# **Stair Climbing System**

escalino

User's Manual









#### **CE-Declaration of conformity**

The company AAT Alber Antriebstechnik GmbH herewith declares that the products of the stair climbing system **escalino** have been developed and manufactured according to the current regulations of the European Community, EEC Guidelines 93/42/EWG.

This declaration becomes void if the above mentioned devices have been altered without the consent of AAT Alber Antriebstechnik GmbH.



Signature of the manufacturer:

Maliscoff

Markus Alber Managing shareholder AAT Alber Antriebstechnik GmbH



The stair climbing system **escalino** has been successfully tested and certified according to the standard design for stair climbing vehicles ISO/FDIS 7176-23 and DIN EN 12182 at the Technical University of Berlin, Berlin-Cert.



## AAT Alber Antriebstechnik GmbH

Postfach 10 05 60 · D-72426 Albstadt Tel. +49.74 31.12 95-0 · Fax +49.74 31.12 95-35 info@aat-online.de · www.aat-online.de



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## 1 General information

### Congratulations!

You just bought an outstanding stair climber which will quickly become your indispensable assistant in transporting physically impaired persons.

With the **escalino** you can transport a person safely and without great physical effort upstairs and downstairs; even winding stairs are no problem at all.

Driving on slopes is also possible. For your safety there are safety brakes on both sides.

Driving on level ground is the **escalino's** easiest exercise. The device is light-weight, veratile and compact.

The **escalino** climbs stairs of maximally 21 cm in height. The minimum height of a step for the device to work properly is 21 cm. The type of stairs, whether they are winding or straight, does not matter.

As for the width of straight stairs, the **escalino** needs 10 cm exceeding its own width for climbing the stairs.

The minimum platform size of U-shaped stairs depends on factors such as the attendant's height, etc. our AAT representatives or your local dealer are happy to advise you in this matter.

#### 1.1 Instruction

The user's manual teaches you step by step the necessary knowledge for operating the **escalino** safely. However, it takes some practise to use the device properly.

Due to safety reasons the **escalino** may only be operated by trained personnel.

Please read the user's manual carefully before using the **escalino** for the first time. Also, please particularly note the caution signs and safety instructions.

#### 1.2 Care and Maintenance

The most important aspect of care is charging the lead batteries. They are integrated into the device and must be charged after every use.

Otherwise your **escalino** is low in maintenance and does not need particular care. Please see chapter 8 for detailed instructions.

### 1.3 Warranty and Liability

For damage caused by disregarding the instructions in the user's manual we do not assume any kind of liability. Please see details in chapter 9.







## 2 Description of the product

#### 2.1 Intended use

Please use the stair climbing device **escalino** exclusively to transport persons unable to walk.

However, he or she should be capable of sitting in a chair without help. If this is not the case, you need to fasten the hip belt, available at AAT Alber Antriebstechnik GmbH as an accessory, to secure the person in the chair.

Please make sure that the person to be transported does not leave his arms protruding the armrests to avoid injuries.

- In the interest of your safety the stair climbing system **escalino** may not be used on escalators or moving belts! Also you may not transport loads of any sort with the **escalino**!
- Due to safety reasons the **escalino** may only be operated by instructed personnel. Therefore, please never leave the **escalino** unsupervised.



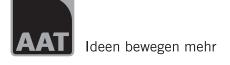
Driving on level ground



Conquering winding stairs

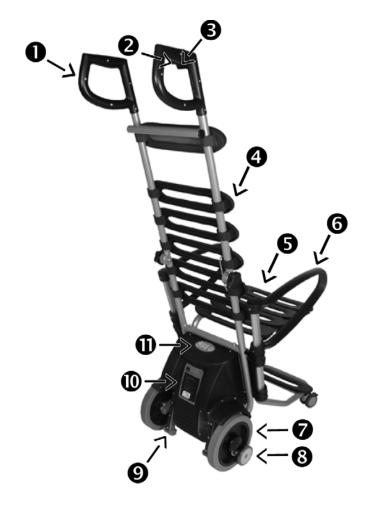


Driving on slopes



## 2.2 Detailed description of the device

- 1 = grip
- 2 = operation chip
- 3 = up/down switch
- 4 = backrest (foldable)
- 5 = C-part with seat (removable)
- 6 = armrest, swivelling
- 7 = running wheel
- 8 = safety brake
- 9 = climber plus climbing foot
- 10 = drive
- 11 = membrane keypad



