Manual Stair Robot SR 450

Stairrobot

Type number	:	SR 450
Serial number	:	
Year of construction	:	2001
Owner	:	

Manufacturer:

AATA International b.v
Willem 2 straat 1e
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The Netherlands

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Preface

AATA International is an innovative and dynamical company, specialised in stair climbing equipment. Stairrobots are active in over 30 countries worldwide.

This manual is written for machine operators and for technician who take care for the maintenance of the machine. Although the tiniest details are not set out, the manual is a useful help for people who are dealing with the machine on a daily basis.

The stairrobot SR 450 has been used for over 20 years by many well-known companies and transport contractors worldwide who are involved in the movement of heavy loads into and out of customer's premises.

The stairrobot SR 450 is designed to carry unit loads weighing up to 350 kg up- and down stairs.

This manual should be used in conjunction with the cd-rom instruction video, which is placed on the inside of the manuals cover.

Read this manual and view the instruction cd-rom carefully before putting the SR 450 into operation. Always take note of the safety rules as mentioned in chapter "safety".

A copy of this manual should be kept with the machine, so the operator has it at his disposal.

AATA International b.v.

Table of contents

Survey of standard

We declare that the construction of the stairrobot SR 450 is according to the provisions of EC-Directives 89/392/EWG.

Applied harmonized standard:

NEN-EN 60034-5; NEN 10034-6; NEN 10072-2

Applied national standards, directives and technical specifications:

IEC 34-5; IEC 34-7; IEC 72-1

Survey of symbols

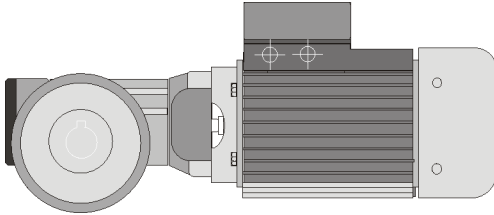|	
	Not (or not completely) observing the operating instructions can lead to serious accidents or damage

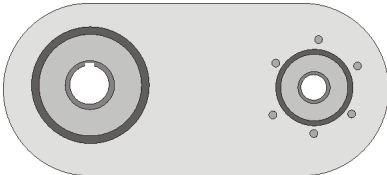|	
	Danger as a result of electric tension

1. Technical data SR 450

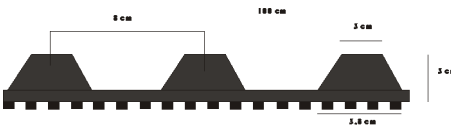| Description	Value	Units
Speed	4	Metres p/minute
Maximum stair-climbing angle	max. 45	⁰ Degrees
Weight	49	Kg.
Maximum load weight	350	Kg.
Colour	~~	~~
Length	1450	Mm
Width	460	Mm
Load length standard	1220	Mm
Load length handles extended	1880	Mm
Height platform	220	Mm
Charger (220V or110V/24V) with cooling ventilator	3	Amp.
Charging time with batteries	+/- 4	Hours
Drive-motor: single phase low noise DC		
Drive-motor capacity	0,375	KW
	0,5	Hp
Drive-motor power	24	V
Battery system	24	V
4 x 12 V monobloc		
Control: single hand safety switch	24	V

2 Description main components stairrobot SR 450

2.1. Drive

- Minimal noise DC permanent magnet motor with built-on worm wheel reduction

2.2. Transmission and brake

- Gearbox built directly onto the Worm wheel reduction of the drive motor
- The worm-wheel reduction forms an affective brake for the (loaded) StairRobot on the staircase

2. 3. Tracks

- Internally and externally toothed caterpillar tracks, specially designed for smooth stair climbing

2. 4. Control

- Safety control handle with integrated battery indicator
- Turn handle counter clockwise and machine will move forward
- Turn handle clockwise and machine will move backwards
- When released the handle will automatically jump to the zero point and will stop the machine directly

2.4.1 Battery indicator

• Batteries 90 -100 % charged	
• Batteries 60 - 90 % charged	
• Batteries 30 – 60 % charged	
• Batteries almost empty ⚠ When the red light is on <u>do not</u> discharge the batteries any further as this will result in damage to the batteries. If on a stairway; descent the machine and charge batteries.	

