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Service Manual

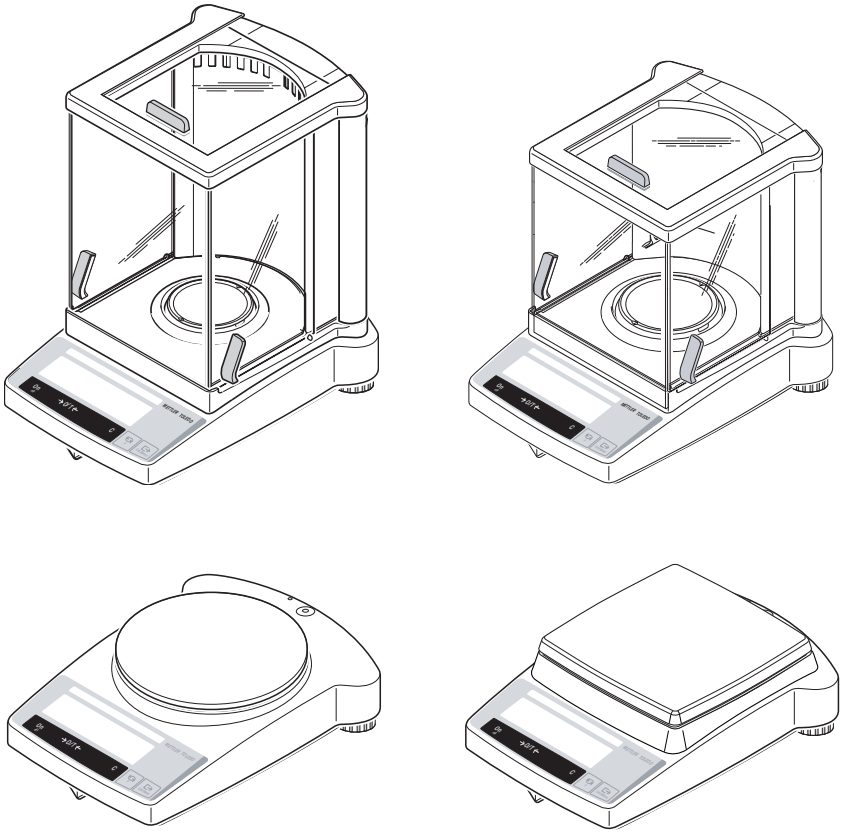
METTLER TOLEDO AB-S, AB-L Balances PB-S, PB-L Balances JB-C, JB-G Balances

Edition 03/2005

Overview of Chapters

Overview Balances

Index



Overview of Chapters

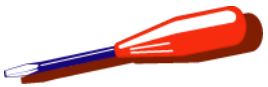
1 Introduction
Using the Service Manual. Designation Concept. Overview of balances and Weighing cells, Document history

2 Safety
Hazard warnings

3 Spare Parts
Exploded-view drawings and spareparts lists, packaging

4 Checks
Routine checks befor/after maintenance, repairs, and adjustment

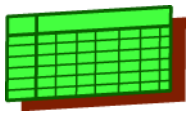
5 Troubleshooting
Problems, causes and remedies



6 Repair
Instructions for repairs

7 LARS
Testing and adjusting the balances with LARS, TDNR lists

8 Adjusting in the Service Menu
Adjustment possibilities without LARS, adjustment of certified balances



9 Adjustment Data
Tables of adjustment tolerances and technical data of the balances

10 Accessories
Spare parts for accessories and technical data of the balances

11 Service Aids
Software, interfaces, gages, tools

12 Forms

1 Introduction

List of Contents

1 Service Manual

1.1 Purpose of the Service Manual

The Service Manual provides support to service personnel of Mettler-Toledo, or other persons authorized by Mettler-Toledo, when performing maintenance and repairs on the balances described in this Service Manual.

1.2 Previous Knowledge Required

Persons using the Service Manual must fulfill the following basic knowledge requirements regarding the handling of Mettler-Toledo products and associated software:

- Understanding of the Operating Instructions of the respective balance (see CD LabTec serviceexpert or http://extranet.mt.com LabTec Market Support).
- Experience with LARS (LabTec Repair and Service Software).
- Ability to load new software onto the balance from the Internet using LARS or e-loader (see CD LabTec serviceexpert or http://extranet.mt.com LabTec Market Support).
- Basic knowledge of using Adobe Acrobat Reader®

Mettler-Toledo offers service courses which include this basic knowledge.

1.3 Structure of the Service Manual

The Service Manual is divided into 12 chapters.

The sequence of the chapters largely corresponds to the sequence of the operations for repairing a balance: checking, troubleshooting, repair, and adjustment.

The Service Manual is designed mainly for display on a desktop or laptop computer screen.

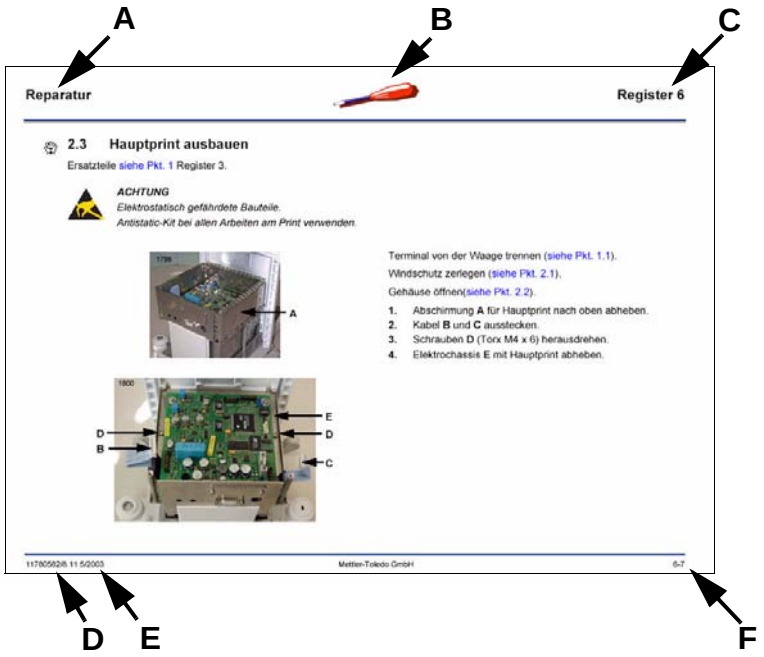
1.3.1 Tables of Contents / Index

For rapid location of the required information, the Service Manual has:

- an overview of the chapters
- an index
- a table of contents for each chapter.

Instructions for using the tables of contents and the index are given in see Section 1.4.4 of this chapter.

1.3.2 Page Structure



Header

- **A** Title of the respective chapter
- **B** Icon for the respective chapter
- **C** Chapter number

Text field

Information containing text and illustrations

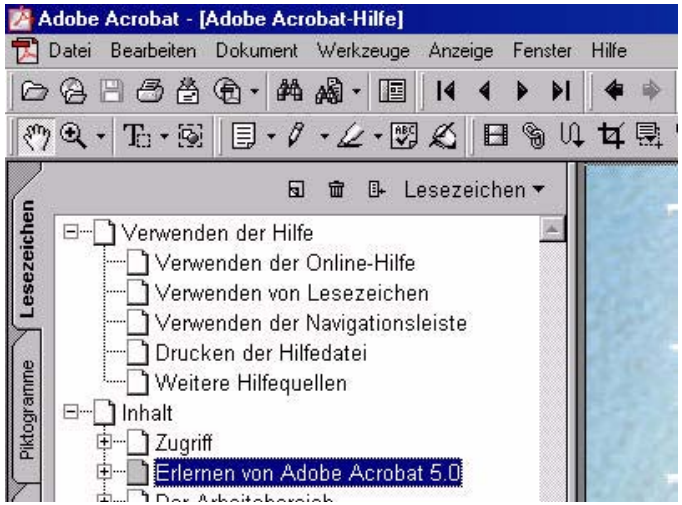
Footer

- **D** Number of the Service Manual
- **E** Issue date (month/year)
- **F** Page number «6-7»
  6 = chapter number
  7 = page number within this chapter

1.4 Navigating in the Screen

- Buttons on the title page
  - Overview of Chapters
  - Overview Balances
  - Index
- Adobe Acrobat Reader® functions
- Hyperlinks in the document

1.4.1 Adobe Acrobat Reader®



To be able to navigate with Adobe Acrobat Reader® you need to know the basic functions of this software. To teach yourself the functions of Adobe Acrobat Reader® :

1. Start the software
2. In the menu bar, click on Help
3. Select Acrobat Help
4. In the help tree, click on Learn Adobe Acrobat.

1.4.2 Navigation with Adobe Acrobat Reader®

The most important functions of the Adobe Acrobat Reader® tool-bar for navigation in the Service Manual are the following:

A Open/close the navigation window **B**

C Zoom

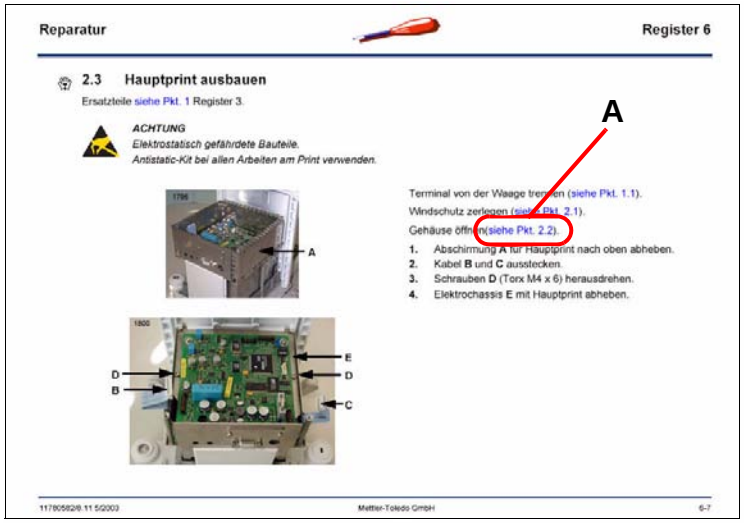
D Page forward/backward

E Go to start/end of document

F Go to Previous View
(e.g. return to the page with the «link origin»)

G Go to Next View
(e.g. from the page with the «link origin»
back to the «linked page»).

1.4.3 Display on a Small Screen

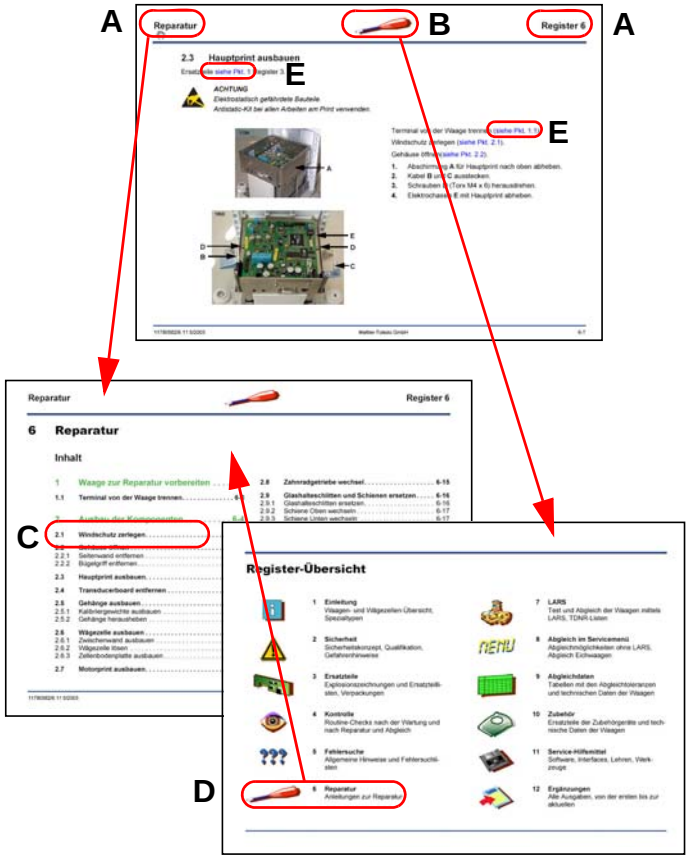


To enable use of a small screen, it can be switched to full-screen mode. The Service Manual is then displayed without the toolbar.

The key combinations required for navigation in full-screen mode are as follows:

Ctrl+L	Switch to full-screen
Esc	Reset to normal view
Ctrl++	Zoom in
Ctrl+-	Zoom out
←→	Page forward/backward
Alt+←	Return to selected hyperlink **A**

1.4.4 Navigation within the Manual



The Service Manual contains hyperlinks which make direct navigation possible. They can also be used when navigating with the toolbar of Adobe Acrobat Reader® (see Section 1.4.2).

Click on **A**
The table of contents of the respective chapter is displayed.

Click on **B**
The Overview of Chapters is displayed.

Click on **C**
The respective section in the chapter is displayed.

Click on **D**
The table of contents of the respective chapter is displayed.

Click on **E**
The respective cross-reference in this, or another, chapter is displayed.
For clarity, the many links of this type are shown blue.

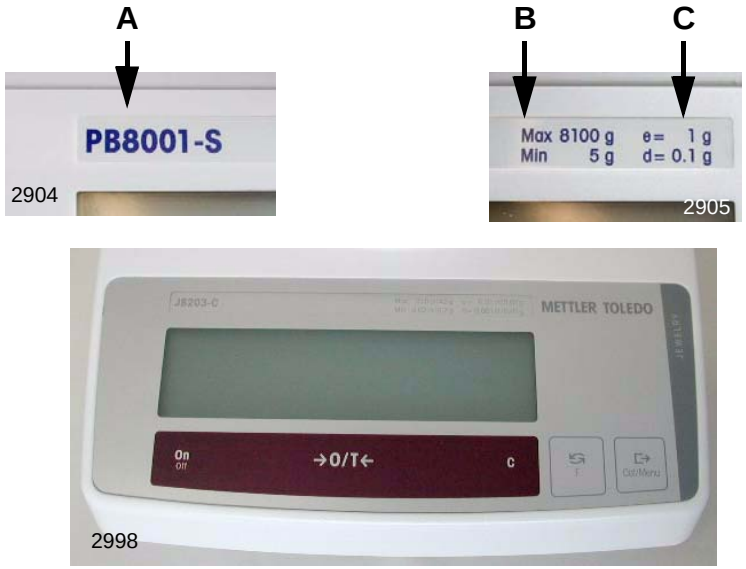
1.5 Paper Printout

A paper printout of the Service Manual can be created with Adobe Acrobat Reader®. The printout in landscape orientation can be on either US Letter or DIN A4 paper size. If scaling of 95% is selected, the margin is sufficiently wide for punching.

To set scaling in Adobe Acrobat Reader®: File/Print/Properties/Layout/Advanced/Graphics/Scaling.

2 Designation Concept

2.1 Model Plate

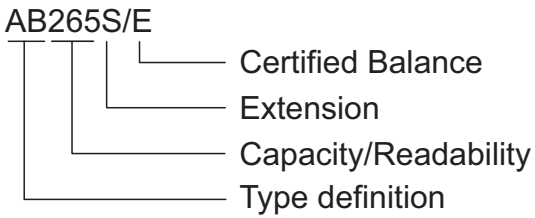


A Marketing designation

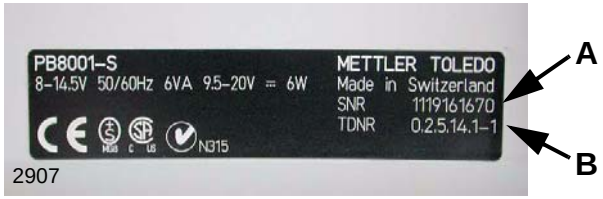
B Maximum capacity

C Readability

2.1.1 Designation definition



2.2 Type plate



A Serial number (SNR).

B Type definition number (TDNR) of Balance when leaving the factory.

Note

If a new TDNR is loaded when servicing is performed, the new number must be entered on the service data plate (see Section 2.3).

2.3 Service Data Plate

The service data plate is located on the upper housing under the weighing pan or under the draft shield.

A Column for new TDNR.

B Column for new software version.

C Column for date of update.

Service Data Plate Chapter 11

2.4 Serial number decoding

as of 2004 - example with SNR 1125010001:

11 25 01 0001

- 0001 = consecutive number within a production week
- 01 = production week (01 - 52)
- 25 = production year 2004. Offset = 21 (26 = 2005) etc.
- 11 = production site Switzerland (12 = China)

up to 31.12.2003 production site Switzerland, example with SNR 1118420763:

11 18 42 0763

- 0763 = consecutive number within a production week
- 42 = production week (01 - 52)
- 18 = production year 1999. Offset = 19 (22 = 2003)
- 11 = MTLabTec (Switzerland)

up to 31.12.2003 production site China, example with SNR 1202440020:

12 02 44 0020

- 0020 = consecutive number within a production week
- 44 = production week (01 - 52)
- 02 = production year (02 = 2002)
- 12 = MTCS (China)

3 History

3.1 AB-S, AB-L

Date	First SNR	New features	Changes
1999		Introduction	
March 2000	1119110000	Internal calibration	New TDNR Added calibration drive
April 2001	1120160000	F Dyn / % /	New software V1.20 New TDNR
Oct 2003	1122400000	Introduction of ABxx5-S	All AB-S except AB304-S: - MonoBloc replaced by conventional cells - New housing, balance PCB and software package
May 2004	1125190000	ABxx4-S backlit display	New balance PCB with backlit display
Oct 2004	1125410000	AB54-S and AB104-S with MonoBloc AB135-S with 200 g internal cal. weight	Conventional cell replaced by MonoBloc 100 g internal cal. weight replaced by 200 g MonoBloc cells: SW V1.24 and new TDNR with new weighing filters for improved weighing performance Conventional cells: SW V1.05
March 2005	1126090000	Introduction of - AB-S/FACT - AB-L	New models with FACT, new TDNR New models, **w/o** CAL int, new TDNR

3.2 xBxx3, xBxx2 and xBxxx2

Date	First SNR	New features	Changes
1999		Introduction	
April 2001	1120160000	F Dyn / % /	New balance PCB with software V1.20, new TDNR
May 2004	1125190000	Backlit display Internal calibration Draft shield with sliding doors «mg» (H=170 mm) for PBxx3-S Introduction of JB-G	New balance PCB with backlit display Added calibration drive Change from ‚e' to ‚a' version New draft shield of lesser height with sliding doors for PBxx3-S
October 2004	1125410000	New Software version with new weighing filters for improved weighing performance	new SW V1.24
March 2005	1126090000 1126100000	Introduction of - PB-S/FACT - PB-L PB153-S and PB303-S balances with 500 g cell 11103806	New models with FACT, new TDNR New models, **w/o** CAL int, new TDNR PB153-S and PB303-S balances: replaced 300 g cell 11103800 by 500 g cell 11103806

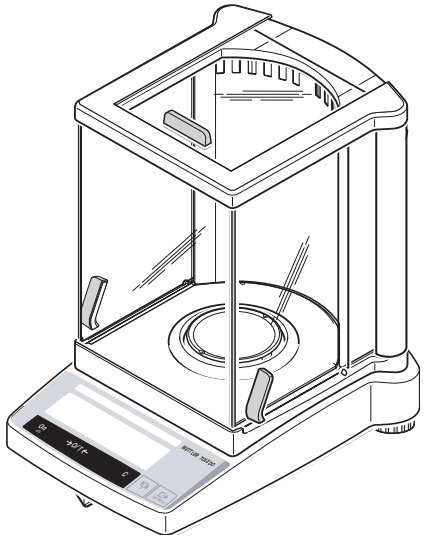
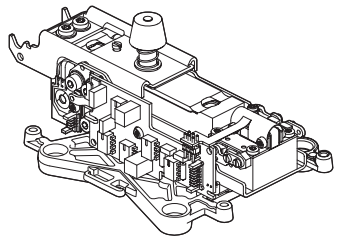
3.3 xBxxx1, xBxxx0

Date	First SNR	New features	Changes
1999		Introduction	
April 2001	1120160000	F Dyn / % /	New balance PCB with software V1.20, new TDNR
May 2004	1125190000	Backlit display	New balance PCB with backlit display
October 2004	1125410000	New Software version with new weighing filters for improved weighing performance	new SW V1.24
Dec 2004	1125490000	JB8001-G with square weighing pan	Round weighing pan replaced by a square one
March 2005	1126090000	Introduction of - PB-S/FACT - PB-S with CAL int - PB-L	New models with FACT, new TDNR, square weighing pan New models, **with** CAL int, new TDNR New models, **w/o** CAL int, new TDNR

4 Overview of balances and measuring cells

4.1 AB and JB-C Types

4.1.1 with «MonoBloc» - no CAL int

Balance ~~CAL int~~		Measuring cell: Part No. 11103800
AB54-S up to SNR 1119109999 AB54-L/A /M AB54-L AB104-S up to SNR 1119109999 AB104-L/A /M AB104-L AB204-S up to SNR 1119109999 AB204-L/A /M AB204-L AB304-S up to SNR 1119109999		
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.1, Chapter 3		**Spare parts:** see Section 3.2.1, Chapter 3

4.1.2 with «MonoBloc» - CAL int

Balance CAL int	Measuring cell: Part No. 11103800

AB54-S/A /M up to SNR 1122399999 and 1125410000 onwards
AB54-S SNR 1119109999 - 1122399999 and 1125410000 onwards

AB54-S/A -F /M -F
AB54-S/FACT

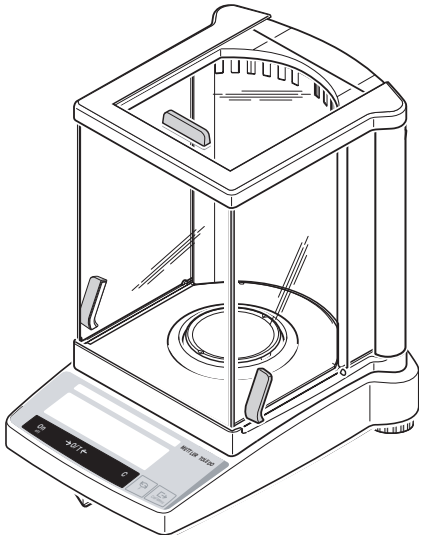
AB104-S/A /M up to SNR 1122399999 and from 1125410000 onwards
AB104-S SNR 1119109999 - 1122399999 and 1125410000 onwards

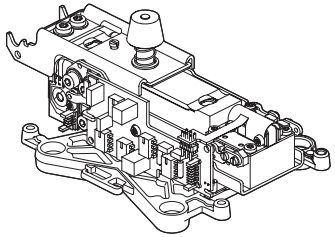
AB104-S/A -F /M -F
AB104-S/FACT

AB204-S/A /M up to SNR 1122399999
AB204-S SNR 1119109999 - 1122399999

AB304-S/A /M
AB304-S SNR 1119109999 upwards

AB304-S/A -F /M -F
AB304-S/FACT





JB203-C/A /M
JB203-C

JB803-C/A /M
JB803-C

JB1603-C/A /M
JB1603-C

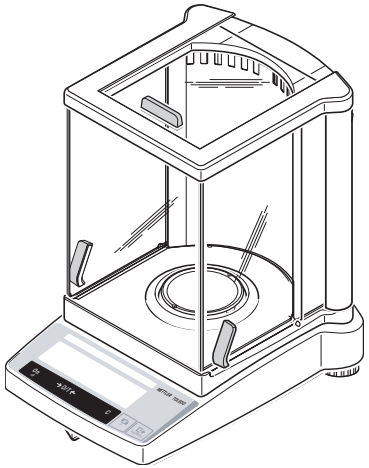
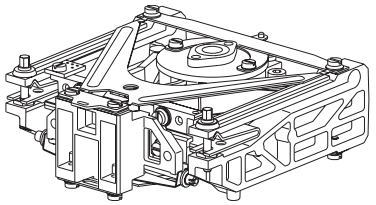
Troubleshooting: see Section 1, Chapter 5

Spare parts: see Section 1.1, Chapter 3

Spare parts:

see Section 3.2.1, Chapter 3

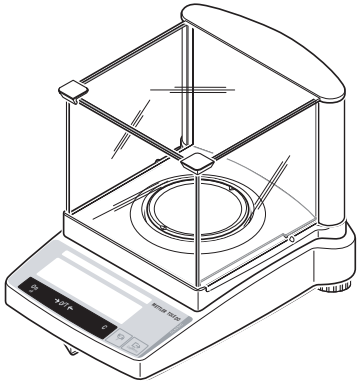
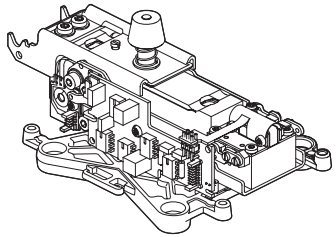
4.1.3 conventional Cell

Balance CAL int	Measuring cell: Part No. 11135410
AB54-S/A /M SNR 1122400000 - 1125409999 AB54-S SNR 1122400000 - 1125409999 AB104-S/A /M SNR 1122400000 - 1125409999 AB104-S SNR 1122400000 - 1125409999 AB204-S/A /M SNR 1122400000 onwards AB204-S SNR 1122400000 onwards AB204-S/A -F /M -F AB204-S/FACT AB135-S/A /M AB135-S AB135-S/A -F /M -F AB135-S/FACT AB265-S/A /M AB265-S AB265-S/A -F /M -F AB265-S/FACT	 
Troubleshooting: see Section 2, Chapter 5 **Spare parts:** see Section 1.3, Chapter 3	**Spare parts:** Chapter 3.1.1, Chapter 3

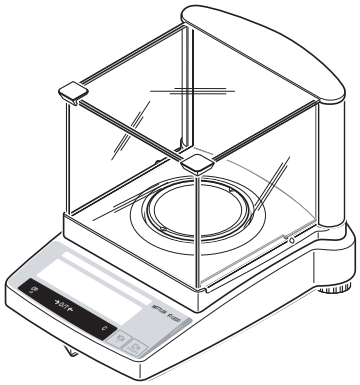
4.2 PB and JB-G types

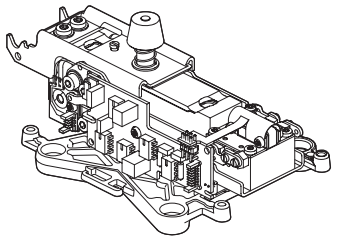
4.2.1 PB-S 300g 1mg - no CAL int

PB153-L, PB303-L and PB303-LDR see Section 4.2.4.

Balance 	**Measuring cell: Part No. 11103800**
PB153-S up to SNR 1125189999 PB303-S up to SNR 1125189999 PB303-SDR up to SNR 1125189999 	
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.4, Chapter 3	**Spare parts:** see Section 3.2.1, Chapter 3

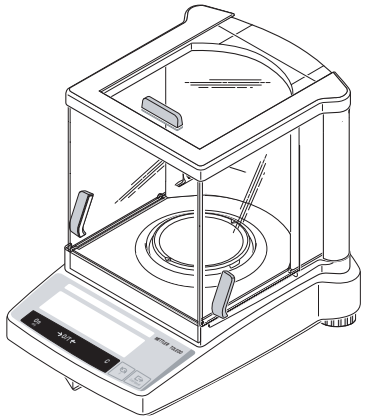
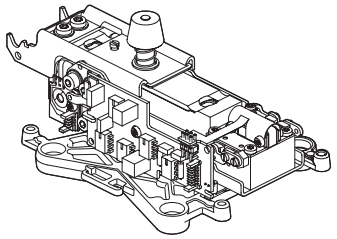
4.2.2 PB-S 300g 1mg - CAL int, basic draft shield

Balance CAL int	**Measuring cell:** **Part No. 11103800**
PB153-S/A /M up to SNR 1125189999 PB303-S/A /M up to SNR 1125189999 PB303-SDR/A /M up to SNR 1125189999	
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.5, Chapter 3	**Spare parts:** see Section 3.2.1, Chapter 3

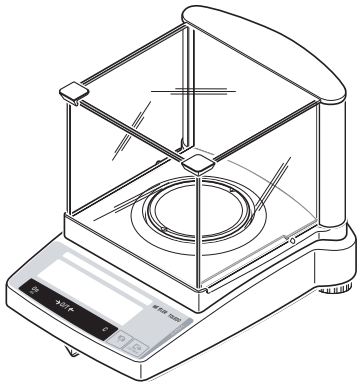
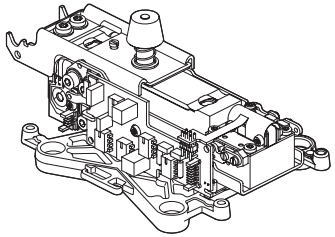


4.2.3 PB-S 300g 1mg - CAL int, draft shield with sliding doors

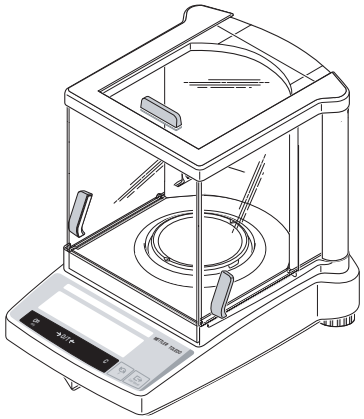
PB153-S, PB303-S and PB303-SDR SNR 1126100000 upwards see Section 4.2.5.

Balance CAL int	**Measuring cell: Part No. 11103800**
PB153-S/A /M SNR 1125190000 - 1126099999 PB153-S SNR 1125190000 - 1126099999 PB303-S/A /M SNR 1125190000 - 1126099999 PB303-S SNR 1125190000 - 1126099999 PB303-SDR/A /M SNR 1125190000 - 1126099999 PB303-SDR SNR 1125190000 - 1126099999	 
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.6, Chapter 3	**Spare parts:** see Section 3.2.1, Chapter 3

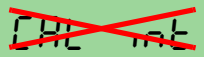
4.2.4 PB-S 500g 1mg - w/o CAL int

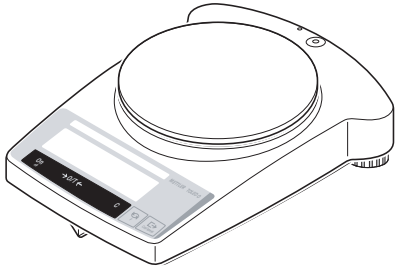
Balance ~~CAL int~~	Measuring cell: Part No. 11103806
PB153-L/A /M PB153-L PB303-L/A /M PB303-L PB303-LDR/A /M PB303-LDR PB403-S up to SNR 1125189999 PB503-S up to SNR 1125189999	 
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.7, Chapter 3	**Spare parts:** see Section 3.2.1, Chapter 3

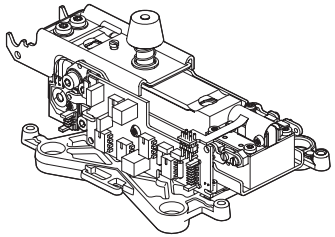
4.2.5 PB-S 500g 1mg - CAL int

Balance CAL int	**Measuring cell:** **Part No. 11103806**
PB153-S/A /M SNR 1126100000 upwards PB153-S SNR 1126100000 upwards PB153-S/A -F /M -F PB153-S/FACT PB303-S/A /M SNR 1126100000 upwards PB303-S SNR 1126100000 upwards PB303-S/A -F /M -F PB303-S/FACT PB303-SDR/A /M SNR 1126100000 upwards PB303-SDR ab SNR 1126100000 PB303-SDR/A -F /M -F PB303-SDR/FACT PB403-S/A /M PB403-S SNR 1125190000 upwards PB403-S/A -F /M -F PB403-S/FACT PB503-S/A /M PB503-S SNR 1125190000 upwards PB503-S/A -F /M -F PB503-S/FACT	
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.8, Chapter 3	**Spare parts:** see Section 3.2.1, Chapter 3

4.2.6 PB-S 3kg 0.1g/0.01g - w/o CAL int

Balance 	**Measuring cell:** **Part No. 11103801**
PB602-S up to SNR 1125189999 PB602-L/A /M PB602-L PB1502-S up to SNR 1125189999 PB1502-L/A /M PB1502-L PB3002-S up to SNR 1125189999 PB3002-L/A /M PB3002-L PB3002-SDR up to SNR 1125189999 PB3002-LDR/A /M PB3002-LDR PB1501-S up to SNR 1126089999 PB1501-L/A /M PB1501-L PB3001-S up to SNR 1126089999 PB3001-L/A /M PB3001-L **Troubleshooting:** see Section 1, Chapter 5 **Spare parts:** see Section 1.9, Chapter 3	**Spare parts:** see Section 3.2.2, Chapter 3



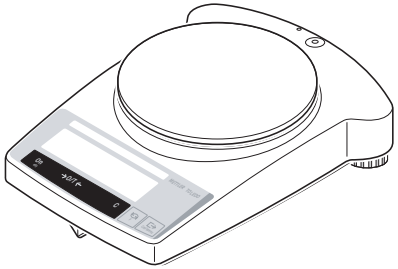


4.2.7 PB-S 3kg 0.1g/0.01g - CAL int

Balance CAL int	**Measuring cell:** **Part No. 11103801**

PB602-S/A /M
PB602-S SNR 1125190000 upwards

PB602-S/A -F /M -F
PB602-S/FACT



PB1502-S/A /M
PB1502-S SNR 1125190000 upwards

PB1502-S/A -F /M -F
PB1502-S/FACT

PB3002-S/A /M
PB3002-S SNR 1125190000 upwards

PB3002-S/A -F /M -F
PB3002-S/FACT

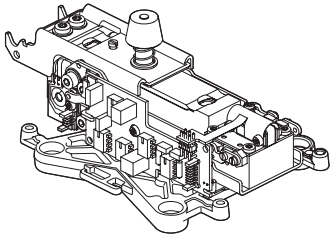
PB3002-SDR/A /M
PB3002-SDR SNR 1125190000 upwards

PB3002-SDR/A -F /M -F
PB3002-SDR/FACT

PB1501-S/A /M
PB1501-S SNR 1126090000 upwards

PB3001-S/A /M
PB3001-S SNR 1126090000 upwards

JB3002-G/A /M
JB3002-G



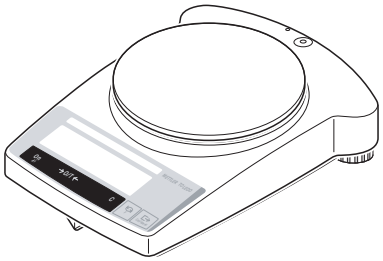
Troubleshooting: see Section 1, Chapter 5

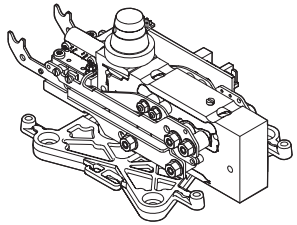
Spare parts: see Section 1.10, Chapter 3

Spare parts: see Section 3.2.2, Chapter 3

4.2.8 PB-S 4kg 0.01g - w/o CAL int

Balance	Measuring cell: Part No. 11103804
PB4002-S up to SNR 1125189999 (not legal for trade)	



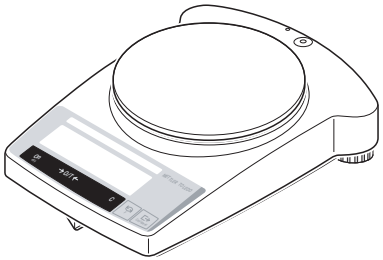


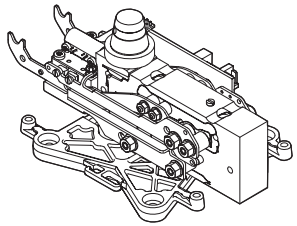
Troubleshooting: see Section 1, Chapter 5
Spare parts: see Section 1.11, Chapter 3

Spare parts: see Section 3.2.2, Chapter 3

4.2.9 PB-S 4kg 0.01g - CAL int

Balance	Measuring cell: Part No. 11103804
PB4002-S/A /M PB4002-S SNR 1125190000 upwards PB4002-S/A -F /M -F PB4002-S/FACT	

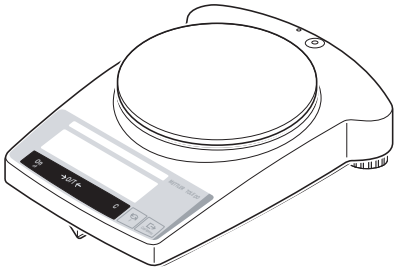
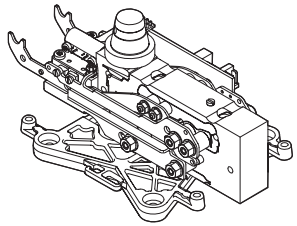




Troubleshooting: see Section 1, Chapter 5
Spare parts: see Section 1.12, Chapter 3

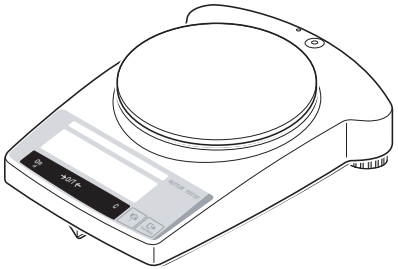
Spare parts: see Section 3.2.2, Chapter 3

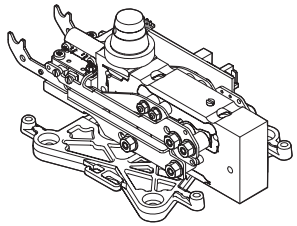
4.2.10 PB-S 8kg 1g/0.1g round - w/o CAL int

Balance	Measuring cell: Part No. 11103802
PB5001-S up to SNR 1126089999 PB8000-S up to SNR 1126089999 PB8001-S up to SNR 1126089999 PB5001-L/A /M PB5001-L PB8000-L/A /M PB8000-L PB8001-L/A /M PB8001-L	 
Troubleshooting: see Section 1, Chapter 5 **Spare parts:** see Section 1.13, Chapter 3	**Spare parts:** see Section 3.2.2, Chapter 3

4.2.11 PB-S 8kg 1g/0.1g round - CAL int

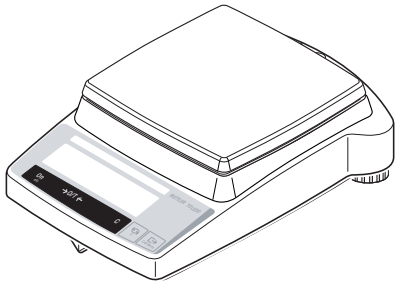
Balance CAL int	**Measuring cell:** **Part No. 11103802**
PB5001-S/A /M PB5001-S SNR 1126090000 upwards PB8000-S/A /M PB8000-S SNR 1126090000 upwards PB8001-S/A /M PB8001-S SNR 1126090000 upwards JB8001-G up to SNR 1125489999 **Troubleshooting:** see Section 1, Chapter 5 **Spare parts:** see Section 1.14, Chapter 3	**Spare parts:** see Section 3.2.2, Chapter 3

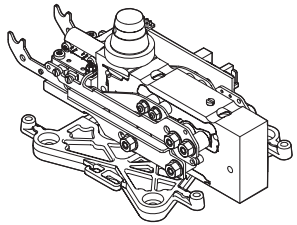




4.2.12 PB-S 8kg 1g/0.1g square - CAL int

Balance CAL int	**Measuring cell: Part No. 11103802**
PB5001-S/A -F /M -F PB5001-S/FACT PB8000-S/A -F /M -F PB8000-S/FACT PB8001-S/A -F /M -F PB8001-S/FACT JB8001-G SNR 1125490000 upwards **Troubleshooting:** see Section 1, Chapter 5 **Spare parts:** see Section 1.15, Chapter 3	**Spare parts:** see Section 3.2.2, Chapter 3





5 Special types

5.1 Allocation of special types to basic types

Special type	Basic type	Comments	Adjustment tolerances
AB54-S-TEX	AB54-S	Textile balance for yarn count determination, operating instruction: 11780353	see Chapter 9
AB104-S-A/M	AB104-S	Pharmacy balance with formula weighing	
AB104-S/P	AB104-S	Pharmacy balance, membrane keypad p/n 11139812, model plate p/n 11139710	
AB184-S-A	AB204-S	Pharmacy balance with formulation, supplement to operating instructions: 11780357 (only german)	
AB184-S-A/E	AB204-S	For supply to Japan only	
AB204-S/A\US GB6001-S/A\US	AB204-S	Second unit with mg, lb, oz, ozt, GN, dwt	
AB204-S/BR	AB204-S	AB204-S with MonoBloc	
AB204-S/P	AB204-S	Pharmacy balance, membrane keypad p/n 11139812, model plate p/n 11139711	
ABxxx-SRS PBxxxx-SRS	AB-S PB-S	Supplied with RS interface	
ABxxx-S/31	ABxxx-S	new Type for \KR110 and \KR220	
B154-S/204-S	AB204-S	College balance, capacity 151 g, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	
B203-S	PB303-S	College balance, capacity 210 g, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	
B303-S	PB303-S	College balance, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	

Special type	Basic type	Comments	Adjustment tolerances
B502-S	PB602-S	College balance, capacity 510 g, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	see Chapter 9
B2002-S	PB3002-S	College balance, capacity 2100 g, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	
B3001-S	PB3001-S	College balance, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	
B3002-S	PB3002-S	College balance, only g/Newton, no piece counting. Top housing: 11103858, membrane keypad: 11103448.	
GB802-S	PB602-S	Gold balance, capacity 810 g, RS interface, no piece counting	
GB1302-S	PB1502-S	Gold balance, capacity 1310 g, RS interface, no piece counting	
GB1501-S	PB1501-S	Gold balance, RS interface, no piece counting	
GB2002-S	PB3002-S	Gold balance, capacity 2100 g, RS interface, no piece counting	
GB3001-S	PB3001-S	Gold balance, RS interface, no piece counting	
GB3002-S/DR	PB3002-S/DR	Gold balance, RS interface, no piece counting	
GB6001-S	PB8001-S	Gold balance, capacity 6100 g, RS interface, no piece counting	
GBxxxx-S\KR110 GBxxxx-S\KR220 PBxxxx-S\KR110 PBxxxx-S\KR220		Korea Version Second unit with g or kg	
LabStyle54	AB54-S	Colored balance with patterned dust cover Spare Parts: AB54-S (Colors see: *Colors)	
LabStyle153	PB153-S	Colored balance with patterned dust cover Spare Parts: AB54-S (Colors see: *Colors)	

Special type	Basic type	Comments	Adjustment tolerances
LabStyle204	AB204-S	Colored balance with patterned dust cover Spare Parts: AB54-S (Colors see: *Colors)	see Chapter 9
LabStyle303	PB303-S	Colored balance with patterned dust cover Spare Parts: AB54-S (Colors see: *Colors)	
LabStyle602	PB602-S	Colored balance with patterned dust cover Spare Parts: AB54-S (Colors see: *Colors)	
		*Colors: S01 Yellow S02 Anthracite S03 Green S04 Blue S05 Orange S06 RAL 7035 Light gray S/M03 Certified green	
LabStyle1501-S	PB1501-S	Colored balance with patterned dust cover Spare Parts: AB54-S Colors: S/M03 Certified green	
PB303-S/P	PB303-S	Pharmacy balance, membrane keypad p/n 11139812, model plate p/n 11139712	
PBxx3-S/21 B303-S/21	PB303-S	With tall draft shield	
PB602-S22	PB602-S/A	Japan Tobacco Advanced type balance without calibration weight but with special software 11670575	
PB602-S23		Draft shield small and Weighing pan 175 mm	
PB602-S25		Draft shield small and Weighing pan 175 mm without front glass	
PB3002-SDR/P	PB3002-SDR	Pharmacy balance, membrane keypad p/n 11139812, model plate p/n 11139713	
PB3002-S-A-DR/E	PB3002-SDR/E		

Special type	Basic type	Comments	Adjustment tolerances
PB8001-S/M20	PB8001-S	Pharmacy balance with formulation, supplement to operating instructions: 11780357 (only German)	see Chapter 9
PBxxxx-S/31	PBxxxx-S	Only with metric unit. Spec. TDNR	
PBxxxx-S-CN/A		Green Membrane keypad ME-11103449	

6 Abbreviations

/A	Certified balance country-specific
FACT	Fully Automated Calibration Technology
LARS	LabTec Repair and Service Software
/M	Certified balance EU
SMA	Service Manual
SNR	Serial number
SW	Software
TDNR	Type Definition Number
w/o	without

7 Document Status

Document number	Date of change	Changed pages	Short description of Change
11780614 8.12	05/2004	Entire document	Summary of cells and balances from the «RGB» service manual in a single document. Migration of the «RGB» data into a new layout. Various amendments and additions.
11780613A 8.11	03/2005	in all chapters	miscellaneous small changes, corrections, amendments
		Chapter 1	- New section *2.4 Serial number decoding* - *3 Overview of xB-S Generations* - new presentation, amendments - *4 Overview of balances and measuring cells* - new structure; -L and FACT models and square weighing pan added - New section *6 Abbreviations*
		Chapter 3	New structure; new models added
		Chapter 7	New structure, revised and amended
		Chapter 8	- *2.5 Certified xB-S balances: external calibration and selection of units* rectified - *2.6 Certification sticker "M"* added
		Index	added

2 Safety

List of Contents

1 Safety

1.1 Before starting service work

- Obtain written confirmation that the balance is not contaminated, or that it has been expertly cleaned before service work is started.
- Obtain this confirmation in advance through your service organization.
- Read the Operating Instructions to familiarize yourself with the functions of the balance.
- Observe all safety instructions in this Service Manual.
- Observe any safety instructions received from the customer. Be specially sure to observe safety instructions which are closely related to your service work.

1.2 Pictograms used in this manual

General warning

Warning of an electric voltage

Electrostatically damageable components

Fire hazard

1.3 Text markers used

Warning, Note	Important information regarding handling

1.4 Disposal of service materials and replaced parts

Service materials (cleaning cloths, cleaning agents, etc.) and replaced parts must be disposed of:

- in accordance with the specific customer's regulations
- in accordance with the specific regulations of the respective country.

1.5 State of the art

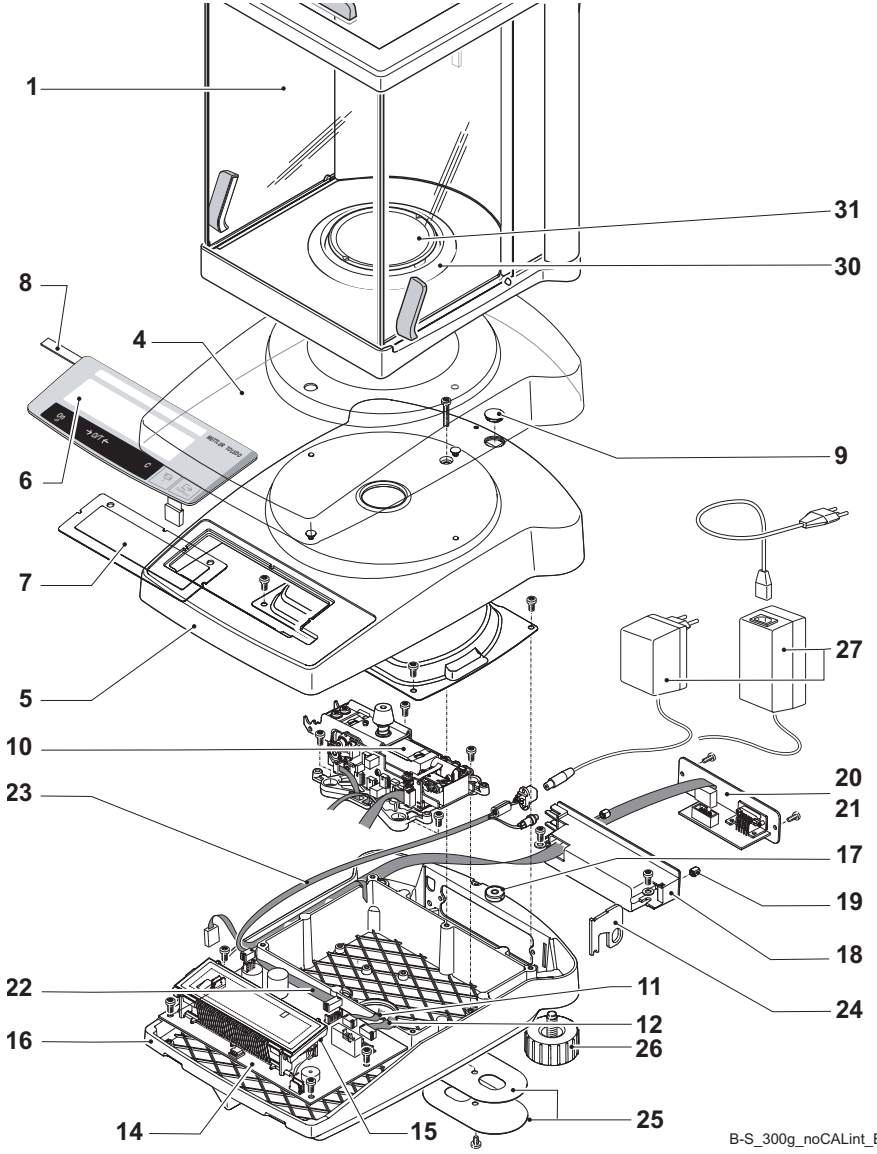
This Service Manual corresponds to the state of the art at the date of issue (e.g. 03/2005).

