



SERVICE MANUAL

LATERA ACUTE
LATERA THEMA
(according to 60601-2-52)

Date 05/2015
Version 02



Latera Acute, Latera Thema – Service Manual

Universal hospital bed

Author: LINET, s. r. o.

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1 Introduction – General Information



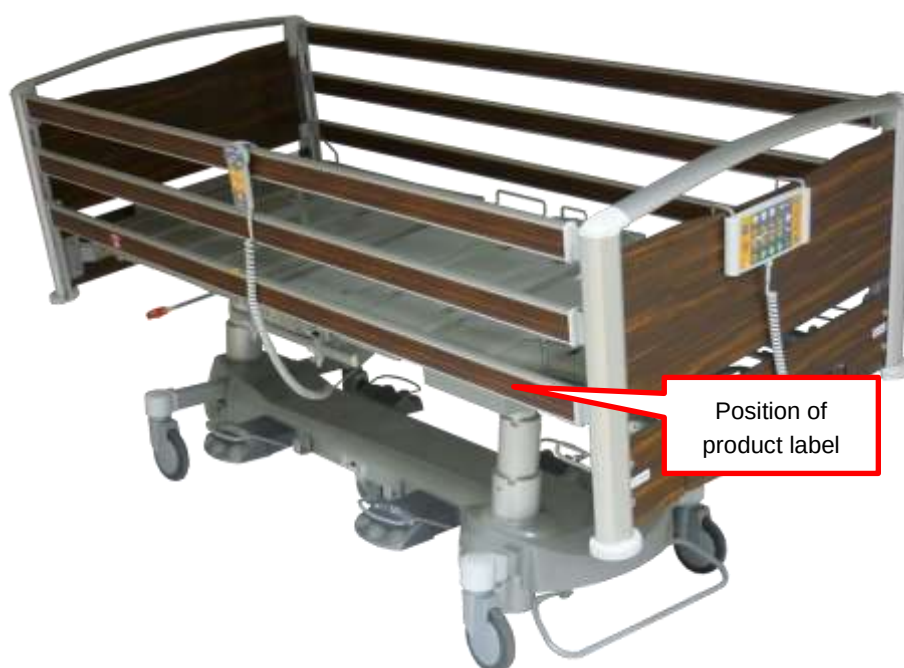
The exclamation mark in a triangle indicates a particular risk during handling, operation and control.



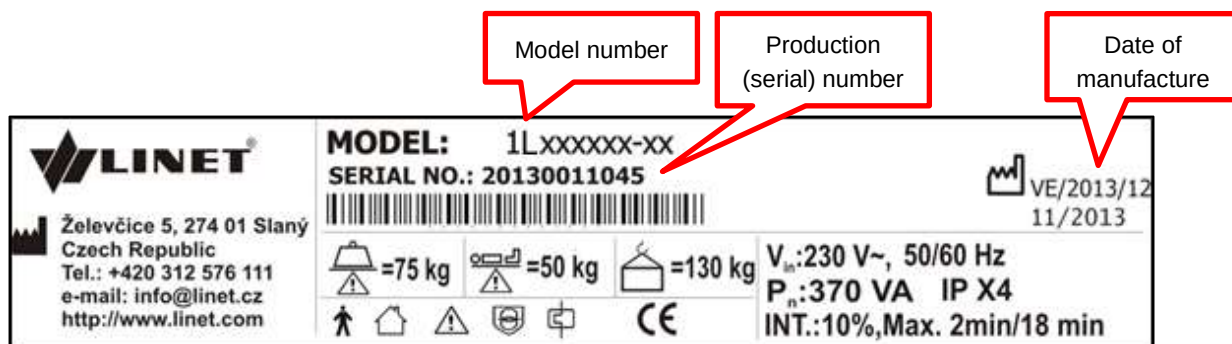
The „hand“ symbol indicates special tips and operating notes.

1.1 Product label and technical label – location

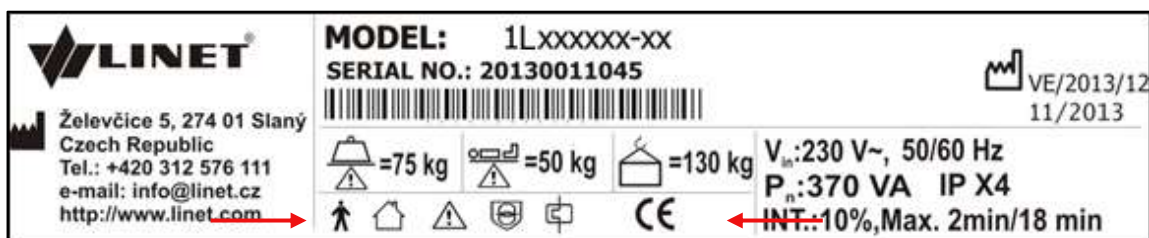
1.1.1 Product label description



Position of
product label

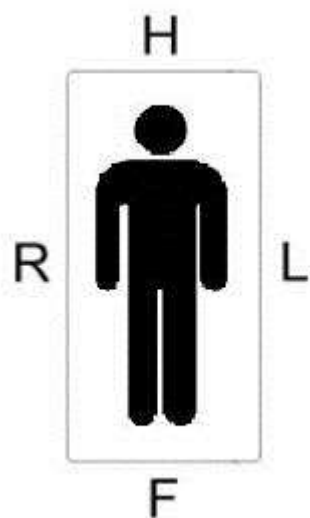


1.1.2 Technical label description



Product Symbols and Labels	
	Transformer thermal protection
	Only suitable for indoor use
	Electric shock protection – Applied part type B
	Safety isolating transformer, general
	Equipotential equalisation connection
	Safe working load
	Warning against injury or entrapment
	Maximum weight of patient
	Only use a mattress recommended by the manufacturer
	Read instructions before use
	Warning

1.2 Identification of bed parts



1.3 List of tools and equipment needed for servicing the bed

Tools (metric)

Socket set
Screwdriver set
Engineer's wrench set
Hex key bits set
Torx bits set
Hex key set
Knife
Set of pincers
Torgue wrench
Hammer, nylon hammer
Tape measure
Crimping pincers for RJ connectors
Multimeter



2 Technical data

2.1 Conditions of use

US parameters	Values
Temperature	+50 °F — +104 °F
Humidity	30 — 75 %
Atmospheric pressure	23,5 — 31,3 inHg

EU parameters	Values
Temperature	+10 °C — +40 °C
Humidity	30 — 75 %
Atmospheric pressure	795 — 1060 hPa

2.2 Mechanical data

Parameters	Values
Outside dimensions (side rails up)	
- Latera Acute	219 x 98,5 cm
- Latera Thema	219 x 102,5 cm
Mattress Platform dimension	200 x 86cm
Maximum Mattress Height	
- Latera Acute	14 cm
- Latera Thema	20 cm
Mattress Platform Height Adjustment	43 - 81 cm
Maximum backrest adjustment	60° (±4°)
Maximum thigh rest adjustment	46° (±4°)
Trendelenburg / reverse Trendelenburg position	+16°/ -16°
Lateral tilt	+15°/ -15°
Auto-regression	11 cm
Weight /basic equipment/	160 kg
Safe working load (SWL)	200 kg
Maximum lifting pole load	75 cm



For more information see User's manual.

2.3 Electrical data

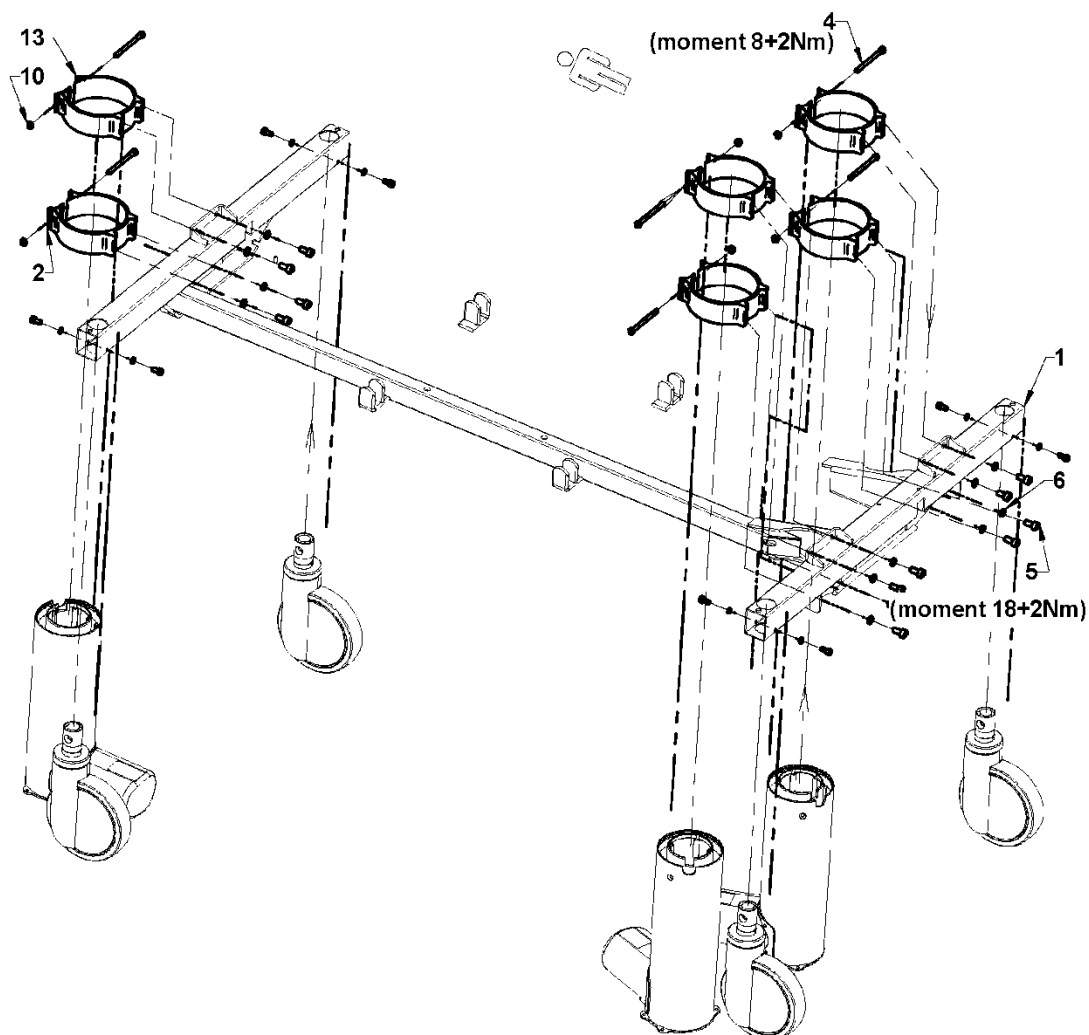
Parameters	Values
Input voltage	230 V, +/- 10%, 50/60 Hz (US version 110V)
Maximum power input	max. 1,6 A, 370 VA
EN 60529 Safety protection	IP 54
Safety class	Class I
Applied parts	Type B
Electrical actuator maximum operating time / cooling time (duty cycle)	10%, max. 2 min. / out of 18 min.
Batteries	2x sealed lead-acid accumulators 12 V (integrated fuse 15 A), capacity 1.2 Ah each
Fuses	T1.6A L 250V (230V version) T3.15A L 250V (100-127V version)



Upon request, LINET can deliver hospital and care beds with electrical specifications that comply with regional standards (custom voltage, different mains plugs).