2.5. Battery charger

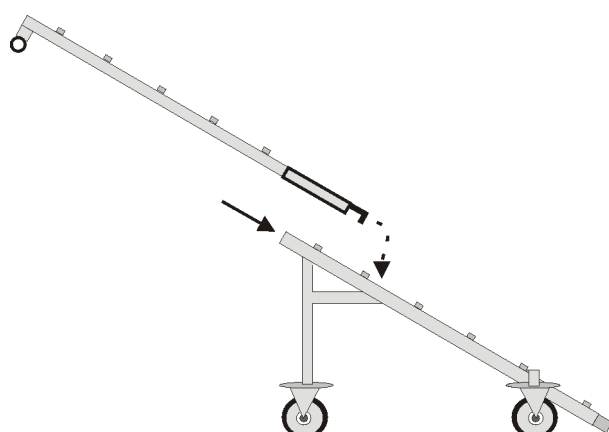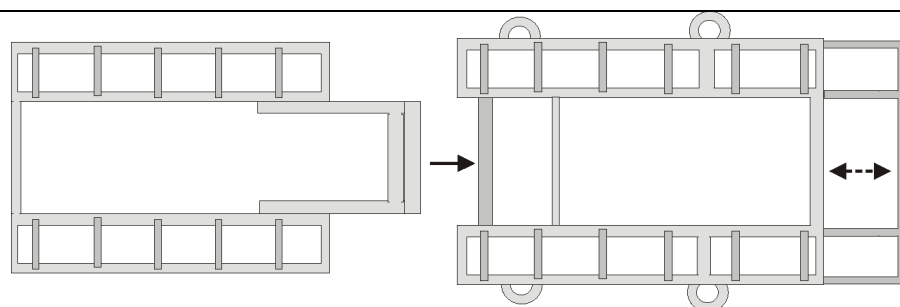|	
The charger comes with a 1,5 mtr cable to connect the charger with the stairrobot. The batteries will be charged automatically if the 24V connector is plugged in the stairrobot. The indication led on the charger with the inscription 'float, boost' will turn red / orange if the batteries need recharging and will turn green if the batteries are fully loaded; the charger will then go into trickle mode. Float, boost indicator: batteries discharged; charger mode: boost batteries half full; charger mode: boost/float batteries full charged; charger mode: trickle, float The robot can be charged directly from a truck or van with a specially designed transformer.	
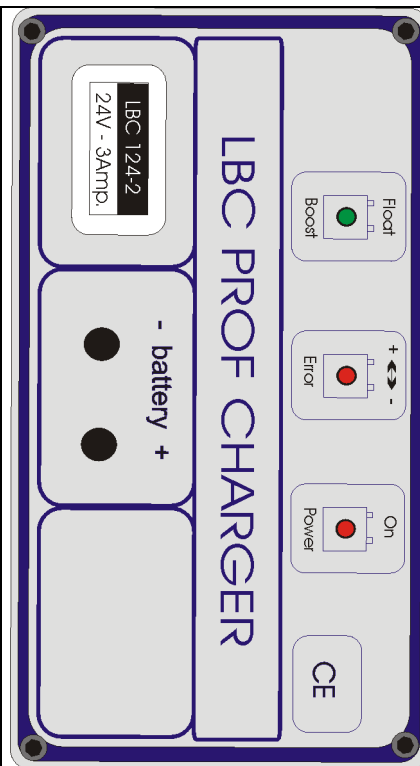
3. Optional equipment

3.1. Dolly

- The dolly is constructed of square steel fittings with four heavy-duty swivel wheels for easy movements. An extendable frame can be pulled out to increase stability while driving the StairRobot on the dolly. The lead-off ramp is used to connect the dolly with the stairway
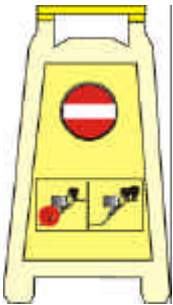
4. Safety

4.1. General safety precaution

⚠️	• It is not permitted to make alterations to the machine. • Everybody who is working with the machine has to be acquainted with the safety rules and has to act upon them. • Always check the surroundings for safety where the stair-robot will be deployed. • Assure that the angle of the stairs is not more than 45 º

⚠️	• Make sure that no operator or other person is underneath the (loaded) Stairrobot during operation

