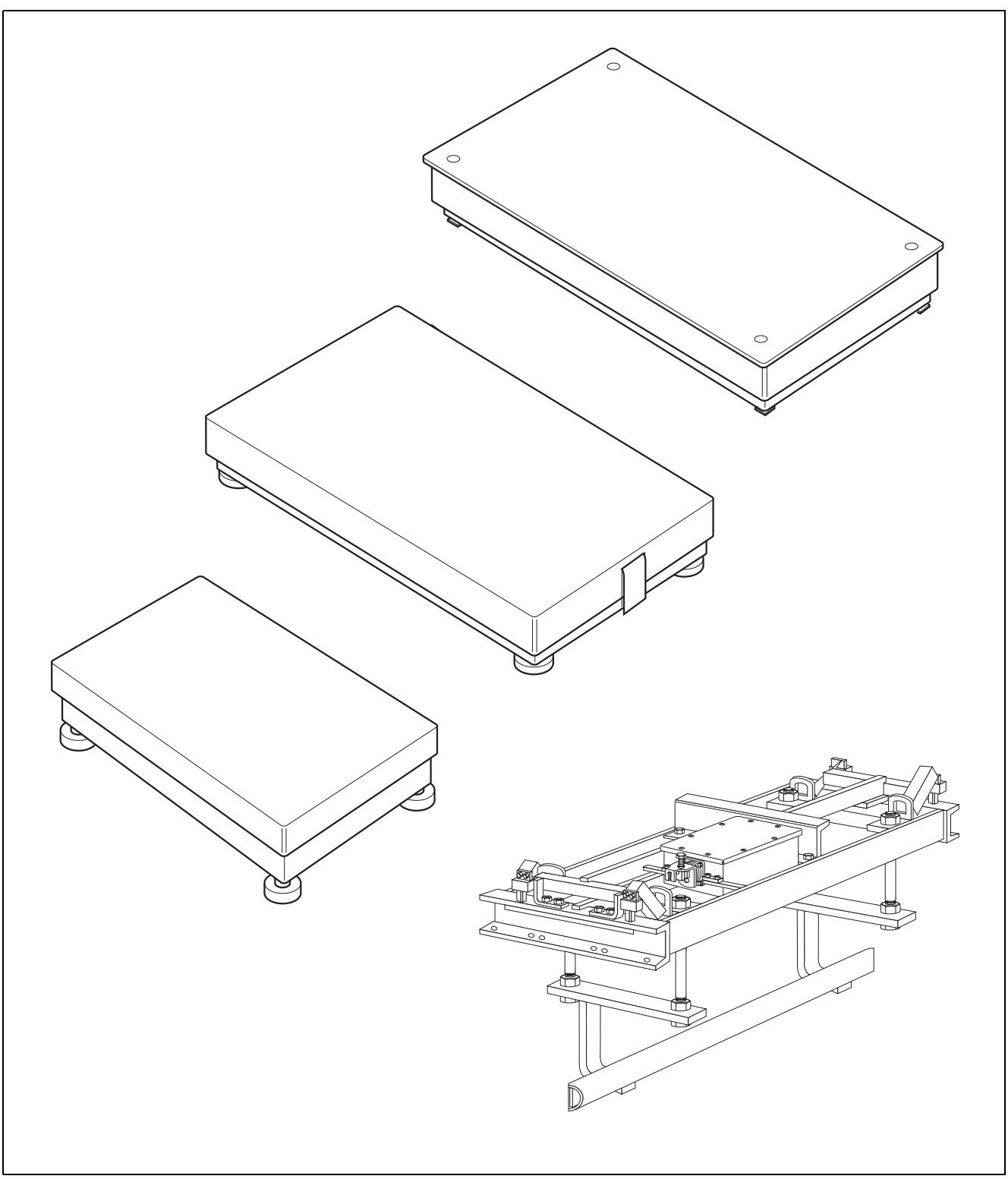
Service manual

METTLER TOLEDO MultiRange
K line weighing platforms

METTLER TOLEDO



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KCC150, KCC300

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KCS300, KCS600
KD600, KD1500
KE1500(sk), KE3000(sk)
KES1500(sk), KES3000(sk)
KN1500
KG3000, KG6000

Overhead rail scales
KO1200

1.2 Documentation for the K line

Service manual
The K line service manual contains all information on the repair and adjustment of all K line weighing platforms.

1.3 General information

1.3.1 Configuration

- All parameters specific to the weighing platform, country and customer are stored in the measuring cell.
- With certified scales, calibration must be performed externally with test weights in accordance with the configured maximum load.
- With noncertified scales, test weights of at least 1/4 maximum weight are required.

1.3.2 Tools

No special tools are required to repair the weighing platforms.

➜ Use a torque wrench to screw in the bolts.

2 Safety information for operation in Ex area

The explosion-protected K weighing platforms are approved for operation in Zone 2 (gases) and Zone 22 (dusts) hazardous areas.
There is an increased risk of injury and damage when the explosion-protected K weighing platforms are used in a potentially explosive atmosphere.
Special care must be taken when working in such hazardous areas. The code of practice is oriented to the "Safe Distribution" concept drawn up by METTLER TOLEDO.

Competence

▲ The K weighing platforms may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Ex approval

▲ No modifications may be made to the terminal and no repair work may be performed on the modules. Any weighing platform or system modules that are used must comply with the specifications contained in the installation instructions. Non-compliant equipment jeopardizes the intrinsic safety of the system, cancels the Ex approval and renders any warranty or product liability claims null and void.

▲ In hazardous areas only use the weighing platforms with the ID7xx terminal!

▲ The safety of the weighing system is only guaranteed when the weighing system is operated, installed and maintained in accordance with the respective instructions.

▲ Also comply with the following:

- the instructions for the system modules,
- the relevant national regulations and standards,
- the applicable statutory requirements for electrical equipment installed in hazardous atmospheres in the respective country,
- all instructions related to safety issued by the operator.

▲ Before initial start-up and following service work, check the explosion-protected weighing system for the proper condition of all safety-related parts.

Operation

▲ Prevent the build-up of static electricity. Always wear suitable working clothes when operating or performing service work in a hazardous area.

▲ Do not use protective hoods.

▲ Avoid causing damage to the weighing platforms.

Installation/ Maintenance

- ▲ Installation and maintenance work may be carried out on the weighing platform in hazardous areas, providing the following conditions are fulfilled:
  - – the owner has issued a permit ("spark permit" or "fire permit"),
  - – the area has been rendered safe and the owner's safety co-ordinator has confirmed that there is no danger,
  - – the necessary tools and any required protective clothing are provided (danger of the build-up of static electricity).
- ▲ The certification papers (certificates, manufacturer's declarations) must be present.
- ▲ Lay cables in such a way that they are protected from damage.
- ▲ Always disconnect the system from the power supply before commencing maintenance work. Where certain inspections, tests or adjustments require the system to remain connected to the power supply, this work must be performed with particular care.

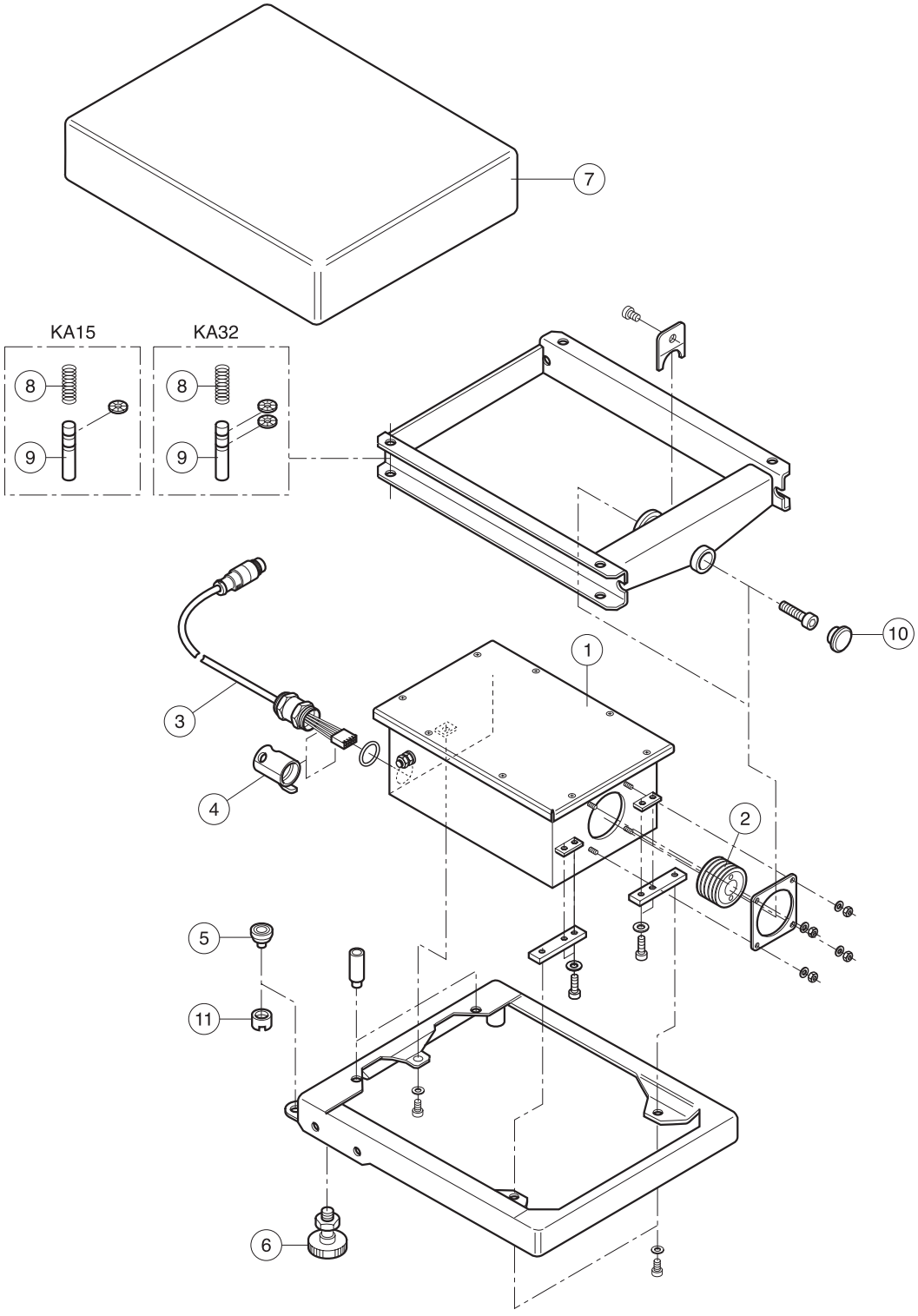
Service

- ▲ Service technicians must have attended a product-specific course of training for hazardous-duty equipment.
- ▲ Zone 2 service work should be performed outside hazardous zones wherever possible. With Zone 22 the measuring cell may not be opened in an explosive dust atmosphere. Service work includes dismantling an Ex unit inside the hazardous zone and moving it into the safe zone.
- ▲ Only use the parts or modules specified in the spare parts list as replacements.
- ▲ Do not separate connectors until the weighing system has been deenergized.

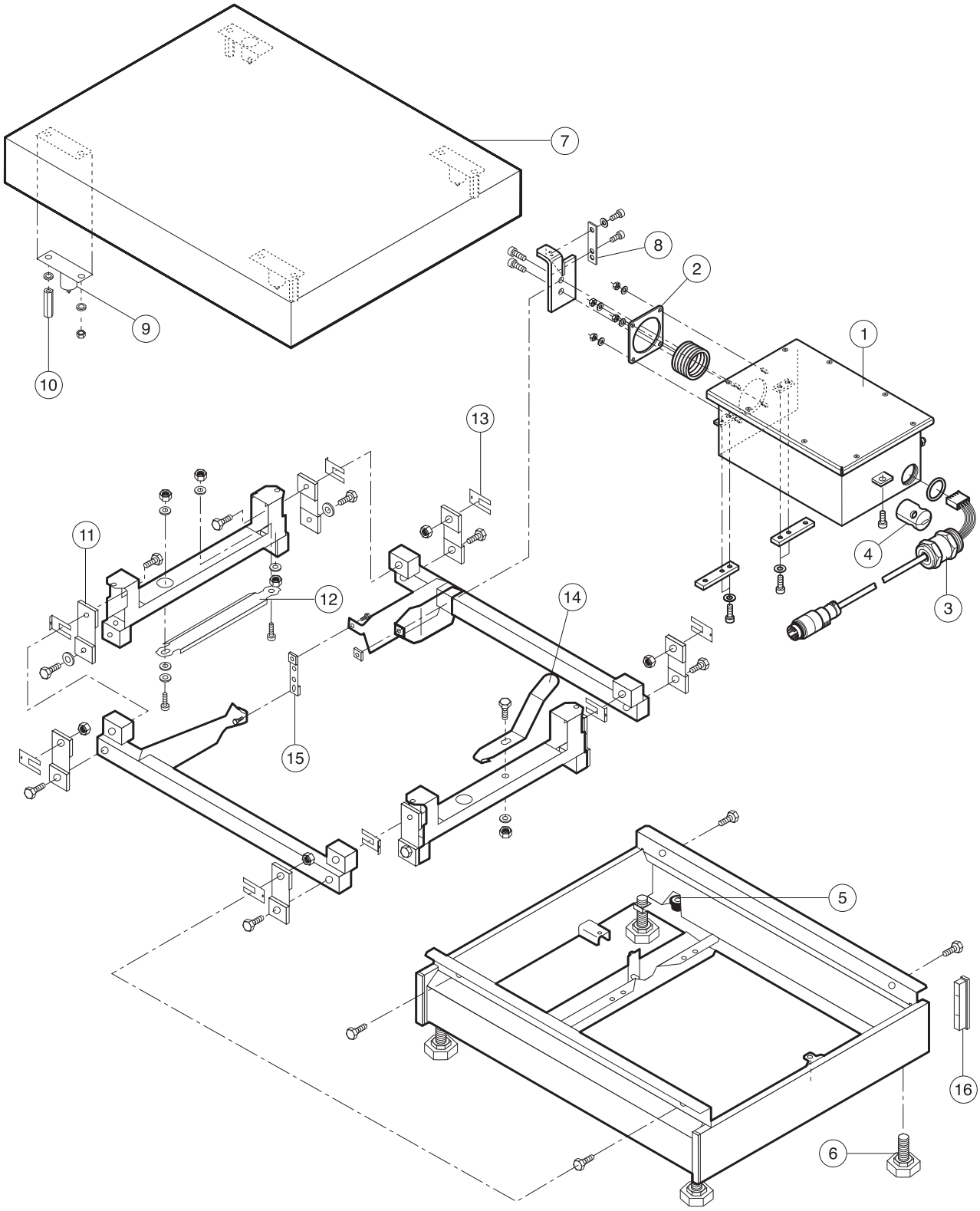
3 Table and stand scales KA / KB / KCC

3.1 Exploded drawings

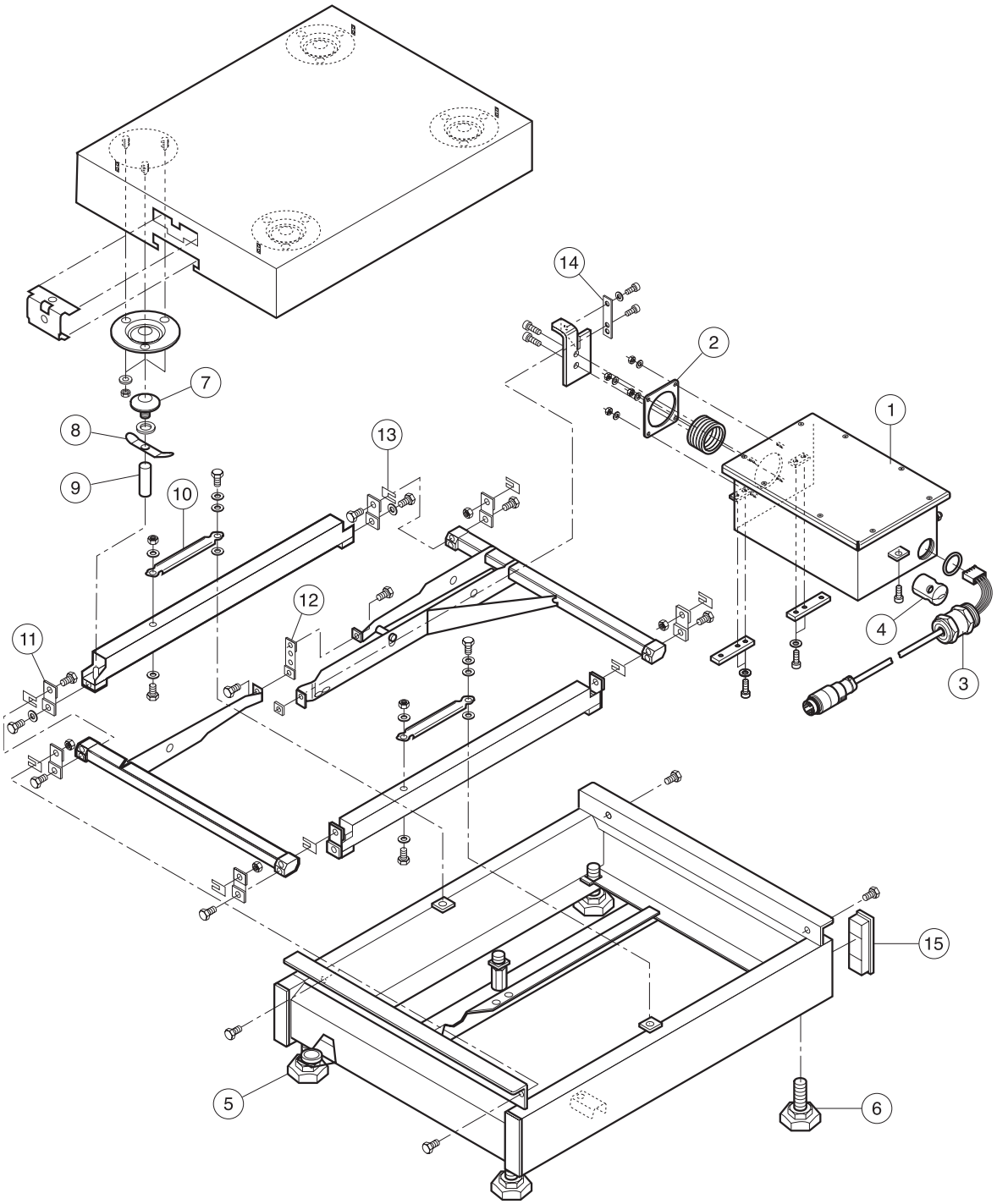
3.1.1 Exploded drawing for KA15 / KA32



3.1.2 Exploded drawing for KB60



3.1.3 Exploded drawing for KCC150 / KCC300



3.2 Spare parts

3.2.1 Spare parts list for KA15 / KA32

Position	Designation	Part number
1	Measuring cell, capsulated KA15: TBrick 15 KA32: TBrick 32	 22 006 716 22 006 717
2	Membrane kit	00 056 410/V
3	Connection cable, 2.5 m (M20x1.5)	22 006 720
4	PG gland, complete	00 504 219
5	Level	00 504 924
6	Leveling foot	00 502 887
7 *	Load plate	00 504 217
8	Pressure spring for KA15 for KA32	 00 504 216 00 504 733
9 *	Load bolt	00 504 218
10	Plug	00 504 215
11	Tapped ring	00 504 213
	Blank label set	22 000 378
	Identcard	22 000 386

* when replacing the load plate also insert the 4 new load bolts.

3.2.2 Spare parts list for KB60

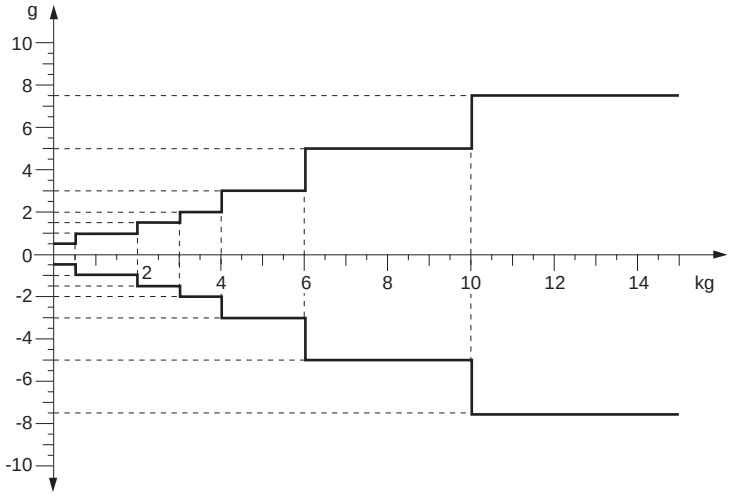
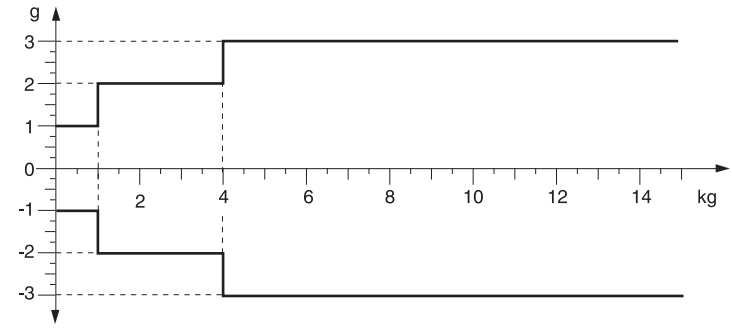
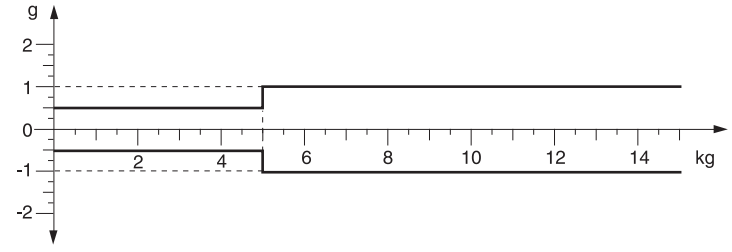
Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 716
2	Membrane kit	00 056 410/V
3	Connection cable, 2.5 m, (M20x1.5)	22 006 720
4	PG gland, complete	00 504 219
5	Level ASC	00 504 924
6	Leveling foot, stainless	00 504 834
7	Load plate	00 504 837
8	Cell link (ribbon link), 50 pieces	00 504 835
9	Load support	00 504 836
10	Stop buffer	00 505 030
11	Flexible bearing, complete	00 504 833
12	Horizontal guide	00 502 913
13	Shim for flexible bearings, set of 50 pieces 0.050 mm 0.055 mm 0.060 mm 0.065 mm 0.070 mm 0.075 mm 0.080 mm 0.085 mm 0.090 mm 0.095 mm 0.100 mm	 00 504 839 00 504 840 00 504 841 00 504 842 00 504 843 00 504 844 00 504 845 00 504 846 00 504 847 00 504 848 00 504 849
14	Contact spring	00 505 031
15	Central link (ribbon link)	00 505 016
16	Tube plug black grey	 00 508 838 00 504 883
	Blank label set	22 000 378
	Identcard	22 000 386

3.2.3 Spare parts list for KCC150 / KCC300

Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 716
2	Membrane kit	00 056 410/V
3	Connection cable, 2.5 m (M20x1.5)	22 006 720
4	PG gland, complete	00 504 219
5	Level ASC	00 504 924
6	Leveling foot, stainless	00 504 834
7	Load bumper	00 505 026
8	Screening plate	00 505 094
9	Load support bolt	00 202 548
10	Horizontal guide	00 502 913
11	Flexible bearing, complete	00 504 833
12	Central link (ribbon link)	00 505 137
13	Shim for flexible bearings, set of 50 pieces 0.050 mm 0.055 mm 0.060 mm 0.065 mm 0.070 mm 0.075 mm 0.080 mm 0.085 mm 0.090 mm 0.095 mm 0.100 mm	 00 504 839 00 504 840 00 504 841 00 504 842 00 504 843 00 504 844 00 504 845 00 504 846 00 504 847 00 504 848 00 504 849
14	Cell link (ribbon link), 50 pieces	00 504 835
15	Tube plug black grey	 00 505 028 00 505 027
	Blank label set	22 000 378
	Identcard	22 000 386

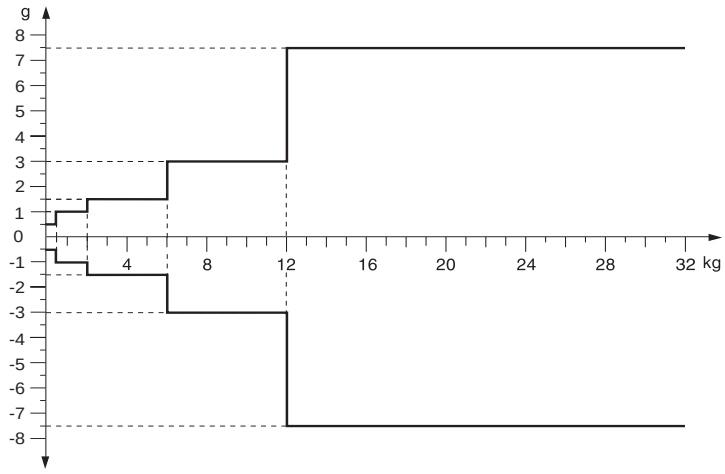
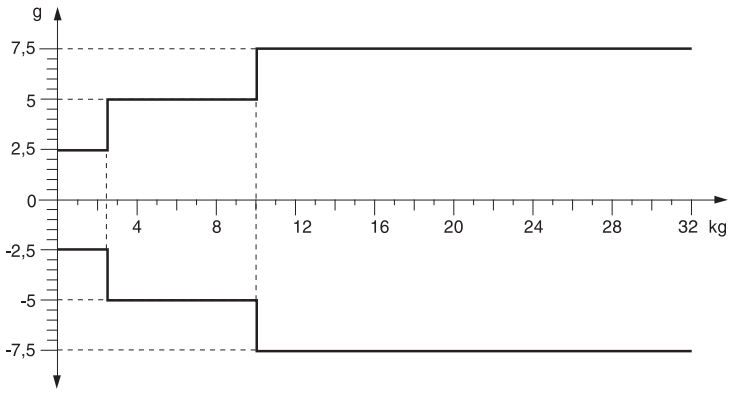
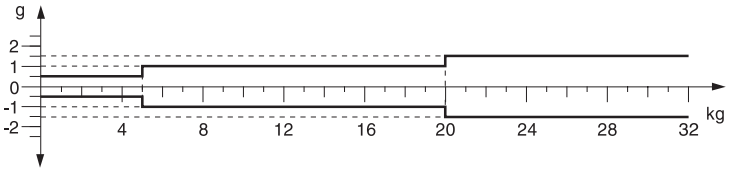
3.3 Certification data, tolerances and certification error limits

3.3.1 KA15

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 5 kg Tolerance 3 g	Certification class III e1 value 0.001 kg e2 value 0.002 kg e3 value 0.005 kg max 15 kg min 0.02 kg Readability in control mode: 0.1 g	
1 x 7500 e 100 %	Weight 5 kg Tolerance 3 g	Certification class III e value 0.002 kg max 15 kg min 0.04 kg Readability in control mode: 0.2 g	
1 x 15000 e 100 %	Weight 5 kg Tolerance 0.5 g	Certification class II e value 0.001 kg max 15 kg min 0.05 kg Readability in control mode: 0.01 g	