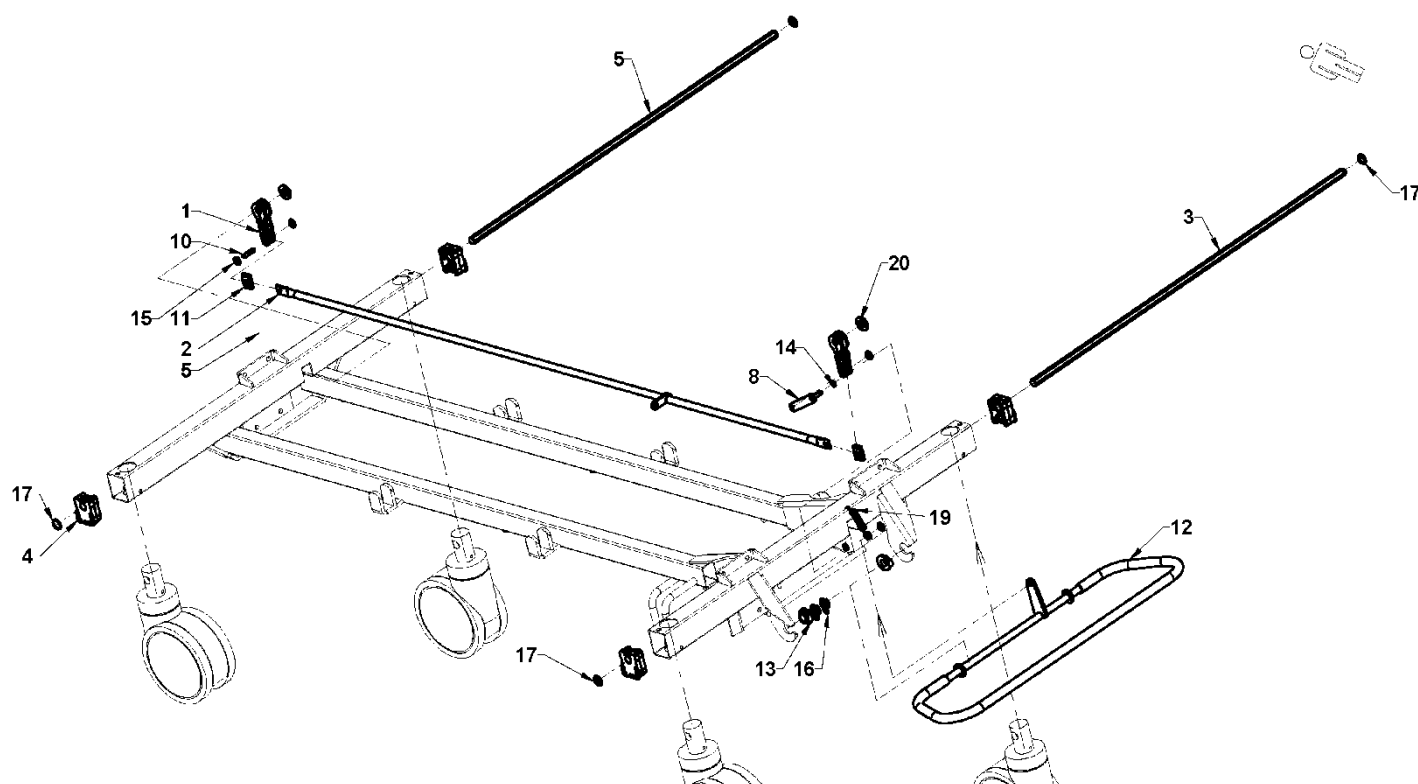
3 Components

3.1 Undercarriage



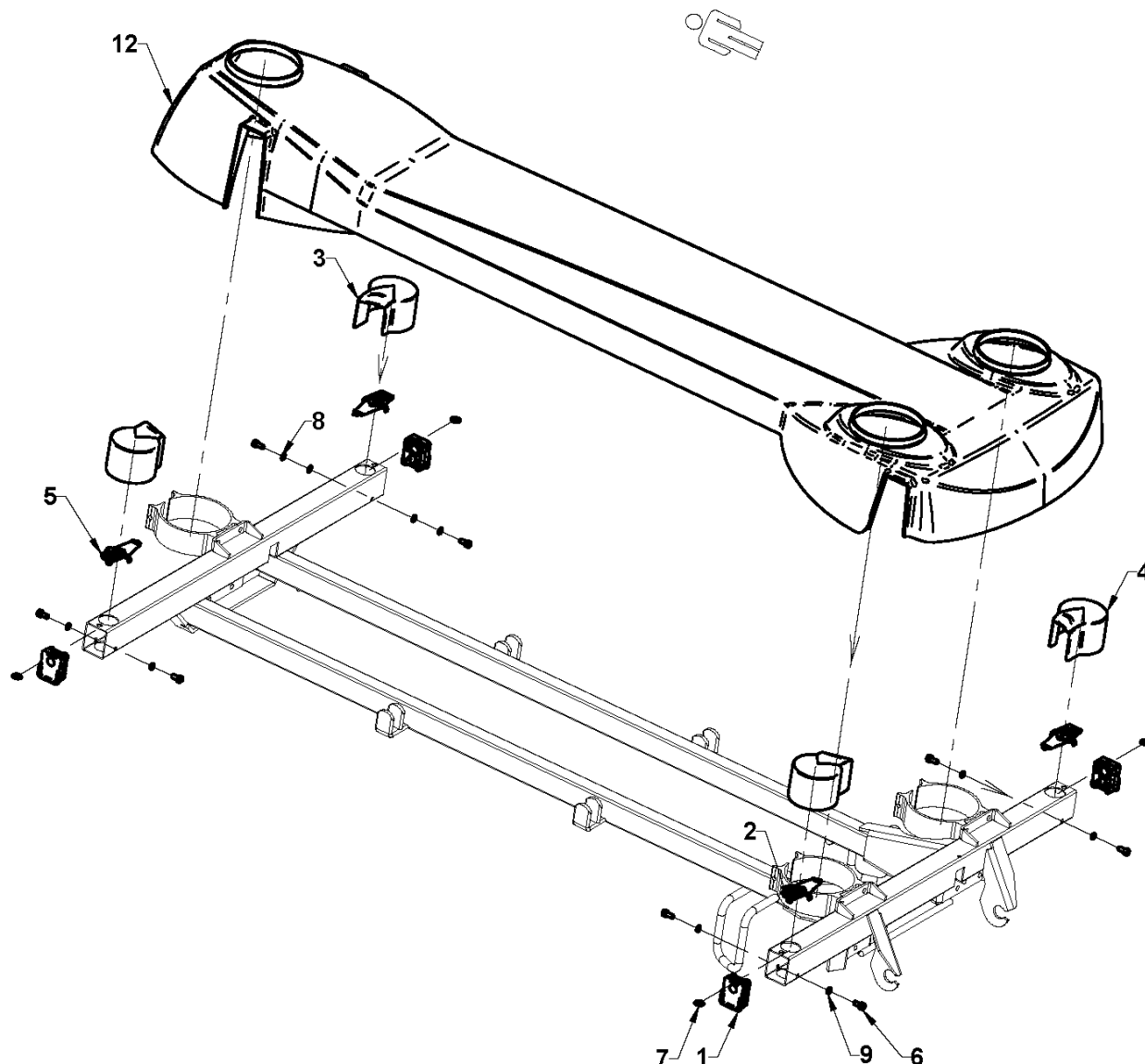
NO.	Part name	Pieces
1	Undercarriage frame, 3 columns	1
2	Bushing of column, E2003, Al	5
4	Connecting screw, M6x75 IMB DIN912, Steel/Zinc	6
5	Connecting screw, M8x16 IMB DIN912, Steel/Zinc	12
6	Flexible washer. 8 DIN 7980, Zinc	12
10	Self-locking nut, M6 DIN 985. Zinc	6
13	Bushing of column, Al	1