	• Secure the working area using warning boards or blocking ribbon

|	
	• To avoid misuse by unauthorised persons, don't leave the machine unattended. • Within the path of the machine there may be no obstructions. • Make sure the environment of the machine is dry, clean and illuminated sufficiently. • With the machine in operation it is forbidden to be within the operation area of this apparatus. • Before taking the machine into operation the machine operator has to be certain that nobody is located within the operating area of the machine. • If the machine is used into the darkness, the operation position has to be illuminated sufficiently (about 50 lux). • The machine may only be used for the intended activities. • Inspection and maintenance activities have to be done before operation • During inspection and maintenance the machine may not be used for other purposes • The local action and safety rules have to be acted upon. • **Make sure never to walk under the robot during operation.** • Keep electrical switch boxes closed in order to prevent contact danger. • Never drive the machine over a cable or extension cord • Make sure that no person stands on a cable or extension cord

5 OPERATORS PROCEDURE

5.1. Adjusting frame

- Unlock the extension frame handle and adjust the extension frame to the load dimensions; lock handle again
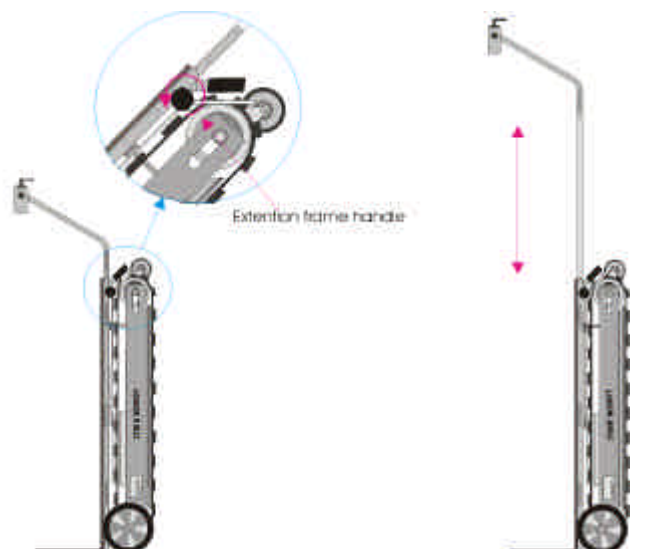
5.2. Unlocking and retracting folding wheel
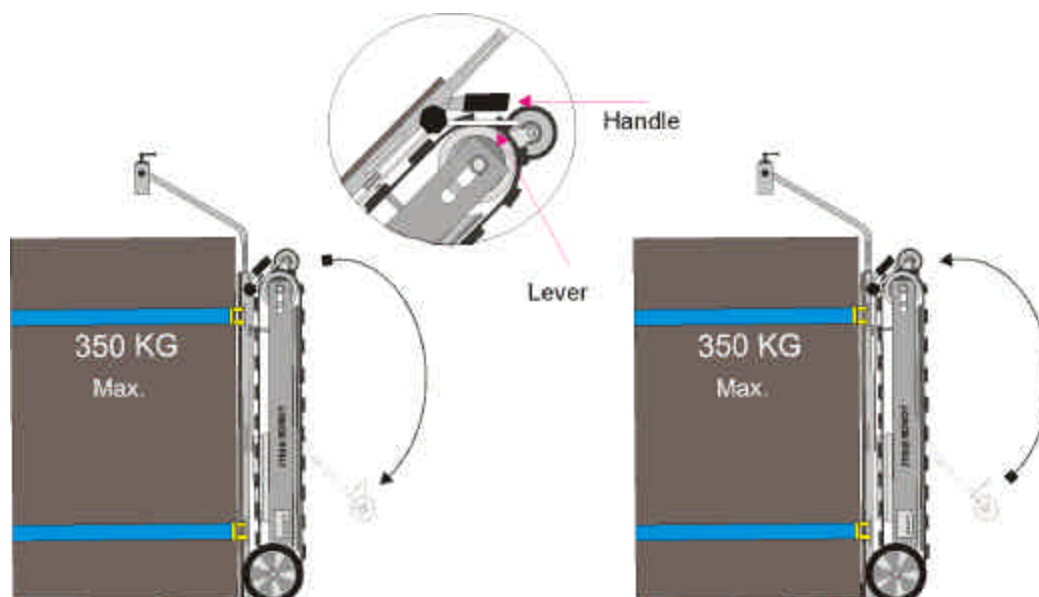
- To unlock the folding wheel; push lever towards handle. Push the folding wheel downwards until it locks into position
- To retract the folding wheel; push lever towards handle; the folding wheel will swing up and lock automatically
- Important! If you retract the folding wheel make sure that you are out off the swing-range