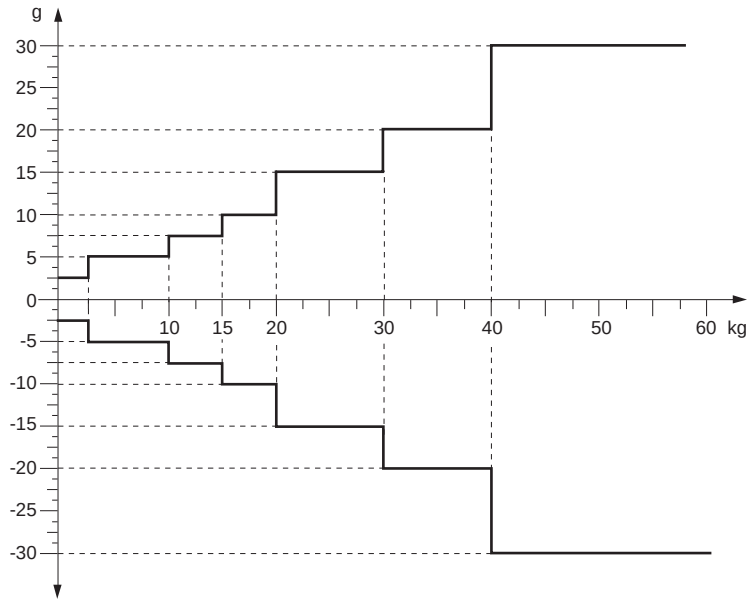
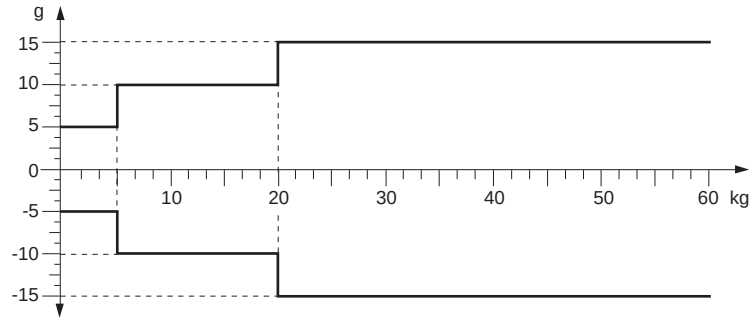
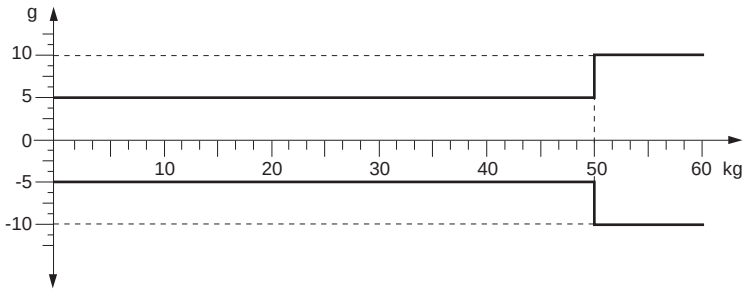
Additional configurations: according to OIML

3.3.2 KA32

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 6000 e 100 %	Weight 10 kg Tolerance 3 g	Certification class III e1 value 0.001 kg e2 value 0.002 kg e3 value 0.005 kg max 32 kg min 0.02 kg Readability in control mode: 0.1 g	
1 x 6000 e 100 %	Weight 10 kg Tolerance 5 g	Certification class III e value 0.005 kg max 32 kg min 0.1 kg Readability in control mode: 0.5 g	
1 x 32000 e 100 %	Weight 10 kg Tolerance 1 g	Certification class II e value 0.001 kg max 32 kg min 0.05 kg Readability in control mode: 0.1 g	

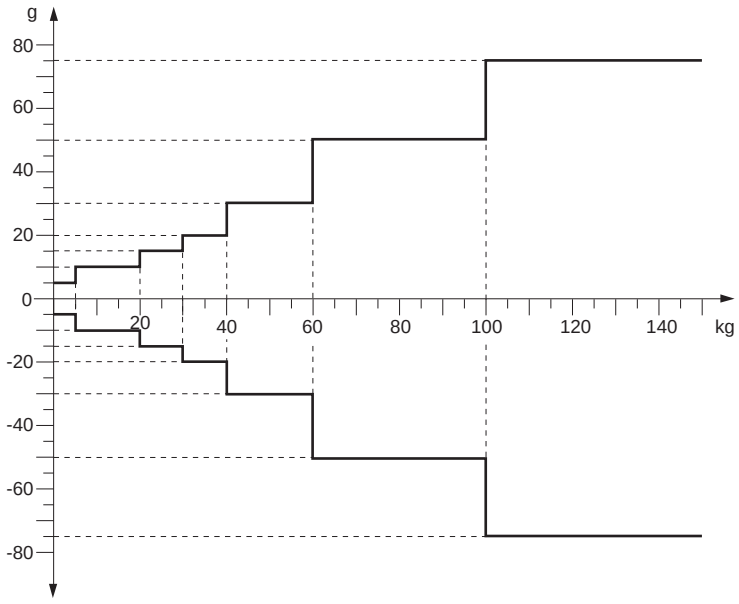
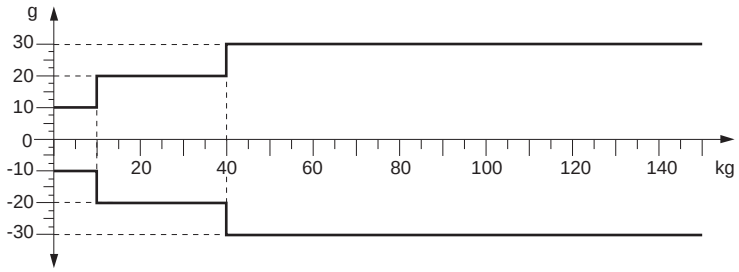
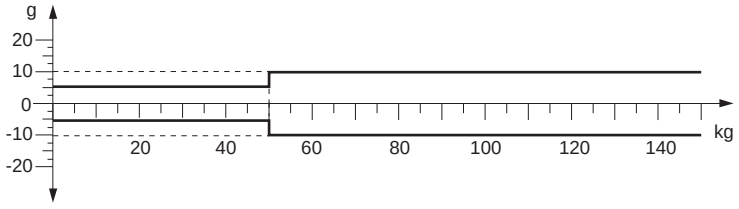
Additional configurations: according to OIML

3.3.3 KB60

Cell configuration	**Test with eccentric load**	**Linearity Hysteresis Range**	
3 x 3000 e 100 %	Weight 20 kg Tolerance 10 g	Certification class III e1 value 0.005 kg e2 value 0.01 kg e3 value 0.02 kg max 60 kg min 0.1 kg Readability in control mode: 0.5 g	
1 x 6000 e 100 %	Weight 20 kg Tolerance 10 g	Certification class III e value 0.01 kg max 60 kg min 0.2 kg Readability in control mode: 1 g	
1 x 6000 e 100 %	Weight 20 kg Tolerance 5 g	Certification class II e value 0.01 kg max 60 kg min 0.5 kg Readability in control mode: 1 g	

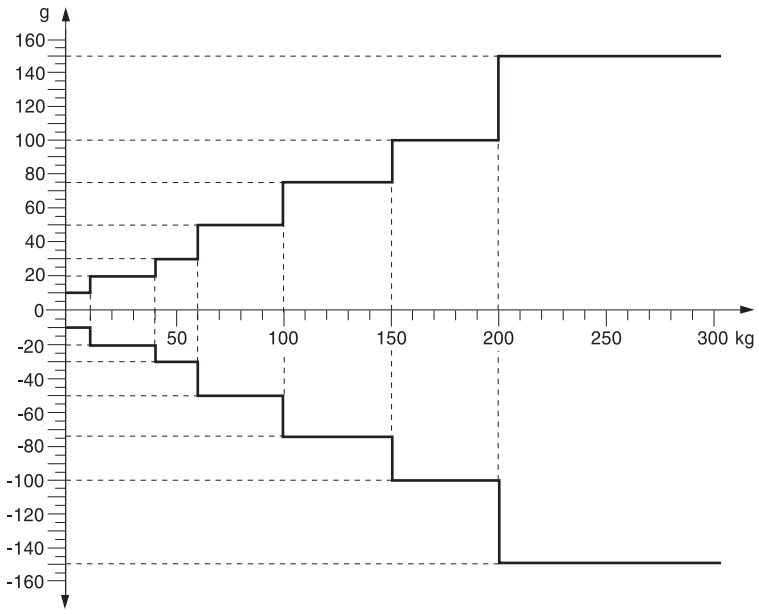
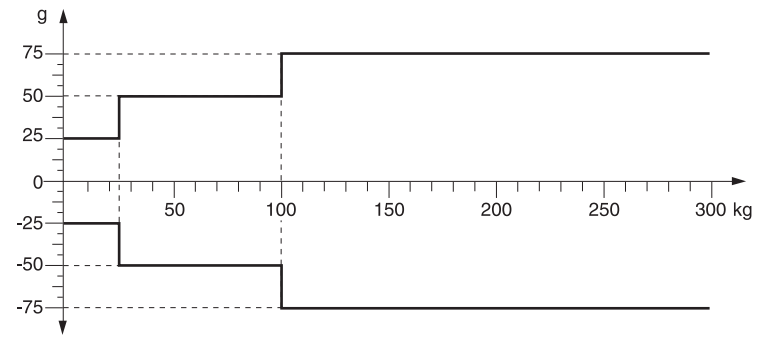
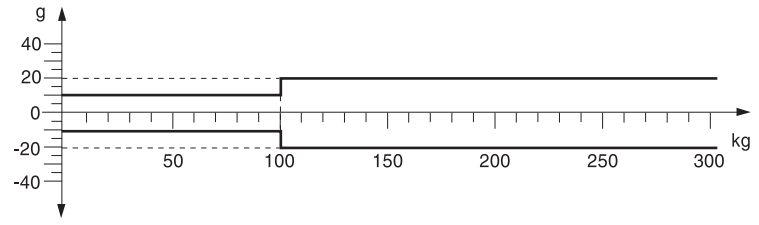
Additional configurations: according to OIML

3.3.4 KCC150

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 50 kg Tolerance 30 g	Certification class III e1 value 0.01 kg e2 value 0.02 kg e3 value 0.05 kg max 150 kg min 0.2 kg Readability in control mode: 1 g	
1 x 7500 e 100 %	Weight 50 kg Tolerance 30 g	Certification class III e value 0.02 kg max 150 kg min 0.4 kg Readability in control mode: 2 g	
1 x 15000 e 100 %	Weight 50 kg Tolerance 5 g	Certification class II e value 0.01 kg max 150 kg min 0.5 kg Readability in control mode: 1 g	

Additional configurations: according to OIML

3.3.5 KCC300

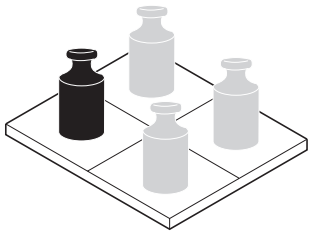
Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 100 kg Tolerance 50 g	Certification class III e1 value 0.02 kg e2 value 0.05 kg e3 value 0.1 kg max 300 kg min 0.4 kg Readability in control mode: 2 g	
1 x 6000 e 100 %	Weight 100 kg Tolerance 50 g	Certification class III e value 0.05 kg max 300 kg min 1.0 kg Readability in control mode: 5 g	
1 x 150000 d 100 %	Weight 100 kg Tolerance 10 g	Tolerances according to factory standard d value 0.002 kg max 300 kg Readability in control mode: 0.5 g	

Additional configurations: according to OIML

3.4 Checking and adjusting the cornerload

3.4.1 Checking the cornerload

1. Ascertain the configured weighing range and readability.
2. Load test weight in the middle of the load plate according to the test and adjusting specifications in section 3.3.
3. Load test weight in succession in the middle of each of the 4 quadrants and note absolute value with sign.



If the absolute value lies outside the certification error curve in section 3.3:

- with KA15 / KA32, replace measuring cell (see section 3.5.5).
- with KB60 / KCC150 / KCC300 adjust cornerload, see following section.

3.4.2 Adjusting the cornerload with KB / KCC

1. Activate master mode of the terminal and select control mode.
2. Check cornerload in control mode with test weights given above, and note deviations with sign.
3. Based on the following adjustment example, decide whether a height adjustment of cell link at force transmission is necessary.

Adjustment example

Add up the signed deviation values: + 15 g + 10 g + 6 g – 9 g = + 22 g
Divide total by 4: + 22 g : 4 = + 5.5 g

Calculated value is larger than half of the certification error

- Adjust load lever and cell link height of force transmission, see section 3.4.3.
- Adjust distance between flexible bearings, see section 3.4.4.

Calculated value is smaller than half of the certification error

- Adjust distance between flexible bearings, see section 3.4.4.

3.4.3 Adjusting the height of force transmission with KB / KCC

Height is altered by adjusting cell links at force transmission.

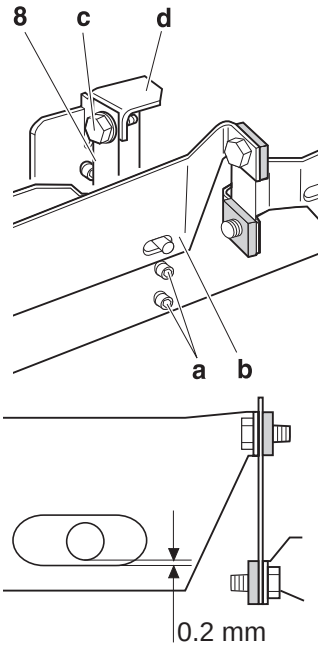
Adjustment rule

- With a positive deviation of the cornerload, move cell link higher.
- With a negative deviation of the cornerload, move cell link lower.

Effect of height adjustment when adjusting cell link by approx. 1 mm

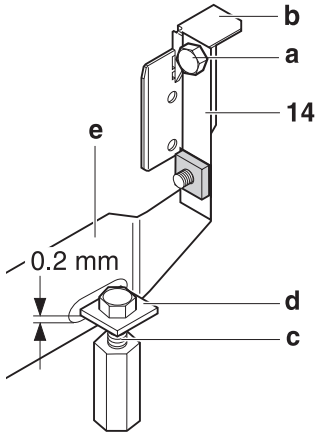
Model	Test weight	Effect
KB60	20 kg	approx. 4 g
KCC150	50 kg	approx. 1.5 g
KCC300	100 kg	approx. 3 g

Procedure for KB60



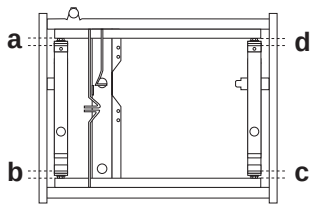
1. Loosen screws (a) of lever stop (b) on load lever.
2. Mark position of cell link (8) at force transmission (d).
3. Loosen hex bolt (c) on cell force transmission (d).
4. Adjust cell link (and load lever as well) up or down according to the deviation.
5. Tighten hex bolt with **10 Nm**, so that no tension is put on cell link.
6. Set lever stop on load lever so that there is approx. 0.2 mm distance between stop pin and the lower side of slot in load lever (corresponds to two 0.1 mm shims).
7. Re-tighten screws.
8. Recheck cornerload ensuring that the test weight is loaded in exactly the same position as before.

Procedure for KCC150 / KCC300



1. Loosen hex bolt (a) on cell force transmission (b).
2. Use the stop screw (c) and square washer (d), adjust height of cell link (14) and load lever (e).
   One turn of the stop screw causes a height deviation of 1 mm.
   Move cell link higher: Turn clockwise,
   Move cell link lower: Turn counter-clockwise.
3. Place two 0.1 mm shims between square washers and slot in load lever (e). Lift load lever and tighten hex bolt with **10 Nm**, so that no tension is put on the cell link.
4. Remove shims again.
5. Recheck cornerload ensuring that the test weight is loaded in exactly the same position as before.

3.4.4 Adjusting distance between flexible bearings for KB / KCC



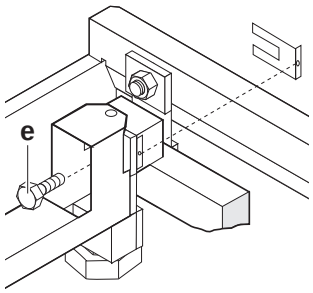
With this adjustment, both corners of one side of the lever are aligned with one another.
The adjustment is done by changing the flexible bearing distances a, b, c, d, using shims.

Adjustment rule

- With a positive deviation in cornerload test, reduce distance between flexible bearings (use thinner shims).
- With a negative deviation in cornerload test, increase distance between flexible bearings (use thicker shims).
- Begin at the corner with the greatest deviation.

See also, Service Software for Corner Adjustment ME-00507660.

Procedure



1. Lift off load plate.
2. Loosen screws (e) and add shims to a thickness appropriate to the deviation.

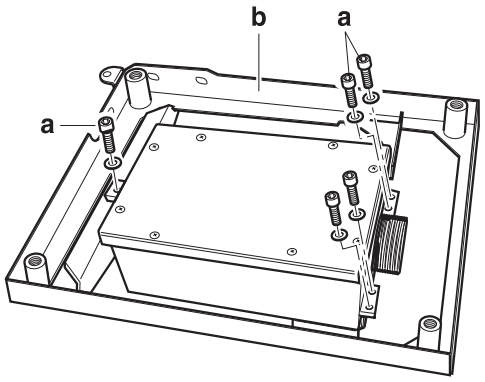
Effect of the shims:

Model	Test weight	Shim	Effect
KB60	20 kg	0.01 mm	approx. 4 g
KCC150	50 kg	0.01 mm	approx. 8 g
KCC300	100 kg	0.01 mm	approx. 20 g

3. Place shims between load lever and flexible bearing, and screw in screws.
4. Replace load plate and recheck cornerload.

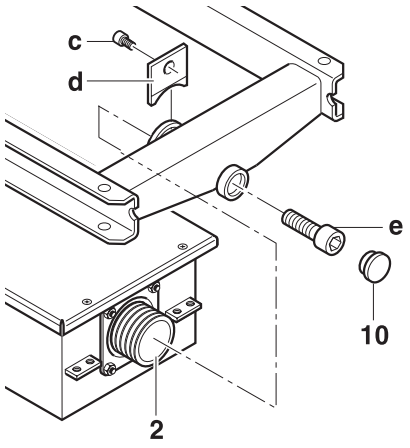
3.5 Corrective maintenance for KA15 / KA32

3.5.1 Removing the supporting frame for KA



1. Shut off terminal, disconnect power plug.
2. Remove load plate, turn weighing platform upside down.
3. Loosen the 5 screws (a) and lift up supporting frame (b).

3.5.2 Removing the load carrier for KA



1. Return weighing platform to its normal position, unscrew hex bolt (c) and remove clamping plate (d).
2. Remove sealing plug (10), and loosen and unscrew lower Allen screw (e).
3. Carefully move load carrier out of membrane (2).

3.5.3 Mounting the load carrier for KA

1. Carefully place load carrier's female threaded coupling over measuring cell membrane (5), and screw in around male threaded extension.
2. Insert Allen screw (e) and screw in slightly.
3. To tighten Allen screw (e), rotate measuring cell and hold on to screw.
   Tightening torque KA15 **10 Nm**
   Tightening torque KA32 **15 Nm**
4. Pull membrane over heel of threaded section and press clamp ring against membrane.
5. Install clamping plate (d) between clamping ring and frame section so that the lower angled end of clamping plate presses against clamping ring and membrane when screw (c) is tightened.
6. Install sealing plug (10).

3.5.4 Mounting supporting frame for KA

➜ Rotate weighing platform, attach supporting frame to measuring cell and screw it in using the 5 screws (a) and washers. Tightening torque: **8 Nm**.

3.5.5 Replacing the measuring cell for KA

Note

Connection cable and adapter plate must be removed from faulty measuring cell and attached to replacement measuring cell.

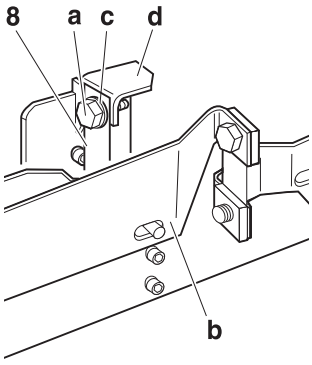
1. Remove the supporting frame and load carrier, see sections 3.5.1 and 3.5.2.
2. Unscrew PG lock.
3. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
4. Screw on PG lock.
5. Mount the supporting frame and load carrier, see sections 3.5.3 and 3.5.4.

Settings

After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in the service mode, see section 6.

3.6 Corrective maintenance for KB60

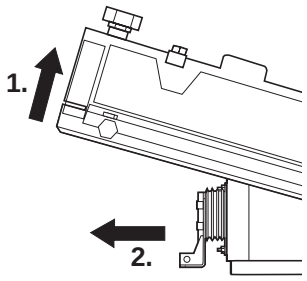
3.6.1 Removing the measuring cell for KB60



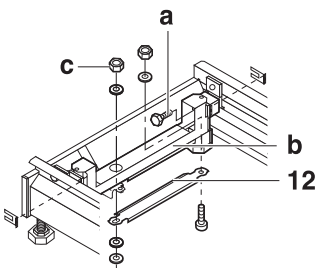
CAUTION

➜ When removing the measuring cell, ensure that the cell link (8) and connection cable are not damaged!

1. Shut off terminal and disconnect power plug.
2. Unscrew and remove connection cable from terminal.
3. Lift off load plate.
4. Loosen upper hex bolt (a) at cell force transmission (d), while lifting up load lever (b) slightly. Remove screw and washer (c).
5. Lay weighing platform on a soft support with the underside facing upward, taking care to not damage the level indicator.
6. Uniformly unscrew the 5 screws on frame body and cell retaining bracket and remove.
7. Lift up one side of weighing platform, pull measuring cell downward and remove from weighing platform.
8. Move weighing platform to its normal position.



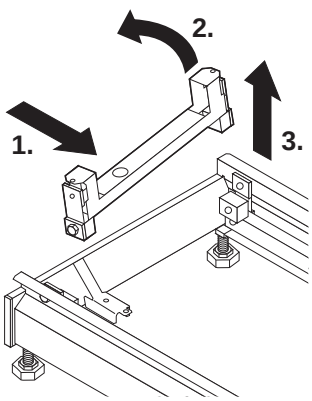
3.6.2 Removing the suspension bars for KB60



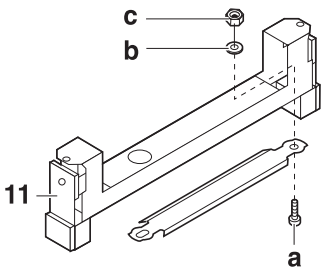
CAUTION

➜ When removing the suspension bars, please ensure that the flexible bearings are not damaged in the process.

1. Remove measuring cell, see section 3.6.1.
2. Loosen nut (c) of the horizontal guide (12) on supporting frame and remove them (and corresponding washers).
3. Loosen and remove screws (a) on suspension bar (b).
4. Remove inserted shims and mark to ensure they are not mixed up during subsequent reinstallation.
5. Move suspension bar sideways toward middle of platform and remove from above.



3.6.3 Removing the horizontal guide for KB60

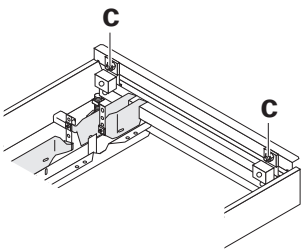


1. Remove suspension bars, see section 3.6.2.
2. Remove flexible bearings (11), see section 3.6.10.
3. Loosen bolt (a) and nut (c), and remove them along with the washer (b).

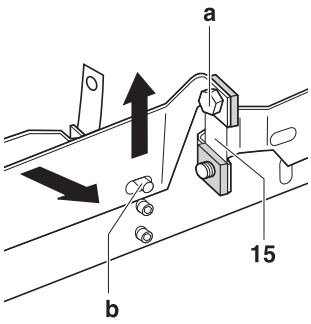
3.6.4 Removing the load lever for KB60

CAUTION

➜ When removing the load lever, please ensure that the flexible bearings and links are not damaged in the process.



1. Remove measuring cell, see section 3.6.1.
2. Remove suspension bars, see section 3.6.2.
3. Loosen bolts (c) on supporting frame, and remove shims. Remove bolts and nuts.

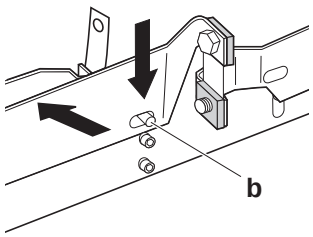


4. Loosen upper bolt (a) on central link (15).
5. Withdraw load lever from lever stop (b), lift up and remove.

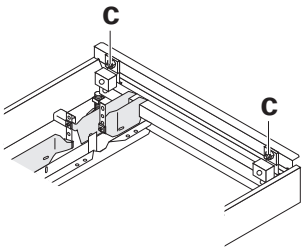
3.6.5 Installing the load lever for KB60

CAUTION

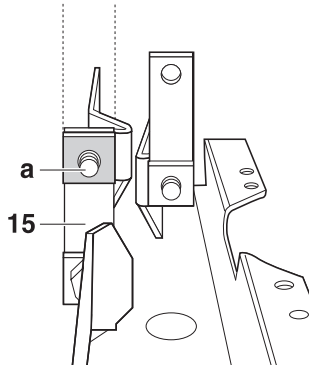
➜ Ensure that the flexible bearings and links are not damaged while installing the load lever.



1. Insert load lever into supporting frame and lever stop (b) from above.

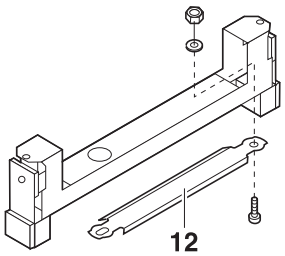


2. Insert screws (c) through supporting frame from outside.
3. Replace shims removed during disassembly (basic shim: 0.100 mm).
4. Secure flexible bearing locking pieces with nuts, brace nuts and tighten bolts with **20 Nm**.



5. Screw in upper bolt (a) on central link (15) with **10 Nm**. Ensure that there is no tension on central link.

3.6.6 Installing the horizontal guide for KB60

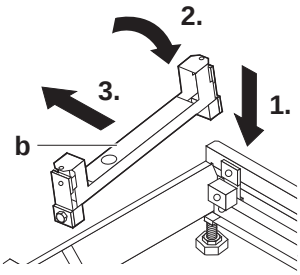


1. Screw new horizontal guide (12) onto suspension bar, paying heed to the position of attachment: round hole of horizontal guide to suspension bar, long hole to supporting frame.
2. Mount flexible bearings, see section 3.6.10.
3. Install suspension bars, see section 3.6.7.

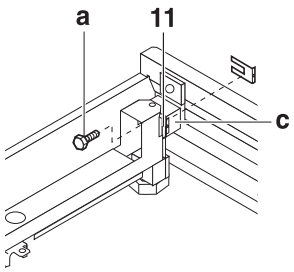
3.6.7 Installing the suspension bars for KB60

CAUTION

➜ The horizontal guide (12) should only be screwed on after the measuring cell has been installed.



1. Insert suspension bars (b) from above in the weighing platform.
2. Insert screws (a) in the flexible bearing locking pieces, and screw into the load lever heads by a few turns.
3. Slide in the shims marked during disassembly sideways between flexible bearing (11) and load lever head (c).
   If flexible bearings were exchanged, insert a basic shim (size 0.1 mm) at each corner, or use previously used shims from these locations.

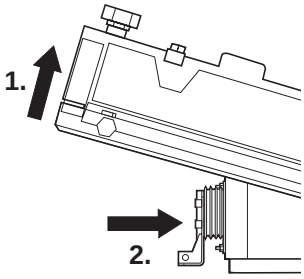


4. Align suspension bars exactly parallel to each other.
5. Tighten bolts with **20 Nm**.

Note

The horizontal guides are fastened to the suspension bar with 1 washer up above.
The horizontal guides are fastened to the supporting frame with 1 washer up above and to the height offset with 2 washers down below.

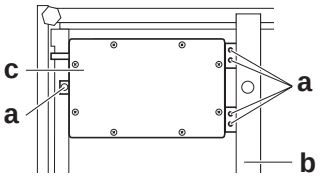
3.6.8 Installing the measuring cell for KB60



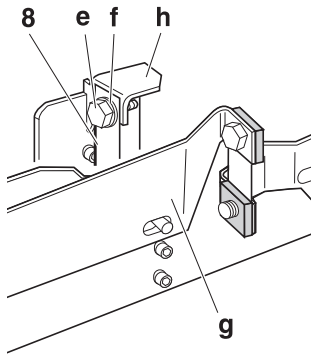
CAUTION

➜ Ensure that the cell link and connection cable are not damaged while installing the measuring cell!

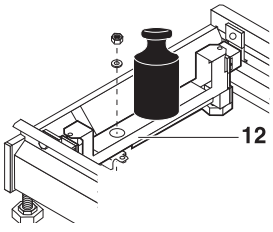
1. Lay weighing platform with the top facing downward on a soft support.
2. Lay measuring cell down with top facing downward.
3. Lift up one side of weighing platform (1.) and slide measuring cell under platform (2.).
4. Run connection cable through supporting frame, and place measuring cell on suspension bar.



5. Carefully lower supporting frame ensuring that the cell link is not damaged by the force transmission.
6. Screw measuring cell with 5 screws (a) uniformly to the frame body (b) and cell retaining bracket (c).
7. Move weighing platform to its normal position.