3.2 Central braking system



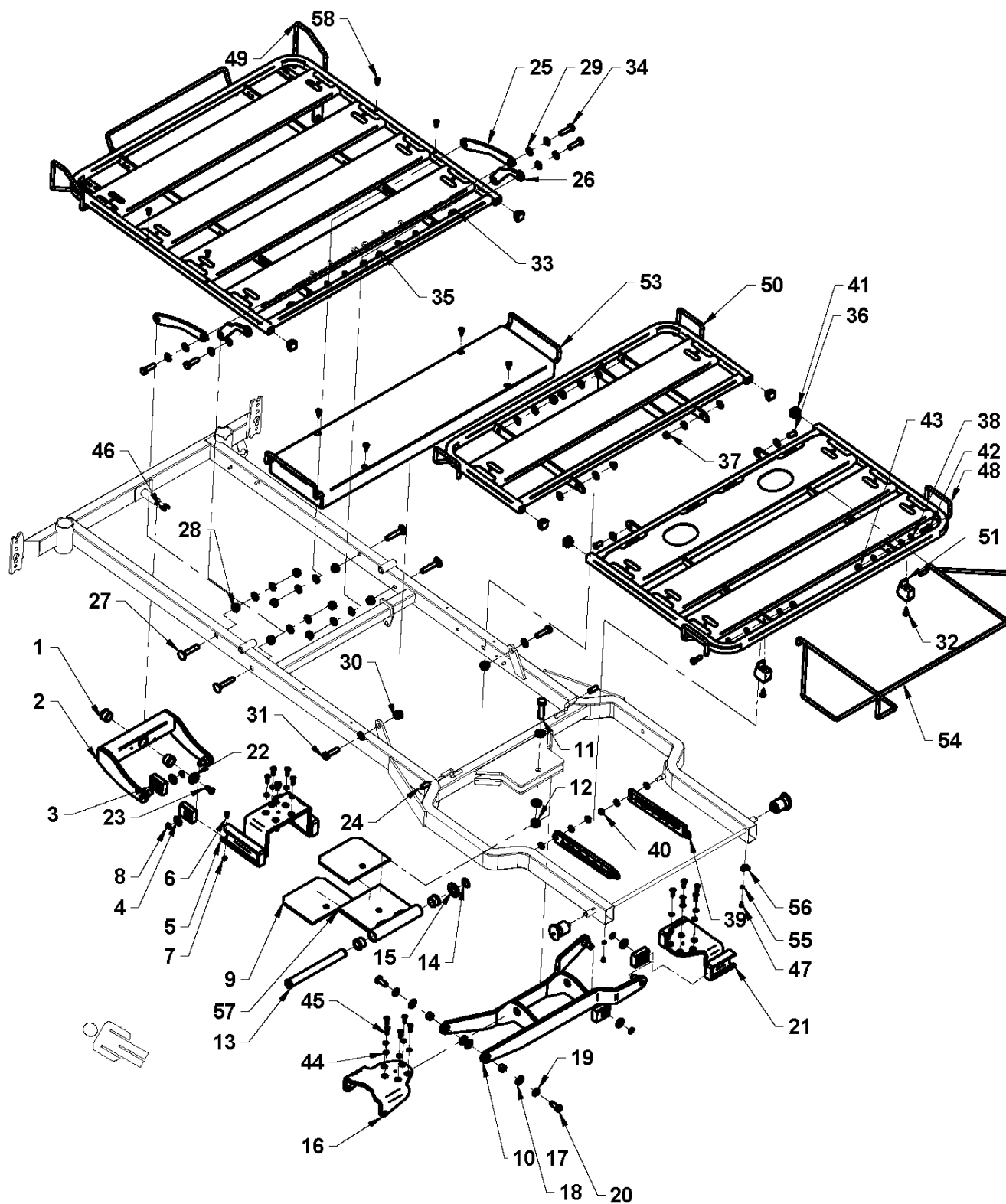
NO.	Part name	Pieces
1	Lever, screw – assembly	2
2	Pull rod, central braking system, 5 th wheel	1
3	Braking rod hexagonal, 11 (11373)	1
4	Stopper, PA 6+30%GF	4
5	Braking rod hexagonal, D 11, L765	1
8	Connector – CBS Latera	1
10	Cog 6x25, 11SMn30 – (11109)	1
11	Spring for pull rod, PA 6	2
12	Lever	1
13	Bushing	2
14	Distance washer, plastic 6,5/12/1, PE, white	4
15	Starlock rounded 6, Cr/Powder coated	4
16	C – ring, PA 6	2
17	Starlock, ring 11, Fe	4
19	Spring – push,	1
20	Distance ring plastic, 12,5/25/3, NP 212 Pa6 – white	2

3.3 Undercarriage cover



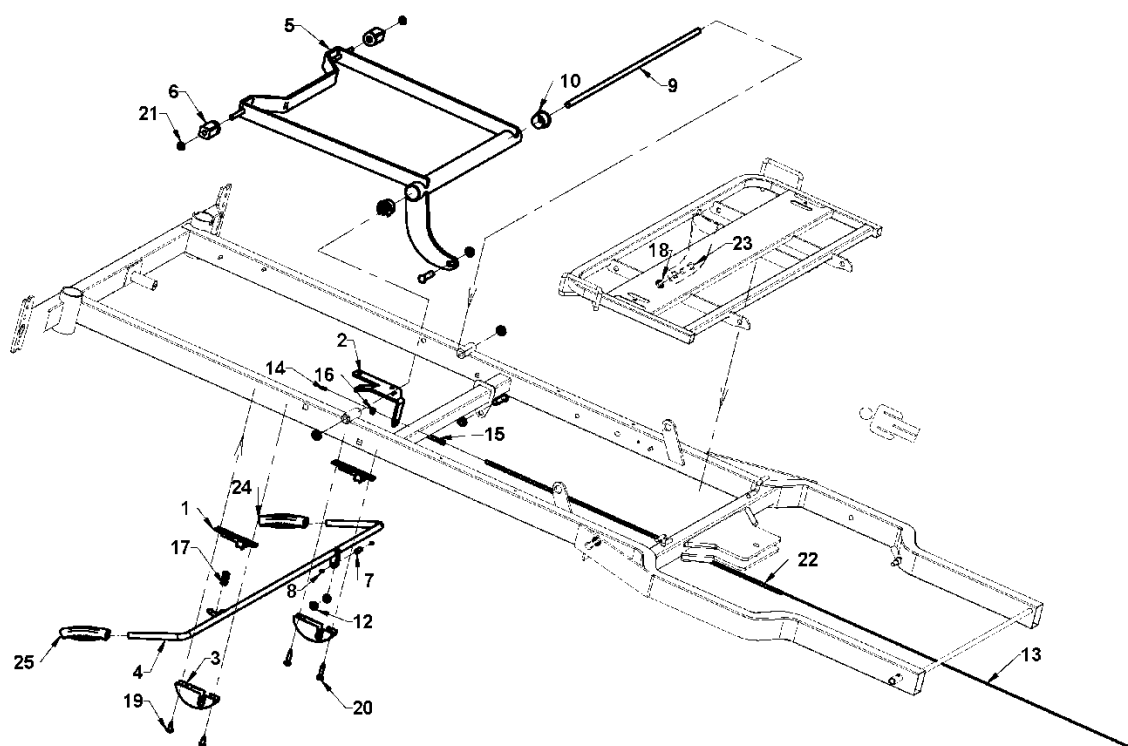
NO.	Part name	Pieces
1	Stopper, PA6	4
2	Cap holder RH-LF, PA6	2
3	Cap LH+RF, ABS	2
4	Cap RH+LF, ABS	2
5	Cap holder RH-LF, PA6	2
6	Connecting screw, M6x12, IMB DIN912, Steel/Zinc	8
7	Starlock, ring 8, Steel	4
8	Toothed washer, 6,4/11/0,7 DIN 6798A	4
9	Flexible washer 6 DIN 7980, Zinc	6
12	Undercarriage cover (Latera 2-52), ABS	1

3.4 Mattress platform



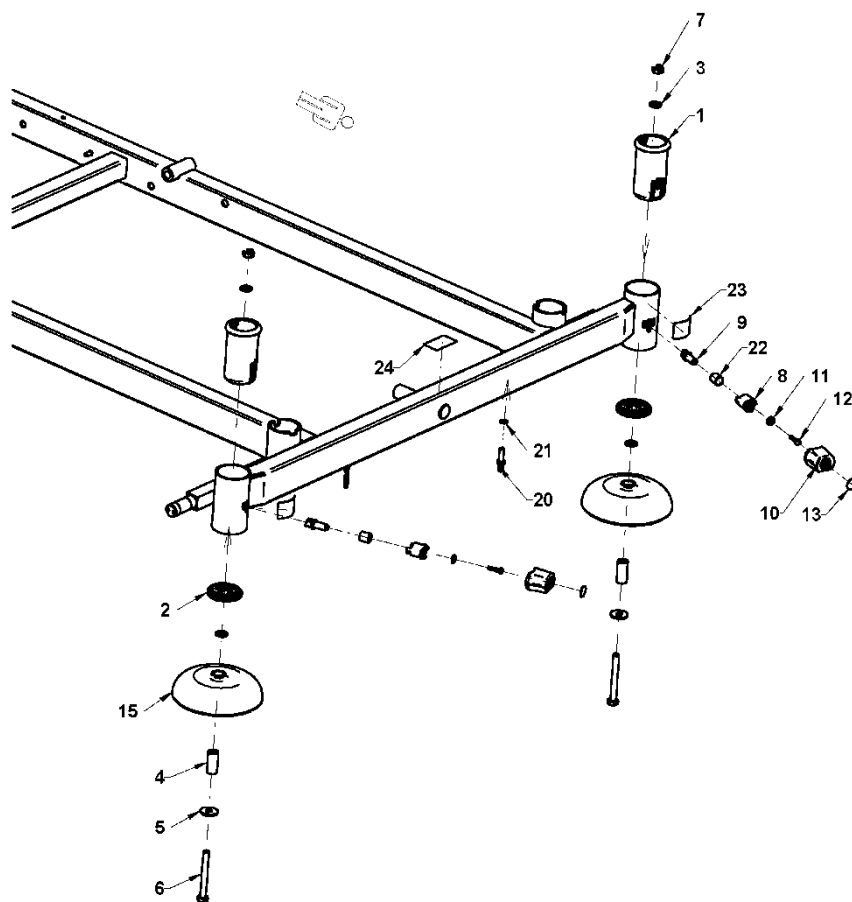
NO.	Part name	Pieces
1	Bushing 20x25x18, PA6	4
2	Rotating bearer	1
3	Guiding element, POM	4
4	Distance washer, 13 DIN125A, Steel/Zinc	6
5	Clamp of head column	1
6	Connecting screw, M5x10, IMB DIN 912, Fe	2
7	Self-locking nut, M5 DIN985, Zinc	2
8	Lock ring, 12 DIN 471	4
9	Sliding board, PE	2
10	Holder of lateral tilt	1
11	Connecting screw, M12x50, Hexagonal, DIN933	1
12	Self-locking nut, M10 DIN985, Zinc	1
13	Welded cog	1
14	Lock ring, 20 DIN471, Steel	1
15	Distance washer 21DIN125A, Steel/Zinc	1
16	Clamp-II, (S235JRG2)	1
17	Bushing, 16x3x10,1 (S235JRG2)	2
18	Distance washer, plastic, 16,5/24/1	4
19	Distance washer, 10,5 DIN 125A, Steel/Zinc	16
20	Connecting screw, M10x25, Hexagonal, DIN933, Steel/Zinc	2
21	Clamp – lateral, free	1
22	Washer – carrier (S235JRG2)	1
23	Connecting screw, M8x16 IMB, DIN912, Steel/Zinc	1
24	Sleeve of the grip bow, rubber	2
25	Grip bow DBFK (S235JRG2)	2
26	Grip bow DBFK, short (S235JRG2)	2
27	Screw M10, L55	4
28	Bushing 16x10x10, PA6	4
29	Distance washer, plastic 10,5/21/1, PA6	22
30	Bushing SD.	2
31	Connecting screw M10x40, hexagonal, DIN931	2
32	Self-tapping screw 6,3x19 VALCOC DIN7981 VZTX, Zinc/Chrome	6
33	Bushing , DBFK, PA6	4
34	Screw, M10x35, Steel/Zinc	4
35	Self-locking nut, M10, DIN985, Zinc	10
36	Cog, 10x20 (11109)	2
37	Starlock deep 10, Steel/Chrome	2
38	Distance washer, plastic 8,4/16/1,6	10
39	RASTO MAT	2
40	Starlock deep 8, Steel/Chrome	2
41	Four-square stopper, VL 20x20x1,5	6
42	Connecting screw, M8x25, Hexagonal, DIN933, Steel/Zinc	2
43	Self-locking nut, M8, DIN985, Zinc	2
44	Fan-shaped washer, 6,4 DIN6798 V/VZ, Zinc	15
45	Embedded screw, M6x20 IMB, DIN 7991, Zinc	15
46	Pin	2
47	Self-tapping screw 4,2x9,5, VALCOC, cross DIN7981F, Zinc	2
48	Calf rest part – Latera 2-52	1
49	Back rest part , welded	1
50	Thigh rest part, welded	1
51	Gliding element, Calf rest part, POM	2
53	Fixed part	1
54	Mattress support (S235JRG2)	1
55	Distance washer, 4,3 DIN 125 A, Steel/Zinc	2
56	Cable clip	1
57	Rotating bearer	1
58	Fastener, plastic	4
60	Locking catch, pull. plastic	1