3 Spare Parts

List of Contents

1 Balances

1.1 AB-S, AB-L MonoBloc w/o CAL int

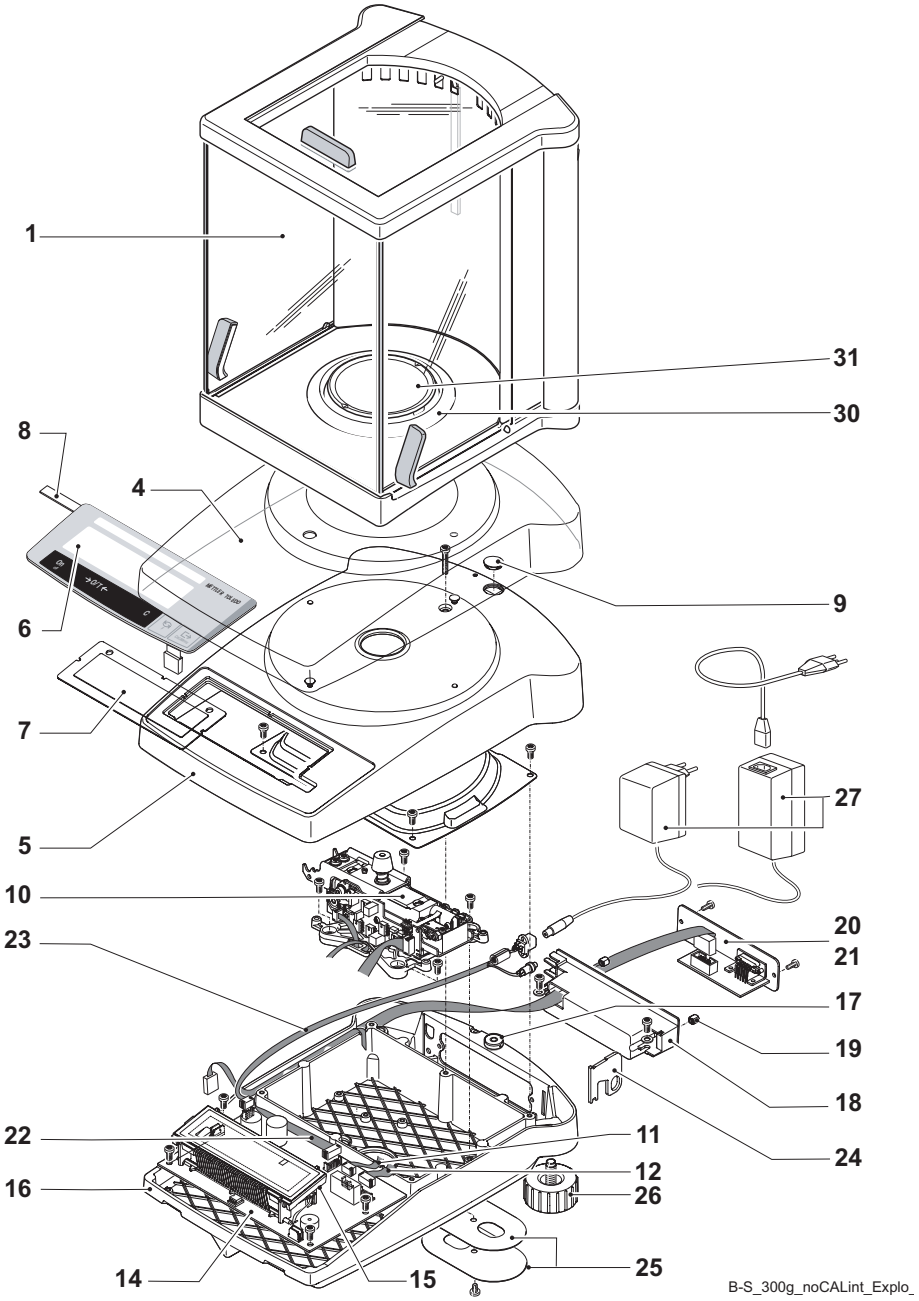


for example AB204-L

overview of all balance types see Section 4.1.1, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield (H=255 mm)	see Section 2.1	
	Draft shield (H=170 mm)	see Section 2.2	
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
	Membrane keypad	«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on balance board «A» Spare parts see Section 3.2.1	11103800
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

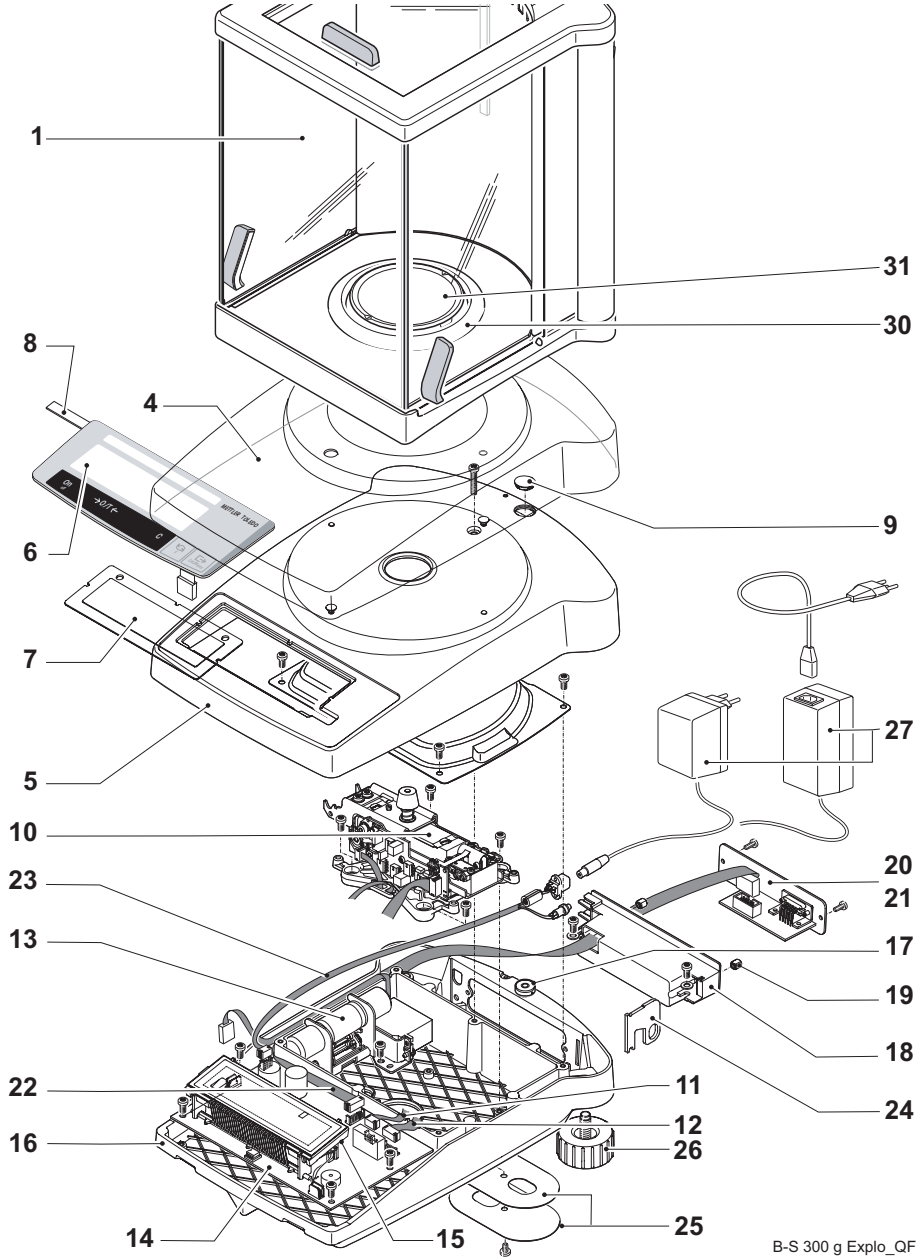
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853 ~~11103854~~
15	Backlight green Backlight white	to SNR 1125190000 from SNR 1125190000	224253 11137475
16	Bottom housing	incl. item 17	11103821
17	Level		11101335
18	Connection holder	without insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 80mm	11103569
31	Weighing pan ∅ 80mm		224218

1.2 AB-S, JB-C MonoBloc with CAL int

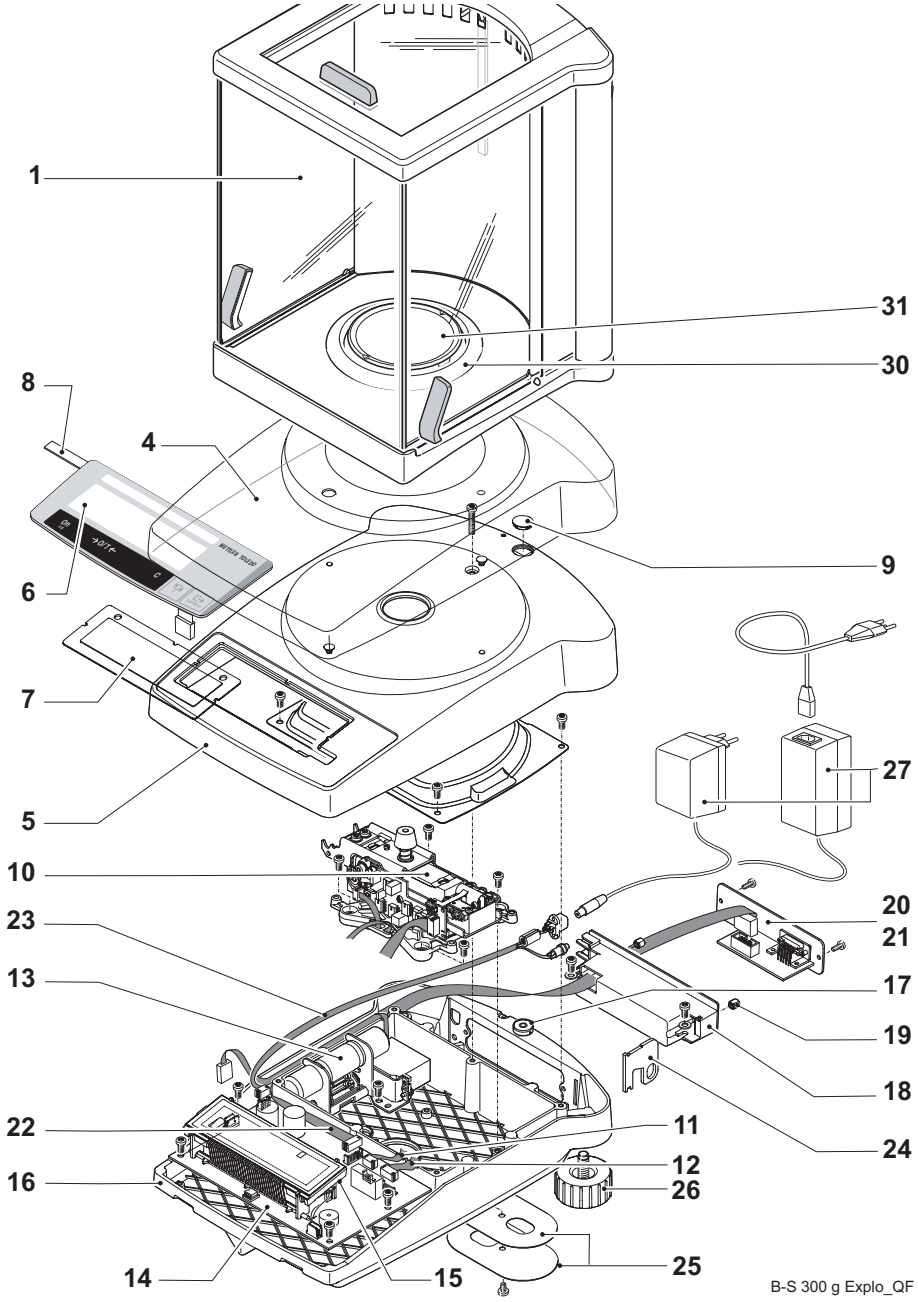


for example AB204-S

overview of all balance types see Section 4.1.2, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield (H=255 mm)	see Section 2.1	
	Draft shield (H=170 mm)	see Section 2.2	
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on balance board «A» Spare parts see Section 3.2.1	11103800
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

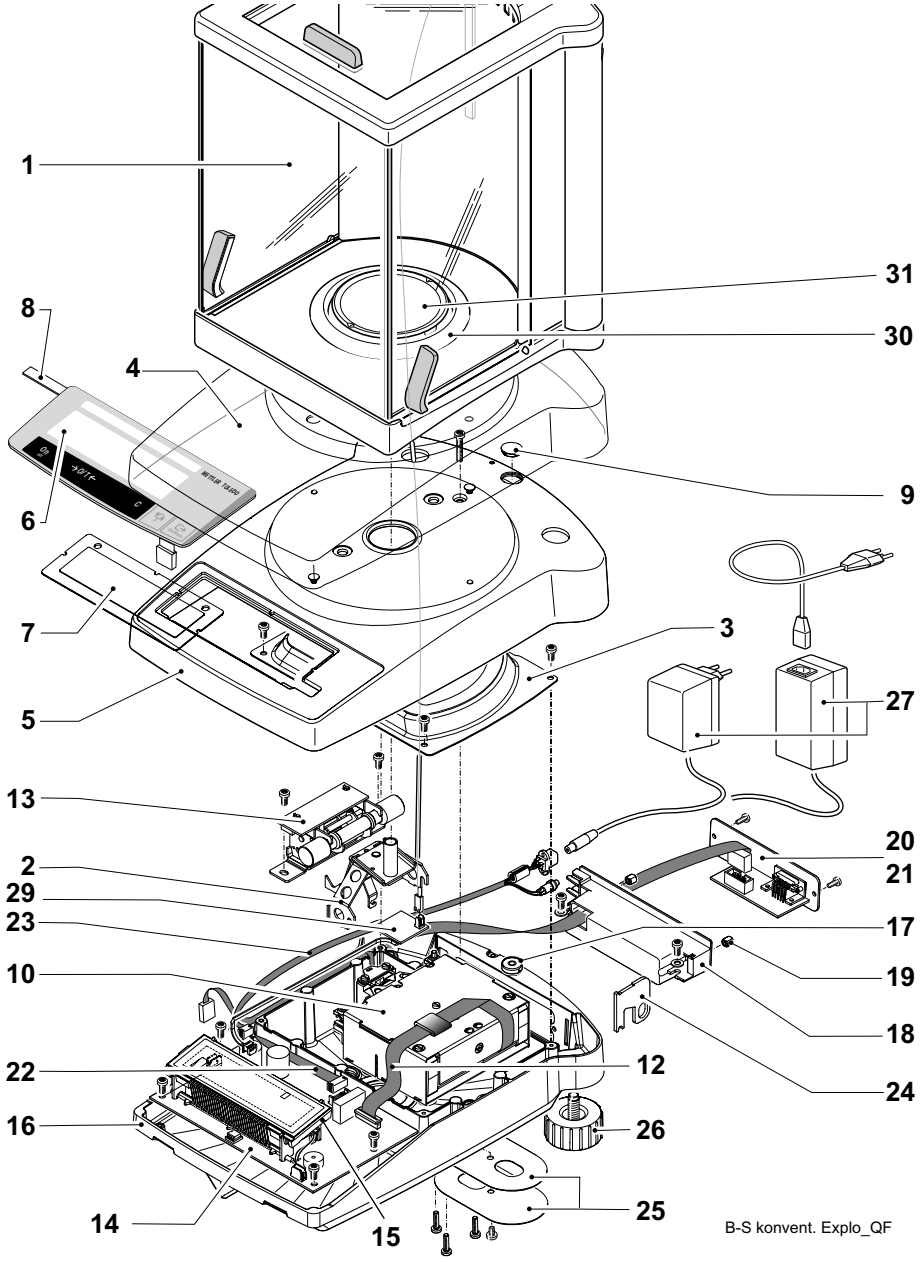
Items 13 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853 ~~11103854~~
15	Backlight green Backlight white	to SNR 1125190000 1125190000 upwards	224253 11137475
16	Bottom housing	incl. item 17	11103821
17	Level		11101335
18	Connection holder	without insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 80mm	11103569
31	Weighing pan ∅ 80mm		224218

1.3 AB-S conventional

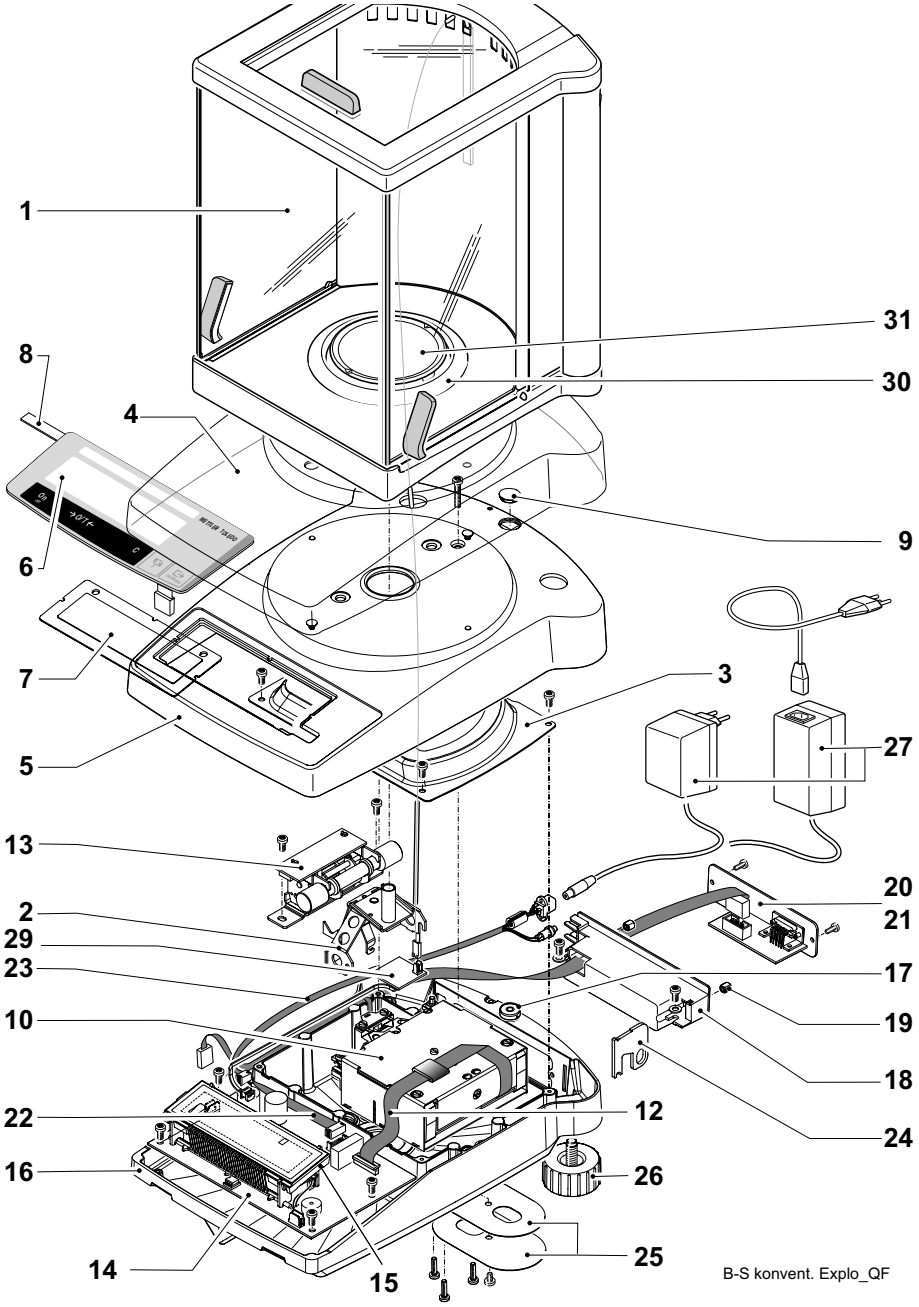


for example AB265-S

overview of all balance types see Section 4.1.3, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield (H=255 mm)	see Section 2.1	
2	Support		11135430
3	Cell shielding		11135431
4	Protective cover		11135408
5	Top housing	comprising Item 6, 7, 9	11135402
	Top housing, Vacuum	comprising Item 6, 7, 9	11135409
6	Membrane keypad	«CLASSIC»	11135444
		«CLASSIC Plus»	11139813
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on balance board «100g» (100g internal cal. weight) «200g» (200g internal cal. weight) Spare parts see Section 3.1.1	11135410
12	Coil cable	11core, 225 mm	11600516

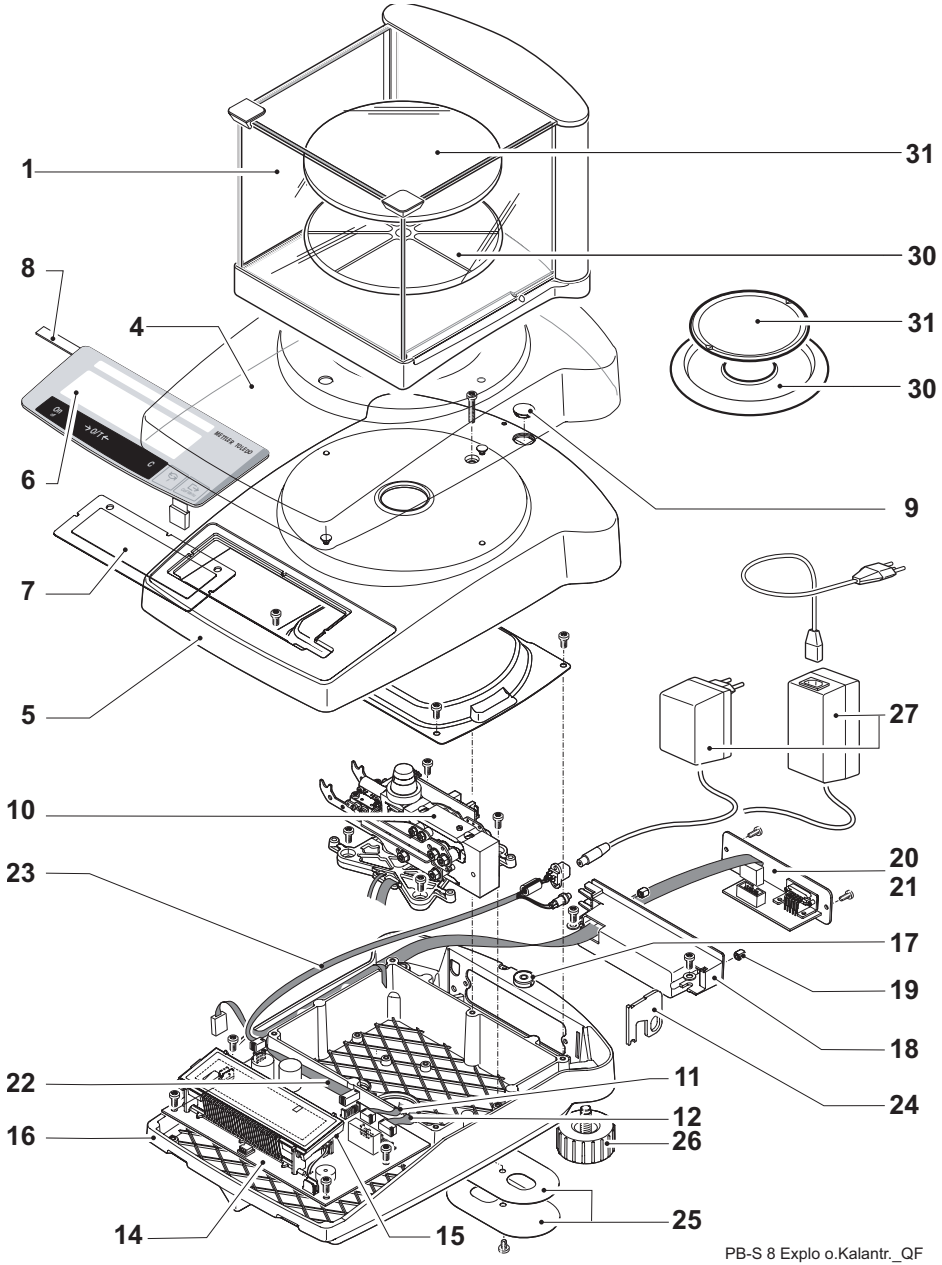
Items 13 - 31



Items 1 - 12

Item	Designation	Comments	Part No.
13	Calibration drive	without calibration weight	11135432
14	Balance board, backlit		11135420 ~~11135421~~
15	Backlit white		11137475
16	Bottom housing	incl. Item 17	11135401
17	Level		11101335
18	Connection holder	without insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11135165 ~~11103756~~
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
29	Stabilizer-PCB		11135422
30	Ring	∅ 80mm	11103569
31	Weighing pan ∅ 80mm		11135434

1.4 PB-S 300g 1mg w/o CAL int

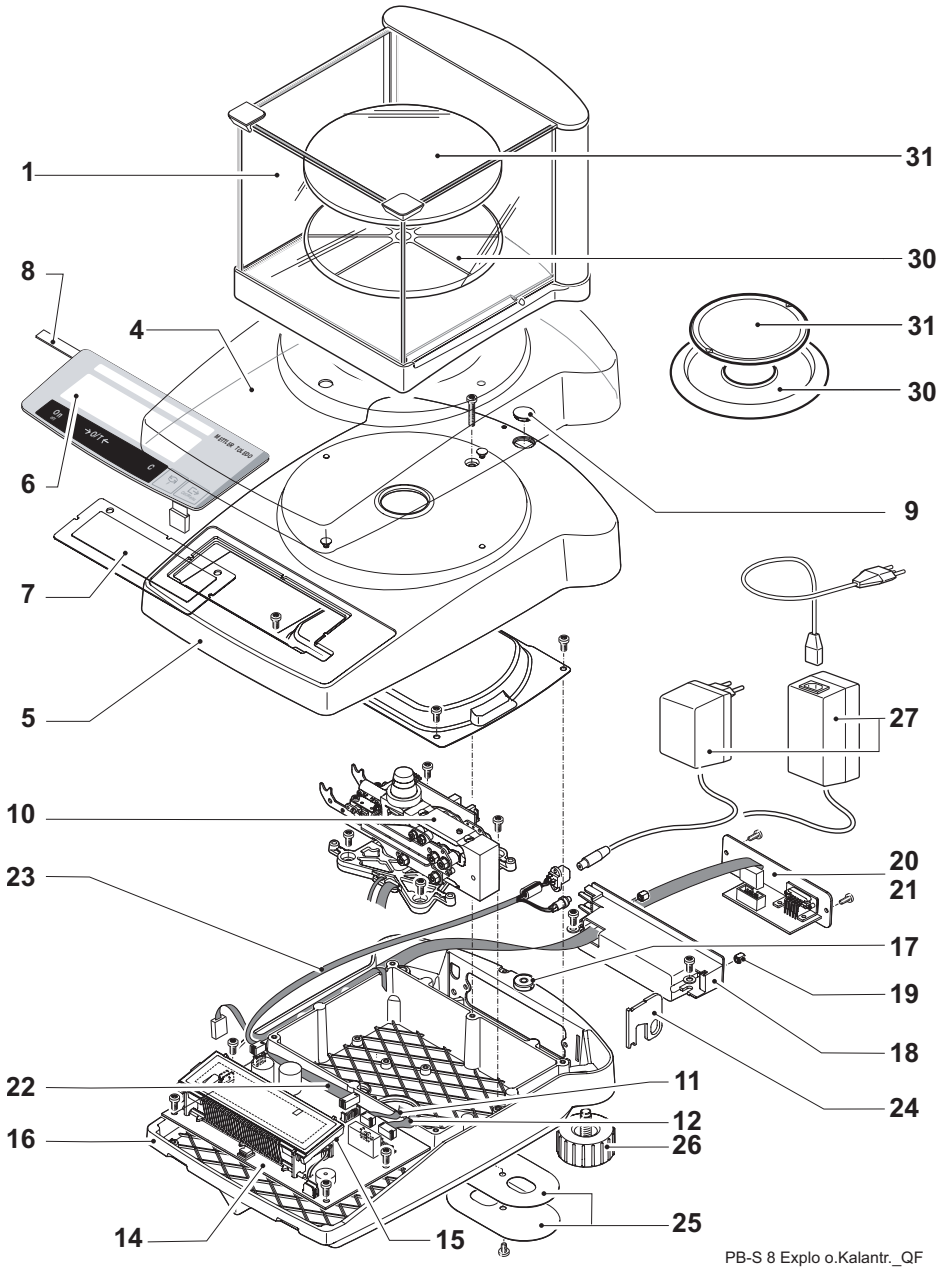


for example PB303-S

overview of all balance types see Section 4.2.1 and Section 4.2.4, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield (H=155 mm)	see Section 2.3	
4	Protective cover		11103681
5	Top housing	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «E» Spare parts see Section 3.2.1	11103800
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

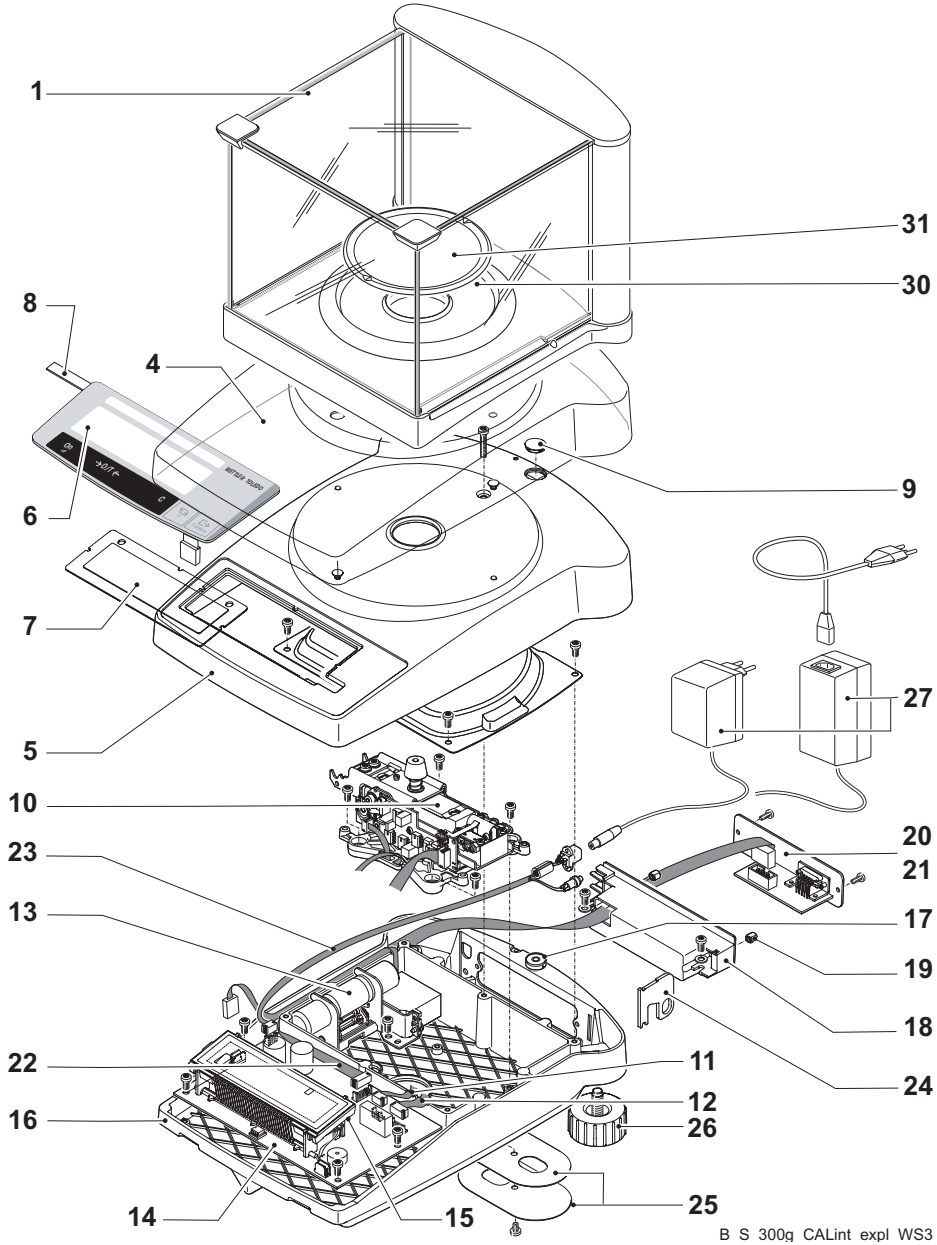
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11137476 ~~11103700~~ ~~11103701~~
15	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring (Weighing pan ∅ 100mm)		224366
	Pan support (Weighing pan ∅ 175mm)		11103857
31	Weighing pan ∅ 100mm		11103855
	Weighing pan ∅ 175mm		11103283

1.5 PB-S 300g 1mg with CAL int, basic draft shield

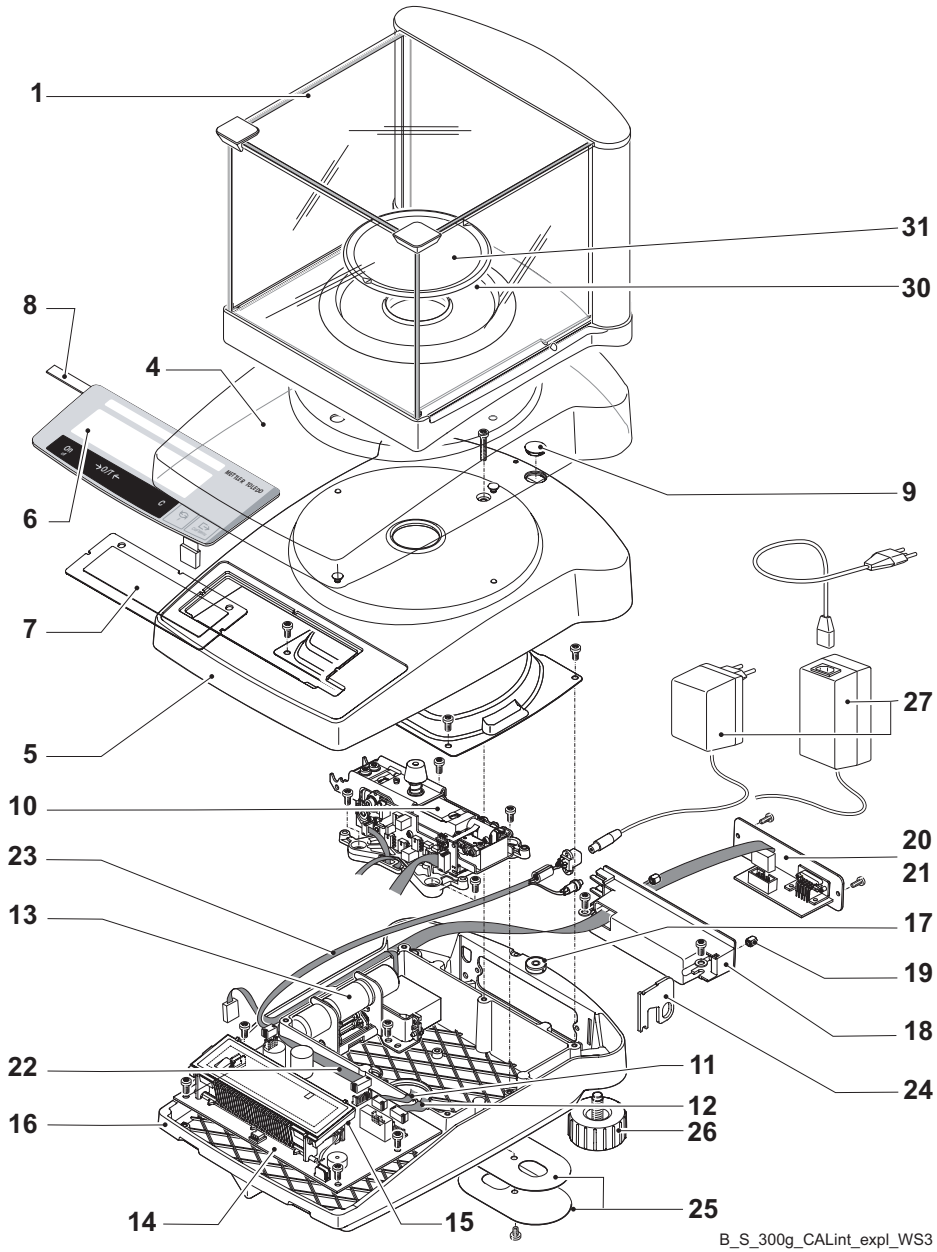


for example PB303-S/A

overview of all balance types see Section 4.2.2, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield (H= 155 mm)	see Section 2.3	
4	Protective cover		11103681
5	Top housing	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSICS»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.1	11103800
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

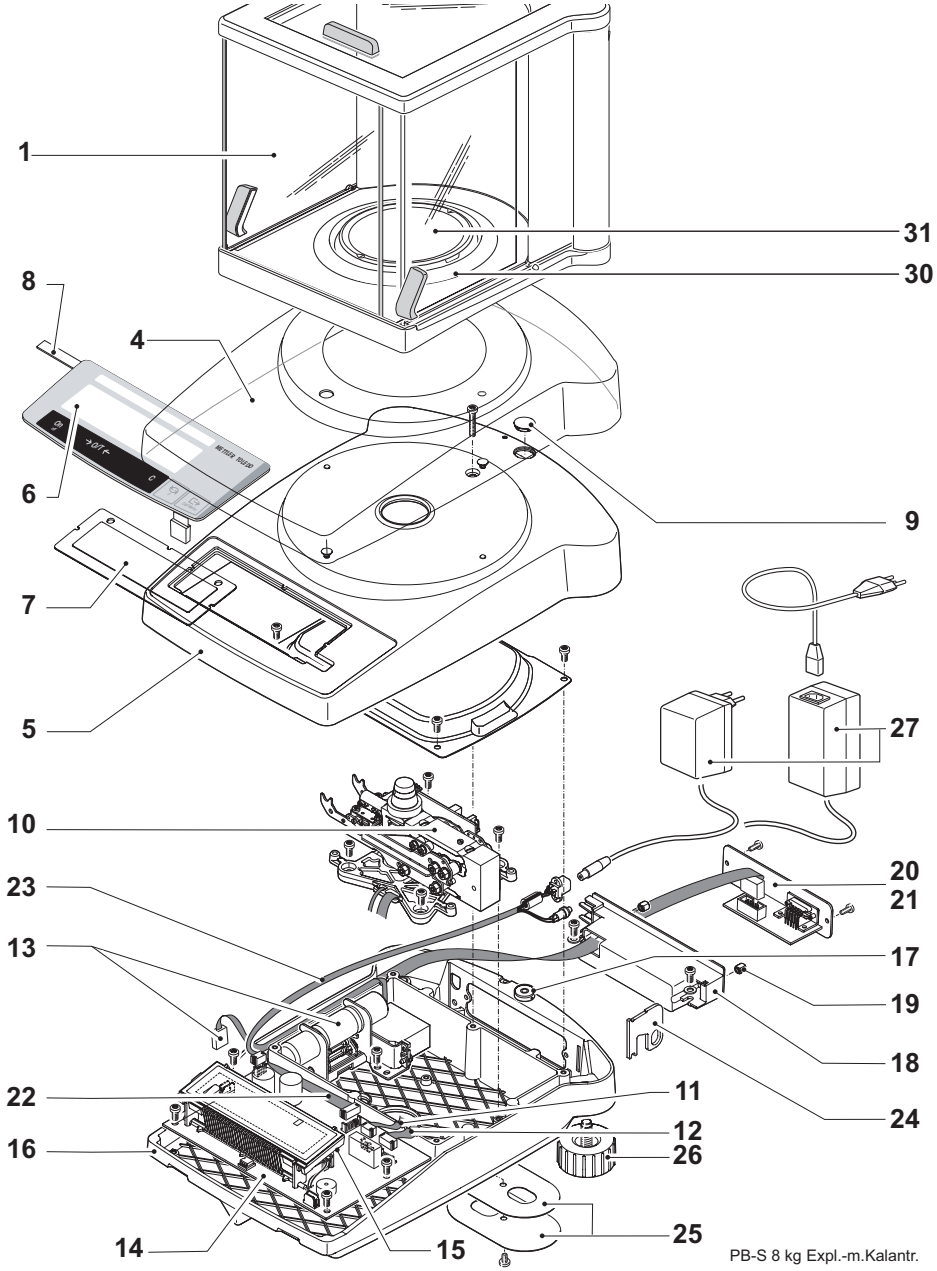
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853 ~~11103854~~
15	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 100mm	224366
31	Weighing pan ∅ 100mm		11103855

1.6 PB-S 300g 1mg with CAL int, draft shield with sliding doors

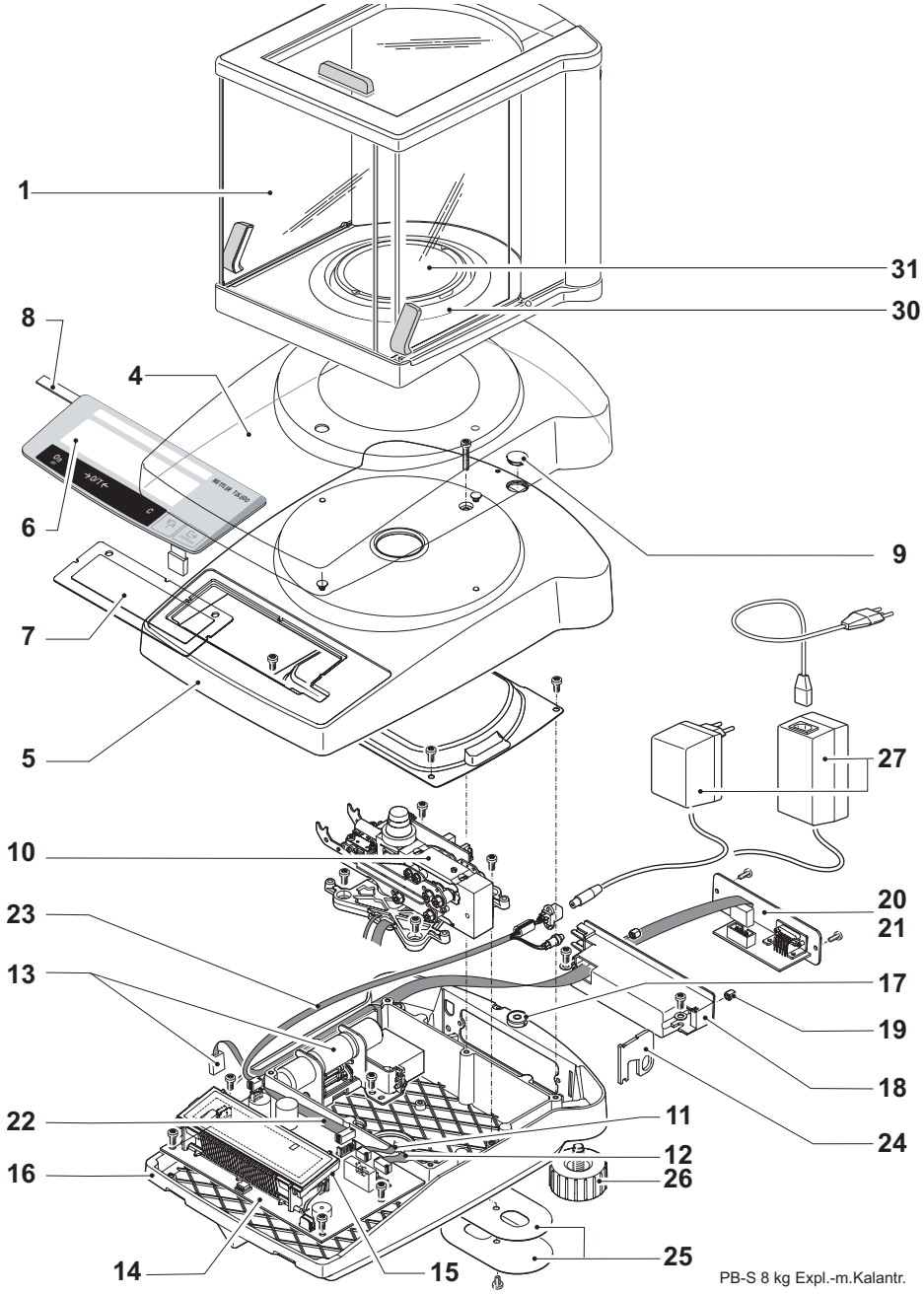


for example PB303-S

overview of all balance types see Section 4.2.3 and Section 4.2.5, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shied (H=170 mm)	see Section 2.2	
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.1	11103800
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

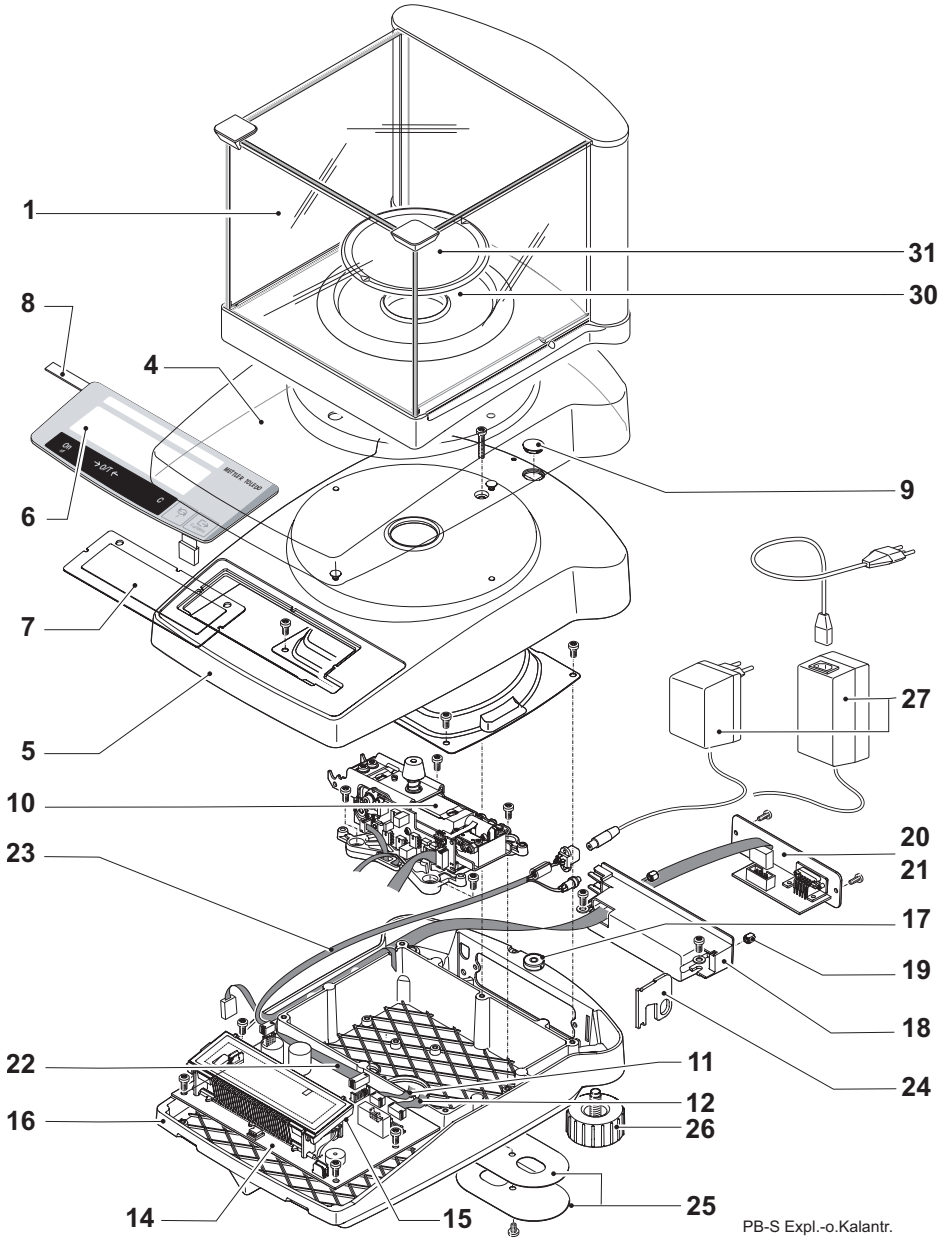
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853
15	Backlight white		11137475
	Backlight green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 100mm	224366
31	Weighing pan ∅ 100mm		11103855

1.7 PB-S 500g 1mg w/o CAL int

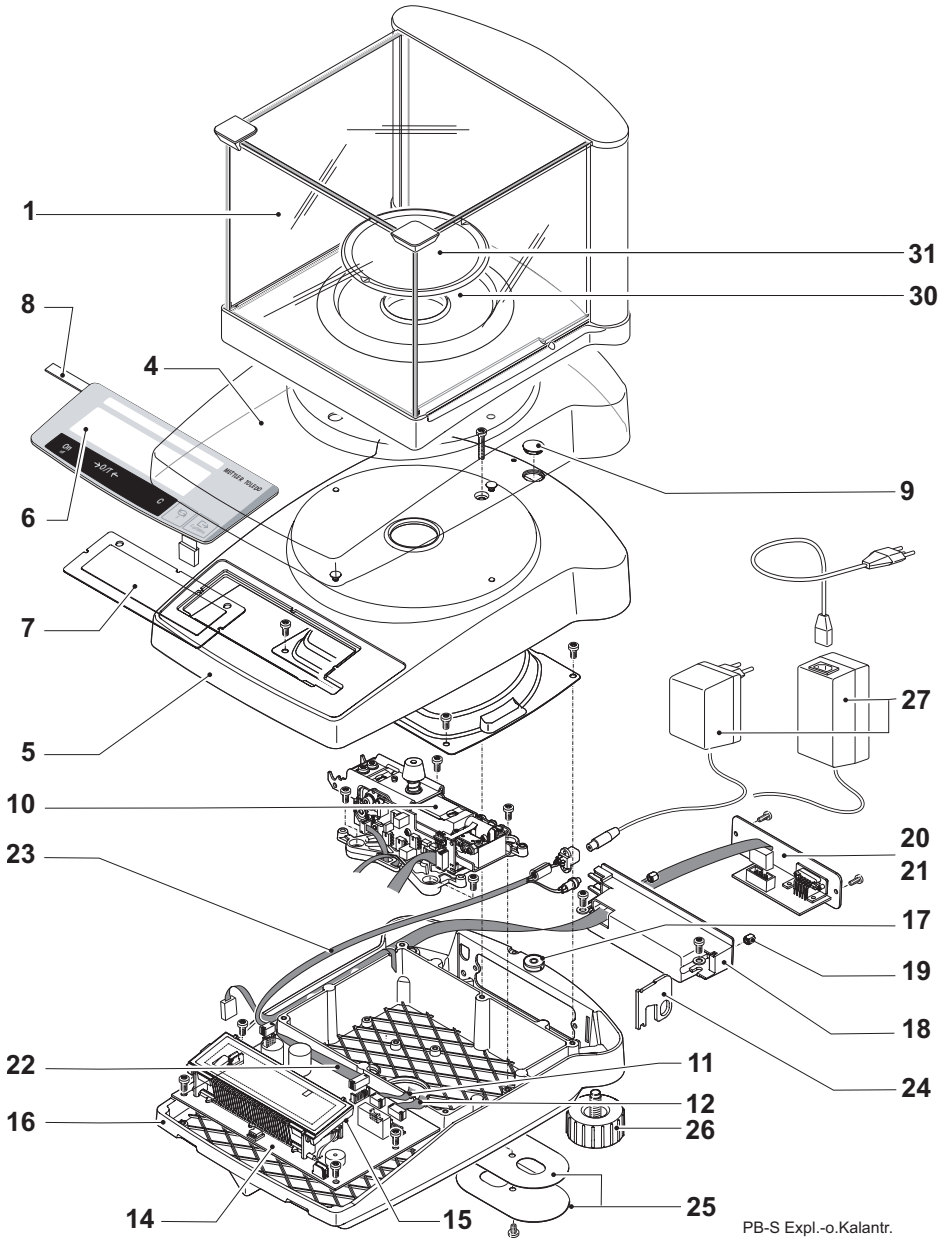


for example PB503-S

overview of all balance types see Section 4.2.4, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield	see Section 2.3	
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «E» Spare parts see Section 3.2.1	11103806
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

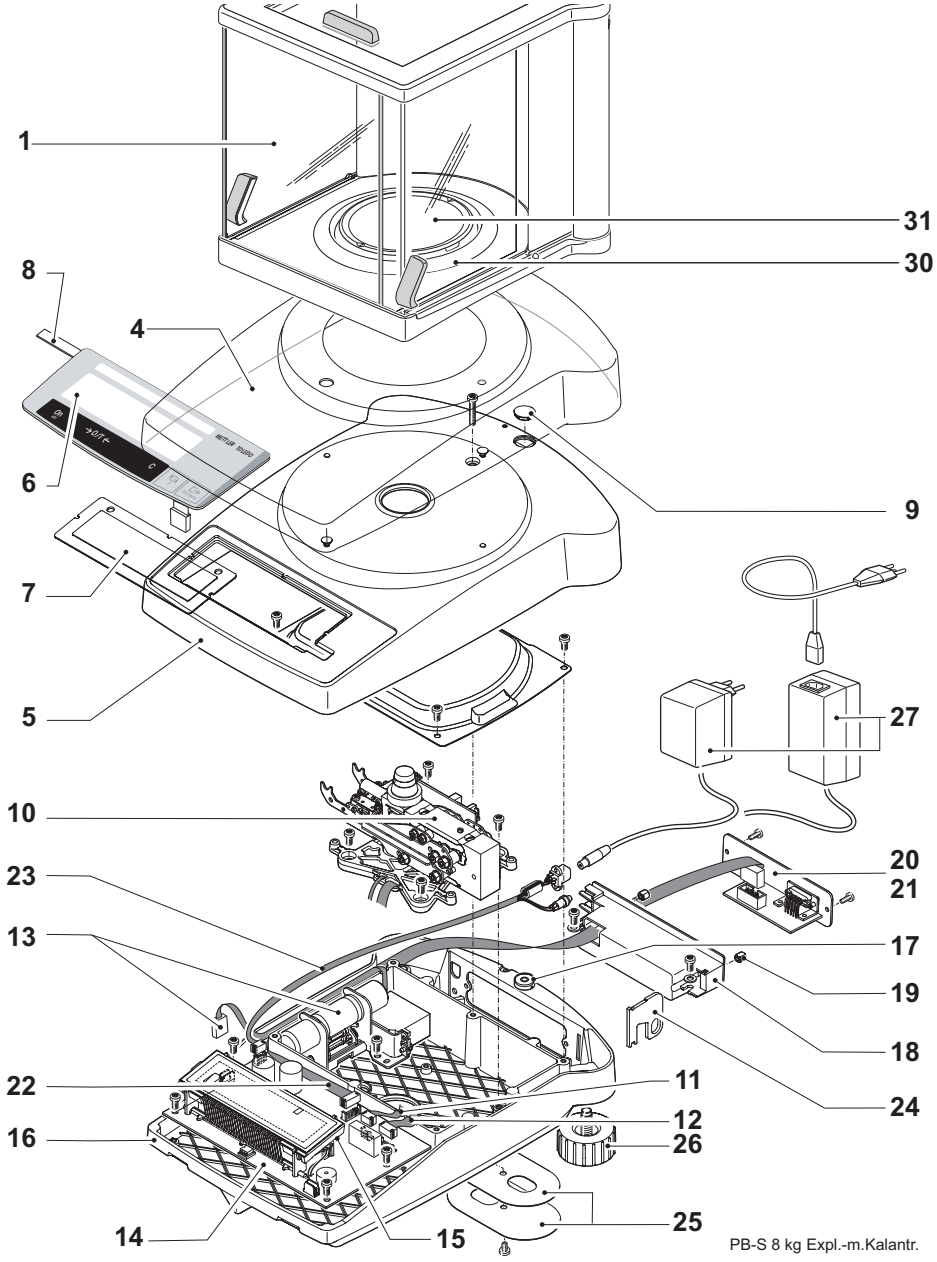
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11137476 ~~11103700~~
15	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 100mm	224366
31	Weighing pan ∅ 100mm		11103855

