Service Manual

for seca 952, 956

Variants:
952 1309009
952 1309369

956 7021099
956 7021159
956 7021249

Service Manual Number
17-05-01-351-
Valid as of: 01.05.2010

Description:
Chairscale digital, with LC electronic

Content:

Repair Instructions

MODEL 952 / 956

Contents

1 General Information

These service instructions are intended for specialist staff charged with maintenance and repair of the scale. These persons must be familiar with all the relevant electro-technical regulations and must adhere to them any time. These instructions are not suitable for users without specialist knowledge.

What is the structure of this document and how should you read it? Section 1 provides a short overview of the most important points for service. We recommend you should read it completely. Section 2 deals with the maintenance of the scale, i.e. work that may have to be carried out more frequently. This section can be read as and when required. Troubleshooting is covered in section 4, where you find detailed descriptions of various measurements intended to identify specific errors. Starting point for troubleshooting is section 0, which includes an overview of error descriptions and the inspection steps required to identify them.

1.1 Type plates

To enable you to identify the device, information about the model and serial number is found on the underside or on the frame of the scale (see

Note down this information so that you have it on hand in case you need to contact us for queries or spare parts orders.

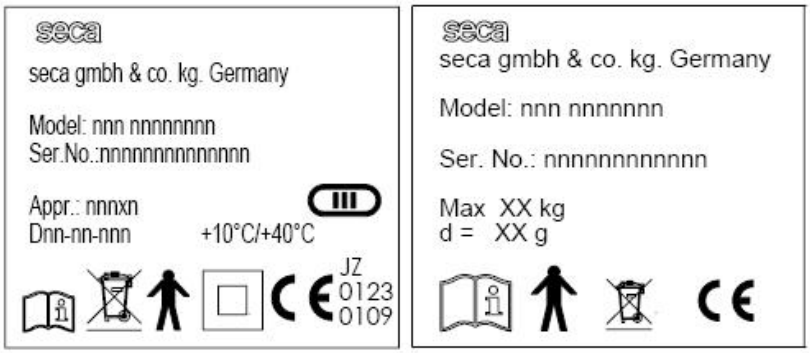

Figure 1: Type plate (left: approved; right: non-approved)

1.2 Design and Function

1.2.1 Design

The scale mainly consists of four parts: the frame, the platform, a housing with printed circuit board (scale electronics with integrated display) and a single measuring sensor (load cell). The measuring sensor connects the platform with the frame and is connected to the scale electronics via a cable.

1.2.2 Function

A force acting on the platform leads to elastic deformation of the load cell. A corresponding analog signal is supplied, which changes linearly with the force applied. This signal is measured and evaluated by the scale electronics and displayed as a weight value. Figure 2: Functional diagram

shows the functional diagram of the scale.

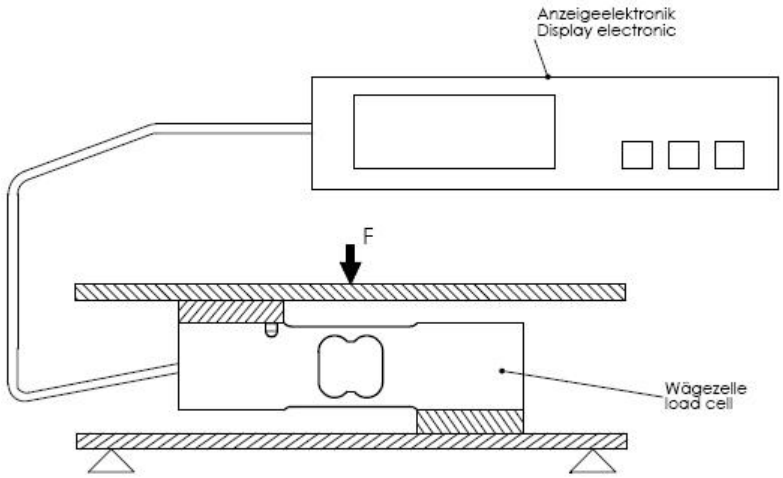

Figure 2: Functional diagram

2 Maintenance

The following section provides an overview of all maintenance jobs which can be carried out.

2.1 Adjustment

2.1.1 General

To compensate for linear measuring deviations, which occur e.g. as a result of gravity variations in different gravity zones, the scale offers an adjustment feature. This adjustment must also be carried out whenever the load cell is replaced.

2.1.2 Carrying Out

The adjustment function is activated using a slide switch/jumper on the PCB (depending on the scale type; see Figure 3: Slide switch (left) in adjustment function activated position / jumper contact (right): adjustment function is activated when connected

After activating the slide switch/jumper, the scale must be switched on to start the adjustment function.

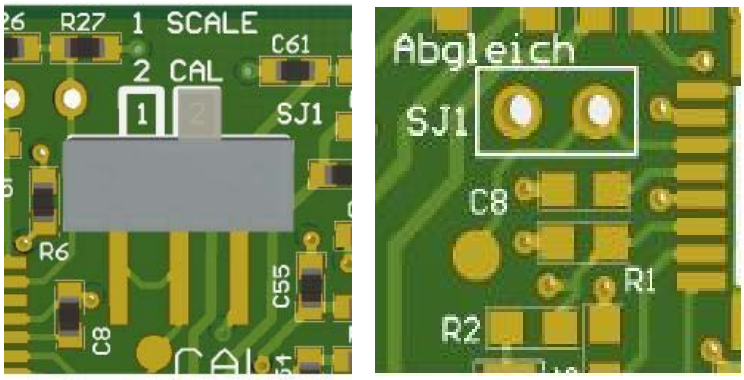

Figure 3: Slide switch (left) in adjustment function activated position / jumper contact (right): adjustment function is activated when connected

To carry out adjustment, the following steps are required:

- Switch on the scale and check the battery status (see note). Do not continue adjustment when the batteries are low.
- Then switch off the scale and open the integrated display by unscrewing the four screws.