8. Fasten cell link (8) to cell force transmission (h) with hex bolt (e) and washer (f); raise load lever (g) slightly for this.
9. Tighten hex bolt with **10 Nm**, without tensioning the cell link. If the holes in the cell link and force transmission are not aligned exactly horizontally, carefully bend the load lever arm by the appropriate amount.



10. If suspension bars are to be removed, wait for them to stop oscillating (load them).
11. Screw horizontal guide (12) to supporting frame with screws and washers.

3.6.9 Replacing the measuring cell for KB60

Note

The cell force transmission and the connection cable must be removed from the faulty measuring cell and attached to the replacement cell.

1. Remove measuring cell, see section 3.6.1.
2. Remove cell force transmission and mount on replacement measuring cell.
3. Unscrew PG lock.
4. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
5. Screw on PG lock.
6. Install measuring cell, see section 3.6.8.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be, see section 3.4.1.

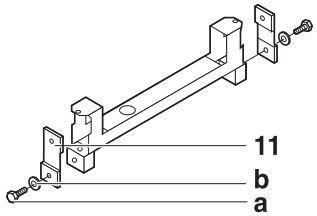
3.6.10 Replacing the flexible bearings and links for KB60

CAUTION

➜ Handle the flexible bearings carefully during assembly and disassembly. Deformations or kinks render the flexible bearings useless.

➜ If weighing platform has been subjected to impacts or shocks resulting in damage to the flexible bearings, replace **all** flexible bearings.

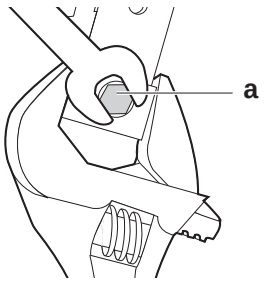
Replacing the flexible bearings on suspension bars



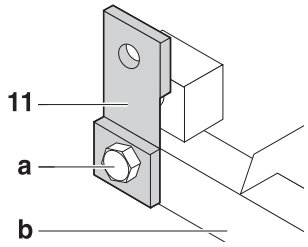
1. Remove suspension bars, see section 3.6.2.
2. Unscrew screws (a), and remove washers (b) and old flexible bearings (11).
3. Align new flexible bearings using an adjustable wrench with suspension bar and screw on using **20 Nm**. Do not forget the washers.

CAUTION

➜ Ensure that both flexible bearings are aligned exactly.

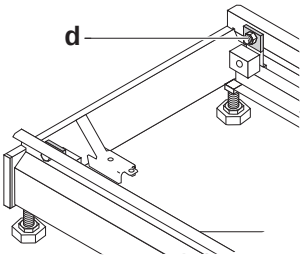


4. Install suspension bars, see section 3.6.7.
5. Check cornerload and adjust if need be, see section 3.4.1.
6. Check calibration and linearity.



Replacing the flexible bearings on load lever

1. Remove measuring cell, see section 3.6.1.
2. Remove suspension bars on both sides, see section 3.6.2.
3. Remove load lever, see section 3.6.4.
4. Loosen screws (a), and remove old flexible bearings (11).
5. Screw new flexible bearings loosely to load lever (b), do not tighten yet!
6. In a trial experiment, insert load lever in supporting frame (c) and make sure that the drill holes in the supporting frame and the holes of the flexible bearings are aligned. If not, it is essential to align the flexible bearings on both sides uniformly inward or outward.



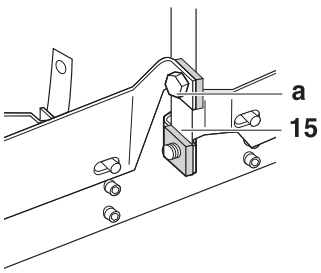
7. It must be possible to insert screws (d) used to fasten the load levers easily in the supporting frame. On no account may the flexible bearings be mounted if tensioned!
8. Take load levers out of supporting frame and tighten flexible bearings with **20 Nm**.
9. Install load levers, see section 3.6.5.
10. Install suspension bars, see section 3.6.7.
11. Install measuring cell, see section 3.6.8.

Adjustment work after flexible bearing replacement

After replacement of the flexible bearings, the reproducibility of the weighing platform must first be checked in the control mode before the required settings are made.

- Load and unload weighing platform several times with maximum load. Note the displayed values on loading and unloading. If deviations of more than 2 d are found, the weighing platform must be checked again; for this, allow the suspension bars to reach equilibrium and recheck the reproducibility.
- Check cornerload and adjust if need be, see section 3.4.1.
- Set calibration and linearity, see section 6.

3.6.11 Replacing the central link for KB60

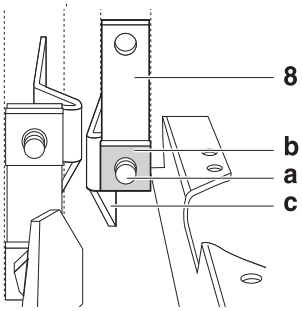


1. Loosen screws (a), and remove central link (15).
2. Fasten new central link with screws (a).
   When tightening bolts with **10 Nm**, ensure that the link is not tensioned.

Note

After replacement of the central link, check cornerload and adjust if need be, see section 3.4.1.

3.6.12 Replacing the cell link for KB60

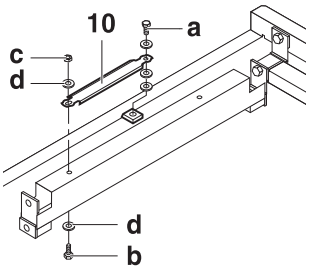


1. Remove measuring cell, see section 3.6.1.
2. Loosen hex bolt (a), remove square nut (b) and cell link (8).
3. Fasten new cell link with square nut and bolt to load lever (c).
   When tightening bolts with **10 Nm**, ensure that the link is not tensioned and that the edges of the square nut are flush with the edges of the link.
4. Install measuring cell, see section 3.6.8.

Note
After replacement of the cell link, check the cornerload and adjust if need be, see section 3.4.1.

3.7 Corrective maintenance for KCC150 / KCC300

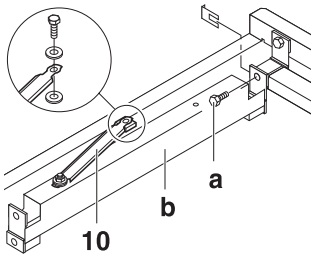
3.7.1 Replacing the horizontal guides for KCC



1. Loosen screw (a) of horizontal guide (10) on supporting frame, and remove it and corresponding washers.
2. Loosen bolt (b) and nut (c), and remove them along with the washers (d).
3. Screw new horizontal guide onto suspension bar paying heed to the position of attachment: round hole of horizontal guide to suspension bar, long hole to supporting frame.
4. Screw horizontal guide to supporting frame.

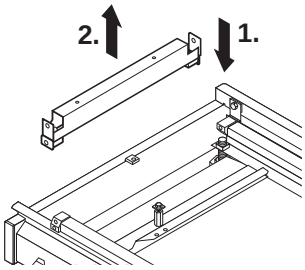
3.7.2 Removing the suspension bars for KCC

CAUTION



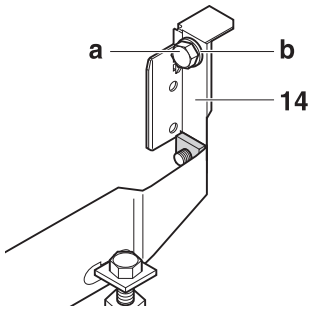
➜ When removing the suspension bars, please ensure that the flexible bearings are not damaged in the process.

1. Remove horizontal guide (10) from the supporting frame, see section 3.7.1.
2. Loosen and remove screws (a) on suspension bar (b).
3. Remove inserted shims and mark to ensure they are not mixed up during subsequent reinstallation.



4. Move one side of suspension bar downward (1.) and lift up and out (2.).

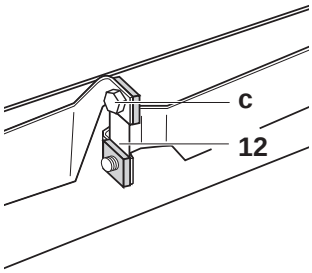
3.7.3 Removing the load lever for KCC



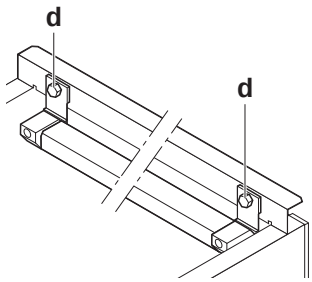
CAUTION

➜ When removing the load lever, please ensure that the flexible bearings and cell and central links are not damaged in the process.

1. Remove suspension bars, see section 3.7.2.
2. Loosen upper bolt (a) on cell link (14), and remove along with the washer (b).



3. Loosen and remove upper bolt (c) on central link (12).

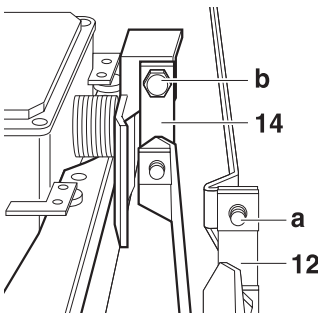


4. Loosen bolts (d) on supporting frame, and remove shims.
   Mark shims so that they are not mixed up before the unit is reassembled.
5. Remove bolts and nuts.
6. Withdraw load lever from lever stop, lift up and remove.

3.7.4 Installing the load lever for KCC

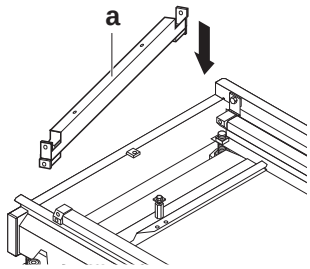
CAUTION

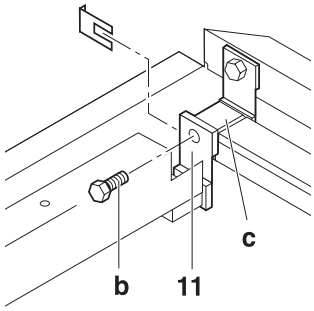
➜ Ensure that the flexible bearings and cell and central links are not damaged while installing the load lever.



1. Insert load lever into supporting frame and lever stop from above.
2. Insert bolts (d) through supporting frame from outside.
3. Replace shims which were removed during disassembly
   (basic shim: 0.100 mm).
4. Secure flexible bearing locking pieces with nuts, brace nuts and tighten bolts with **20 Nm**.
5. Screw in upper bolt (a) on central link (12) with **10 Nm**.
6. Screw in upper bolt (b) on cell link (14) with **10 Nm**.

3.7.5 Installing the suspension bars for KCC





1. Insert suspension bars (a) from above in the weighing platform.
2. Insert bolts (b) into flexible bearing locking pieces, and screw into the load lever heads by a few turns.
3. Slide in the shims marked during disassembly sideways between flexible bearing (11) and load lever head (c). If flexible bearings were exchanged, insert a basic shim (size 0.1 mm) at each corner, or use previously used shims from these locations.
4. Align suspension bars exactly parallel to each other.
5. Tighten bolts with **20 Nm**.
6. Load suspension bars with 20 kg and wait for oscillation to stop.
7. Screw horizontal guide to supporting frame, see section 3.7.1.

3.7.6 Replacing the measuring cell for KCC

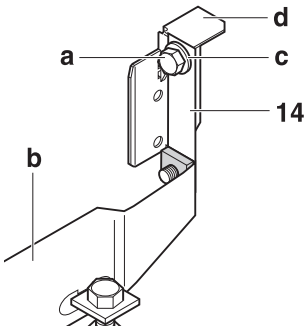
Note

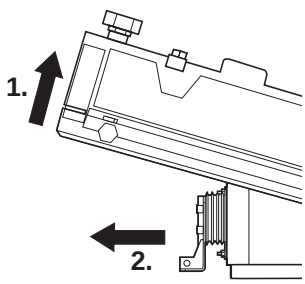
The cell force transmission and the connection cable must be removed from the faulty measuring cell and attached to the replacement cell.

Removing the measuring cell

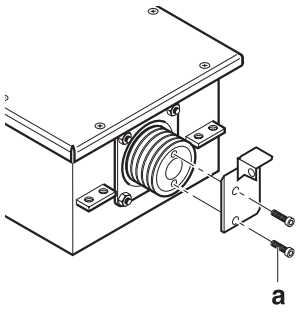
CAUTION

➜ When removing the measuring cell, ensure that the cell link (14) and connection cable are not damaged!





1. Shut off terminal and disconnect power plug.
2. Unscrew and remove connection cable from terminal.
3. Swing out handle and lift off load plate.
4. Loosen upper hex bolt (a) at cell force transmission (d), while lifting up load lever (b) slightly. Remove bolt and washer (c).
5. Lay weighing platform on a soft support with the underside facing upward, taking care to not damage the level indicator.
6. Uniformly unscrew the 5 screws on frame body and cell retaining bracket and remove.
7. Lift up one side of weighing platform (1.) and pull measuring cell downward from weighing platform (2.).
8. Move weighing platform to its normal position.



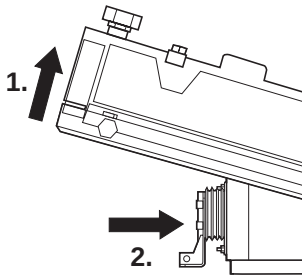
Remounting the cell force transmission and connection cable

1. Carefully unscrew screws (a) on the cell force transmission and mount on replacement measuring cell.
2. Unscrew PG lock.
3. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
4. Screw on PG lock.

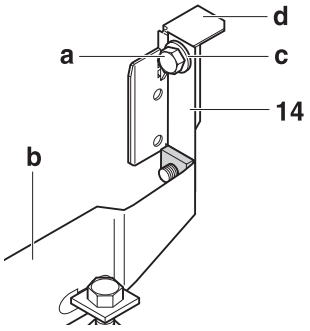
Installing the measuring cell

CAUTION

➜ Ensure that the cell link and connection cable are not damaged while installing the measuring cell!



1. Lay weighing platform with the top facing downward on a soft support.
2. Lay measuring cell down with top facing downward.
3. Lift up one side of weighing platform (1.) and slide measuring cell under platform (2.).
4. Pull through connection cable through the supporting frame.
5. Carefully lower supporting frame, ensuring that cell link is not damaged by force transmission.
6. Screw measuring cell with 5 screws uniformly to the frame body and cell retaining bracket.
7. Move weighing platform to its normal position.



8. Fasten cell link (11) to cell force transmission (d) with hex bolt (a) and washer (c); raise load lever (b) slightly for this.
9. Tighten hex bolt with **10 Nm**, without tensioning the cell link. If the holes in the cell link and force transmission are not aligned exactly horizontally, carefully bend the load lever arm by the appropriate amount.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be, see section 3.4.1.

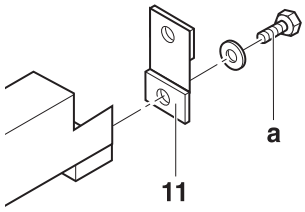
3.7.7 Replacing the flexible bearings and links for KCC

CAUTION

➜ Handle the flexible bearings carefully during assembly and disassembly. Deformations or kinks render the flexible bearings useless.

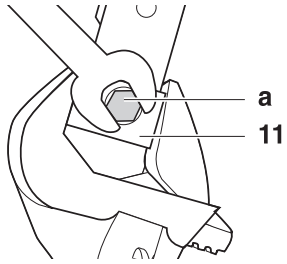
➜ If weighing platform has been subjected to impacts or shocks resulting in damage to the flexible bearings, replace all flexible bearings.

Replacing the flexible bearings on suspension bars



1. Remove suspension bars, see section 3.7.2.
2. Unscrew screws (a), and remove old flexible bearings (11).
3. Align new flexible bearings using an adjustable wrench with suspension bar, and screw on using **20 Nm**.

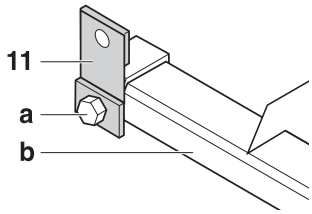
CAUTION

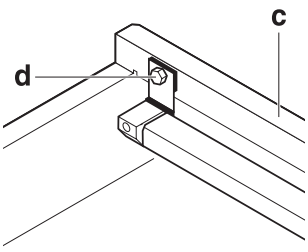


➜ Ensure that both flexible bearings are aligned exactly.

4. Install suspension bars, see section 3.7.5.
5. Check cornerload and adjust if need be, see section 3.4.1.
6. Check calibration and linearity.

Replacing the flexible bearings on load lever





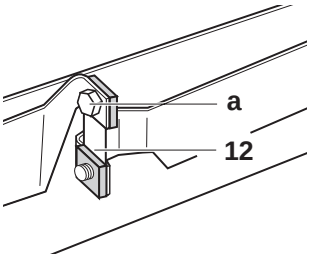
1. Remove suspension bars from both sides, see section 3.7.2.
2. Remove load lever, see section 3.7.3.
3. Loosen screws (a), and remove old flexible bearings (11).
4. Screw new flexible bearings loosely to load lever (b), do not tighten yet!
5. In a trial experiment, insert load lever in supporting frame (c) and make sure that the drill holes in the supporting frame and the holes of the flexible bearings are aligned. If not, it is essential to align the flexible bearings on both sides uniformly inward or outward. It must be possible to insert screws (d) used to fasten the load levers easily in the supporting frame. On no account may the flexible bearings be mounted if tensioned!
6. Take load levers out of supporting frame and tighten flexible bearings with **20 Nm**.
7. Install load levers, see section 3.7.4.
8. Install suspension bars, see section 3.7.5.

Adjustment work after flexible bearing replacement

After replacement of the flexible bearings, the reproducibility of the weighing platform must first be checked in the control mode before the required settings are made.

- Load and unload weighing platform several times with maximum load. Note the displayed values on loading and unloading. If deviations or more than 2 d are found, the weighing platform must be checked again; for this, allow the suspension bars to reach equilibrium and recheck the reproducibility.
- Check cornerload and adjust if need be, see section 3.4.1.
- Setting calibration and linearity in service mode, see section 6.

Replacing the central link

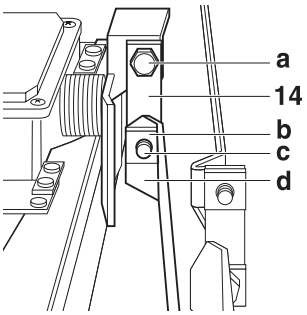


1. Loosen bolts (a), and remove central link (12).
2. Fasten new central link with bolts (a). When tightening bolts with **10 Nm**, ensure that the link is not tensioned.

Note

After replacement of the central link, check cornerload and adjust if need be, see section 3.4.1.

Replacing the cell link



1. Loosen upper hex bolt (a) and remove together with the washer.
2. Loosen hex bolt (c), and remove square nut (b) and cell link (14).
3. Fasten new cell link with square nut and bolt to load lever (d).
   When tightening bolt with **10 Nm**, ensure that the link is not tensioned and the edges of the square nut are flush with the edges of the link.

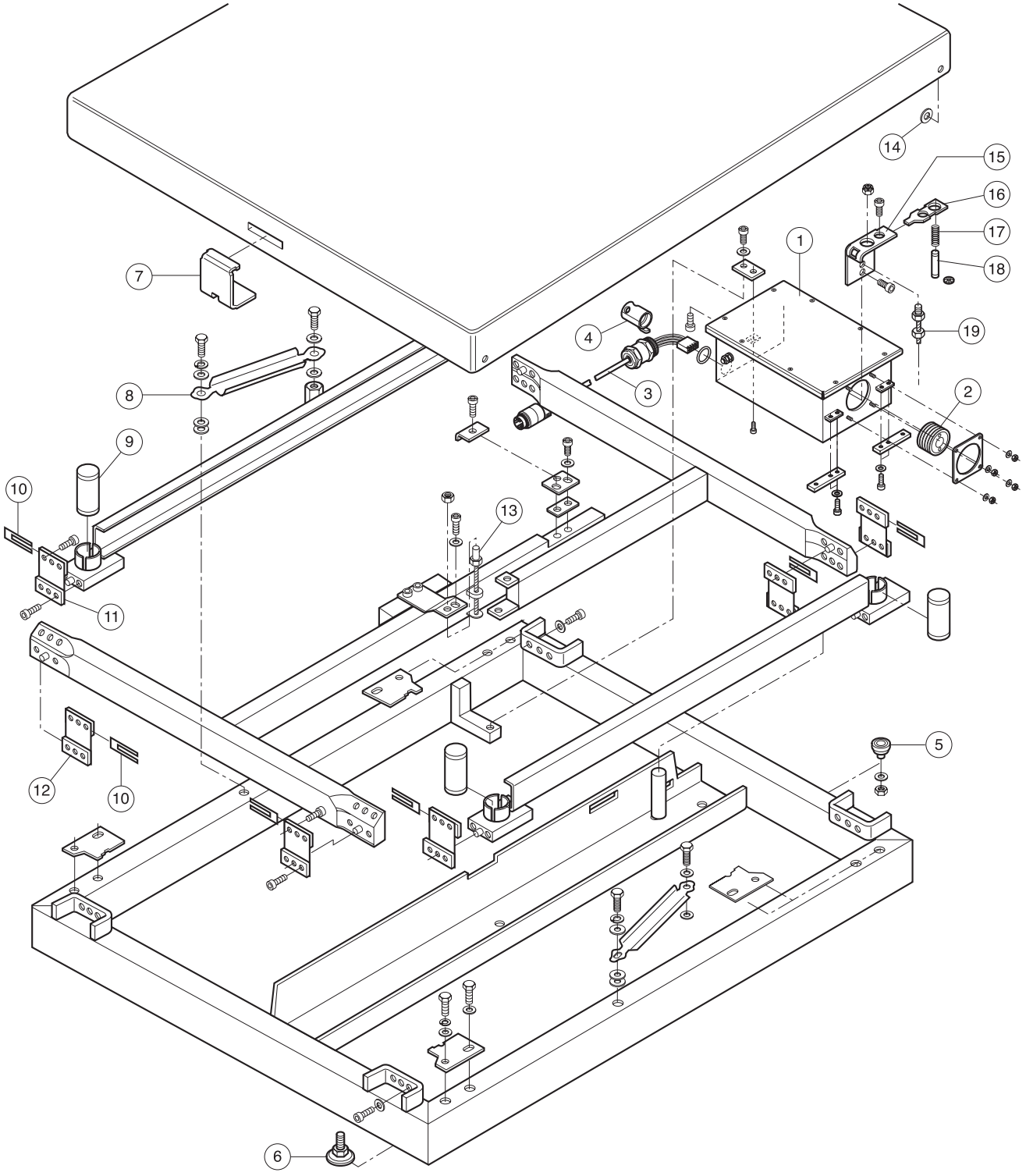
Note

After replacement of the cell link, check the cornerload and adjust if need be, see section 3.4.1.

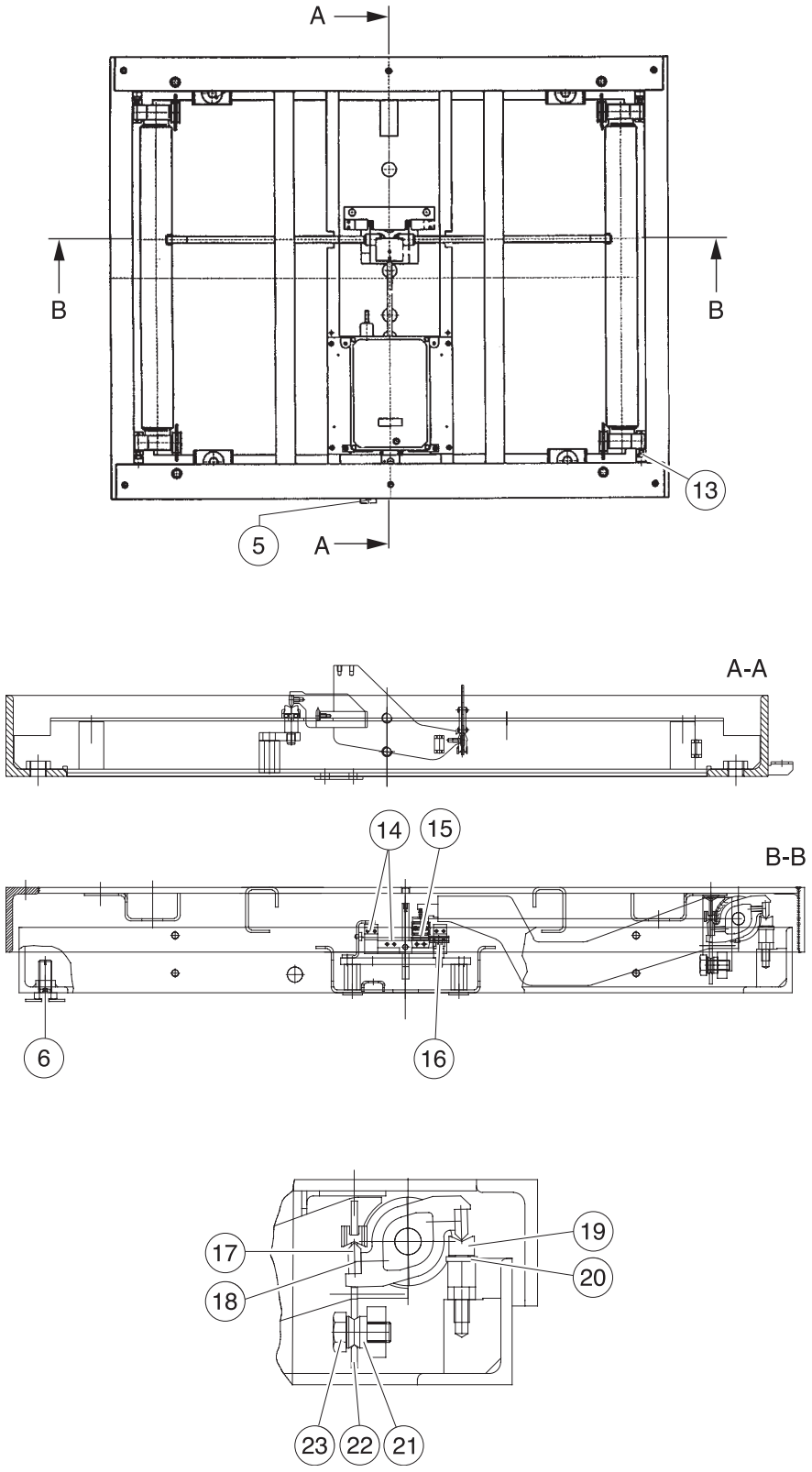
4 Floor scales / Pit scales KC / KD / KE / KN / KG