1.8 PB-S 500g 1mg with CAL int

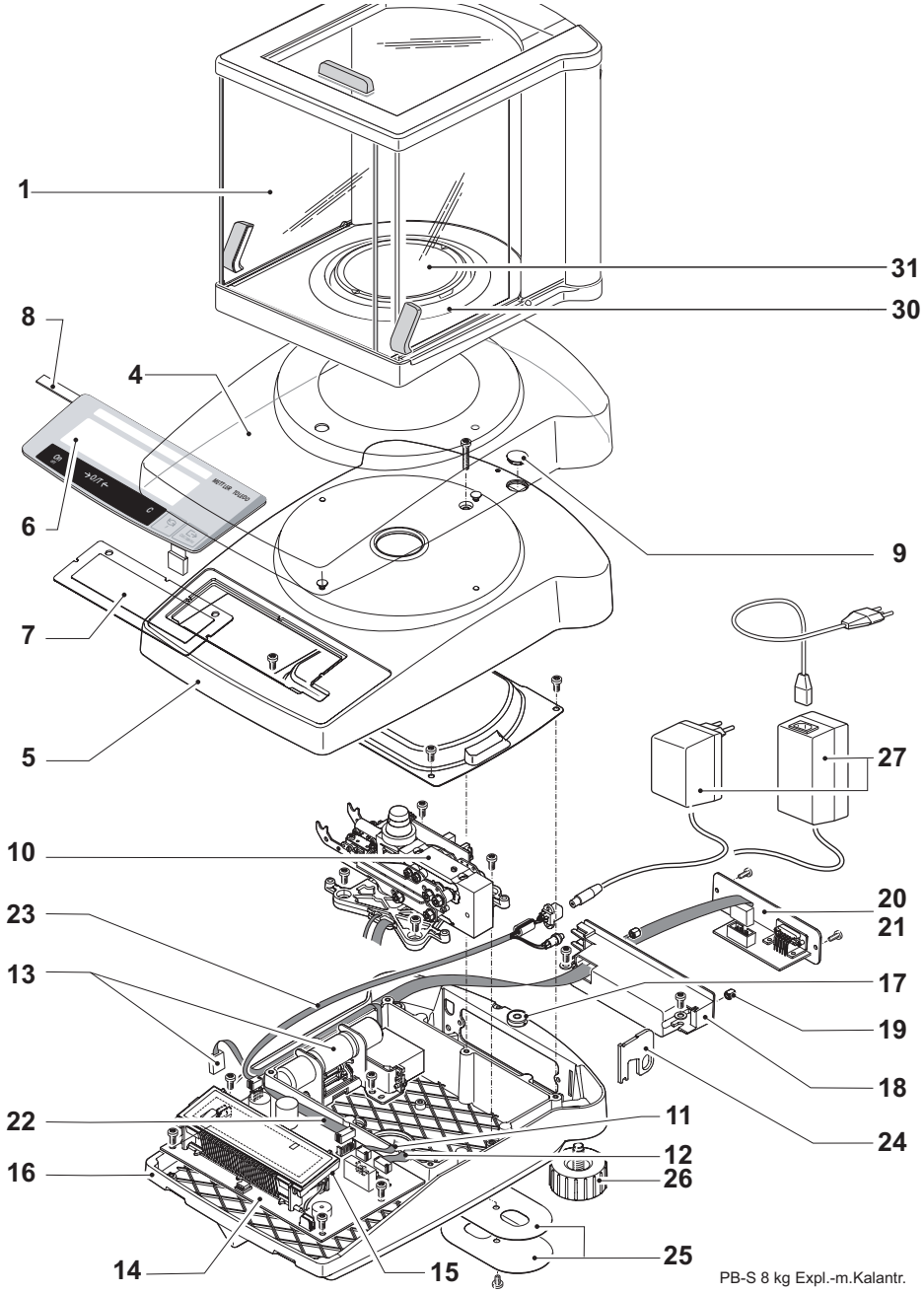


for example PB503-S

overview of all balance types see Section 4.2.5, Chapter 1

Item	Designation	Comments	Part No.
1	Draft shield	see Section 2.2	
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.1	11103806
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

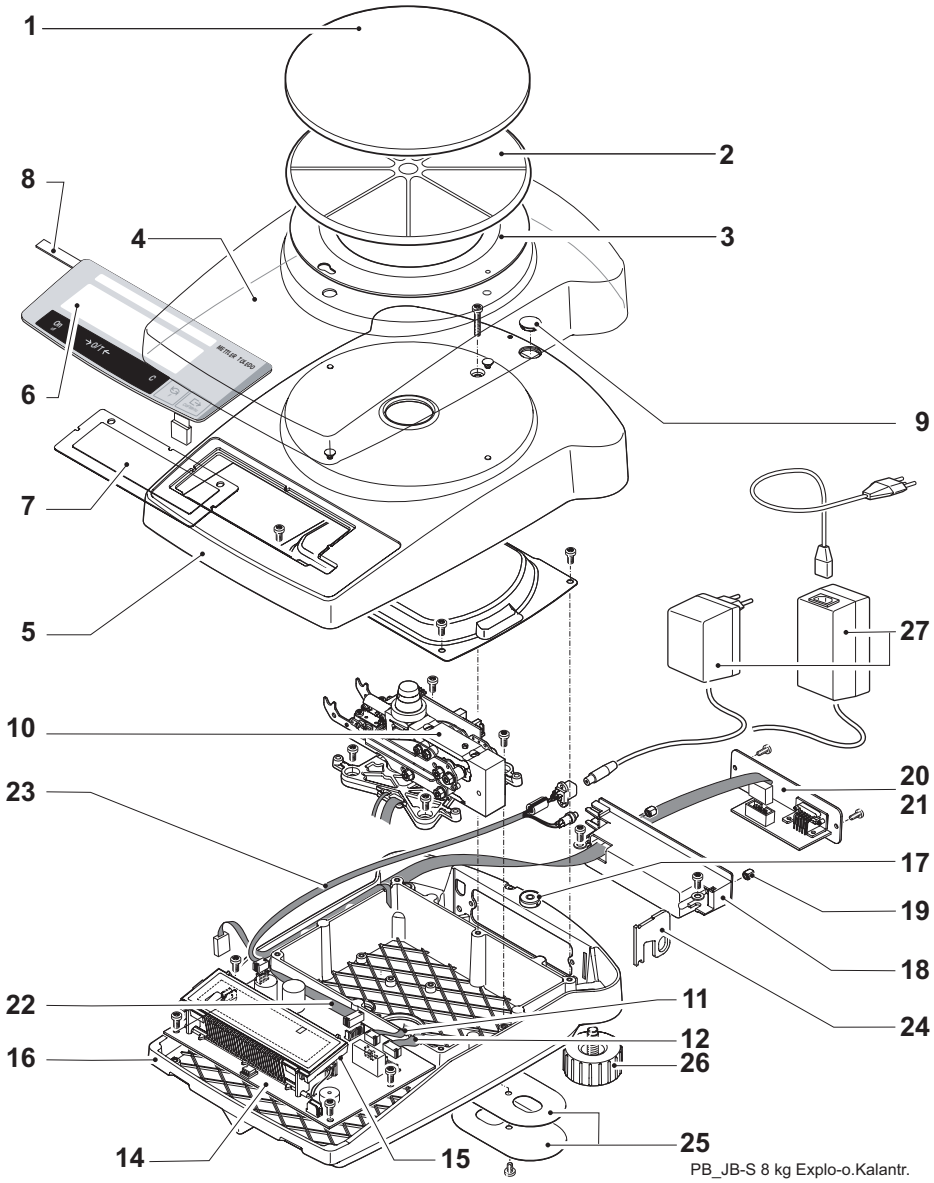
Items 14 - 31



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	
30	Ring	∅ 100mm	224366
31	Weighing pan ∅ 100mm		11103855

1.9 PB-S 3kg 0.1g/0.01g w/o CAL int

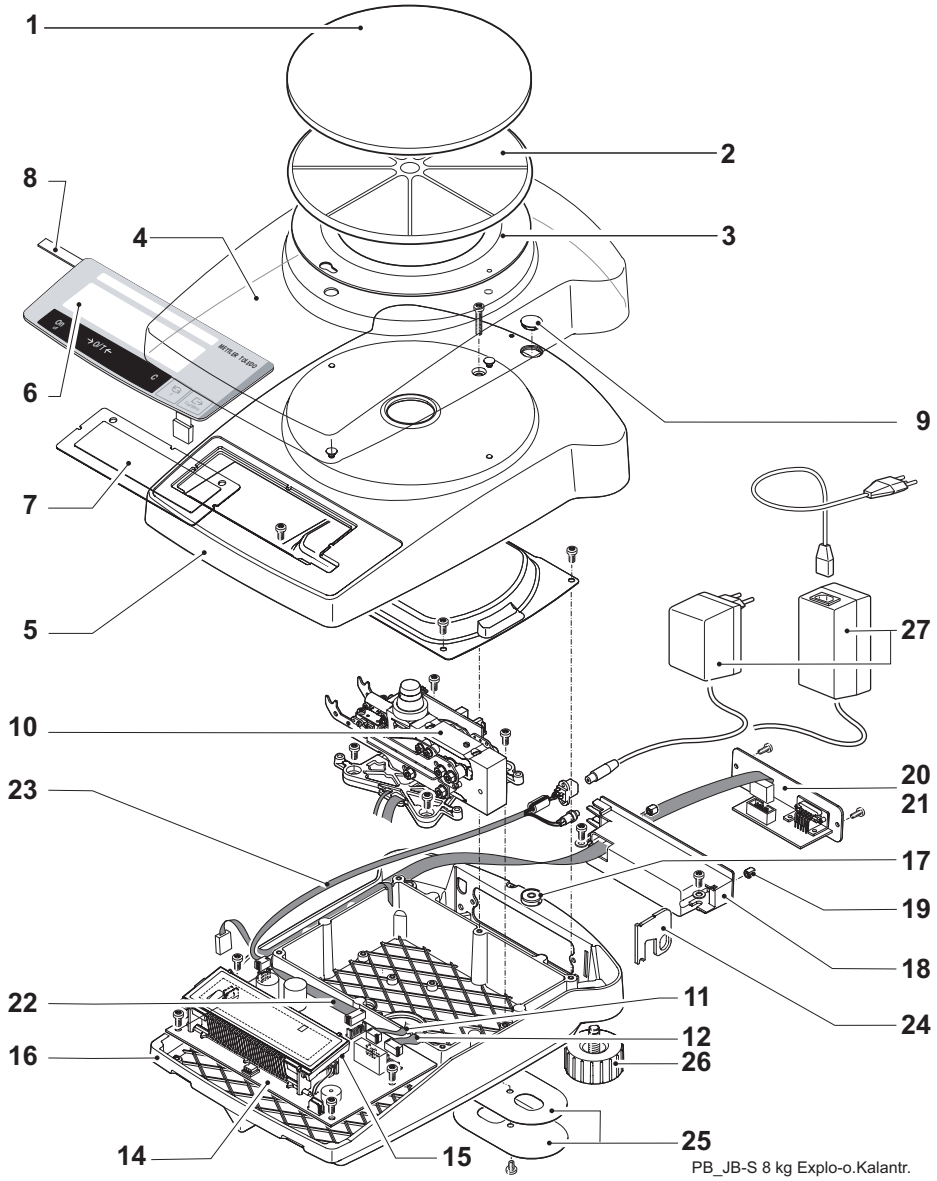


for example PB3002-S

overview of all balance types see Section 4.2.6, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm Draft shield (optional)	 see Section 2.3	11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance without draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled Top housing for Vacuum	comprising Item 5, 6, 7, 9 comprising Item 5, 6, 7, 9	11103852 11103859
6	Membrane keypad	«CLASSIC»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «E» Spare parts see Section 3.2.2	11103801
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

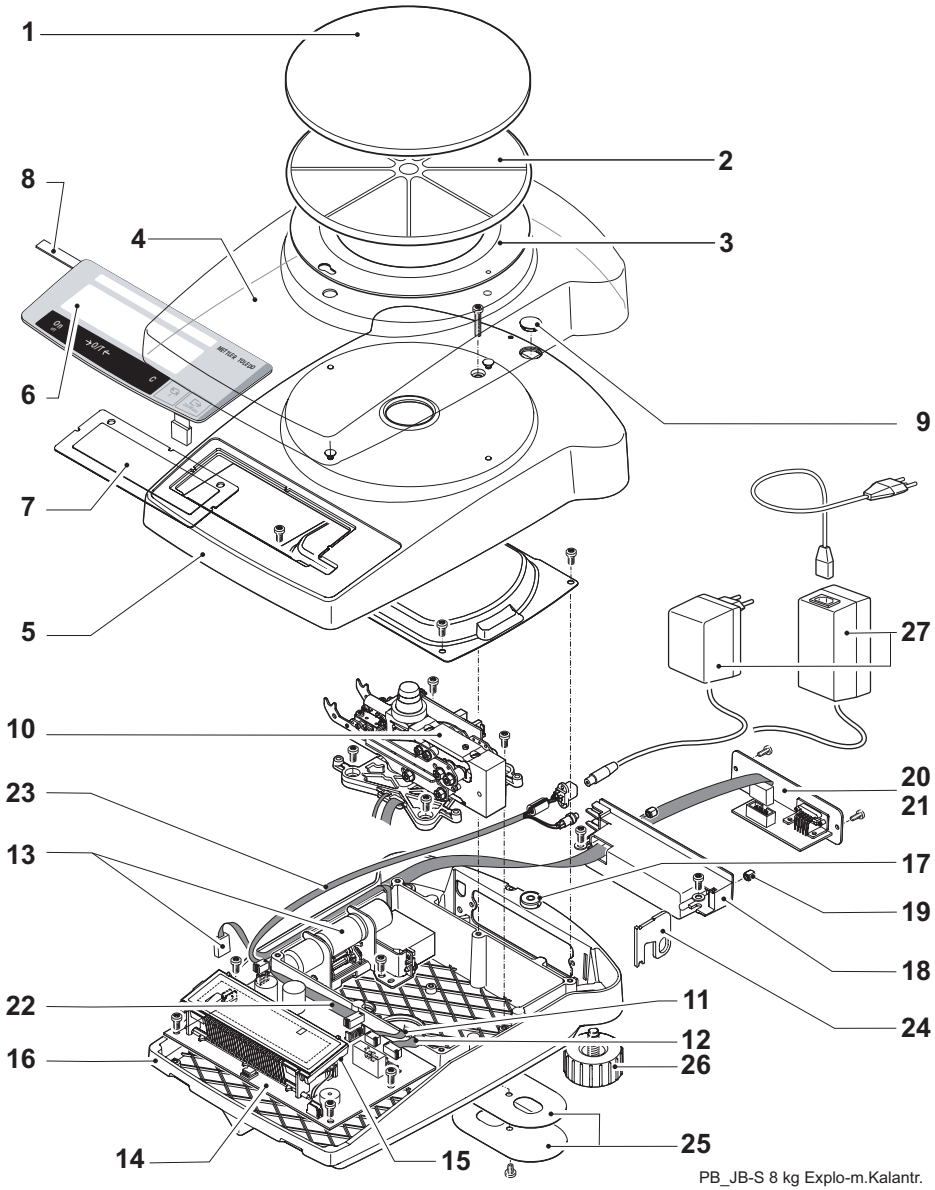
Items 14 - 27



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board, backlit	not available any-more without back-light	11137476 ~~11103700~~ ~~11103701~~
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.10 PB-S 3kg 0.1g/0.01g with CAL int

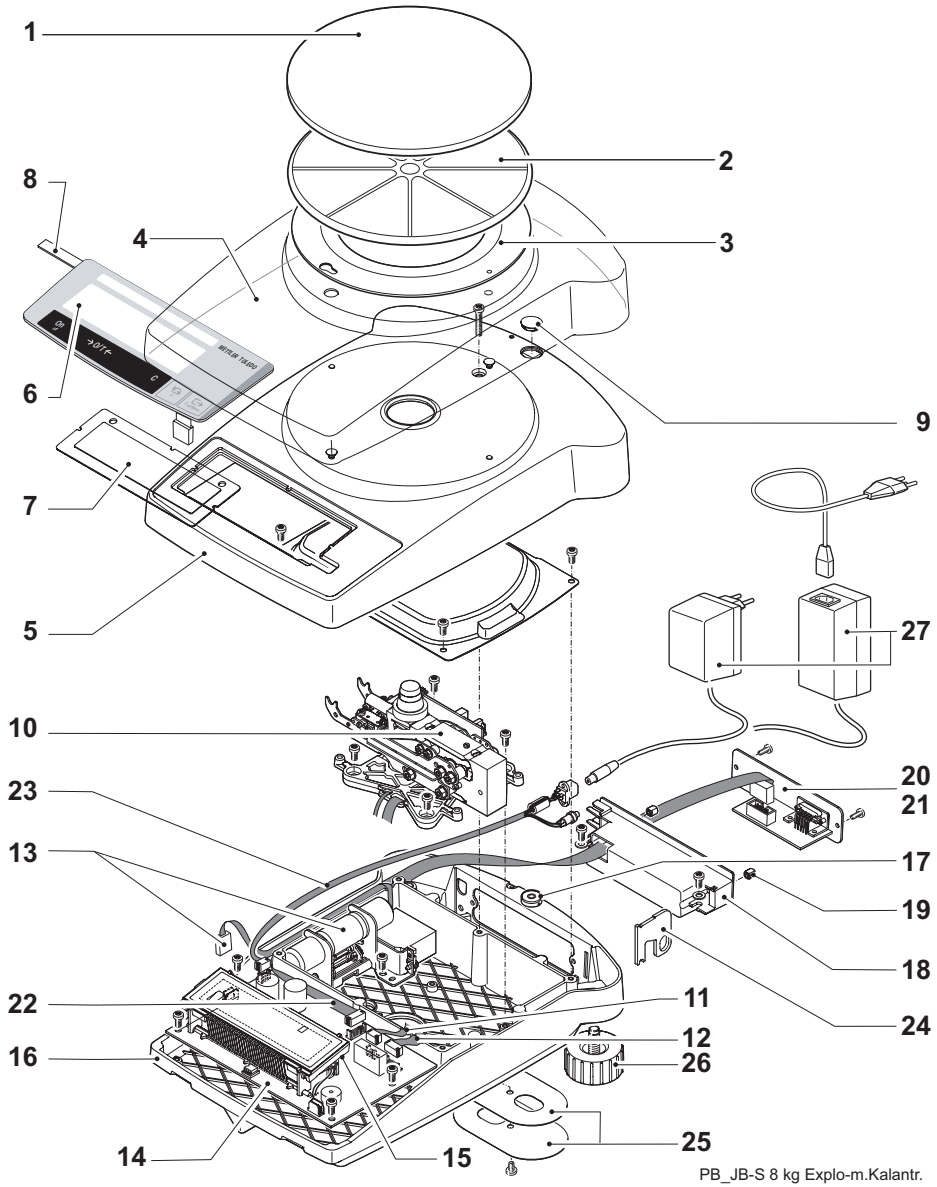


for example PB3002-S

overview of all balance types see Section 4.2.7, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm		11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance without draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.2	11103801
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

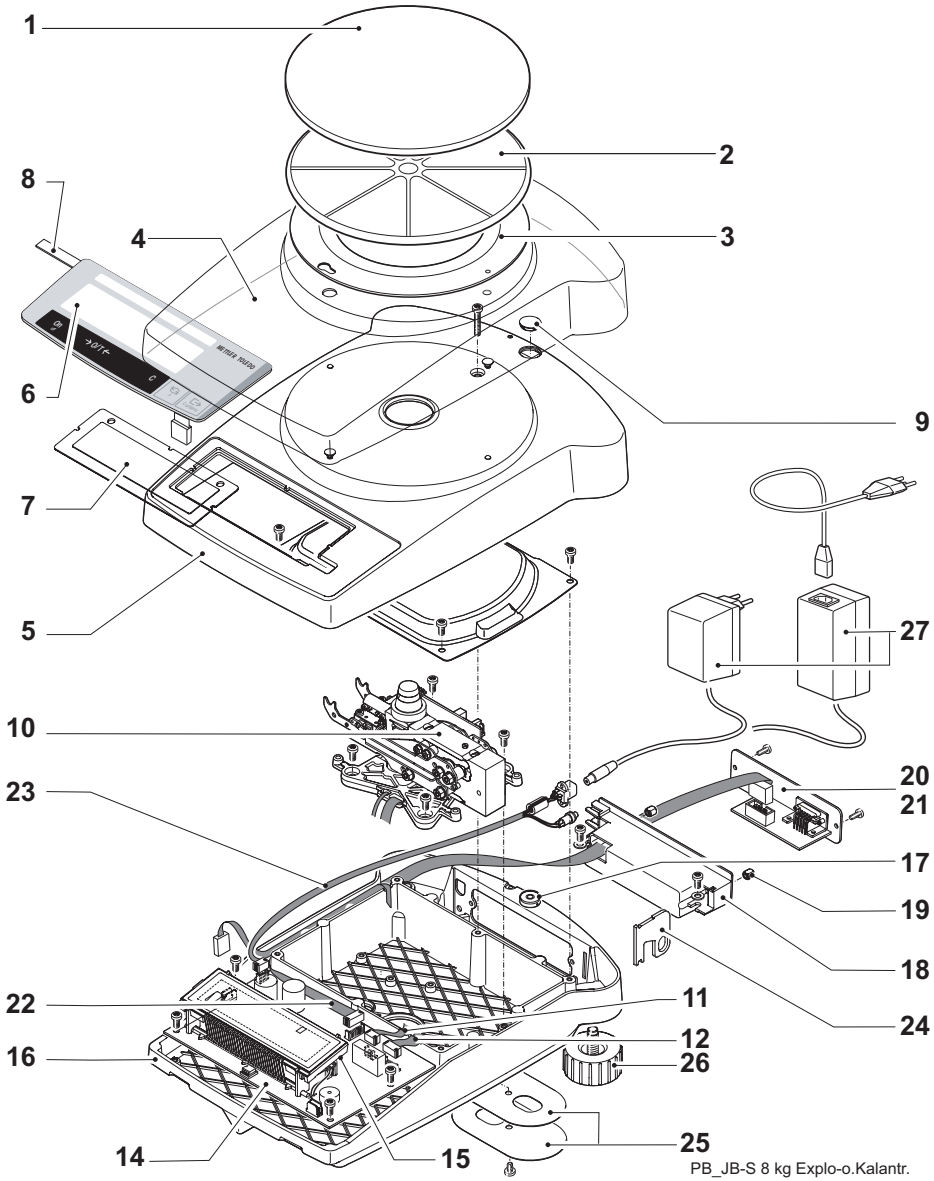
Items 14 - 27



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 pieces	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.11 PB-S 4kg 0.01g w/o CAL int

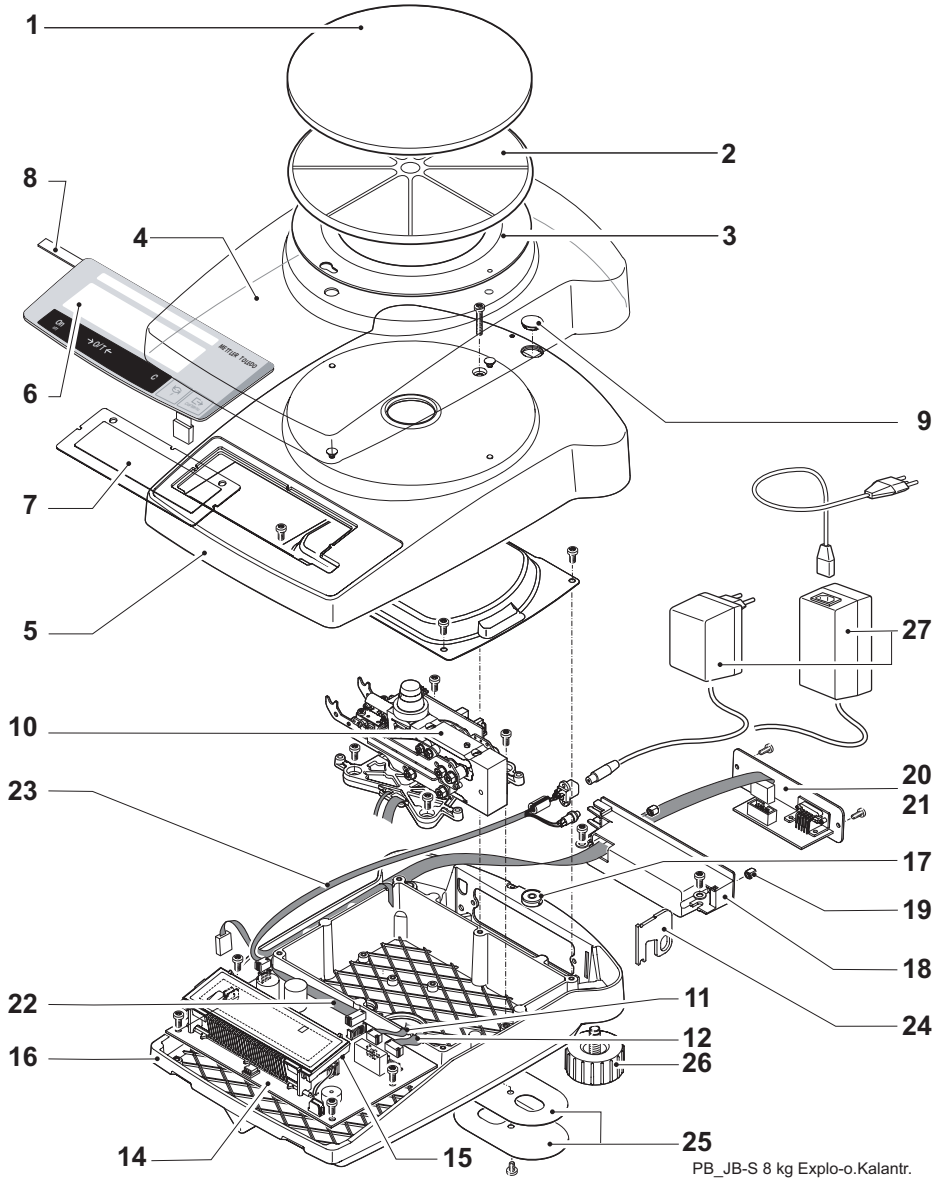


for example PB4002-S

overview of all balance types see Section 4.2.8, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm Draft shield (optional)	 see Section 2.3	11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance without draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled Top housing for Vacuum	comprising Item 5, 6, 7, 9 comprising Item 5, 6, 7, 9	11103852 11103859
6	Membrane keypad	«CLASSIC»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «E» Spare parts see Section 3.2.2	11103804
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

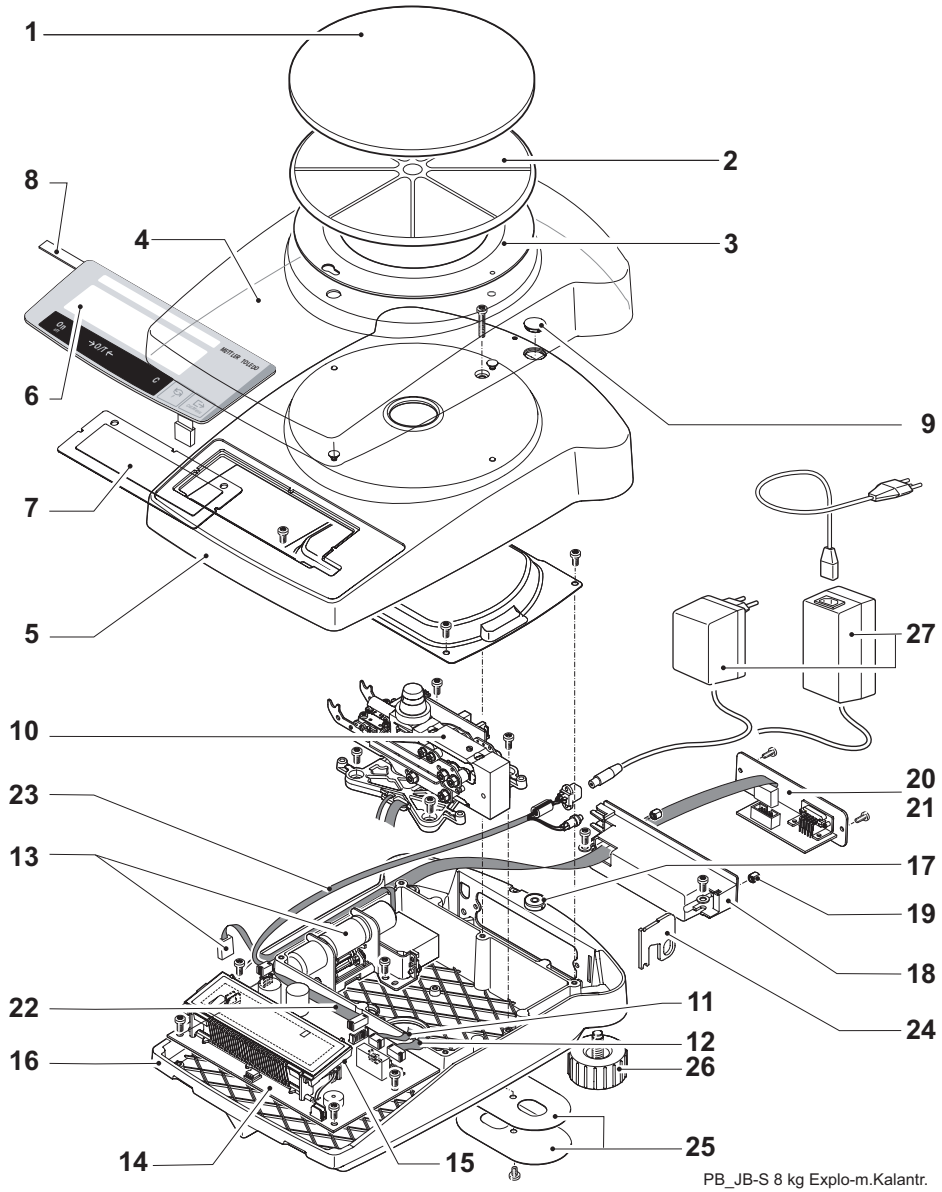
Items 14 - 27



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11137476 ~~11103700~~ ~~11103701~~
15	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 pieces	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.12 PB-S 4kg 0.01g with CAL int

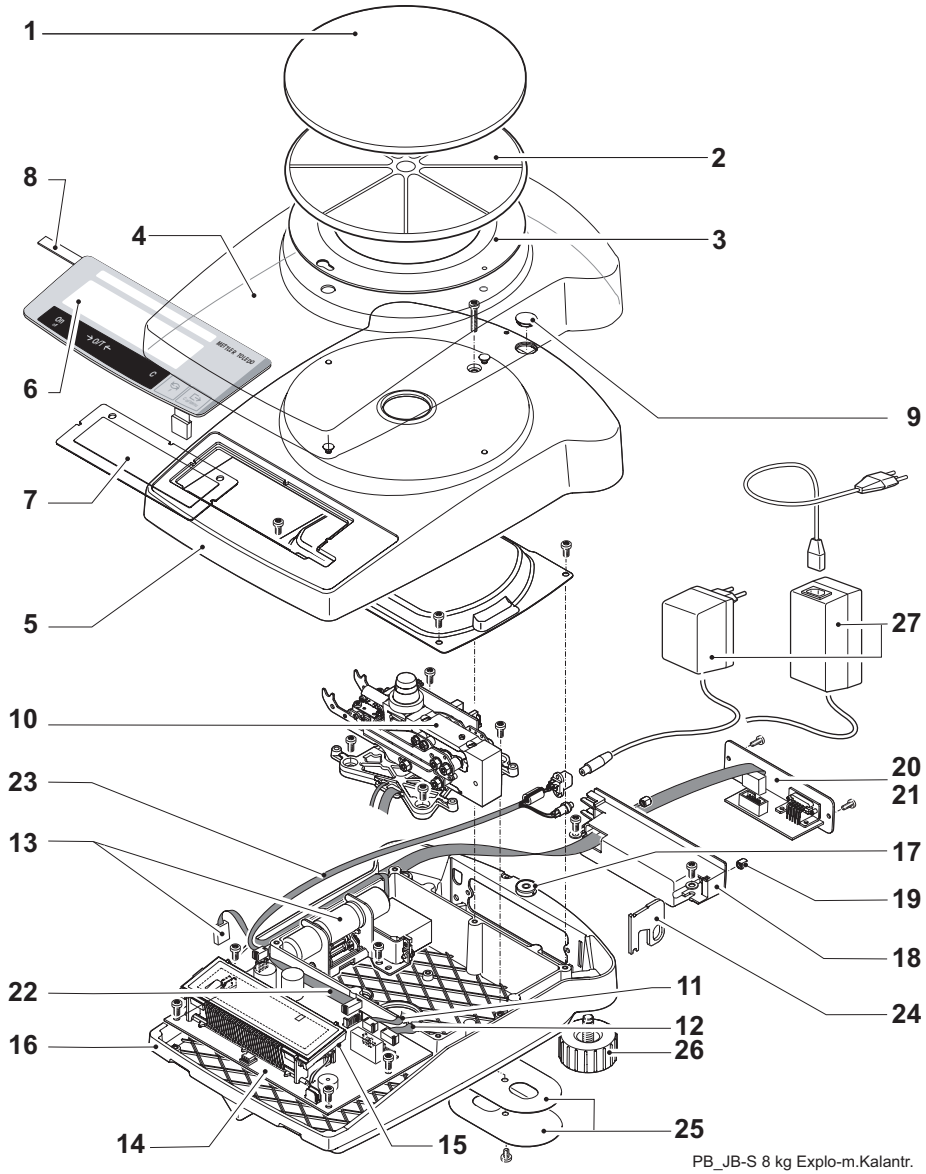


for example PB4002-S

overview of all balance types see Section 4.2.9, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm		11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance without draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.2	11103804
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	without calibration weight	11103820

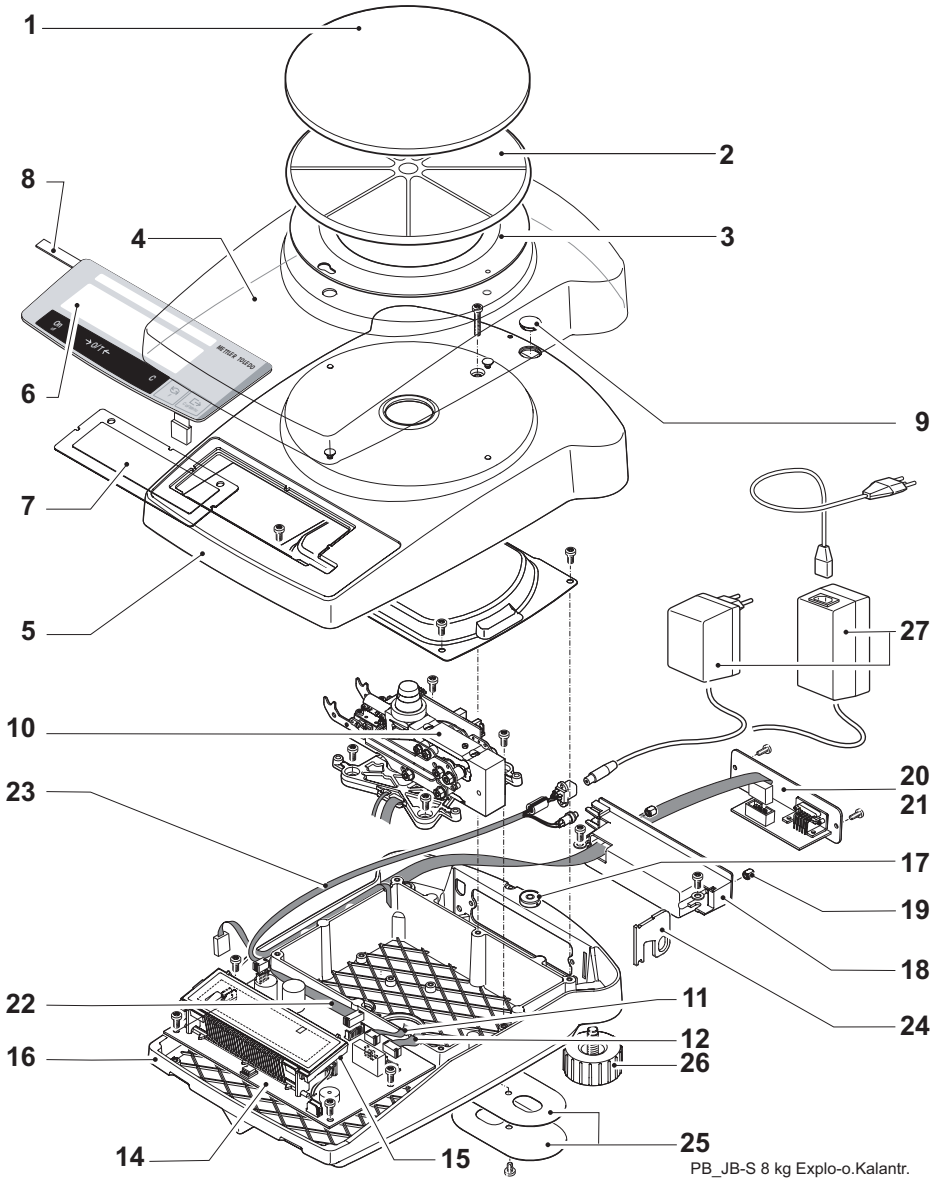
Items 14 - 27



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853 ~~11103854~~
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 pieces	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.13 PB-S 8kg 1g/0.1g round weighing pan, w/o CAL int

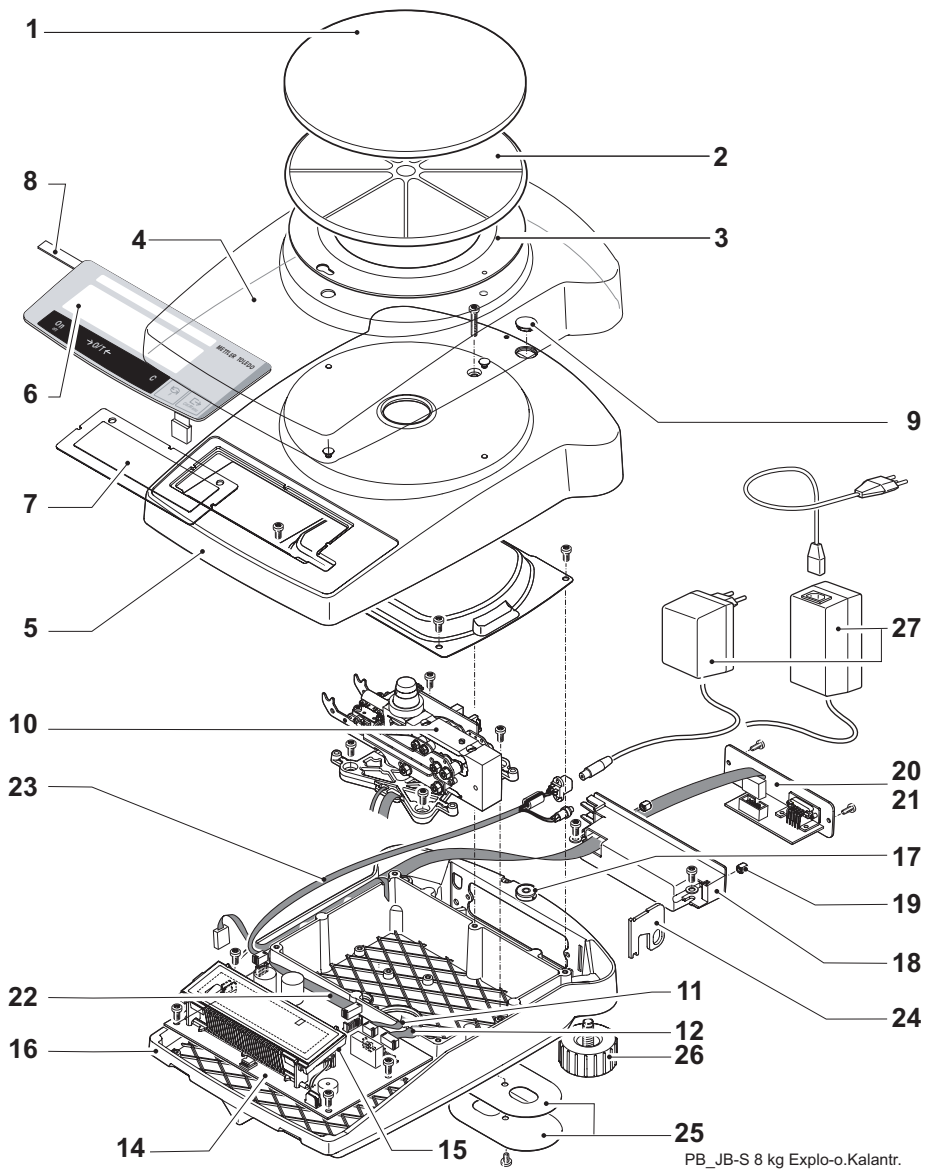


for example PB8001-S

overview of all balance types see Section 4.2.10, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm		11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance without draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «E» Spare parts see Section 3.2.2	11103802
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755

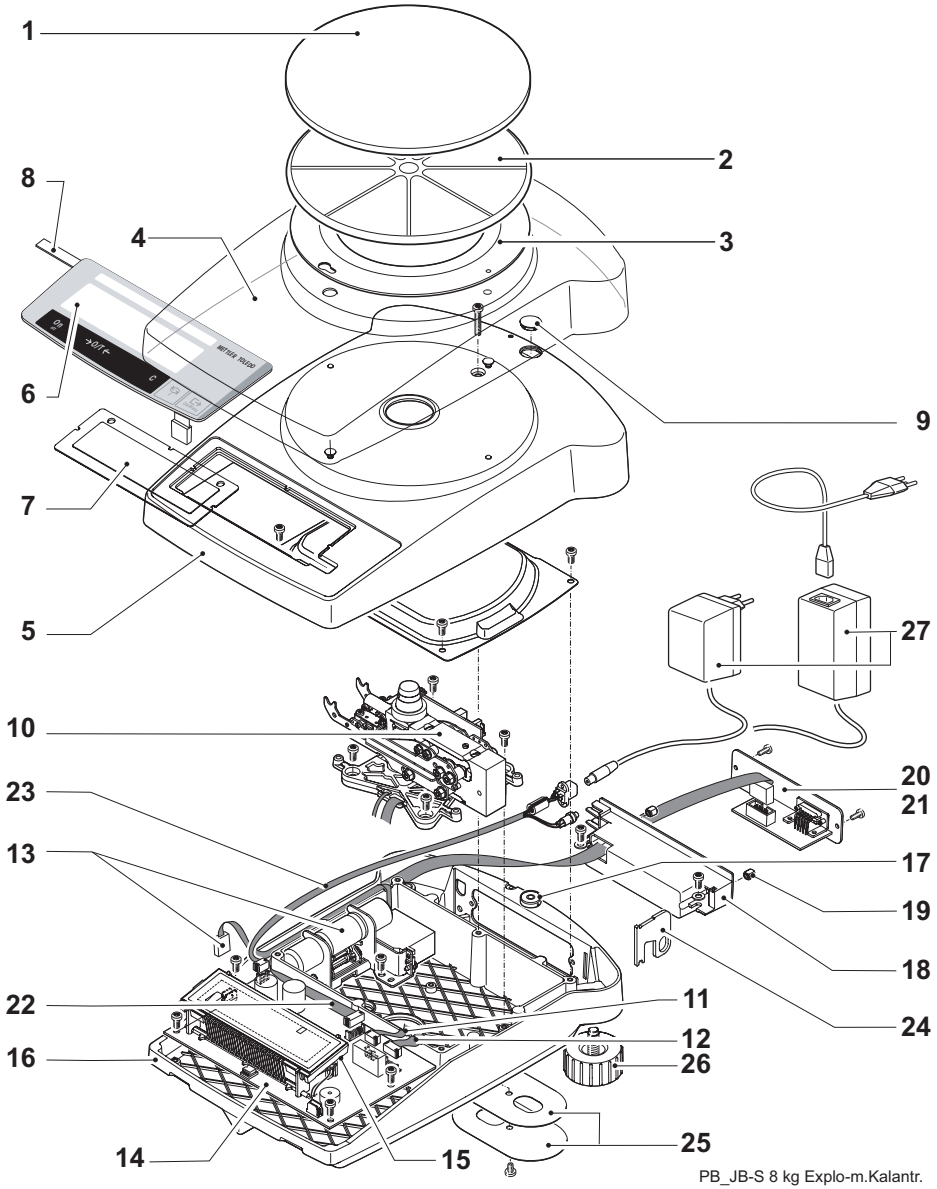
Items 14 - 28



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11137476
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.14 PB-S 8kg 1g/0.1g round weighing pan, with CAL int

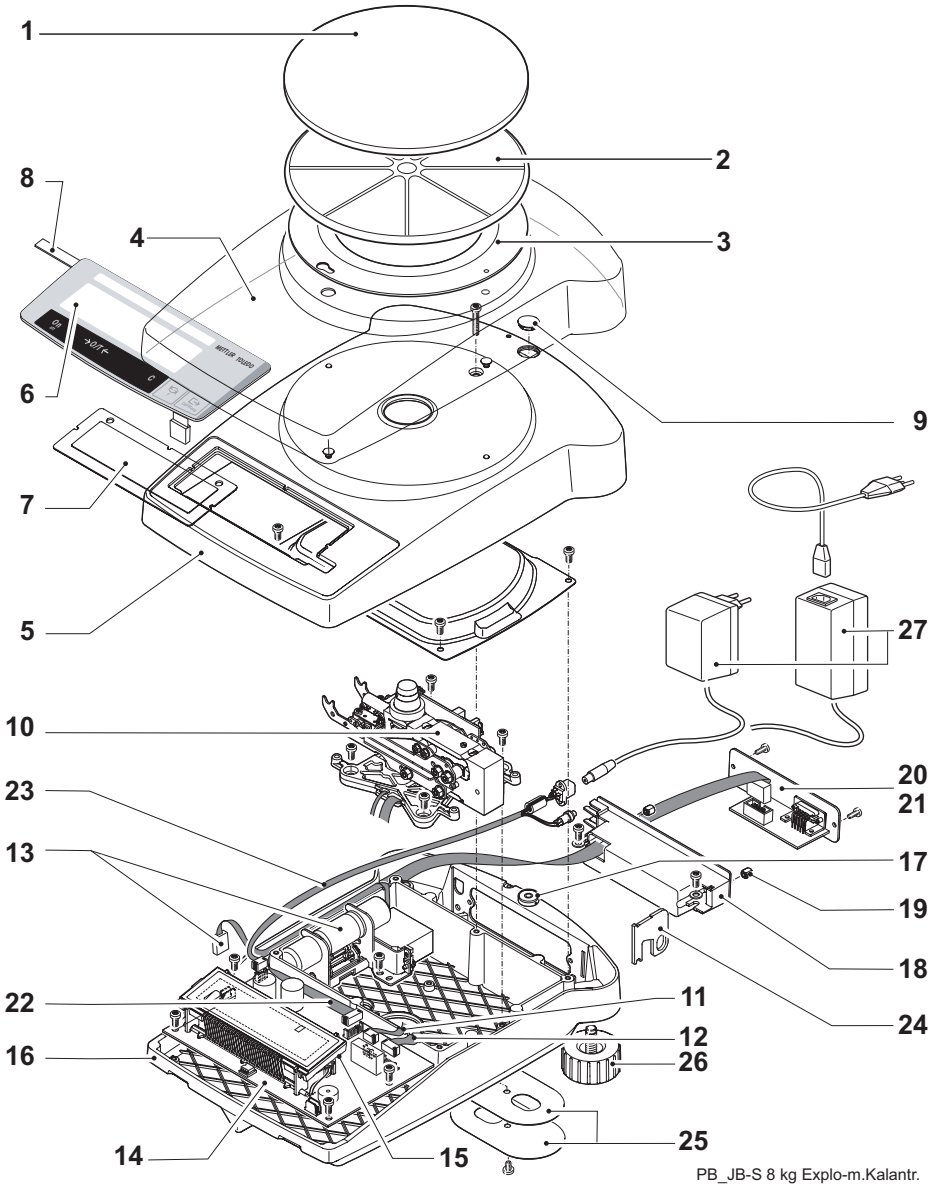


for example PB8001-S

overview of all balance types see Section 4.2.11, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan ø 180 mm		11103280
2	Pan support	Ø 180 mm	11103279
3	Retaining ring	balance w/o draft shield	11103568
4	Protective cover		11103681
5	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
6	Membrane keypad	«CLASSIC»	11103444
		«JEWELRY»	11137464
7	Display glass		11103443
8	Model plate	see Section 4.1	
9	Level cover		210374
10	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.2	11103802
11	Coil cable	4-core	228076
12	Detector cable	8-core	11103755
13	Calibration drive	w/o calibration weight	11103820

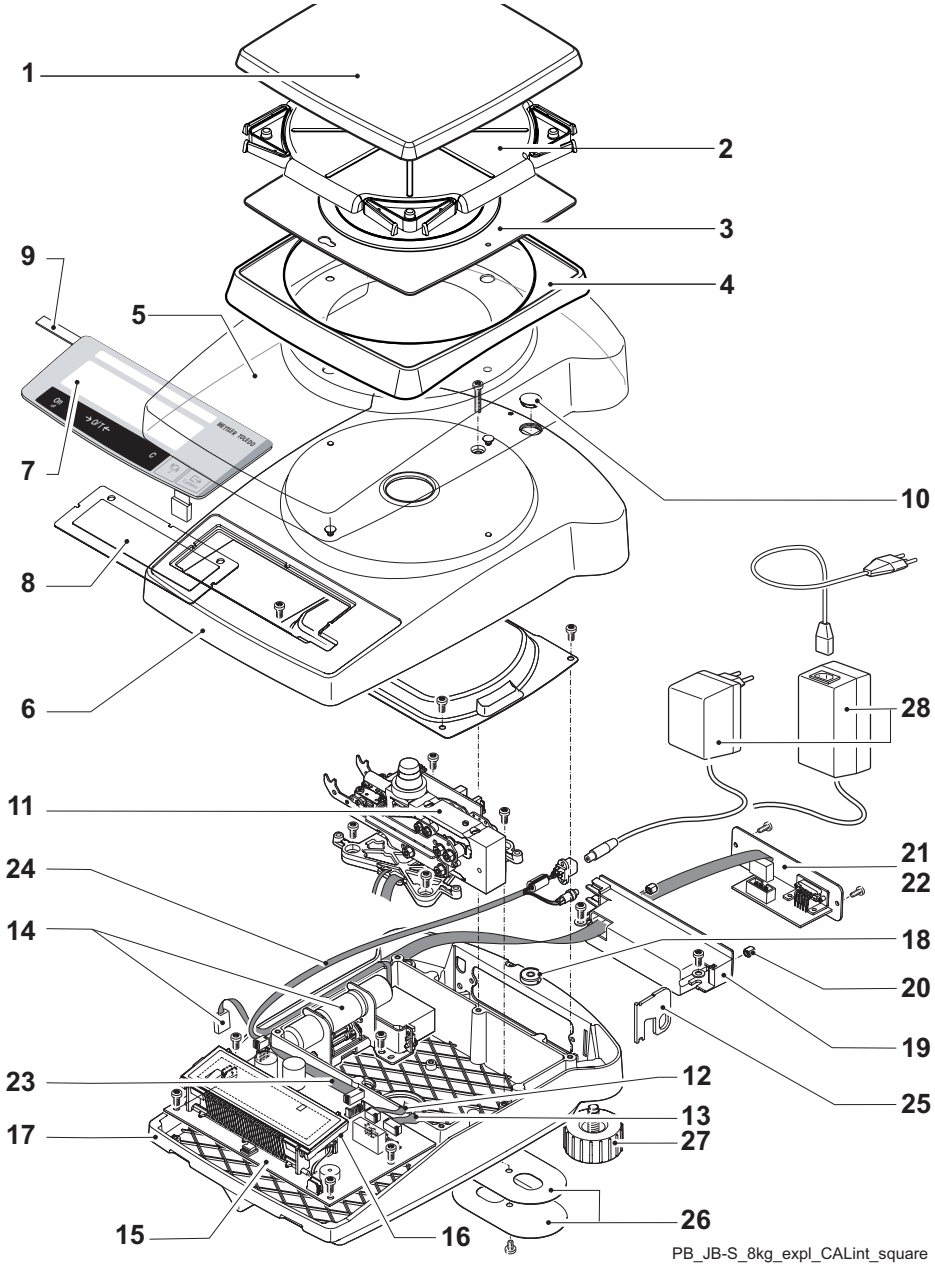
Items 14 - 27



Items 1 - 13

Item	Designation	Comments	Part No.
14	Balance board backlight		11103853
15	Backlighting white		11137475
	Backlighting green		224253
16	Bottom housing	incl. Item 17	11103821
17	Level		11101335
18	Connection holder	without Insert nut	11103434
19	Insert nut	10 piece	11103445
20	Blank plate		11103435
21	RS232 interface, without cable	see Chapter 11	
22	RS232 connection cable	10-core	11103751
23	Power cable	with socket	11103756
24	Lug for antitheft device		11103433
25	Cover plate for weighing below balance		11103432
26	Leveling foot		11101302
27	AC adapter	see Section 1.1.3, Chapter 10	