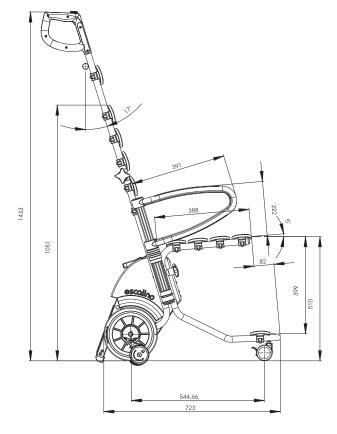


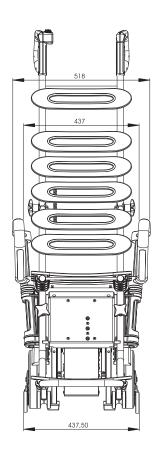


#### 2.3 Technical data:

Measurements	height = 1433 mm height (folded) = 780 mm width without armrests = 537 mm width with mounted armrests = 518 mm depth with footrest = 723 mm
Weight	drive = 24.5 kg, C-part with seat = 4.0 kg, both armrests = 1.5 kg total weight = 30 kg
Maximum carrying capacity	100 kg
Batteries	2 x 12 V / 5 Ah (sealed)
DC-motor	24 V
Climbing speed	approximately 10 steps / minute
Capacity with one battery charge	8 - 12 levels (approximately 120 - 180 steps), depending on the load
Maximum height of step	21 cm
Noise level	the A-evaluated sound level of the device lies typically under 70 dB (A)
Vibration level	the weighted effective value of acceleration to which the upper body is exposed, lies typically under 2.5m/s <sup>2</sup>

### 2.4 Dimensional sketch:









## 3 Assembly

You can assemble and disassemble the escalino very quickly.

The assembly is accomplished through various locking grips and fixings.

#### 3.1 Unfold the back part

The back part can be unfolded and put in a vertical position by means of toothed wheels. You need to lock it in that position with locking screws  $\bullet$ .

Please always make sure that the back part is securely locked.





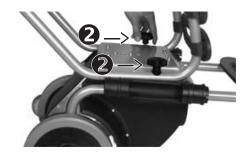
### 3.2 Attach the C-part plus seat to the drive

Insert the locking bolts into the C-part's drillings and in the corresponding ones on the drive.



Tighten the locking screws ② well so that the C-part is securely attached to the drive.

Please always make sure that the C-part is securely fixed to the drive.





### 3.3 Armrests

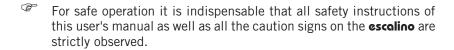
Insert the armrests on both sides.

- Please make sure that the armrests are completely inserted into their respective holding devices.
- Depending on the person's size the armrests may be switched from right to left and vice versa allowing for a wider or narrower seat.





## 4 Safety instructions



- **4.1 Instruction:** The **escalino** may only be operated by trained personnel. In addition, persons under age are not allowed to work with the **escalino** except for those over 16 who were trained under supervision. When using the **escalino** you need to wear non-skidding shoes.
- **4.2 Safety brakes:** Please check the safety brakes before each operation (see chapter 6.4 and 8.6).

The safety brakes and in particular the brake drum's corrugated surface in the rims must be cleaned with alcohol once a week to assure an optimum braking effect.

Never use suds or lubricating cleaning solutions.

After each cleaning you need to check the safety brakes as described in chapter 6.4.

- **4.3 Lining of the climbing foot:** Please regularly check whether the linings of the climbing feet are sufficient (see chapter 8.7).
- **4.4** Carrying power: The maximum weight may never be exceeded (see chapter 5.1).

You may only transport people with the escalino.

- **4.5 Climbing mechanism:** The climbing unit and the climbers are for the most part covered. Nevertheless, please pay attention that neither hands nor feet get into the rotating area during the climbing process. Please always keep a safe distance.
- **4.6** Care and maintenance: Please make sure that the device is charged after each use. If you park the **escalino** for a while, please turn off the device.

If any of the functions lock, please turn off the escalino immediately.

Repairs may only be performed by the manufacturer or authorized personnel. Please only use original parts and accessories by AAT.