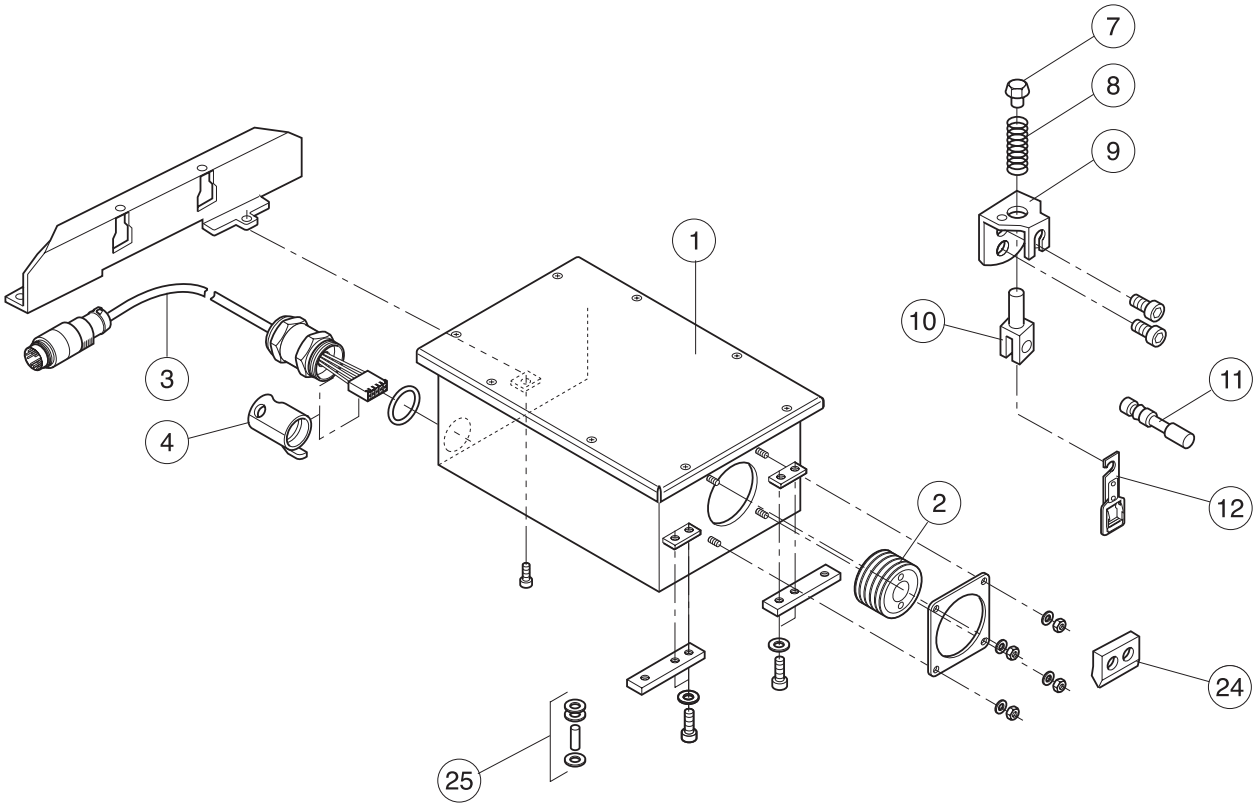
4.1 Exploded drawings

4.1.1 Exploded drawing for KC300 / KCS300 / KC600 / KCS600



4.1.2 Exploded drawing for KD / KE / KE...sk / KES / KES...sk

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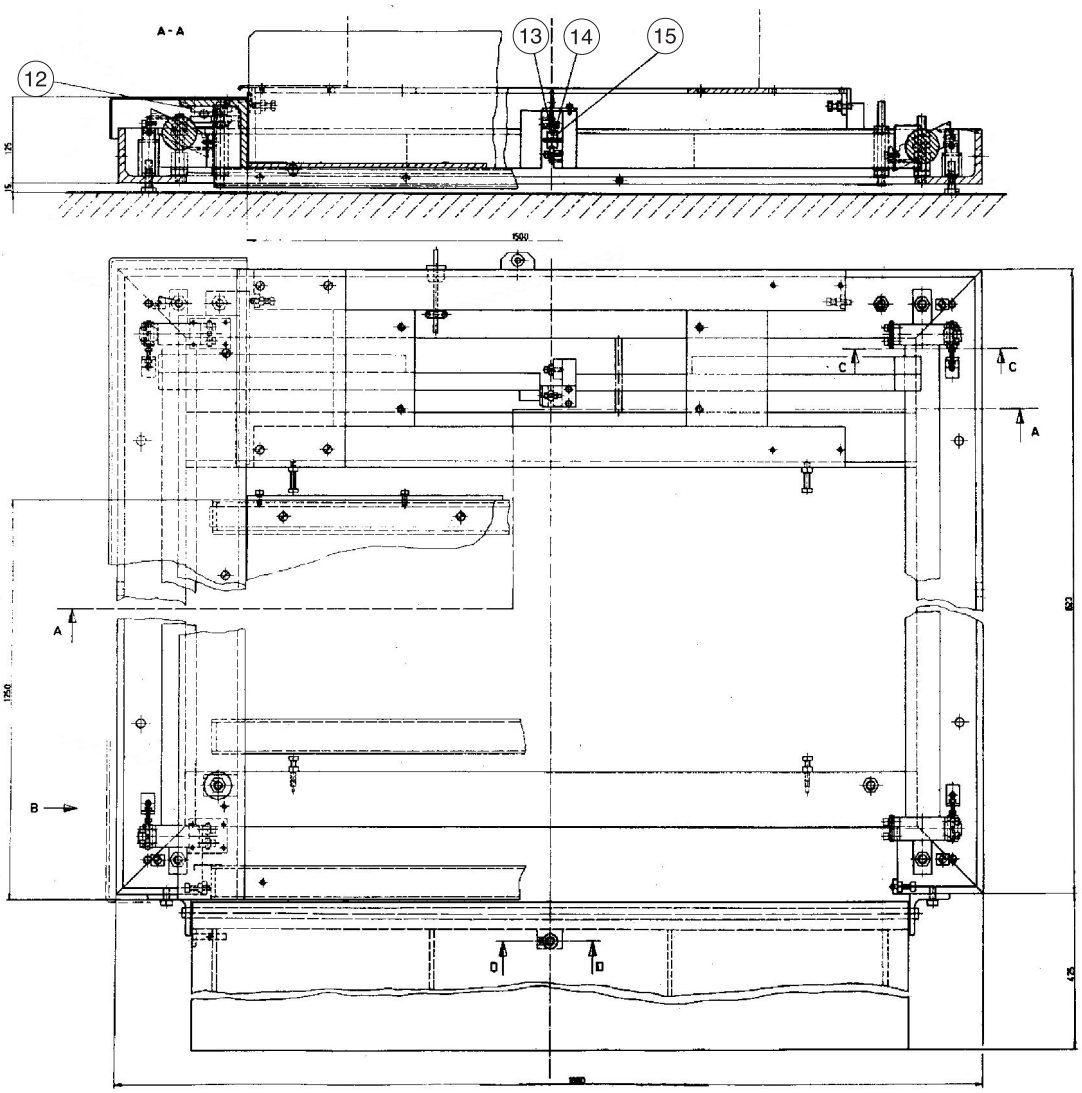
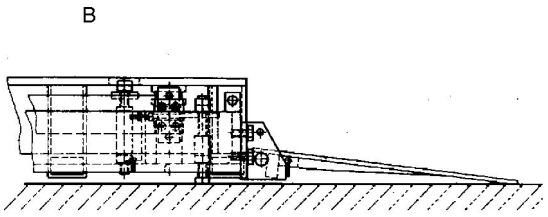
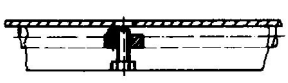
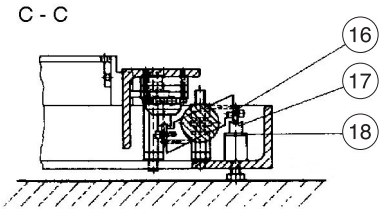
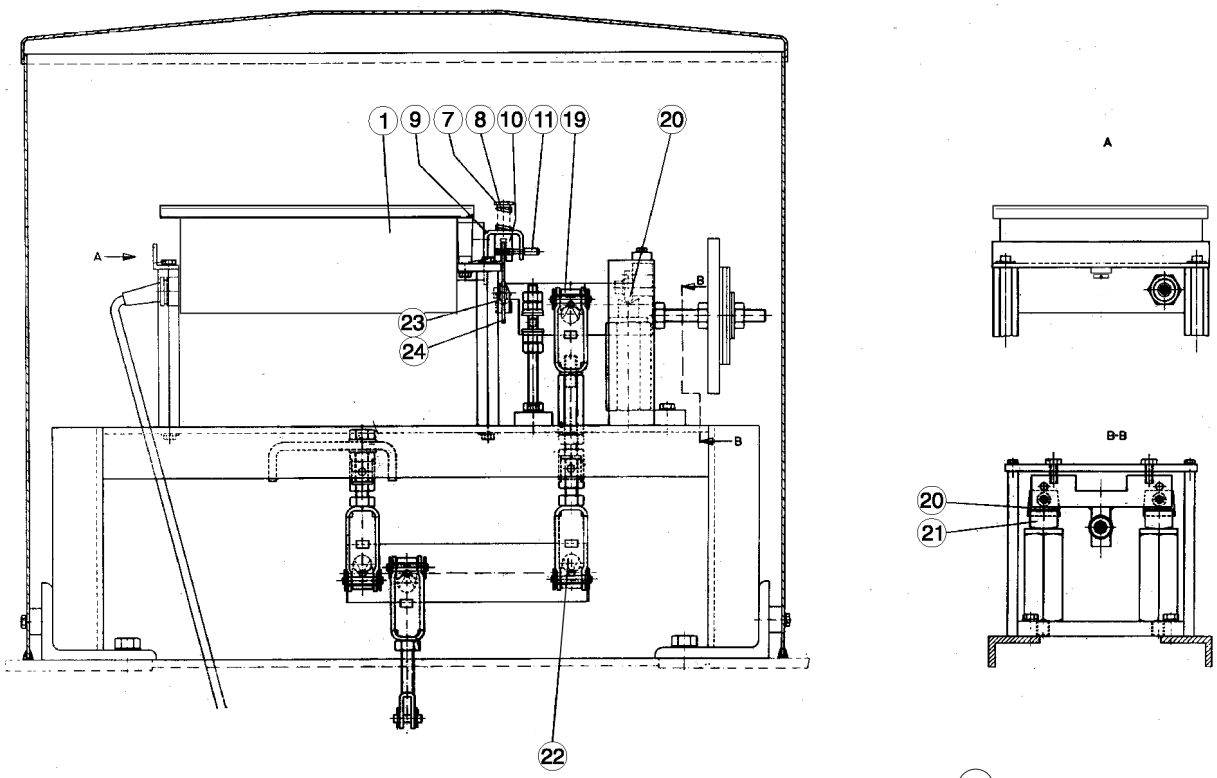
4.1.3 Exploded drawing for KN







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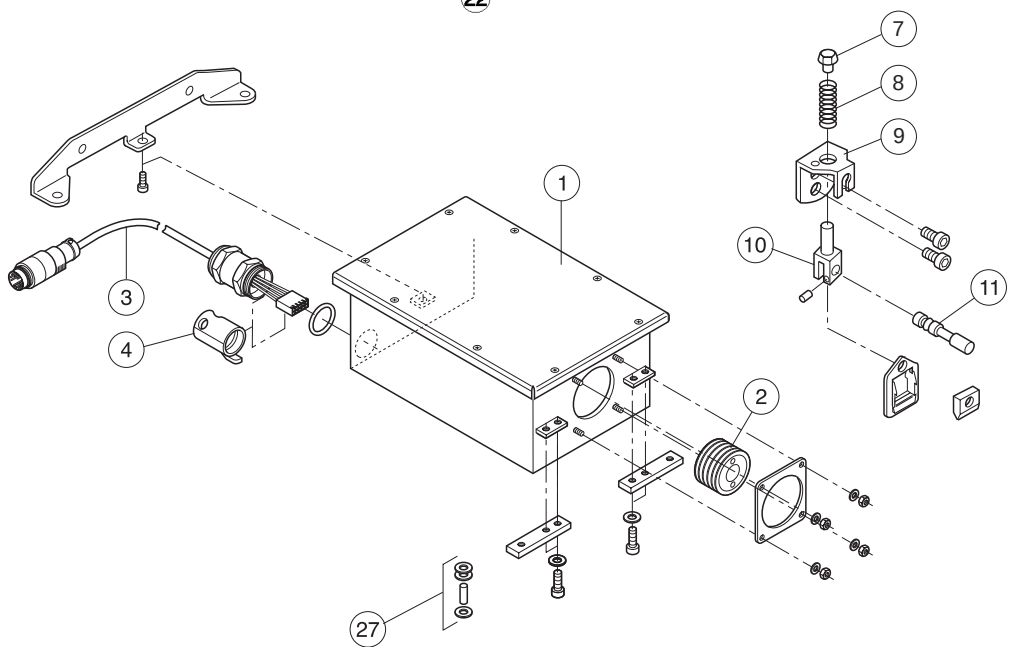
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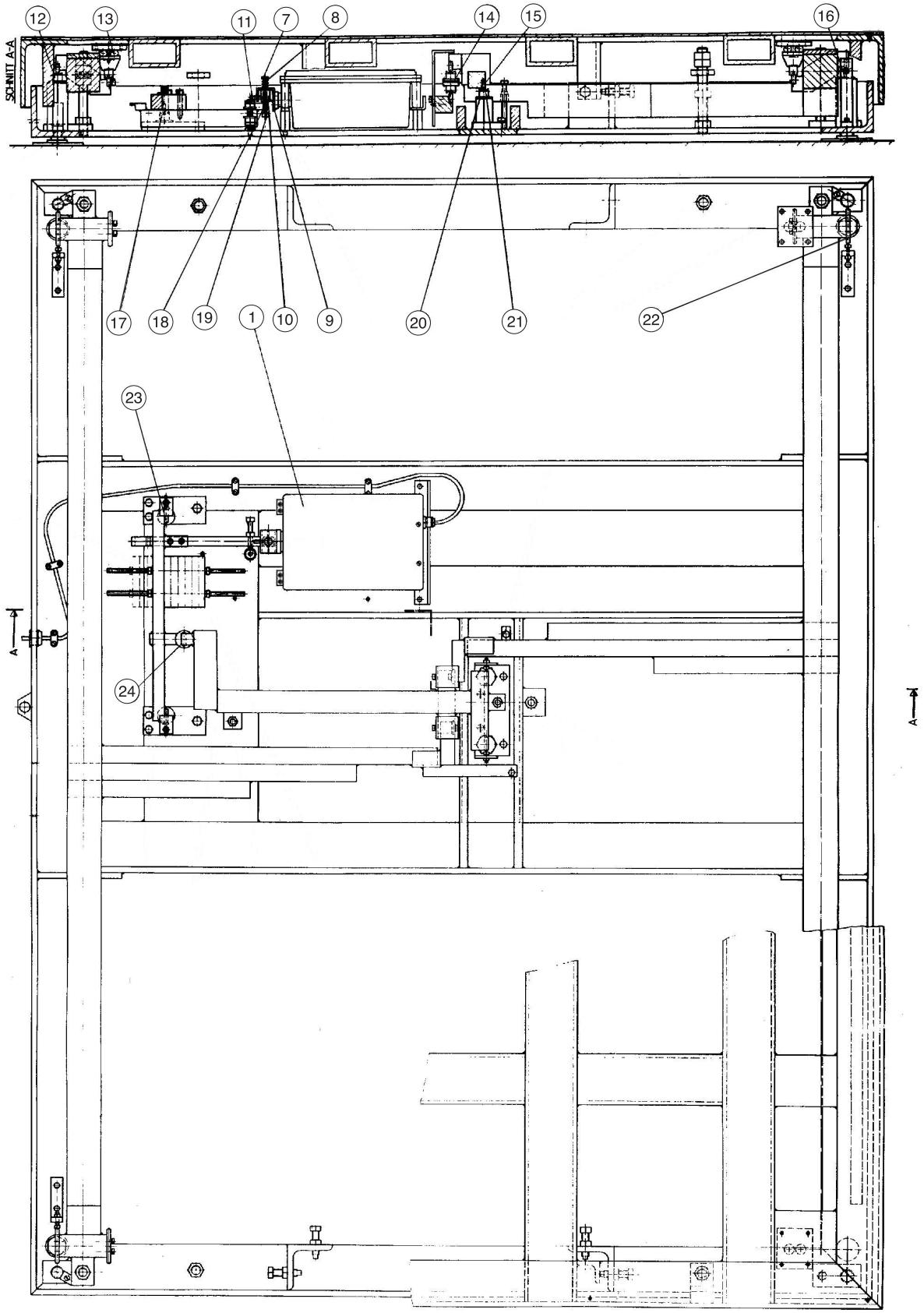
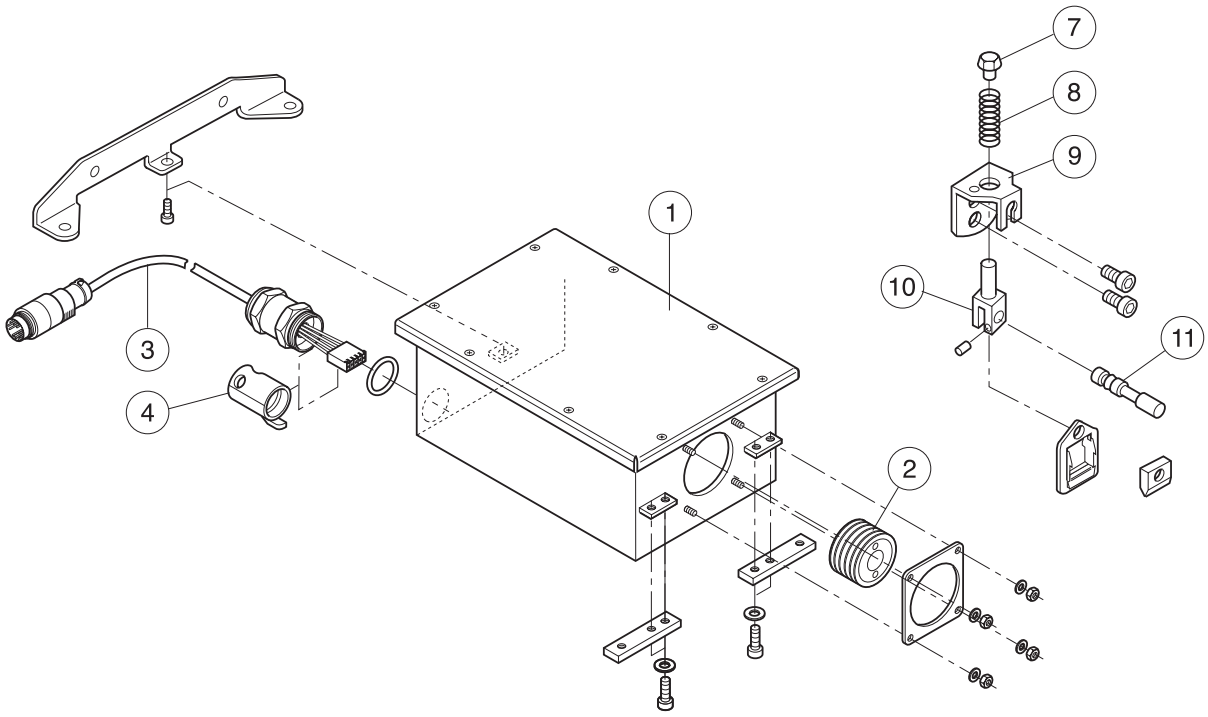
4.1.4 Exploded drawing for KG

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4.2 Spare parts

4.2.1 Spare parts list for KC300 / KCS300 / KC600 / KCS600

Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 716
2	Membrane kit	00 564 10/V
3	Connection cable, 5 m (M20x1.5)	22 006 721
4	PG gland, complete	00 504 219
5	Level	00 502 889
6	Leveling foot	00 502 890
7	Arrester	00 502 933
8	Horizontal guide	00 502 913
9	Load support	00 502 928
10	Shim 0.05 mm 0.055 mm 0.06 mm 0.065 mm 0.075 mm 0.08 mm 0.085 mm 0.09 mm 0.095 mm 0.10 mm	 00 502 935 00 502 936 00 502 937 00 502 938 00 502 940 00 502 941 00 502 942 00 502 943 00 502 944 00 502 945
11	Flexible bearing, long	00 502 901
12	Flexible bearing, short	00 502 896
13	String connector, long	00 502 931
14	Protector	00 502 034
15	Cell bracket	00 504 236
16	Rocker	00 502 930
17	Pressure spring	00 502 009
18	Guide pin	00 502 934
19	String connector, short	00 502 932
	Blank label set	22 000 378
	Identcard	22 000 386

4.2.2 Spare parts list for KD / KE / KE...sk / KES / KES...sk

Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 716
2	Membrane kit	00 056 410/V
3	Connection cable, 5 m (M20x1.5)	22 006 721
4	PG gland, complete	00 504 219
5	Level	00 504 924
6	Leveling foot	00 502 741
7	Pressure screw	00 502 904
8	Pressure spring	00 502 009
9	Cell bracket	00 504 237
10	Clevis	00 502 902
11	Hanger pin	00 502 905
12	Tension link, complete	00 502 947
13	Stop screw	00 502 738
14	Knife edge 30	00 502 552
15	Link, complete	00 502 736
16	Ball 6 mm, workpiece No. 1.4034 Bearing cage Bearing block Bearing shim	00 502 014 00 502 551 00 502 553 00 502 549
17	Knife edge 40	00 502 725
18	Shim for knife edge 40 0.05 mm 0.06 mm 0.07 mm 0.08 mm 0.09 mm 0.10mm	 00 502 729 00 502 727 00 502 730 00 502 728 00 502 731 00 502 726
19	Bearing block 40	00 502 740
20	Bearing shim 40	00 502 739
21	Socket	00 505 253
22	Hanger 40	00 502 732
23	Hex screw M16x35	00 203 675
24	Knife edge 20	00 502 519
25	Cell bearing set	00 505 377
	Cable clip	00 502 098

Position	Designation	Part number
	Pneumatic spring for KE…sk black, 1200 N stainless, 850 N Pneumatic spring for KES…sk stainless, 1400 N	 00 203 912 22 004 321 22 004 329
	Circlip for KE…sk / KES…sk	00 203 928
	Blank label set	22 000 378
	Identcard	22 000 386

4.2.3 Spare parts list for KN

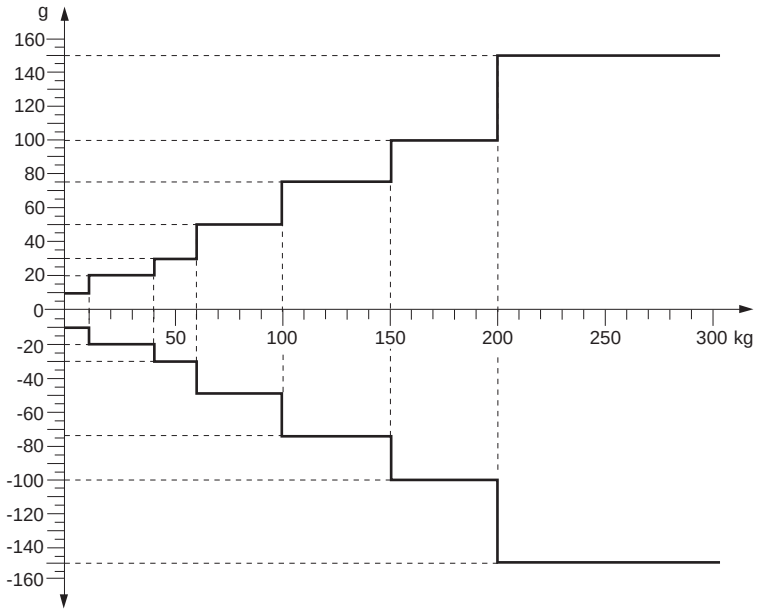
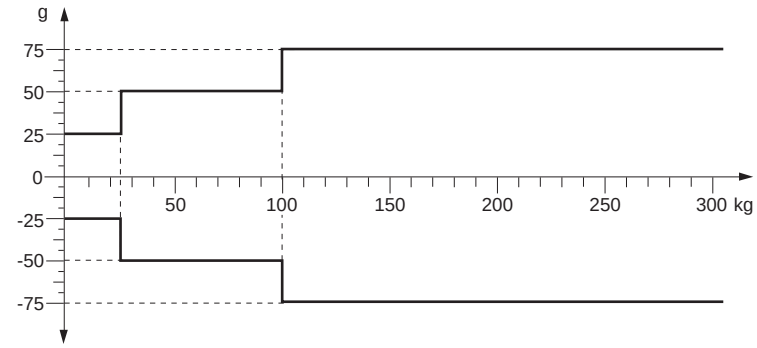
Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 717
2	Membrane kit	00 056 410/V
3	Connection cable, 5 m (M20x1.5)	22 006 721
4	PG gland, complete	00 504 219
7	Pressure screw	00 502 904
8	Pressure spring	00 502 009
9	Cell bracket	00 504 237
10	Clevis	00 502 950
11	Hanger pin	00 502 951
12	Ball support, complete	00 502 758
13	Knife edge	00 502 762
14	Bearing ball	00 502 761
15	Link	00 502 760
16	Load knive edge	00 502 767
17	Hinged bearing	00 502 757
18	Bearing shim	00 502 751
19	Bearing	00 502 768
20	Knife edge 20	00 502 747
21	Hinged bearing	00 502 750
22	Knife edge Shim 0.10 mm 0.09 mm 0.08 mm 0.07 mm 0.06 mm 0.05 mm	00 502 765 00 500 404 00 500 405 00 500 406 00 500 407 00 500 408 00 500 409
23	Knife edge 20	00 502 519
24	Hanger, complete	00 502 949
	Blank label set	22 000 378
	Identcard	22 000 386

4.2.4 Spare parts list for KG

Position	Designation	Part number
1	Measuring cell TBrick 15, encapsulated	22 006 717
2	Membrane kit	00 056 410/V
3	Connection cable, 5 m (M20x1.5)	22 006 721
4	PG gland, complete	00 504 219
7	Pressure screw	00 502 904
8	Pressure spring	00 502 009
9	Cell bracket	00 504 237
10	Clevis	00 502 950
11	Hanger pin	00 502 951
12	Hinged bearing	00 502 746
13	Ball support, complete	00 502 755
14	Pressure plate	00 502 748
15	Knife edge	00 502 747
16	Bearing shim	00 502 745
17	Hinged bearing	00 502 750
18	Knife edge 20 Shim 0.10 mm 0.09 mm 0.08 mm 0.07 mm 0.06 mm 0.05 mm	00 502 519 00 500 404 00 500 405 00 500 406 00 500 407 00 500 408 00 500 409
19	Hanger, complete	00 502 949
20	Bearing shim	00 502 751
21	Hinged bearing	00 502 750
22	Knife edge	00 502 753
23	Knife edge	00 502 747
24	Thrust bearing	00 502 752
	Blank label set	22 000 378
	Identcard	22 000 386

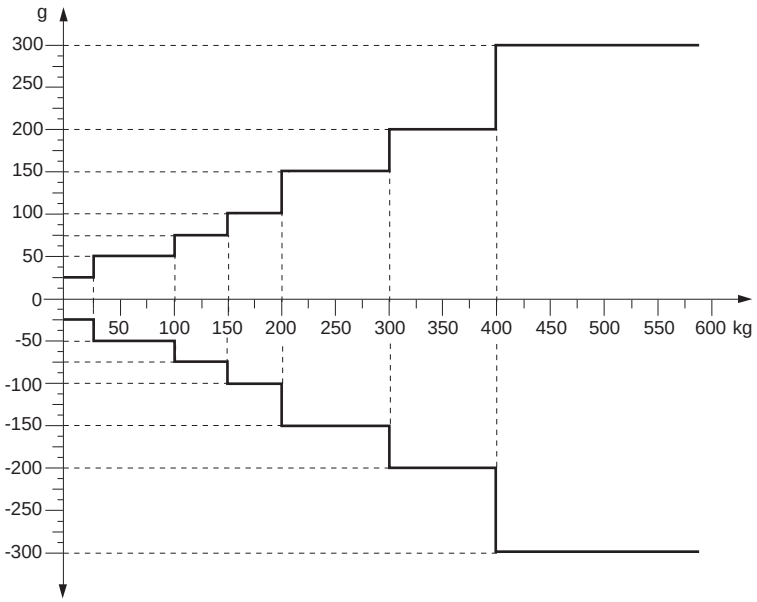
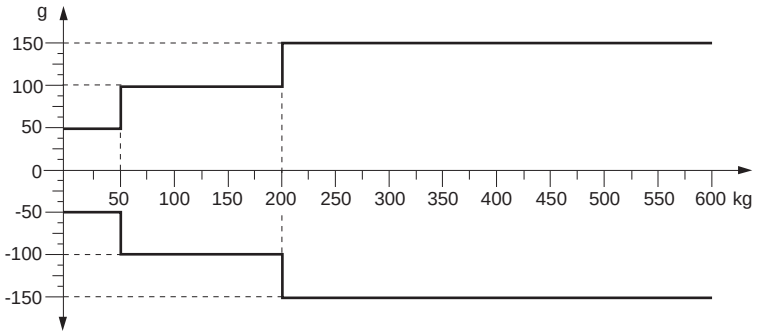
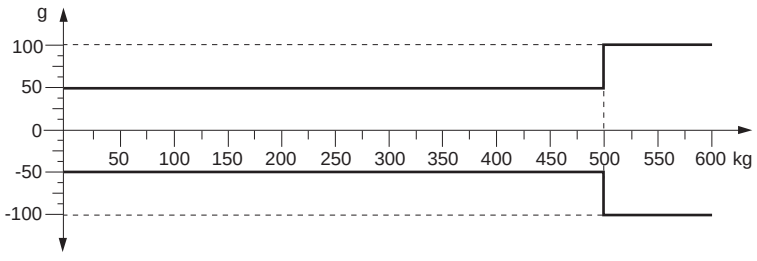
4.3 Certification data, tolerances and certification error limits

4.3.1 KC300 / KCS300

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 100 kg Tolerance 50 g	Certification class III e1 value 0.02 kg e2 value 0.05 kg e3 value 0.1 kg max 300 kg min 0.4 kg Readability in control mode: 2 g	
1 x 6000 e 100 %	Weight 100 kg Tolerance 50 g	Certification class III e value 0.05 kg max 300 kg min 1.0 kg Readability in control mode: 5 g	