3.5 Mechanisms of mattress platform



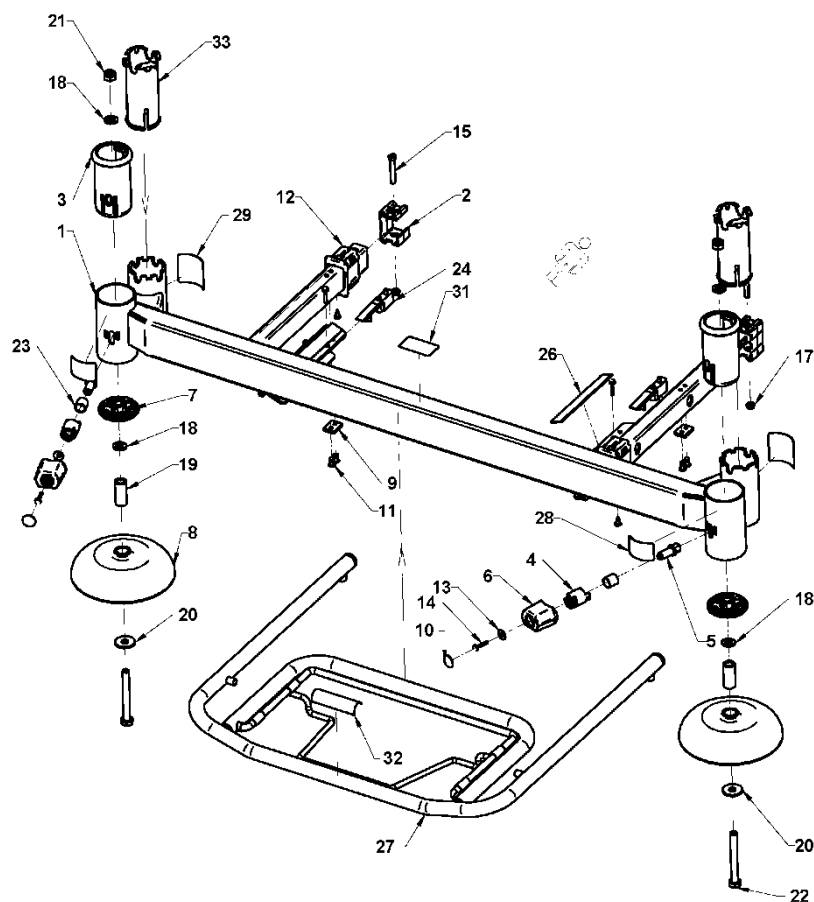
NO.	Part name	Pieces
1	Bearing cover, PA 6	2
2	Bowden stopper (S235JRG2)	1
3	Bearing, ABS	2
4	CPR arm	1
5	Pattern	1
6	Sliding rock, POM	2
7	Cog (11 373)	1
8	Locking screw M5x6 IMB DIN913, Zinc	2
9	Rod of the lifter (S235JRG2)	1
10	Cylindrical bushing, PA6	2
12	Distance washer, 8,4/16/1,6, plastic	2
13	Litz wire, 1,0 2500 mm, anticoro	1
14	Litz wire's ending, 1,5x6,6, Al	1
15	Screw of Bowden (42 3212)	1
16	Nut M6, DIN934, Zinc	2
17	Spring, (17 242) DIN 17224 x 12	1
18	Starlock deep 10, Steel/Cr	6
19	Self-tapping screw, 6,3x19 VALCOC, DIN7981VZTX, Zinc/Cr	2
20	Self-tapping screw, 6,3x32 VALCOC, cross, DIN7981 VZTX	2
21	Starlock deep 8, Steel/Cr	2
22	Bowden II	1
23	Deformation rivet, 10x40 COC, DIN674, Zinc	4
24	CPR lever grip, left, PP	1
25	CPR lever grip, right, PP	1

3.6 Head end bar



NO.	Part name	Pieces
1	Head end bushing	2
2	Corner insert, PA6	2
3	Distance washer, 8,4 DIN125A, Steel/Zinc	4
4	Spacing tube (11 343)	2
5	Distance washer, 8,4-24-2 DIN9021, Steel/Zinc	2
6	Connecting screw, M8x70, Hexagonal, DIN933, Steel/Zinc	2
7	Self-locking nut, M8x70, Hexagonal, DIN933, Steel/Zinc	2
8	Frame of head end locking	2
9	Locking part, PA6	2
10	Controlling element, ABS	2
11	Distance washer, 4,3 DIN9021, Zinc	2
12		2
13	Self-stick cap, ABS	2
15	Wheel (bumper), 125mm, PA6	2
20	Grounding pin	1
21	Fan-shaped washer, 6,4/11/0,7 DIN 6798A	1
22		2
23	Self-stick label, PVC	2
24	Self-stick label, PVC, transparent	1

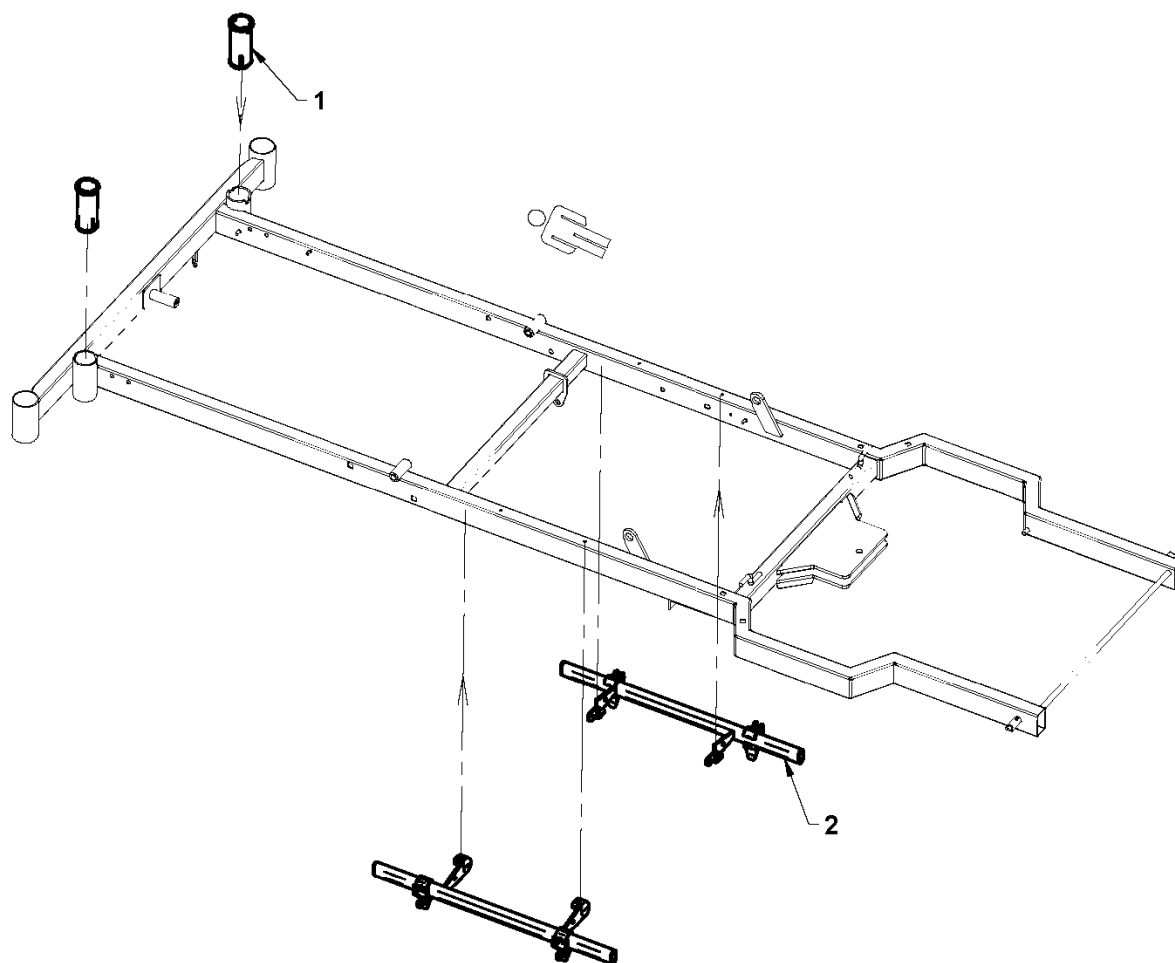
3.7 Foot end bar



NO.	Part name	Pieces
1	Foot end bar (with protector bushing)	1
2	Back guiding element, PA6	2
3	Foot end bushing	2
4	Frame of foot end locking	2
5	Locking part, PA6	2
6	Controlling element, ABS	2
7	Corner insert, PA6	2
8	Wheel (bumper), 125mm, PA6	2
9	Foot end bar stopper (S235JRG2)	2
10	Self-stick cap, ABS	2
11	Tearing rivet, 4x12 DIN7337A, Al/Zn	4
12	Guiding element, front, PA6	2
13	Distance washer 4,3x12 DIN9021, Zinc	2
14	Special screw, 4,3x18	4
15	Connecting screw, M5x35 IMB, DIN912, Steel/Zinc	2
17	Self-locking nut, M5 DIN985, Zinc	2
18	Distance washer, 8,4 DIN125A, Steel/Zinc	4
19	Spacing tube (11 343)	2
20	Distance washer, 4,3 DIN9021, Steel/Zinc	2
21	Self-locking nut, M8, DIN985, Zinc	2
22	Connecting screw, M8x70, Hexagonal, DIN933, Steel/Zinc	2
24	Stopper of the shelf, POM	2
26	Insert, ABS	2