5.3. Pre-use inspection

To ensure proper working and safe condition of the SR 450 StairRobot:

- Check that no rubber blocks on the tracks are severely damaged or torn off
- Check the drive-tooth side of the tracks for exposed stringing cords or damage
- Check that nothing has been trapped between the tracks and the robot
- Check that the batteries are fully loaded (battery charge indicator)
- Check that the castor of the folding wheel moves free
- Check that the two fixed wheel can move free
- Check that the lever of the folding wheel permits the folding wheel to drop and lock in its position for horizontal moving
- Move the control handle left and right causing the tracks to move forward and backward, listen for excessive sounds ;If a defect is found do not use the machine until the Stair-Robot is repaired.
- Unlock the handle of the extension frame and check if the extension frame will move up and down
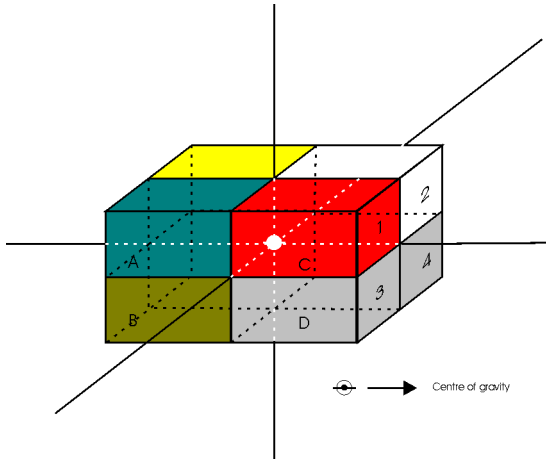
If there are no defects found the machine is ready for use. If a defect is found do not use the machine until the Stair-Robot is repaired.

5.4.   Loading

### 5.4.1. The correct position of the load

⚠️	• If the load is not placed in the correct position on the platform, the Stair robot can get instable during the process of climbing or descending a staircase. This can cause the robot to fall down the stairs resulting in serious damage and injuries.

- The objective is to create an optimal centre of gravity position for the loaded stairrobot considering the 'weight distribution' of the load

 Centre of gravity	• Before positioning the load on the platform the centre of gravity of the load has to be determined
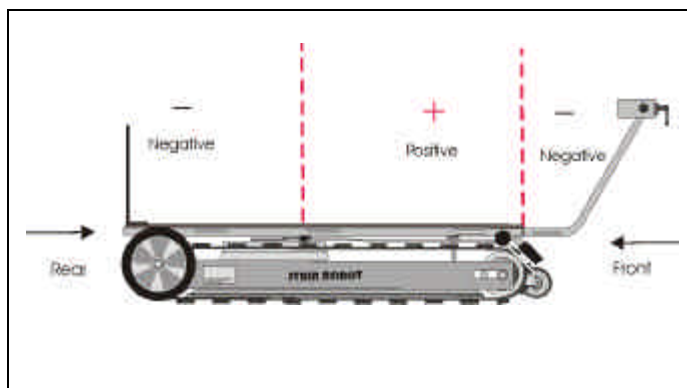
- Position the load on the platform with the centre of gravity of the load towards the front (in positive area)
- Position the load with the centre of gravity of the load as low as possible to the lifting platform.
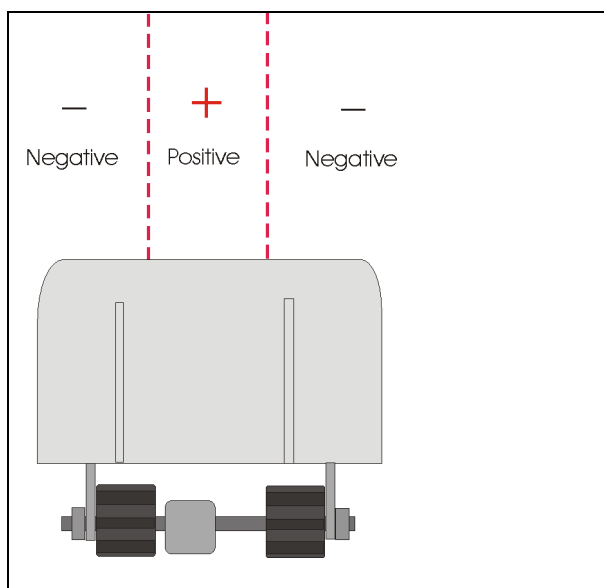
- The centre of gravity of the load should be within the positive area between the tracks.