1.15 PB-S 8kg 1g/0.1g square weighing pan, with CAL int

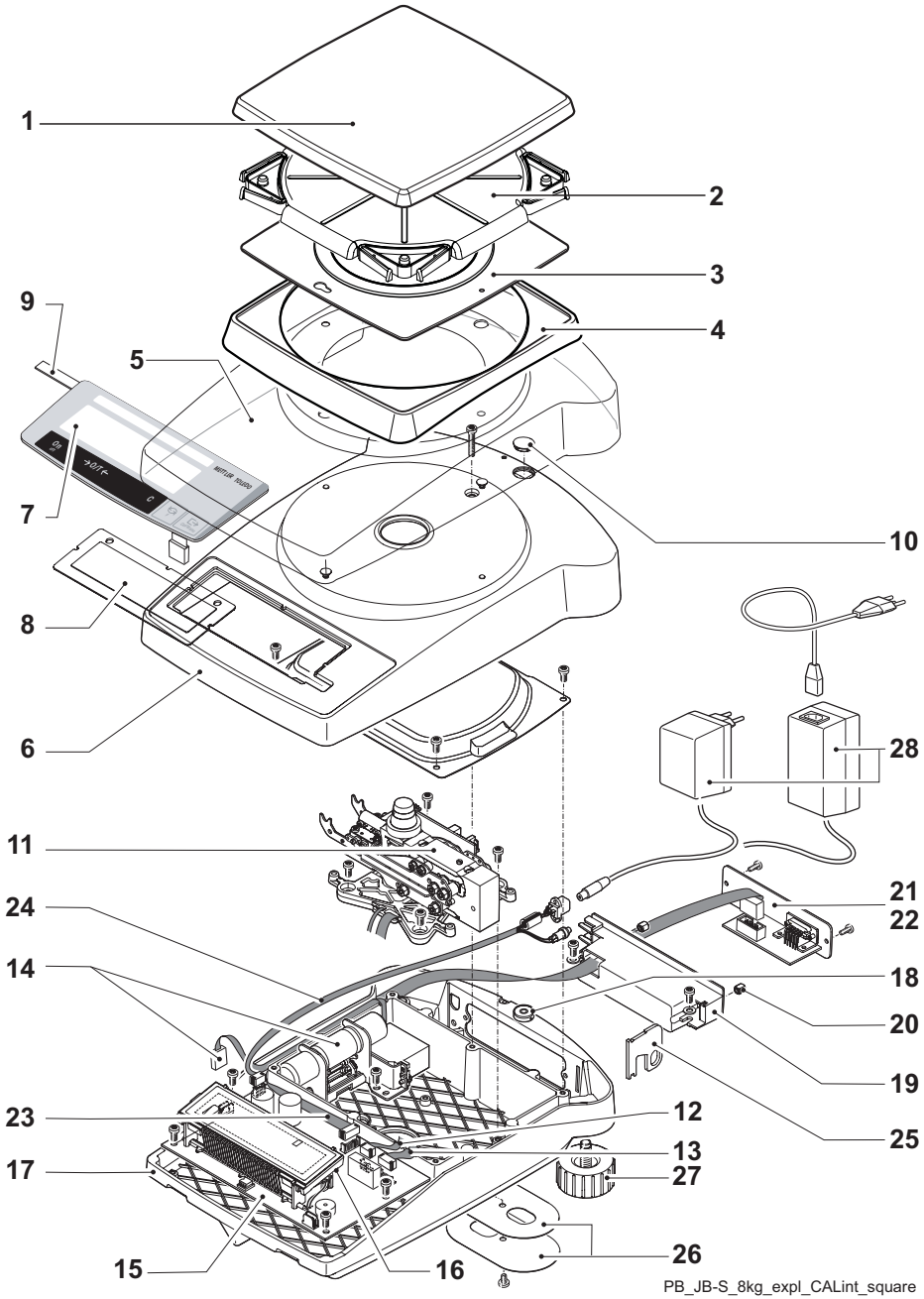


for example PB8001-S

overview of all balance types see Section 4.2.12, Chapter 1

Item	Designation	Comments	Part No.
1	Weighing pan square		12102540
2	Pan support square	Ø 180 mm	11137310
3	Retaining ring square	balance w/o draft shield	12102538
4			12102537
5	Protective cover		11103681
6	Top housing, assembled	comprising Item 5, 6, 7, 9	11103852
	Top housing for Vacuum	comprising Item 5, 6, 7, 9	11103859
7	Membrane keypad	«CLASSIC Plus»	11139813
		«JEWELRY»	11137464
8	Display glass		11103443
9	Model plate	see Section 4.1	
10	Level cover		210374
11	Measuring cell, assembled	Cell data EEPROM on Balance board «A» Spare parts see Section 3.2.2	11103802
12	Coil cable	4-core	228076
13	Detector cable	8-core	11103755
14	Calibration drive	w/o calibration weight	11103820

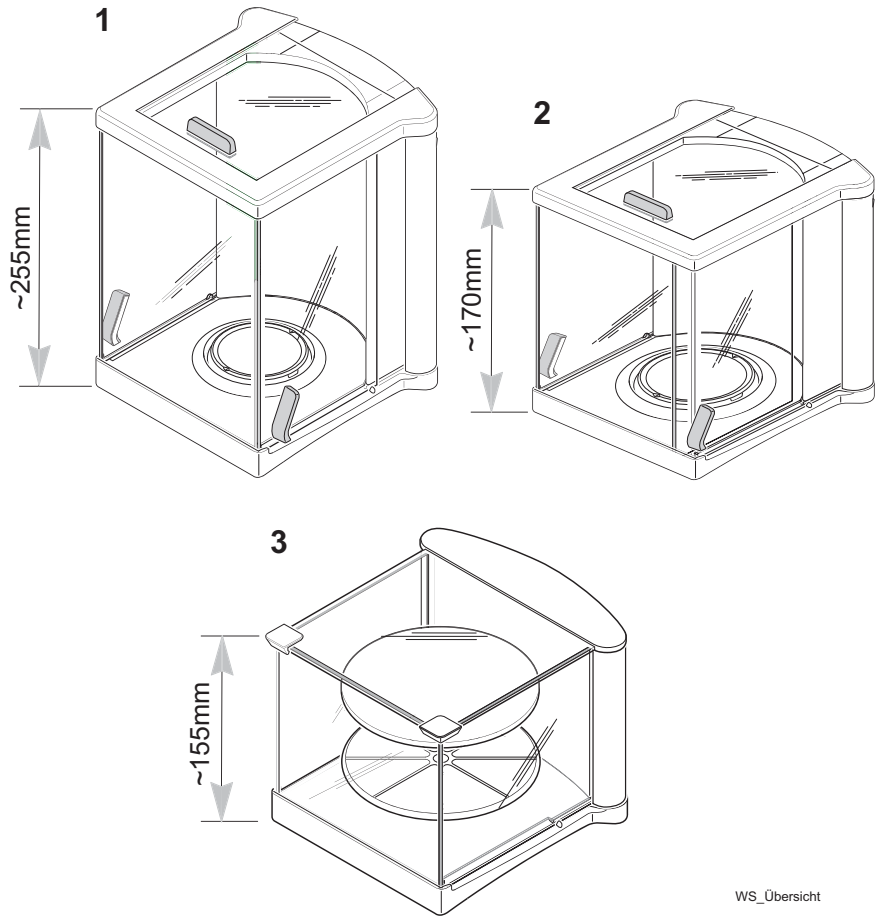
Items 15 - 28



Items 1 - 14

Item	Designation	Comments	Part No.
15	Balance board backlight		11103853
16	Backlighting white		11137475
	Backlighting green		224253
17	Bottom housing	incl. Item 17	11103821
18	Level		11101335
19	Connection holder	without Insert nut	11103434
20	Insert nut	10 piece	11103445
21	Blank plate		11103435
22	RS232 interface, without cable	see Chapter 11	
23	RS232 connection cable	10-core	11103751
24	Power cable	with socket	11103756
25	Lug for antitheft device		11103433
26	Cover plate for weighing below balance		11103432
27	Leveling foot		11101302
28	AC adapter	see Section 1.1.3, Chapter 10	

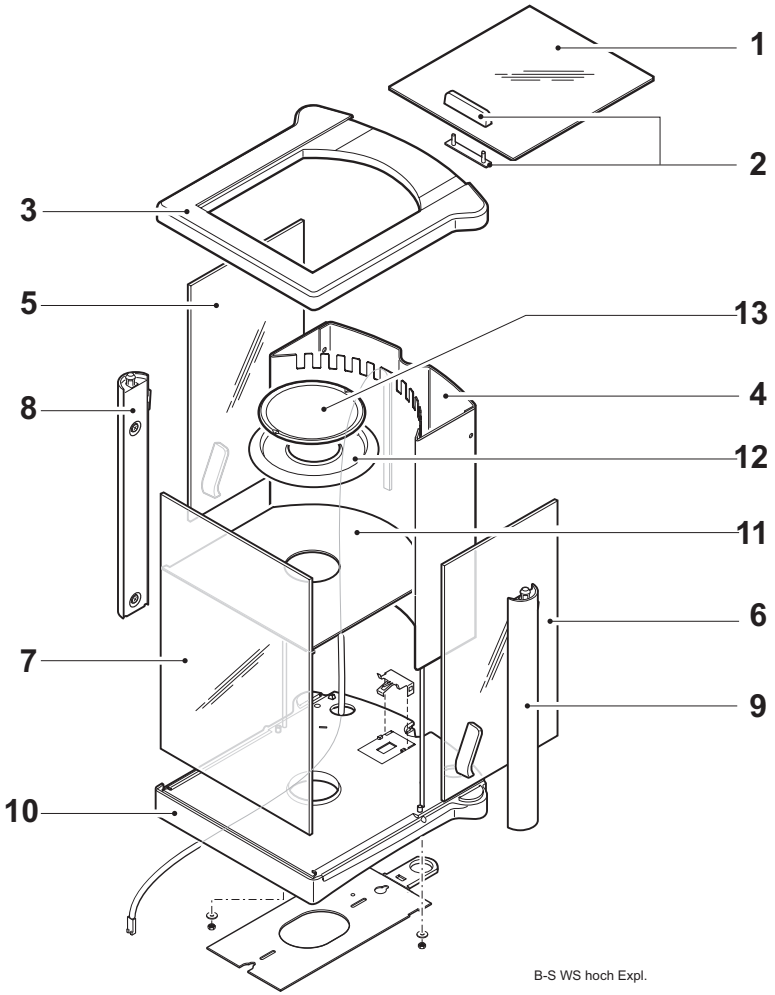
2 Draft shield overview



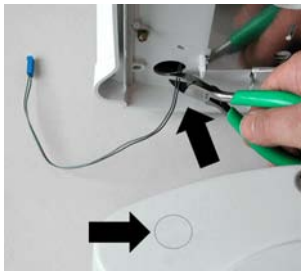
Item	Designation	Type of balance	see
1	Draft shield with sliding doors «0.1mg» (H=255 mm)	xBxx2-S, xBxx2-G, xBxx3-S, xBxx3-C, xBxx4-S, ABxx5-S	Section 2.1 for spare parts Part no.: 11103682
2	Draft shield with sliding doors «mg» (H=170 mm)	xBxx2-S, xBxx3-S, xBxx3-C, xBxx4-S, ABxx5-S	Section 2.2 for spare parts Part no.: 11137468
3	Draft shield «mg» (H=155 mm)	xBxx3-S	Section 2.3 for spare parts Part no.: 11103683

2.1 Draft shield with sliding doors «0.1mg» (H=255 mm)

Types xBxx2-S, xBxx2-G, xBxx3-S, xBxx3-C, xBxx4-S, ABxx5-S



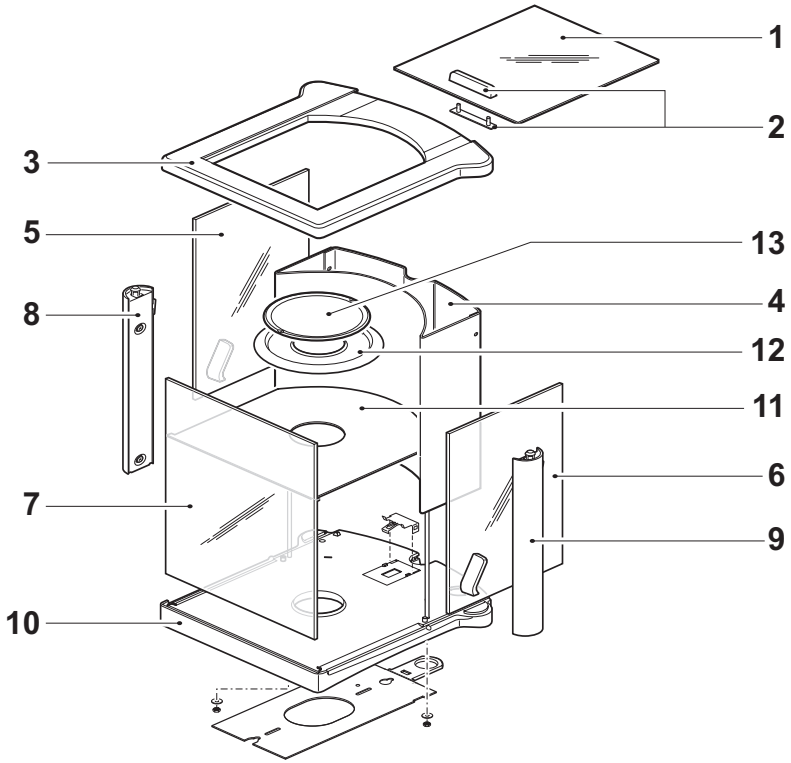
Item	Designation	Comments	Part No.
1	Door top		11103543
2	Handle for door, top		11103822
3	Draft shield top frame		11103831
4	Draft shield rear panel [1)]	with stabilizer and cable	11135412
5	Door, left	with handle	11103823
6	Door, right	with handle	11103824
7	Front panel		11103535
8	Left corner post		11103825
9	Right corner post		11103826
10	Draft shield base, assembled		11103827
11	Botom plate		11103542
12	Ring	weighing pan Ø 80 mm	11103569
	Ring	weighing pan Ø 100 mm	224366
13	Weighing pan ø 80 mm	conv. Cell	11135434
	Weighing pan ø 80 mm	MonoBloc	114218
	Weighing pan ø 100 mm		11103855



[1)] On balance types xBxx3 and xBxx4 cut stabilizer cable level with bottom edge of rear panel.

2.2 Draft shield with sliding doors «mg» (H=170 mm)

Types xBxx2-S, xBxx3-S, xBxx3-C, xBxx4-S, ABxx5-S

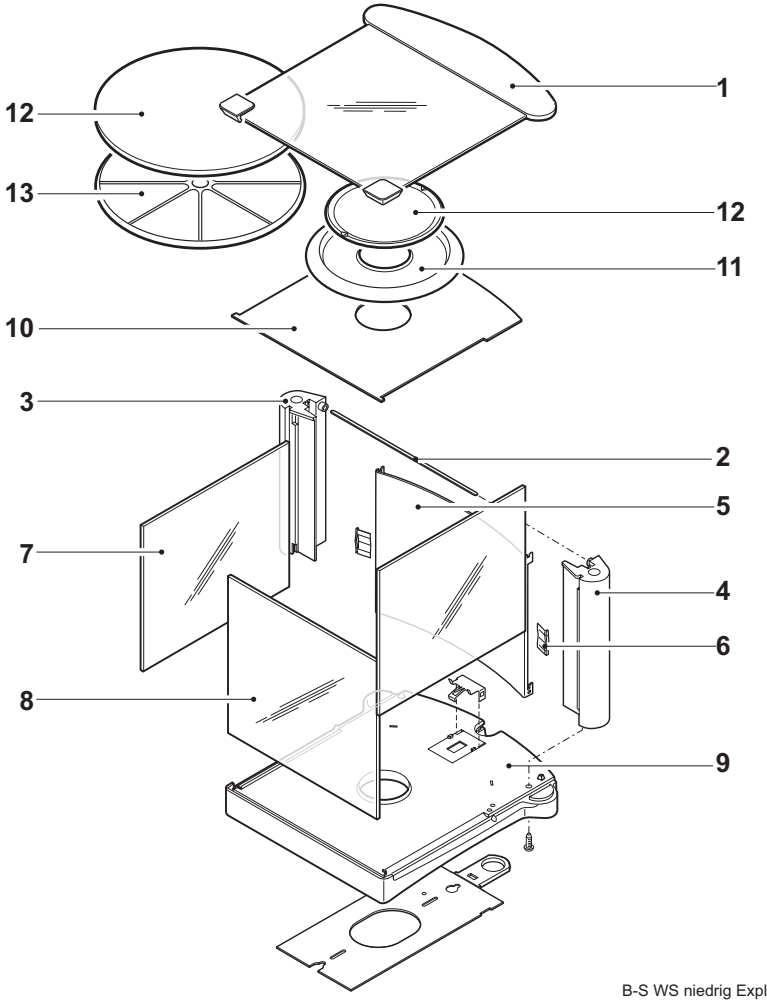


B-S WS mittel Expl.

Item	Designation	Comments	Part No.
1	Door top		11103543
2	Handle for door, top		11103822
3	Draft shield top frame		11103831
4	Draft shield rear panel		11137470
5	Door, left	with handle	11137460
6	Door, right	with handle	11137461
7	Front panel		11137471
8	Left corner post		11137462
9	Right corner post		11137463
10	Draft shield base, assembled		11103827
11	Botom plate		11103542
12	Ring	weighing pan Ø 100 mm	224366
13	Weighing pan ø 100 mm		11103855

2.3 Draft shield «mg» (H=155 mm)

Types xBxx3-S

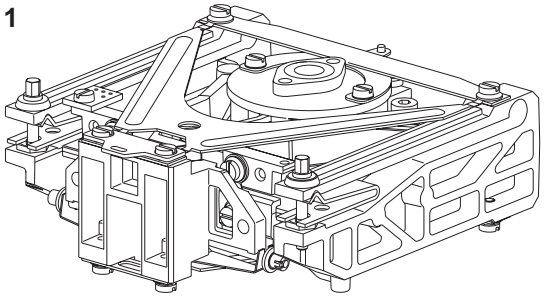


B-S WS niedrig Expl.

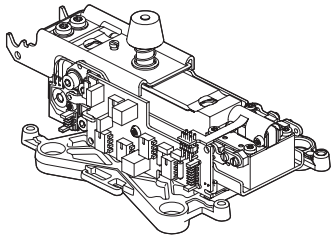
Item	Designation	Comments	Part No.
1	Cover		11103828
2	Leaf spring		11103562
3	Left corner post, with cap		11103832
4	Right corner post, with cap		11103833
5	Rear panel		11103553
6	Retaining springs	10 piece	11103573
7	Side pane		11103558
8	Front pane		11103559
9	Draft shield base, assembled		11103827
10	Bottom plate		11103565
11	Ring	for weighing pan ø 100 mm	224366
12	Weighing pan ø 100 mm	xBxx3-S, xBxx3-S/E	11103855
	Weighing pan ø 175 mm	xBxx2-S, xBxx2-S/E, xBxx1-S, xBxx1-S/E	11103283
13	Pan holder	weighing pan ø 175 mm	11103857
	Weighing pan ø 175 mm	incl. Pan holder	11103680

3 Cell overview

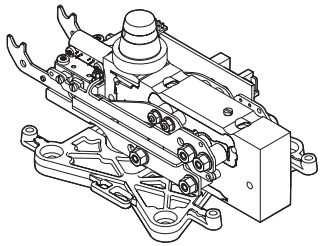
1



2



3

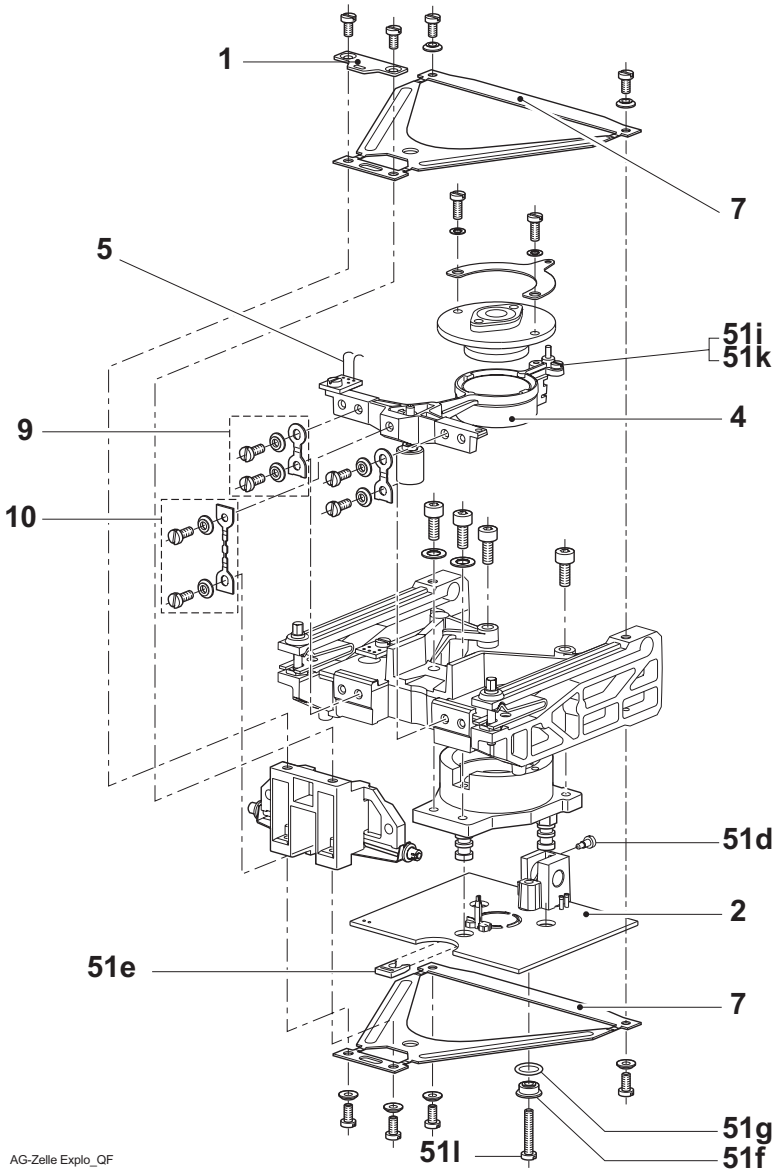


Zellen Übersicht

Item	Designation	Type of balance	see
1	Conventionel Cell	AB-S	Section 3.1
2	MonoBloc Cell	AB-S, JB-C, PB-S	Section 3.2.1
3	MonoBloc Cell	PB-S, JB-G	Section 3.2.2

3.1 Conventionel Cell

3.1.1 Type of cell: 11135410



Item	Designation	Comments	Part No.
1	Guide piece		238091
2	Detector		238766
4	Lever, compl.		238294
5	Contact strips	10 piece	43540
7	Guide set	2 guides 8 special screws 8 locking rings	238297
9	Pillow-block bearing set	6 Pillow-block bearing 12 special screws 12 locking rings	238295
10	Link set	6 link 12 special screws 12 locking rings	238296

The spare parts listed in the exploded view drawing under item 51... are part of the «small parts set» of the AG balances and can be ordered under order number 238293.

51d 1 Stop screw (detector)

51e 1 Clamp (detector)

51f 1 Sleeve (detector)

51g 1 O-ring ø 7 x 1,5 (detector)

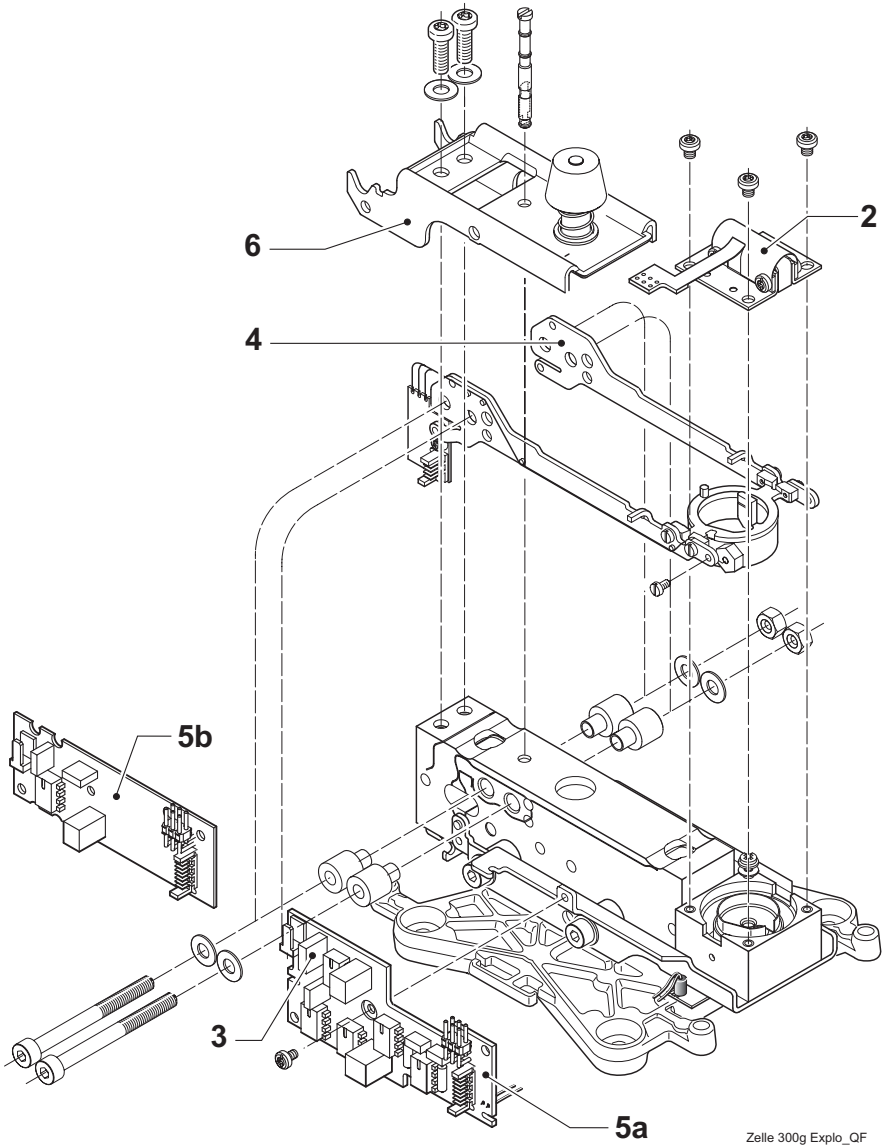
51i 2 Fillister head screws ø 2.5 x 3 (dead load)

51k 6 Washers ø 2.7/5 x 0.5 (dead load)

51l 1 Fillister head screw ø 3 x 18 (detector)

3.2 MonoBloc

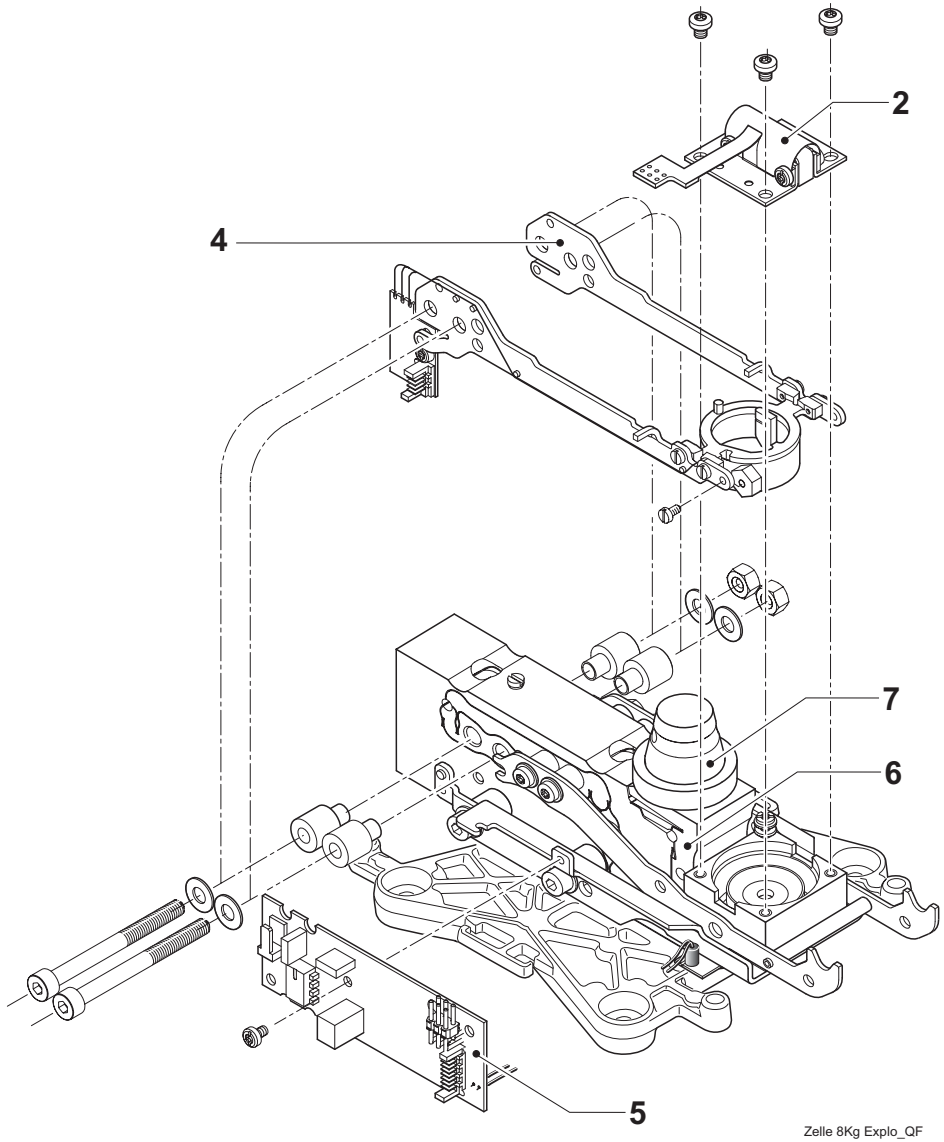
3.2.1 Type of cell: 11103800, 11103806



		for: xBxx3-S/A /M xBxx4-S	for: xBxx3-S
Item	**Designation**	**Part No.**	**Part No.**
2	Detector	217401	217401
3	Reference resistor 0,5 W/0,5 % 1 kΩ	11600042	
4	Lever	217400	
5a	Cell board for high-resolution balances [1)]	11103704	
5b	Cell board for low-resolution balances incl. reference resistor (SMDtype)		11103705
6	Overload protection	11103829	11103829

[1)] Retain reference resistor from defective cell board.

3.2.2 Type of cell: 11103801, 11103802, 11103804



Item	Designation	Part No.
2	Detector	217401
-	Reference resistor (SMDtype, already mounted)	
4	Lever	217400
5	Cell board incl. reference resistor (SMD-device)	11103705
6	Overload protection (integrated in monobloc)	
7	Cone incl. ferrite ring	11103830

4 Model plates, Packagings

4.1 Model plates

Note

For replacement on normal balances the model plate for certified balances is used.

4.1.1 AB-S Model plates

Type of balances	Model plate no.
AB135-S	11135121
AB135-S/FACT	11139650
AB265-S	11135122
AB265-S/FACT	11139651
AB54-S	11103132
AB54-S/FACT	11139652
AB54-L	11139680
AB104-S	11103130
AB104-S/FACT	11139653
AB104-L	11139681
AB204-S	11103131
AB204-S/FACT	11139654
AB204-L	11139682
AB304-S	11103163
AB304-S/FACT	11139655

4.1.2 PB-S Model plates

Type of balances	Model plate no.
PB153-S	11103133
PB153-S/FACT	11139656
PB153-L	11139683
PB303-S	11103134
PB303-S/FACT	11139657
PB303-SDR	11103135
PB303-SDR/FACT	11139658
PB303-L	11139684
PB303-LDR	11139685
PB403-S	11103167
PB403-S/FACT	11139659
PB503-S	11137179
PB503-S/FACT	11139660
PB602-S	11103137
PB602-S/FACT	11139661
PB602-L	11139686

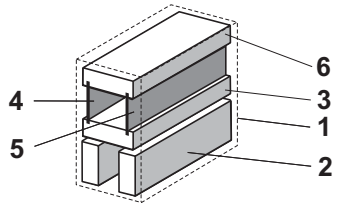
Type of balances	Model plate no.
PB1502-S	11103138
PB1502-S/FACT	11139662
PB1502-L	11139687
PB3002-S	11103139
PB3002-S/FACT	11139663
PB3002-SDR	11103193
PB3002-SDR/FACT	11139664
PB3002-L	11139688
PB3002-LDR	11139689
PB4002-S	11103168
PB4002-S/FACT	11139665
PB1501-S	11103142
PB1501-S/FACT	11139666
PB1501-L	11139690
PB3001-S	11103143
PB3001-S/FACT	11139667
PB3001-L	11139691
PB5001-S	11103144
PB5001-S/FACT	11139668
PB5001-L	11139692
PB8001-S	11103145
PB8001-S/FACT	11139669
PB8001-L	11139693
PB8000-S	11103164
PB8000-S/FACT	11139670
PB8000-L	11139694

4.1.3 JB-C, JB-G Model plates

Type of balances	Model plate no.
JB203-C	11137220
JB803-C	11137221
JB1603-C	11137223
JB3002-G	11137240
JB8001-G	11137242

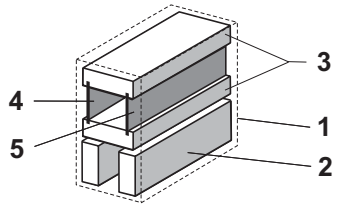
4.2 Packagings

4.2.1 ABxx4-S, ABxx5-S, with conventional Cell



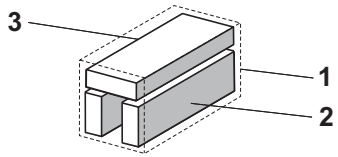
Item	Designation	Part No.
1	Export carton	11103630
2,3,4	Export foam cushioning halfs	11135270
5	Cutout for accessories	11135275
6	Foam cushioning for accessories	11135274

4.2.2 ABxx4-S, PBxx3-S, JBxx3-C, JBxx3-G with MonoBloc



Item	Designation	Part No.
1	Export carton	11103630
2	2 Export foam cushioning halfs	11103603
3	2 Holder for doors	11103604
4	Foam cushioning left	11103638
5	Foam cushioning right	11103639

4.2.3 PBxx2-S, PBxx1-S, JBxx2-G, JBxx1-G with MonoBloc



Item	Designation	Part No.
1	Export carton	11103631
2	2 Export foam cushioning halfs	11103603
3	Cutout for accessories	11103633

4 Checks

List of Contents

1 Checklists

Before you start work on the balance, check the model strip and the type plate (see Section 2.1, Section 2.2, Chapter 1) to ensure that the balance in front of you is the balance which should be serviced.

ATTENTION

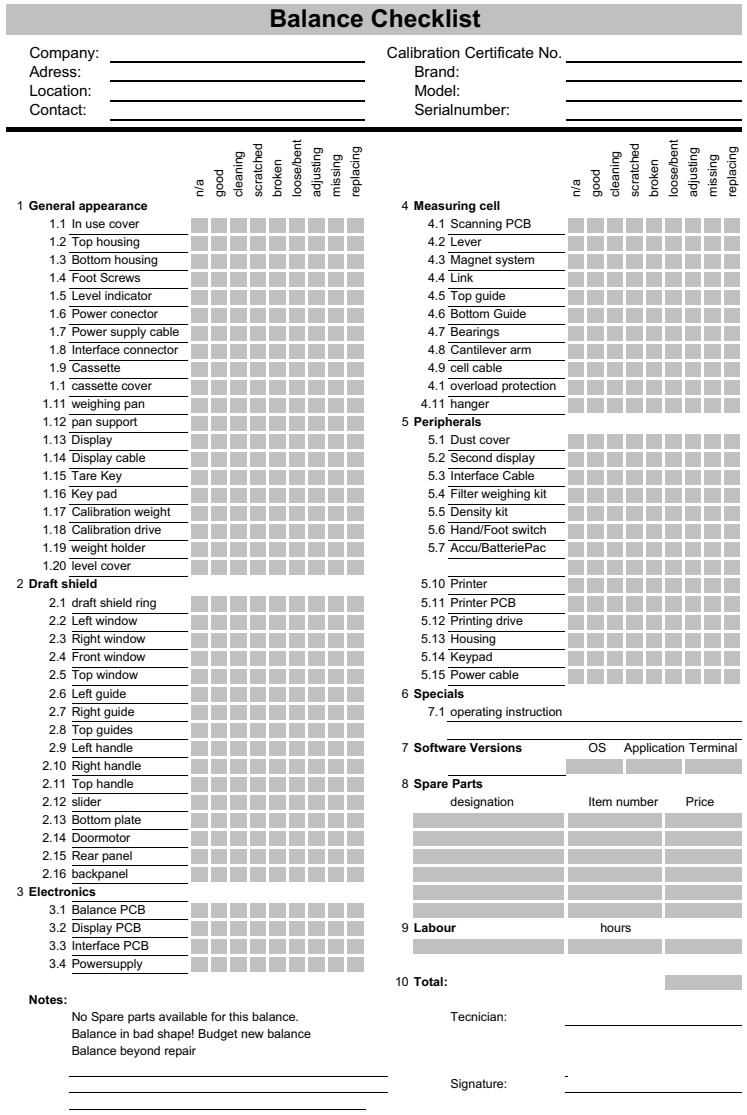
Standby circuit.
The balance is energized when it is connected to the power supply. This is the case even if the display is switched off.

When inspecting the AC adapter and power supply cable:

ATTENTION

Danger of electric current.
Disconnect AC adapter from power supply.

1.1 Balance Checklist



Balance Checklist

Company: _____ Calibration Certificate No. _____
Adress: _____ Brand: _____
Location: _____ Model: _____
Contact: _____ Serialnumber: _____

	n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
1 General appearance									
1.1 In use cover									
1.2 Top housing									
1.3 Bottom housing									
1.4 Foot Screws									
1.5 Level indicator									
1.6 Power conector									
1.7 Power supply cable									
1.8 Interface connector									
1.9 Cassette									
1.1 cassette cover									
1.11 weighing pan									
1.12 pan support									
1.13 Display									
1.14 Display cable									
1.15 Tare Key									
1.16 Key pad									
1.17 Calibration weight									
1.18 Calibration drive									
1.19 weight holder									
1.20 level cover									
2 Draft shield									
2.1 draft shield ring									
2.2 Left window									
2.3 Right window									
2.4 Front window									
2.5 Top window									
2.6 Left guide									
2.7 Right guide									
2.8 Top guides									
2.9 Left handle									
2.10 Right handle									
2.11 Top handle									
2.12 slider									
2.13 Bottom plate									
2.14 Doormotor									
2.15 Rear panel									
2.16 backpanel									
3 Electronics									
3.1 Balance PCB									
3.2 Display PCB									
3.3 Interface PCB									
3.4 Powersupply									

	n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
4 Measuring cell									
4.1 Scanning PCB									
4.2 Lever									
4.3 Magnet system									
4.4 Link									
4.5 Top guide									
4.6 Bottom Guide									
4.7 Bearings									
4.8 Cantilever arm									
4.9 cell cable									
4.1 overload protection									
4.11 hanger									
5 Peripherals									
5.1 Dust cover									
5.2 Second display									
5.3 Interface Cable									
5.4 Filter weighing kit									
5.5 Density kit									
5.6 Hand/Foot switch									
5.7 Accu/BatteriePac									
5.10 Printer									
5.11 Printer PCB									
5.12 Printing drive									
5.13 Housing									
5.14 Keypad									
5.15 Power cable									

6 Specials

7.1 operating instruction _____

7 Software Versions

OS	Application	Terminal

8 Spare Parts

designation	Item number	Price

9 Labour hours

10 Total:

Notes:

No Spare parts available for this balance.
Balance in bad shape! Budget new balance
Balance beyond repair

Tecnician: _____

Signature: _____

With the general «Balance Checklist» which speeds up the process of testing and assessing a balance. The condition of the balance is documented point by point.

This checklist can be used to document periodic servicing and also to produce an estimate of repair costs.

Form «Balance Checklist» see Section 1, Chapter 12

1.1.1 How to fill out the checklist

Go through the checklist point by point and assess the condition of each part by placing a cross in the appropriate box

This is an example for a balance in good shape

Balance Checklist

Company: Testcompany
Adress: Testadress
Location: Testlaboratory
Contact: Testperson

Calibration Certificate No. 1234567890
Brand: Mettler Toledo
Model: XS204
Serialnumber: 1121090001

		n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
1	**General appearance**									
1.1	In use cover			X						
1.2	Top housing			X						
1.3	Bottom housing			X						
1.4	Foot Screws			X						
1.5	Level indicator		X							
1.6	Power conector		X							
1.7	Power supply cable		X							
1.8	Interface connector		X							
1.9	Cassette	X								
1.1	cassette cover	X								
1.11	weighing pan			X	X					
1.12	pan support	X								
1.13	Display		X							
1.14	Display cable		X							
1.15	Tare Key			X						
1.16	Key pad			X						
1.17	Calibration weight	X								
1.18	Calibration drive	X								
1.19	weight holder	X								
1.20	level cover		X							
2	**Draft shield**									
2.1	draft shield ring	X								
2.2	Left window			X						
2.3	Right window					X	X	X	X	
2.4	Front window			X						
2.5	Top window			X						
2.6	Left guide		X							
2.7	Right guide		X							
2.8	Top guides		X							
2.9	Left handle			X						
2.10	Right handle							X		
2.11	Top handle			X						
2.12	slider		X							
2.13	Bottom plate			X						
2.14	Doormotor	X								
2.15	Rear panel			X						
2.16	backpanel	X								
3	**Electronics**									
3.1	Balance PCB		X							
3.2	Display PCB		X							
3.3	Interface PCB		X							
3.4	Powersupply		X							

		n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
4	**Measuring cell**									
4.1	Scanning PCB			X						
4.2	Lever			X						
4.3	Magnet system			X						
4.4	Link			X						
4.5	Top guide			X						
4.6	Bottom Guide			X						
4.7	Bearings			X						
4.8	Cantilever arm			X						
4.9	cell cable			X						
4.1	overload protection			X						
4.11	hanger			X						
5	**Peripherals**									
5.1	Dust cover	X								
5.2	Second display	X								
5.3	Interface Cable			X						
5.4	Filter weighing kit	X								
5.5	Density kit	X								
5.6	Hand/Foot switch	X								
5.7	Accu/BatteriePac	X								
5.10	Printer			X						
5.11	Printer PCB			X						
5.12	Printing drive				X					
5.13	Housing				X					
5.14	Keypad			X						
5.15	Power cable	X								
6	**Specials**									
7.1	operating instruction	in locker 007								

7	**Software Versions**	OS	Application	Terminal
		1.00	1.00	

8	**Spare Parts**	designation	Item number	Price
		light Window	1100471 1	40

9	**Labour**	hours	
		2	150

10	**Total:**		190

Notes:

No Spare parts available for this balance.
Balance in bad shape! Budget new balance
Balance beyond repair
This is an example for a balance in good shape

Tecnician: Mr. Sample

Signature: Joe Sample

- To calculate the labor when preparing an estimate, allow 5 minutes' work for every item not rated as n/a or good.

This is an example for a balance in bad shape

Balance Checklist

Company: Testcompany
Adress: Testadress
Location: Testlaboratory
Contact: Testperson

Calibration Certificate No. 1234567890
Brand: MettlerToledo
Model: AE200
Serialnumber: A02001

		n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
1	**General appearance**									
1.1	In use cover	X								
1.2	Top housing			X	X					
1.3	Bottom housing			X				X		
1.4	Foot Screws			X				X		
1.5	Level indicator							X		
1.6	Power conector			X						
1.7	Power supply cable			X						
1.8	Interface connector	X								
1.9	Cassette	X								
1.1	cassette cover	X								
1.11	weighing pan			X	X					
1.12	pan support	X								
1.13	Display								X	
1.14	Display cable		X							
1.15	Tare Key			X			XX			
1.16	Key pad	X								
1.17	Calibration weight			X	X					
1.18	Calibration drive			X			XX			
1.19	weight holder			X				X		
1.20	level cover			X						
2	**Draft shield**									
2.1	draft shield ring							X	X	
2.2	Left window			X	X					
2.3	Right window			X	X					
2.4	Front window			X	X					
2.5	Top window			X			X		X	
2.6	Left guide				X				X	
2.7	Right guide				X				X	
2.8	Top guides			X						
2.9	Left handle			X						
2.10	Right handle			X			X	X		
2.11	Top handle			X						
2.12	slider	X								
2.13	Bottom plate			X	X					
2.14	Doormotor	X								
2.15	Rear panel			X						
2.16	backpanel	X		X						
3	**Electronics**									
3.1	Balance PCB		X							
3.2	Display PCB								X	
3.3	Interface PCB		X							
3.4	Powersupply		X							

		n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
4	**Measuring cell**									
4.1	Scanning PCB			X				X		
4.2	Lever			X				X		
4.3	Magnet system			X				X		
4.4	Link			X			X			X
4.5	Top guide							X		
4.6	Bottom Guide							X		
4.7	Bearings							X		
4.8	Cantilever arm							X		
4.9	cell cable							X		
4.1	overload protection							X		
4.11	hanger							X		
5	**Peripherals**									
5.1	Dust cover	X								
5.2	Second display	X								
5.3	Interface Cable	X								
5.4	Filter weighing kit	X								
5.5	Density kit	X								
5.6	Hand/Foot switch	X								
5.7	Accu/BatteriePac	X								
5.10	Printer	X								
5.11	Printer PCB	X								
5.12	Printing drive	X								
5.13	Housing	X								
5.14	Keypad	X								
5.15	Power cable	X								
6	**Specials**									
7.1	operating instruction	manual								

7	**Software Versions**	OS	Application	Terminal
		OFF4		

8	**Spare Parts**	designation	Item number	Price
		Dock	38606	120
		DisplayPCB	600302	1200
		UpperWindow	38603	160
		Bottomguides	600142	450
		Link	600290	9650

9	**Labour**	hours	
		55	41250

10	**Total:**		71430

Notes:

✓ No Spare parts available for this balance.
✓ Balance in bad shape! Budget new balance
Balance beyond repair
This is an example for a balance in bad shape

Tecnician: Mr.Sample

Signature: Joe Sample

1.1.2 Benefits of the checklist

Feature	Advantages	Benefits
Point by point listing of all test steps.	Every part on a balance is tested and assessed.	Full test of the balance.
Predefined test sequence.	Condition of the balance is recorded in detail.	Documentation in accordance with QM guidelines, with an entry in the logbook.
Each operating step is ticked.	Document is quick to produce.	Minimal production effort.
All possible defects are listed.	Nothing is overlooked when preparing an estimate.	Fewer instances of final costs exceeding estimate.
Clear and simple layout.	Rapid overview of condition of balance • Most crosses on left = condition is good • Most crosses on right = condition is poor And/Or • Lots of crosses = complex balance • Not many crosses = simple balance	Customers can clearly see what work they are paying for. The document is also easy for non-experts like buyers to understand.
Chronological record produced by completing the list for each service.	Wear and use of the product is easily verifiable.	Encourages replacement of the product with a new one. Preventive measures such as employee training can be taken.
Simple evidence that balances will soon need replacing.	Facilitates preparation of a budget for balances for a customer.	Sale of spare parts for obsolete products is easier.
Servicing work is documented.	Visual record of complex work.	Customer is more likely to buy clearly documented servicing.

2 Function check

1. Connect balance to power supply.
   Check functioning of:
   - Display and Membrane Keypad
2. Check calibration drive.
3. Level balance.
4. Acclimatize balance, approx. 2 hour.
   Only necessary:
   - if the balance has been without voltage for a long time.
   - if the AC adapter was unplugged (balance, outlet socket).
5. Check adjustment of balance using the following Tests (see Chapter 9):
   - Hysteresis
   - Cornerload
   - Repeatability
   - Linearity
   - Sensitivity.
6. If appropriate, check peripheral instruments.

3 Checklist for cleaning

ATTENTION

Danger of electric current.

Disconnect power cable between AC adapter and balance before starting work on the balance or terminal.

External cleaning

ATTENTION

Do not use cleaning agents which contain solvents or abrasives.

Cleaning agents must not enter the balance, terminal, or AC adapter.

Clean housing, draft shield, and weighing chamber with a soft cloth and a small amount of mild, commercially available cleaning agent.

Internal cleaning

ATTENTION

Do not blow near the weighing cell!

Dust may enter the magnet system.

Remove dust with a dry or slightly damp brush, or with a soft, non-fibrous cloth.

Clean the magnet recess.

Clean adjustment weight and/or weight support with alcohol.

After cleaning

Check the balance's repeatability! If it is outside the tolerance (see Chapter 9), this may be due to brush hairs or dust fibers caught in moving parts.

4 Repairs

1. Troubleshooting:
   - Troubleshooting (see Chapter 5)
   - Test using LARS, LabTec Repair and Service Software, (see Chapter 7).
2. Repairs
   - Replace faulty parts (see Chapter 6)
3. Adjustment
   - The necessary adjustments, such as linearization or Service adjustment CAL for each type of balance are given as a service procedure in the LARS Help text LARS, (see Chapter 7).
4. Final procedures
   - Reinstate user settings.
   - Connect peripheral devices if necessary.

Complete certification tasks Adjustments.

5 Troubleshooting

List of Contents

1 Troubleshooting Balance with «MonoBloc»

1.1 Display is dark

Error symptom	Possible cause	Diagnostic	Remedy
Display is dark	**1.** Balance on standby.	-	Press «On» key.
	2. Power plug not connected.	Check	Plug in power plug.
	3. AC adapter not connected to balance.	Check	Plug in AC adapter.
	4. AC adapter is faulty.	Green LED on AC adapter does not light.	Replace AC adapter (see Section 1.1.3, Chapter 10).
	5. Connector socket on balance is corroded or faulty.	Check	Replace connector socket.
	6. Membrane keypad is not plugged in.	Check plug connection.	Plug ribbon cable in (see Section 3.2, Chapter 6).
	7. Power outage in building supply.	• Plug AC adapter into other socket. • Check socket with phase tester. • Plug in a different electrical device.	Inform person responsible (building electrician).
	8. Incorrect AC adapter.	Check that input data on type plate match the power supply values.	Select correct AC adapter (see Section 1.1.3, Chapter 10).
	9. Balance PCB faulty.		Replace balance PCB (see Section 3.12, Chapter 6).

1.2 Membrane keypad does not function

Error symptom	Possible cause	Diagnostic	Remedy
Membrane keypad does not function	**1.** Membrane keypad is not plugged in.	Check plug connection.	Plug ribbon cable in (see Section 3.2, Chapter 6).
	2. Membrane keypad faulty.	Plug in a new membrane keypad (without affixing it first). If it functions, the existing membrane keypad is faulty.	Replace membrane keypad (see Section 3.3, Chapter 6).
	3. Balance PCB faulty.	-	Replace Balance PCB (see Section 3.12, Chapter 6)

1.3 Display drifts, increases and decreases alternately

Error symptom	Possible cause	Diagnostic	Remedy
Increases and decreases alternately	**1.** Vibrations at the workplace	Place beaker with tap water on the weighing bench. Vibrations cause ripples on the water surface.	• Protect weighing location against vibrations (vibration absorber, etc.). • Set weighing parameters coarser (e.g. change «Environment» from «Very stable» to «Stable»). • Find a different weighing location (by agreement with customer).
	2. Drafts	Check that draft shield is closed.	• Close draft shield. • Set weighing parameters coarser (e.g. change «Environment» from «Very stable» to «Stable»).
	3. Internal adjustment weight is jammed.	Actuate adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weights correctly (see Section 3.8, Chapter 6).
	4. Magnet system soiled.		Clean magnet system (see Section 4.1.3, Chapter 6).
	5. Loose screws on the measuring cell.		Check correct seating of the screws.
	6. Moving part touching measuring cell.		Check (see Section 3.7, Chapter 6).
	7. Detector soiled or faulty.		Check, replace (see Section 4.1.1, Chapter 6).
	8. Current-conducting strips are touching, badly soldered or broken.	Use measuring instrument to check continuity (ring through).	Replace current-conducting strips (see Section 4.2.1, Item 7, Chapter 6).