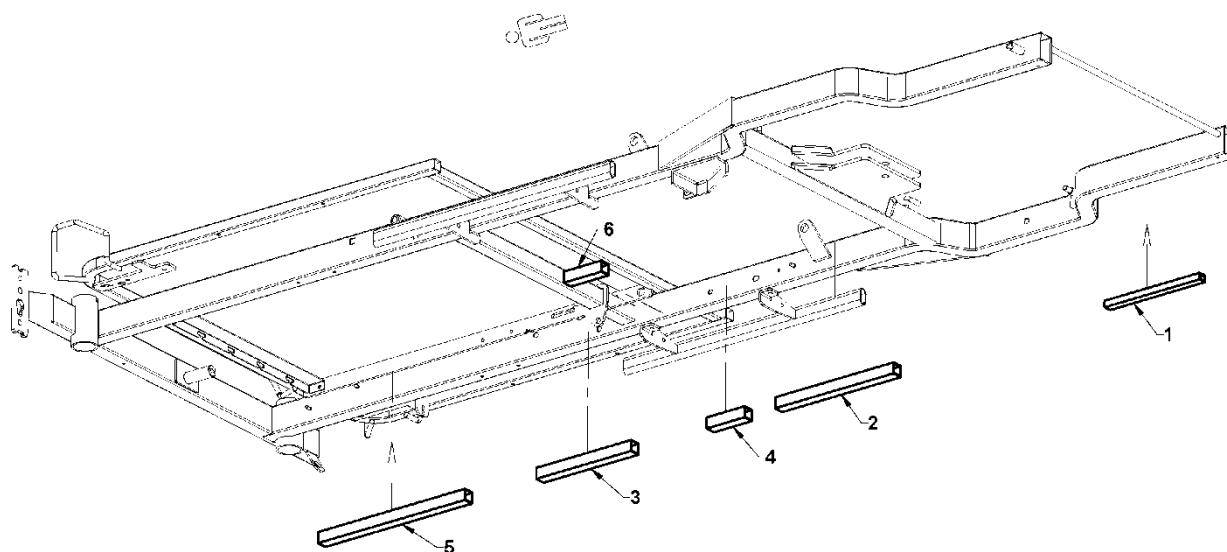
27	Shelf	1
28	Self-stick label, PVC, transparent	2
29	Self-stick label, PVC – incorrect placement of the lifting pole	2
31	Self-stick label, PVC – removeable bed ends	1
32	Self-stick label, plastic, L60 W25 – Eleganza, max. load of shelf 15 kg	1
33	Bushing of the lifting pole, PA6	2
50	Self-tapping screw, 3,9x9,5 VALCOC, cross DIN7981, Zinc	2

3.8 Accessory rails



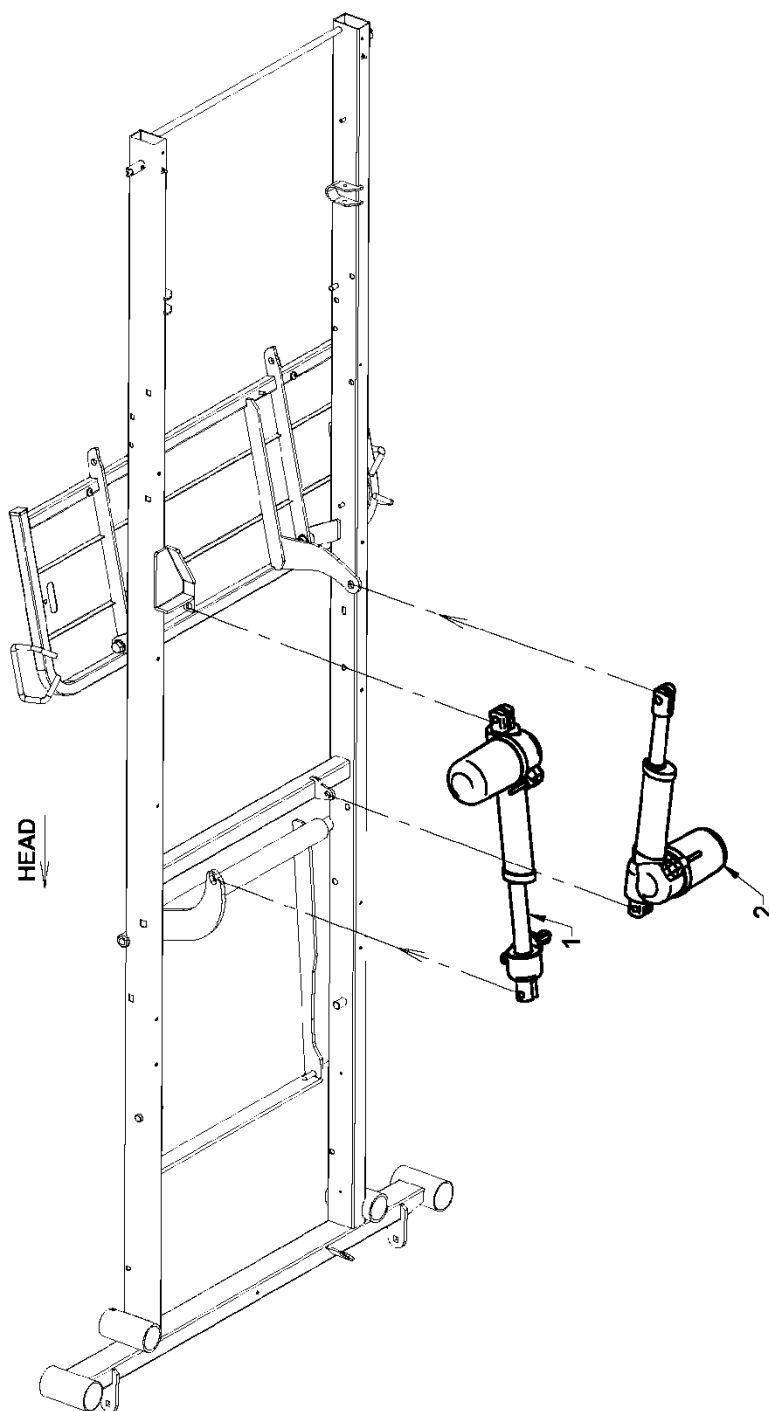
NO.	Part name	Pieces
1	Bushing of the lifting pole, PA6	2
2	Accessory rail	2

3.9 Electronic equipment



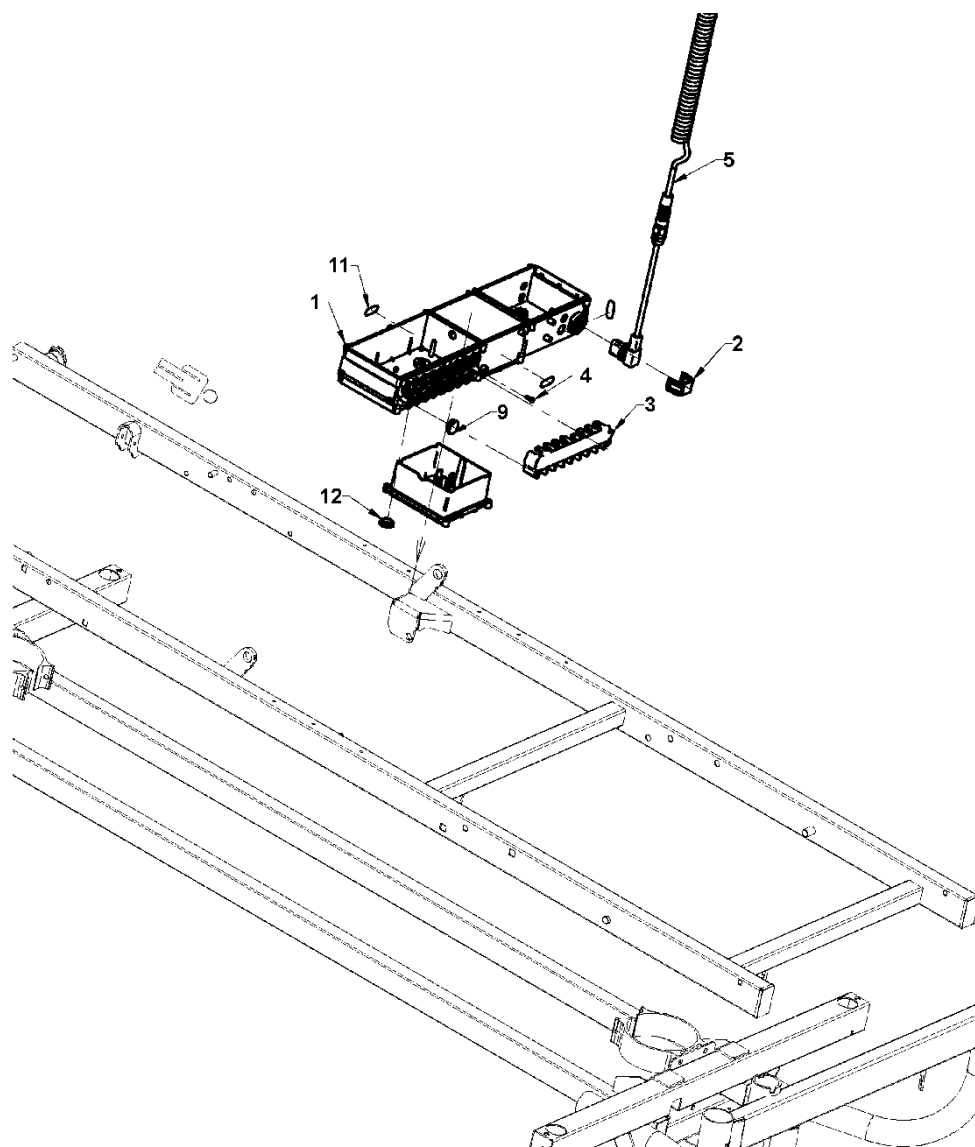
NO.	Part name	Pieces
1	Cable ribbon 12x15-200	1
2	Cable ribbon 20x20-250	1
3	Cable ribbon 20x20-200	1
4	Cable ribbon 20x20-80	2
5	Cable ribbon 12x15-450	1