5.4.2. Loading procedure

- Start the procedure by securing the area for loading. Move the stair robot into the desired position for loading.

The stairrobot SR450 can be loaded by use of the following two techniques:

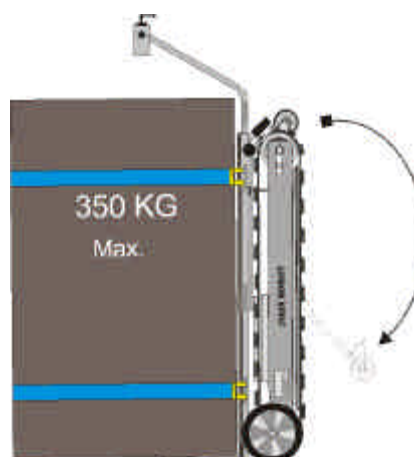|	
1.a - Place the stairrobot flat on the ground close to the load - Lift the load on the platform	
1.b - Secure the load on the platform	
1.c - Lift the stairrobot and drop the folding wheel by pushing the lever	

2.a

- Move the stairrobot in front of the load
- Upend the stairrobot and shove the rear-end of the platform under the load
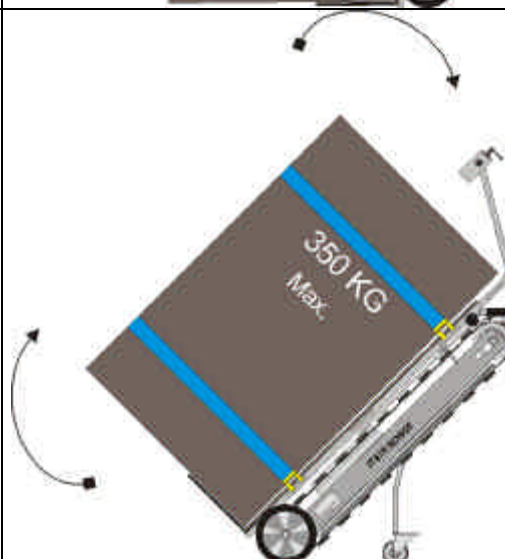- Secure the load on the platform

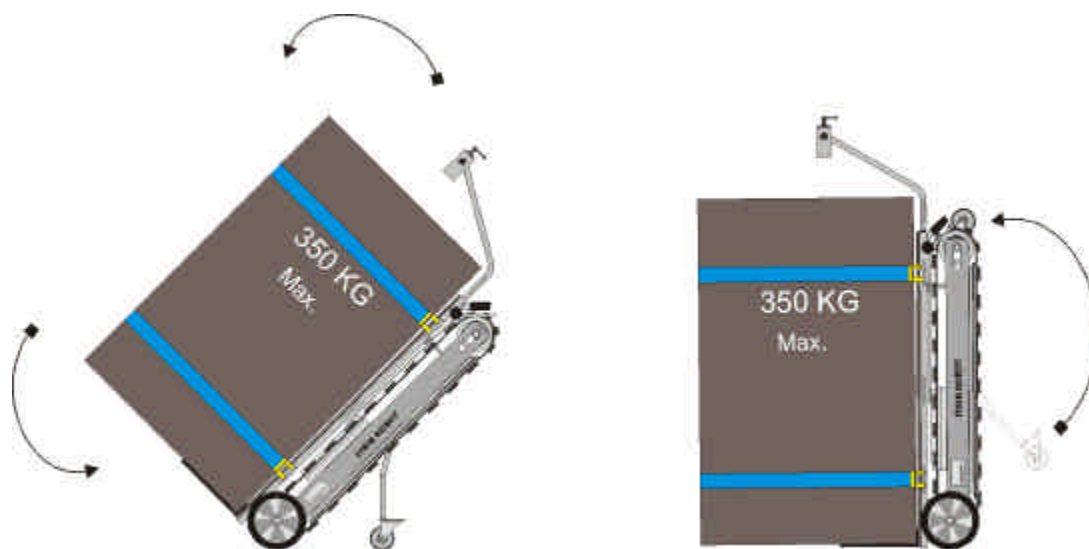| **2.b**	
- Drop the folding wheel by pushing the lever	
2.c	
- Place one foot on the folding wheel and pull the stairrobot on it's three wheels	