Please observe the detailed instructions on care and maintenance in chapter 8.

- **4.7** Surface of the terrain: Please make sure that the surfaces you are using the escalino on are not slippery or uneven. Avoid driving on damaged carpets, snow, ice, etc.
  - Do not use the **escalino** in wet conditions.





- **4.8** Battery charge: The **escalino** should only be operated with full batteries. You can check the batteries' capacity on the display of the membrane keypad.
  - Should the batteries fall into the back-up range (red LED starts blinking) you will hear a signal recurring every 15 seconds.
  - It takes about 8 to 10 times of charging and discharging the batteries before they reach their full capacity again.



## 5 Operation

### 5.1 Maximum carrying power

Please note that the maximum carrying power of 100 kg may not be exceeded.

#### 5.2 Membrane keypad

With the membrane keypad • you can turn the device on and off. Check the batteries' capacity and turn the single step mode on or off.

## 5.3 Safety brakes

Please check the safety brakes 9 on both wheels before each operation.

See detailed information in chapter 6.4 and 8.6.

### 5.4 Lining of the climbing foot

Check regularly whether the lining on both climbing feet **②** is sufficient. See chapter 8.7 for further details.







## 6 Operation

Before we get to the actual instructions, we would like to introduce you to the **escalino's** most important components.

### 6.1 Up/Down switch

This switch on the right grip activates the climbing mechanism.

Turn on the device as described in chapter 6.2.1 before you activate the Up/Down switch.

## 6.1.1 Operation chip

- The Up/Down switch only works if you insert the operation chip onto its receptacle on the grip. Please make sure that the chip locks in properly. Only then the escalino works accurately.
- If you do not insert the operation chip, the **escalino** can be turned on, but not driven. This feature prevents unauthorized persons from using the **escalino**.





### 6.2 Membrane keypad

#### 6.2.1 On/Off key

The On/Off key  $oldsymbol{0}$  on the membrane keypad is the power key to turn the **escalino** on or off.

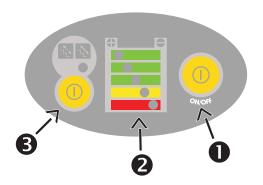
The **escalino** is equipped with turn-off electronics, i.e. if the device is switched on and not used for 5 minutes, it turns itself off automatically. In such case you neet do switch the **escalino** back on with the On/Off key should you want to use it again.

#### 6.2.2 Capacity of the batteries

On the membrane keypad you can check the batteries' capacity **②**. If the display highlights the green area, your batteries are fully charged. If the yellow area is highlighted your batteries are running low. At this point you should charge your batteries.

If the display highlights the red area (LED is blinking), you hear a signal that recurs every 15 seconds.

Once you hear the first signal, the batteries' capacity is sufficient for a maximum of 25 - 35, steps depending on the weight of the transported person.





#### 6.2.3 Indication of malfunction

Potential malfunction is indicated by the blinking LED on the display showing the battery's capacity.

In case of malfunction, please turn the device fist off and then on again. If there is still an indication of malfunction, charge the battery because there could be an undervoltage. In all other cases, please contact your local dealer.

(F

Please press the Up/Down switch only after you turn the device on. Should you have neglected that the LED blinks 4 times. In such case, please turn the device off and then on again.

LED is blinking	identified malfunction
1 x	socket is defective
2 x	error, lifter plate (Fet)
3 x	error, lifter (relay)
4 x	Up/Down switch is defective
5 x	malfunction in the motor

#### 6.2.4 Single step mode

On the membrane keypad is a key for the single step mode **3**. Should you not need the single step mode you can turn it off manually on the membrane keypad. The yellow LED above the pictogram showing a continuous arrow **4** lights up once you turned off the single step mode.



#### 6.3 Climbers

The climbers must be folded in by means of the Up/Down switch as shown in the picture to the right:

- to drive on even ground and on slopes
- to check the safety brakes
- to begin climbing stairs (upstairs and downstairs)

However, you need to fold out the climbers by activating the Up/Down switch, direction up, whenever a person takes a seat in the **escalino**, so the device is supported by the climbers (please also see chapter 6.5.1).

## 6.4 Safety brakes

The drive features safety brakes on both sides (see picture to the right).

