-11 states that measuring equipment must be calibrated at defined intervals and before use. The measurement devices and measurement standards needed to do this must:

- be traced back to international or national standards.
  - (▶ **Traceability to the National Standard**)
  - their uncertainty of measurement must be known- they must be marked with a clear identification
  - the test must be documented
- The **DAkS Calibration (DKD)** fulfils all these requirements.

### Conventional mass of weights

The problem is the air movement, which makes the weight appear lighter. In order to avoid this "distortion" in daily use, all weights are adjusted to the unit specifications given in R 111, e.g. it is accepted that: material density of the weights is 8000 kg/m<sup>3</sup>, air density is 1.2 kg/m<sup>3</sup> and measuring temperature is 20°C.

### Counting resolution

The counting resolution is calculated in points from the ratio of the weighing range [Max] divided by the smallest part weight. It is a statement of counting accuracy.

## D

### DAkS = German accreditation authority

#### ▶ Calibration Certificate DKD/DAkS

See product group 18 "Calibration service"

### Data interface



To connect the balance to a printer, PC, network or a second balance. Typical interfaces are, for example, RS-232, RS-485, USB, Bluetooth, LAN, Digital I/O, DUAL, LAN etc. The interface parameters can be set using the balance. The interfaces available are stated in the model description.

### Density determination

One of the main areas of application for laboratory balances is determining densities, e.g. determining the specific weight of liquids and solids. To do this you will need a highly accurate precision or analytical balance and a density set. It is particularly convenient if the balance can calculate and display the density right away.

It has become apparent that by means of weighing when in the process of determining the density of liquids and solids according to the buoyancy method particularly accurate results can be obtained (Archimedes' principle).

- Density determination of liquids: By means of measuring the buoyancy with a glass plummet with known volume immersed in the liquid to be measured
- Density determination of solid bodies:

$$\rho = \frac{A}{A-B} \cdot \rho_0$$

$\rho$  = Density of sample

A = Weight of sample in air

B = Weight of sample in auxiliary liquid

$\rho_0$  = Density of the auxiliary liquid

## Glossary

### Applications:

- Pre-packaged goods control, whenever a product is sold according to its volume [cm<sup>3</sup>]. This volume is calculated with weight [g] : density [g/cm<sup>3</sup>].
- Materials analysis

### DMS = Strain gauge



An electrical resistor strip that is glued to an elastic deforming body made of aluminium. As the strain gauge is mechanically deformed its resistance value changes, allowing the measured value to be calculated.

### Draught shield

Required for balances with ► **Readout**  
d ≤ 1 mg, to avoid disturbing air movements.

### Dual-range balance

As the load increases, the balance switches automatically to the next largest range, for both, weighing range [Max] as well as readout [d].

## E

### Error limit classes for test weights according to EU directive OIML R111

For further details, see product group 17 "Test weights"

## F

### FACTORY

These options can only be carried out at KERN factory.

### FORCE= Electromagnetic force compensation



A counterforce is created by means of a coil in a permanent magnet. This counterforce is the same as the load of the weight being measured on the scale and therefore equalising. The measured value is calculated via the change in the coil current.

## G

### GLP= Good Laboratory Practice

► **ISO/ GLP**

### Gravitational acceleration

► **Gravitational force**

### Gravitational force

very important influence for precise electronic balances. Due to the varying influence balances have to be ► **adjusted at the location of use.**

## H

### HACCP

= **Hazard Analysis and Critical Control Points (HACCP)** The HACCP concept is a preventative system, which is designed to guarantee the safety of foodstuffs. EC regulation 853/2004 mandates the use of the HACCP concept for all companies which are involved in production, processing and sales of foodstuffs.

### ISO 9000ff/DIN EN ISO 9000ff

Quality Management System in the form of a DIN Norm for quality assurance in a factory.

### ISO calibration/ISO certificate = factory calibration certificate

Testing measurement devices for accuracy in accordance with a procedure which is recognised, but not accredited.

### ISO/GLP record keeping



Quality Assurance Systems demands record keeping of weighing results and correct adjusting of the balance, giving details of date, time and balance identification. The easiest way to obtain this documentation is by means of a connected printer.

## J

### Junction Box

For connection and simple corner adjustment of several load cells.

## K

### KCP

KCP is an universal communication protocol between laboratory balances, industrial scales or other measuring instruments and digital devices, such as a computer, server or process management system. Due to the universal protocol structure, one measuring instrument can be replaced by another without adapting the communication interface.

## L

### Linearity/Precision

Greatest deviation of the weight displayed of a balance with regard to the value of the respective test weight in terms of plus and minus across the whole weighing range.

## M

### Minimum load [Min]

Lower limit of the verifiable weighing range. Is marked on the verification mark. The function of the balance is also given below the minimum load.

### Minimum sample weight

Indicates the smallest weight which can be determined, depending on the process accuracy required.

### Multi-division balance/ Multi-range balance

On multi-division balances, the weighing range is subdivided several times, each with a different readability. The readability [d] changes automatically with increasing and decreasing load. Multi-range balances have several weighing ranges with different maximum loads and different numerical increments. Switching takes effect automatically when the load increases; switching back to the lower weighing range only takes effect when the scale has been completely unloaded.

## N

### Newton

Newton (N) is the unit for physical force values. A Newton is the force required to accelerate a 1 kg mass at rest to a speed of 1 m/s within one second.

### Notified body

Neutral and independent, predominantly government bodies, which are formally appointed by the EC. They are engaged in the field of verification for conformity evaluations (initial verification) and type-approval test within the scope of type approvals.