3.10 Mattress platform actuators



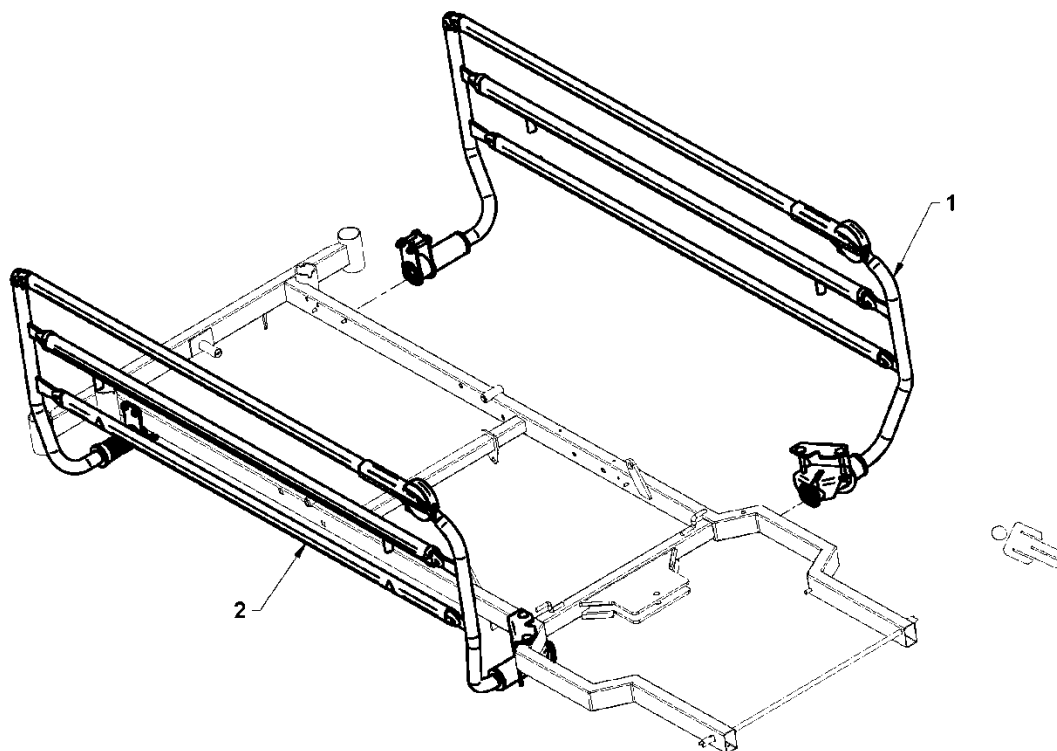
NO.	Part name	Pieces
1	Linear motor MEGAMAT MCZ, 340/110, Nr. 60207	1
2	Linear motor MCZ2, GQR2, USW, Nr. 72363, 453/180, with CPR	1

3.11 Control unit PB45.x

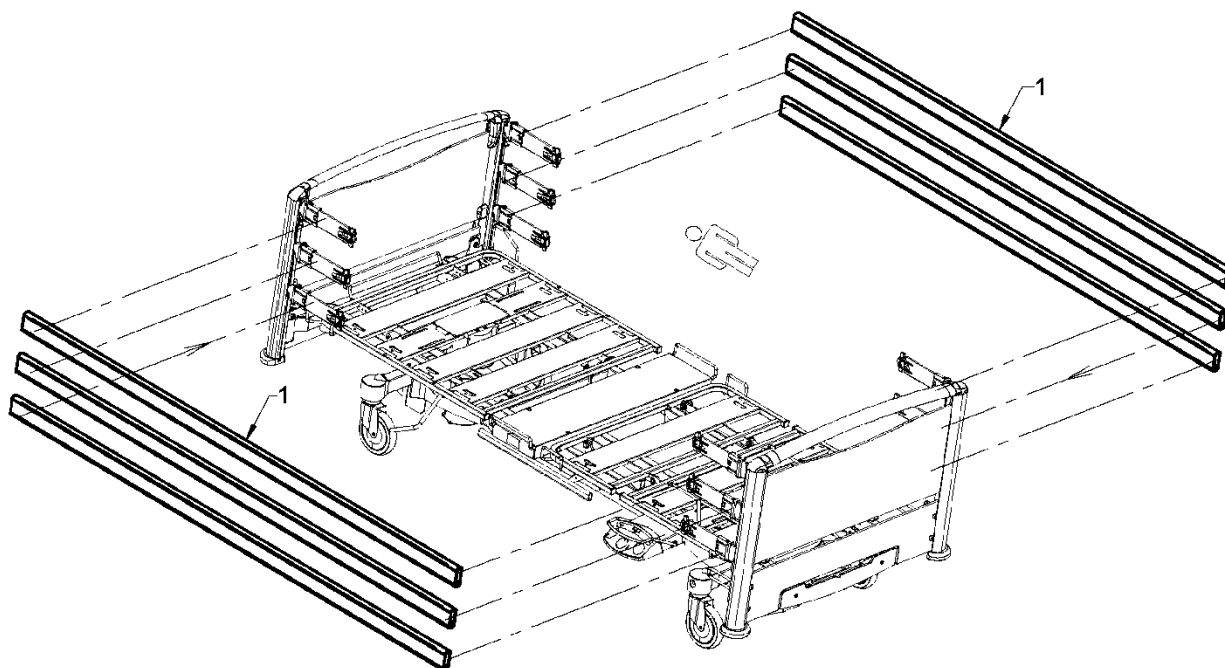


NO.	Part name	Pieces
1	PB45.x Control unit box, ABS	1
2	Clip, ABS	1
3	Cover, ABS	1
4	Screw for plastic parts, 3,5x12 VALCOC, TORX, 30T, Zn	6
5	Mains cable	1
7	Sealing ring 13,5x2	4
8	Box, ABS	1
9	Plastic stopper, rounded, PE, Dewert 26044	1
11	Self-stick label	4
12	Plastic stopper, rounded, PE, H6, black	1