Check the safety brakes before each operation.

The braking effect can be tested in two different ways as described in chapter 6.4.1 and 6.4.2.





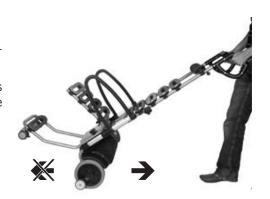




#### 6.4.1 Check the braking effect on even ground

Tilt the **escalino** backwards until the backrest is almost in a horizontal position. (See picture to the right).

If the **escalino** cannot be pushed forward but merely rolls backwards in this position, then the braking effect is sufficient for safe operation (See picture on the right).



# 6.4.2 Check the braking effect on the first step's edge on top of the stairs

Please do not test this function, if a person is sitting in the chair!

Tilt the device into its regular climbing position and drive forward to the top step's edge as you would transporting a person. If you cannot push the **escalino** over the edge, then the braking effect is sufficient for safe operation.

Note of caution: If the braking effect is not sufficient, you may under no circumstances use the **escalino**. In such case, please contact your local dealer or AAT representative immediately.

### 6.5 Transporting a person with the escolino

Please note that we developed the **escalino** to be operated by one person who is using both hands at all times.

- Please practise driving on even ground and on slopes as well as climbing stairs without a person sitting in the chair. Further make sure that nobody is in the possibly dangerous area below the device while you practise.
- The maximum carrying capacity (see chapter 5) may never be exceeded.
- Due to safety reasons, never operate the **escalino** from the side but always from behind.

If you ask a person to take a seat in the **escalino**, please always remember the following aspect (also see chapter 6.5.1 and 6.5.2):

#### 6.5.1 Stable position

When a person takes a seat in the chair you need to make sure that the **escalino** does not roll away. You must fold out the climbers so that they touch the ground and support the device (see picture on the right).

Press the On/Off key and turn on the escalino.

Then press the Up/Down key direction "up" until the climbers touch the ground.





#### 6.5.2 Fold out or remove armrests

Sitting down can be facilitated by folding out the armrest. Simply lift the armrest and turn it to the back.

If necessary you can remove the armrests altogether. After the person to be transported has taken a seat you put the armrests back into their original position.



### 6.6 Driving on level ground

After the person has taken a seat, you can drive the **escalino** without problem on level ground. However, you need to fold in the climbers before you begin driving.

The **escalino** masters thresholds easily, but there is a trick to it, you need to pull the device backwards over the threshold.



### 6.7 Transportation

To transport the **escalino**, please remove the C-part, and the armrests as described in chapter 3.2. Then you activate the Up/Down switch, direction "down", until the climbers touch the floor. At this point you can fold the **escalino** as described in chapter 3.1.

Please make sure that the locking knobs are always tightened properly.

The easiest way to carry the **escalino** is to stand behind the folded stair climber and lift it by the bars on both sides.

Note that the **escalino** weighs 24.5 kg.







#### 6.8 Tilt the stair climber

To drive on slopes and to climb stairs you need to tilt the **escalino**, which is easily done by means of the climbers.

- 1. Turn on the **escalino** with the On/Off key.
- 2. Press the Up/Down key, direction "up" until the climbers lift the running wheels approximately 1 to 2 cm from the ground.
- 3. Put your foot on the housing and tilt the **escalino** slightly toward you until the device is in balance.
- 4. The device is balanced when you do not feel any pressure nor pull holding it in this position.
- 5. To drive now on level ground you need to fold in the climbers completely.

If you tilt the **escalino** too much, the safety brakes stop the device automatically when you try to drive forward.





### 6.9 Driving on slopes

Tilt the **escalino** slightly as described in chapter 6.7.

In the interest of your safety there should be a second assistant helping you.

### 6.9.1 Driving down slopes

Drive forward to the edge of the slope. To brake tilt the device a bit more, so that the safety brakes are activated.

#### 6.9.2 Driving up slopes

You drive up slopes backwards. To brake the **escalino** you tilt the device a bit more so that the safety brakes are activated.





### 6.10 Climbing stairs

If you observe the following instructions closely, you can easily and quickly climb stairs with the **escalino**.