This allows access to the slide switch/jumper on the PCB, which can now be operated/placed (see Figure 3: Slide switch (left) in adjustment function activated position / jumper contact (right): adjustment function is activated when connected

- Set the scale up properly again and then switch it on.
- After starting the scale, the segment test comes up and then the display flashes to request that a specific weight be placed on the scale.
- Place the necessary weight in the centre of the weighing platform.
- Once a stable and correct weight value has been detected, the LCD stops flashing and a calibration value is calculated and saved. The scale switches off automatically a few moments later. If the LCD does not stop flashing, this indicates that the weight measured is below the expected weight value or that it is not possible to determine a stable weight value (as a result of vibrations etc.).
- Next remove the weight from the scale, return the slide switch on the PCB to its original position (or alternatively remove the jumper) and refit the display.
- Now set the scale up again and then switch it on. Afterwards, place an adjustment weight on the scale and check whether the correct weight is displayed. If you are working on an approved scale, the scale must be sealed again after successful adjustment in accordance with national regulations.

Note:

Monitoring of the battery voltage is not possible during the adjustment procedure. Therefore make sure to check the battery voltage before and after adjustment. You can do so by switching on the scale and watching the display. If the battery voltage is low, either the early battery warning symbol or the "*bAtt*" display is activated. If one of the two displays occurs before or immediately after adjustment, the batteries must be replaced and adjustment must be repeated.

3 Errors

The following section provides an overview of possible error symptoms, their causes and the steps required to remedy the error. In addition, the error messages generated by the scale and ways to eliminate them are explained.

3.1 Error Symptoms

Error description	Possible causes	Remedy
Scale does not start	Battery not inserted or flat	Check the batteries
	Voltage supply defective	See *section 4*
	Keyboard defective or not connected	Check cable connections, check cable and keyboard for interruptions, replace if necessary
Scale shows no weight or an incorrect weight	Packaging / transport locking device not removed completely	Check the scale
	Scale not correctly adjusted	See *section 2*
	Load cell damaged	See Replacement Instructions 30-34-00-787
	Force transmission into load cell interrupted	Check base frame for damage or incorrect assembly
Measured values vary greatly	Display electronics/load cell damaged	See Replacement Instructions 30-34-00-787

Table 1: Error symptoms

3.2 Error Messages Generated by the Scale

Scale displays	Cause	Remedy
Er 11	Load cell defective or supply lines damaged	See *sections 4.1*
Er 12	Admissible switch-on zero point overshot *or* Load cell damaged	Check initial load and reduce if necessary See *sections 4.1*
Er 16	Device failed to determine a valid switch-on zero point	Avoid subjecting the scale to vibrations during start-up
Er 40	EEPROM defective/deleted	Replace display electronics/load cell
Er 50	Flash memory defective	Replace display electronics/load cell

Table 2: Scale error messages

4 Measurements

The following section provides an overview of measurements which can be performed to identify specific errors.

4.1 Supply Voltage

Measuring the supply voltage at the electronics board provides information on whether the supply lines to the battery compartment and/or the power supply unit are OK. When operating on battery power you should measure approx. 9V and approx. 12V when using a power supply unit. Carry out the measurement by connecting a multimeter to measuring points A and B (see Appendix 1).

4.2 Display Electronics and Load Cell

The most effective way to identify a defect of the load cell is using an oscilloscope (see 4.2); if you do not have this type of equipment at your disposal, you can alternatively use a multimeter (see 0). A multimeter measurement, however, is less conclusive so that it should always be second choice.

4.2.1 Measurement Using an Oscilloscope

To carry out the measurement, switch on the scale and attach the probe head at measuring point C (see Appendix 1). Measuring point B (see Appendix 1) is used as ground contact. Make sure that you pierce the paint with the probe tip.

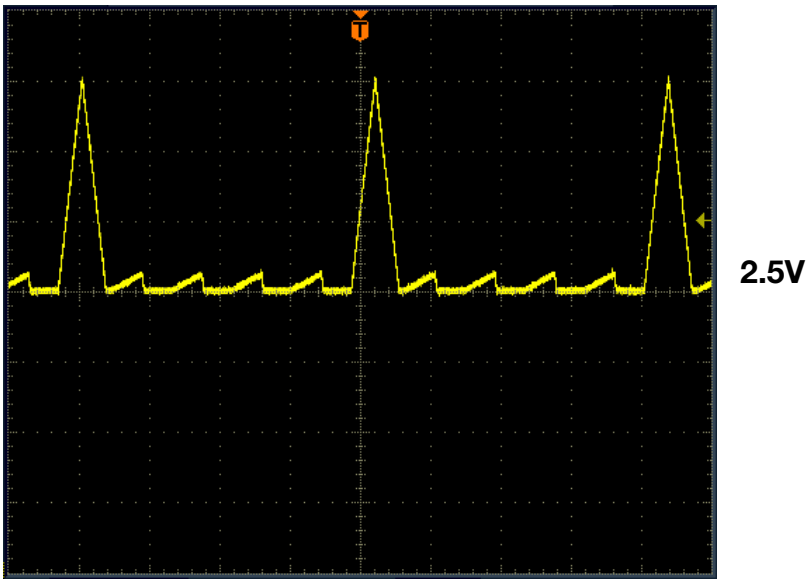

Figure 4: Output signal of AD converter when load cell and supply line are intact

On the oscilloscope you should now see recurrent ramps starting from a 2.5V line, the height of which depends on the load on the load cell. When you press on the load cell, the amplitude of the four ramps which come after the large ramp increases (see Figure 4: Output signal of AD converter when load cell and supply line are intact

For the measurement, the following settings are recommended: time basis 10ms, resolution 500mV, trigger level 3V (rising edge).