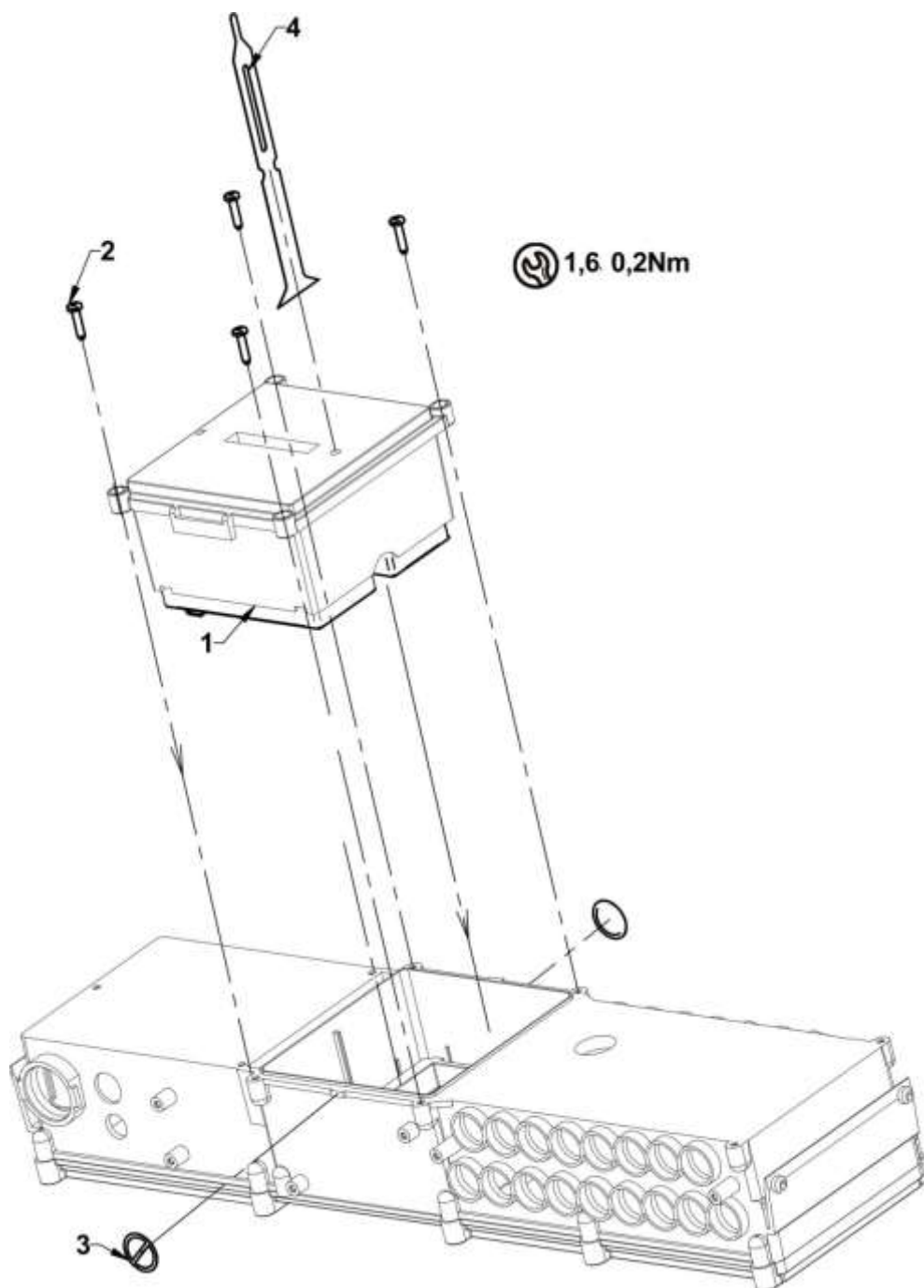
3.12 Single collapsible side rails



3.13 Full length side rail



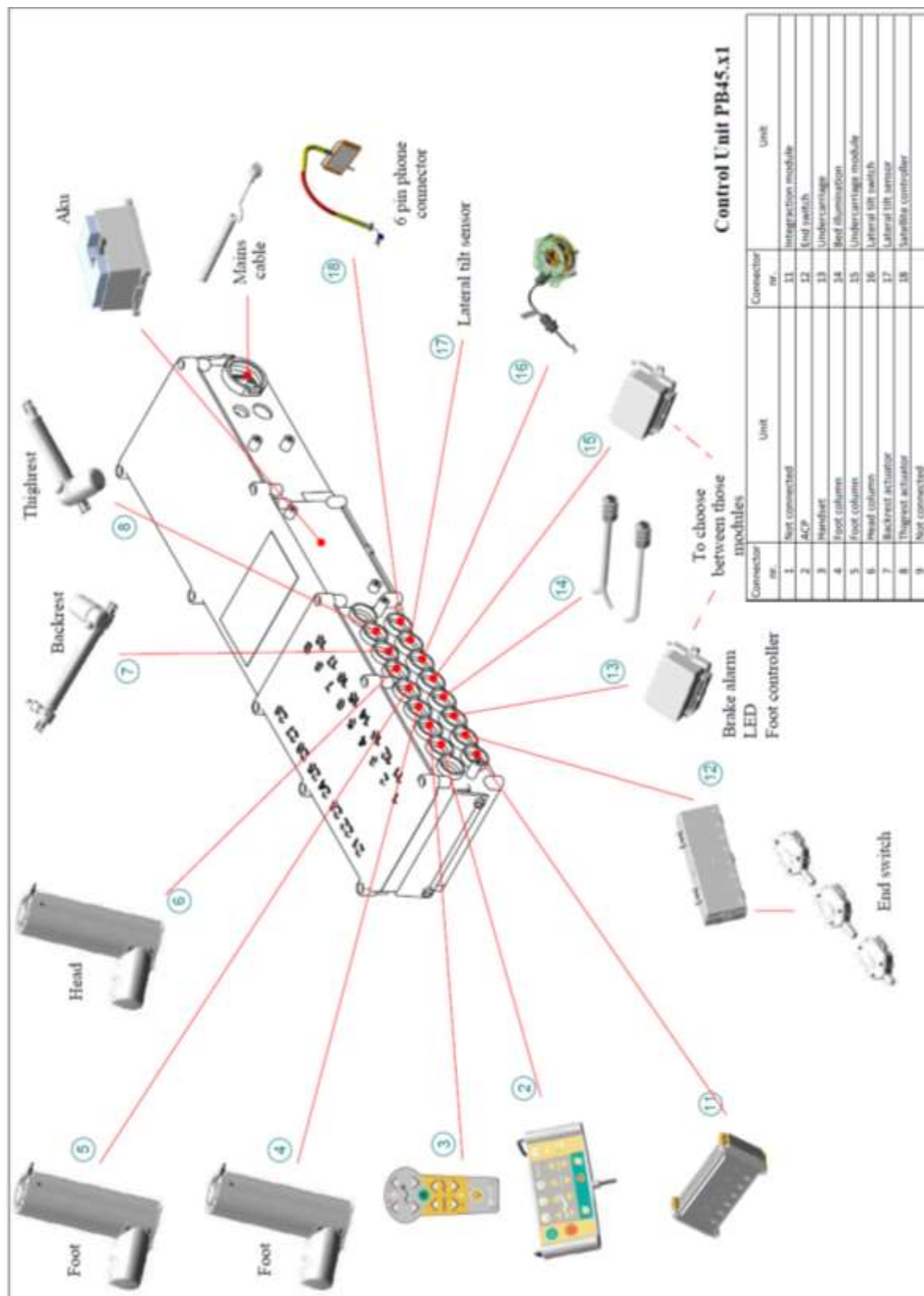
3.14 Battery back-up



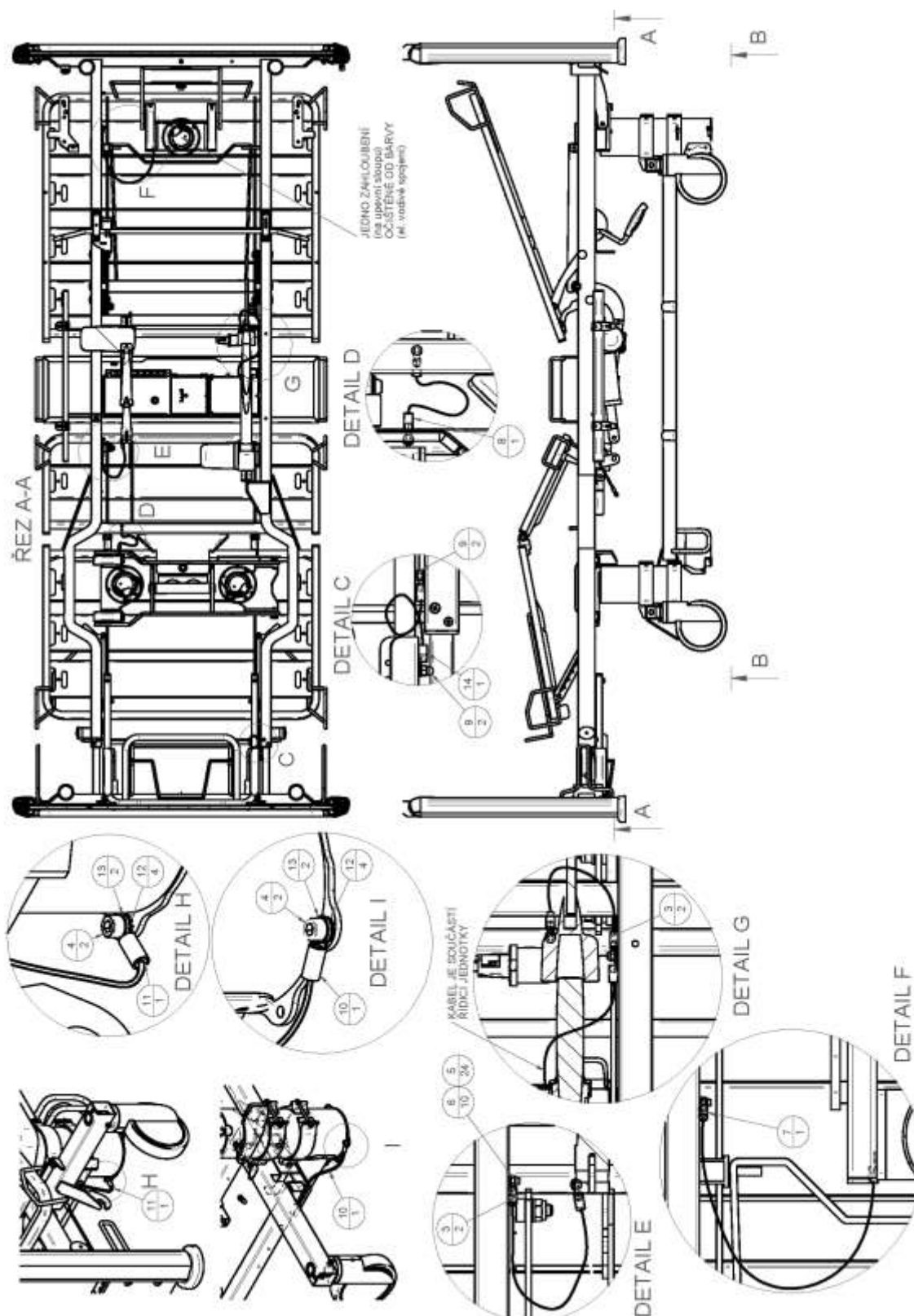
NO.	Part name	Pieces
1	Acumulators, RAL7035, 1,2Ah,	1
2	Screw for plastic parts, Fe, Zn-Cr, D3,5 L16, plasfast 30T torx, valcoc	4
3	Self-stick label, plastic, white, W30H12 Seal	2
4	Protection plastic seal	1

4 Electrical devices – component connections

4.1 Complete wiring diagram – control unit PB45.x



4.2 Equipotential bonding connection



In case that there is one wheel on the bed with antistatic performance, there is no chain installed on the undercarriage. Equipotential bonding connections remain the same.

5 Bed setting

5.1 Column calibration



Always calibrate after replacing:

- a) Any column
- b) Main control box



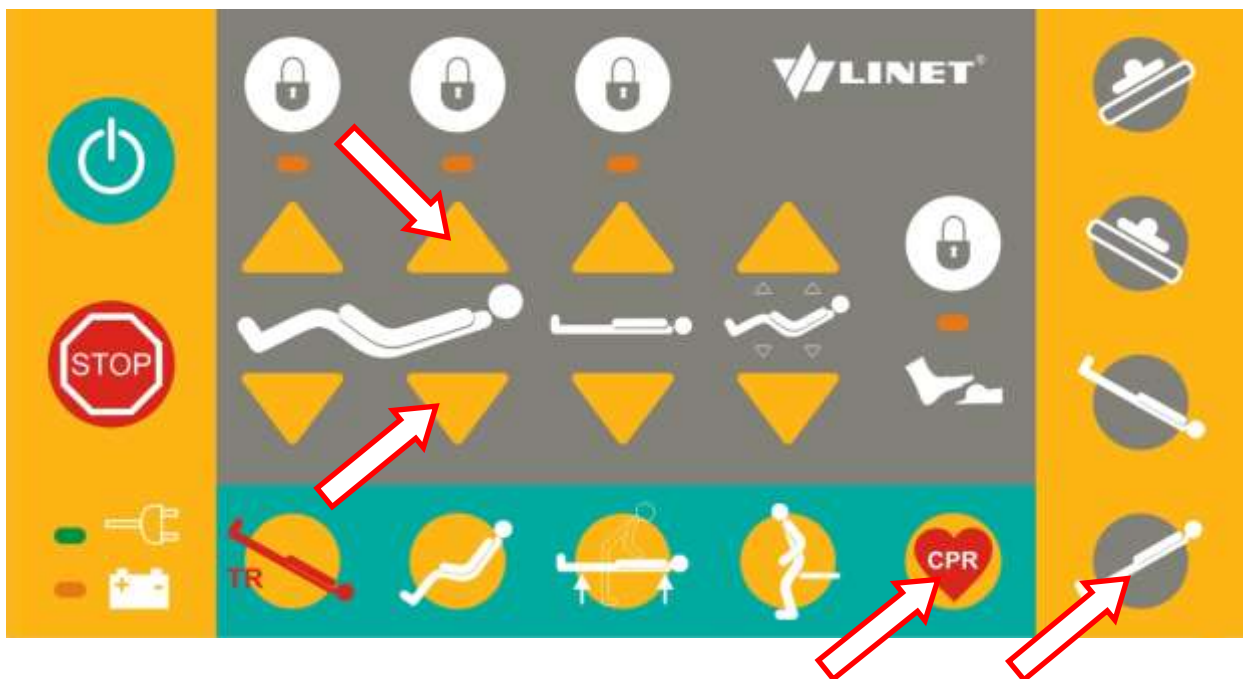
Calibration of the columns is only possible with control unit PB43. The control unit MCL II does not have calibration function.

Calibration of columns means:

To calibrate the control unit to equate the speed of both columns during raising and lowering. Not doing this procedure may cause permanent inclination of mattress platform during normal use.



Connecting the bed to the mains supply and activating the „GO“ button.



To activate calibration mode, **simultaneously** press “Backrest up”, “Backrest down”, “CPR” and „Anti-Trendelenburg“ buttons **for 3 seconds**.

3 lock LEDs will begin to flash. To proceed, press and hold the **CPR** button for a further **3 full cycles** (down + up + down). After each cycle, one LED light will stop blinking. When finished, all LED lights stop blinking and a steady tone can be heard.



The columns are now calibrated to move at the same speed.

5.2 RC circuit

5.2.1 Function description and purpose

For improved safety reasons peripheral controls (ACP, patient hand control, siderail controls and Mobilift) have been fitted with RC components. These allow the control box to recognize whether a circuit activation is a valid press of a button or a short circuit. In such a case, the function is blocked as protection against a short circuit. Short circuit protection only works when all controls are fitted with RC components and the function is activated in the control box.

All Eleganza range beds with serial number 2015xxxxxxx and higher have short circuit detection turned on by default.

All control units are equipped with switching on or off of the short-circuit detection function. Switching can be achieved using the ACP.