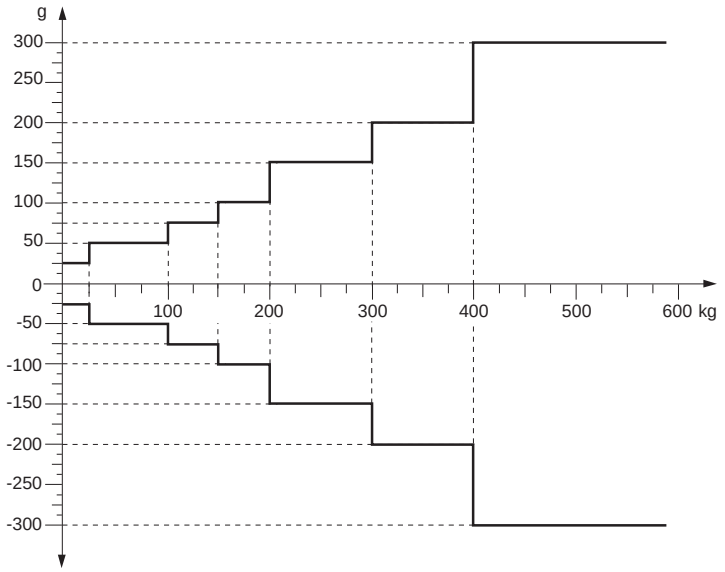
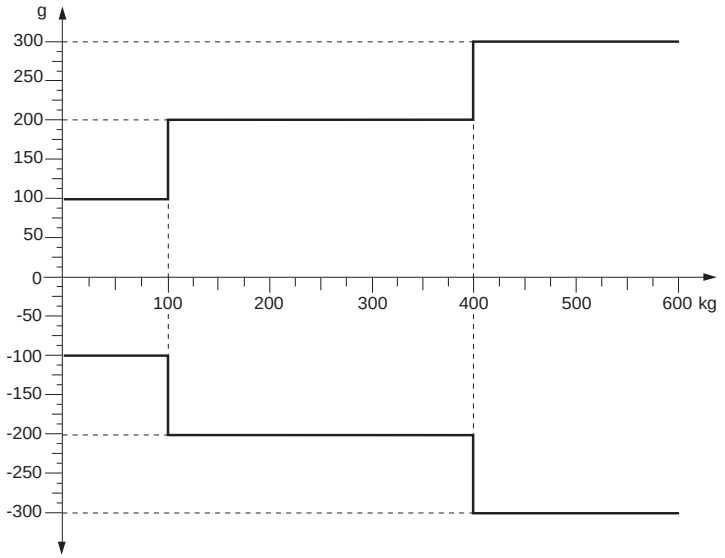
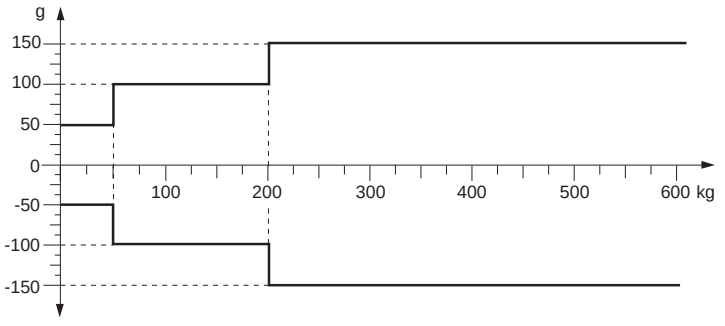
Additional configurations: according to OIML

4.3.2 KC600 / KCS600

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 200 kg Tolerance 100 g	Certification class III e1 value 0.05 kg e2 value 0.1 kg e3 value 0.2 kg max 600 kg min 1.0 kg Readability in control mode: 5 g	
1 x 6000 e 100 %	Weight 200 kg Tolerance 100 g	Certification class III e value 0.1 kg max 600 kg min 2.0 kg Readability in control mode: 10 g	
1 x 6000 e 100 %	Weight 200 kg Tolerance 50 g	Certification class II e value 0.1 kg max 600 kg min 0.5 kg Readability in control mode: 10 g	

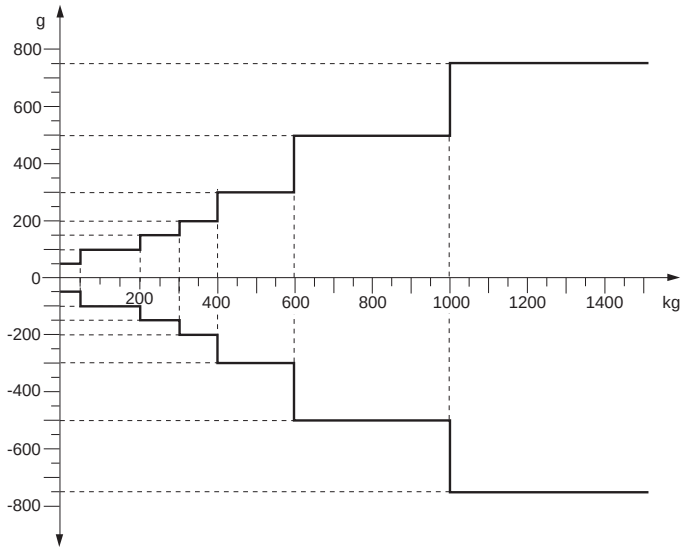
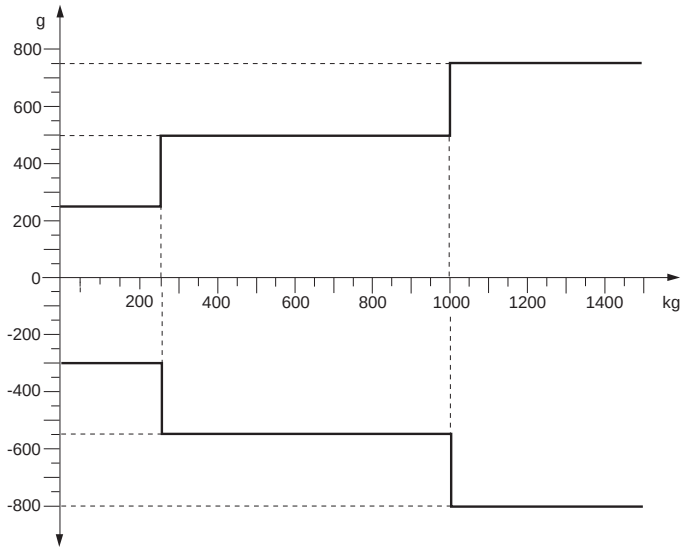
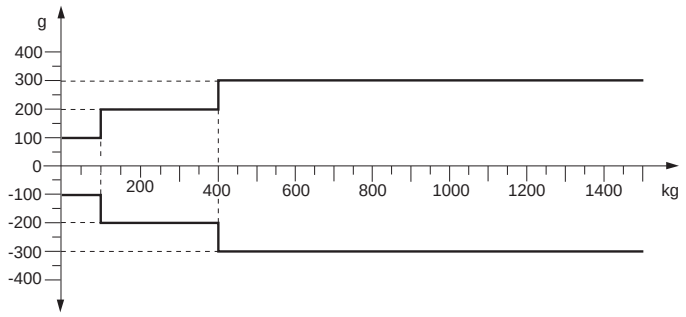
Additional configurations: according to OIML

4.3.3 KD600

Cell configuration	**Test with eccentric load**	**Linearity Hysteresis Range**	
3 x 3000 d 100 %	Weight 200 kg Tolerance 100 g	Certification class III e1 value 0.05 kg e2 value 0.1 kg e3 value 0.2 kg max 600 kg min 1 kg Readability in control mode: 5 g	
1 x 3000 d 100 %	Weight 200 kg Tolerance 200 g	Certification class III e value 0.2 kg max 600 kg min 4 kg Readability in control mode: 20 g	
1 x 6000 d 100 %	Weight 200 kg Tolerance 100 g	Certification class III e value 0.1 kg max 600 kg min 2 kg Readability in control mode: 10 g	

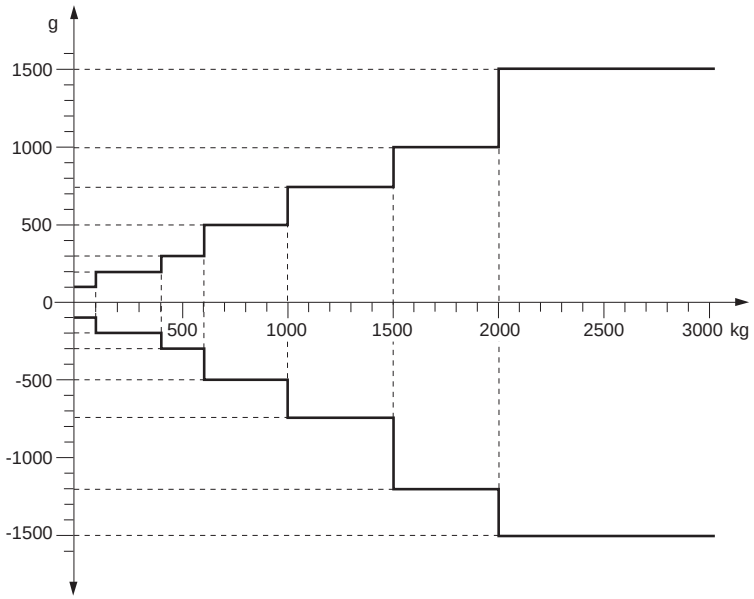
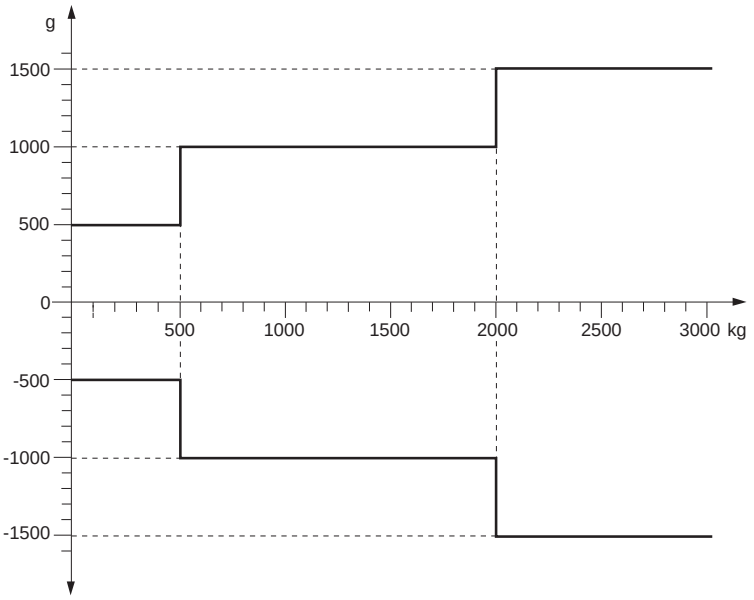
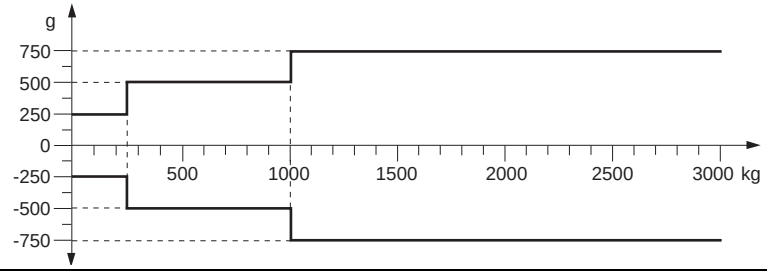
Additional configurations: according to OIML

4.3.4 KD1500 / KE1500 / KE1500sk / KES1500 / KES1500sk

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 500 kg Tolerance 300 g	Certification class III e1 value 0.1 kg e2 value 0.2 kg e3 value 0.5 kg max 1500 kg min 2 kg Readability in control mode: 10 g	
1 x 3000 e 100 %	Weight 500 kg Tolerance 500 g	Certification class III e value 0.5 kg max 1500 kg min 10 kg Readability in control mode: 50 g	
1 x 7500 e 100 %	Weight 500 kg Tolerance 300 g	Certification class III e value 0.2 kg max 1500 kg min 4 kg Readability in control mode: 20 g	

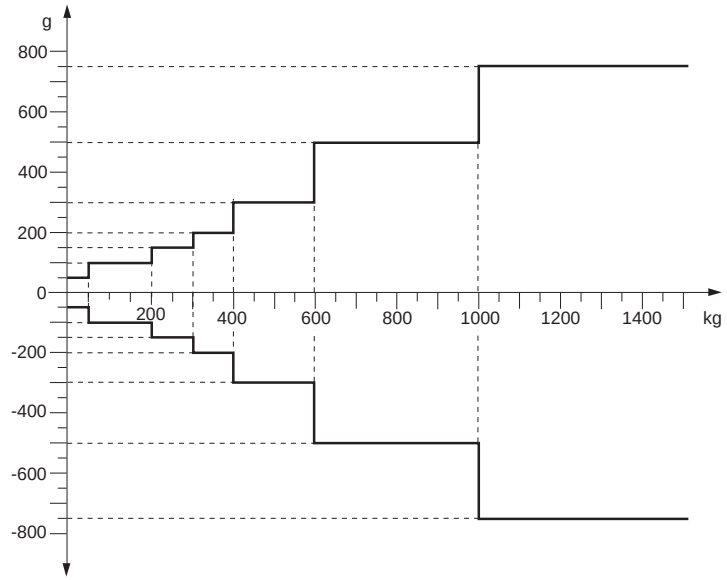
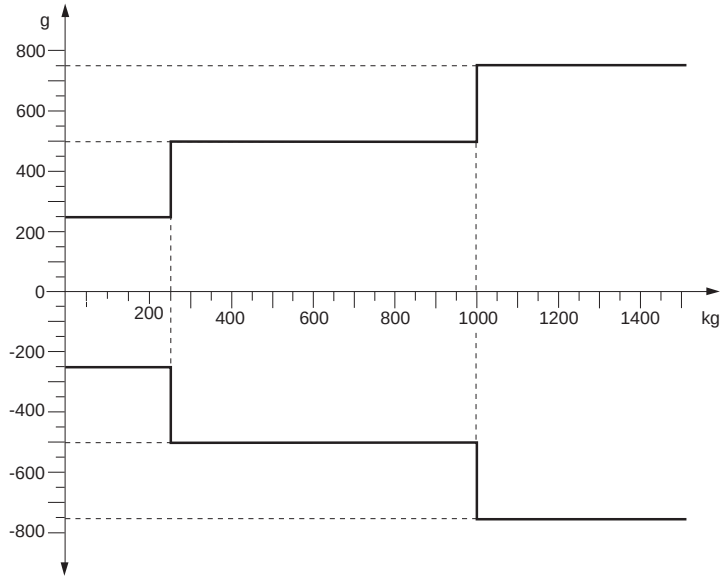
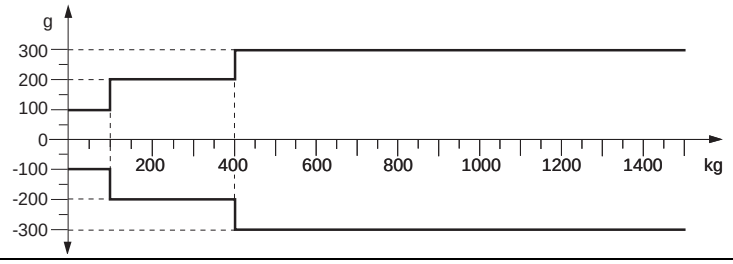
Additional configurations: according to OIML

4.3.5 KE3000 / KE3000sk / KES3000 / KES3000sk

Cell configuration	**Test with eccentric load**	**Linearity Hysteresis Range**	
3 x 3000 e 100 %	Weight 1000 kg Tolerance 500 g	Certification class III e1 value 0.2 kg e2 value 0.5 kg e3 value 1 kg max 3000 kg min 4 kg Readability in control mode: 20 g	
1 x 3000 e 100 %	Weight 1000 kg Tolerance 1000 g	Certification class III e value 1 kg max 3000 kg min 20 kg Readability in control mode: 100 g	
1 x 6000 e 100 %	Weight 1000 kg Tolerance 500 g	Certification class III e value 0.5 kg max 3000 kg min 10 kg Readability in control mode: 50 g	

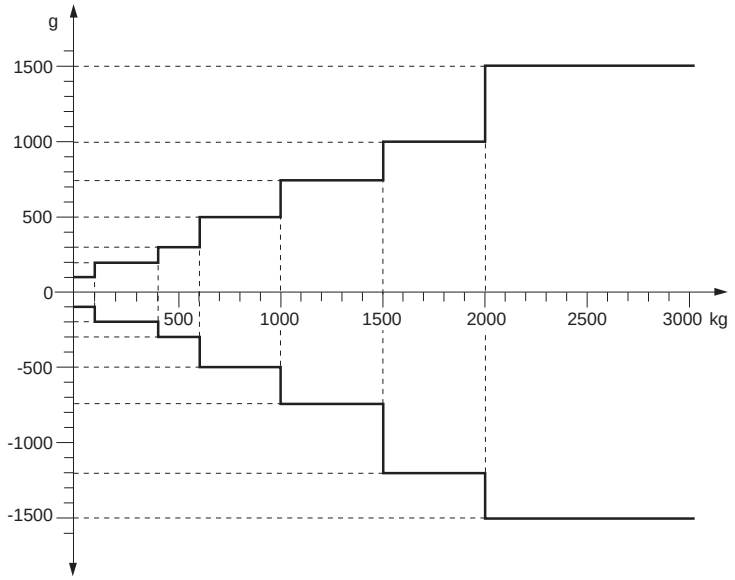
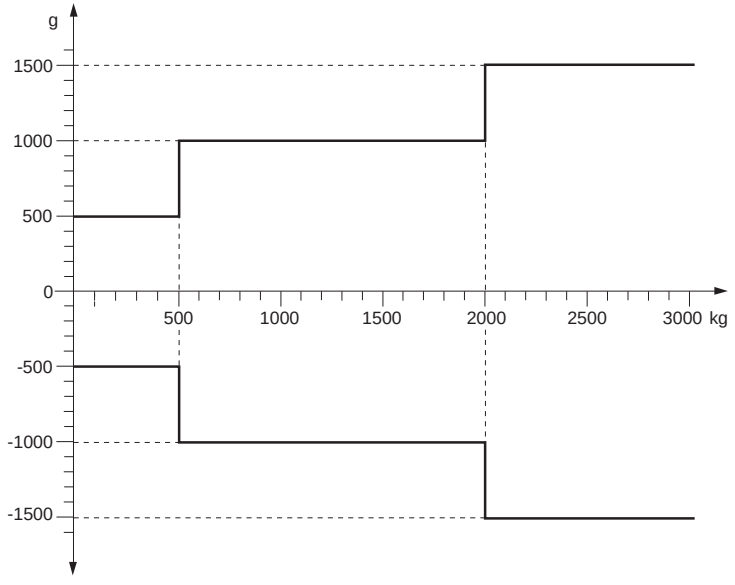
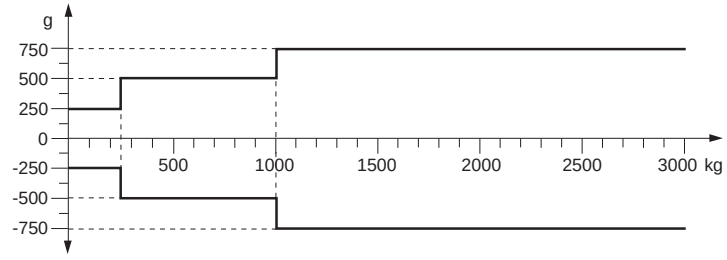
Additional configurations: according to OIML

4.3.6 KN1500

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 500 kg Tolerance 300 g	Certification class III e1 value 0.1 kg e2 value 0.2 kg e3 value 0.5 kg max 1500 kg min 2 kg Readability in control mode: 10 g	
1 x 3000 e 100 %	Weight 500 kg Tolerance 500 g	Certification class III e value 0.5 kg max 1500 kg min 10 kg Readability in control mode: 50 g	
1 x 7500 e 100 %	Weight 500 kg Tolerance 300 g	Certification class II e value 0.2 kg max 1500 kg min 4 kg Readability in control mode: 20 g	

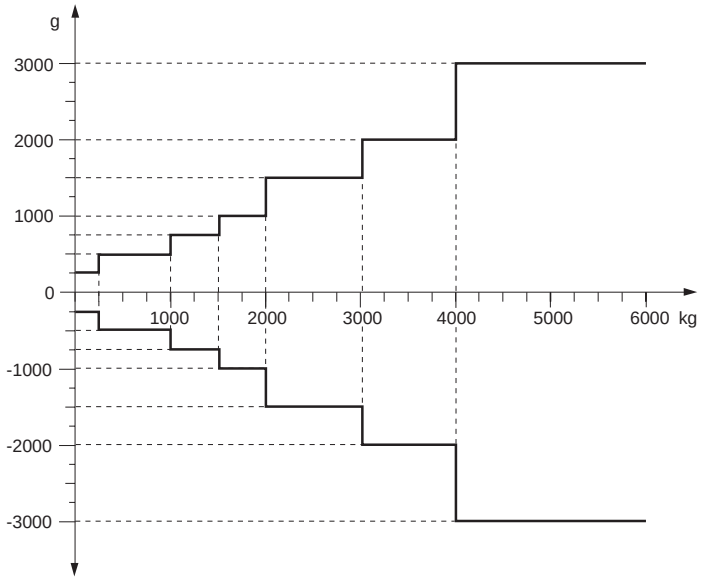
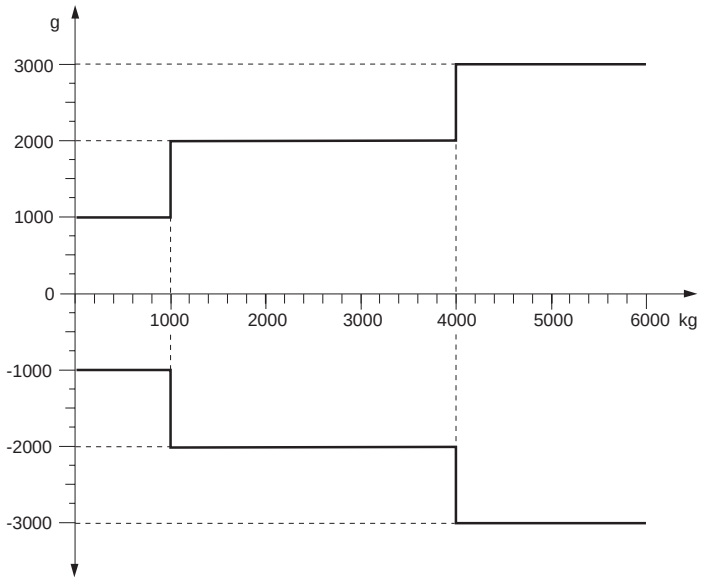
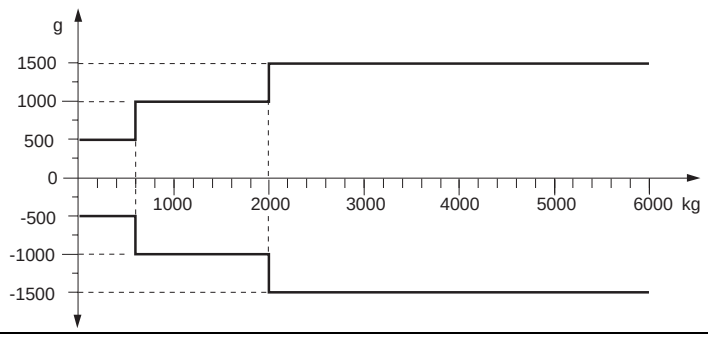
Additional configurations: according to OIML

4.3.7 KG3000

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 1000 kg Tolerance 500 g	Certification class III e1 value 0.2 kg e2 value 0.5 kg e3 value 1 kg max 3000 kg min 4 kg Readability in control mode: 20 g	
1 x 3000 e 100 %	Weight 1000 kg Tolerance 1000 g	Certification class III e value 1 kg max 3000 kg min 20 kg Readability in control mode: 100 g	
1 x 6000 e 100 %	Weight 1000 kg Tolerance 500 g	Certification class III e value 0.5 kg max 3000 kg min 10 kg Readability in control mode: 50 g	

Additional configurations: according to OIML

4.3.8 KG6000

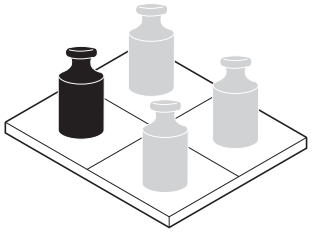
Cell configuration	Test with eccentric load	Linearity Hysteresis Range	
3 x 3000 e 100 %	Weight 2000 kg Tolerance 1000 g	Certification class III e1 value 0.5 kg e2 value 1 kg e3 value 2 kg max 6000 kg min 10 kg Readability in control mode: 50 g	
1 x 3000 e 100 %	Weight 2000 kg Tolerance 2000 g	Certification class III e value 2 kg max 6000 kg min 40 kg Readability in control mode: 200 g	
1 x 6000 e 100 %	Weight 2000 kg Tolerance 1000 g	Certification class II e value 1 kg max 6000 kg min 20 kg Readability in control mode: 100 g	

Additional configurations: according to OIML

4.4 Checking and adjusting the cornerload

4.4.1 Checking the cornerload

1. Ascertain the configured weighing range and readability.
2. Load test weight in the middle of load plate according to test and adjusting specifications in section 4.3 and tare.
3. Load test weight in succession in the middle of each of the 4 quadrants and note absolute value with sign.



If absolute values lie outside certification error curve in section 4.3, adjust cornerload (see following section).

4.4.2 Adjusting the cornerload for KC / KCS

1. Activate master mode of the terminal and select control mode.
2. Check cornerload in control mode with test weights given above, and note deviations with sign.
3. Based on the following adjustment example, determine whether there is a + or – dominance from the corner to the middle which would need to be adjusted.

Adjustment example

Add up the signed deviation values:
+70 g –100 g –160 g –140 g = –330 g
Divide total by 4: –330 g : 4 = –82.5 g

- If the calculated value is larger than half of the certification error, a + or – dominance is present, and the distance between supporting frame and load lever on all corners must be adjusted.
- With small deviations, proceed with adjustment.

1. Adjusting the + or – dominance of a corner to the middle

The adjustment is carried out by placing shims **between supporting frame and load lever flexible bearing**.

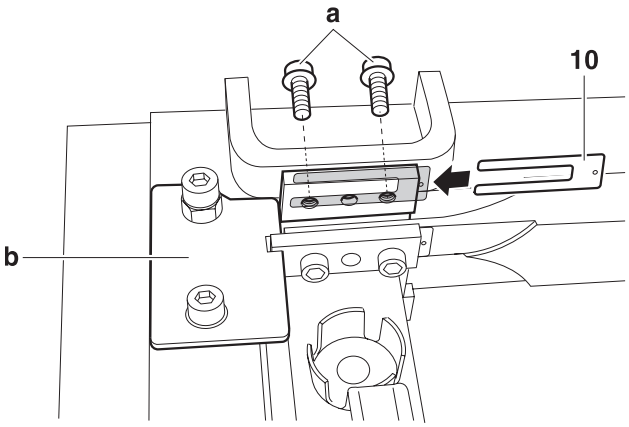
Adjustment rule

- With **– dominance**, **reduce** distance between supporting frame and load lever flexible bearing, i.e. insert thinner shim.
- With **+ dominance**, **increase** distance between supporting frame and load lever flexible bearing, i.e. insert thicker shim.

Effect of shims

When adjusting the + or – dominance, a shim of 0.1 mm causes a difference of approx. 15 g.

Procedure for KC



1. Lift off load carrier.
2. Loosen screws (a) and add shims (10) of a new size; insert between load lever flexible bearing and supporting frame and screw in screws.
3. Ensure correct position of lever safety (b).
4. Replace load carrier and recheck cornerload.

2. Adjusting the corners

The corner adjustment is carried out by placing shims **between load lever and suspension bar flexible bearing**.

Adjustment rule

- With **positive deviation**, **reduce** distance between load lever and suspension bar flexible bearing, i.e. insert thinner shim.
- With **negative deviation**, **increase** distance between load lever and suspension bar flexible bearing, i.e. insert thicker shim.
- Begin at the corner with the greatest deviation.