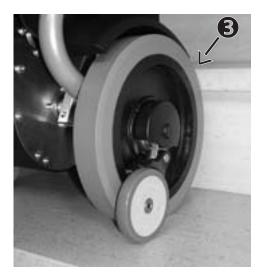
Before you start, please note:

- During the entire climbing process always pull the **escalino** a bit backwards so that the device is always slightly under pressure. That way the wheels touch down on the next step properly.
- 1. Turn the **escalino** on with the On/Off key (see chapter 6.1).
- 2. Fold in the climbers all the way with the Up/Down switch (see chapter 6.3).
- 3. Tilt the **escalino** slightly towards you (see chapter 6.7).
- 4. Drive the **escalino** backwards to the stairs **1** and climb 2 3 steps **2**.



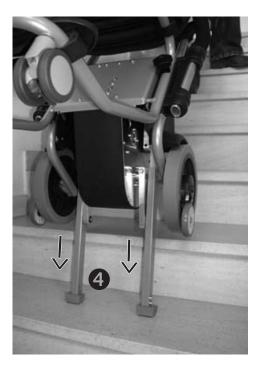
The device is now in the proper position to climb upwards.

Make sure that both running wheels touch the lowest step 3.

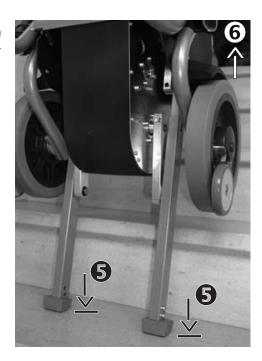




The climbing process occurs in two phases per step.
Press the Up/Down switch, direction "up", and the climbing process begins by folding out the climbers 4.



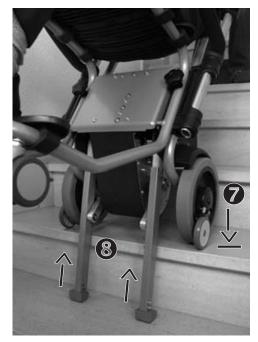
6. After the climbers reach the ground **⑤**, they assume the load from the running wheels, while they are lifted from the ground with the entire frame **⑥**.





- 7. The first phase is finished when the running wheels touch down on the next step **②** and resume the load from the climbers.
- 8. The second phase begins with the retraction of the climbers **3**. It ends as soon as they reach their highest position.

Since the single step mode is generally activated, the climbing process ends at this point. To continue climbing you need to press the Up/Down switch, direction "up" again.



Because the **escalino** is continually under pressure while climbing, it rolls automatically to the next step and reaches its initial position for climbing.

At this point the climbing process repeats itself as described in point  ${\bf 5}$  and following.





### 6.11 Descending stairs

Please practise descending stairs with the **escalino** without transporting a person.

You will quickly master the climbing process, if you observe all of the following instructions.

- 1. Turn on the **escalino** with the On/Off key (see chapter 6.1).
- 2. Retract the climbers all the way with the Up/Down switch (see chapter 6.3).
- 3. Tilt the **escalino** slightly towards you (see chapter 6.7).
- 4. Drive the **escalino** forward to the edge of the stairs **0**.

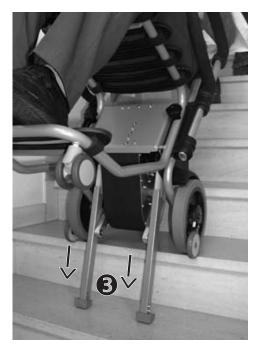


5. The safety brakes **②** keep the **escalino** from rolling over the stairs' edge.

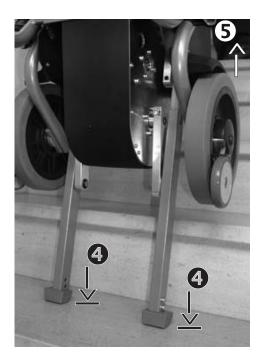




- 6. Press the Up/Down switch, direction "down" and the climbing process downstairs begins.
- 7. The climbers are extended by the drive **3**.



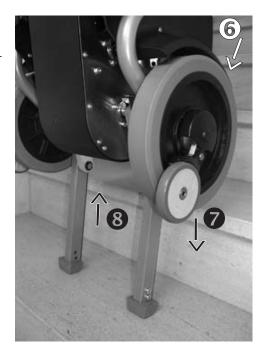
8. After the climbers touch down on the next step 4 they assume the load from the wheels. Then the wheels plus the frame are slightly lifted off the upper step 5.