1.4 Display unstable, constantly drifts into plus or minus

Error symptom	Possible cause	Diagnostic	Remedy
Display constantly drifts into plus or minus	**1.** Sun or other heat source shines directly onto the balance.	Is any sun shade (blinds, curtains, etc.) available?	Select location according to Operating Instructions (customer responsibility).
	2. Weighing sample absorbs moisture or evaporates moisture.	• Is the weighing result with a test weight stable? • Sensitive weighing samples e.g. paper, cardboard, wood, plastic, rubber, liquids.	• Use aids. • Cover weighing sample.
	3. Weighing sample is electrostatically charged.	• Is the weighing result with a test weight stable? • Sensitive weighing samples e.g. plastic, powder, insulating materials.	• Increase air humidity in weighing chamber (45% - 50%). • Use ionizer (see under accessories).
	4. Weighing sample is hotter or colder than the air in the weighing chamber.	Weighing operation with test weight does not show this effect.	Bring weighing sample to room temperature before weighing.
	5. Balance has not yet reached thermal equilibrium.	• Was there a power outage? • Was the AC adapter unplugged (balance, socket)	Acclimatize balance for approx. 2 hours.
	6. Internal adjusting weight is jammed.	Actuate the adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weight correctly (see Section 3.8, Chapter 6).
	7. Detector soiled or faulty.		Check, replace (see Section 4.1.1, Chapter 6).
	8. Magnet system soiled.		Clean magnet system (see Section 4.1.3, Chapter 6).
	9. Loose screws on the measuring cell.		Check correct seating of the screws.

1.5 Display shows overload or underload

Error symptom	Possible cause	Diagnostic	Remedy
Display shows overload or under-load	**1.** Incorrect weighing pan.	Slightly lift or press weighing pan. The weight display appears.	Attach correct weighing pan.
	2. Missing weighing pan.		Attach correct weighing pan.
	3. Incorrect zero point at switch-on.		• Switch off balance. • Unplug power cable and plug in again.
	4. Incorrect TDNR.	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7).
	5. Internal adjustment weight is jammed.	Actuate adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weights correctly (see Section 3.8, Chapter 6).
	6. Incorrect measuring cell built in.	Check whether the part number of the new measuring cell matches the respective balance (see Section 4, Chapter 1)	Build in correct measuring cell.
	7. Lever short-circuits to ground.	Measure the resistance between the coil contact and the measuring cell chassis.	Replace lever (see Section 4.1, Chapter 6).
	8. Detector faulty.		Replace (see Section 4.1.1, Chapter 6).
	9. Balance PCB faulty.		Replace Balance PCB (see Section 3.12, Chapter 6)

1.6 display flashes «0.00000»

Error symptom	Possible cause	Diagnostic	Remedy
display flashes «0.00000»	**1.** Dead load too small.		Check tolerance values in Service Mode and compare with tolerance table (see Chapter 9).
	2. Incorrect TDNR.	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7).
	3. Lever cannot move freely, touches fixed parts.	• Switch off balance. • Unplug power cable. • Remove weighing pan. • Press lightly on pan support. Typical click of the measuring cell must be audible.	• Check measuring cell.
	4. Ribbon cable not plugged into balance or faulty.	Check all cable connections on the balance PCB and cell PCB.	Plug in ribbon cable.
	5. Detector soiled or faulty.		Check, replace (see Section 4.1.1, Chapter 6).
	6. Current-conducting strips are touching, badly soldered or broken.	Use measuring instrument to check continuity (ring through).	Replace current-conducting strips (see Section 4.2.1, Item 7, Chapter 6).
	7. Coil short-circuits to ground, short-circuits otherwise, or is interrupted.	Measure resistance.	Replace lever (see Section 4.1, Chapter 6).
	8. Balance PCB faulty.		Replace Balance PCB (see Section 3.12, Chapter 6)

1.7 Taring not possible

Error symptom	Possible cause	Diagnostic	Remedy
Taring not possible	**1.** Vibrations at the workplace.	• Press Tare again. • Display unstable.	see Section 1.4

1.8 Adjustment with internal calibration weights not possible

Error symptom	Possible cause	Diagnostic	Remedy
Internal calibration not possible	**1.** Weighing pan is loaded.	Check	Unload (empty) weighing pan.
	2. Dead load too small.		Check tolerance values in Service Mode and compare with tolerance table (see Chapter 9).
	3. Adjustment weight is jammed or outside the supporting position.	• Lower the internal weights from Service Mode or LARS. • If the display remains unstable, raise the internal weights and place external weights in position. If the display is stable the adjusting weight is jammed. If the display is unstable, see Section 1.3.	Insert adjustment weights correctly (see Section 3.8, Chapter 6).
	4. Adjusting motor is faulty.	No sound from motor.	• Plug in cable to motor. • Replace motor PCB. • Replace motor.
	5. Incorrect TDNR.	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7).
	6. SW V1.20	Standard calibration cannot be performed	Upgrade SW to V1.21 or later

1.9 Excessive hysteresis

Error symptom	Possible cause	Diagnostic	Remedy
Excessive hysteresis	**1.** Hair, dust fibers, or dirt between fixed and moving parts.		Check
	2. Detector soiled or faulty.		Check, replace (see Section 4.1.1, Chapter 6).
	3. Magnet system soiled.		Clean magnet system (see Section 4.1.3, Chapter 6)
	4. Loose screws on the measuring cell.		Check correct seating of the screws.

1.10 Corner load cannot be set

Error symptom	Possible cause	Diagnostic	Remedy
Corner load cannot be set	**1.** Excessive hysteresis.	Check hysteresis: • Touch empty weighing pan and raise slightly Display does not return to original value. • Place weight on pan and touch weighing pan without moving weight.	see Section 1.9
	2. Corner load coarse adjustment was not done.		Perform coarse adjustment (see Section 5.2, Chapter 6).

1.11 Linearity cannot be adjusted

Error symptom	Possible cause	Diagnostic	Remedy
Linearity cannot be adjusted	**1.** Incorrect switch-on zero point.		• Switch off balance. • Unplug power cable and plug in again.
	2. Excessive hysteresis.		see Section 1.9
	3. Corner load too high.		Check, adjust (see Section 5.2, Chapter 6).
	4. Balance PCB faulty.		Replace Balance PCB (see Section 3.12, Chapter 6)
	5. Adjustment parameters outside permitted range.		Reload cell data (see Chapter 9).
	6. Incorrect coarse adjustment.	Perform CAL (Service menu or LARS).	Mandatory sequence of adjustments: • CAL • LIN • Std CAL • CAL

2 Troubleshooting Balance with conventional Cell

2.1 Display is dark

Error symptom	Possible cause	Diagnostic	Remedy
Display is dark	**1.** Balance on standby.	-	Press «On» key.
	2. Power plug not connected.	Check	Plug in power plug.
	3. AC adapter not connected to balance.	Check	Plug in AC adapter.
	4. AC adapter is faulty.	Green LED on AC adapter does not light.	Replace AC adapter (see Section 1.1.3, Chapter 10).
	5. Connector socket on balance is corroded or faulty.	Check	Replace connector socket.
	6. Power outage in building supply.	• Plug AC adapter into other socket. • Check socket with phase tester. • Plug in a different electrical device.	Inform person responsible (building electrician).
	7. Incorrect AC adapter.	Check that input data on type plate match the power supply values.	Select correct AC adapter (see Section 1.1.3, Chapter 10).
	8. Membrane keypad is not plugged in.	Check plug connection.	Plug ribbon cable in (see Section 6.2, Chapter 6).
	9. Balance PCB faulty.		Replace balance PCB (see Section 6.12, Chapter 6).

2.2 Membrane keypad does not function

Error symptom	Possible cause	Diagnostic	Remedy
Membrane keypad does not function	**1.** Membrane keypad is not plugged in.	Check plug connection.	Plug ribbon cable in (see Section 6.2, Chapter 6)
	2. Membrane keypad faulty.	• Plug in a new membrane keypad (without affixing it first). If it functions, the existing membrane keypad is faulty.	Replace membrane keypad (see Section 6.3, Chapter 6).
	3. Balance-PCB faulty.	-	Replace balance PCB (see Section 6.12, Chapter 6).

2.3 Display drifts, increases and decreases alternately

Error symptom	Possible cause	Diagnostic	Remedy
Increases and decreases alternately	**1.** Vibrations at the workplace	Place beaker with tap water on the weighing bench. Vibrations cause ripples on the water surface.	• Protect weighing location against vibrations (vibration absorber, etc.). • Set weighing parameters coarser (e.g. change «Environment» from «Very stable» to «Stable»). • Find a different weighing location (by agreement with customer).
	2. Drafts	Check that draft shield is closed.	• Close draft shield. • Set weighing parameters coarser (e.g. change «Environment» from «Very stable» to «Stable»).
	3. Internal adjustment weight is jammed.	Actuate adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weights correctly (see Section 6.8, Chapter 6).
	4. Magnet system soiled.		Clean magnet system (see Section 7.8, Chapter 6).
	5. Bearing and/or Coupling		Check, replace (see Section 7.5, Section 7.2, Chapter 6)
	6. Loose screws on the measuring cell.		Check correct seating of the screws (see Section 7.1.1, Chapter 6).
	7. Moving part touching measuring cell.		Check (see Section 7, Chapter 6).
	8. Detector soiled or faulty.		Check, replace (see Section 7.7, Chapter 6).
	9. Current-conducting strips are touching, badly soldered or broken.	Use measuring instrument to check continuity (ring through).	Replace current-conducting strips (see Section 7.6, Chapter 6).

2.4 Display unstable, constantly drifts into plus or minus

Error symptom	Possible cause	Diagnostic	Remedy
Display constantly drifts into plus or minus	**1.** Sun or other heat source shines directly onto the balance.	Is any sun shade (blinds, curtains, etc.) available?	Select location according to Operating Instructions (customer responsibility).
	2. Weighing sample absorbs moisture or evaporates moisture.	• Is the weighing result with a test weight stable? • Sensitive weighing samples e.g. paper, cardboard, wood, plastic, rubber, liquids.	• Use aids. • Cover weighing sample.
	3. Weighing sample is electrostatically charged.	• Is the weighing result with a test weight stable? • Sensitive weighing samples e.g. plastic, powder, insulating materials.	• Increase air humidity in weighing chamber (45% - 50%). • Use ionizer (see Chapter 10).
	4. Weighing sample is hotter or colder than the air in the weighing chamber.	Weighing operation with test weight does not show this effect.	Bring weighing sample to room temperature before weighing.
	5. Balance has not yet reached thermal equilibrium.	• Was there a power outage? • Was the AC adapter unplugged (balance, socket)	Acclimatize balance for approx. 2 hours.
	6. Internal adjusting weight is jammed.	Actuate the adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weight correctly (see Section 6.8, Chapter 6).
	7. Detector soiled or faulty.		Check, replace (see Section 7.7, Chapter 6).
	8. Magnet system soiled.		Clean magnet system (see Section 7.8, Chapter 6).
	9. Loose screws on the measuring cell. **10.** Bearing and/or Coupling		Check correct seating of the screws. Check, replace (see Section 7.5, Section 7.2, Chapter 6).

2.5 Display shows overload or underload

Error symptom	Possible cause	Diagnostic	Remedy
Display shows overload or underload	**1.** Incorrect weighing pan.	Slightly lift or press weighing pan. The weight display appears.	Attach correct weighing pan.
	2. Missing weighing pan.		Attach correct weighing pan.
	3. Incorrect zero point at switch-on.		• Switch off balance. • Unplug power cable and plug in again.
	4. Incorrect TDNR.	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7).
	5. Internal adjusting weight is jammed.	Actuate the adjustment motor from Service Mode or LARS. The weight display changes and becomes stable.	Insert adjustment weight correctly (see Section 6.8, Chapter 6).
	6. Incorrect measuring cell built in.	Check whether the part number of the new measuring cell matches the respective balance (see Section 4, Chapter 1)	Build in correct measuring cell.
	7. Lever short-circuits to ground.	Measure the resistance between the coil contact and the measuring cell chassis.	Replace lever (see Section 7.3, Chapter 6).
	8. Detector faulty.		Replace (see Section 7.7, Chapter 6).
	9. Balance PCB faulty.		Replace balance PCB (see Section 6.12, Chapter 6).

2.6 Display flashes «0.00000»

Error symptom	Possible cause	Diagnostic	Remedy
Display flashes «0.00000»	**1.** Dead load too small.		Check tolerance values in Service Mode and compare with tolerance table (see Chapter 9).
	2. Incorrect TDNR.	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7).
	3. Lever cannot move freely, touches fixed parts.	• Switch off balance. • Unplug power cable. • Remove weighing pan. • Press lightly on pan support. Typical click of the measuring cell must be audible.	• Check measuring cell.
	4. Ribbon cable not plugged into balance or faulty.	Check all cable connections on the balance PCB and cell PCB.	Plug in ribbon cable.
	5. Detector soiled or faulty.		Check, replace (see Section 7.7, Chapter 6).
	6. Current-conducting strips are touching, badly soldered or broken.	Use measuring instrument to check continuity (ring through).	Replace current-conducting strips (see Section 7.6, Chapter 6).
	7. Coil short-circuits to ground, short-circuits otherwise, or is interrupted.	Measure resistance.	Replace lever (see Section 7.4, Chapter 6).
	8. Balance PCB faulty.		Replace balance PCB (see Section 6.12, Chapter 6).

2.7 Taring not possible

Error symptom	Possible cause	Diagnostic	Remedy
Taring not possible	**1.** Vibrations at the workplace.	• Press Tare again. • Display unstable.	see Section 2.4
	2. Pan support jams	• Touches the fastening plate • Hook for below-the-balance weighing touches	Check

2.8 Adjustment with internal calibration weights not possible

Error symptom	Possible cause	Diagnostic	Remedy
Internal calibration not possible	**1.** Weighing pan is loaded.	Check	Unload (empty) weighing pan.
	2. Dead load too small.		Check tolerance values in Service Mode and compare with tolerance table (see Chapter 9).
	3. Adjustment weight is jammed or outside the supporting position.	• Lower the internal weights from Service Mode or LARS. • If the display remains unstable, raise the internal weights and place external weights in position. If the display is stable the adjusting weight is jammed. If the display is unstable, see Section 2.3.	see Section 6.8, Chapter 6
	4. Adjusting motor is faulty.	No sound from motor.	• Plug in cable to motor. • Replace motor PCB. • Replace motor.
	5. Incorrect TDNR. **6.** Coupling faulty	Input TDNR in LARS «Data» «Type definition» and check whether the balance type matches	Load TDNR (see Chapter 7). Replace (see Section 7.2, Chapter 6)

2.9 Excessive hysteresis

Error symptom	Possible cause	Diagnostic	Remedy
Excessive hysteresis	**1.** Hair, dust fibers, or dirt between fixed and moving parts.		Check
	2. Detector soiled or faulty.		Check, replace (see Section 7.7, Chapter 6).
	3. Magnet system soiled.		Clean magnet system (see Section 7.8, Chapter 6).
	4. Loose screws on the measuring cell.		Check correct seating of the screws.

2.10 Corner load cannot be set

Error symptom	Possible cause	Diagnostic	Remedy
Corner load cannot be set	**1.** Excessive hysteresis.	Check hysteresis: • Touch empty weighing pan and raise slightly Display does not return to original value. • Place weight on pan and touch weighing pan without moving weight.	see Section 2.9
	2. Corner load coarse adjustment was not done.		Perform coarse adjustment (see Section 8.3, Chapter 6).
	3. Guide faulty		Replace (see Section 7.3, Chapter 6)

2.11 Linearity cannot be adjusted

Error symptom	Possible cause	Diagnostic	Remedy
Linearity cannot be adjusted	**1.** Incorrect switch-on zero point.		• Switch off balance. • Unplug power cable and plug in again.
	2. Excessive hysteresis.		see Section 2.9
	3. Corner load too high.		Check, adjust (see Section 8.3, Chapter 6).
	4. Adjustment parameters outside permitted range.	-	Reload cell data (see Chapter 7).
	5. Incorrect coarse adjustment.	Perform CAL (Service menu or LARS).	Mandatory sequence of adjustments: • CAL • LIN • Std CAL • CAL
	6. Coupling faulty		Replace (see Section 7.2, Chapter 6)

3 Troubleshooting on Balance-Type …

3.1 JB803-C/ A, M

Error symptom	Possible cause	Diagnostic	Remedy
Range like JB1603-C	**1.** TDNR 1.0.2.448.191 are fault	Types of Balances to SNR 1125349999	TDNR 1.0.2.494.191 loading

6 Repair

List of Contents

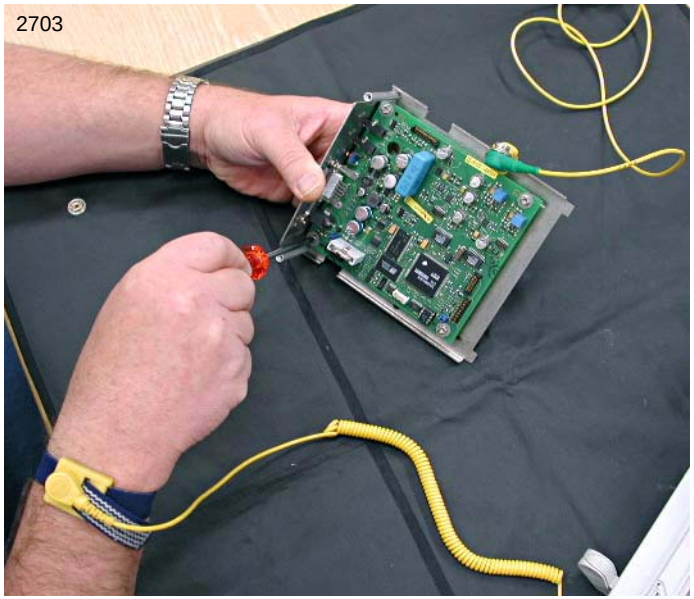
1 Preparing the Balance for Repair

ATTENTION

Hazard from electric current.

Unplug power supply cable before starting work on scale or Terminal.

1.1 Working on electronically damageable components



WARNING

Electrostatically damageable components.

Always use antistatic kit when working on electronic components.

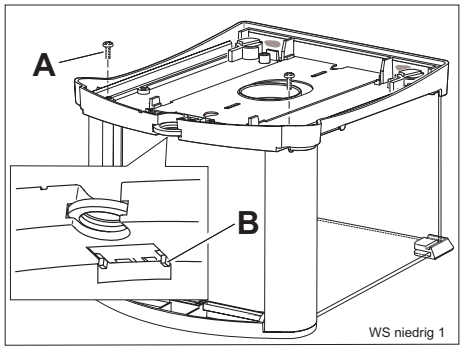
- When removing and installing the Weighing cell, neither the detector PCB nor the cable contacts may be touched.
- If no workplace with ESD protection is available, always touch the bottom housing or any other metal part of the balance before any contact with the electronics. Following this action, the PCB and the balance are at the same electrical potential as the person performing the work.
- PCBs which are returned for repair must be packaged in the original antistatic packaging regardless of the fault.
- EEPROMs kept outside the balance must be stored on conductive foam.
- If soldering work is performed on the PCB, a soldering iron isolated from the power supply (isolating transformer) is recommended.

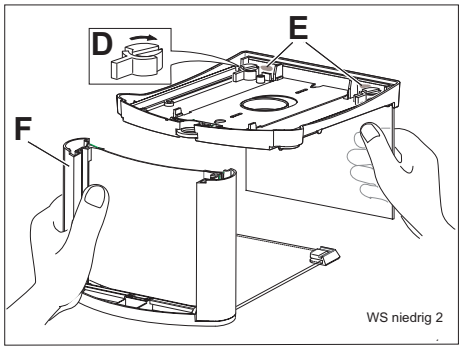
Exchangeable components which are sensitive to electrostatic discharge are marked with an ESD protection symbol.

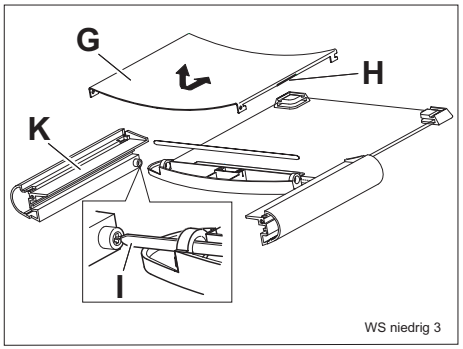
2 Repairs draft shield

2.1 Draft shield «mg» (H=155mm)

Spare Parts see Chapter 2.3, Chapter 3





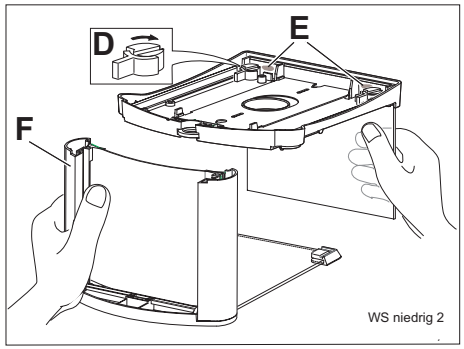


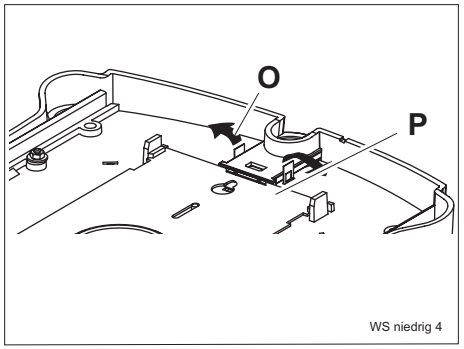
2.1.1 Disassembling

1. Open cover and remove side panes.
2. Remove ring and bottom plate.
3. Turn draft shield upside down and stand on cover.
4. Remove the 2 corner post retaining screws **A**.
5. Hold the corner post **F** steady with the left hand and with the right hand raise the front pane together with the draft shield base.
6. Turn corner posts **K** and rear panel down to lie flat.
7. Withdraw rear panel **G**.
8. Pull off corner posts sideways and remove leaf spring **I**.

2.1.2 Assembling

1. Place cover as shown in the illustration 3, insert leaf spring **I** and push on corner posts **K** at the sides.
2. Insert rear panel (with retaining springs **H** left and right) and push to the rear until it clicks into place.
3. With the left hand hold up the corner post **F** and rear panel together.
4. Verify the correct position of the nibs **B**.
5. Insert the screws **A** and secure the draft shield base to the corner posts.
6. Turn the draft shield over and fit the bottom plate, ring and side panes.





2.1.3 Replacing front pane

1. Bond the new front pane with 2 drops of silicon adhesive **E**.
2. Insert the eccentric **D** and turn clockwise to tighten.
   Check: the front pane must stand up vertically.

2.1.4 Replacing draft shield base

Note

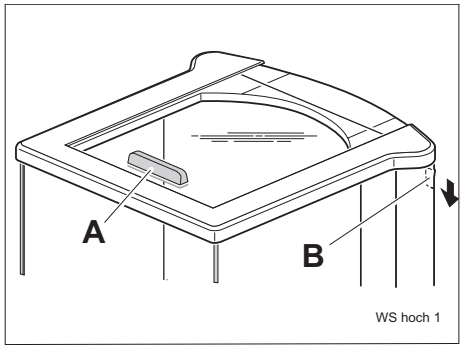
The old locking plate and contact spring must be retained for the new base.

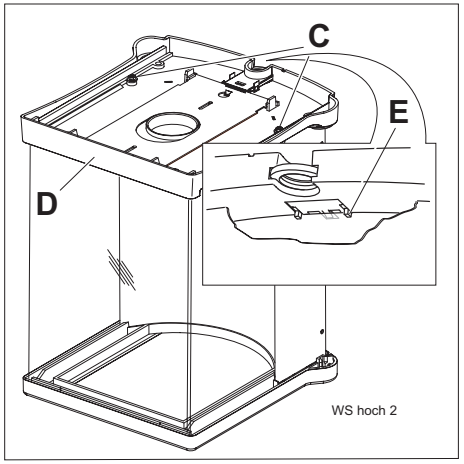
1. Splay the tabs of the contact spring **O** on the underside of the base outward and push out the contact spring downward.
2. Withdraw the locking plate **P** together with its handle out of the draft shield base.

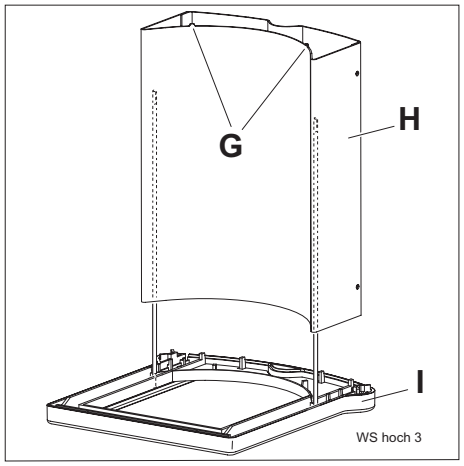
2.2 Draft shield with sliding doors «mg» (H=170 mm) or «0.1mg» (H=255 mm)

Spare Parts Draft shield H=170 mm see Section 2.2, Chapter 3

Spare Parts Draft shield H=255 mm see Section 2.1, Chapter 3







2.2.1 Disassembling

Removing side doors

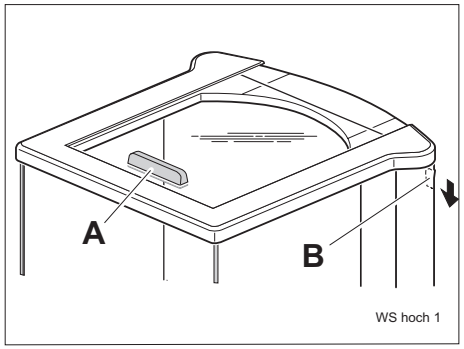
1. Unlatch **B** the corner posts left and right and remove.
2. Push out the side doors to the rear.

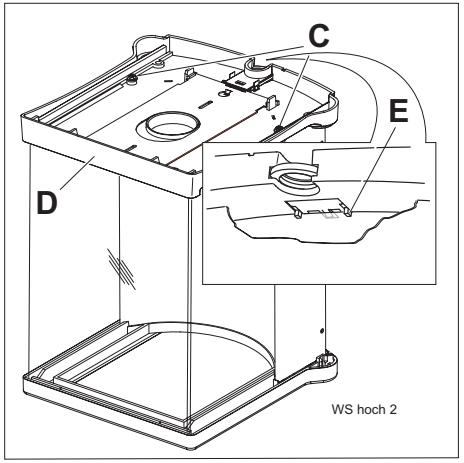
Removing top door

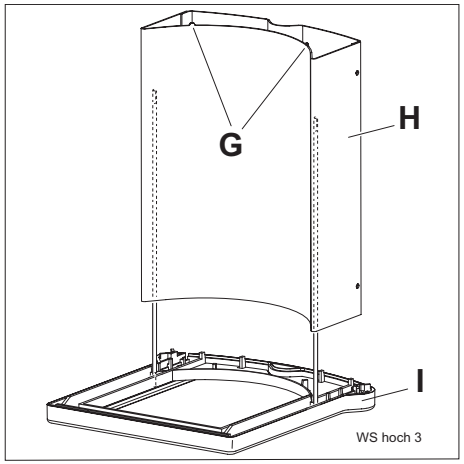
3. Disassemble handle **A** by pulling out the lower part from the upper part.
4. Pull out door from the rear.

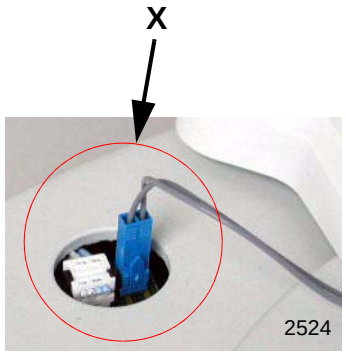
Removing draft shield base and draft shield top frame

5. Remove ring and bottom plate.
6. Turn draft shield upside down.
7. Remove nuts **C** and washers.
8. Raise draft shield **D** without front pane.
9. Remove front pane.
10. Lift off rear panel **H**.
11. Replacing draft shield base see Section 2.1.4









2.2.2 Assembling

Assembling draft shield base, rear panel and draft shield top frame

1. Place draft shield top frame **I** on the bench with the studs pointing upward.
2. Place the rear panel **H** on draft shield top frame with the lugs **G** upward.
3. Insert front pane in draft shield top frame.
4. On ABxx5-S balances:
   Pass stabilizer cable through base of draft shield and insert plug **X**.
5. Fit draft shield base, checking the positions of the nibs **E** and lugs **G**.
6. Secure the draft shield base to the studs with the washers and nuts **C**.

Note

Do not overtighten nuts.

Fitting side doors

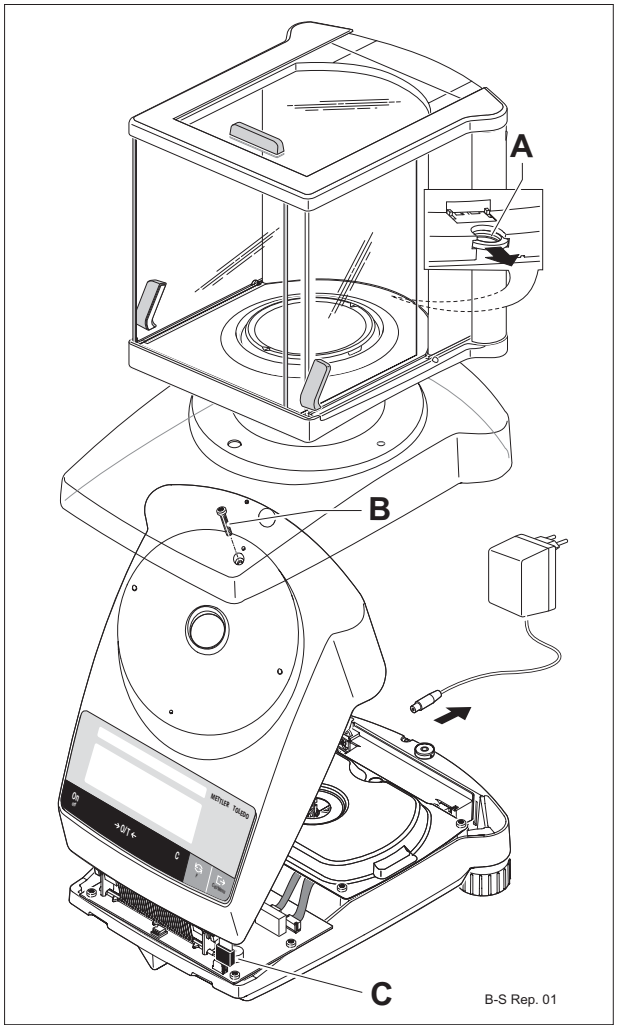
1. Turn draft shield over to stand on its base.
2. Insert side doors from the rear.
3. Insert left and right corner posts with the latches **B** a the rear.

Inserting top door

4. Insert door.
5. Fit handle.
6. Fit bottom plate and ring.

3 Removing/installing components on AB, PB, JB balances with MonoBloc

3.1 Opening the balance



ATTENTION

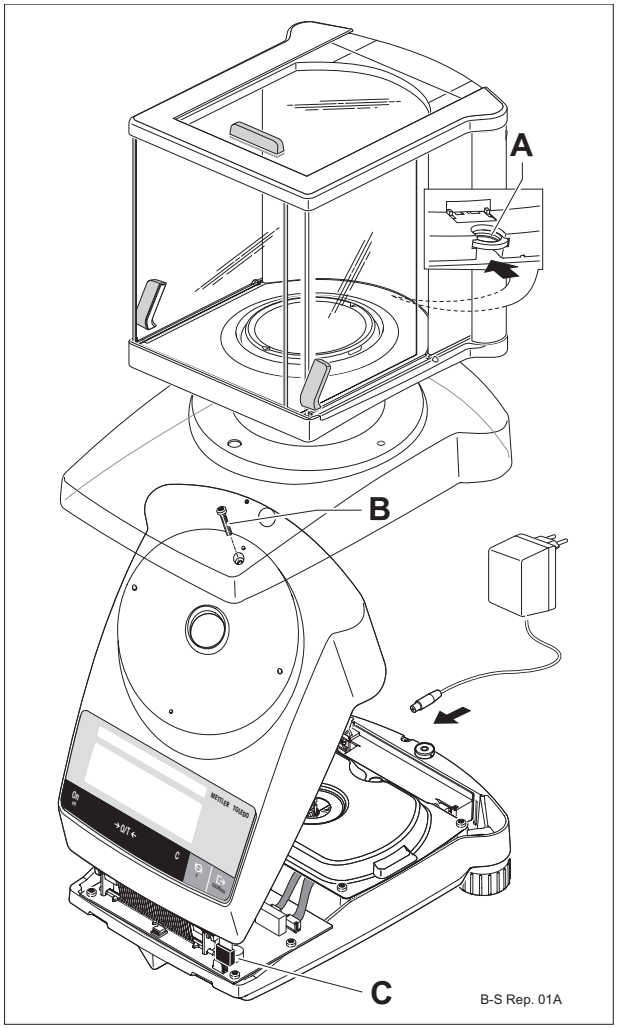
Hazard from electric current.

Unplug power supply cable before starting work on scale or Terminal.

1. Unplug the power cable.
2. Remove weighing pan, pan holder and retaining ring, or unlatch **A** draft shield and remove.
3. Remove protective cover.
4. Remove screw **B**.
5. Raise top housing at rear at an angle of about 45° and at the front disconnect the cable **C** connecting the membrane key-pad to the balance PCB.
6. Remove top housing.

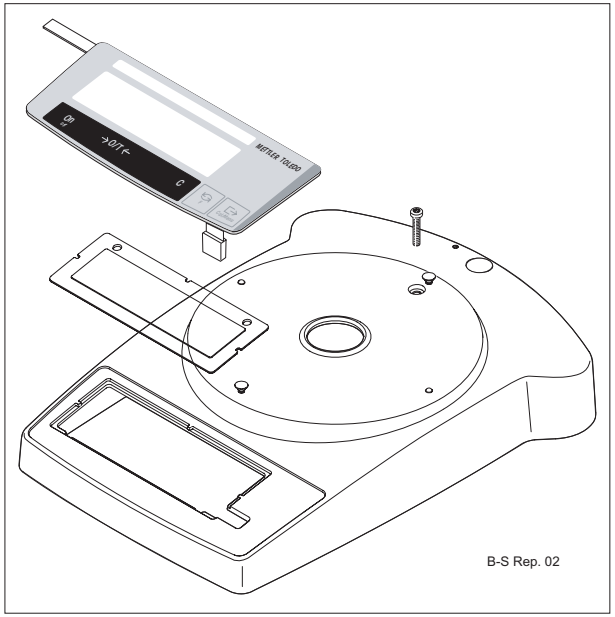
Closing the balance see Section 3.2

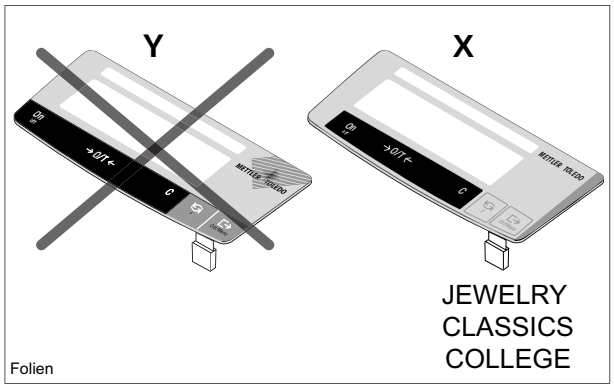
3.2 Closing the balance



1. Fit top housing and connect the cable **C** for the membrane keypad.
2. Raise top housing at rear at an angle of about 45°, engage with bottom housing at front and then lower into place at the rear.
3. Insert screw **B**.
4. Fit protective cover.
5. Fit draft shield **A** or weighing pan, pan holder and retaining ring.

3.3 Replacing membrane keypad





Opening the balance see Section 3.1

1. Push out membrane keypad from top housing. Retain the original model plate and display glass (with drawing the model plate at the left).
2. Clean top housing and display glass to remove all traces of grease and adhesive.
3. Place the model plate in the new membrane keypad.
4. Place the display glass loosely in the top housing so that the notches fit snugly over the nibs.

Note

Avoid leaving fingerprints on the glass and window of the membrane keypad!

Replacement membrane keypads have a modified design **X**. Available membrane keypads are:

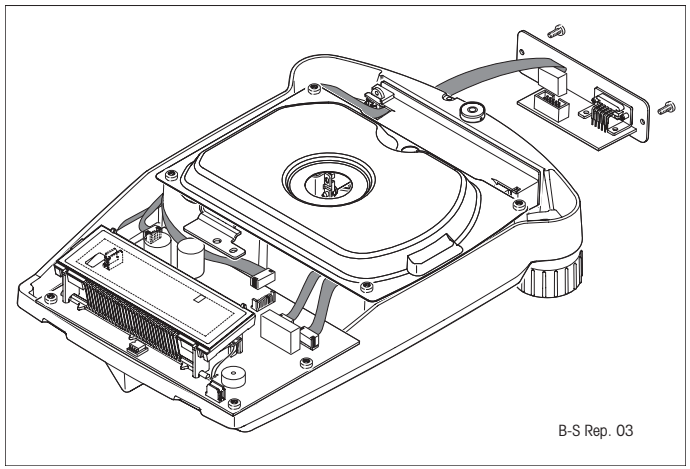
- JEWELRY membrane keypad for balance type JB
- CLASSIC membrane keypad for balance types AB and PB
- COLLEGE membrane keypad for balance types PB

However, the functionality is identical to the membrane keypad being replaced **Y**.

5. Carefully use adhesive to bond the membrane keypad without trapping any air.

Closing the balance see Section 3.2.

3.4 Fitting RS232 interface and connection cable

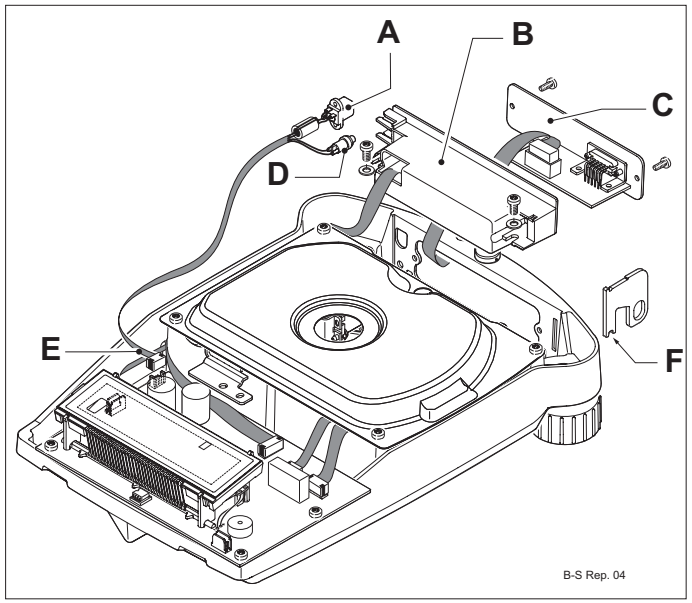


Opening the balance see Section 3.1

1. Remove blank plate at rear of balance.
2. Fit RS232 connection cable:
   - Pass ribbon cable through opening in connection holder.
   - Plug in connectors on interface and balance PCBs.
3. Secure interface with screws.

Closing the balance see Section 3.2

3.5 Replacing power cable

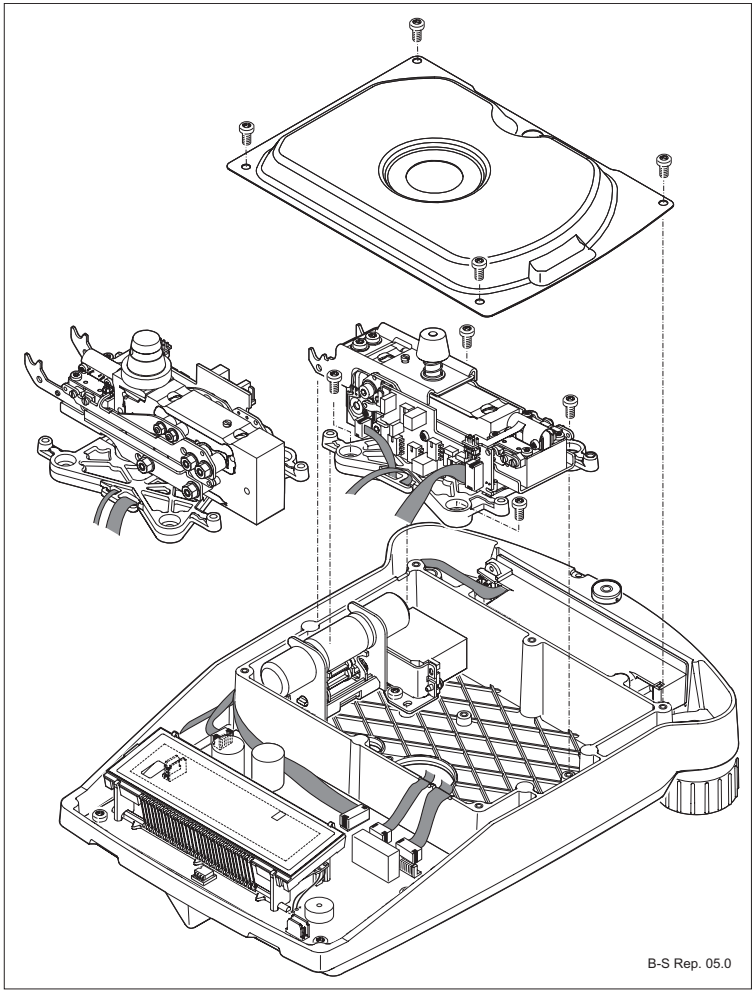


Opening the balance see Section 3.1

1. Remove RS232 interface or blank plate **C**.
2. Unplug power cable **E** from balance PCB.
3. Remove connection holder **B**.
4. Remove power socket **A** and certification switch **D** from connection holder.
5. Fit new power cable:
   - Insert cable for certification switch into slot and press switch fully home.
   - Insert power socket at the side with the round part underneath.
6. Fit connection holder **B** into balance bottom housing:
   - Place antitheft lug in bottom housing (notch **F** over rib of housing).
   - Insert connection holder from above and screw down securely with the power socket **A** flush with the bottom housing.
7. Fit blank plate or RS232 interface.
8. Plug in power cable **E** to balance PCB.

Closing the balance see Section 3.2.

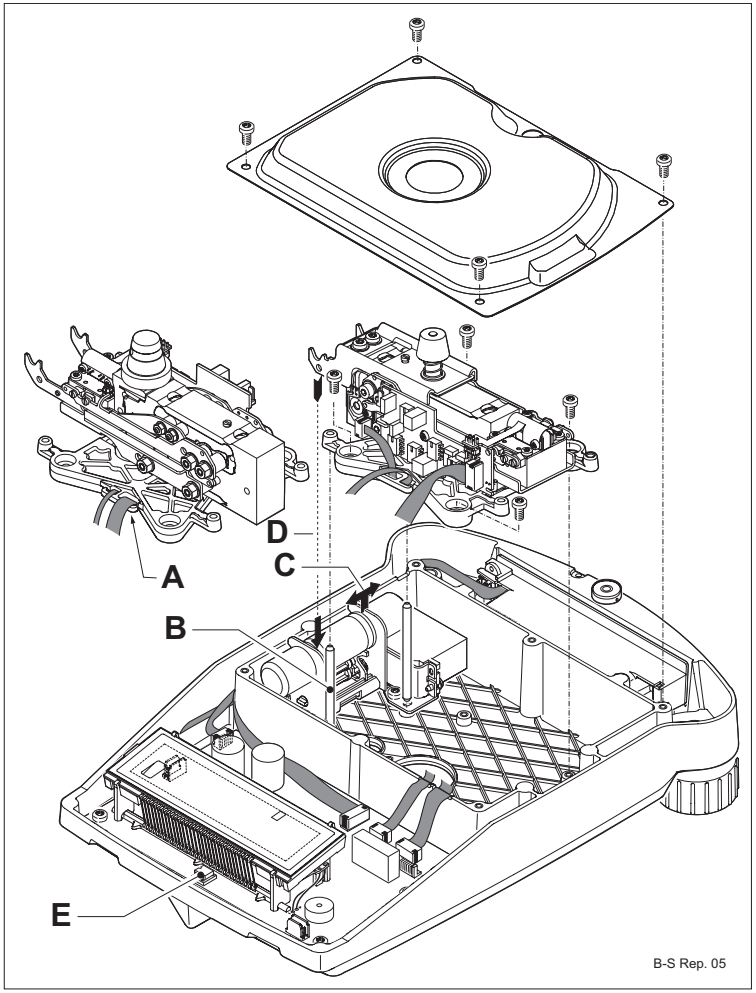
3.6 Removing measuring cell



Opening the balance see Section 3.1

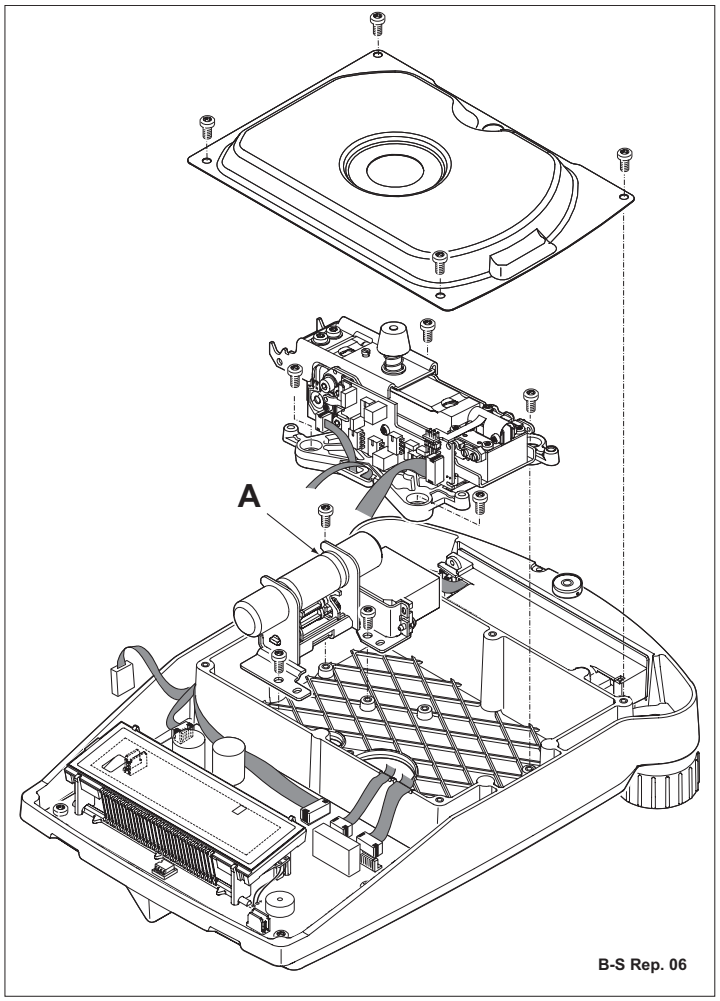
1. Remove cell shielding.
2. Disconnect detector and coil cables from balance PCB.
3. Unscrew measuring cell from bottom housing and remove it.
   - Without calibration drive: lift out cell.
   - Balance with calibration drive: raise cell at right at an angle of about 45° and withdraw from calibration drive.

3.7 Fitting measuring cell



1. Pass detector and coil cables through guides **A** in mounting plate.
2. Balances **without** calibration drive:
   - Place measuring cell in bottom housing and screw down securely.
3. Balances **with** calibration drive:
   - Raise cell at right at an angle of about 45°, insert into calibration drive, lower and secure with screws.
   - Slacken the 3 screws of the calibration drive.
   - Insert two ø 3.47 mm centering pins **B** (see Chapter 11) in locating holes in mounting plate.
   - Move calibration drive sideways **C** to align it with calibration weight support **D**.
   - Tighten calibration drive screws.
   - Remove centering pins.
4. Plug in detector and coil cables to balance PCB.
5. Fit cell shielding.
6. Closing the balance see Section 3.2.
7. If the measuring cell has been replaced by a new one, download the corresponding SW: see Section 4.2, Chapter 7.

3.8 Replacing calibration drive or calibration weight



Opening the balance see Section 3.1

1. Remove cell shielding
2. Removing measuring cell see Section 3.6
3. Disconnect calibration drive cable.
4. Remove calibration drive.
5. The calibration weight must be retained:
   - Connect calibration drive to balance PCB and lower calibration weight using service software.
   - Remove calibration weight.
6. Place calibration weight in new drive:
   - Connect calibration drive to balance PCB and lower using service software.
   - Insert calibration weight with the flat surface **A** facing downward and raise using service software.

ATTENTION

The calibration weight must be at the top position when fitting the measuring cell, otherwise the cell will be damaged!

7. Screw calibration drive loosely in place in bottom housing.
8. Plug in calibration drive cable on balance PCB.
9. Fitting measuring cell see Section 3.7 (incl. positioning the calibration drive).
10. Closing the balance see Section 3.2.
11. Check standard calibration and execute if necessary (see Chapter 9).

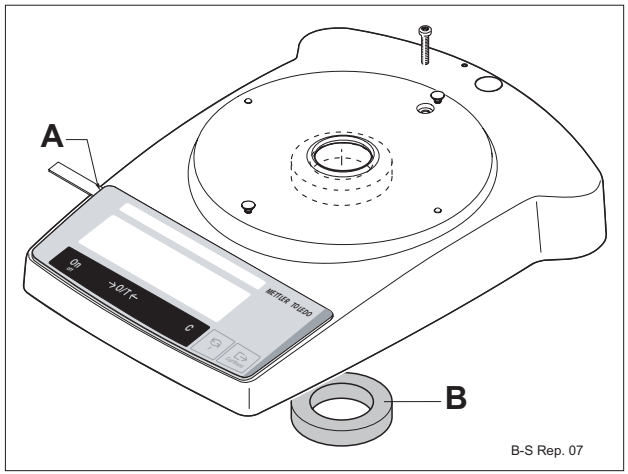
3.9 Replacing level

Opening the balance see Section 3.1

1. Remove level (**avoid blows to the instrument**, these could damage the measuring cell!).
2. Clean level seat thoroughly, removing all traces of grease and adhesive.
3. Place the test level from tool case on monobloc and level the balance. Remove the test level.
4. Fit new level:
   - Apply a thin layer of adhesive.
   - Place level and adjust it so that the air bubble is in the center.

Closing the balance see Section 3.2.

3.10 Replacing top housing

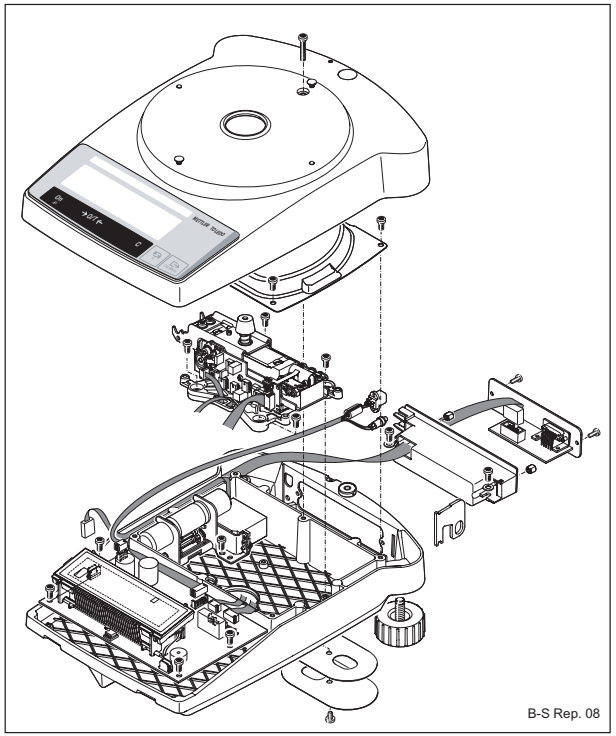


Opening the balance see Section 3.1

1. Affix the corresponding membrane keypad to the new upper housing (see Section 3.3).
2. Insert model plate from old balance in new membrane keypad.
   - slightly raise the opening for model plate **A** and insert it.
3. Analytical balances (xBxx5-x, xBxx4-x)
   - Affix self-adhesive seal ring **B** supplied with the housing around opening for cone.

Closing the balance see Section 3.2.

3.11 Replacing bottom housing



Opening the balance see Section 3.1

Replacing balance PCB see Section 3.12

Removing measuring cell see Section 3.6

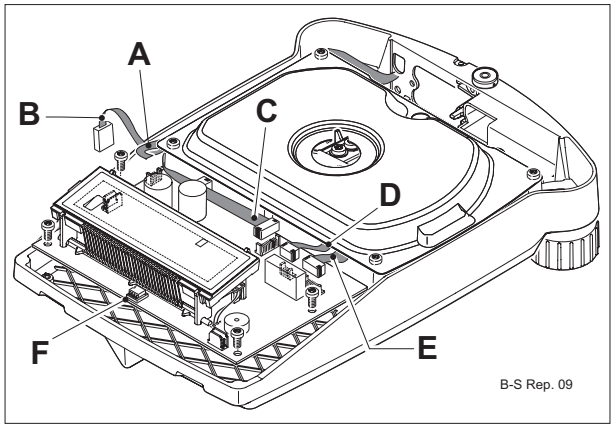
Replacing calibration drive or calibration weight see Section 3.8

Fitting RS232 interface and connection cable see Section 3.4

1. Remove lug for antitheft device.
2. Remove leveling feet.
3. Remove hanger cover.
4. Fit new bottom housing:
   - hanger cover
   - leveling feet (grease threads)
   - connection holder and blank plate or RS232 interface see Section 3.4
   - Balance PCB see Section 3.12
   - Calibration drive see Section 3.8
   - Measuring cell see Section 3.7

Closing the balance see Section 3.2.