Note

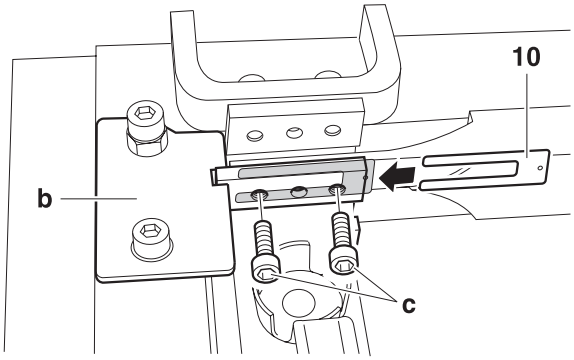
Corner adjustments also effect + and – dominance.
With + dominance, adjust corner with – deviation.
With – dominance, adjust corner with + deviation.

See also, Service Software for Corner Adjusting ME-00507660.

Effect of shims

Model	Test weight	Shim	Effect
KC300	100 kg	0.01 mm	approx. 40 g
KC600	200 kg	0.01 mm	approx. 80 g
KCS300	100 kg	0.01 mm	approx. 55 g
KCS600	200 kg	0.01 mm	approx. 110 g

Procedure for KC



1. Lift off load carrier.
2. Loosen screws (c) and add shims (10) to a thickness appropriate to the deviation. Place shims between load lever and flexible bearing on suspension bar, and screw in screws.
3. Ensure correct position of lever protector (b).
4. Replace load carrier and recheck cornerload.

4.4.3 Adjusting cornerload for KD / KE

1. Activate master mode of the terminal and select control mode.
2. Check cornerload in control mode with test weights listed in section 4.3.3 onwards, and note deviations with sign.
3. Adjustment is necessary if tolerances are exceeded during eccentric load testing, see section 4.3.3 onwards.

Adjustment is performed by altering the knife edge distances on left and right of load lever.

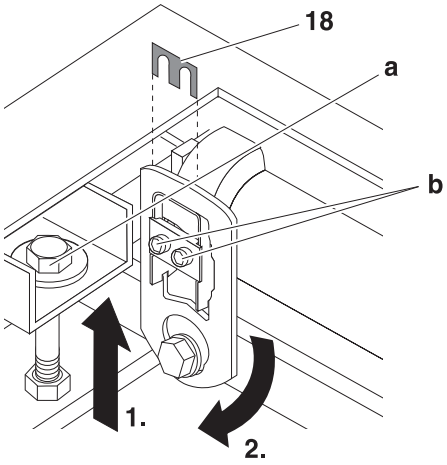
Adjustment rule

- With **negative deviation**, **increase** distance between knife edges on load edge, i.e. insert shims.
- With **positive deviation**, **reduce** distance between knife edges on load edge, i.e. remove shims.
- Begin at the corner with the greatest deviation.

Effect of the shims

Model	Test weight	Shim	Effect
KD600	200 kg	0.01 mm	approx. 20 g
KD / KE / KES150	500 kg	0.01 mm	approx. 50 g
KD / KE / KES300	1,000 kg	0.01 mm	approx. 100 g

Procedure for KD / KE



1. Remove or open load plate.
2. Unscrew locking bolt (a).
3. Lift relevant corner of suspension frame (b) with lifting iron and remove hanger from its hinges.
4. Loosen knife edge at mounting screws (b) and correct distance with shims (18).
5. Screw in mounting screws and return hanger (19) to its hinges.
6. Set and fix fastening screw.

4.4.4 Adjusting cornerload for KN / KG

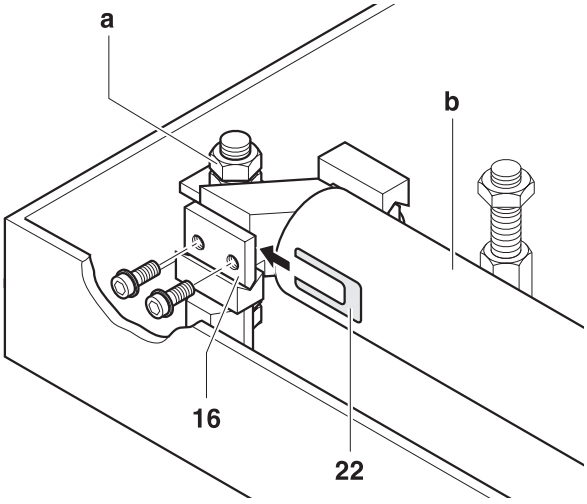
1. Activate Master mode of the terminal and select control mode.
2. Check cornerload in control mode with test weights listed in section 4.3.6 onwards, and note deviations with sign.
3. Adjustment is necessary if tolerances are exceeded during eccentric load testing, see section 4.3.6.

Adjustment is performed by altering the knife edge distances on left and right of load lever.

Adjustment rule

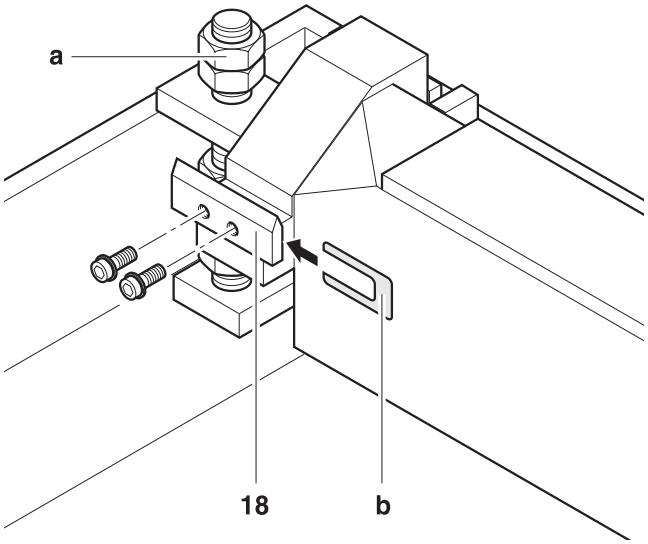
- With **negative deviation**, **increase** distance between knife edges on load edge, i.e. insert shims.
- With **positive deviation**, **reduce** distance between knife edges on load edge, i.e. remove shims.
- Begin at the corner with the greatest deviation.

Procedure for KN



1. Remove angled cover.
2. Screw up load-lever lock nut (a) at corners concerned.
3. Lift load lever (b) with lifting iron and support.
4. Loosen knife edge (16) at mounting screws and correct distance with shims (22).
5. At first only slightly tighten knife edge.
6. Lower load lever and load if necessary so that knife edge can align horizontally.
7. Tighten knife edge.

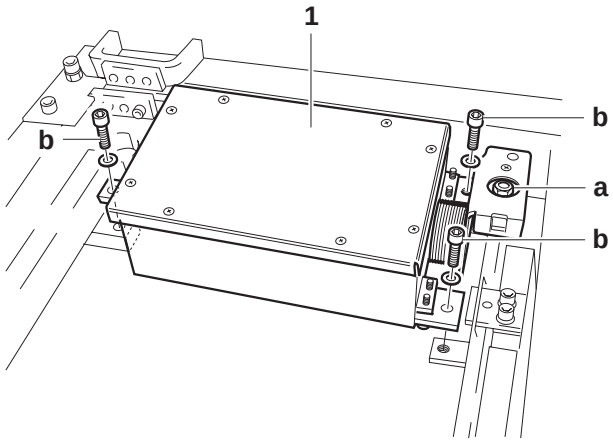
Procedure for KG



1. Remove load plate.
2. Screw off load-lever lock nuts (a).
3. Lift off load frame. When using lifting tools, make sure that load frame does not tilt and jam.
4. Correct knife edge (18) with shim (b).

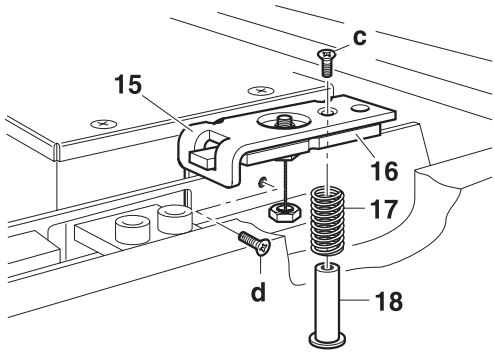
4.5 Corrective maintenance for KC / KCS

4.5.1 Removing the measuring cell for KC / KCS



1. Switch off terminal, disconnect power plug and unscrew connection cable.
2. Lift off load carrier.
3. Loosen nut (a) on string connector, and hold on to nut on string connector with an adjustable wrench when loosening.
4. Loosen screws (b) on measuring cell and lift off from above.
5. Withdraw connection cable under supporting frame.

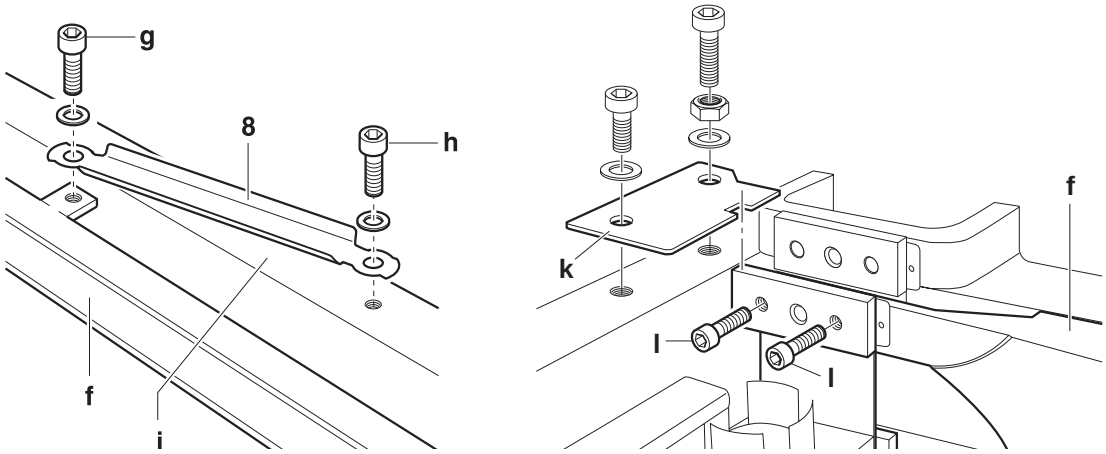
4.5.2 Removing the cell force transmission for KC / KCS



1. Loosen screw (c) and remove rocker (16), pressure spring (17) and guide pin (18).
2. Remove screws (d) from cell bracket (15).

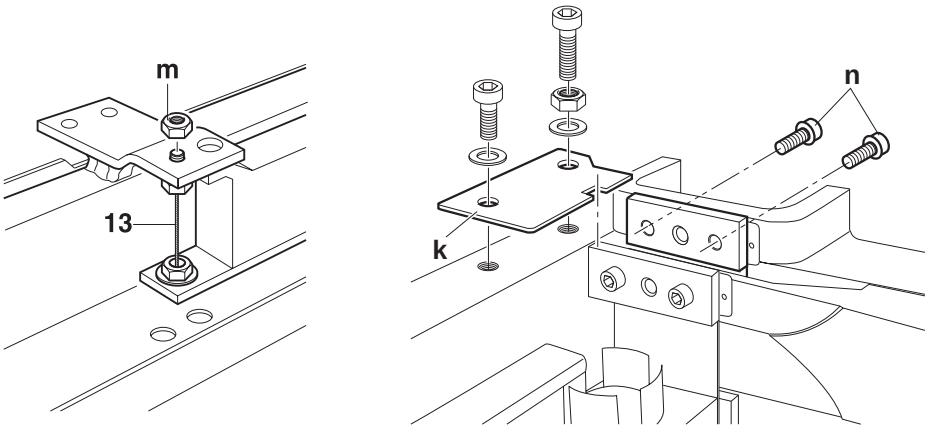
4.5.3 Removing the load lever and suspension bars for KC / KCS

Removing the suspension bars



1. Remove lever lock (k).
2. First, loosen screw (g) from horizontal guide (8) on suspension bar (f), and then loosen screw (h) on supporting frame (i).
3. Remove horizontal guide, screws and washers.
4. Loosen screws (l) on both ends of suspension bar of load lever and remove from positioning pins.
5. Lift supporting frame and remove suspension bar (f).
6. Remove second suspension bar.

Removing the load lever

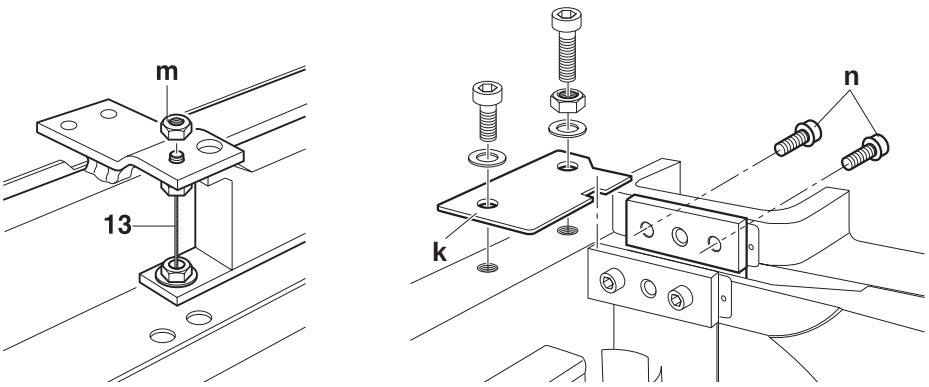


1. Lift "short" load lever by 25 mm, so that the string connector (13) is unloaded.
2. Loosen nut (m) on string connector (13), and hold hex nut firmly.
3. Loosen screws (n) on "short" load lever at supporting frame. Remove load lever from positioning pins, remove support and remove load lever from above.
4. Remove "long" load lever in the same manner.

4.5.4 Installing the load lever and suspension bars for KC / KCS

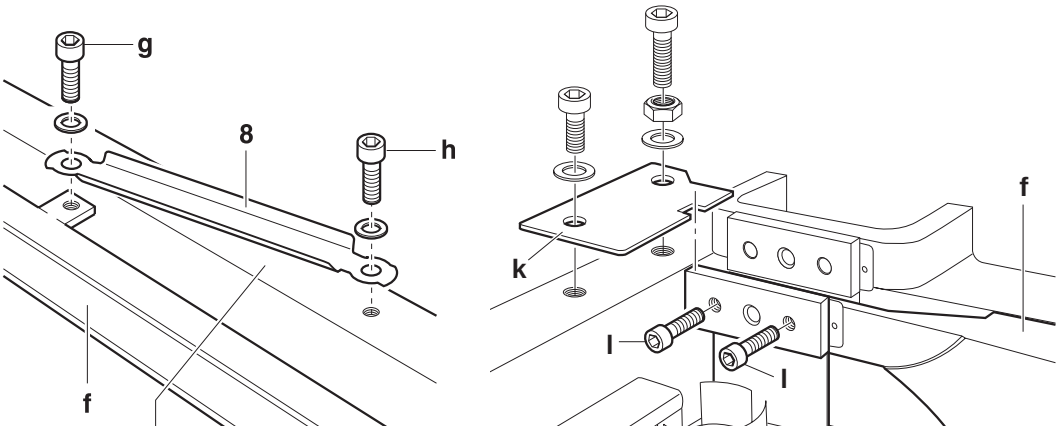
Note
When installing load lever and suspension bars, use shims which were already installed at each corner.

Installing the load lever



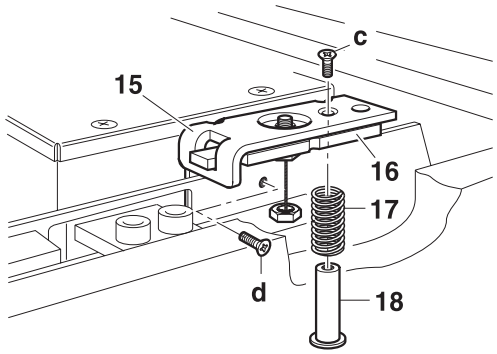
1. Place "long" load lever on positioning pin located on supporting frame, and screw down with screws (n).
2. Place "short" load lever on positioning pin, extend load lever under string connector (13) and screw down with screws (n).
3. Secure string connector (13) with nut (m), and remove support.

Installing the suspension bars



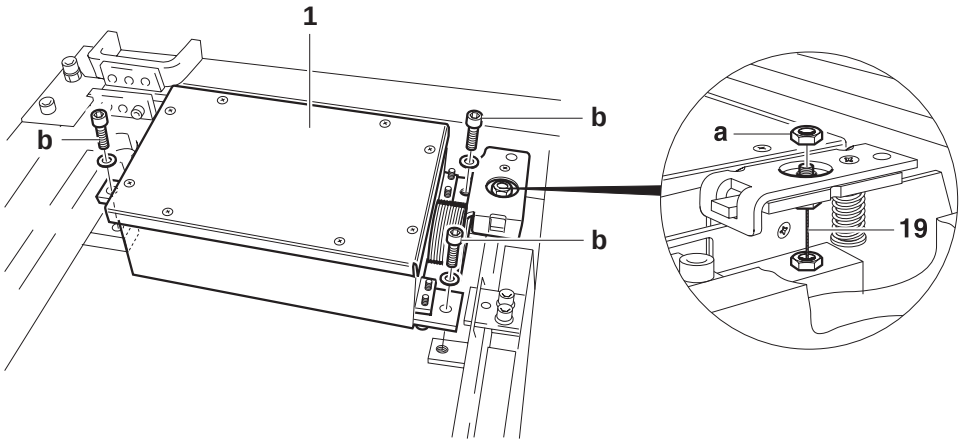
1. Place suspension bars (f) on positioning pins, and lift up supporting frame (i). Insert screws (l), but do not tighten.
2. Align suspension bars by placing a ruler above both bars and loading them with 20 kg; screw in screws (l).
3. Secure horizontal guide (8) to suspension bar.
4. Oscillate suspension bars (f): when oscillating, suspension bars must not touch each other.
5. Secure other side of horizontal guide (8) to supporting frame.
6. Align and screw in lever safety (k).
7. Set stop screw (o) to same height as load support.

4.5.5 Mounting the cell force transmission for KC / KCS



1. Screw on cell bracket (15) to measuring cell with screws (d).
2. Secure rocker (16), guide pin (18) and pressure spring (17) with screw (c).

4.5.6 Installing the measuring cell for KC / KCS



1. Insert measuring cell (1).
2. Screw in screws (b), but do not tighten.
3. Secure string connector (19) with nut (a). String connector must not be allowed to twist.
4. Adjust measuring cell until string connector is vertical; screw down measuring cell.

4.5.7 Replacing the measuring cell for KC / KCS

Cell force transmission, connection cable and mounting strips must be removed from faulty measuring cell and attached to replacement measuring cell.

Procedure

1. Remove measuring cell, see section 4.5.1.
2. Remove cell force transmission (see section 4.5.2), and attach to replacement measuring cell (see section 4.5.5).
3. Remove mounting strips from faulty measuring cell and attach to replacement unit.
4. Unscrew PG lock.
5. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
6. Screw on PG lock.
7. Install measuring cell, see section 4.5.6.

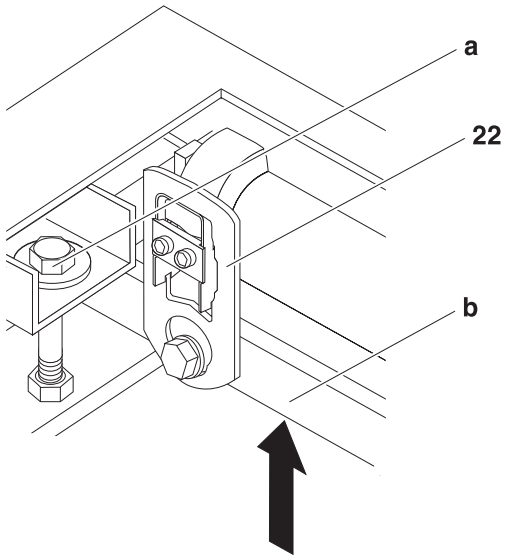
Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be, see 4.4.1.

4.6 Corrective maintenance for KD / KE / KES

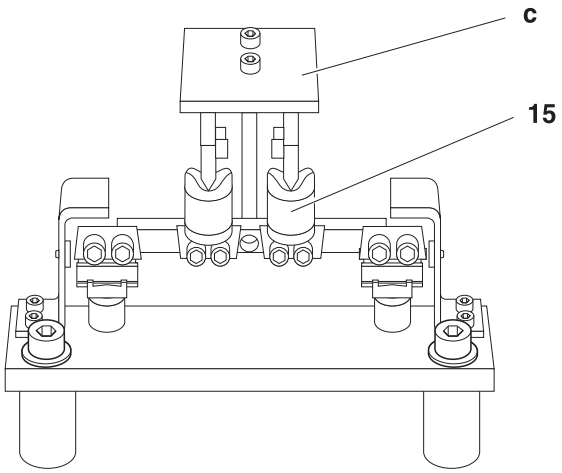
4.6.1 Replacing the hanger for KD / KE / KE...sk / KES / KES...sk

Note
Before removing, take note of the installation location and position of the hanger.



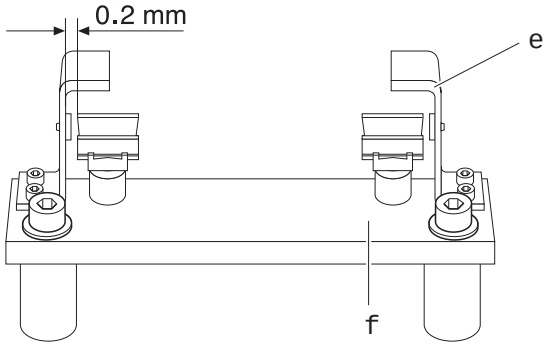
1. Remove or open load plate.
2. Unscrew and remove the 4 locking bolts (a) after loosening the lock nut.
3. Lift suspension frame (b) and remove hanger from hinges (22).
4. For mounting, carry out these steps in reverse order.

4.6.2 Replacing the load frame, link, load lever and knife edge 30 for KD / KE / KE...sk / KES / KES...sk



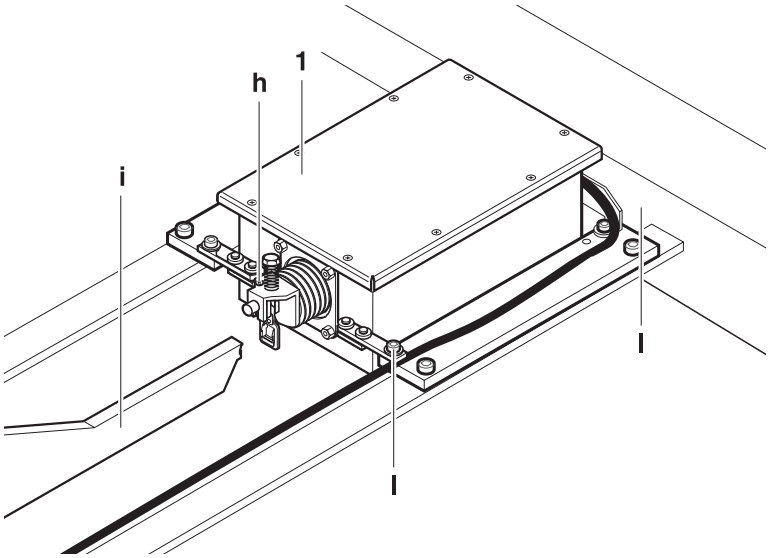
1. Remove or open load plate.
2. Unscrew and completely remove the 4 locking bolts after loosening the lock nut.
3. Unscrew the 4 fastening screws from load frame.
4. With an KE...sk / KES...sk, close load plate and screw in 2 eye bolts.
5. Lift off load frame according to noted installation position.
6. Remove lever safety from transfer lever.
7. Completely remove links (15).
8. Remove load lever, and unscrew knife edge 30.
9. For mounting, carry out these steps in reverse order.

4.6.3 Replacing the stop screw, bearing, mid-position lever and knife edge 20 for KD / KE / KE...sk / KES / KES...sk



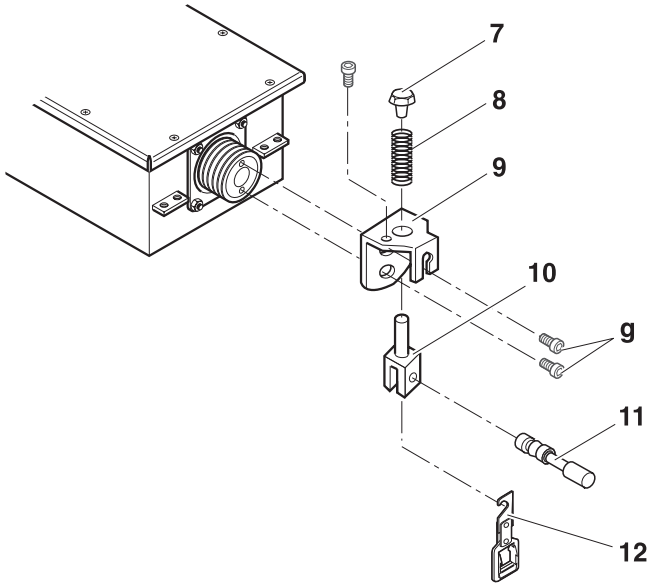
1. Remove or open load plate.
2. Loosen locking bolt on cell bracket.
3. Remove mid-position lever from hinge on tension link.
4. With a short mid-position lever, remove one thrust jaw angle bracket (e); with a long mid-position lever, remove both angle brackets.
5. Remove bearing seat (f).
6. Remove mid-position lever, and unscrew knife edge 20.
7. For mounting, carry out these steps in reverse order.
   Adjust stop screw with a 0.2 mm clearance.

4.6.4 Removing and installing the measuring cell for KD / KE / KE...sk / KES / KES...sk



1. Shut off terminal, disconnect power plug.
2. Unscrew connection cable from terminal.
3. Loosen cable clip and remove connection cable from cable clamps.
4. Route connection cable through supporting frame.
5. Loosen fastening screws (l) on measuring cell.
6. Unscrew locking bolt (h), and remove hook from hinge.
7. Remove measuring cell (1) from weighing platform.
8. For mounting, carry out these steps in reverse order.

4.6.5 Replacing the force transmission for KD / KE / KE...sk / KES / KES...sk

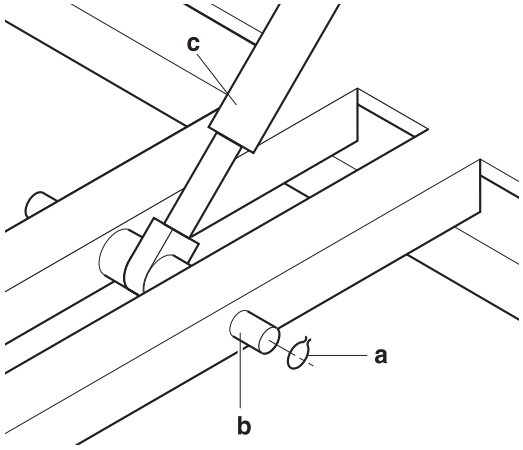


1. Remove measuring cell, see section 4.6.4.
2. Unscrew pressure screw (7), and remove pressure spring (8).
3. Remove clevis (10) and hanger pin (11).
4. Unscrew screws (g) and remove cell bracket (9).

4.6.6 Replacing the pneumatic spring for KE...sk / KES...sk

CAUTION

➜ Do not replace both pneumatic springs at the same time; they must be replaced one after the other.



1. Open load plate and secure with lifting implement.
2. Remove one shaft protection (a) each from both ends.
3. Remove shafts (b) and pneumatic spring (c).
4. Install new pneumatic spring so that the piston rod points downward.

4.6.7 Replacing the measuring cell for KD / KE / KE...sk / KES / KES...sk

Note

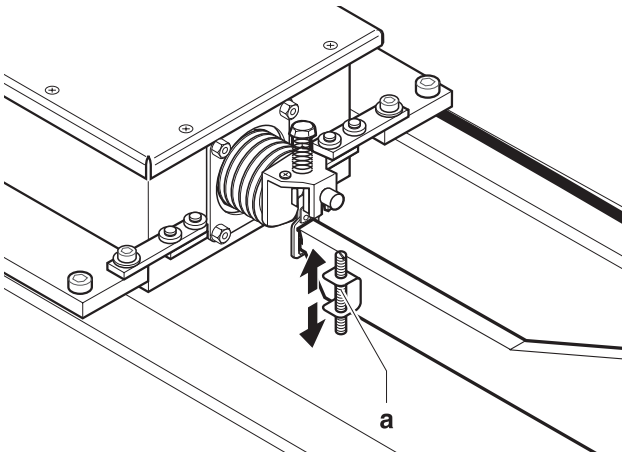
The cell force transmission and the connection cable must be removed from the faulty measuring cell and attached to the replacement cell.