9. Now the wheels plus the frame are moved forward **6**.

Afterwards the wheels plus the frame are lowered slowly **9** by retracting the climbers **9**, until...



10. ...the wheels touch down on the next step (see picture on the right).

Since the single step mode is activated, the climbers are retracted to their highest position marking the end of the climbing process.



11. Now push the **escalino** again to the very edge of the step until the safety brake's rollers stop the **escalino**.

The climbing process downward can only be continued when the Up/Down switch, direction "down" is activated anew.

To descend stairs repeat the process from point 4 following.



## 6.12 Parking the escolino on stairs

The safety brakes keep the device from rolling down the stairs.



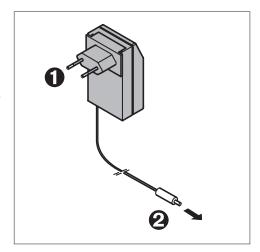


## 7 Accessories

### 7.1 Charger

The charger by AAT is part of the standard delivery package. Plug  $oldsymbol{0}$  is inserted into the wall outlet and the other plug is plugged into the power unit's housing  $oldsymbol{0}$ .

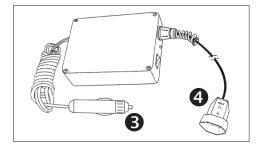
With the charger you can charge the batteries 100%. The device switches automatically to maintaining the charge once the lead batteries are fully charged; therefore, overcharging is not possible.



#### 7.2 Voltage transformer for your vehicle

We recommend you obtain a voltage transformer as an accessory, if you transport the **escalino** in your car. The voltage transformer by AAT is designed to connect with the  $12\ V$  electrical system of a car. It transforms the  $12\ V$  /  $24\ V$  direct current to  $230\ V$  alternating current.

The transormer's one plug **3** is inserted into the cigarette lighter or a network outlet on the dashboard. Into the European 230 V plug socket **4** you put the automatic charger's main plug **1**.







#### 8 Care and maintenance

In order to guarantee the **escalino's** reliability of operation you need to have the device checked biannually, even if there is no visible or functional damage.

Due to safety reasons the safety check or repairs of any kind may only be performed by AAT Alber Antriebstechnik GmbH or by your local dealer's trained personnel.

The device itself does not need particular maintenance and except for the occasional cleaning no particular care.

#### 8.1 Test badge

The test badge, indicating when you have to have your **escalino** checked again, is located on the housing.

#### 8.2 New owner

Should you receive a used device, we recommend that you have it checked.

#### 8.3 Charger

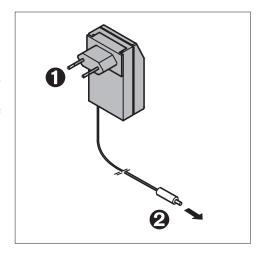
Please use exclusively AAT chargers to charge your batteries.



#### 8.3.1 Automatic charger

The automatic charger is part of the **escalino's** delivery package. Plug **0** you put into the wall outlet and plug **2** you plug into the socket on the housing.

The automatic charger charges your batteries 100%. The device switches from charging mode to maintenance mode as soon as the lead batteries are fully charged, so an overcharge is not possible. Thanks to its maintenance mode the automatic charger can also be used overnight.

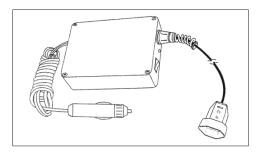


#### 8.3.2 Voltage converter for your vehicle

The voltage converter does not call for special care or maintenance. However, you should check your converter regularly and avoid any oils, grease, aggressive cleaning and reducing agents and/or damage due to sharp edges, etc.

Service and repairs on the voltage converter may only be performed by trained personnel.

Please observe the separate yet included user's manual for the voltage converter.





#### 8.4 Battery pack

The sealed lead  $12\,\text{V}/5$  Ah batteries are located within the device's housing. They are sealed, maintenance-free, rechargeable and of top quality. To keep the batteries in good shape you should recharge them every time after using the **escalino**.

#### Advice:



If the **escalino** is not in use for some time, always connect it to the charger to maintain the charge. This increases the batteries' lifespan.