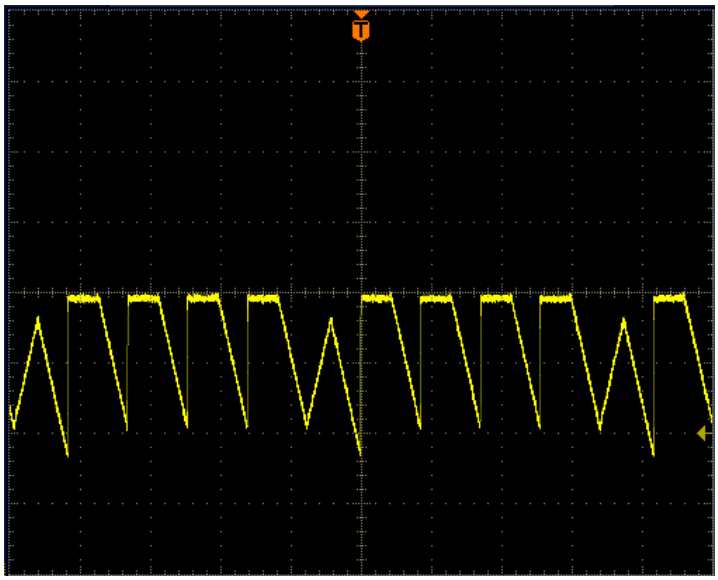

Figure 5: Output signal of AD converter when load cell or supply line is defective

If load cells are defective, this is usually easy to identify. Sometimes they distort the signal to such an extent that the ramps no longer start at 2.5V (see Figure 5: Output signal of AD converter when load cell or supply line is defective
, 1V resolution).

4.2.2 Measurement Using a Multimeter

First of all, unsolder the load cell from the electronics and measure the resistance between the different connecting wires (see Figure 6: Design of a load cell

. The table below shows the values to be expected:

Measurement between	*Ohmic resistance [Ω]*
V_+ and V-	405±10
Sig_+ and Sig-	350±5
Sig_+/Sig- and V_+/V-	290±5
Sig_+/Sig-/V_+/V- and aluminium body of the load cell	approaches infinity

Table 3: Ohmic resistances of load cell

The relevant cabling diagram shows the designations and associated cable colour. The measured values only have a limited informative value; however, as even a defective load cell can supply absolutely correct values when no load is placed on it (a more qualified result can be obtained using an oscilloscope to carry out the measurement). If the load cell supplies incorrect values when unloaded, it is definitely defective.