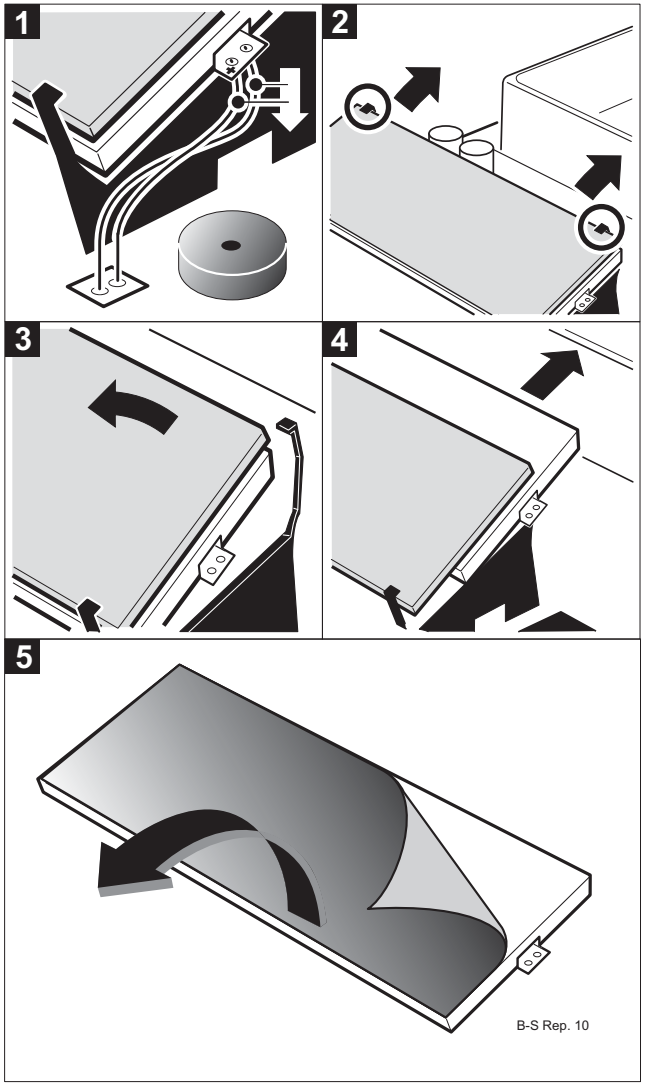
3.12 Replacing balance PCB



Opening the balance see Section 3.1

1. Disconnect cables for:
   - power **A**
   - calibration drive **B**
   - detector **E**
   - coil **D**
   - RS232 **C**
2. Remove screws and balance PCB.
3. Retain cell data EEPROM **F** for new balance PCB.
4. Fit and connect new PCB in reverse order.
5. Load TDNR (see Chapter 7).
6. Adapt the SW accordingly (see Section 4.2, Chapter 7).

3.13 Replacing backlighting



Opening the balance see Section 3.1

1. Unsolder cables.
2. Bend retaining tabs slightly to the rear.
3. Turn the display upward.
4. Remove backlighting unit (unsoldering cable).
5. Remove protective film from the new backlighting unit.
6. Fit the new backlighting unit.
7. Solder the cables as shown in Fig. **1** with correct polarity.

Closing the balance see Section 3.2.

4 Check/repair «MonoBloc» Weighing cell

ATTENTION

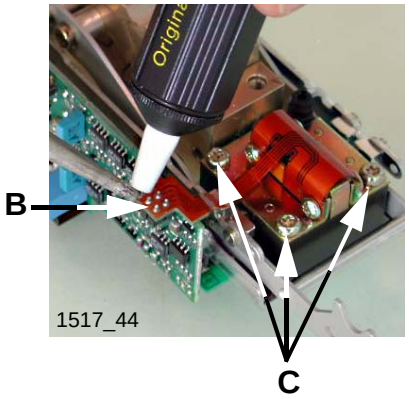
Electrostatically damageable components.

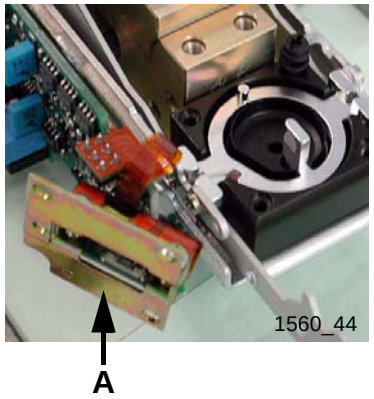
Always use antistatic kit when working on electronic components (see Section 1.1).

4.1 Dismantle «MonoBloc»

Spare Parts see Section 3.2, Chapter 3

4.1.1 Remove detector





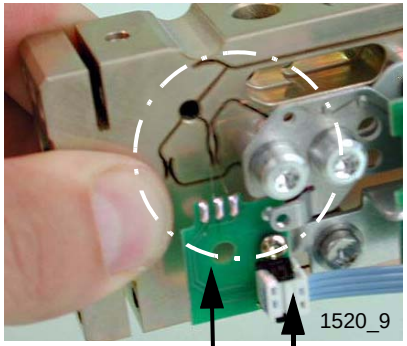
1. If the detector **A** needs to be replaced:
   - Unsolder flexprint **B**.
2. Slacken the fastening screws **C** of the detector.
3. Lift the detector **A** which is held by the magnetic field and fold it aside.

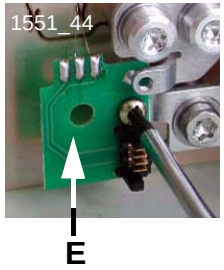
Install detector, see Section 4.2.2.

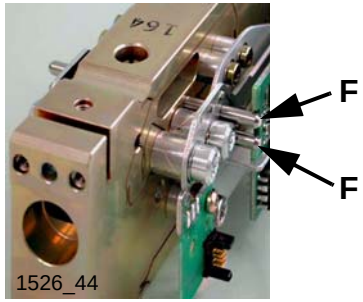
Note

If the detector is replaced, the height stop must be checked and possibly readjusted (see Section 5.1).

4.1.2 Remove lever



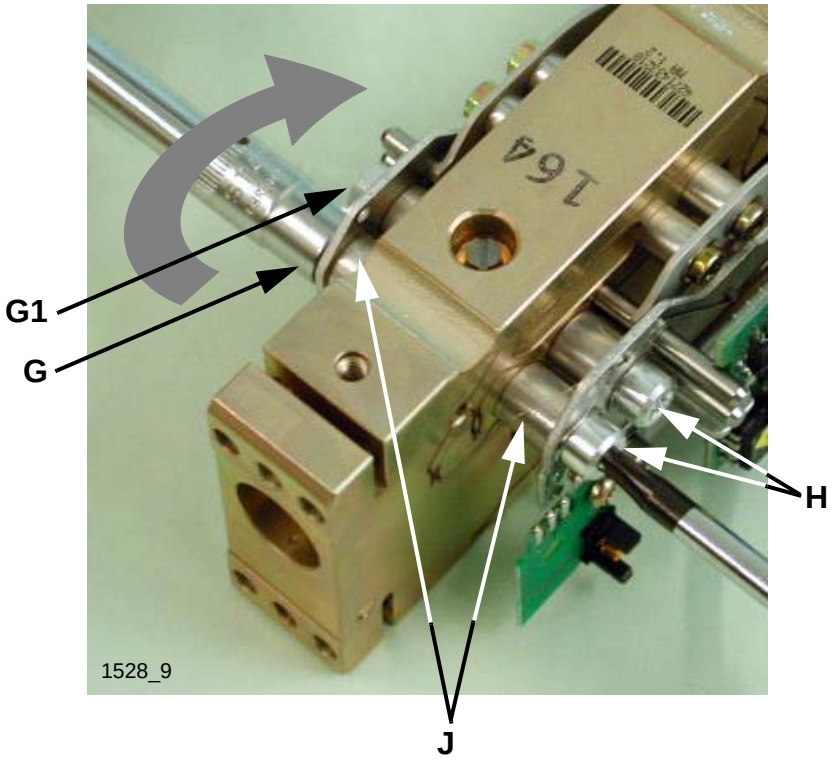




ATTENTION

*Only hold the «MonoBloc» by the back end. Do not damage the three coil wires **C** on the contact PCB.*

1. Pull out plug **D**.
2. Slacken the contact print **E** from the holder and screw it tightly onto the lever.
3. Insert 2 centering pins **F** from the gage set into the holes provided.

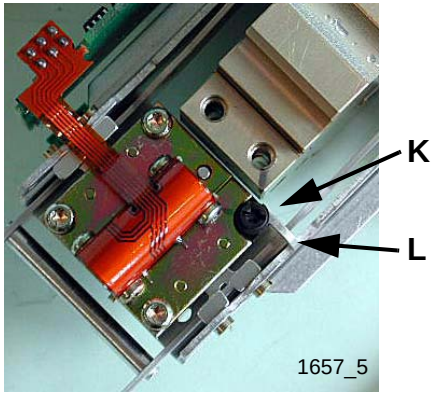


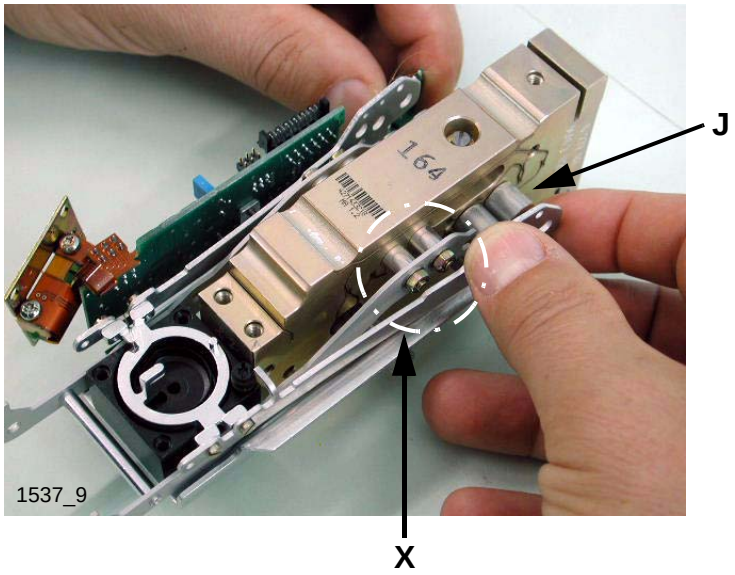
ATTENTION

Only load the lever in the direction of the arrow, so that the flexible bearing is not compressed!

4. Carefully slacken the nuts **G** in the direction of the arrow, holding the screw heads **H** only to stop them turning. Do not turn the screw heads. To release the nuts **G1**, push the centering pin slightly back.

5. Remove the screws.
Do not confuse the 4 aluminum lugs **J**! Mark them if necessary.





6. Mark the position of the height-adjusting screw **K** with a pencil. Turn the height-adjusting screw so that the lever **L** can be pulled out.
7. Slacken the detector and swivel to the side (see Section 4.1.1).
8. Pull out the centering pin.
9. Carefully pull out the lever and spread it if necessary so that it can minimal pass over the screws/nuts at **X**.

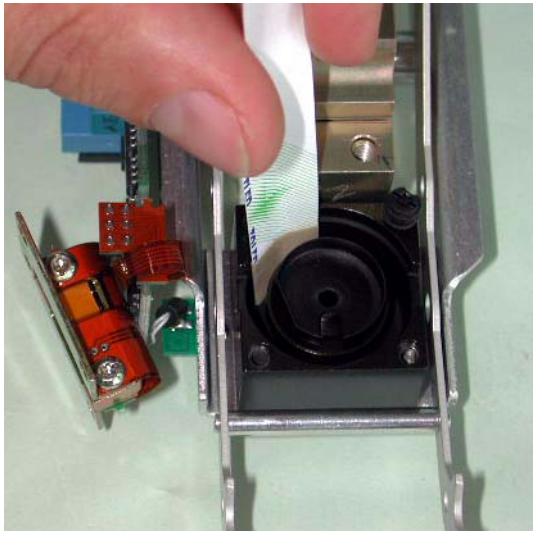
Note

Do not confuse the 4 aluminum lugs **J**! Mark them if necessary.

10. When replacing the lever, if any dead weight is screwed onto the old lever, transfer it to the new lever.

Install the lever, see Section 4.2.1.

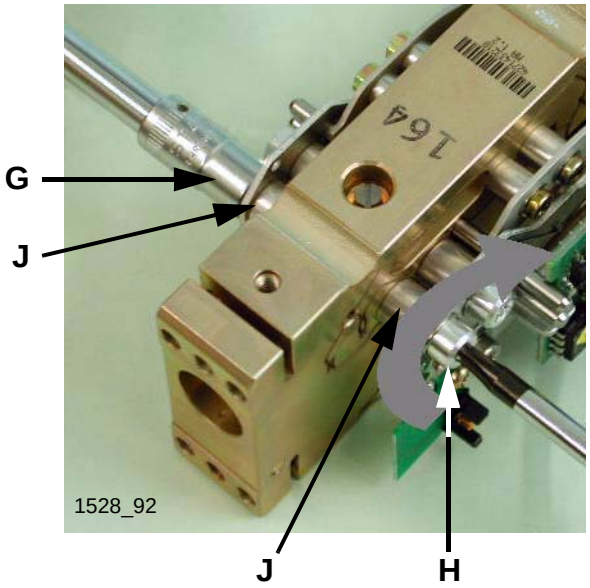
4.1.3 Clean the magnet recess



1. Affix double-sided adhesive tape to one end of a strip of card (e.g. part of a business card).
2. Clean the magnet recess.

4.2 Assemble the «MonoBloc»

4.2.1 Install the lever



ATTENTION

Only load the lever in the direction of the arrow, so that the flexible bearing is not compressed.

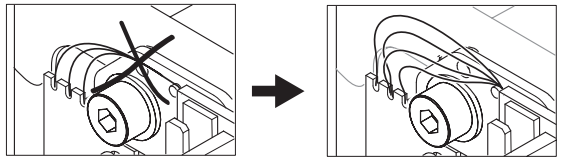
*Ensure correct positioning of the aluminum sleeves **J**.*

Insert the screws correctly (see photo at left).

1. Lay the lever in the specified position, spreading it if required.
2. Check that the aluminum lugs are correctly positioned.
3. Insert centering pins in the holes provided.
4. Carefully tighten the screws **H** in the direction of the arrow (tightening torque 1.8 Nm), holding the nuts **G** only to stop them turning.
   Do not turn the nuts!
5. Tighten the screws **H** alternately.

Note

Take care that the lever is centered in the magnet recess and does not make contact at the sides.



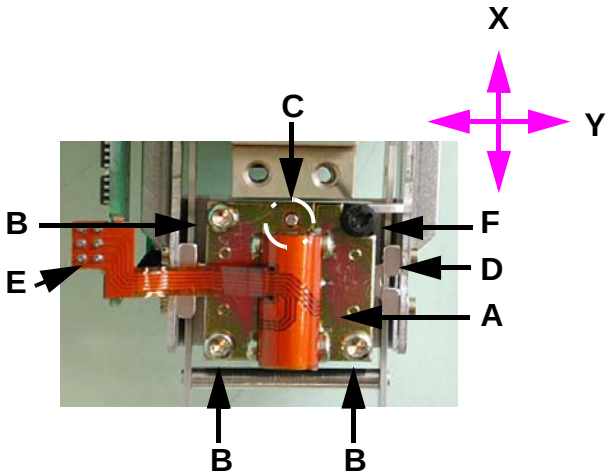
6. Separate the contact PCB from the lever and screw it tightly to the holder.
7. Fan out the coil wires (sketch).

Note

If the coil wires touch each other, hysteresis effects of several digits can occur.

8. Pull out the centering pins.

4.2.2 Install detector



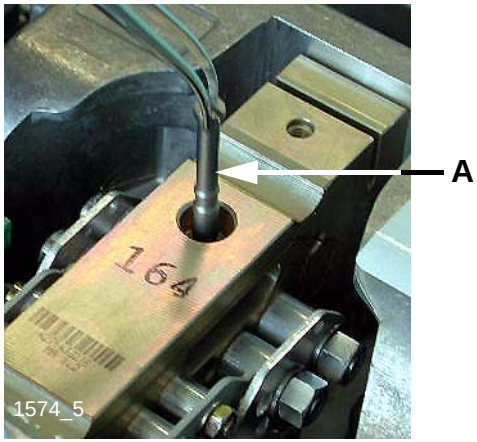
1. Place detector **A** in position. Screw in screws **B** but do not tighten yet.
2. Center detector on the side stops **C**.
   - Longitudinal direction **X**
     Move the detector in the longitudinal direction **X** until the side stop **C** is positioned in the center of the drilled hole.
   - Lateral direction **Y**
     Carefully move the lever **D** to the right and left stops. This will center the detector in the lateral direction **Y**.
3. Tighten the screws **B** alternately by equal amounts.

Check

Move the lever within the lever stop **F**. The side stop must not touch the detector.

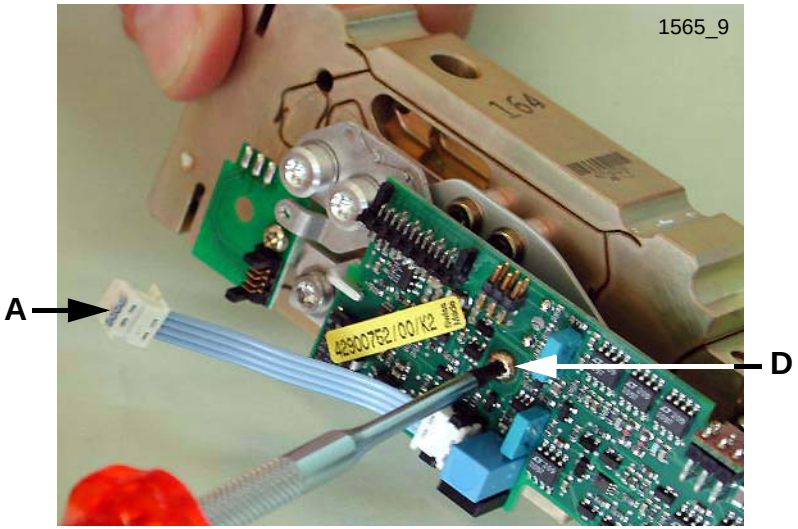
4. If necessary, solder the flexprint **E** to the cell PCB.
5. Adjusting vertical stop (see Section 5.1).

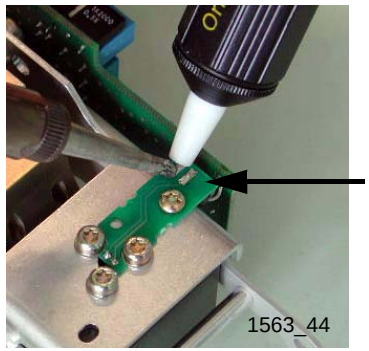
4.3 Clean the drilled hole in the shock protector

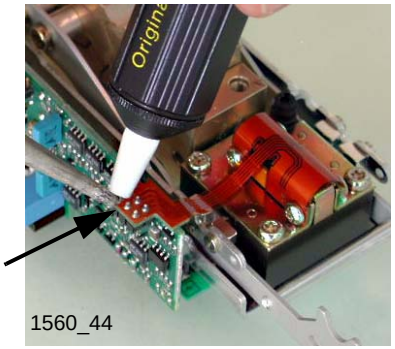


1. With a screwdriver slacken the shock protector **A** approx. ¼ turn counterclockwise.
2. Pull the shock protector up and out.
3. Check that the drilled hole is free of dirt.
   - Clean.
4. Insert the shock protector.
   - The machined edges on the shock protector must point away from the magnet.
   - Insert the shock protector as far as the stop.
5. With a screwdriver tighten the shock protector.

4.4 Replace the cell PCB







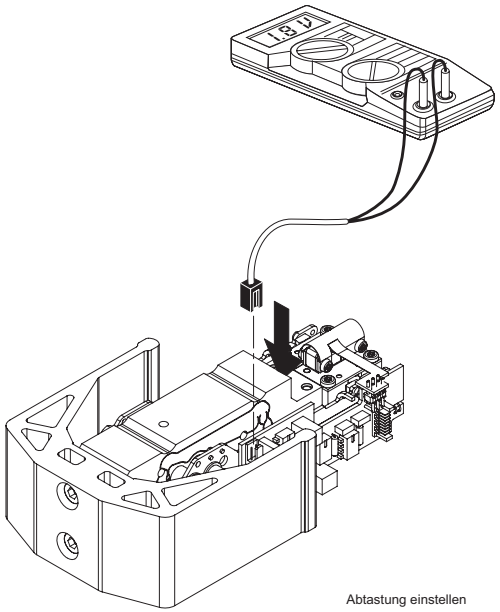
1. Unplug cable **A**.
2. Unsolder connection **B** to the temperature sensor.
3. Unsolder flexprint **C**.
4. Remove screw **D** and replace cell PCB.
5. Load new cell data (see Chapter 7).

Note

First turn the self-tapping screw **D** counterclockwise until it engages in the first thread. Only then tighten it clockwise.

5 Adjust the «MonoBloc» Weighing cell

5.1 Vertical stop



Note

If the detector is changed, it may be necessary to readjust the vertical stop.

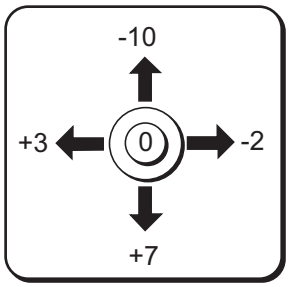
1. Preparation
- The measuring cell remains in the balance housing.
- Switch off balance.
- The ribbon cable of the detector PCB remains plugged into the cell PCB. The coil cable must be unplugged.
- Plug detector cable into the cell PCB and use the service cable to connect it to the voltmeter (DC range).

2. Adjusting vertical stop
- Switch on balance.
- Press coil lever down (the lever is at the bottom of the vertical stop).
- Note voltage value.
- Lift coil lever until it touches the height stop.
- Note voltage value.

If the two voltage values either side of zero are not of the same magnitude but, e.g. +2 V and -1,6 V, the vertical stop must be adjusted until the values are symmetrical.
Voltage range: ± 1,8 - 3,5 V
Asymmetry: max. ± 10% of Voltage range

5.2 Cornerload

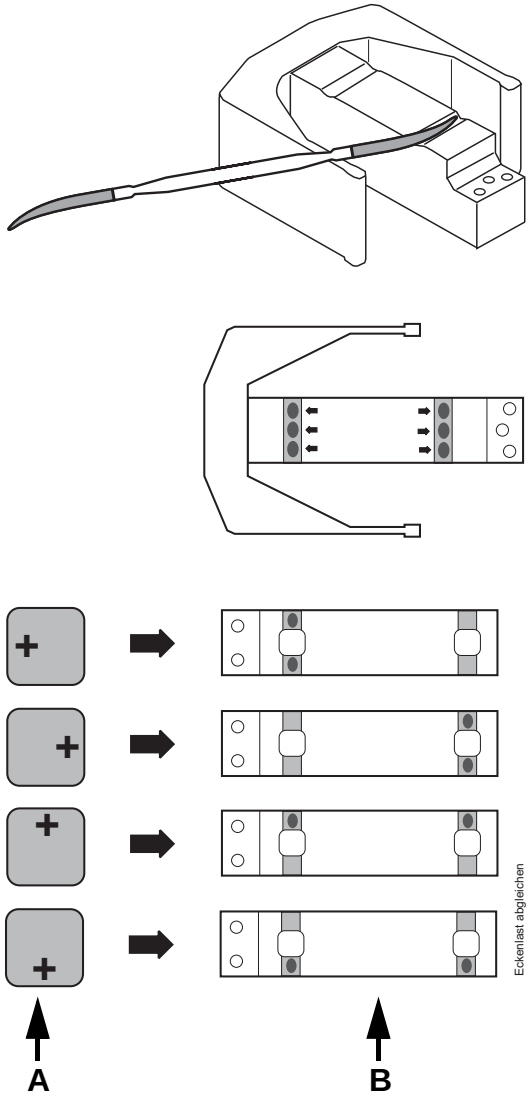
5.2.1 Checking the cornerload



Eckenlast kontrollieren

1. Place test weight in the middle of the weighing pan and tare.
2. Move test weigh to the weighing pan edge and note down/print out display values witch differ from zero with sign (see examples).
3. Compare display values with cornerload tolerances (see Chapter 9)

5.2.2 Adjusting the cornerload



The «MonoBloc» measuring cell is not adjusted by means of the cornerload screws, but by removing material from its top.

This is achieved by a few strokes with a round needle file exerting slight pressure.

ATTENTION

Do not file right at the outside at the flexible bearing positions.

On completion of the adjustments, clean filing sites by removing swarf with adhesive tape.

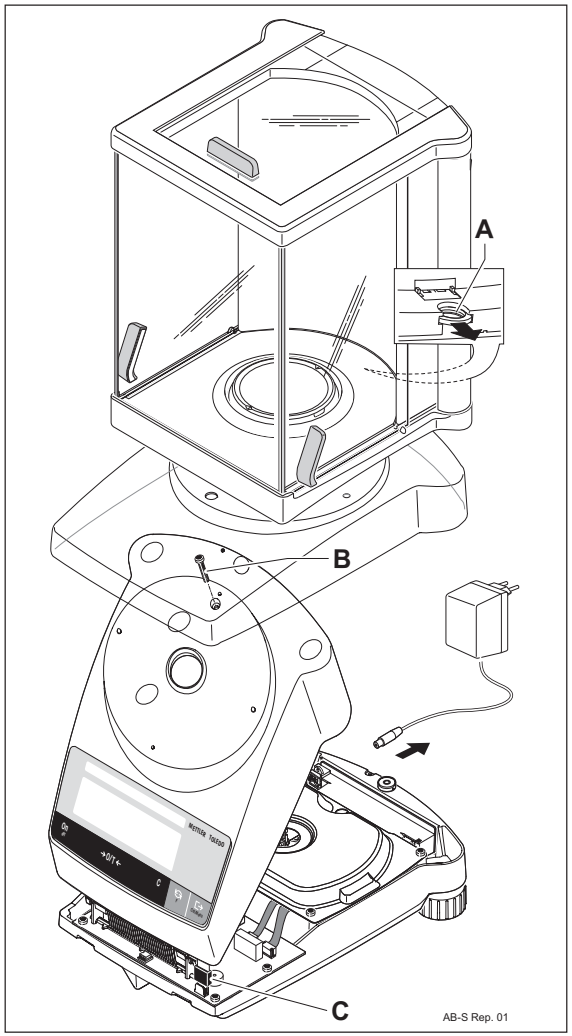
Filing must be performed at one or two of the marked positions as described in the below table.

Determining the filing position on the corner-load indicator.

- Place the test weight on the weighing pan **A** so that the balance displays a positive value.
- Determine the corresponding filing position **B** by reference to the table at left.

6 Removing/installing components on AB, PB, JB balances with conv. Cell

6.1 Opening the balance



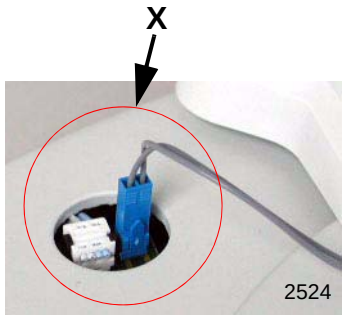
ATTENTION

Hazard from electric current.

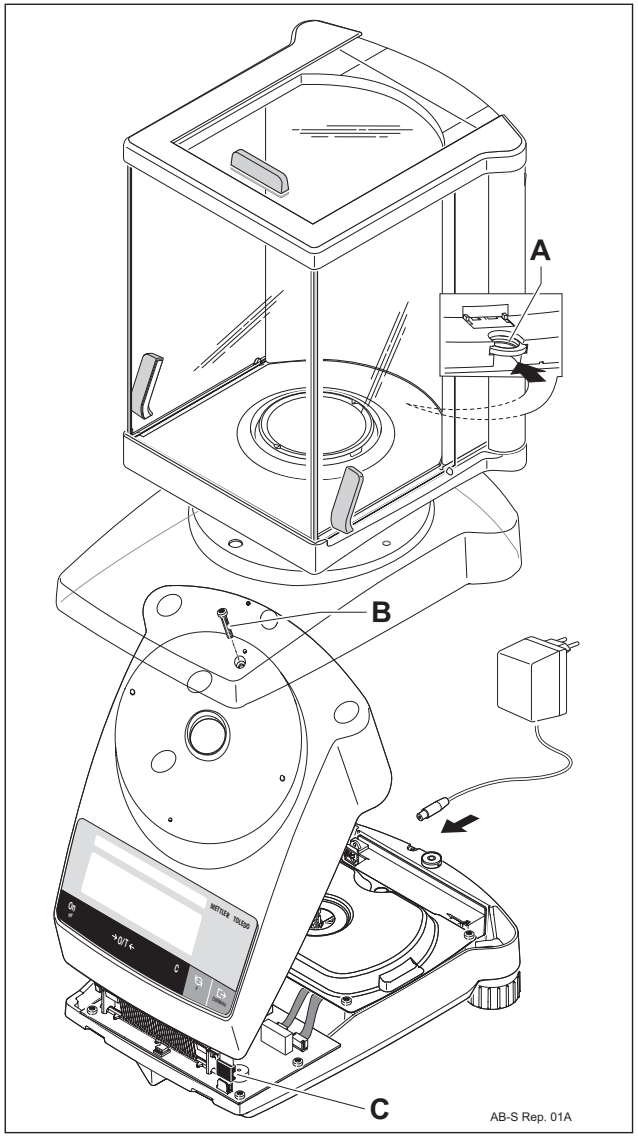
Unplug power supply cable before starting work on scale or Terminal.

1. Unplug the power cable.
2. Remove weighing pan, pan holder and retaining ring, or unlatch **A** draft shield and remove.
   In the case of ABxx5 balances, disconnect stabilizer cable **X**.
3. Remove protective cover.
4. Remove screw **B**.
5. Raise top housing at rear at an angle of about 45° and at the front disconnect the cable **C** connecting the membrane key-pad to the balance PCB.
6. Remove top housing.

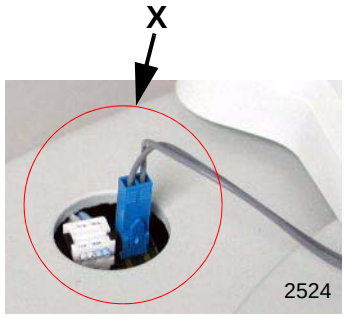
Closing the balance see Section 6.2



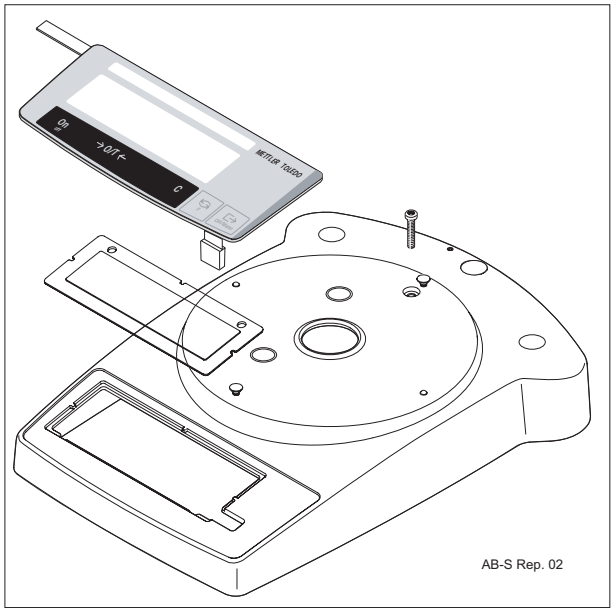
6.2 Closing the balance

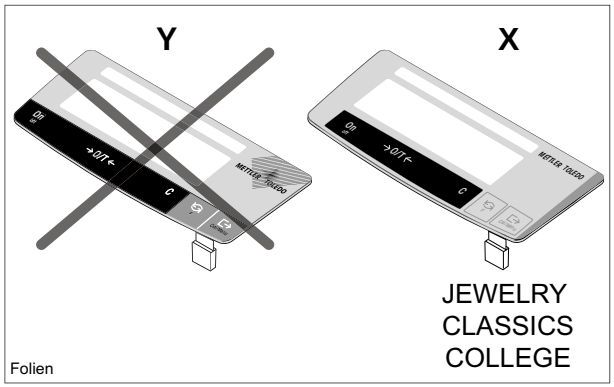


1. Fit top housing and connect the cable **C** for the membrane keypad.
2. Raise top housing at rear at an angle of about 45°, engage with bottom housing at front and then lower into place at the rear.
3. Insert screw **B**.
4. Fit protective cover.
5. Fit draft shield or weighing pan, pan holder and retaining ring. Latch the draft shield **A**.
   In the case of ABxx5 balances, disconnect stabilizer cable **X**.



6.3 Replacing membrane keypad





Opening the balance see Section 6.1

1. Push out membrane keypad from top housing. Retain the original model plate and display glass (with drawing the model plate at the left).
2. Clean top housing and display glass to remove all traces of grease and adhesive.
3. Place the model plate in the new membrane keypad.
4. Place the display glass loosely in the top housing so that the notches fit snugly over the nibs.

Note

Avoid leaving fingerprints on the glass and window of the membrane keypad.

Replacement membrane keypads have a modified design **X**. Available membrane keypads are:

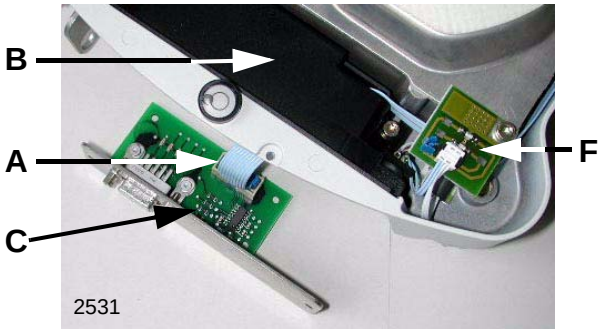
- JEWELRY membrane keypad for balance type JB
- CLASSIC membrane keypad for balance types AB and PB
- COLLEGE membrane keypad for balance types PB

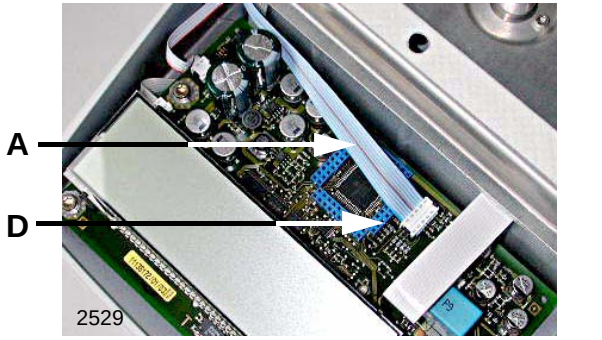
However, the functionality is identical to the membrane keypad being replaced **Y**.

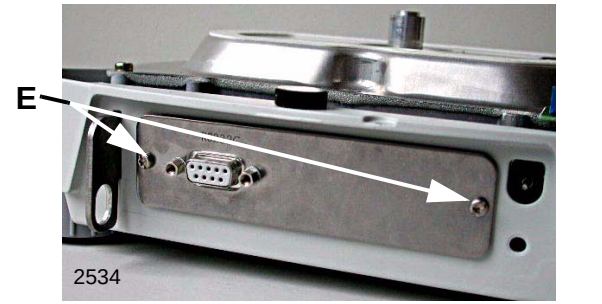
5. Carefully use adhesive to bond the membrane keypad without trapping any air.

Closing the balance see Section 6.2.

6.4 Replacing/installing the RS232 interface and connecting cable





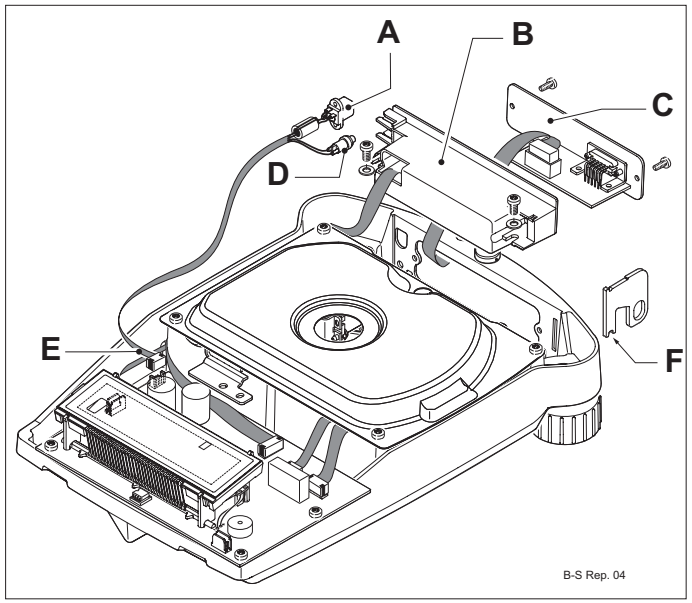


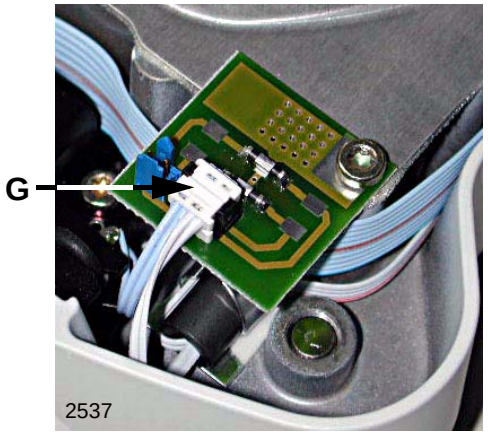
Opening the balance see Section 6.1

1. Fitting RS232 interface and connection cable
2. Fit RS232 connection cable:
   - Pass ribbon cable **A** through opening in connection holder **B**.
   - Plug in connectors on interface **C** and balance PCB **D**.
   - **On ABxx5-S balances:** Slacken stabilizer print **F** and pass ribbon cable under print.
3. Secure interface with screws **E**.

Closing the balance see Section 6.2.

6.5 Replacing power cable



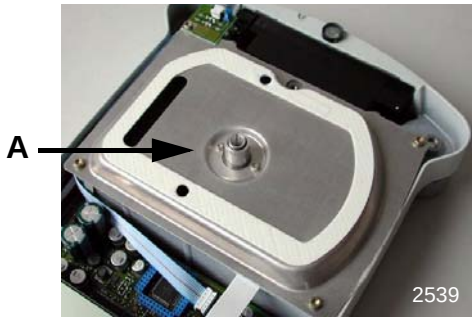


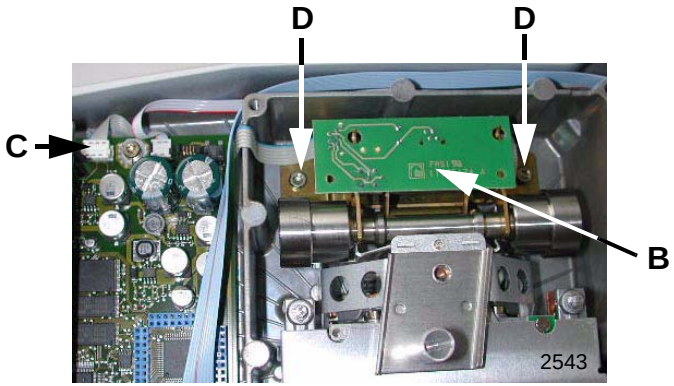
Opening the balance see Section 6.1

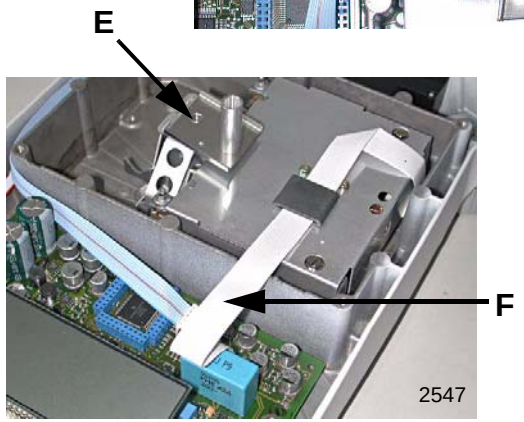
1. Remove RS232 interface or blank plate **C**.
2. Unplug power cable **E** from balance- and from stabilizer PCB.
3. Remove connection holder **B**.
4. Remove power socket **A** and certification switch **D** from connection holder.
   On ABxx5-S balances: Unplug plug **G** from stabilizer print.
5. Fit new power cable:
   - Insert cable for certification switch into slot and press switch fully home.
   - Insert power socket at the side with the round part underneath.
6. Fit connection holder **B** into balance bottom housing:
   - Place antitheft lug in bottom housing (notch **F** over rib of housing).
   - Insert connection holder from above and screw down securely with the power socket **A** flush with the bottom housing.
7. Fit blank plate or RS232 interface (see Section 6.4).
8. Plug in power cable E to balance- and to stabilizer PCB.
   On ABxx5-S balances: Insert plug **G** into stabilizer print.

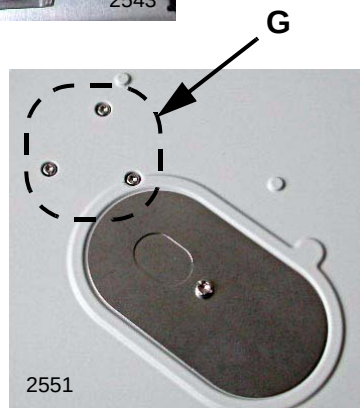
Closing the balance see Section 6.2.

6.6 Removing measuring cell









Opening the balance see Section 6.1

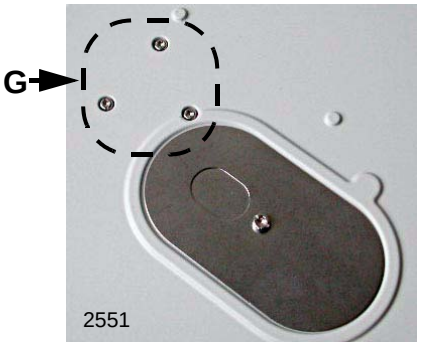
ATTENTION

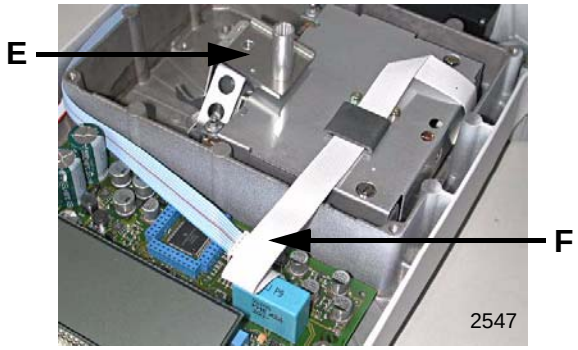
Hazard from electric current.

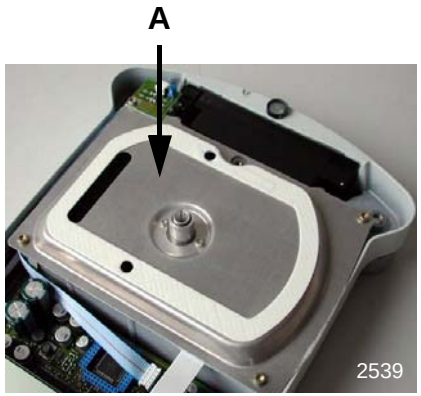
Unplug power supply cable before starting work on scale or Terminal.

1. Remove cell shielding **A**.
2. Disassemble calibration drive **B**.
   - Disconnect calibration drive connection cable **C** from PCB balance.
   - Unscrew two calibration drive screws **D**. Hold calibration drive in order to prevent it from tipping
   - Carefully remove calibration drive.
3. Remove arm **E**.
4. Disconnect PCB balance cell's connection cable **F** from PCB balance.
5. Hold balance upside-down and remove the 3 cell screws **G**.
6. Carefully turn the balance right side up and place it on the table, taking care to prevent the cell falling out.
7. Lift cell out.

6.7 Fitting measuring cell





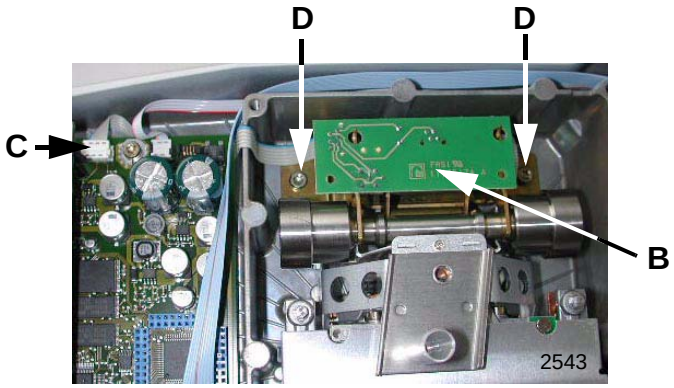


ATTENTION

Electrostatically damageable components.

Always use antistatic kit when working on electronic components (see Section 1.1).

1. Place cell in balance housing.
2. Carefully turn the balance housing upside-down and hold in the hand. Take care to ensure that the cell does not fall out.
3. Screw in 3 screws **G**, do not tighten.
4. Position cell.
   - Fit arm **E**
   - Fit cell cover **A**
   - Move the cell on the centre fastening screw until the conical sleeve is centred in the cell cover.
5. Remove cell cover **A**.
6. Plug cell cable **F** into PCB balance.



7. Install calibration drive **B** in housing base and screw tight **D**.

ATTENTION

Do not touch the weight with the fingers, if necessary clean it.

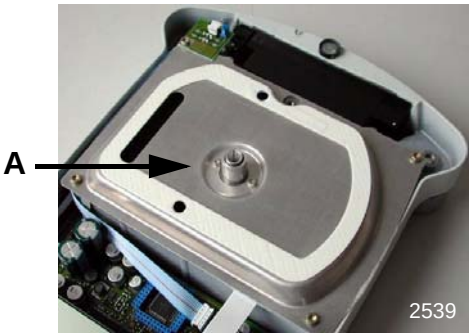
Do not allow the weight to fall onto the arm as this could damage the cell.

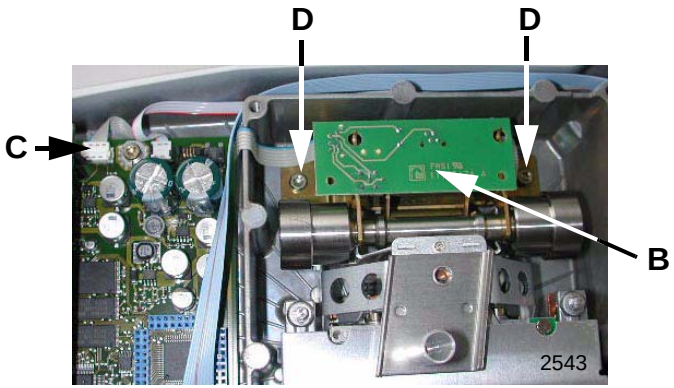
8. Connect calibration drive connection cable **C** from PCB balance.
9. Connect balance to LARS and switch on service mode (see Chapter 7).
10. Lower motor with LARS and position calibration drive in such a way that the weight is placed on the hanger cover without lateral movement.
11. Fit cell cover.

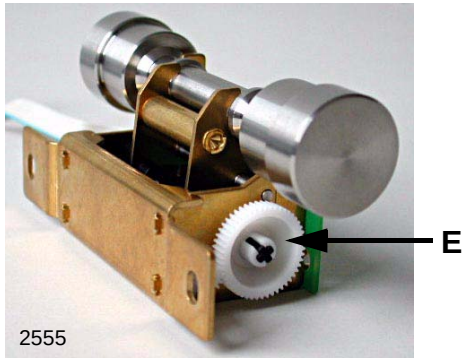
Note
Do not pinch the cable.

12. If the measuring cell has been replaced by a new one, download the corresponding SW: see Section 4.2, Chapter 7.

6.8 Replacing calibration drive or calibration weight







Opening the balance see Section 6.1

1. Remove cell shielding **A**.
2. Disassemble calibration drive **B**.
   - Disconnect calibration drive connection cable **C** from PCB balance.
   - Unscrew two calibration drive screws **D**. Hold calibration drive in order to prevent it from tipping
   - Carefully remove calibration drive.
3. Rotate the gear wheel **E** until the weight can be removed.
4. Install the weight in the new motor and turn the gear wheel until the calibration drive has reached the top position.

ATTENTION

Only install the calibration drive in the lower housing with the weight lifted up (top position). Otherwise, the cell could be damaged.

5. Install calibration drive in housing base and screw **D** tight.

ATTENTION

Do not touch the weight with the fingers, if necessary clean it.
Do not allow the weight to fall onto the arm as this could damage the cell.

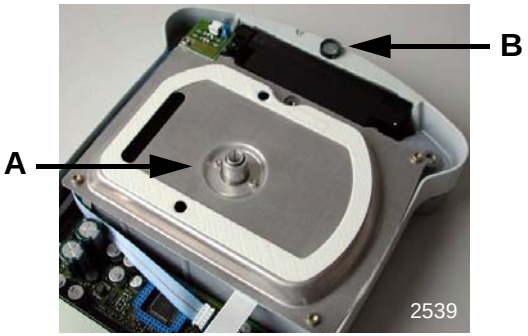
6. Plug calibration drive cable **C** into the cell PCB.

7. Connect balance to LARS and switch on service mode (see Chapter 7).
8. Lower motor with LARS and position calibration drive in such a way that the weight is placed on the hanger cover without lateral movement.
9. Fit cell cover.

Note

Do not pinch the cable.

6.9 Replacing spirit level

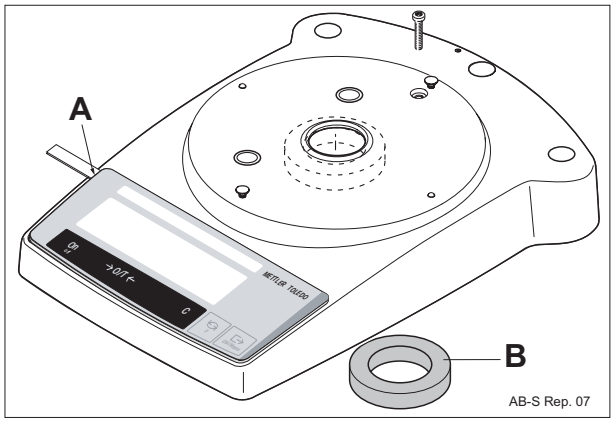


Opening the balance see Section 6.1

1. Remove cell shielding **A**.
2. Remove level **B** (avoid blows to the instrument, these could damage the measuring cell!).
3. Clean level seat thoroughly, removing all traces of grease and adhesive.
4. Place the test level on monobloc and level the balance. Remove the test level.
5. Fit new level:
   - Apply a thin layer of adhesive.
   - Place level and adjust it so that the air bubble is in the center.

Closing the balance see Section 6.2.

6.10 Replacing top housing

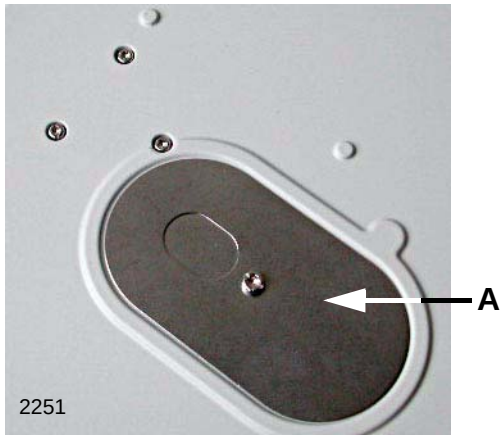


Opening the balance see Section 6.1

1. Affix the corresponding membrane keypad to the new upper housing (see Section 6.3).
2. Insert model plate from old balance in new membrane keypad.
   - slightly raise the opening for model plate **A** and insert it.
3. Analytical balances (xBxx5-x, xBxx4-x)
   - Affix self-adhesive seal ring **B** supplied with the housing around opening for cone.

Closing the balance see Section 6.2.