NOTES:

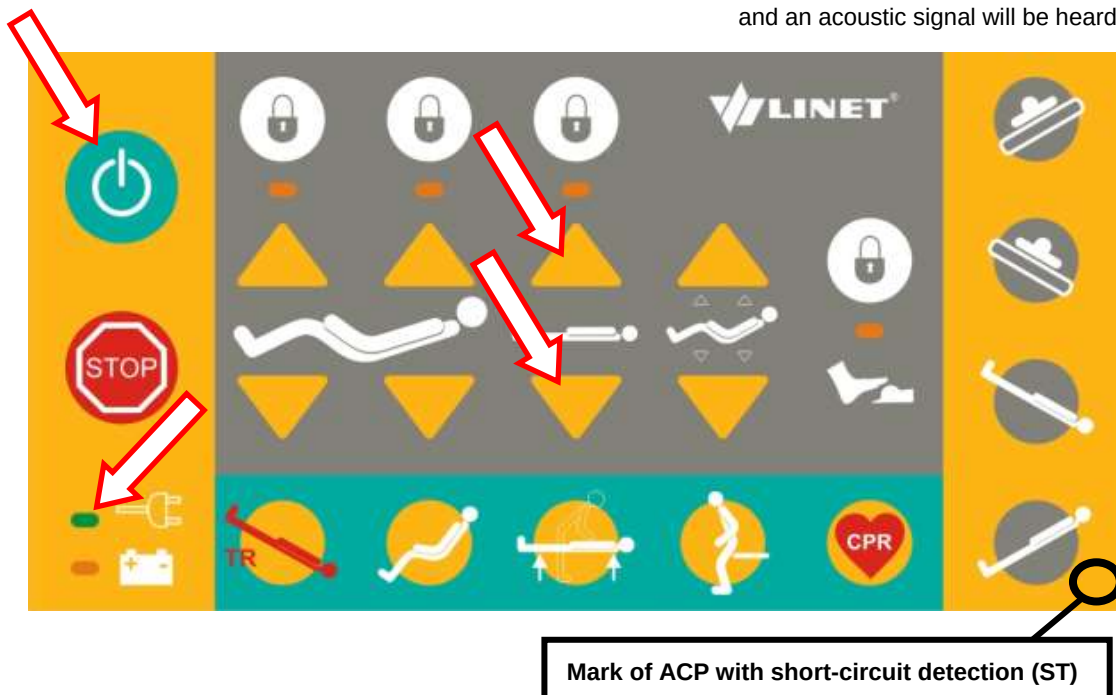
- Peripheral controls which **are** equipped with an RC circuit for short-circuit detection **are** compatible with control units with short-circuit detection turned ON or OFF.
- Peripheral controls which **are not** equipped with an RC circuit for short-circuit detection **are not** compatible with control units with short-circuit detection turned ON and it is necessary to turn this function off in the control unit.
- If there is one peripheral component which is not equipped with short-circuit detection (does not have an „ST“ or „KA“ {SN 2014 and higher} mark on the handset or „ST“ mark on the ACP) it is necessary to turn OFF the short-circuit detection.
- If the function is controlled by data transfer (undercarriage module), then short-circuits are not detected.

COMPATIBILITY IDENTIFICATION

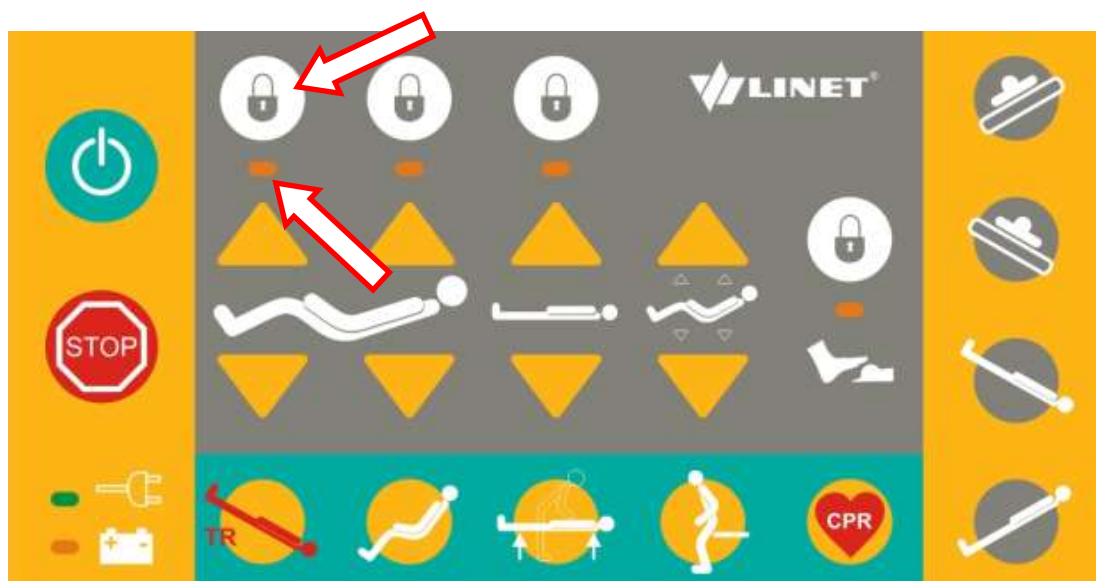
Part	Label	Short-circuit detection
Control unit PB45	SW version: since 2.10 till 2.20	Default: Turned OFF
Control unit PB45	SW version: since 2.21 and newer	Default: Turned ON
ACP Controller	ST	Compatible with short-circuit detection
Handset	KA (for SN 2014 and higher) or ST	Compatible with short-circuit detection

5.2.2 Activating / deactivating short-circuit detection on the ACP

- To enter short-circuit detection switching mode:
- Activate the ACP by pressing the **GO** button. Then press **mattress platform UP + DOWN + GO** simultaneously for 5s.
- The LED mains power indicator will start blinking and an acoustic signal will be heard.

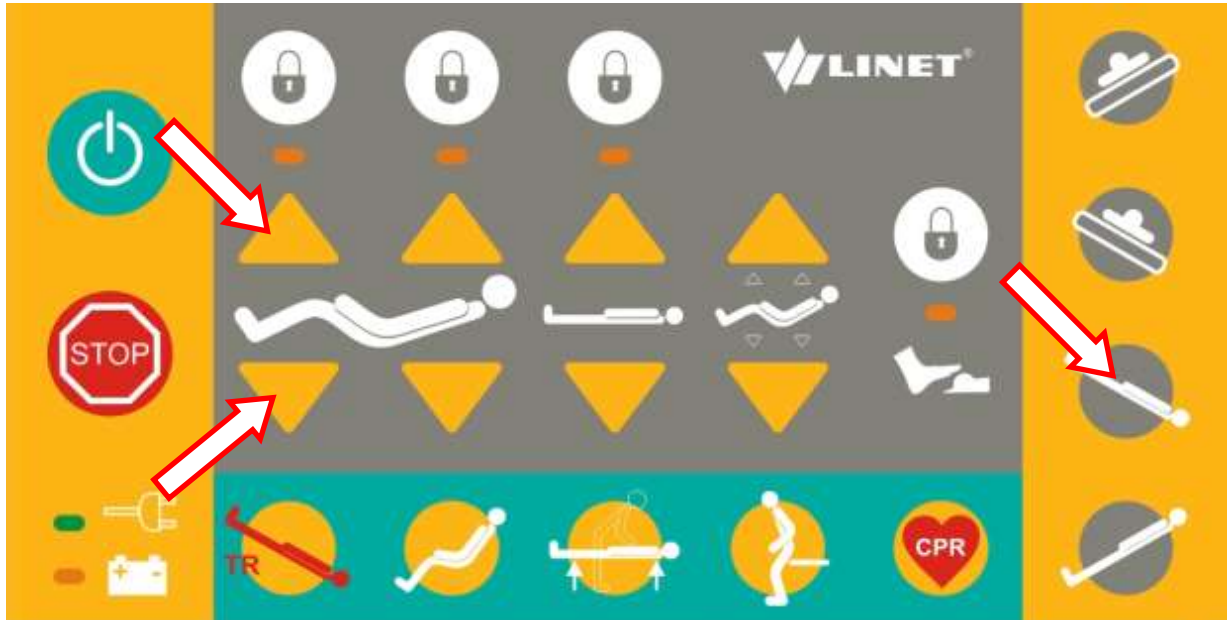


- Switching is achieved using the **leg rest lock** button
- Short-circuit detection is **ON** when the leg rest lock is **not lit**.
- Short-circuit detection is **OFF** when the leg rest lock is **lit**.



5.3 Electronic safety lock (disabling battery back-up)

The bed has to be disconnect from the main power supply.



Simultaneously pressing „Legrest up“, Legrest down and Trendelenburg“ for 3 seconds activates the electronic safety lock thus disabling the battery.



Procedure of disabling the battery is recommended during longer storage or transportation of beds.

6 Troubleshooting

6.1 Troubleshooting table

Error/Fault	Cause	Solution
The bed cannot be adjusted with the position buttons	GO button was not pressed.	Press the GO button.
	Function disabled on supervisor panel (locked)	Enable disabled function (unlock the function)
	Drive motors have no power, Defective drive motors, Defective battery.	Check the mains connection. Service action needed.
	Plug inserted incorrectly.	Insert the mains plug correctly.
	Faulty power box.	Service action needed.
	Faulty control element.	Service action needed.
Faulty mattress platform height/tilt adjustment	There is an object on the undercarriage cover.	Remove the object.
	Function disabled on supervisor Panel.	Enable disabled function.
	Drive motors have no power, Defective drive motors, Defective battery.	Check the mains connection. Service action needed.
	Plug inserted incorrectly.	Insert the mains plug correctly.
	Faulty power box.	Service action needed.
	Faulty control element.	Service action needed.
Backrest cannot be lowered from the upright position	There is an object under the backrest or in the drive mechanism.	Remove the object.
	Locking handle is defective.	Service action needed.
The siderails cannot be adjusted	The siderail lock is dirty.	Clean the locking mechanism.
	Locking handle is defective.	Service action needed.
Faulty brakes	The brakes are blocked by dirt.	Clean the brake system.
	The brake mechanism is defective.	Service action needed.
The head and foot boards cannot be inserted	The head or foot board is in the wrong position.	Check the locking mechanism. Position the head or foot board correctly.
	Defective mechanism.	Service action needed.

6.2 Emergency mode

If ACP panel is faulty sound alarm will start (If on battery, sound alarm will signalise only for approximately 1 minute and then turns off. Signalisation starts again if GO button is pressed)

Should this occur, it is possible to position the bed only for 5 second and then GO button must be pressed again in order to position for next 5 seconds.

6.3 Power box overheating

If the heatsink temperature in the main power box reaches:

85°C / 185°F – Battery charging is disconnected.

100°C / 212°F – Battery charging is still disconnected + sound signalization (beeping).

115°C / 239°F – Bed is not functional + sound signalization (beeping).

After the power box has cooled down, the bed is automatically reactivated.

6.4 Transformer overheating

If the transformer in the main control box reaches:

100°C / 212°F – The transformer automatically switches off and is automatically reactivated after cooling down.

130°C / 266°F – The overheat fuse blows (power box replacement is necessary).

6.5 One fault state

When the green mains LED at the ACP panel is blinking, this is a signal that a fault has been detected. In this case, only one bed movement is possible. After this movement, all functions will be blocked if the fault is still detected - this is indicated by all the lock LEDs flashing.