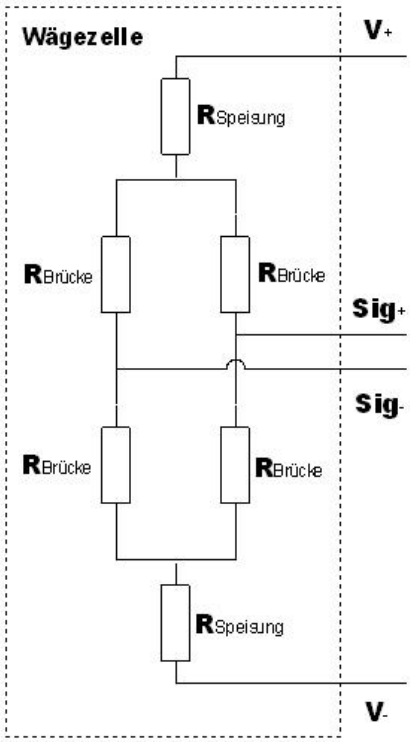

Figure 6: Design of a load cell

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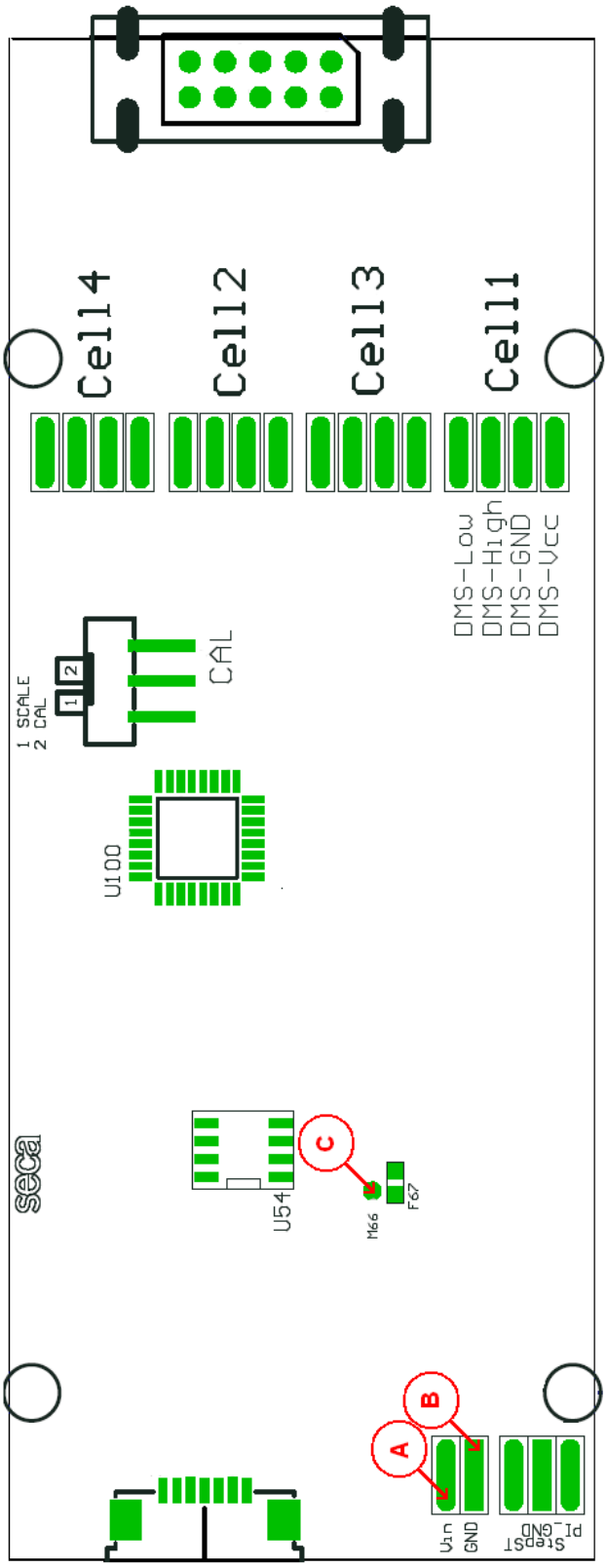
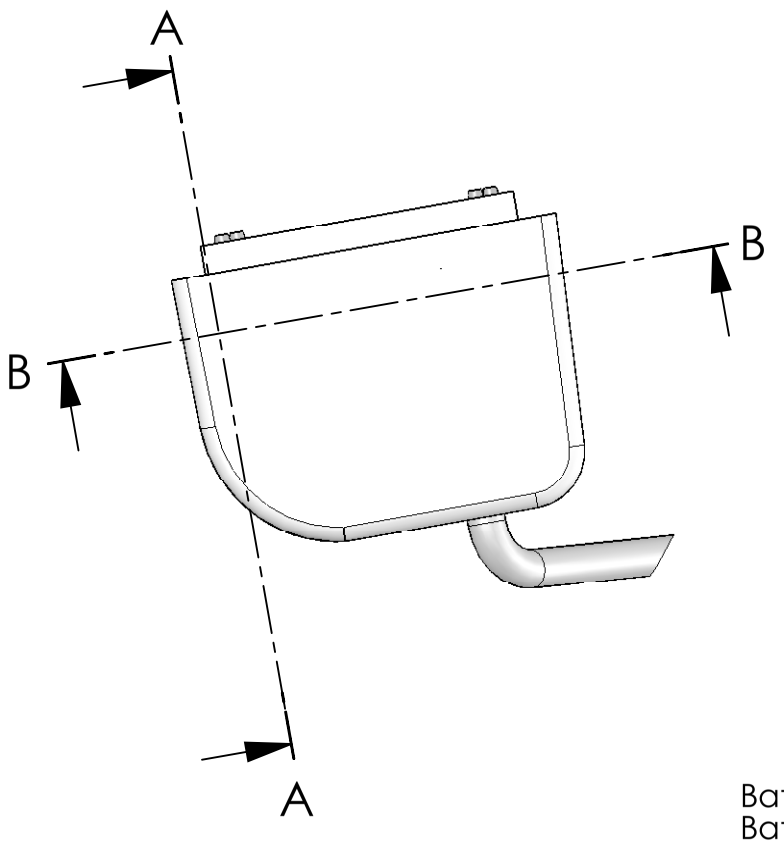
B Index of Diagrams