6.11 Replacing bottom housing



Opening the balance see Section 6.1

Replacing balance PCB see Section 6.12

Removing measuring cell see Section 6.6

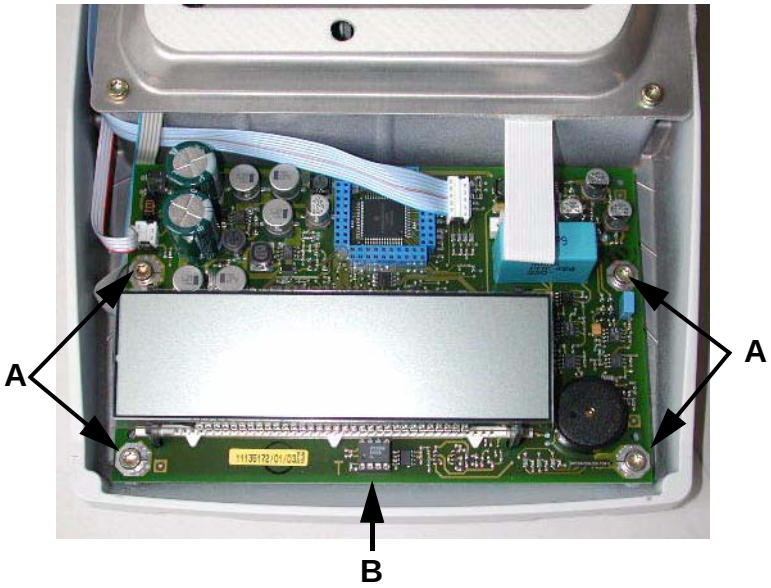
Replacing calibration drive or calibration weight see Section 6.8

Replacing/installing the RS232 interface and connecting cable see Section 6.4

1. Remove lug for antitheft device.
2. Remove leveling feet.
3. Remove hanger cover **A**.
4. Fit new bottom housing:
   - hanger cover
   - leveling feet (grease threads)
   - connection holder and blank plate or RS232 interface see Section 6.4
   - Balance PCB see Section 6.12
   - Calibration drive see Section 6.8
   - Measuring cell see Section 6.7

Closing the balance see Section 6.2.

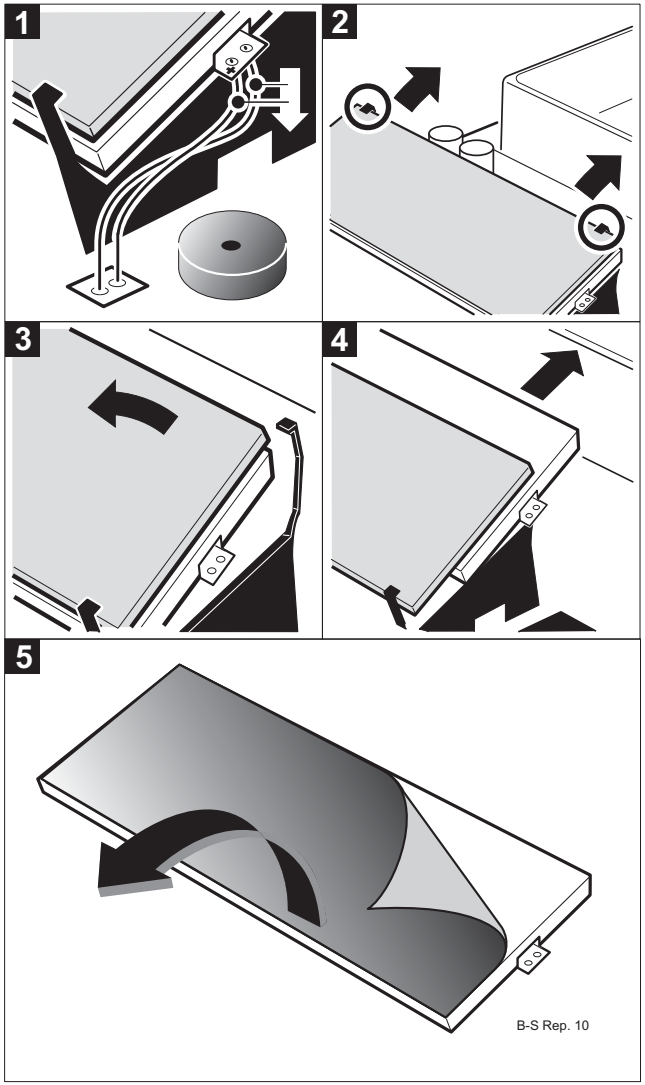
6.12 Replacing balance PCB



Opening the balance see Section 6.1

1. Disconnect all cables for:
2. Remove screws **A** and balance PCB.
3. Retain cell data EEPROM **B** for new balance PCB.
4. Fit and connect new PCB in reverse order.
5. Load TDNR see Chapter 7.
6. Adapt the SW accordingly (see Section 4.2, Chapter 7).

6.13 Replacing backlighting



Opening the balance see Section 6.1

1. Unsolder cables.
2. Bend retaining tabs slightly to the rear.
3. Turn the display upward.
4. Remove backlighting unit (unsoldering cable).
5. Remove protective film from the new backlighting unit.
6. Fit the new backlighting unit.
7. Solder the cables as shown in Fig. **1** with correct polarity.

Closing the balance see Section 6.2.

7 Check/Repair «conventional» Weighing Cell

ATTENTION

Electrostatically damageable components.

Always use antistatic kit when working on electronic components (see Section 1.1).

7.1 Special instructions for safety and handling

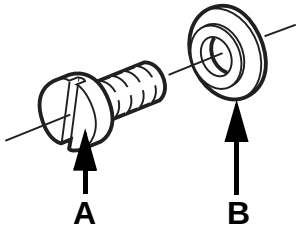
To avoid (further) damage to the weighing cell during inspection and repair, the following instructions must always be observed.

Reminders of these instructions are given at relevant points in this document.

7.1.1 Correctly tighten screw with locking ring

ATTENTION

Guides, hanger bearing, and coupling are fastened with special screws. The installation instructions which follow below must always be observed.

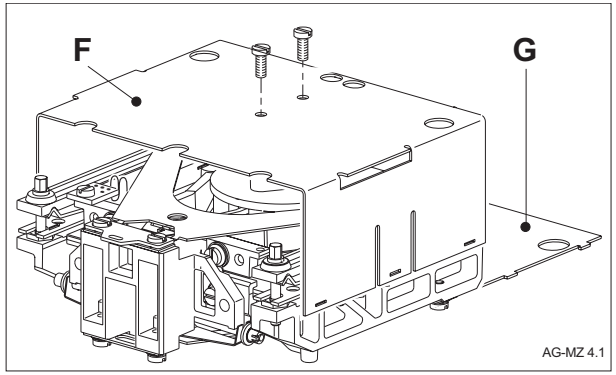


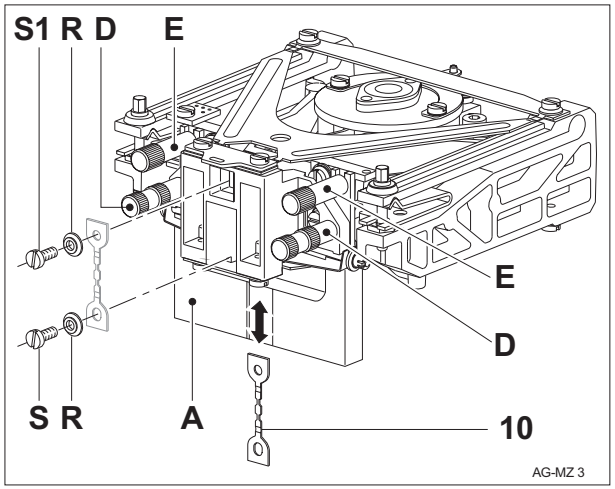
Guides, Hanger bearing and Coupling

Fasten with special screw **A** and locking ring **B**.

- Using a corresponding screwdriver, screw in the screw until resistance becomes noticeable.
- Unscrew the screw by 1/8 of a turn and tighten the screw by turning lightly.
- If a torque screwdriver is available, set the torque to 60 Ncm.

7.2 Removing link





7.2.1 Removing

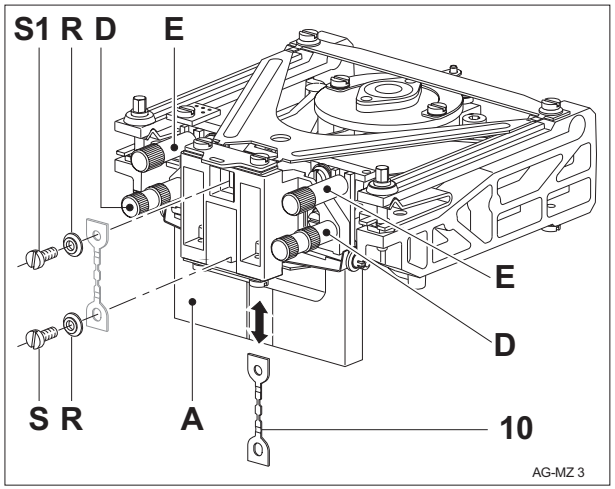
Removing measuring cell see Section 6.6

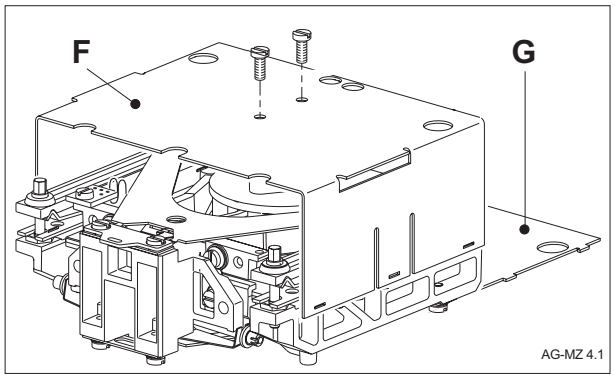
1. Place measuring cell on top screening plate **F**. Prize open middle clip on the side walls and disengage the bottom screening plate **G** towards the rear.
2. Mounting hanger gauge **A**
   - Insert hanger gauge from the board side between frame and hanger as far as it will go (marked side pointing up) and secure with the 4 knurled screws (service gauge set).

Note

First screw the 2 long knurled screws **D** through the hanger into the frame. Screw in the 2 short knurled screws **E** at the top at the lever.

3. Unscrew bottom link screw **S**.
4. Unscrew top link screw **S1**.
5. Remove two link screws and locking rings **R**.
   Hold link **(10)** firmly.
6. Carefully take out link downward.





7.2.2 Installing

1. Carefully insert link **10**.
   Round hole at lever.
2. Screw link onto lever loosely with locking ring **R** and link screw **S**.

ATTENTION

Long hole must be centred on all sides at the hanger.

3. Screw link loosely to hanger with locking ring **R** and link screw **S1**.
4. Tighten both link screws.

Note

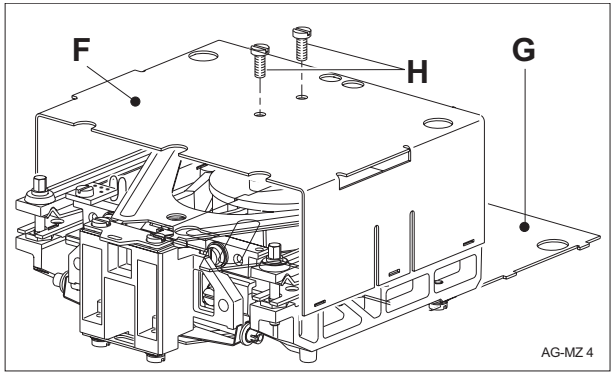
Correctly tighten screw with locking ring see Section 7.1.1.

5. Removing hanger gauge **A**
   - Remove 4 knurled screws **D**+**E** and carefully detach hanger gauge.
6. Place measuring cell on the top screening plate **F**. Insert bottom screening plate **G** with 6 lateral lugs in the slot of the side walls and engage at the front (beads outward).

ATTENTION

Do not damage guides!

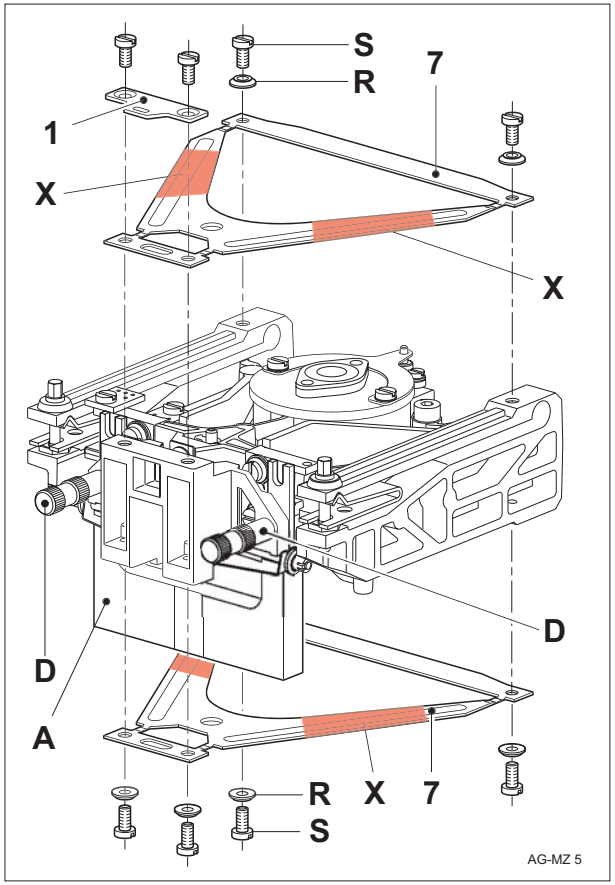
7.3 Removing top and bottom guides



7.3.1 Removing

Removing measuring cell see Section 6.6

1. Place measuring cell on top screening plate **F**. Prize open middle clip on the side walls and disengage the bottom screening plate **G** towards the rear.
2. Turn measuring cell, unscrew the 2 screws **H** on the top screening plate and remove plate.



3. Mounting hanger gauge **A**
   - Insert hanger gauge from the board side between frame and hanger as far as it will go (marked side pointing up) and secure with the 2 long knurled screws **D** (service gauge set).

Note

Screw only the 2 long knurled screws **D** through the hanger into the frame.

4. Unscrew the 4 guide screws **S** at the top guide **7** and remove together with the locking rings **R**.
5. Remove guide piece **1**.
6. Remove guide **7**.

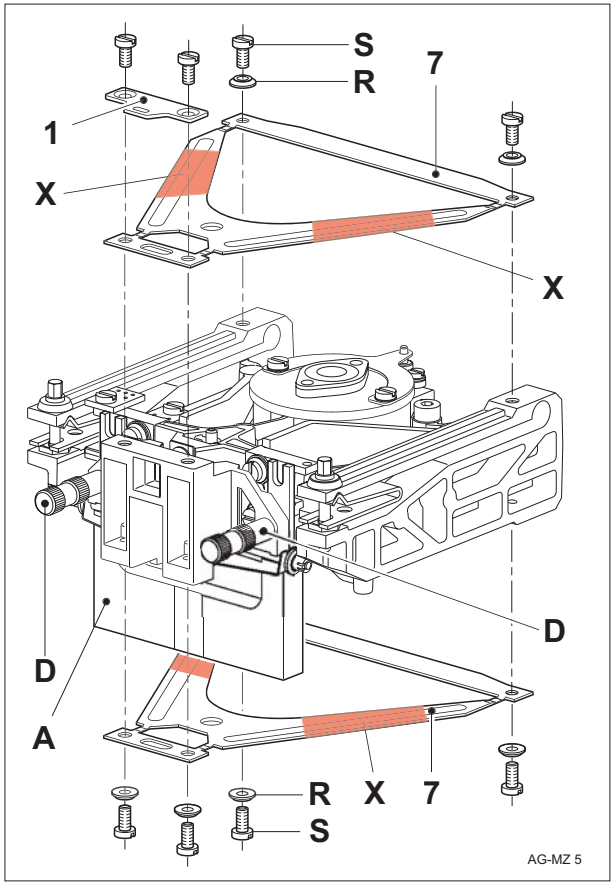
Warning

*Always grasp the guide only at the points marked **X** in the illustration!*

7. Turn cell over (board side), unscrew the 4 guide screws **S** and remove together with the locking rings **R**.
8. Remove guide **7**.

Warning

*Always grasp the guide only at the points marked **X** in the illustration!*



7.3.2 Installing

1. Place bottom guide in position (bead outward).

Warning

Always grasp the guide only at the points marked **X** *in the illustration!*

2. Insert a guide screw **S** with locking ring **R** loosely in the frame.

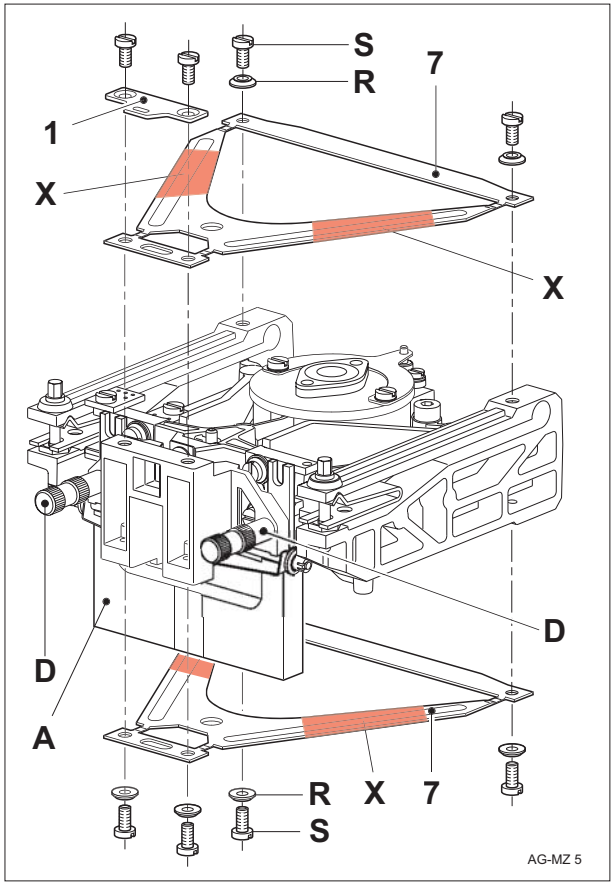
3. Align the other 3 guide holes with the threaded holes.
- Front edge of guide must be flush with the hanger.
- Loosely tighten guide screw.

4. Insert the remaining 3 guide screws with locking rings and tighten loosely.

5. To avoid strains in the guide, loosely tighten all 4 screws again and then tighten firmly.

Note

Correctly tighten screw with locking ring see Section 7.1.1.



6. Careful turn measuring cell over.
7. Place top guide in position (bead outward).
8. Insert a guide screw **S** with locking ring **R** loosely in the frame.

Warning

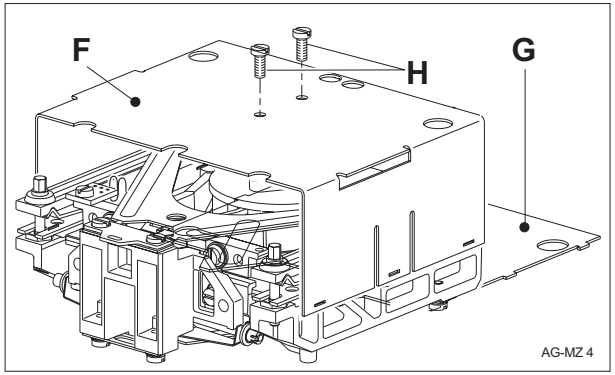
Always grasp the guide only at the points marked **X** *in the illustration!*

9. Align the other 3 guide holes with the threaded holes.
   - Front edge of guide must be flush with the hanger.
   - Loosely tighten screw.
10. Lay guide piece **1** in place.
    - Camber must lie on the guide.
11. Align guide piece with hanger, insert two guide screws **S** without locking rings and loosely tighten.
12. Insert last guide screw with locking ring and loosely tighten.

Note

Correctly tighten screw with locking ring see Section 7.1.1.

13. Removing hanger gauge
    - Unscrew the long knurled screws **D** and carefully pull out hanger gauge **A**.
    - Check that the stop bolt at the lever is centred in the engagement hole of the stop plate **K***, if not correct, centring gauge **C*** must be inserted.
      *see Section 7.4.1, Pos.5



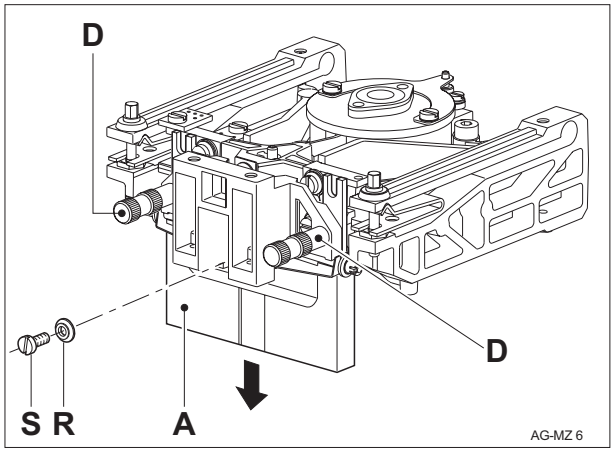
14. Place measuring cell on the 3 supports, align top screening plate **F** with cell and screw on.
Screening plate **F** must not touch the frame.

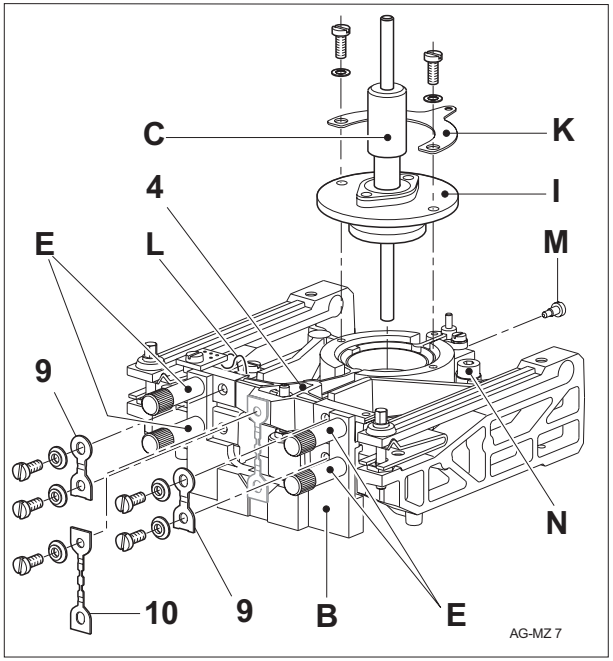
15. Place measuring cell on top screening plate. Insert bottom screening plate **G** (bead outward) with the 6 lateral lugs in the slot of the side walls and engage at the front.

ATTENTION

Do not damage guides!

7.4 Removing lever





7.4.1 Removing

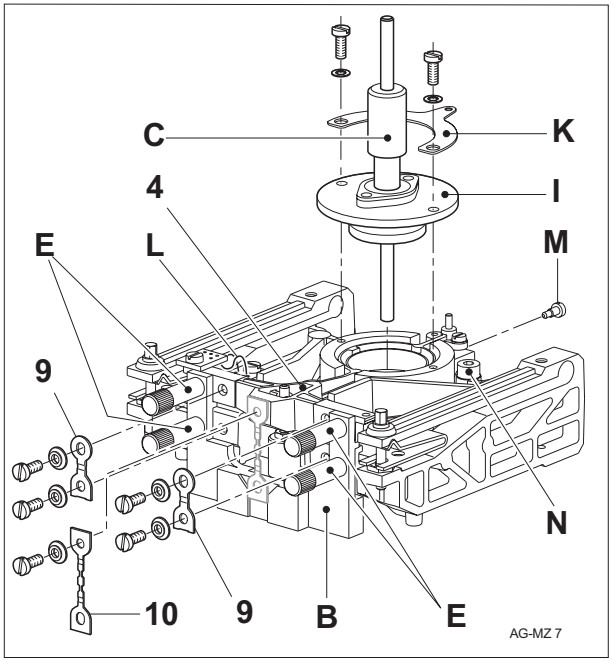
Removing top and bottom guides see Section 7.3

1. Remove link screw **S** with locking ring **R** only at hanger.
2. Unscrew both knurled screws **D**.

ATTENTION

To protect the link, the gauge must be held in its original position when unscrewing.

3. Carefully withdraw hanger gauge **A** together with the hanger (link remains on lever) «on board side».
4. Very carefully insert lever gauge **B** under the link **10** as far as it will go and lay on frame.
   - Secure lever gauge with the 4 short knurled screws **E**.
   - Link **10** lies in the slot of the lever gauge.
   - The protruding lugs on the lever gauge support the lever.
5. Insert centring gauge **C** from above in the magnetic circuit as far as it will go.
   - Push in steel pin up to the stop.
   - Push in brass guide up to the stop.
6. Hold magnet cover **I** firmly (magnet cover is repelled strongly by the magnet system) and unscrew stop plate **K**.
7. Lift off magnet cover **I** together with the centring gauge **C**.
8. Unsolder contact strips **I** and remove.



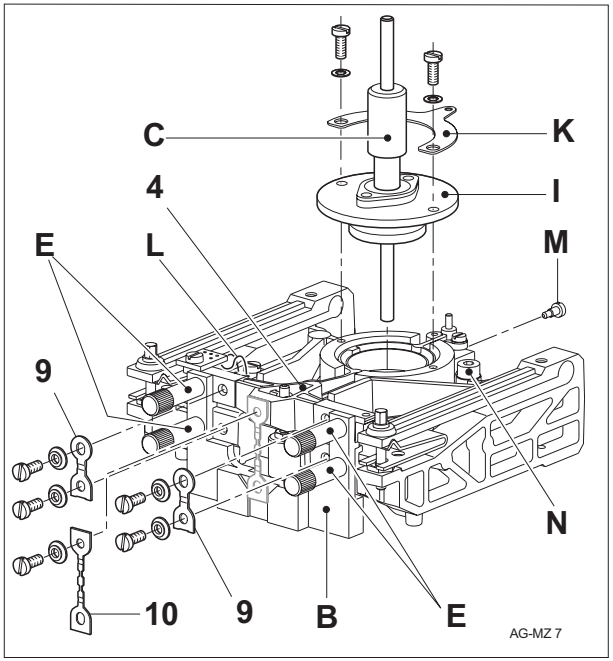
9. Remove stop screw **M** at rear on detector housing.

10. Remove pillow-block bearings **9**.

11. Remove link **10**.

12. Remove 2 knurled screws **E** on lever **4**.
- Gauge remains fastened to frame.

13. Lift off lever **4**.



7.4.2 Installing

1. Clean lever and magnet.
2. Insert lever **4**.
   - Lever lies on the lugs of the lever gauge.
3. Insert stop screw **M** at detector housing.
4. Screw lever with knurled screws **E** to the lever gauge **B** at top.
   - Coil must be centred in the pole shoe of the magnet.
5. Mounting pillow-block bearings **9** at the lever **4**:
   - Place flat side of the pillow-block bearings on gauge so that the bearings align parallel and screw on at lever side.
   - Pillow-block bearings have lateral play with the lever gauge.

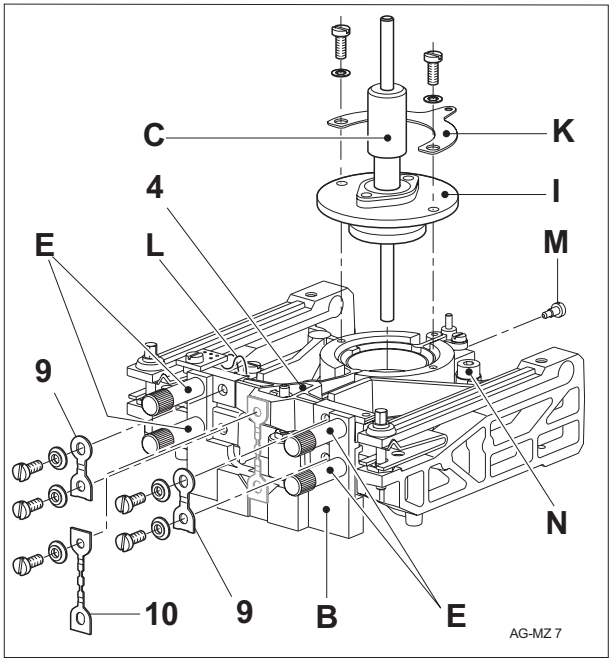
Note

Correctly tighten screw with locking ring see Section 7.1.1.

6. Check that the threaded holes in the frame are aligned with the flexible bearings.
   - If necessary, unscrew bottom knurled screws **E**, shift frame sideways then make fast again.
   - Lever gauge must lie flat against frame from the front and from below (board side).
7. Screw pillow-block bearings **9** at bottom onto frame.

Note

Correctly tighten screw with locking ring see Section 7.1.1.



8. Check that coil is centred in the magnet:
- If necessary, the magnetic circuit must be centred with the coil.
- Unscrew 4 Allen screws **N** and center magnetic circuit with the coil, then retighten screws.

9. Screw on link on lever side:
- Round hole at lever.
- Bottom end of link must lie in the slot in the gauge.

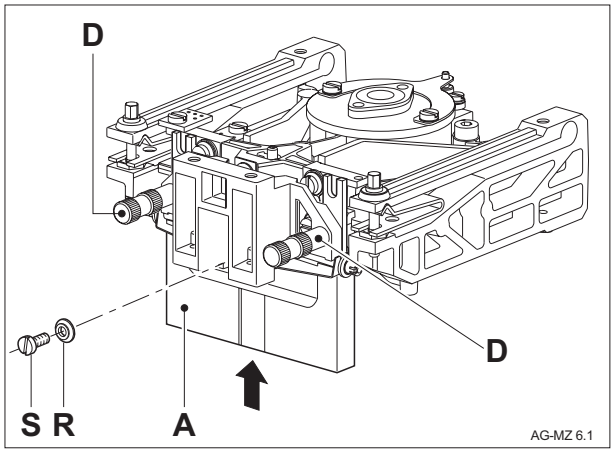
Note

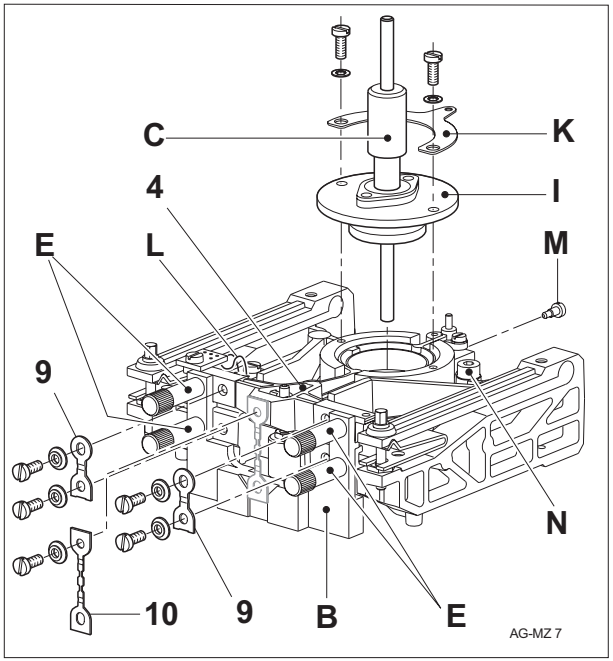
Correctly tighten screw with locking ring see Section 7.1.1.

10. Solder in new contact strips **L** (see Section 7.6).

11. Check coil resistance (with contact strips). R = 52Ω - 56Ω

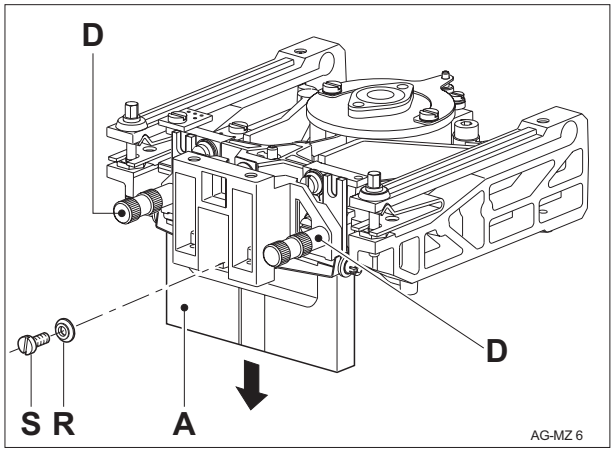
12. Removing lever gauge **B**
- Place measuring cell on its back (upright).
- First unscrew the 2 knurled screws **E** at the lever **4**, then the 2 remaining knurled screws **E**.
- Carefully tilt gauge (do not damage link) downward.

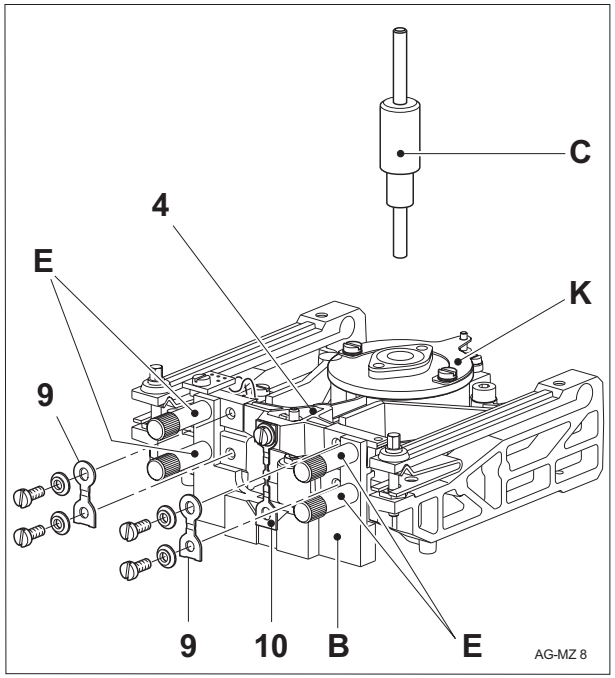




13. Mounting hanger and hanger gauge **A**
    - Carefully push hanger under link.
    - Insert hanger gauge with the marked side upward between frame and hanger and screw to frame. (2 knurled screws **D**.)
    - To fix the hanger position, the measuring cell must be lined up with the hanger gauge.
    - Unscrew knurled screws **D** slightly and press hanger down into the gauge.
    - Align hanger at side with the fastening hole of the link **10** and screw down knurled screws **D**.
14. Screw link **10** firmly to hanger.
    - Check that coil is centred in the magnet. If necessary, the magnetic circuit must be centred with the coil (see item 8).
15. Mount cleaned magnet cover **I** with mounted centring gauge **C**.
16. Press down cleaned magnet cover by hand and mount stop plate **K**.
    - Align engagement hole with stop bolt (at lever).
17. Remove centring gauge **C**.
18. Install top and bottom guide (see Section 7.3).

7.5 Removing pillow-block bearings





7.5.1 Removing

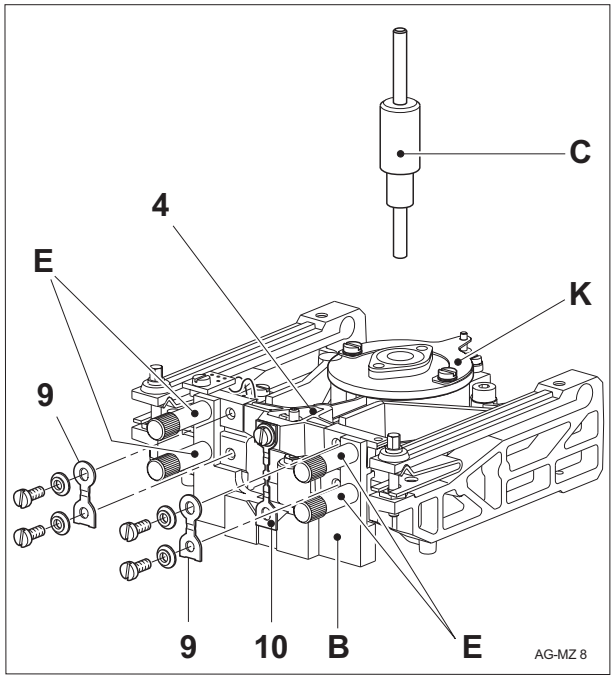
Removing top and bottom guides see Section 7.3

1. Remove link screw **S** with locking ring **R** only at hanger.
2. Unscrew two knurled screws **D**.

ATTENTION

To protect the link, the gauge must be held in its original position when unscrewing.

3. Carefully withdraw hanger gauge **A** together with the hanger (link remains on lever) «on board side».
4. Very carefully insert lever guide **B** under link **10** as far as it will go and lay on frame.
   - Secure lever gauge with the 4 short knurled screws **E**.
   - Link **10** lies in the slot of the lever gauge.
   - The projecting lugs of the lever gauge protect the lever.
5. Remove pillow-block bearings **9**.



7.5.2 Installing

ATTENTION

Always replace both pillow-block bearings!

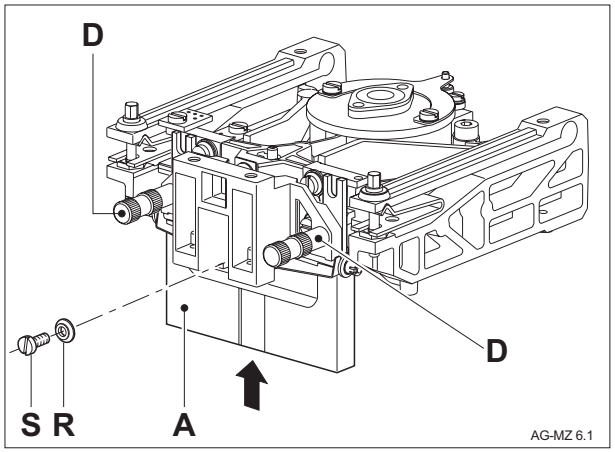
1. Mounting pillow-block bearings **9** at lever **4**
- Place flat side of pillow-block bearings on gauge so that the bearings are aligned parallel and fasten on the lever side.
- Pillow-block bearings have lateral play with lever gauge.

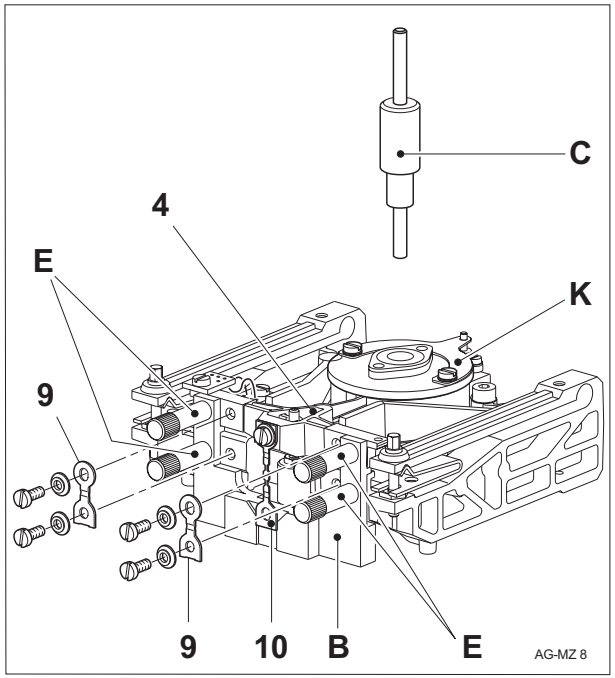
2. Screw pillow-block bearings to frame.

Note

Correctly tighten screw with locking ring see Section 7.1.1.

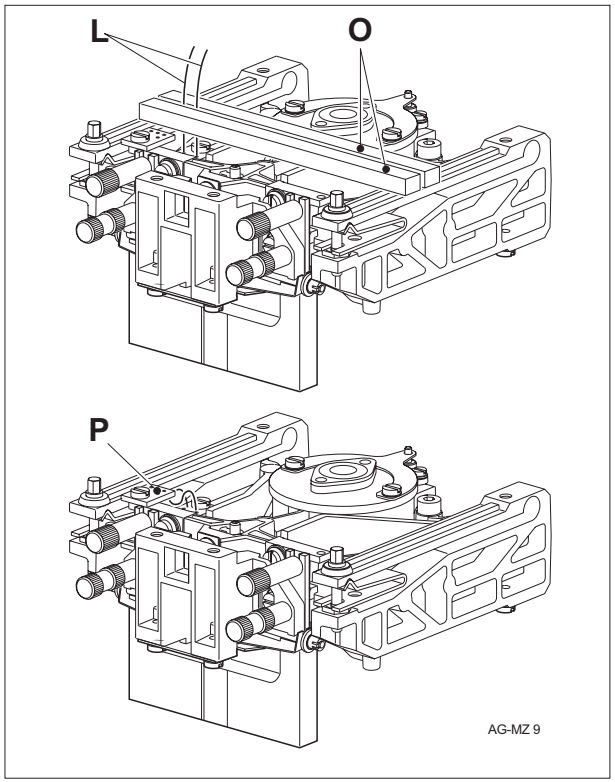
3. Removing lever gauge **B**
- First unscrew the two top knurled screws **E** at the lever, then the two bottom knurled screws **E**.
- Tilt gauge backwards.





4. Mounting hanger and hanger gauge **A**
   - Push hanger carefully under link.
   - Insert hanger gauge with the marked side upward between frame and hanger and screw to frame. (2 knurled screws **D**.)
   - To fix the hanger position, the measuring cell must be lined up with the hanger gauge.
   - Unscrew knurled screws **D** slightly, and press hanger down into the gauge.
   - Align hanger with fastening hole of link **10** at side and tighten knurled screws **D**.
5. Screw link **10** firmly to hanger.
6. Check that the stop bolt at the lever is centred in the engagement hole of the stop plate **K**, if not correct (centring gauge **C** must be used).
7. Instal top and bottom guides (see Section 7.3.2)
   - Before mounting the screening plates, perform check once more as described under point 6!

7.6 Replacing contact strips



Remove top guide see Section 7.3.1.
The bottom guide is not removed!

1. Unsolder contact strips **L** at both boards (frame and lever).
2. Remove any solder from soldering eyelets and clean.
3. Pull measuring cell to edge of bench. Gauge must project over edge of bench.
4. Soldering in new contact strips **L**
   - To fix the contact strips, use the 2 square supports **O** from the service gauge set and solder in the 2 strips **L** at the frame board. The strips should not protrude at the bottom at the board!

ATTENTION

There must be no contact between the strips and the frame!

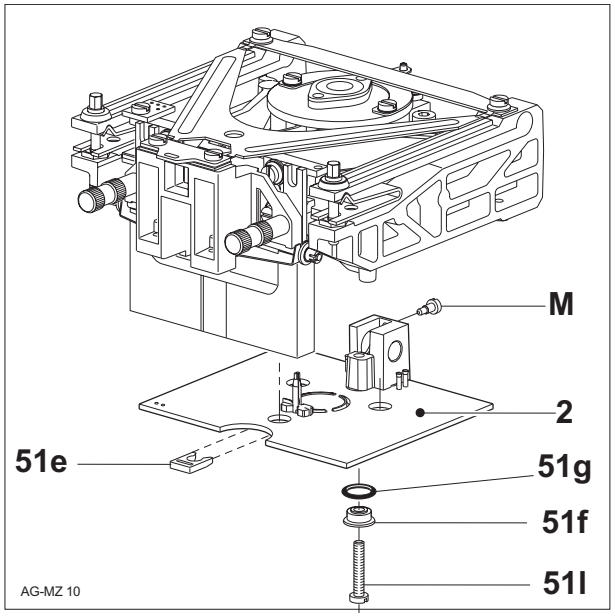
   - Remove two square supports **O**.
   - Solder in both strips at lever board **P** in an S shape and running parallel.
   - Shorten strips above lever board **P**.
5. Use an ohmmeter to check that there is no short circuit to frame.
6. Install top guide see Section 7.3.2

7.7 Detector

ATTENTION

Electrostatically damageable components.

Always use antistatic kit when working on electronic components (see Section 1.1).



7.7.1 Removing

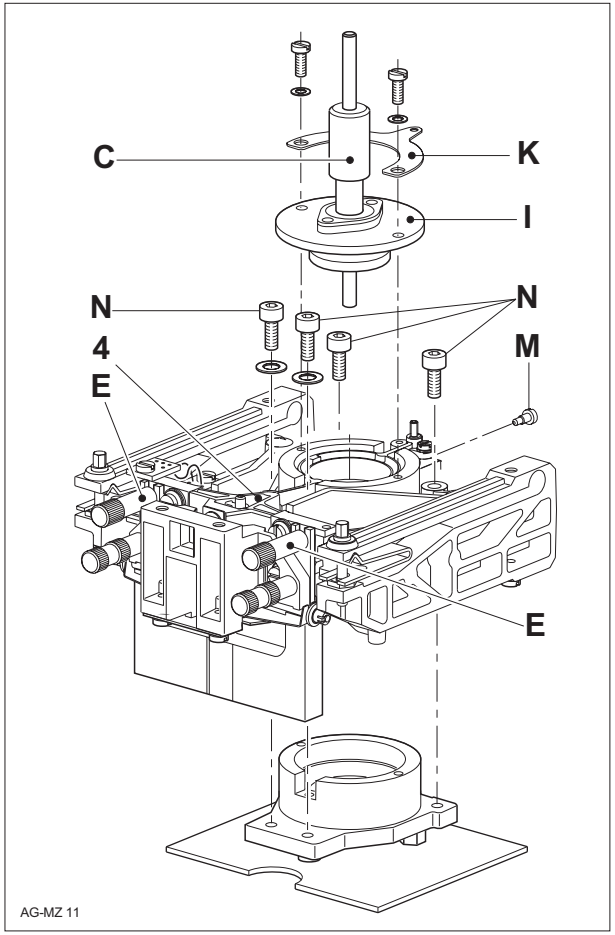
Remove bottom guide see Section 7.3.1.
The top guide is not removed!

1. Remove stop screw **M** at detector housing.
2. Put on equipotential bonding strap and attach to ground and detector housing.
3. Unscrew screw **51l** at detector **2** and remove sleeve **51f** with O-ring **51g**.
4. Remove clamp **51e** and raise detector **2** slightly.
   - Take off coil cable.
   - Remove detector **2** completely.

7.7.2 Installing

1. Remove detector **2** from protective packaging and attach equipotential bonding strap.
2. Connect detector to coil cable and carefully insert. Do not damage temperature sensor!
   - Detector housing must stop at magnet plate.
3. Push in clamp.
4. Insert sleeve **51f** with O-ring **51g** in the detector and screw on.
5. Screw in stop screw **M** at detector housing at rear.
6. Remove equipotential bonding strap.
7. Install bottom guide (see Section 7.3.2).

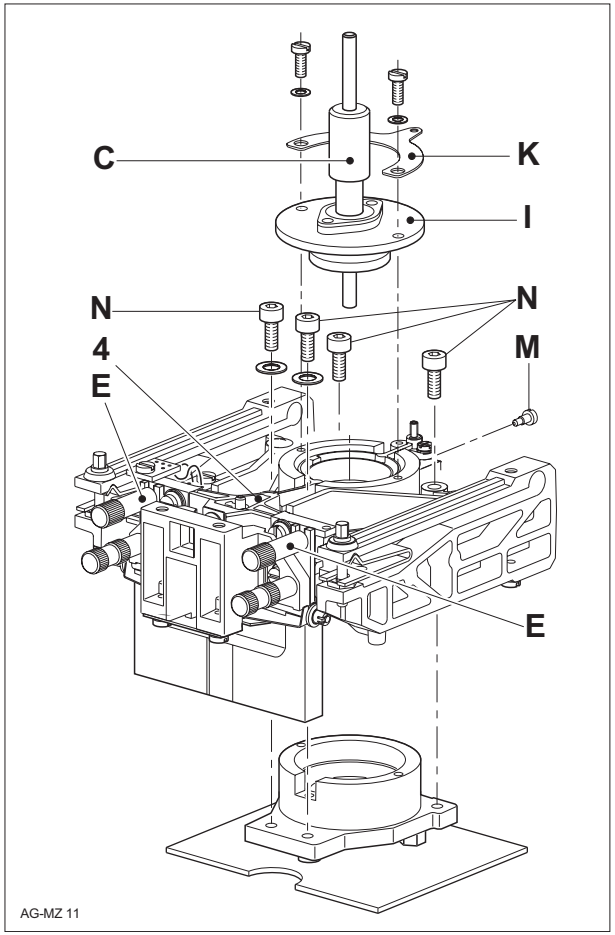
7.8 Magnetic circuit (with detector)



7.8.1 Removing

Removing top and bottom guides see Section 7.3.1

1. Secure lever **4** with the two short knurled screws **E**.
2. Position measuring cell on gauge side and insert centring gauge **C** from above in the magnetic circuit as far as it will go.
   - Push in steel pin up to the stop.
   - Push in brass guide up to the stop.
3. Hold magnet cover **I** (magnet cover is strongly repelled by magnet system) and unscrew stop plate **K**.
4. Lift off magnet cover **I** together with the centring gauge **C**.
5. Unscrew stop screw **M** at detector housing.
6. Unscrew 4 Allen screws **N** slightly.
7. Pull measuring cell to edge of bench. Gauge must project over edge of bench.
8. Unscrew 4 Allen screws **N**.
9. Lift up frame vertically a short way and withdraw coil cable.



7.8.2 Installing

1. Place cleaned magnetic circuit with detector on edge of bench.
   - Check that the coil area is clean.
   - Move frame in position above the magnetic circuit, plug in coil cable and carefully lower coil vertically into magnetic circuit.
2. Align magnetic circuit provisionally and fix with the 4 Allen screws **N**.
3. Screw in stop screw **M**.
4. Unscrew 2 knurled screws **E**.
5. Center magnetic circuit definitively with the coil and tighten 4 Allen screws **N**.
   - Check that play is the same on left and right.
6. Mount cleaned magnet cover with mounted centring gauge **C**.
7. Press down magnet cover by hand and screw on stop plate.
   - Engagement hole in stop plate **K** aligned with stop bolt.
8. Remove centring gauge **C**.
9. Install top and bottom guide (see Section 7.3.2).
   - Before installation, perform check again as described in point 7!

8 Adjustments conventional cell

8.1 General information

ATTENTION

Electrostatically damageable components.

Always use antistatic kit when working on electronic components (see Section 1.1).

All adjustments are made with the service mode.

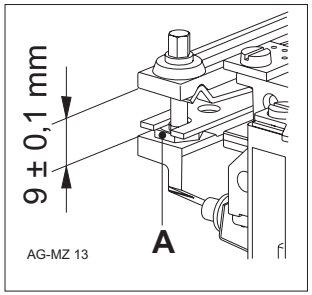
Test weights and tolerance table see Chapter 9

Before every adjustment, a check must be made to see that the measuring cell is in good mechanical order

With the exception of the fine adjustment of the cornerload, all adjustments are made with the balance opened, in other word without weighing chamber and top housing.

Service cover for weighing pan which reduces the influence of drafts to a minimum.

8.1.1 Preparation



1. Opening the balance (see Section 6.1).
2. Check basic setting of the cornerload springs (see illustration). The distance is 9 ± 0.1 mm.
   Locking nut **A** must not turn with the adjustment screw, if so tighten locking nut **A**.
3. Check dead load, if outside tolerance readjust (see Section 8.4).
4. Remove sealing plate
   Measuring cell, arm and calibration drive are built in.
5. Mount weighing pan
6. Start balance in Service Mode (see Chapter 7).
7. Check calibration drive
   - Check position of the calibration weight.
   - Test of the calibration motor
     The weight must be loaded without wobbling, otherwise readjust calibration drive.

8.1.2 Level zero left/right

This setting can not be adjusted. However, the check can show whether the measuring cell has suffered mechanical damage.

1. Tare with weighing pan unloaded.
2. Lift up balance at right rear and place a support (metal ruler) of 0.5 mm under the right leveling foot.

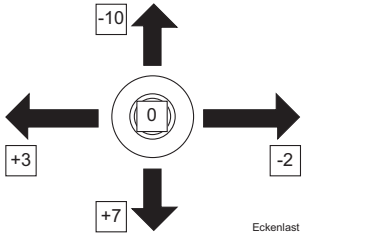
If the deviation is more than 2 mg, the measuring cell must be removed and checked for mechanical damage.

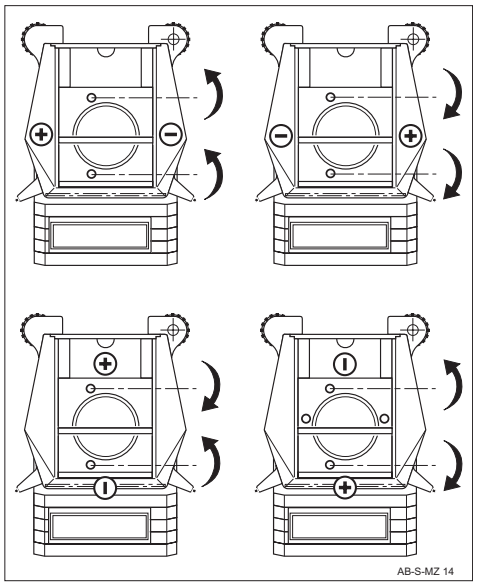
8.2 Checking the hysteresis

1. Pre-check level zero left/right (see Section 8.1.2).
2. Check
   - Place full load on pan and remove, read off display value.
   - Repeat procedure about 3 times and then tare.
   - Press down weighing pan slightly with a brush and raise.
   - If the display does not return to ±0.1 mg, the measuring cell must be checked for mechanical damage or dirt in the magnet system.