1. Remove measuring cell, see section 4.6.4.
2. Remove cell force transmission and mount replacement measuring cell, see section 4.6.5.
3. Remove both mounting strips and angle brackets from cell bracket and attach to replacement measuring cell.
4. Unscrew PG lock.
5. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
6. Screw on PG lock.
7. Install new measuring cell.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be.

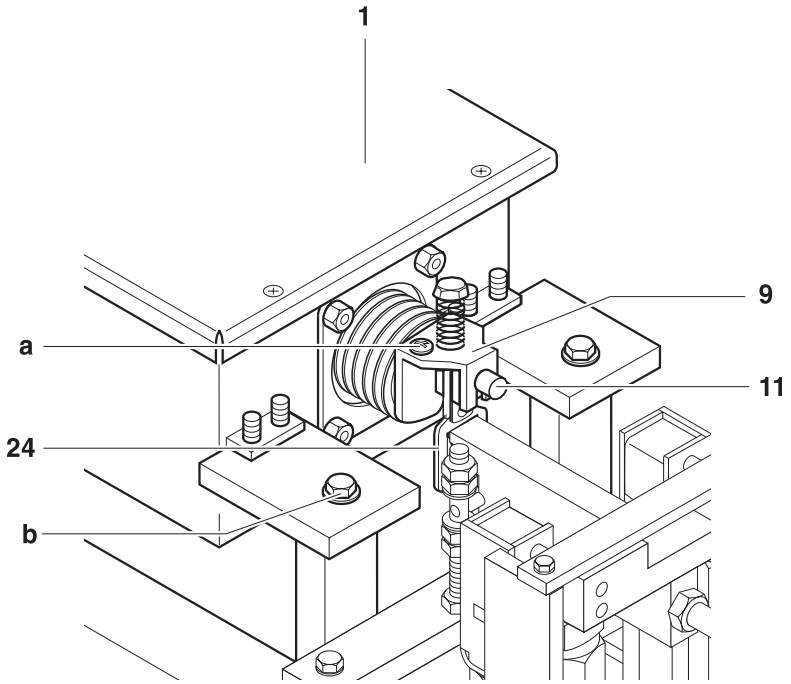
4.6.8 Setting excessive load safety for KD / KE / KE...sk / KES / KES...sk



1. Screw in excessive load screw (a) on transfer lever until it will go no further.
2. Unscrew excessive load screw by 1 complete rotation.

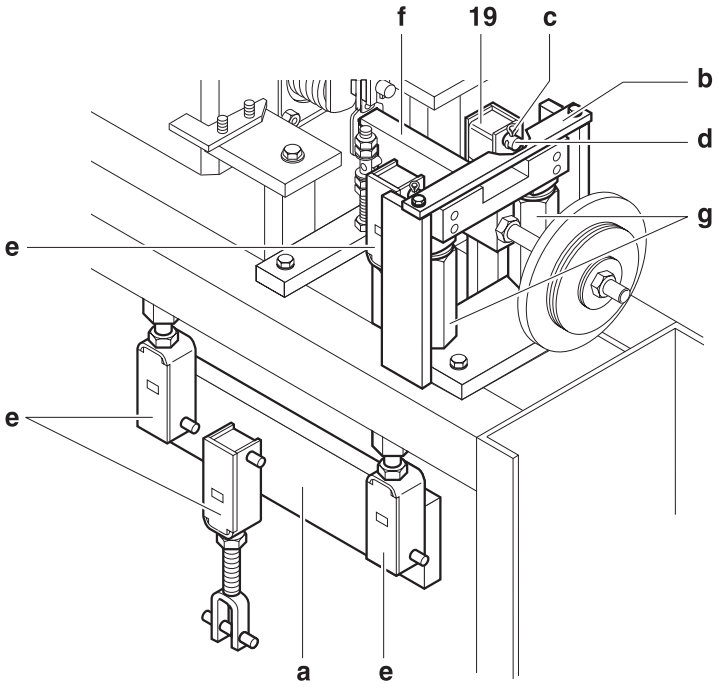
4.7 Corrective maintenance for KN

4.7.1 Removing and installing measuring cell for KN



1. Remove cover box after screwing out screws.
2. Loosen locking screw (a) a few turns.
3. Unload hanger (24) and pull hanger pin (11) outward up to stop on cell bracket (9).
4. Unscrew mounting bolts (b) of measuring cell and open cable clamp.
5. Lift off measuring cell (1) upward.
6. Install measuring cell in reverse order. When doing so, make sure that
   - hanger (24) rests in recess of hanger pin (11) and there is clearance on both sides between hanger and clevis,
   - hanger is in vertical position.

4.7.2 Removing and installing transfer lever mechanism for KN

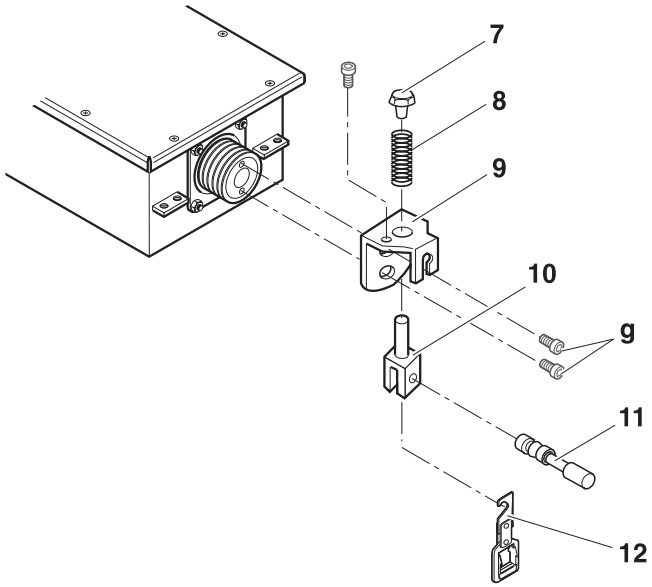


1. Remove measuring cell, see section 4.7.1.
2. Unload lever mechanism by inserting a spacer,
   - either approx. 45 mm thick between bottom transfer lever (a) and base frame
   - or approx. 20 mm thick between load lever and base frame.
3. Remove locking bar (b).
4. Pull out splint (c) and push locking pin (d) out of bearing holder (e) to one side.
5. Remove bearing (19) from bearing holder.
6. Lift off upper transfer lever (f).
7. Release bearing holder (e) on lower transfer lever (a) in same way and take out remove piece (g) of two transfer levers.
8. Release and remove bottom transfer lever (a) at two mounting points on bearing holders (e).
9. Install transfer lever mechanism in reverse order. Note the following when doing so:
   - Clearance of transfer levers in bearing holders
   - Locking pins that secure bearings in bearing holders must be locked with splints.
   - Hanger must be positioned vertically; adjustment possible by moving measuring cell, see section 4.7.1.

4.7.3 Removing and installing load frame and load lever for KN

1. Unscrew access ramp from base frame.
2. Unscrew angled covers and cover plates.
3. Screw off lock nuts.
4. Lift off load frame. When using lifting tools, make sure that load frame does not tilt and jam. The cabinet must not be damaged.
5. Remove lift-off lock nuts of load lever.
6. Disconnect connection between load lever and transfer lever mechanism at lower bearing holder.
7. Unscrew lift-off lock.
8. Lift off load lever and remove coupling.
9. Install load lever and load frame in reverse order. Note the following when doing so:
   - There must be clearance at load levers.
   - Not present when fitting load frame.
   - Do not damage cabinet.

4.7.4 Replacing cell-force transmission unit for KN



1. Remove measuring cell, see section 4.7.1.
2. Unscrew pressure screw (7), and remove pressure spring (8).
3. Remove clevis (10) and hanger pin (11).
4. Unscrew screws (g) and remove cell bracket (9).

4.7.5 Replacing measuring cell for KN

Note

The cell-force transmission unit and the connection cable must be removed from the faulty measuring cell and attached to the replacement cell.

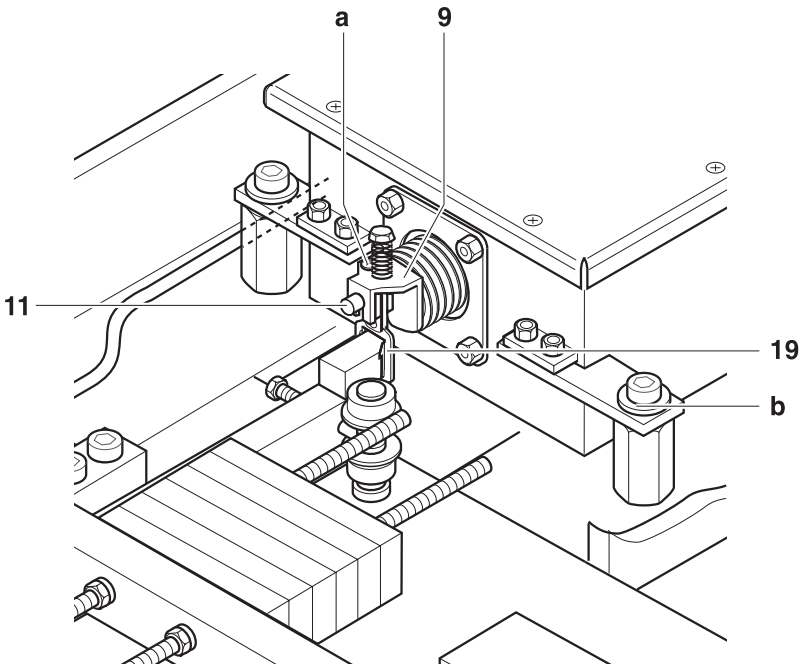
1. Remove measuring cell, see section 4.7.1.
2. Remove cell-force transmission unit and mount on replacement measuring cell, see section 4.7.4.
3. Remove mounting parts on defective measuring cell and mount on replacement cell.
4. Unscrew PG lock.
5. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
6. Screw on PG lock.
7. Install new measuring cell.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be.

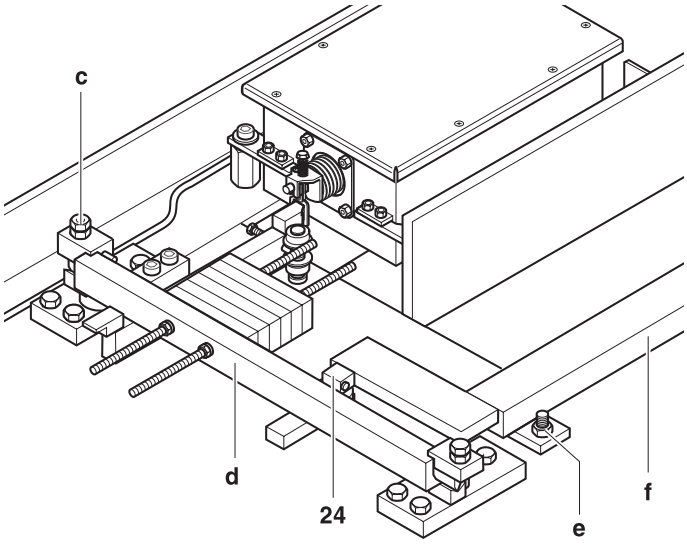
4.8 Corrective maintenance for KG

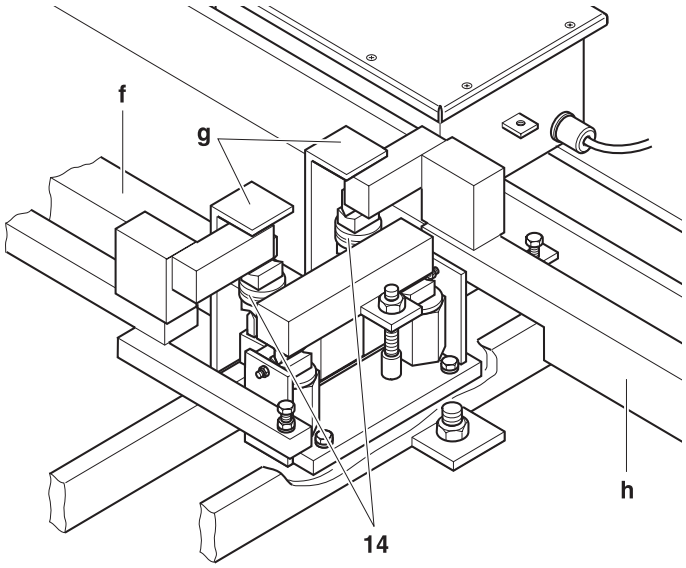
4.8.1 Removing and installing measuring cell for KG



1. Remove load plate.
2. Unscrew load-frame lock nuts.
3. Lift off load frame. When using lifting tools, make sure that load frame does not tilt and jam.
4. Loosen locking screw (a) a few turns.
5. Unload hanger (19) and pull hanger pin (11) outward up to stop on cell bracket (9).
6. Unscrew mounting bolts (b) of measuring cell and open cable clamp.
7. Lift off measuring cell upward.
8. Install measuring cell in reverse order. When doing so, make sure that
   - hanger rests in recess of hanger pin and there is clearance on both sides between hanger and clevis,
   - hanger is in vertical position. Adjustment possible by moving measuring cell.

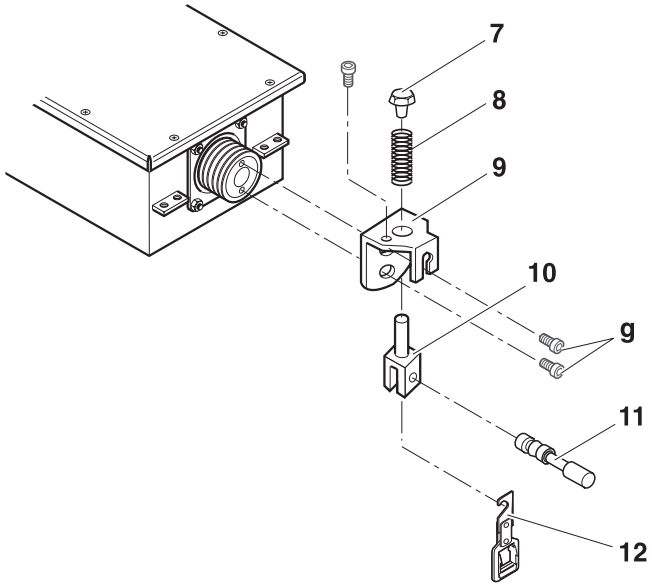
4.8.2 Removing and installing lever mechanism for KG





1. Remove measuring cell, see section 4.8.1.
2. Remove lock nuts (c) of transfer lever (d).
3. Remove lock nuts (e) of intermediate lever, lift intermediate lever (f) and take out pressure bearing (24).
4. Lift off transfer lever (d).
5. Unscrew locking angle (g) from intermediate lever.
6. Lift load lever (h) and remove two pressure pieces.
7. Lift off intermediate lever (f).
8. Unscrew lock nuts of load lever and lift off load lever (h).
9. Install lever mechanism in reverse order. Note the following when doing so:
   - axial clearance must be present at all levers,
   - all stops, lock nuts and bolts must be adjusted with approx. 1 mm clearance.
   - load frame may not be jammed.

4.8.3 Replacing cell-force transmission unit for KG



1. Remove measuring cell, see section 4.8.1.
2. Unscrew pressure screw (7), and remove pressure spring (8).
3. Remove clevis (10) and hanger pin (11).
4. Unscrew screws (g) and remove cell bracket (9).

4.8.4 Replacing measuring cell for KG

Note

The cell-force transmission unit and the connection cable must be removed from the defective measuring cell and mounted on the replacement cell.

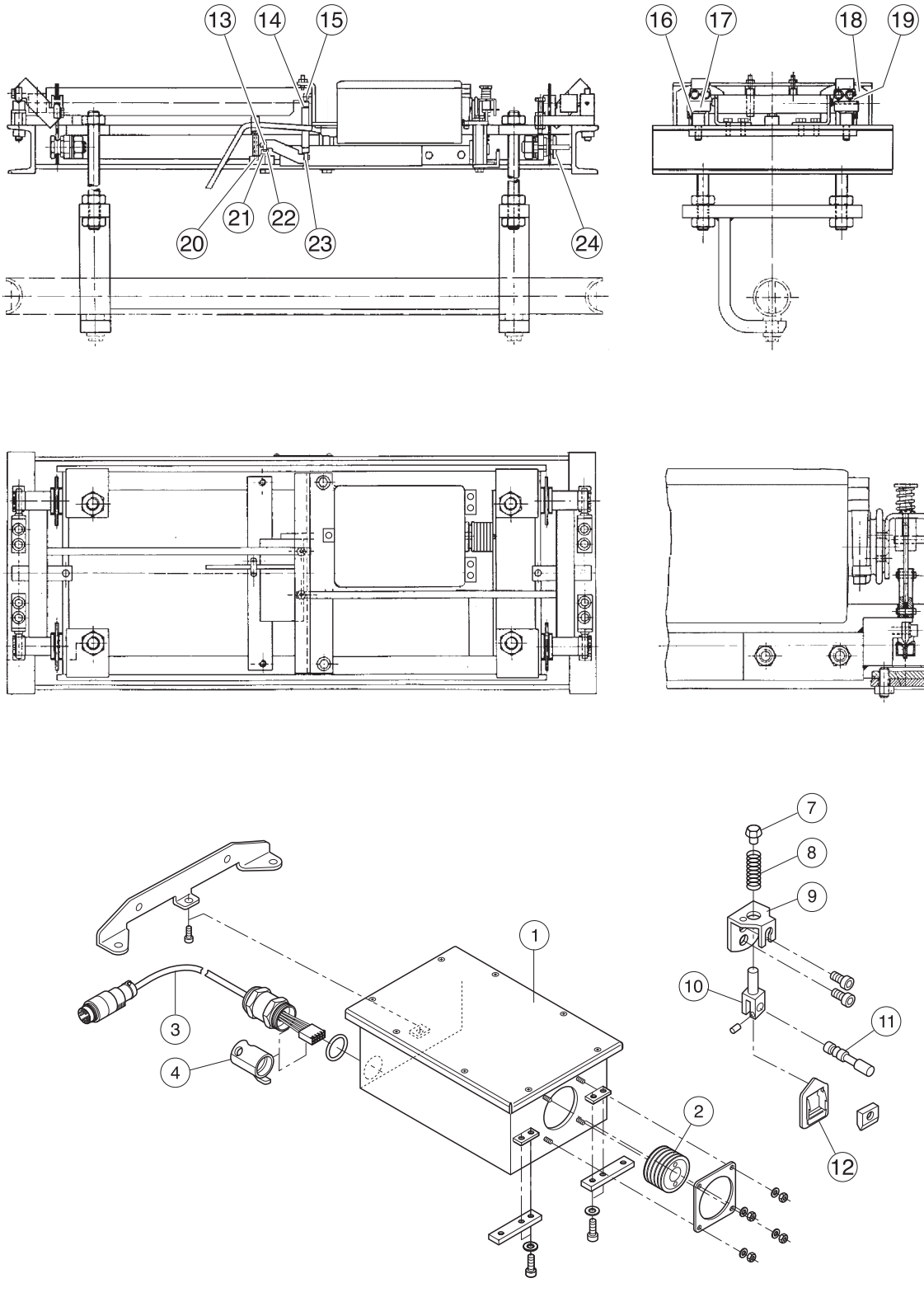
1. Remove measuring cell, see section 4.8.1.
2. Remove cell-force transmission unit and mount on replacement measuring cell, see section 4.8.3.
3. Remove mounting parts on defective measuring cell and mount on replacement cell.
4. Unscrew PG lock.
5. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
6. Screw on PG lock.
7. Install new measuring cell.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check cornerload and adjust if need be.

5 Overhead rail scales KO

5.1 Exploded drawing

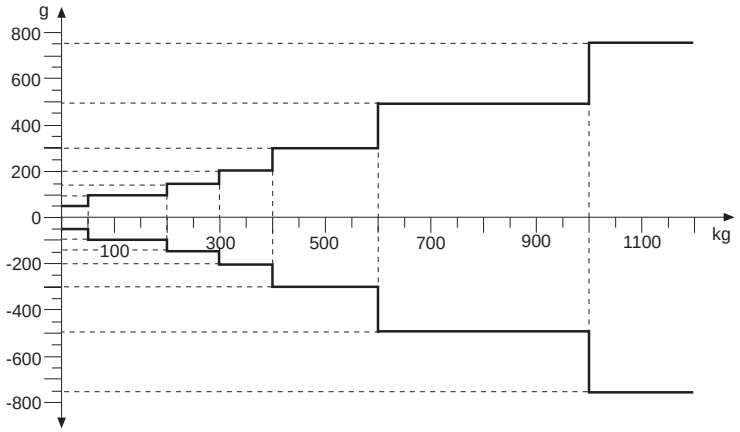
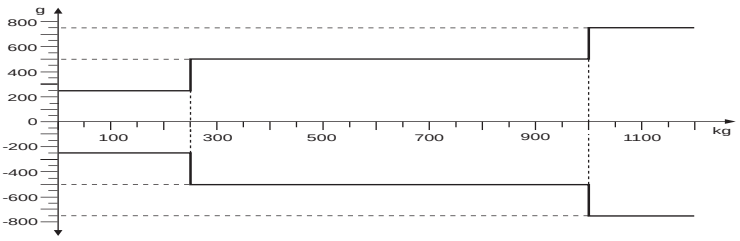
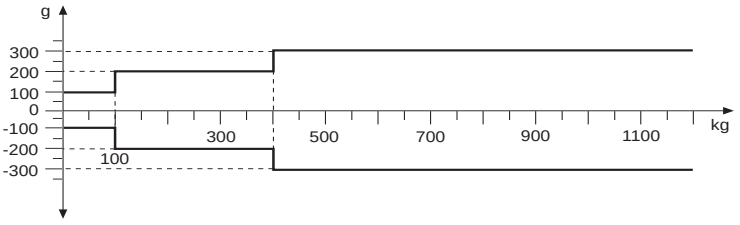


5.2 Spare parts

Position	Designation	Part number
1	Measuring cell TBrick 32, encapsulated	22 006 717
2	Membrane kit	00 056 410/V
3	Connection cable, 20 m (M20x1.5)	22 006 722
4	PG gland, complete	00 504 219
7	Pressure screw	00 502 904
8	Pressure spring	00 204 082
9	Cell bracket	00 504 237
10	Clevis	00 502 902
11	Hanger pin	00 502 905
12	Tension link	00 502 947
13	Shim 0.05 mm 0.07 mm 0.10 mm	 00 502 894 00 502 893 00 502 892
14	Bearing shim	00 502 524
15	Knife edge 20	00 502 519
16	Bearing shim (bearing 40)	00 502 739
17	Bearing housing 40	00 502 740
18	Hanger	00 502 732
19	Knife edge 40	00 502 725
20	Knife edge 20	00 502 519
21	Bearing shim	00 502 924
22	V-bearing	00 502 952
23	Knife edge 20	00 502 519
24	Pin joint	00 502 735
	FO/KO cell bearing kit	00 505 377
	Blank label set	22 000 378
	Identcard	22 000 386

5.3 Certification data, tolerances and certification error limits

5.3.1 KO1200

Cell configuration	Test with eccentric load	Linearity Hysteresis Range	KO1200
3 x 3000 e 100 %	Weight 500 kg Tolerance 300 g	Certification class III e1 value 0.1 kg e2 value 0.2 kg e3 value 0.5 kg max 1200 kg min 2 kg Readability in control mode: 10 g	
1 x 2400 e 100 %	Weight 500 kg Tolerance 500 g	Certification class III e value 0.5 kg max 1200 kg min 10 kg Readability in control mode: 50 g	
1 x 6000 e 100 %	Weight 500 kg Tolerance 300 g	Certification class III e value 0.2 kg max 1200 kg min 4 kg Readability in control mode: 20 g	

Additional configurations: according to OIML

5.4 Checking and adjusting the sideload

5.4.1 Checking the sideload

1. Ascertain the configured weighing range and readability.
2. Hang test weight in the middle of weighing rail insert according to the test and adjusting specifications in section 5.3.
3. Push test weight to the left and right on weighing rail insert.
   Note absolute values with sign.

If the absolute values are outside the tolerances listed in section 5.3, adjustment is necessary.

5.4.2 Adjusting the sideload

Adjustment is performed by altering the knife edge distances on transfer lever.

1. Activate master mode of the terminal and select control mode.
2. Check sideload in control mode with test weights listed in section 5.3, and note absolute values with sign.

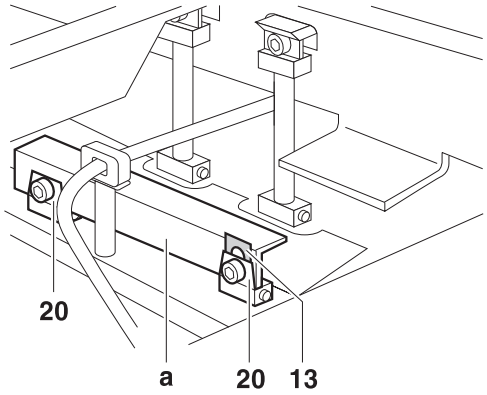
Adjustment rule

Adjust side with negative deviation. Only adjust the transfer lever knife edge located on the bracket side of load lever with negative deviation.

Effect of the shims

A 0.1 mm shim leads to a change of approx. 60 g when adjusting the side load.

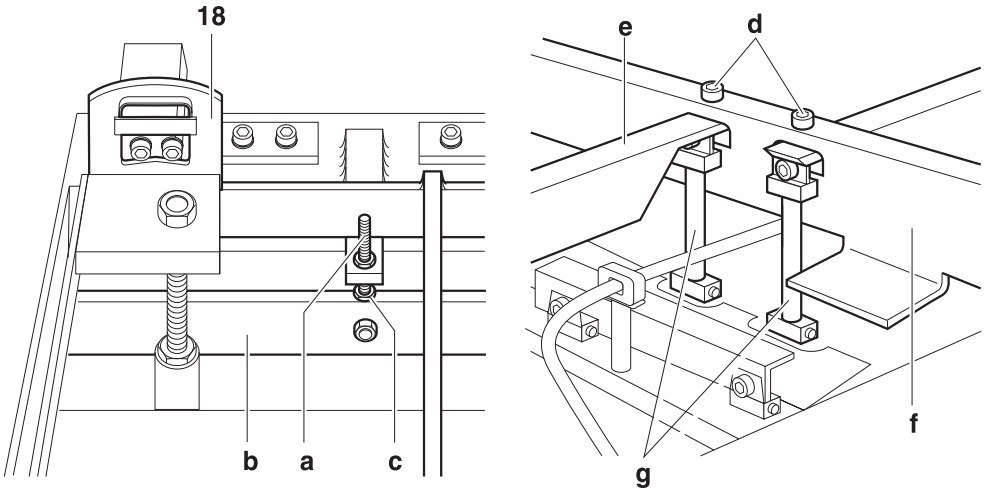
Procedure



1. Unload transfer lever (a).
2. Loosen knife edge (20) on respective side of transfer lever and insert shim (13).
3. Re-tighten knife edge.

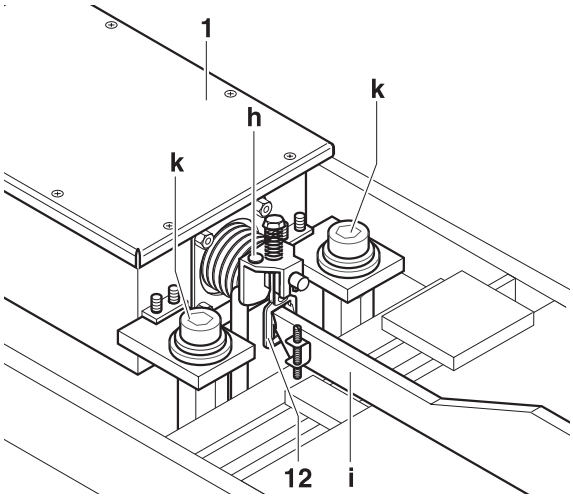
5.5 Corrective maintenance for KO

5.5.1 Removing the load lever



1. Screw in stop screw (a) upward with one complete turn.
2. Lift suspension frame (b), and remove hanger (18).
3. Unscrew stop screws (c) a few turns to allow easier removal of hanger, if need be.
4. Screw in lift-safety screws (d) upward with one complete turn.
5. Lift load lever (e) and remove from rocking bracket (f). When carrying out this procedure, hold the pressure links (g) firmly and remove.