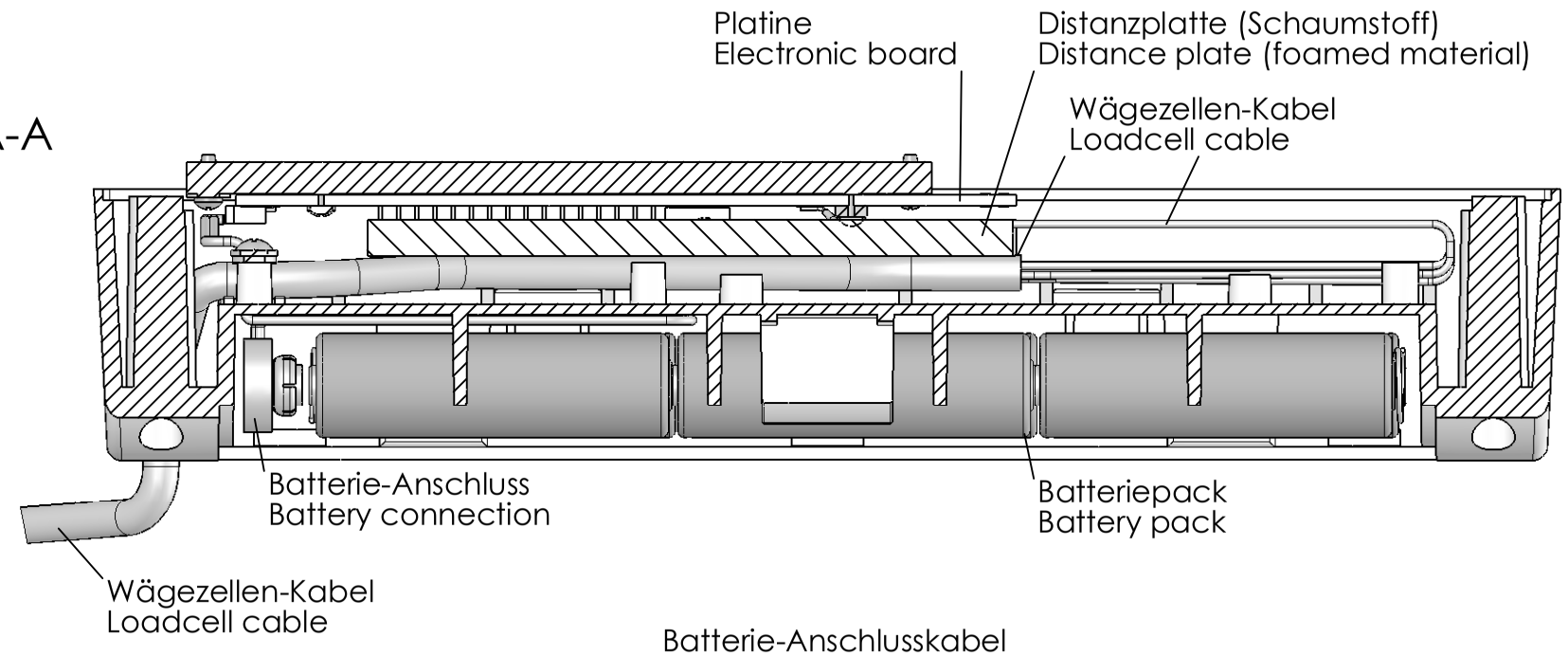
C Appendixes

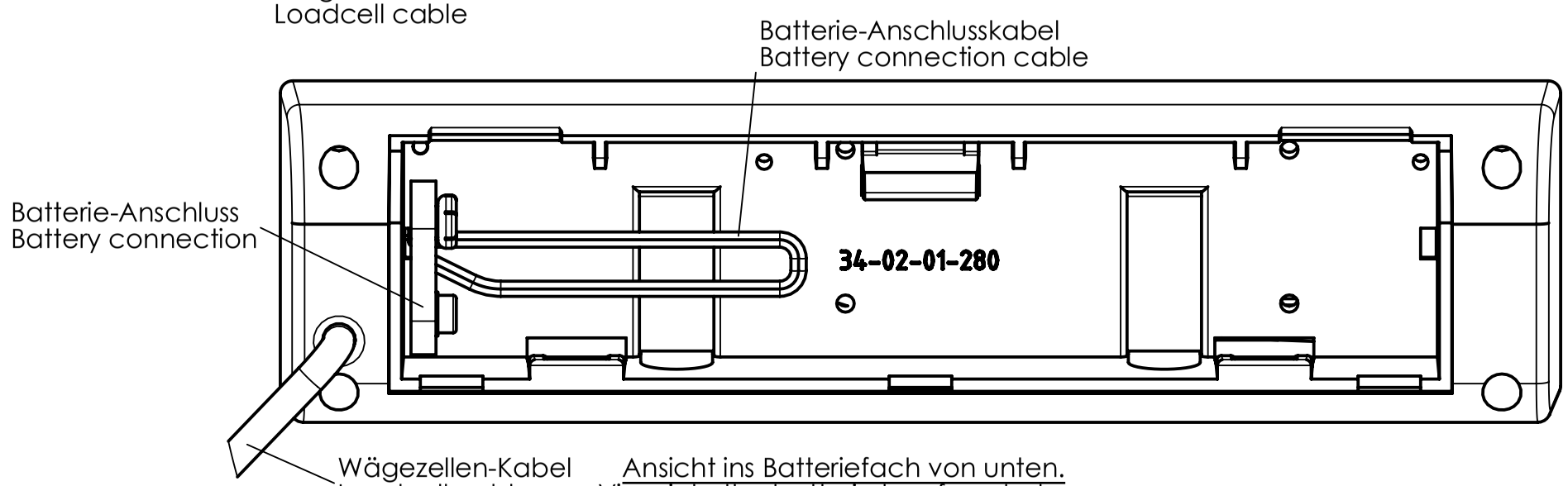


Appendix 1: Measuring points on SECA module 08-06-18-160



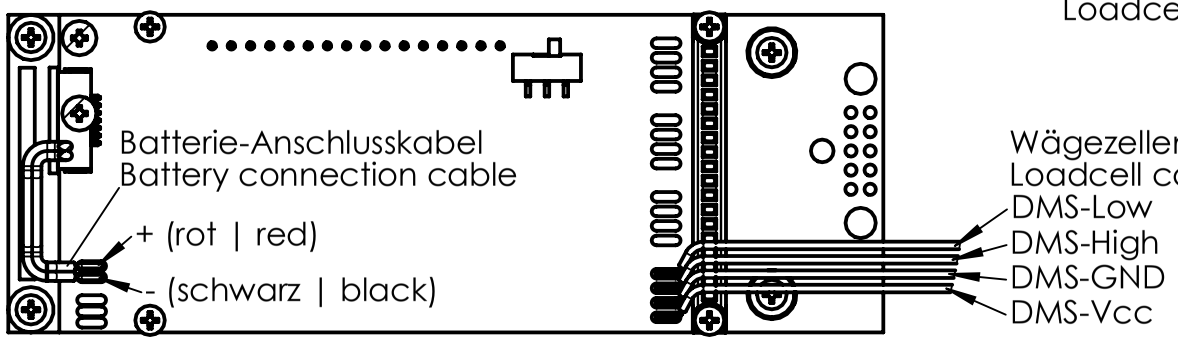
A-A





Ansicht ins Batteriefach von unten.
View into the batterie box from below.

B-B



Wägezellen-Kabel. Farbzuordnung siehe Tabelle.
Loadcell cable. Colour allocation see table.

DMS-Low
DMS-High
DMS-GND
DMS-Vcc

Ansicht auf Platine von unten.
View on the electronic board from below.