8.3 Cornerload

8.3.1 Checking and correcting cornerload

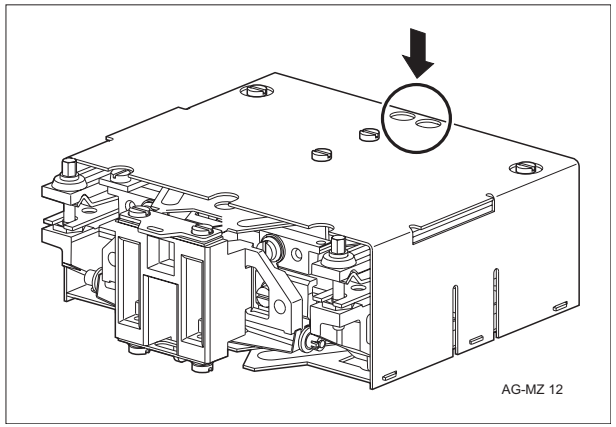




Coarse tolerance ± 1 mg

1. Place test weight in middle of weighing pan and tare.
2. Move weight to the left, rear, right and front weighing pan edge and note/print out display values deviating from zero with sign.
3. Compare display values with coarse tolerance
   - If the value is larger than 0.1 g, check the measuring cell for mechanical damage.
4. Correct deviations from the coarse tolerance as shown in the following drawings by turning the cornerload screws (socket wrench 3.5 mm) in the direction of the arrow.

8.4 Dead load



Work with Adjustment Data table (see Chapter 9).

Note

For adjustment of the dead load, first check whether the measuring cell is of the 1st generation or the 2nd generation. Distinguishing feature of the 1st generation is that the 2 holes in the screening plate of the measuring cell are completely round (see illustration), whereas those in the screening plate of the 2nd generation are long.
To adjust the dead load of the 1st generation, it is necessary to remove the measuring cell and detach the two screening plates. With the 2nd generation, the dead load can be adjusted directly, i.e. no removal is necessary.

1. Check dead load
- If the dead load is too high, attach washer or dead load screw.
- If the dead load is too low, remove washer or dead load screw.
- Weight change per washer, around 0.6 g.
- Weight change per screw, around 3 g.

8.5 Final work steps

1. Mount top housing without cover plate.
2. Level balance and acclimatize.
3. Check cornerload (see Chapter 9) and adjust if need be as described in Section 8.3.

8.6 Fine adjustment of cornerload

1. Uncouple side doors and open one door completely
2. Remove weighing pan.
3. Remove both stoppers.
4. Replace weighing pan
5. Check cornerload (see Section 8.3).
6. Remove weighing pan.
7. Insert both stoppers.
8. Insert cover plate (press down completely).
9. Replace weighing pan.

7 LARS

List of Contents

1 LARS - LabTec Repair and Service Software

LARS is a Service SW to verify and repair balances (replaces the LC-PT45 (Local Can Performance Tester)).

Verify means to remeasure the technical data and to compare these measured data with the nominal values listed in the tolerance table.

Repair means to replace parts and configure the balance as to restore it to the original working order, i.e. a state in which it can perform the specified performance.

Configuration after repair

All types within a balance family, as for example the PB-S, are equipped with the same electronics. By means of the Type Definition, the weighing range is controlled (e.g. from 0.0001g to 200g or from 0.1g to 8000g). In addition, there are the individual cell parameters, the serial number and the service date.

If the balance electronics is defect, it must be replaced. As the replacement PCB does not contain any balance specific data, these parameters must be downloaded by means of LARS.

LARSLock

Dongle (copy protection) required to run the service software. Order no. see Chapter 11.

LARS SW availability

Find the LARS Service Software on the Service Expert CD. However, to make sure to always have the latest version, download it from the LabTec Homepage http://extranet.mt.com.

Operating instructions

The LARS Operating Instructions are

The LARS Operating Instructions are part of the software, i.e. an integrated help file. Press the F1 key or select the Help Menu.

The step-by-step instructions in four languages (de, en, fr, es) allow even the unexperienced service technician to properly adjust the balance after performing a repair job.

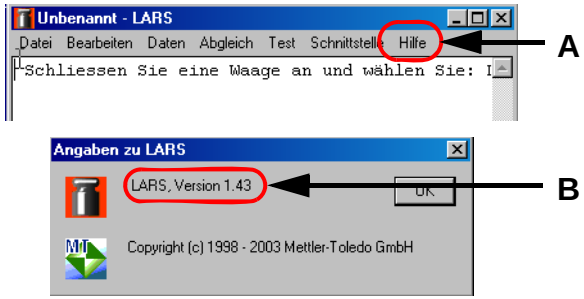
Operating system requirements

LARS runs on any PC under *Windows 95/98/NT/XP*.

2 Install LARS

NOTE: Make sure to always work with the newest version of LARS. You can download it from the Internet (see Section 2.2) or from your Service Organization (Service CD).

Versions check if LARS is already installed:



1. Double-click  .
2. Click «Help» **A** and then on «Info».

The About LARS window opens. The currently installed version is displayed **B**.

If the installed software is not the current version (Internet), the new version must be installed on the laptop/PC.

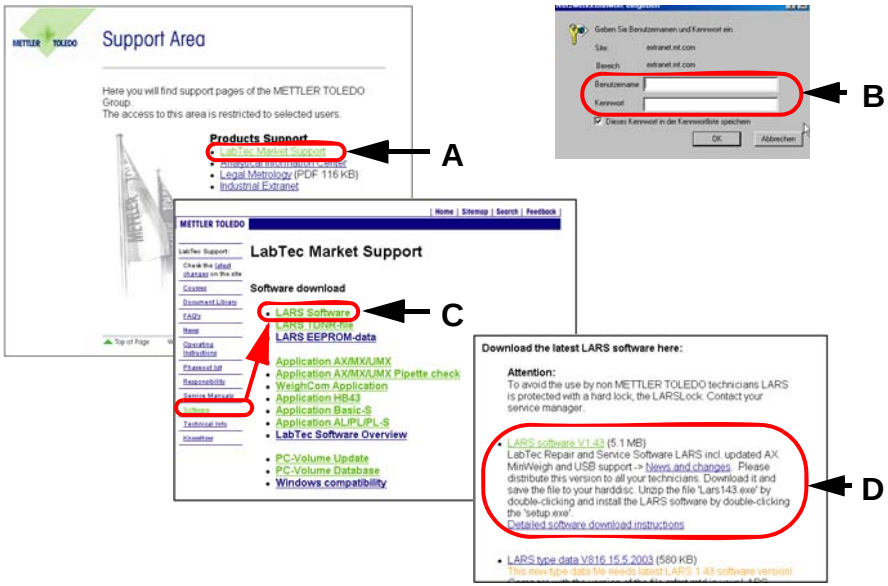
New software versions are available:

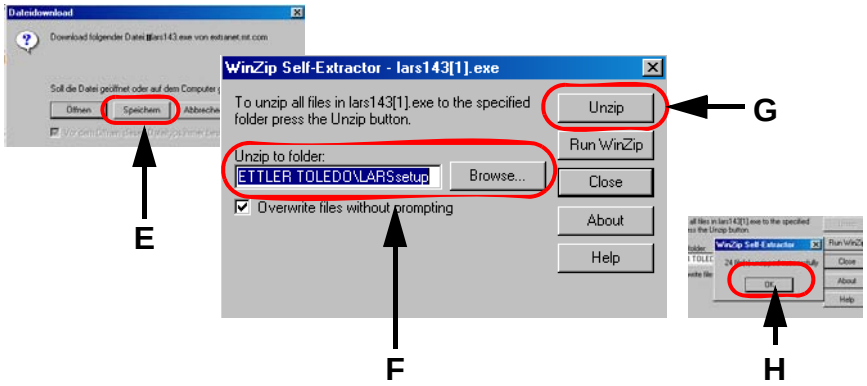
- on the Service CD which can be obtained from your service organization
- on the Internet (see Section 2.2).

2.1 Software installation from the CD

1. Insert Service CD into the drive.
2. Enter «Login» and «Password».
3. Choose language.
4. Click «Software» (below menu header Technical)
5. Click «LARS Software» and follow the instructions of the installation program.

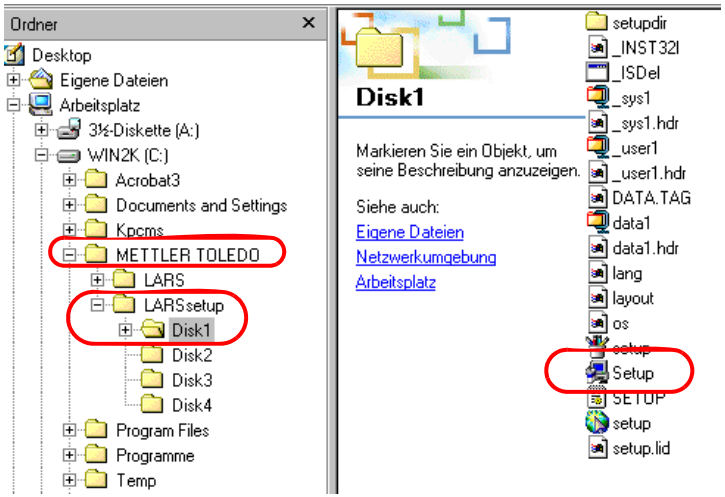
2.2 Software download from the Internet





1. Click on the link http://extranet.mt.com (Labtec Market Support).
2. Click on LabTec Market Support **A**.
3. Enter user name and password **B**.
4. Click on Software and then on LARS Software **C**.
   The most recent version of the LARS software is shown at the top of the list **D**.
5. Select the link of the software version you wish to download.
6. Click on Open **E**.
7. The storage location **F** is displayed. This can be accepted (recommended), or selected according to your own system organization.
8. Click on Unzip **G**.
   The individual files are saved in the selected storage location.
9. Click on OK **H**. Close the WinZip window.

2.3 Software-Installation

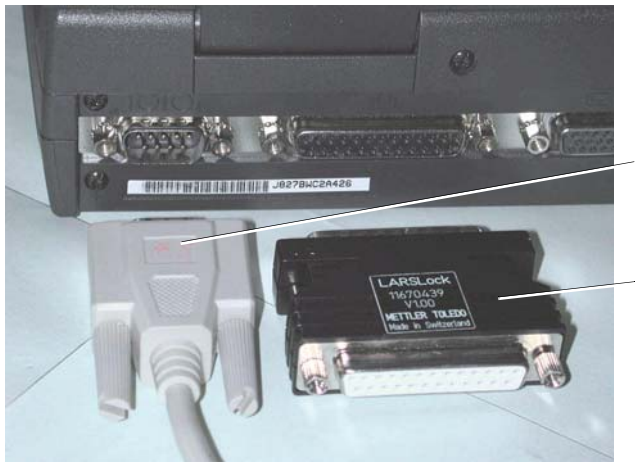


1. Open the METTLER TOLEDO folder.
2. Open the LARSsetup Disk1 folder.
3. Click on  icon.

The installation procedure now starts. Follow the instructions of the installation program.

3 Using LARS

3.1 Connect balance to Laptop/PC



RS9-RS9-cable

LARSLock DB25

up to LARS SW V1.54

LARSLock USB

LARS SW V1.60 and later

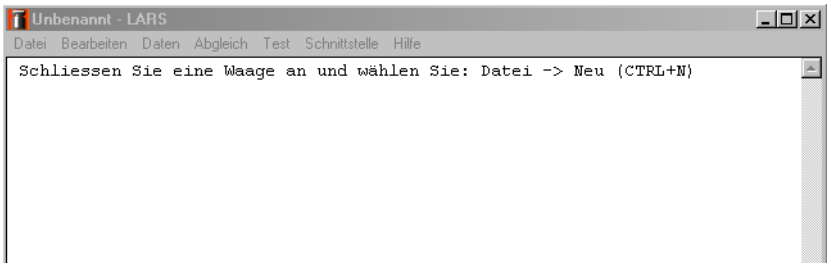
1. Switch off balance and Laptop/PC.
2. Connect the balance by means of a RS9–RS9 cable to the serial port COM of the Laptop/PC
3. Connect the LARSLock:
   - up to LARS SW V1.54, connect the LARSLock DB25 to the parallel port LPT of the Laptop/PC.
   - with LARS SW V1.60 and later use the LARSLock USB.

Part No. for

- LARSLock
- RS9– RS9-cable

see Chapter 11.

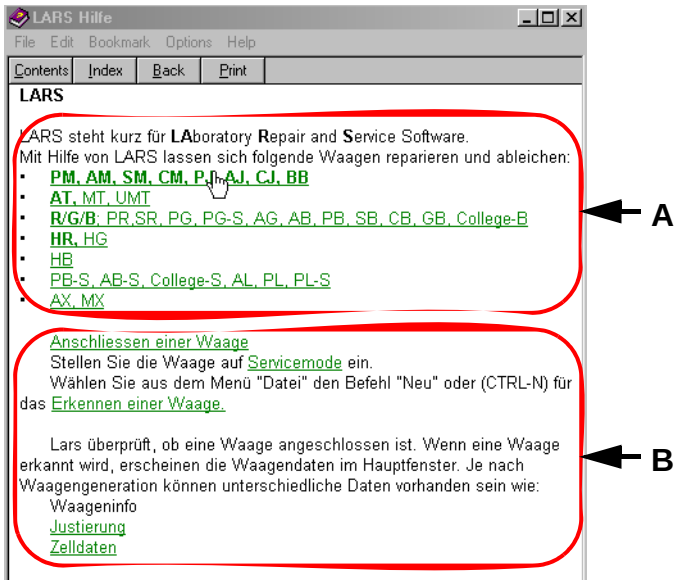
3.2 Working with LARS



To start

Double-click 

The LARS menu appears.



LARS Operating Instructions

The LARS functions are described in detail in the LARS-help.

Press **F1** to open the Help window shown on the left:

- **B** shows the steps which are generally necessary for service with LARS.
- Double-clicking on the balance type **A** shows in an additional window the special service procedure for the selected balance.

The Help key F1 can be pressed again for each operation. The Help function explains the current situation.

To quit

File > Quit.
The stored data of the balance are backed up in the selected file and are available for a future service.

3.3 Load type data

If a new main board has been installed in the balance, a new type definition must be loaded.

Note

The TDNR on the black laser label **A** should not be used before being tested.

Software or hardware changes may make it necessary to adjust the TDNR in line with the new functionalities too.

Where this is the case, it is useful to enter the new TDNR and the new software version in the relevant service label **B**. This prevents errors and facilitates searches for the correct TDNR if they can no longer be read from the balance.

Service Data Plate see Chapter 11.

4 Software Handling

4.1 Software storage

ATTENTION

Before replacing the balance SW, the customer settings must be saved.

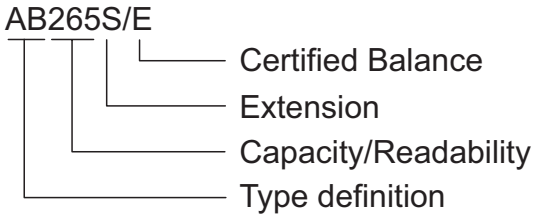
	EEPROM - Type E = Easy	A = Advanced	Data origin
Balance SW	PROM	-	Permanently stored on the PROM on the balance PCB.
Balance SW	-	Flash Memory	Download the balance SW or applications by means of LARS from the Extranet (http://extranet.mt.com) to the balance. Balance adjustments and customer settings are retained.
Cell data	EEPROM	EEPROM	Data obtained during cell production and stored in a data base. EEPROM-data can be downloaded from http://extranet.mt.com. Requires balance serial number.
Load type data	EEPROM	EEPROM	TDNR data from LARS (see Section 3.3)
Customer‘s menu settings	EEPROM	EEPROM	Backup. Print menu settings according to instructions in the operator‘s manual.

4.2 Change of hardware also affects software

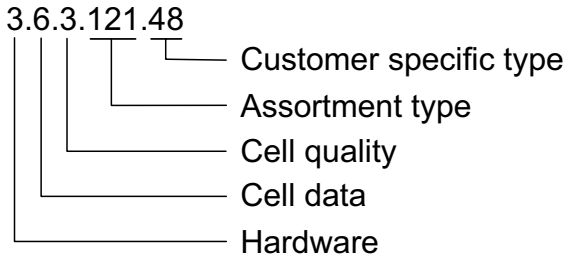
Changed hardware	What changes must be made to the software?				
	Cell data	Adjustment	TDNR	Balance software	Customer settings
Balance PCB	Load	Check LIN, StdCAL* and CAL *if available	Load (see Section 3.3)	Load software (see Section 2.3)	Input by hand.
Cell PCB	Load	Check LIN, StdCAL* and CAL *if available	Load (see Section 3.3)	-	Input by hand.
Measuring cell	Exchange EEPROM on balance board	Check LIN, StdCAL and CAL	Load (see Section 3.3)	-	Input by hand

5 Allocation of the type definition numbers TDNR to the balance types

5.1 Explanation of the type designations of the TDNR list



5.2 Structure of the TDNR



8 Adjusting in the Service Menu

List of Contents

1 General

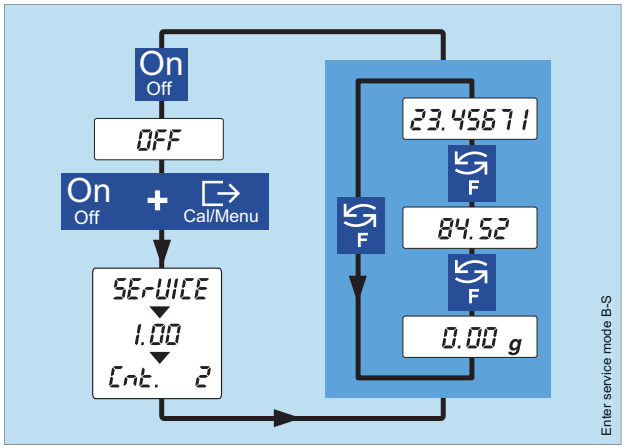
The service software is part of the balance software.

Updating the balance software will automatically update the service software.

Note: Do not use SW (11670444) V1.20 as it contains errors. Replace by a newer version!

1.1 Switching to service mode

1.1.1 Regular balances



1. Switch off the balance: press and hold down On Off .

2. Simultaneously press On Off and Cal/Menu for about 5 sec.

«SERVICE» indicates that the balance is now in service mode.

«1.00» is the version of the balance+service software and

«CNT. 2» is the total number of CAL service adjustments and LIN 3 three-point linearizations carried out successfully to date.

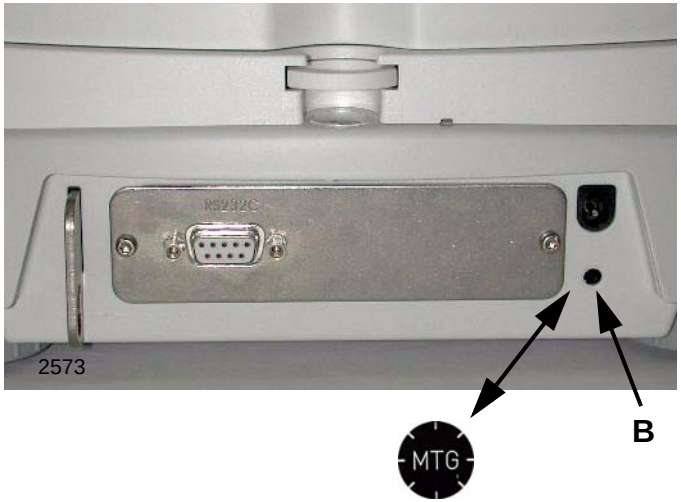
In service mode the balance indicates the weight in grams to one more decimal place (but with the last digit only either 0 or 5).

F toggles the display to the cell dead load in g, then to the temperature of the weighing cell in °C.

Note

If no key is pressed for 30 minutes, the balance automatically reverts from service mode to weighing mode.

1.1.2 Certified balances



Initial verification

1. For the initial verification procedure the switch to service mode is made in the same way as for regular balances see Section 1.1.1.
2. Adjustment is carried out at the balance user's location, following which the balance is switched to “approved“ status in the service menu, in order to block any further adjustment see Section 2.5.
3. Fit a seal to the housing so that the calibration switch is only accessible at the rear of the balance.

Verification at a later date

1. Switch off the balance by pressing and holding down the On Off key.
2. Pry off the security sticker **A** and remove it.
3. Press in the calibration switch **B** until «SERVICE» is displayed.
   The balance is now in service mode and has the same characteristics are those of a standard balance that has not been certified.
4. Carry out the service work and adjust the balance.

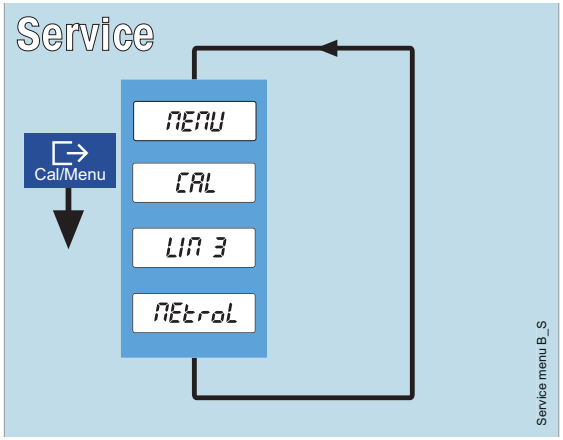
Recommissioning as certified balance

1. Exit service mode by pressing the: On Off key for 3 seconds.

   The adjustment function is now blocked again, and the balance is ready for operation.
2. Affix a new security sticker MTG .

2 Functions in service mode

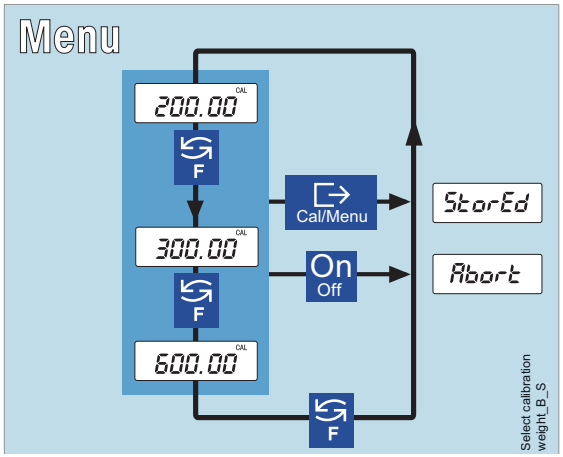
2.1 Selecting functions



Press the Cal/Menu key and hold it down until the desired function is displayed.

Press the On Off key to abort or exit the function prematurely.

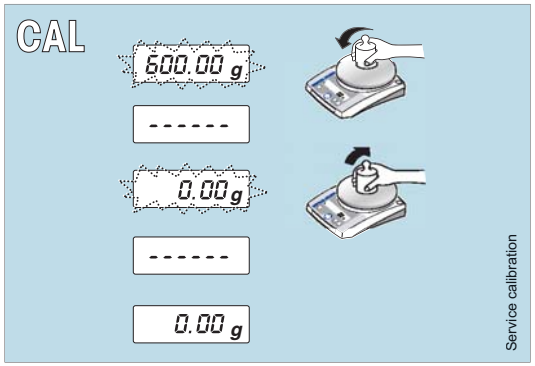
2.2 Changing the value of the adjustment weight for adjustment in normal mode



When desired, change the value of the adjustment weight for the customer by pressing the F key.

Save a value by pressing and holding down the key Cal/Menu, or cancel the change of adjustment weight value by pressing the key On Off.

2.3 Service mode adjustment



Purpose

Calibration of deviations in the weight signal of up to ±10%.

Procedure

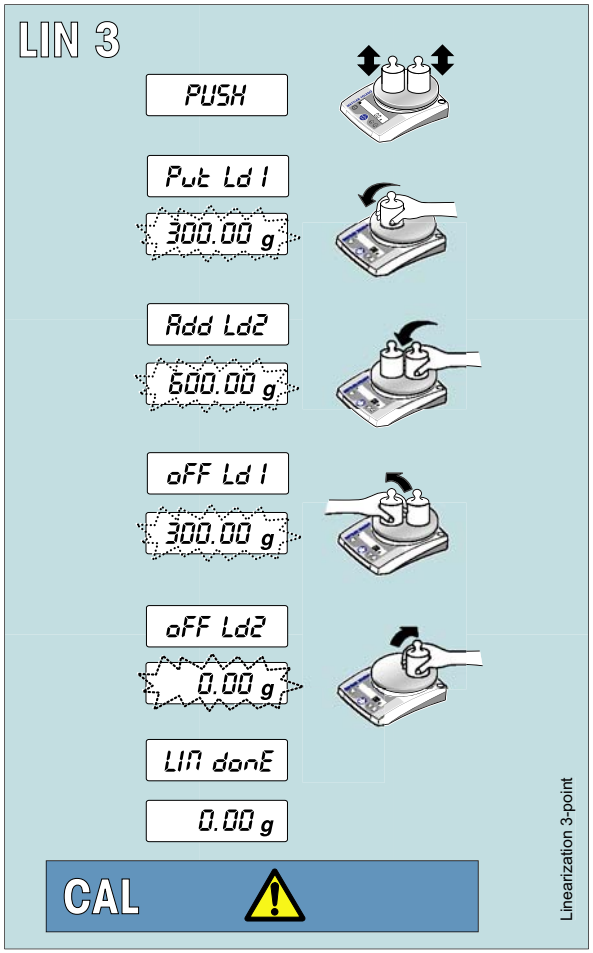
Place the specified weight on the pan, wait

lift the weight off the pan, wait;

adjustment is completed.

Pressing the On Off key cancels

2.4 3-point linearization of the balance



Place full load briefly on pan.

Prompt: now put 1st half of load on pan.

Put indicated load on weighing pan.

Prompt: now put 2nd half of load on pan.

Add the additional weight to give the indicated weight in total.

Prompt: now remove the 1st half-load, leaving only the 2nd half-load on the pan.*

Take 1st half load off the pan.

Prompt: now remove the 2nd half-load.

Take 2nd half load off the pan.

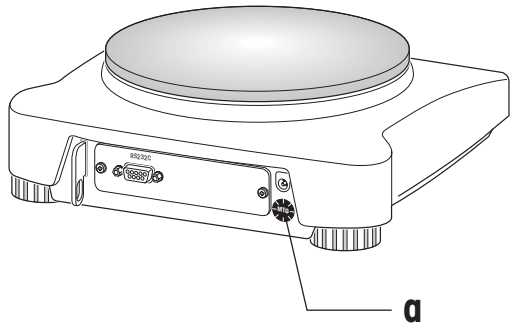
Linearization is complete.

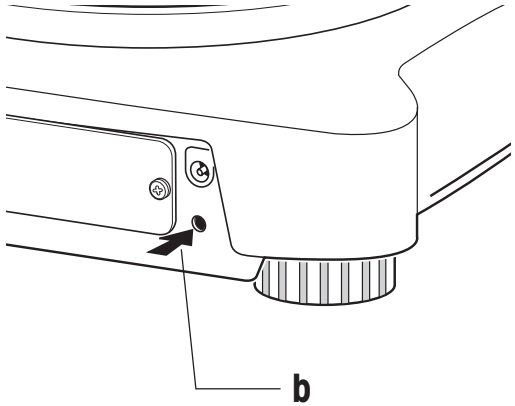
After linearization has been carried out, it is absolutely necessary to adjust the balance, because linearization annuls any existing adjustment.

*Adhering to the exact sequence of adding and removing the weights means that even test weights that are slightly different may be used.

Pressing the On Off key cancels.

2.5 Certified xB-S balances: external calibration and selection of units





2.5.1 Unblocking external calibration and unit selection

- Press **Off** key.
- Remove the securing sticker (a).
- Press the certification switch (b) in until *service* will be displayed.

The balance is now in service mode and has the same characteristics as a non-certified standard balance.

2.5.2 Calibrating balance externally or selecting a different unit

- Select calibration or, in the menu, a different unit as described in the operating instructions.

Warning!

Before selecting the unit, check that this is allowed in the country in question. In EEA countries, the SI, ct and British units are officially allowed.

Other units can be selected if a sticker in the vicinity of the display indicates that these units are not certified.

- On completion of an external calibration or unit selection, attach securing sticker (c).

2.5.3 Putting balance back into operation as certified balance

Quit service mode by holding down the **Off** key for 3 seconds.

External calibration and unit selection are now again blocked, the balance is ready for operation.

Note

Unit 1 must match the unit marked above the display. This is the factory setting.

2.6 Certification sticker "M"

The successful certification of the balance is confirmed by the placement of the green certification sticker "M".

Certification sticker "M", order no. 220 726

9 Adjustment Data

List of Contents

1 Adjustment data / Tolerance

Note: Values of -S balances also correspond to -S/FACT, SDR/FACT, -L and -LDR types.

1.1 ABxxx-S Types

Balance Data			Excentricity		Repeatability		Hysteresis and Linearity				Span	
Type Range Class	Capacity Readability d e		Weights Tolerance ±	Index	Weights Measurements s ≤	Index	Method Hysteresis	Preload / Test Points Weights Tolerance ±	Linearity	Index	Weights Class Tolerance ±	Index
AB104-S 1 I	101 g 0.1 mg 1 mg		50 g 0.3 mg		50 g 10 0.1 mg			0/20/40/60/80 g			100 g E2 0.5 mg	
							d 0.2 mg		20 g 0.2 mg			
AB135-S DU1 I	120 g 0.1 mg 1 mg		50 g 0.4 mg		50 g 10 0.1 mg			0/20/40/60/80/100 g			120 g E2 0.7 mg	
							d 0.2 mg		20 g 0.2 mg			
AB135-S DU2 I	31 g 0.01 mg 1 mg		N.A. N.A.		10 g 10 0.03 mg			N.A.			N.A. N.A.	
							  N.A.		N.A. N.A.			
AB204-S 1 I	210 g 0.1 mg 1 mg		100 g 0.4 mg		100 g 10 0.1 mg			0/50/100/150 g			200 g E2 1 mg	
							d 0.2 mg		50 g 0.2 mg			
AB265-S DU1 I	220 g 0.1 mg 1 mg		100 g 0.4 mg		100 g 10 0.1 mg			0/50/100/150 g			220 g E2 1.2 mg	
							d 0.2 mg		50 g 0.2 mg			
AB265-S DU2 I	61 g 0.01 mg 1 mg		N.A. N.A.		10 g 10 0.03 mg			N.A.			N.A. N.A.	
							  N.A.		N.A. N.A.			
AB304-S 1 I	320 g 0.1 mg 1 mg		200 g 0.4 mg		200 g 10 0.1 mg			0/100/200 g			300 g E2 1.5 mg	
							d 0.2 mg		100 g 0.4 mg			

Balance Data			Excentricity		Repeatability		Hysteresis and Linearity				Span	
Type Range Class	Capacity Readability d e		Weights Tolerance ±	Index	Weights Measurements s ≤	Index	Preload / Test Points Method Hysteresis	Weights Tolerance ±	Linearity	Index	Weights Class Tolerance ±	Index
AB54-S 1 I	51 g 0.1 mg 1 mg		20 g 0.2 mg		20 g 10 0.1 mg			0/10/20/30/40 g d 0.2 mg	 10 g 0.2 mg		50 g E2 0.3 mg	

1.2 JBxxx-S Types

Balance Data			Excentricity		Repeatability		Hysteresis and Linearity				Span	
Type Range Class	Capacity Readability d e		Weights Tolerance ±	Index	Weights Measurements s ≤	Index	Preload / Test Points Method Hysteresis	Weights Tolerance ±	Linearity	Index	Weights Class Tolerance ±	Index
JB1603-C 1 II	1600 ct 0.001 ct 0.01 ct		100 g 0.002 ct		100 g 10 0.001 ct			0/100/200 g d 0.002 ct	 100 g 0.002 ct		320 g E2 0.008 ct	
JB203-C 1 II	210 ct 0.001 ct 0.01 ct		20 g 0.002 ct		20 g 10 0.001 ct			0/10/20/30/40 g d 0.001 ct	 10 g 0.001 ct		40 g E2 0.003 ct	
JB3002-G 1 II	3100 g 0.01 g 0.1 g		1 kg 0.03 g		1 kg 6 0.01 g			0/1/2 kg d 0.02 g	 1 kg 0.02 g		3000 g F1 0.1 g	
JB8001-G 1 II	8100 g 0.1 g 1 g		5 kg 0.2 g		5 kg 6 0.1 g			0/2/4/6 kg d 0.1 g	 2 kg 0.1 g		8000 g F1 0.5 g	
JB803-C 1 II	810 ct 0.001 ct 0.01 ct		100 g 0.002 ct		100 g 10 0.001 ct			0/50/100 g d 0.001 ct	 50 g 0.001 ct		160 g E2 0.005 ct	

1.3 PBxxx-S Types

Balance Data			Excentricity		Repeatability		Hysteresis and Linearity				Span	
Type Range Class	Capacity Readability d e		Weights Tolerance ±	Index	Weights Measurements s ≤	Index	Preload / Test Points Method Hysteresis	Weights Tolerance ±	Linearity	Index	Weights Class Tolerance ±	Index
PB1501-S 1 II	1510 g 100 mg 0.1 g		500 g 0.1 g		500 g 6 0.08 g			500/1000/1500 g			1500 g F1 0.5 g	
							F1 0.1 g		N.A. 0.1 g			
PB1502-S 1 II	1510 g 10 mg 0.1 g		500 g 0.03 g		500 g 6 0.01 g			0/500/1000 g			1500 g F1 0.1 g	
							d 20 mg		500 g 0.02 g			
PB153-S 1 II	151 g 1 mg 0.01 g		50 g 3 mg		50 g 6 1 mg			50/100/150 g			150 g F1 0.01 g	
							E2 2 mg		N.A. 2 mg			
PB3001-S 1 II	3100 g 0.1 g 0.1 g		1000 g 0.4 g		1000 g 6 0.08 g			1/2/3 kg			3 kg F1 0.5 g	
							F1 0.1 g		N.A. 0.1 g			
PB3002-S 1 II	3100 g 10 mg 0.1 g		1000 g 0.04 g		1000 g 6 0.01 g			0/1/2 kg			3 kg F1 0.1 g	
							d 0.02 g		1 kg 0.02 g			
PB3002-S DR DR II	3100/600 g 100/10 mg 0.1 g		1000 g 0.04 g		1000 g 6 0.01 g			1/2/3 kg			3 kg F1 0.2 g	
							F1 0.1 g		N.A. 0.1 g			
PB303-S 1 II	310 g 1 mg 0.01 g		100 g 4 mg		100 g 6 1 mg			100/200/300 g			300 g F1 0.01 g	
							E2 2 mg		N.A. 2 mg			
PB303-S DR DR II	310/60 g 10/1 mg 0.01 g		100 g 4 mg		100 g 6 1 mg			100/200/300 g			300 g F1 0.02 g	
							F1 2 mg		N.A. 0.01 g			

Balance Data			Excentricity		Repeatability		Hysteresis and Linearity				Span	
Type Range Class	Capacity Readability d e		Weights Tolerance ±	Index	Weights Measurements s ≤	Index	Method Hysteresis	Preload / Test Points Weights Tolerance ±	Linearity	Index	Weights Class Tolerance ±	Index
PB4002-S 1 II	4100 g 0.01 g 0.1 g		2000 g 0.04 g		2000 g 6 0.01 g			0/1/2/3 kg d 0.02 g	 1000 g 0.02 g		4 kg F1 0.1 g	
PB403-S 1 II	410 g 1 mg 10 mg		200 g 3 mg		200 g 6 1 mg			0/100/200/300 g d 2 mg	 100 g 2 mg		400 g F1 0.01 g	
PB5001-S 1 II	5100 g 0.1 g 1 g		2 kg 0.5 g		2 kg 6 0.08 g			1/2/3/4/5 kg F1 50 mg	 N.A. 0.1 g		5 kg F1 0.5 g	
PB503-S 1 II	510 g 1 mg 10 mg		200 g 3 mg		200 g 6 1 mg			0/100/200/300/400 g d 2 mg	 100 g 2 mg		500 g F1 0.01 g	
PB602-S 1 II	610 g 10 mg 0.1 g		200 g 0.02 g		200 g 6 5 mg			200/400/600 g F1 0.02 g	 N.A. 0.02 g		600 g F1 0.1 g	
PB8000-S 1 II	8100 g 1 g 1 g		5000 g 1 g		5000 g 6 0.8 g			2/4/6/8 kg F1 1 g	 N.A. 1 g		8000 g F1 1 g	
PB8001-S 1 II	8100 g 0.1 g 1 g		5 kg 0.5 g		2 kg 6 0.08 g			0/2/4/6 kg d 0.1 g	 2 kg 0.1 g		8 kg F1 0.5 g	

10 Accessories

List of Contents

1 Note

Accessories for the xB-S balances are listed in the «Accessories» chapter of the Operating Instructions. All information required for ordering accessories will be found there.

The Operating Instructions are on the LAB service-expert CD or at http://extranet.mt.com LabTec Market Support.

1.1 Frequently used accessories

1.1.1 Protective Cover

Designation	Part No.
Protective Cover PB-S, JB-G	11103681
Protective Cover AB-S, JB-C	11135480

1.1.2 Draft shield

Designation	Part No.
Draft shield «mg» (H=155 mm) [1)]	11103683
Draft shield with sliding doors «0.1mg» (H=255 mm)	11103682
Draft shield with sliding doors «mg» (H=170 mm)	11137468

[1)] Weighing pan Ø 180 mm Part No. 11103280 necessary.

1.1.3 Power supply

Designation	Part No.
Plug-in AC adapter	
Euro 230 V	11103740
Euro (Schuko) 230 V	11103744
UK 240 V	11103742
USA 120 V	11103741
Japan 100 V	11103743

Designation	Part No.
Universal AC adapter	
Neutral version 220 - 240 V	11103745
Line cable	
DK	87452
GB	89405
USA	88668
AUS	88751
SA	89728
EU (Schuko)	87925
CH	87920
I	87457

1.1.4 Further accessories

All accessories are listed in the Operating Instructions in the chapter Technical Data and Accessories.

11 Service Aids

LARS Software

Download the latest version of the LARSSoftware from http://extranet.mt.com LabTec Market Support.

USB-Dongle ‚LARSLock'

Part No.

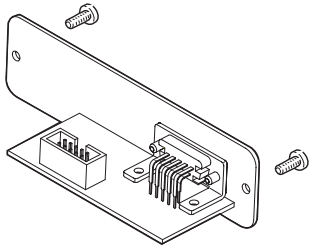
11107505

CD ServiceExpert

Part No.

11780410

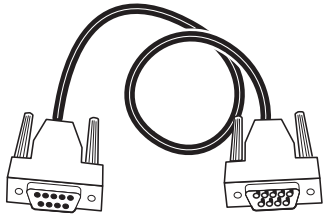
B-S Interface RS232C



Part No.

11103678

RS9-RS9-extension cable



Part No.

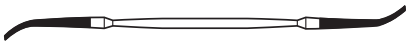
11101051

ESD-Servicekit

Part No.

11600009

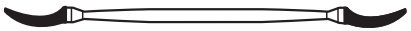
File



Part No.

299017

File for B monobloc



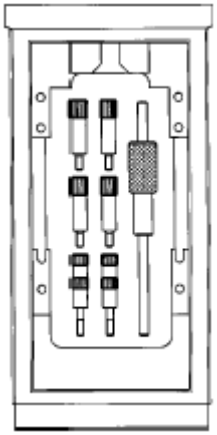
Part No.

11600083

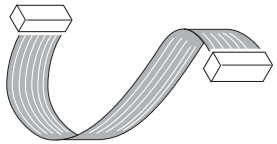
Service gauges monobloc, set 217411

	Including:	Part No.
	2 Centering pins Ø 2,97 mm	217211
	2 Centering pins Ø 3,47 mm	217270
	1 Distance gauge 0,5 mm	217225
	1 Distance gauge 6,5 mm	217378

Service gauges AG cell, set, Part No. 238200



Detector cable (8 poles)



Part No.

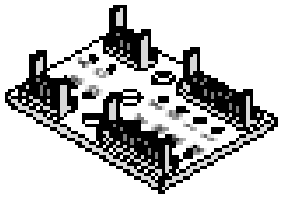
225635

Coil cable (4 poles)

Part No.

224414

Connection board for measuring cells



Part No.

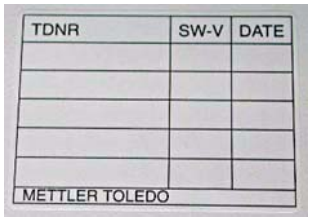
225306

PG-S/PB-S extension cable display

Part No.

11101880

Service Data Plate



Part No.

11106832

12 Forms

List of Contents

1 Forms

1.1 Checklist

Balance Checklist

1.2 Certificate - Examples

1.2.1 Certificate of Balance Calibration

PB3001-S

PB3002-S

PB3002-SDR

JB803-C

1.2.2 Certificate Blanc

Cal_Cert_Blanc

1.2.3 Certificate of minimum weigh (MinWeigh)

MinWeigh_Page_1

MinWeigh_Page_2

1.2.4 Blank print

Blank print order no.: 11780454 (100 pcs)

Balance Checklist

Company: _____ Calibration Certificate No. _____
Adress: _____ Brand: _____
Location: _____ Model: _____
Contact: _____ Serialnumber: _____

	n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
1 General appearance									
1.1 In use cover									
1.2 Top housing									
1.3 Bottom housing									
1.4 Foot Screws									
1.5 Level indicator									
1.6 Power conector									
1.7 Power supply cable									
1.8 Interface connector									
1.9 Cassette									
1.1 cassette cover									
1.11 weighing pan									
1.12 pan support									
1.13 Display									
1.14 Display cable									
1.15 Tare Key									
1.16 Key pad									
1.17 Calibration weight									
1.18 Calibration drive									
1.19 weight holder									
1.20 level cover									
2 Draft shield									
2.1 draft shield ring									
2.2 Left window									
2.3 Right window									
2.4 Front window									
2.5 Top window									
2.6 Left guide									
2.7 Right guide									
2.8 Top guides									
2.9 Left handle									
2.10 Right handle									
2.11 Top handle									
2.12 slider									
2.13 Bottom plate									
2.14 Doormotor									
2.15 Rear panel									
2.16 backpanel									
3 Electronics									
3.1 Balance PCB									
3.2 Display PCB									
3.3 Interface PCB									
3.4 Powersupply									

	n/a	good	cleaning	scratched	broken	loose/bent	adjusting	missing	replacing
4 Measuring cell									
4.1 Scanning PCB									
4.2 Lever									
4.3 Magnet system									
4.4 Link									
4.5 Top guide									
4.6 Bottom Guide									
4.7 Bearings									
4.8 Cantilever arm									
4.9 cell cable									
4.1 overload protection									
4.11 hanger									
5 Peripherals									
5.1 Dust cover									
5.2 Second display									
5.3 Interface Cable									
5.4 Filter weighing kit									
5.5 Density kit									
5.6 Hand/Foot switch									
5.7 Accu/BatteriePac									
5.10 Printer									
5.11 Printer PCB									
5.12 Printing drive									
5.13 Housing									
5.14 Keypad									
5.15 Power cable									

6 Specials

7.1 operating instruction _____

7 Software Versions

OS	Application	Terminal

8 Spare Parts

designation	Item number	Price

9 Labour

hours

10 Total:

Notes:

- ❒ No Spare parts available for this balance.
- ❒ Balance in bad shape! Budget new balance
- ❒ Balance beyond repair
- ❒ _____

Tecnician: _____

Signature: _____

Certificate of Balance Calibration

Balance: *PB3001-S*

Eccentricity

Yes [x] No [ ]

	First/Center: 1000.0 g	
Rear/Left: 1000.0 g		Rear/Right: 999.9 g
Front/Left: 1000.0 g		Front/Right: 1000.0 g
	Last Center: 1000.0 g	

Tolerance: *0.4 g* Deviation: *0.1 g*

Linearity

Yes [x] No [ ]

	Absolute Differential / Weight Tare	Display Tare / Reference	Difference Reference
1	0 kg	0.0 g	0.0 g
2	1 kg	1000.1 g	0.1 g
3	2 kg	2000.0 g	0.0 g
4	3 kg	3000.0 g	0.0 g
5	Void	Void	Void
6	Void	Void	Void
7	Void	Void	Void

Tolerance: *0.1 g* Deviation: *0.1 g*

Sensitivity

Yes [x] No [ ]

	Weight	Display
	3000.0 g	3000.0 g

Tolerance: *0.5 g* Deviation: *0 mg*

Repetability

Yes [x] No [ ]

	empty	load	Difference
1	-1.2 g	998.8 g	1000.0 g
2	-1.2 g	998.9 g	1000.1 g
3	-1.2 g	998.8 g	1000.0 g
4	-1.2 g	998.8 g	1000.0 g
5	-1.2 g	998.8 g	1000.0 g
6	-1.2 g	998.8 g	1000.0 g
7	Void	Void	Void
8	Void	Void	Void
9	Void	Void	Void
10	Void	Void	Void

Tolerance: *0.08 g* Deviation: *0.041 g*

METTLER TOLEDO

Mettler-Toledo GmbH, CH-8606 Greifensee, Schweiz

issued by

Mettler-Toledo Services, Balance Road, MT-8606 Weightcity

11780454

Certificate of Balance Calibration

Balance: *PB3002-S*

Eccentricity

Yes [x] No [ ]

	First/Center: 999.99 g	
Rear/Left: 999.98 g		Rear/Right: 999.96 g
Front/Left: 1000.00 g		Front/Right: 999.99 g
	Last Center: 999.99 g	

Tolerance: *40 mg* Deviation: *30 mg*

Linearity

Yes [x] No [ ]

	Absolute Differential Weight Tare	Display Tare Reference	Difference Reference
1	0.00 g	1000.01 g	1000.01 g
2	1000.01 g	1999.99 g	999.98 g
3	1999.99 g	3000.00 g	1000.01 g
4	Void	Void	Void
5	Void	Void	Void
6	Void	Void	Void
7	Void	Void	Void

Tolerance: *20 mg* Deviation: *15 mg*

Sensitivity

Yes [x] No [ ]

	Weight	Display
	3000.00 g	3000.01 g

Tolerance: *0.1 g* Deviation: *0.01 g*

Repetability

Yes [x] No [ ]

	empty	load	Difference
1	-1.23 g	998.76 g	999.99 g
2	-1.22 g	998.75 g	999.97 g
3	-1.21 g	998.76 g	999.97 g
4	-1.21 g	998.77 g	999.98 g
5	-1.21 g	998.76 g	999.97 g
6	-1.22 g	998.75 g	999.97 g
7	Void	Void	Void
8	Void	Void	Void
9	Void	Void	Void
10	Void	Void	Void

Tolerance: *10 mg* Deviation: *8 mg*

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Certificate of Balance Calibration

Balance: *PB3002-S DR*

Eccentricity

Yes [x] No [ ]

	First/Center	1.23 g	
Rear/Left	Rear/Right	1.22 g	1.22 g
Front/Left	Front/Right	1.25 g	1.24 g
	Last Center	1.24 g	

Tolerance: 40 mg Deviation: 20 mg

Linearity

Yes [x] No [ ]

	Absolute Differential Weight Tare	Display Tare Reference	Difference Reference
1	1000.0 g	1000.1 g	0.1 g
2	2000.0 g	2000.0 g	0.0 g
3	3000.0 g	2999.9 g	0.1 g
4	Void	Void	Void
5	Void	Void	Void
6	Void	Void	Void
7	Void	Void	Void

Tolerance: 0.1 g Deviation: 0.1 g

Sensitivity

Yes [x] No [ ]

	Weight	Display
	3000.0 g	3000.0 g

Tolerance: 100 mg Deviation: 0 mg

Repetability

Yes [x] No [ ]

	empty	load	Difference
1	-499.99 g	500.02 g	1000.01 g
2	-500.00 g	500.01 g	1000.01 g
3	-499.99 g	500.03 g	1000.02 g
4	-500.00 g	500.03 g	1000.03 g
5	-500.02 g	500.01 g	1000.03 g
6	-500.01 g	500.01 g	1000.02 g
7	Void	Void	Void
8	Void	Void	Void
9	Void	Void	Void
10	Void	Void	Void

Tolerance: 0.01 g Deviation: 0.009 g

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11780454

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Mettler-Toledo Services, Balance Road, MT-8606 Weightcity

Certificate of Balance Calibration

Balance: JB803-C

Eccentricity

Yes ☑ No ☐

First/Center	500.001 ct	
Rear/Left	499.999 ct	Rear/Right 500.001 ct
Front/Left	500.001 ct	Front/Right 500.001 ct
Last Center	500.000 ct	

Tolerance: 0.002 ct Deviation: 0.002 ct

Linearity

Yes ☑ No ☑

	Absolute Differential Weight Tare	Display Tare Reference	Difference Reference
1	0.000 ct	250.000 ct	250.000 ct
2	250.000 ct	500.001 ct	250.001 ct
3	499.999 ct	749.998 ct	249.999 ct
4	Void	Void	Void
5	Void	Void	Void
6	Void	Void	Void
7	Void	Void	Void

Tolerance: 0.001 ct Deviation: 0.001 ct

Sensitivity

Yes ☑ No ☐

	Weight	Display
	800.000 ct	800.001 ct

Tolerance: 0.005 ct Deviation: 0.001 ct

Repetability

Yes ☑ No ☐

	empty	load	Difference
1	-6.173 ct	493.827 ct	500.000 ct
2	-6.173 ct	493.826 ct	499.999 ct
3	-6.173 ct	493.826 ct	499.999 ct
4	-6.172 ct	493.827 ct	499.999 ct
5	-6.172 ct	493.826 ct	499.998 ct
6	-6.171 ct	493.826 ct	499.997 ct
7	-6.171 ct	493.827 ct	499.998 ct
8	-6.170 ct	493.825 ct	499.995 ct
9	-6.170 ct	493.827 ct	499.997 ct
10	-6.171 ct	493.826 ct	499.997 ct

Tolerance: 0.001 ct Deviation: 0.001 ct

METTLER TOLEDO

Mettler-Toledo GmbH, CH-8606 Greifensee, Schweiz

11780454

issued by

Mettler-Toledo Services, Balance Road, MT-8606 Weightcity

Certificate of Balance Calibration

Balance:

Eccentricity

Yes ☐ No ☐

	First/Center	
Rear/Left	Rear/Right	
Front/Left	Front/Right	
	Last Center	

Tolerance: _____ Deviation: _____

Linearity

Yes ☐ No ☐

Absolute Differential	Weight Tare	Display Tare	Display Reference	Difference Reference
1				
2				
3				
4				
5				
6				
7				

Tolerance: _____ Deviation: _____

Sensitivity

Yes ☐ No ☐

Weight	Display

Tolerance: _____ Deviation: _____

Repetability

Yes ☐ No ☐

	empty	load	Difference
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Tolerance: _____ Deviation: _____

issued by

Mettler-Toledo Services, Balance Road, MT-8606 Weightcity

Certificate of minimum weight

MinWeigh according to USP

	Balance	AB265-S
	Serial Number	11223000003
	Location	Greifensee GD613
	Weight Nr.	PM0018
	Test date	03.10.2003
	Expiry date	27.10.2004
Settings	Weighing process adapter	Medium
	AutoZero	On
	Relative Error	0.1 %
	Expansion factor	3
	Maximum Tare	60.00000 g
	Minimum Weight	0.06000 g

Measurements

Tared	Test Weight	Difference
0.00000 g	0.06001 g	0.06001 g
0.00000 g	0.05999 g	0.05999 g
0.00000 g	0.06000 g	0.06000 g
0.00000 g	0.05998 g	0.05998 g
0.00000 g	0.05997 g	0.05997 g
0.00000 g	0.05999 g	0.05999 g
0.00000 g	0.06002 g	0.06002 g
0.00000 g	0.06004 g	0.06004 g
0.00000 g	0.06003 g	0.06003 g
0.00000 g	0.06002 g	0.06002 g
	Min	0.05997 g
	Max	0.06004 g
	Mean	0.060005 g
	StDv	0.000023 g
	Rel Error	0.1136 %

Status of Test **Passed**

Failed Tests see overleaf

Signature:

Peter Sieber

METTLER TOLEDO

Mettler-Toledo GmbH, CH-8606 Greifensee, Schweiz

Balance	AB265-S
Serial Number	11223000003
Location	Greifensee GD613
Weight Nr.	PM0018
Test date	03.10.2003
Expiry date	27.10.2004

Weighing process adapter	Medium
AutoZero	On
Relative Error	0.1 %
Expansion factor	3
Maximum Tare	60.00000 g
Minimum Weight	0.06000 g

Tared	Test Weight	Difference
0.00000 g	0.05996 g	0.05996 g
0.00000 g	0.05998 g	0.05998 g
0.00000 g	0.06003 g	0.06003 g
0.00000 g	0.06004 g	0.06004 g
0.00000 g	0.06003 g	0.06003 g
0.00004 g	0.06003 g	0.05999 g
0.00004 g	0.06001 g	0.05997 g
0.00000 g	0.06001 g	0.06001 g
0.00000 g	0.06005 g	0.06005 g
0.00000 g	0.06002 g	0.06002 g
	Min	0.05996 g
	Max	0.06005 g
	Mean	0.060008 g
	StDv	0.000031 g
	Rel Error	0.1560 %

Status of Test **Failed**

Signature:

Peter Sieber

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