5.5.2 Removing the measuring cell



1. Remove load lever, see section 5.5.1.
2. Unscrew locking bolt (h) upward from force transmission.
3. Lift transfer lever (i), and remove tension link (12) from hinge.
4. Unscrew the 4 screws (k), open clip and lift measuring cell (1).
5. Remove transfer lever (i).

5.5.3 Installing the measuring cell

1. Carry out mounting in reverse order, as described in section 5.5.2. Ensure that the tension link (12) is in a vertical position.
2. Check axial movement of both load levers and transfer lever, and adjust if need be.
3. Adjust stop screws (c) and lift-safety screws (a) and (d) with approx. 1 mm play, then lock.

5.5.4 Replacing the measuring cell

Note

The cell force transmission and the connection cable must be removed from the faulty measuring cell and attached to the replacement cell.

1. Remove measuring cell, see section 5.5.2.
2. Remove cell force transmission and mounting parts from faulty measuring cell, and attach to replacement measuring cell.
3. Unscrew PG lock.
4. Unscrew M20 screw gland, pull off cable and mount with sealing ring on replacement measuring cell.
5. Screw on PG lock.
6. Carry out mounting of the replacement measuring cell in reverse order.

Settings

- After replacing the measuring cell, all parameters specific to the weighing platform, country and customer must be reloaded in service mode, see section 6.
- Check sideload and adjust if need be.

6 Service mode

The service mode is used

- to enter weighing platform-specific parameters,
- to calibrate the scale,
- to set the linearity,
- to reset the measuring cell parameters to the factory setting.

CAUTION
The changeable parameters in the service mode are protected with certification. If the scale is set certifiable (APPROVE in program block SCALE), the ID code counter is increased by one when the changed parameters are saved. On a certified scale this corresponds to destroying the certification seal. As a result, recertification of the scale is required.

6.1 Overview of service mode

RETURN ?	Exit service mode without changing the set parameters and ID code counter.
RESET ?	Reset weighing platform parameters to factory settings, see Section 6.3.1.
NATION ?	Country selection, see Section 6.3.2. This uses the certification specifications of the country automatically.
SCALE PARAMETERS ?	Input the weighing platform-specific parameters certifiability, type, maximum load and resolution, see Section 6.3.3.
LINEARITY ?	Enter or measure linearity, see Section 6.3.4.
CALIBRATION ?	Calibrate the weighing platform, see Section 6.3.5.
ADAPTION ?	Enter application-specific parameters, see Section 6.3.6.
SAVE PARAMETERS ?	Save the selected configuration.

The abbreviations on weighing terminals ID1 Plus, ID3s and ID5 are printed in **bold**.

6.2 Entering and operation

6.2.1 Entering service mode

Entering service mode is described in the service manual of the connected weighing terminal.

6.2.2 Service mode operation

Enter = YES →T← = NO

In service mode, only the two keys for YES and NO are active; the numeric keypad is not available for use.

Example 1: Entering the maximum load 60 kg

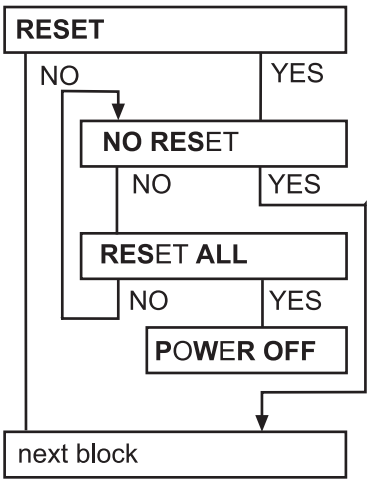
CA 150 kg NO	➜ The offered maximum load is not the desired maximum load. Answer with NO.
0 NO	➜ The digit 0 appears. Use NO to increase the first digit to the desired value.
1 NO	
⋮	
6 YES	➜ 6 is the desired first digit. Confirm with YES.
60 YES	➜ The digit 0 appears in the second place; 60 is the desired value. Confirm with YES.
600 NO	➜ An additional place appears, but is not required. Answer with NO.
60. SI	➜ 60. is the desired value. Confirm with YES.
CA 60 kg	➜ As a checking measure, the presently set value for maximum load is displayed. Confirm with YES and move on to the next program block.

Example 2: Entering the resolution 0.005 kg

d 0.001 kg NO	➜ The offered resolution is not the desired resolution. Answer with NO.
0 YES	➜ The digit 0 appears. Confirm with YES.
00 NO	➜ An additional 0 appears before the comma, but is not required. Answer with NO.
0. YES	➜ The decimal point appears; confirm with YES.
0.0 YES	➜ Press YES to move additional places until the number of decimal places has been reached.
⋮	
0.000 NO	➜ Select the desired resolution with NO.
0.001 NO	
⋮	
0.005 YES	➜ 0.005 is the desired value. Confirm with YES.
d 0.005 kg	➜ As a checking measure, the presently set value for resolution is displayed. Confirm with YES and move on to the next program block.

6.3 Settings in service mode

6.3.1 RESET – Resetting to factory default

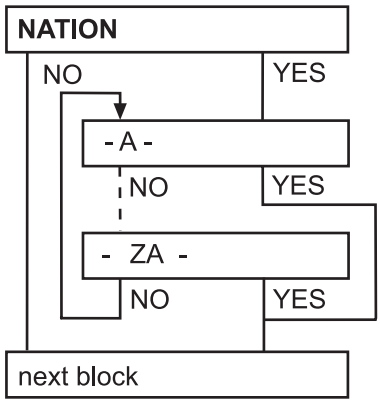


➜ Exit the service mode block without resetting the parameters.

➜ Reset all weighing platform-specific parameters to the factory setting:
Platform number ?
ID code counter +1, only in certifiable configuration

➜ Switch off weighing terminal.
After switching on again, the weighing terminal is in normal mode.

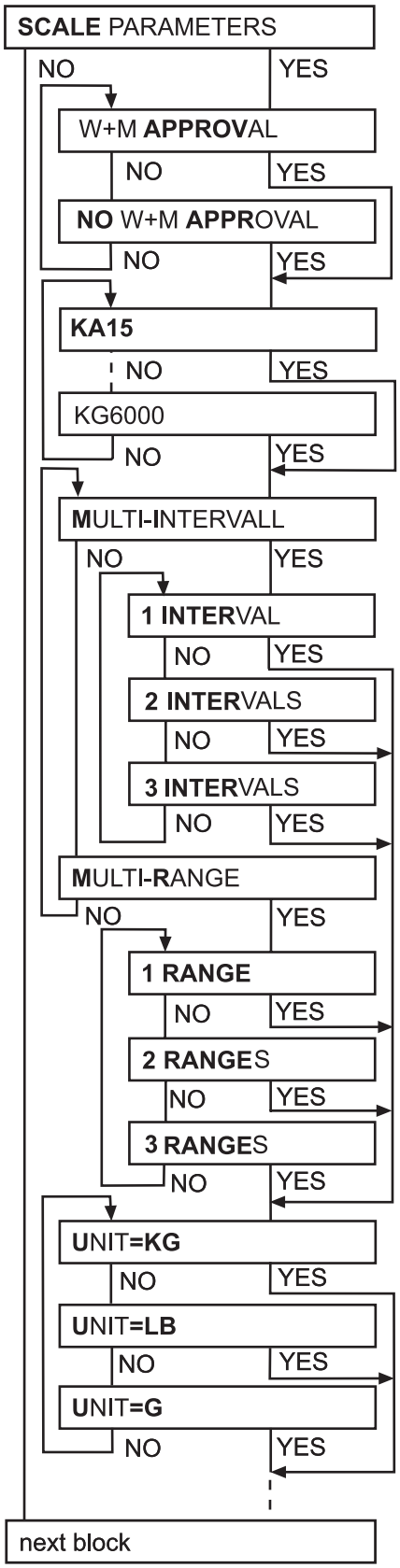
6.3.2 NATION – Country selection



➜ Select your country.

Note
After selecting your country, the national certification specifications are used automatically.

6.3.3 SCALE PARAMETERS – Selection of the weighing platform-specific parameters



1. Select certifiability

- Certifiable scale
- Non-certifiable scale

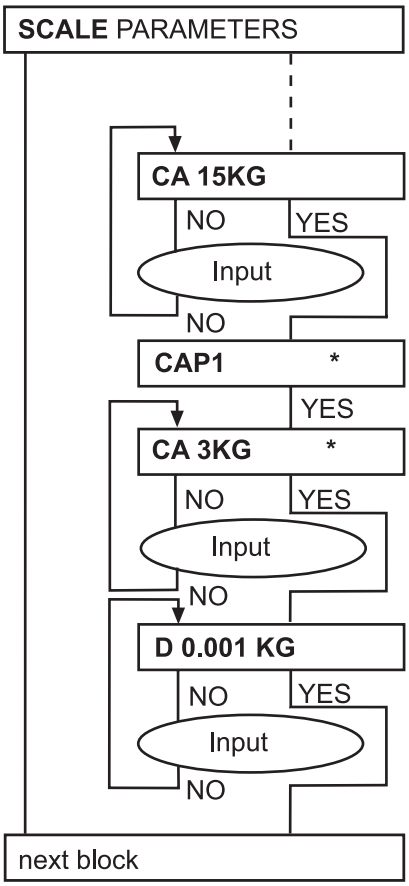
2. Select type

3. Select multi-interval or multi-range scale

- **Multi-interval scale**
  (ranges can be shifted with tare function)
  Refer to the following page for examples of range intervals.
- **Multi-range scale** (fixed ranges)
  Refer to the following page for examples of range intervals.

4. Select display and calibration unit

- Display in kg
- Display in lb, if permitted with certification
- Display in g



5. Select maximum load

➜ Accept currently set maximum load with YES.

– or –

➜ Enter desired maximum load and confirm with YES.

6. Define weighing ranges

(* only applicable for multi-range and multi-interval scales).

➜ Display for information: Weighing range 1.

➜ Accept currently set value for the first weighing range with YES.

– or –

➜ Enter the desired value for the first weighing range and confirm with YES.

7. Select interval value

➜ Accept currently set interval value for the first weighing range with YES.
With multi-range or multi-interval scales, the interval value of additional weighing ranges is determined automatically by the weighing terminal.

– or –

➜ Enter the desired interval value for the first weighing range and confirm with YES.

Example for multi-interval or multi-range scales

Weighing platform with max. load of 60 kg and the same resolution in all ranges

	Upper limit of the range	**Weighing range**	**Interval value**	**Resolution**
1 interval / 1 range	Max = 60 kg	0 ... 60 kg	e = 0.02 kg	n = 3,000
2 intervals / 2 ranges	Max_1 = 30 kg Max_2 = 60 kg	0 ... 30 kg 30 ... 60 kg	e_1 = 0.01 kg e_2 = 0.02 kg	n_1 = 3,000 n_2 = 3,000
3 intervals / 3 ranges	Max_1 = 15 kg Max_2 = 30 kg Max_3 = 60 kg	0 ... 15 kg 15 ... 30 kg 30 ... 60 kg	e_1 = 0.005 kg e_2 = 0.01 kg e_3 = 0.02 kg	n_1 = 3,000 n_2 = 3,000 n_3 = 3,000

Calculation of Max_2 and Max_3 with the setting 3 intervals / 3 ranges

Max_2 = no. of resolution points of the 1st range x interval value of the 2nd range

Max_2 = no. of resolution points of the 2nd range x interval value of the 3rd range

$Max_2 = n_1 \times e_2 = 3{,}000 \times 0.01$ kg = 30 kg

$Max_3 = n_2 \times e_3 = 3{,}000 \times 0.02$ kg = 60 kg

Note
The ERR_Rx message appears if one of the settings or a combination of settings was not permissible; x represents the weighing range. In this case, the program jumps back to Step 1.

6.3.4 LINEARITY – Measuring or entering the linearity

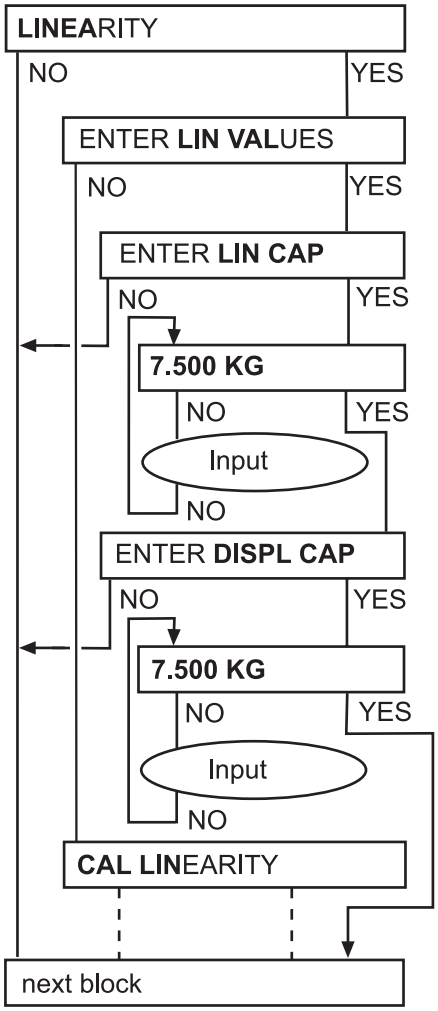
The linearity error can be compensated for in two ways:

- via manual entry – for this, record the displayed weight value for the linearity weight before linearization

– or –

- via measuring the applied linearity weight.

Linearization should be performed with half of the selected maximum load.



1. Linearization via manual entry

Enter linearity point or weight

➜ Accept currently set linearity weight, e.g. half-load with YES.

– or –

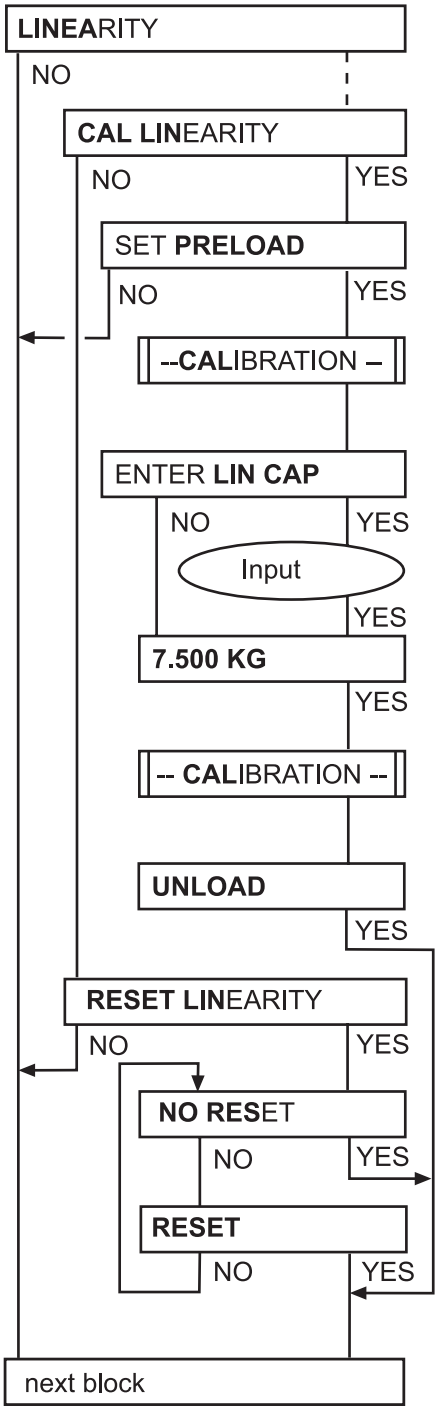
➜ Enter desired linearity weight.

Enter linearity deviation

➜ Accept displayed weight value with YES.

– or –

➜ Enter the weight value displayed when the previous linearity weight was applied and confirm with YES.



2. Linearization via measuring or applying the linearity weight

➜ Unload weighing platform, apply preload if available and confirm with YES.

The weighing platform calibrates the zero point.

➜ Prompt: Enter linearity weight.

➜ Enter the desired linearity weight and confirm with YES.

➜ Apply linearity weight to weighing platform and confirm with YES.

The weighing platform is calibrated with the linearity weight.

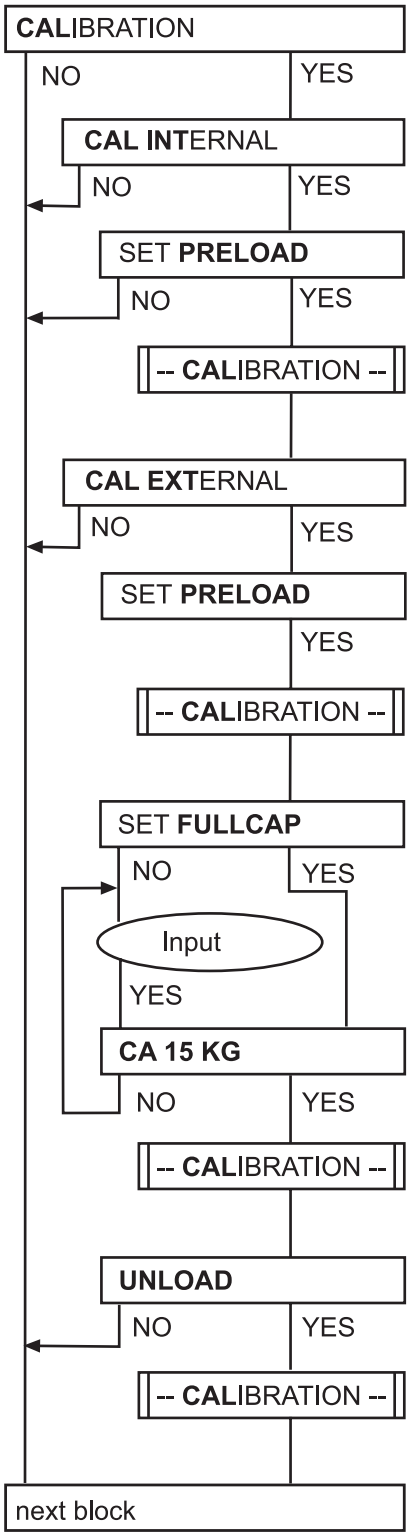
➜ Unload weighing platform and confirm with YES.

3. Reset linearity compensation

➜ Do not reset the linearity compensation.

➜ Completely reset the linearity of the weighing platform.
Afterward, the weighing platform must be checked and, if necessary, relinearized.

6.3.5 CALIBRATION – Calibrating of the weighing platform



1. Calibrate the weighing platform internally with the in-built calibration weight

➜ Load preload and confirm with YES.

The weighing platform is calibrated internally.

2. Calibrate weighing platform with external weights

➜ Apply preload and confirm with YES.

The weighing platform calibrates the zero point.

➜ Prompt: Select full load.

➜ If desired, use NO to enter calibration weight smaller than the maximum load and confirm.

– or –

➜ Select the maximum load with YES.

➜ Apply selected calibration weight to weighing platform and confirm with YES.

The weighing platform calibrates the selected maximum load.

➜ Unload weighing platform and confirm with YES.

The weighing platform rechecks the zero point.

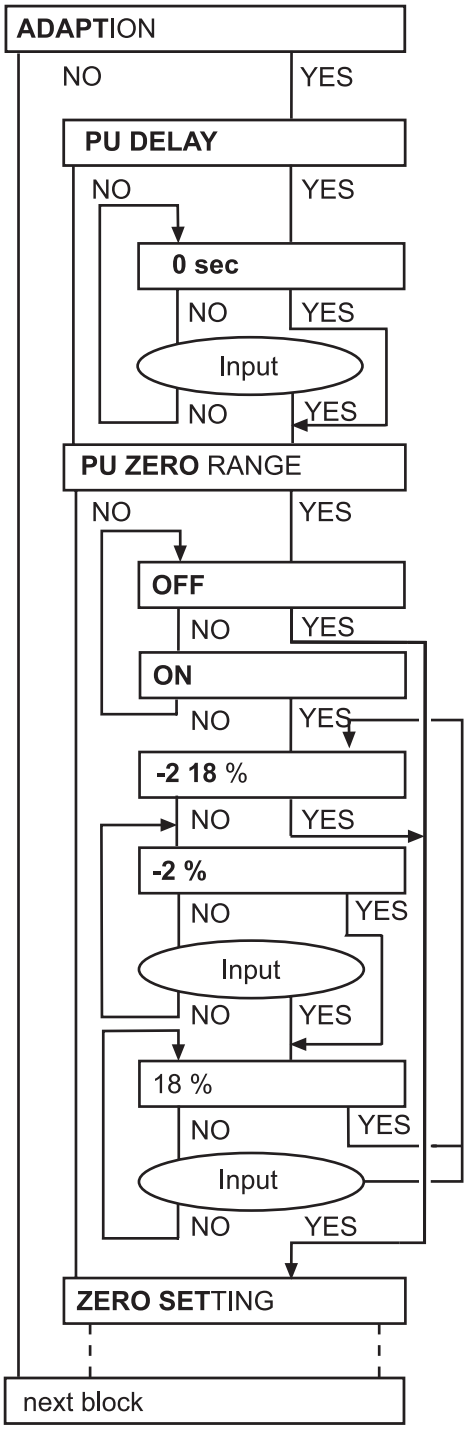
6.3.6 ADAPTION – Setting application-specific parameters

The range adjustment for adjusting the endpoint (SPAN ADJUST), among other things, can be performed in this block. This adjustment can be performed in 2 ways:

- via manual entry – for this, record the displayed weight value for the test weight before adjustment

– or –

- via measuring the applied test weightts



Note

The factory settings in the ADAPTION block are listed on Page 93.

1. Delay time

➜ Enter additional delay time when switching on.

Depending on the environmental condition and degree of loading of the weighing platform, the system requires additional time for determining the switch-on zero point.
Possible settings: 0 ... 600 sec.

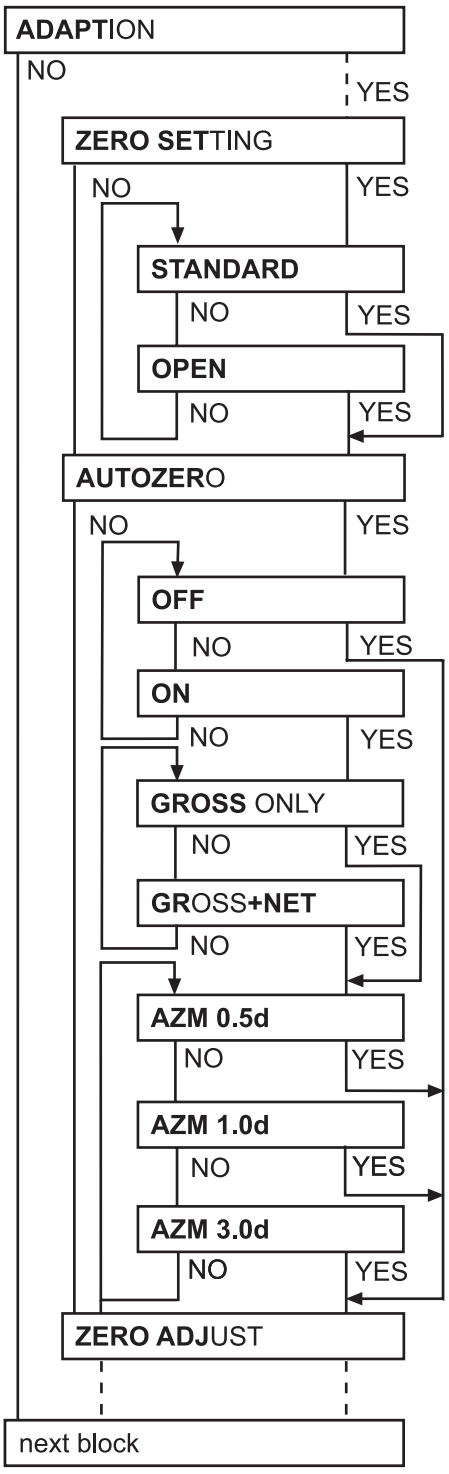
2. Zero-set range

➜ Deactivate the zero-set range
With this the zero-set range can be shifted over the entire weighing range; only with a non-certifiable configuration.

➜ Activate the zero-set range:
The zero-set range is restricted to max. 20 % of the weighing range in the **certifiable** configuration.
(from –19 % +1 % to –1 % +19 %)
100 % of the weighing range is available for the zero-set range in the **non-certifiable** configuration
(from –99 % +1 % to –1 % +99 %)

➜ Change the lower limit of the zero-set range.

➜ Change the upper limit of the zero-set range.

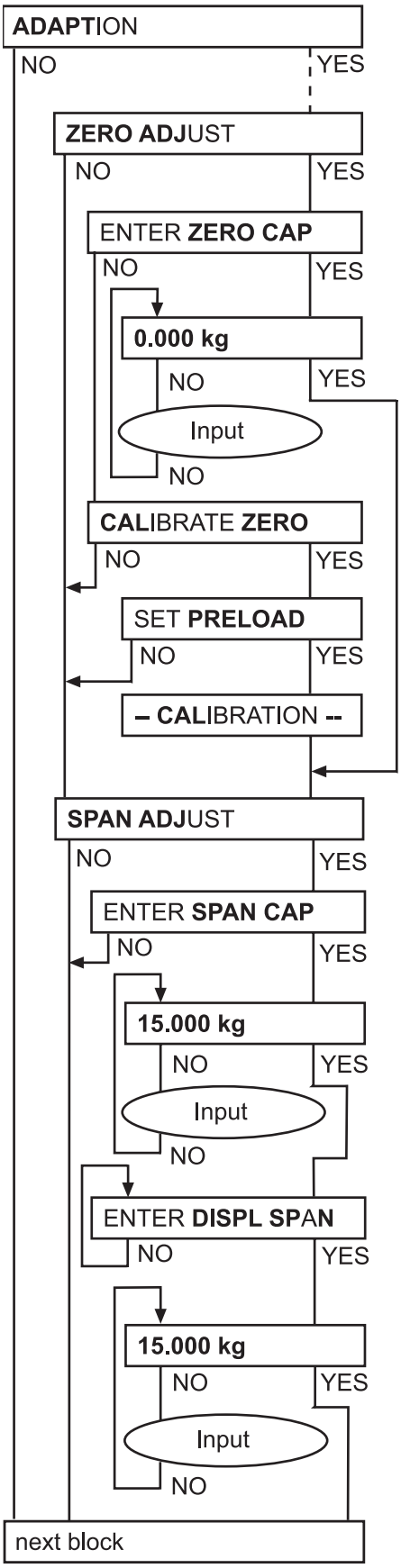


3. Select zero-set range

- Zero-set range of ± 2 % of the weighing range.
- Zero-setting over the entire weighing range is possible, but is only permissible in the non-certifiable configuration.

4. Activate/deactivate zero-point correction

- Automatic zero-point correction deactivated, but is only possible in the non-certifiable configuration.
- Automatic zero-point correction activated.
- Automatic zero-point correction for gross value.
- Automatic zero-point correction for gross and net value.
- Effective range of the automatic zero-point correction. Only the value **AZM 0.5 d** is permissible in the **certifiable** configuration.



5. Zero-point shift

Note
Following a zero-point shift the weighing range must be checked again!

Via manual entry

➜ Enter weight value with sign and confirm with enter.
A positive sign raises the zero point, while a negative sign lowers it.

– or –

Zero-point shift with calibration

➜ Apply preload to weighing platform and confirm with YES.

Weighing platform specifies new zero point.

6. Range adjustment

For adjusting the endpoint.

➜ Prompt to select test weight.

➜ Accept displayed test weight with YES.
– or –
➜ Enter test weight and confirm with YES.

➜ Prompt to enter the previously read weight value for the test weight.

➜ Accept displayed value with YES.
– or –
➜ Enter the read value for the test weight and confirm with YES.

Factory settings in the ADAPTION block

PU DELAY	Delay time	0 sec.	
PU ZERO RANGE	Zero-set range	ON	
		Certifiable	–2 18 %
		Non-certifiable	–50 50 %
ZERO SETTING	Zero-set range	STANDARD (± 2 %)	
AUTOZERO	Auto zero-pt. correction	ON	
		GROSS ONLY	
		AZM 0.5d	

6.3.7 SAVE PARAMETERS – Saving the selected configuration

The ID code counter is increased by one here. On certified scales, this corresponds to destroying a certification seal. A recertification is subsequently required.

6.4 ID code counter expired

The ID code counter runs to 99. Additional certifiable configurations are no longer possible after this, and the scale can then only be operated in a non-certifiable configuration.

The following messages appear in this case:

ERROR Acknowledge error message.

IDENT The error message then appears in plain text.

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