WZ-Type	DMS-Vcc	DMS-GND	DMS-HIGH	DMS-Low	Zugelassen admitted
HBM PW10 C4 250 kg	blau | blue	schwarz | black	weiß | white	rot | red	ja | yes
TEDEA Mod.Nr. 1242	grün | green	schwarz | black	rot | red	weiß | white	ja | yes
Kogean/V-Care 250 kg	grün | green	schwarz | black	weiß | white	rot | red	nein | no
(b) Flintec PC46	grün | green	schwarz | black	weiß | white	rot | red	ja | yes
Scaime AHN250C4SH10e	braun | brown	grün | green	gelb | yellow	weiß | white	ja | yes

Datum/Name:	10.12.2008 Asch.	15.07.2009 Rein.	23.11.2009 Rein.						
Änd.Mitteil. / CHANGE:	(1x)	load cell add	scale change						
Index / REVISION:	a	b	c						

seca HAMBURG

Erstellt / DRAWN	Geprüft / APPROVED Ver. c
27.11.2008	24.11.2009
Aschke	Winterberg

PROJECTION

Maßstab / SCALE :	Werkstoff / MATERIAL :	Benennung / TITLE :	Nr. / NO. :
1:1		Kabelplan Mod. 952, 956 Cabel scheme mod. 952, 956	08-02-06-047 Blatt/SHEET 1/1

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Replacement instructions

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Safety measures:
Before starting any work on the scale, first disconnect the power supply (mains and batteries).

Safety instructions regarding the prevention of electrostatic charging (ESD protective measures):

ESD protective measures (electrostatic discharge) must be taken whenever work is performed on electronic components. Please observe the following precautions so that you can safely repair the scale:

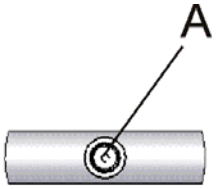
- Ground yourself using an antistatic wrist strap.
- Wear ESD safe shoes.
- Wear ESD compatible clothing.
- Only carry out the work to be performed in an electrostatic protective area.
- Make sure the floor is electrically conductive.
- Only use ESD proof tools.

Special notes regarding the replacement and installation of:

Replacing bubble level A (model 956 only)

Only remove bubble level A if it is defective. Destruction of the bubble level cannot be avoided, and a new bubble level can only be fitted by a skilled person working with great care.

- Lever out bubble level A from the bearing bush.
- Scrape out the plaster from the bearing bush and thoroughly clean the bush.
- When fixing the new bubble level with plaster align it so that it indicates the horizontal position. Alignment must be repeated until the plaster has fully hardened.



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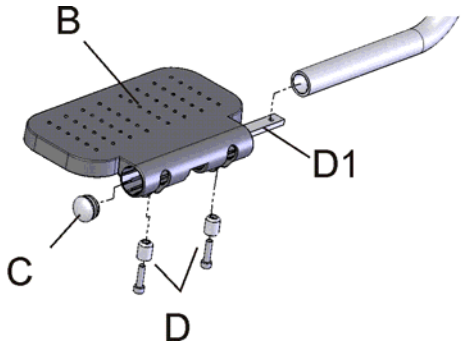
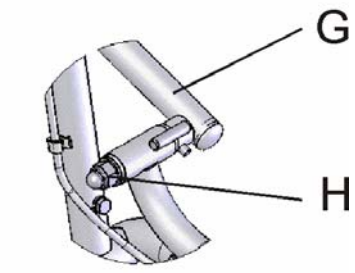
Removing foot rests B:

- Remove plug C.
- Unscrew the two screws and bushes D.
- You can now pull off foot rest B.
- **Attention:** When refitting foot rest B make sure threaded plate D1 is correctly seated in the pipe!



Replacing arm rests G

- When replacing arm rests G take care that screw connections H are only tightened so much that the rests can still move freely.



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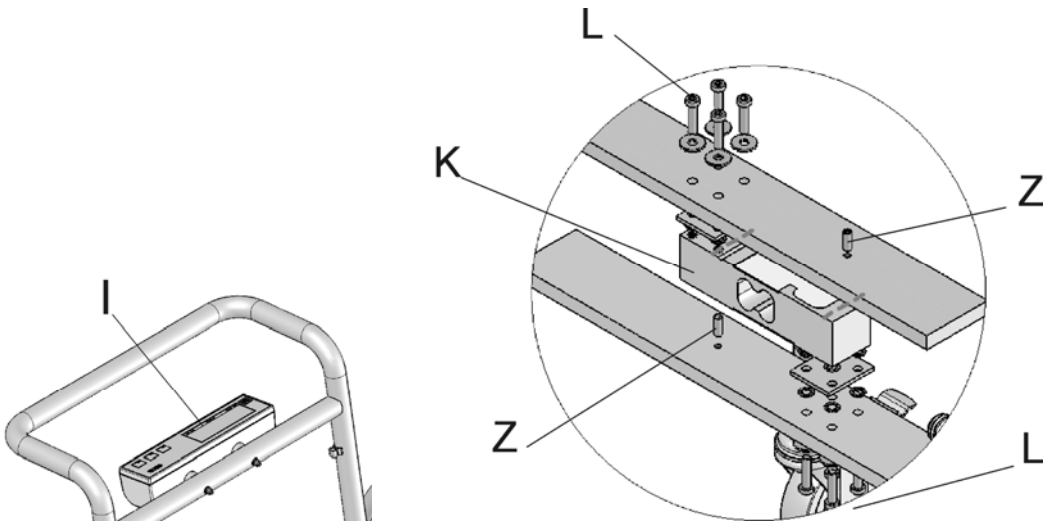
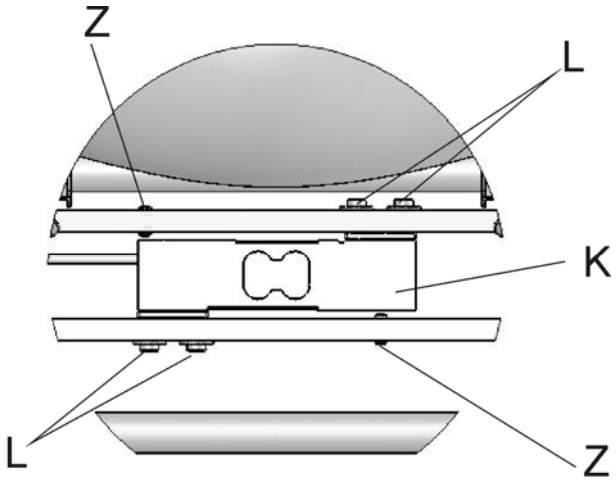
Replacing display housing I with electronics and load cell K adjusted

- Take great care when replacing the display housing I with electronics and load cell K in order not to detach any cables from the printed circuit board.
- The tightening torque for the load cell screw connections L is Mt = 12.5 Nm.