**Please avoid total discharge:** The lifespan of your lead batteries depends considerably on the charging/discharging cycles. If you avoid a total discharge you can, for example, get more than 750 partial discharges and 200 times the full capacity out of your lead batteries.

A total discharge of lead batteries leads not only to a loss of capacity but also shortens their lifespan. You can avoid a total discharge by charging the batteries whenever possible!

Charging equals care as far as your lead batteries are concerned.

### 8.5 Fuses

Within the housing there is a 30 A fuse. If this fuse must be exchanged please contact your local dealer.



#### 8.6 Check brake lining

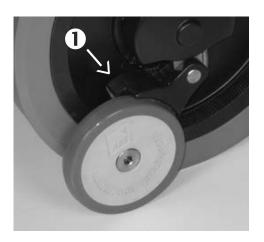
The brake lining's depth • must be checked regularly. The minimum depth • is 1 mm. If it has worn down below that mark the brake's lining must be replaced on both sides. Please contact your local dealer or AAT Alber Antriebstechnik GmbH.

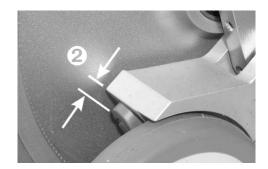
Please check the **escalino**' brake lining every time before you use the device (see chapter 4.2 and 6.4).

To assure an optimum braking effect you must clean the safety brakes in particular the brake drums' corrugated surface inside the rims once a week with alcohol.

Never use greasy cleaning agents or suds to clean the brakes.

After cleaning the brakes you need to check them as described in chapter 6.4.

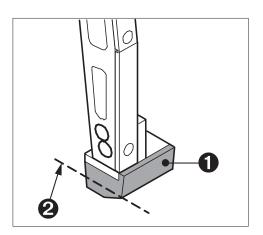




## 8.7 Check lining of the climbing foot

You also need to check the climbing feet's lining regularly.

If the lining **①** is worn down to the edge **②** or broken, you need to replace both feet's linings.





#### 8.8 Cleaning

To clean the seat, backrest or armrests, please use light suds.

With the exception of the safety brakes (see chapter 8.6) clean the rest of the **escalino** with a damp cloth and a mild household cleaner.



Due to safety reasons, please do not use a high pressure cleaning device!

### 8.9 Recycling

Your **escalino** and its battery pack are long-lasting products. However, once they are old, you can return the components to AAT Alber Antriebstechnik GmbH or your local dealer for recycling.

The law concerning electronic devices (ElektroG) and their recycling has been issued on March 24, 2005.

According to the National Ministry of the Environment (BMU) concerning said law, the **escalino** is considered a means of transportation thus the ElektroG does not apply (see the guidelines of the European Parliament 2002/96/EG)).





## 9 Warranty and liability

#### 9.1 Warranty

AAT Alber Antriebstechnik GmbH assumes the warranty for the product, type **escalino** (with the exception of the lead batteries) and all accesssories for the period of 2 years from the date of purchase. We guarantee that these products are free of faulty material and processing defects.

For the lead batteries - always providing their proper care and maintenance - AAT Alber Antriebstechnik GmbH assumes a warranty of 6 months from the day of purchase.

We do not honour this warranty if:

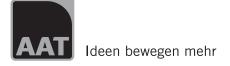
- the escalino has not been maintained and checked properly by the client.
- the **escalino** has been tampered with, altered in any way or operated inappropriately.
- the escalino has been used exceeding the maximum load.
- the escalino's batteries have not been properly charged.

#### 9.2 Liability

The manufacturer of the **escalino** AAT Alber Antriebstechnik GmbH is not responsible for potential damage if:

- the escalino was handled inappropriately.
- repairs and/or assembly has been performed by unauthorized persons.
- the escalino has not been used in accordance with this user's manual
- additional parts were added or connected to the **escalino**.
- parts of the escalino were removed.
- the **escalino** carried a person who exceeded the maximum load.







## **AAT Alber Antriebstechnik GmbH**

Postfach 10 05 60  $\cdot$  D-72426 Albstadt Tel. +49.74 31.12 95-0  $\cdot$  Fax +49.74 31.12 95-35 info@aat-online.de  $\cdot$  www.aat-online.de