## O

### Optimisation of reference weight (when piece counting)

See product group 9 "Counting balances/ Counting systems".

## P

### Percentage determination



Example: Reference weight prior to drying: 50g = balance display 100%. After drying 40g = balance display 80% absolute (dry mass) or 20% relative (humidity).

### Permissible ambient temperature

Measuring errors are possible if you use the balances outside the permitted specified ambient temperature range. With verified balances this is stated on the identification plate.

### PLU (Price Look Up)

This refers to a data memory in price-computing retail scales for the base price of sales items.

### Pre-packaging legislation (FPVO)

Ensures that pre-packed goods are filled correctly, for example, in food industry. The Weights and Measures Act governs the permissible weight and volume tolerances.

### PRE-TARE

Entering and saving a tare weight (e.g. container weight) through weighing or manual entry using the balance keypad before the actual weighing process. When you subsequently place the tare container on the balance, the balance will show zero immediately – saves time. Particularly useful e.g. for checking fill levels

### Proof of compatibility

This documents the verification compatibility for combinations of weighing modules such as display devices, load cells and connecting elements.

## R

### Readout [d]

Smallest readable weight increment on a digital display.

### Recalibration

Periodic checking of the precision of measurement equipment/checking equipment (e.g. balances/weights) to control accuracy, **►Control of measurement equipment**

### Reference weight (when piece counting)

See product group 9 "Counting balances/Counting systems".

### Reproducibility (standard deviation)

Sequenced measure of conformity in repeated weighing (e.g. balances) subject to the same conditions. Mostly 1 [d] or less. Quality feature.

### Resolution of a balance

The resolution is calculated from the weighing range [Max] divided by the readout [d], e.g. [Max] 420 g : [d] 0.001 g = 420,000 points. The resolution is a quality feature – the higher, the better.

## S

### SC-TECH= Single-Cell-Technology



**►FORCE.** The load cell consists of a single aluminium block, which gives a very high measurement quality.

### Semi-micro balance

Analytical balance with a readout [d] = 0,01 mg

### Smallest part weight when counting

The smallest piece weight, which a balance can accept for piece counting. For the relevant model, enter "g/piece" in the product data table.

## T

### T-FORK= Tuning fork principle



A resonating body (like a tuning fork) is electromagnetically excited, causing it to oscillate. The measured value is calculated via the change in frequency corresponding to the load of the weight being measured on the scale.

### Taring, automatic

**►PRE-TARE**

### Taring, subtractive

The available weighing range of a balance is reduced by the value of the tare load. Example: weighing range of a balance Max 6000g, Tare (= container) 470g, available weighing range 5530g.

### Test weight, external (previously calibration weight)



For adjusting or checking the balance accuracy **►Adjusting the weighing range.** The external test weight can be DAkkS calibrated at any time, even afterwards, see product group 18 "Calibration Service".

### Test weight, internal



Like test weight external, but installed in the balance and powered.

### Totalising



Various individual weighings are added automatically to aggregate, e.g. all individual weighings of a batch.

### Traceability to the National Standard

A pre-requisite for every perfect measurement is the validated comprehensive proof that the measuring equipment can be traced back to the international or national standards. In Germany the statutory binding standards are available from the PTB.

### Type approval for balances

Strict process to test whether a balance fulfils the verification requirements. A balance can only be verified, if it has got a type approval from a **►notified body.**

## U

### Uncertainty of measurement of a balance (= standard deviation)

Determined for each balance according to a precisely given test method and documented in the **►Calibration certificate.** It depends on various factors, both, internal and external. Uncertainty of measurement increases by a rising charge of the balance, see product group 18 "Calibration Service"

## V

### Verification

Verification, in accordance with the new terminology "Conformity assessment". Only balances with **►EC type approval** can be evaluated for conformity. These balances have an identification plate with the metrology marking **M**. The state requires assessment for conformity and this assessment serves as consumer protection. According to EU directive 2014/31/EEC balances must be officially assessed for conformity (calibrated) if they are used as follows:

- a) in commercial trade when the price of a commodity is determined by weighing.
- b) in the manufacture of pharmaceuticals in pharmacies and analysis in pharmaceutical and medical laboratories.
- c) for official purposes.
- d) in the production of prepackaging.
- e) in medical applications.

Every balance is tested by KERN and marked with a conformity mark. Its accuracy within the framework of permissible tolerances is thereby confirmed. EU verification applies to all member states of the EU.

### Verification classes of balances



Class I – Analytical balance (precision balance), Class II – precision balance, Class III – industrial scale (commercial scale).

### Verification of a balance with adjusting program CAEXT

The adjusting program is sealed with an official mark after the verification. Thus the verification is only valid for the specific location of use.

#### ►Gravitational force

To be able to correctly adjust the balance to your location of use, it is necessary to advise the location of use and postcode. See individual model details for the information as to whether verification can be carried out in the factory or at the location of use.

### Verification of a balance with automatic internal adjusting CALINT

The above restrictions in respect of the location of use do not apply, because the automatic internal adjusting works also after verification, therefore it is not sealed. In this case, verification does not depend on the location.

### Verification validity for balances

Generally 2 years for all verification classes, for control balances generally 1 year, after expiry the balance has to be re-verified.

### Verification value [e]

Measure of the verification tolerance, depending on balance, mostly between 1 [d] and 10 [d] **►Readout**

## W

### Weighing range [Max]

is the working range of the balance. The balance can be loaded up to the specified upper limit.