Setting the stop screws Z for overload protection

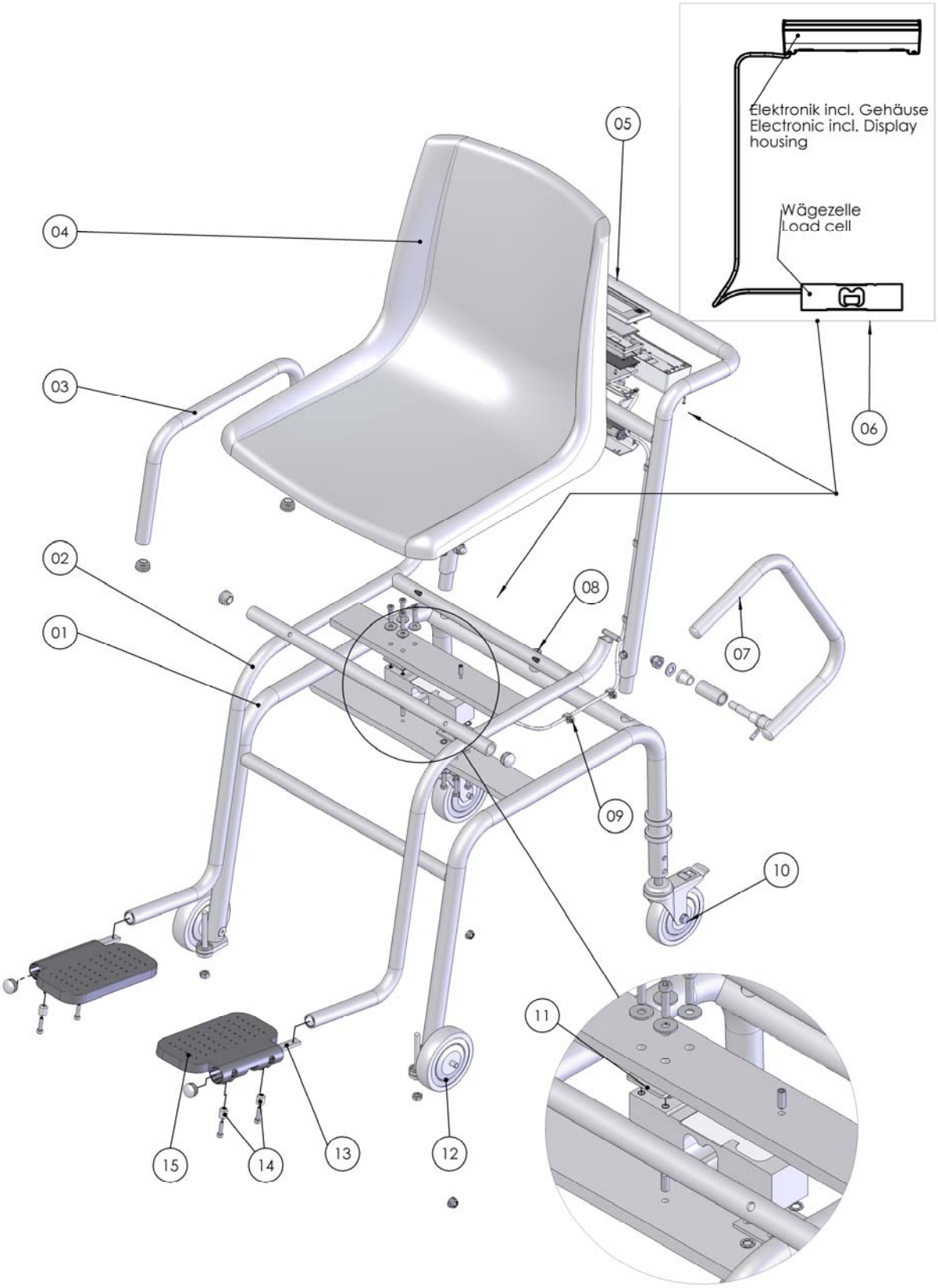
- After tightening the load cell K, the stop screws Z should be turned in so far that they are in light contact with the load cell. Afterwards turn them back by exactly 2 turns. Secure the stop screws in this position with a screwlock adhesive.



Spare parts list

seca 952, 956 Chairscale with LC Elektronik

Item	Articel-no.	Designation	Price stage
Chairscale drawing page 2			
01	02-02-03-105-008	Baseframe, light grey	45
	02-02-03-121-008	Baseframe, light grey (red. seat height)Japan, China	45
02	02-04-03-078-008	Seat frame, light grey	36
	02-04-03-078-006	Seat frame, distant blue , WIBU	36
03	02-04-03-065-008	Arm rest right, light grey	35
	02-04-03-065-006	Arm rest right, distant blue , WIBU	35
04	02-12-15-248-009	Seat	35
05	02-02-03-120-008	Handlebar frame, light grey	33
06	08-06-12-099-509	Load cell with electronic compl. adjusted incl. display housing without frontfoil	45
	08-06-12-101-509	Load cell with electronic calibrated compl. adjusted incl. display housing without frontfoil	50
07	02-04-03-066-008	Arm rest left, light grey	35
	02-04-03-066-006	Arm rest left, distant blue, WIBU	35
08	01-17-01-203-009	Bubble level (only mod. 956)	15
	50-90-00-710-009	Cap (only Mod. 952)	01
09	66-30-42-051-009	Clip holder	01
10	02-11-04-060-509	Guide roll compl. with wheel	30
11	08-04-02-211-009	Pressure plate (load cell)	15
12	02-11-04-228-009	Roller	22
13	01-16-02-268-009	Thread base plate (foot rest)	10
14	01-16-02-269-009	Socket	05
15	01-13-05-458-009	Foot rest	20
Display housing drawing page 3			
18	34-02-01-281-009	Cover for battery compartment	05
19	66-30-60-025-009	Battery holder	10
20	34-02-01-282-009	Spacer	01
21	34-02-01-280-009	Display housing	20
22	34-02-01-272-009	Window	10
23	14-05-08-230-009	Sticker weighing data mod. 952	01
	14-05-08-231-009	Sticker weighing data mod. 956	01
24	34-02-01-265-009	Display cover	10
25	34-02-04-403-009	Frontfoil mod. 952	25
	34-02-04-420-009	Frontfoil Mod. 956 calibrated	25
	34-02-04-423-009	Frontfoil Mod. 956 China calibrated	25
	34-02-04-424-009	Frontfoil Mod. 956 Japan calibrated	25
26	01-13-04-351-009	Distance plate	01
(27)	18-01-07-056-009	Package compl. 952/956	23
	18-01-07-059-009	Package compl.. 956 China, 956 Japan	23


Elektronik incl. Gehäuse
Electronic incl. Display housing
Wägezelle
Load cell
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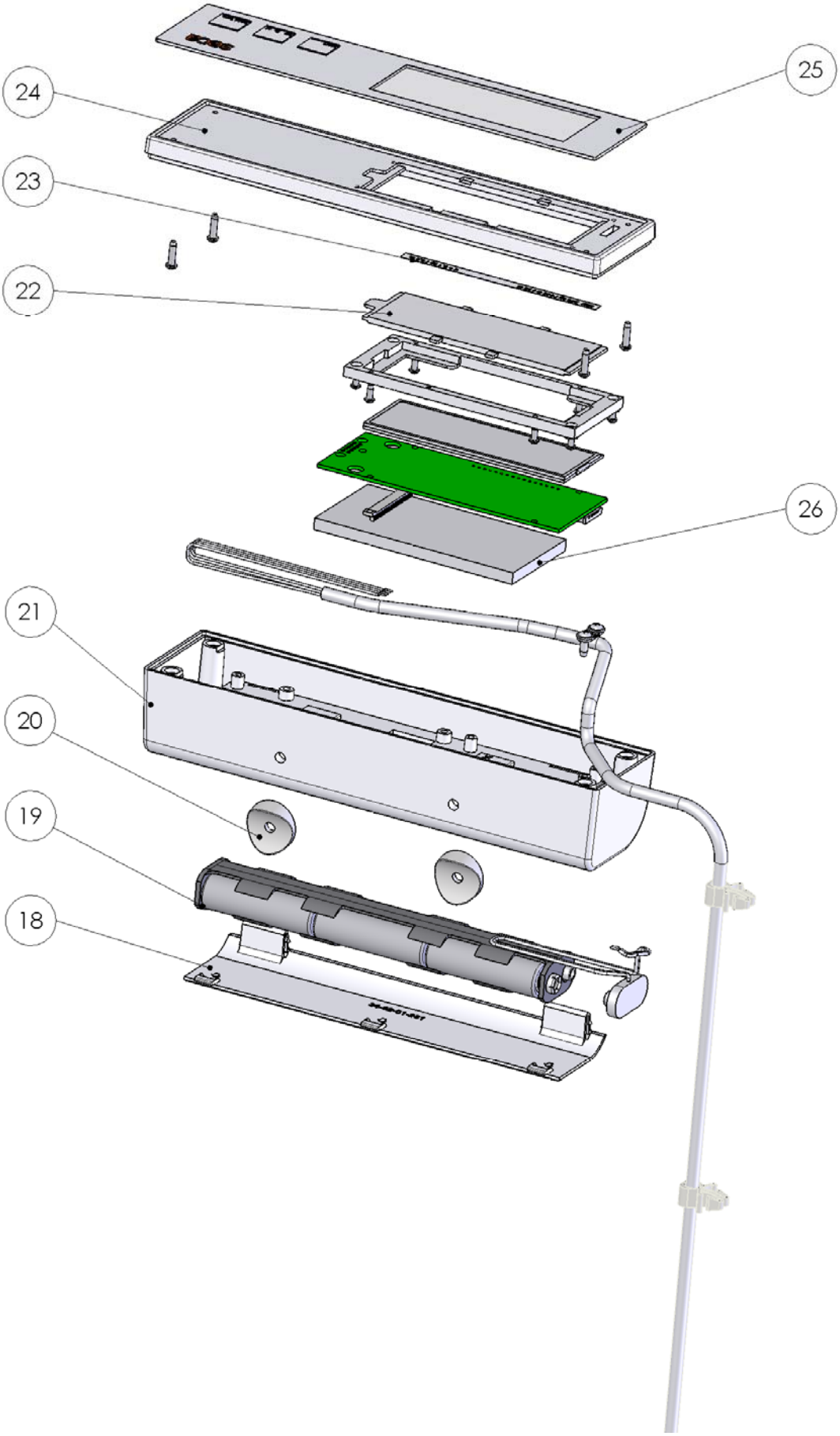
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