5.5. Ascending

- Up-end the stairrobot with the rear-end on the floor
- Push the lever in to retract the folding wheel; the folding wheel will swing-up and lock automatically
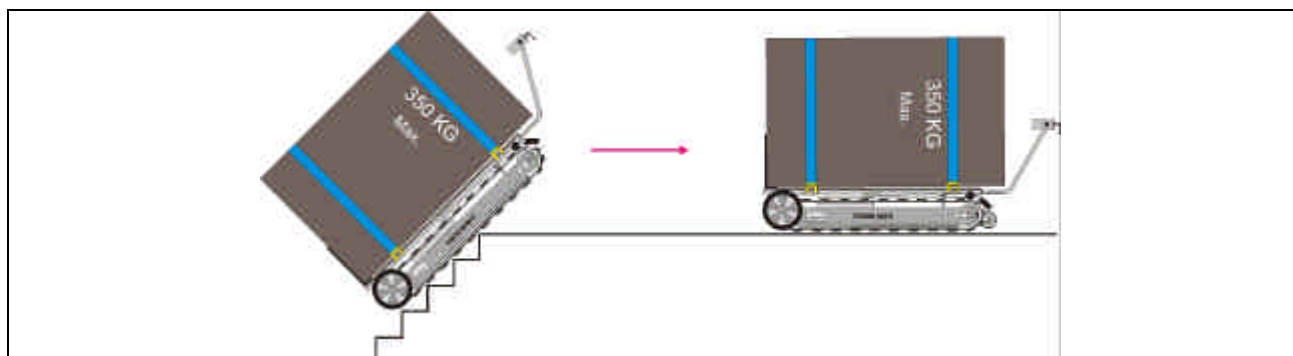
Important! If you retract the folding wheel make sure that you are out off the swing- range
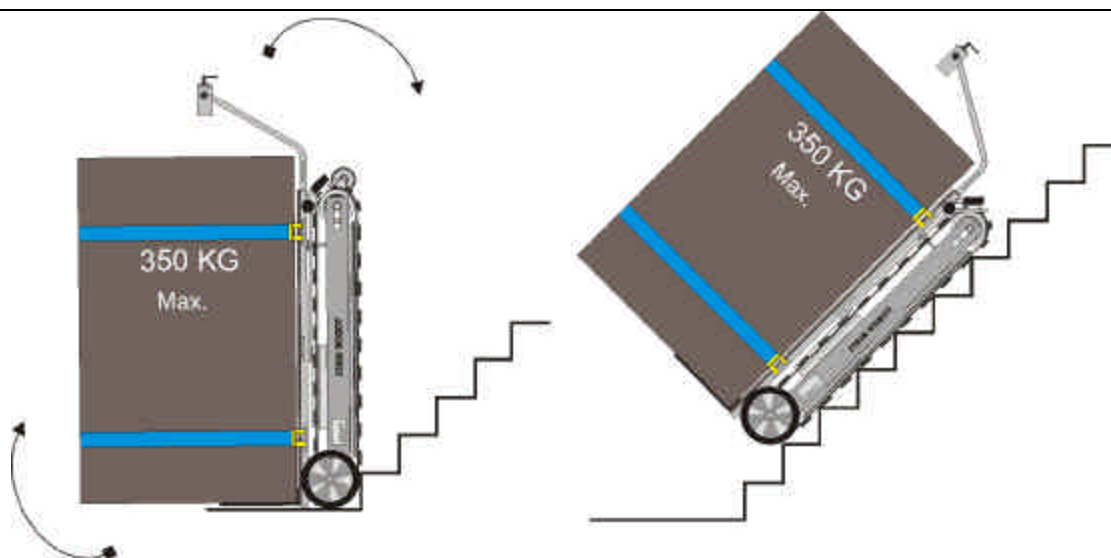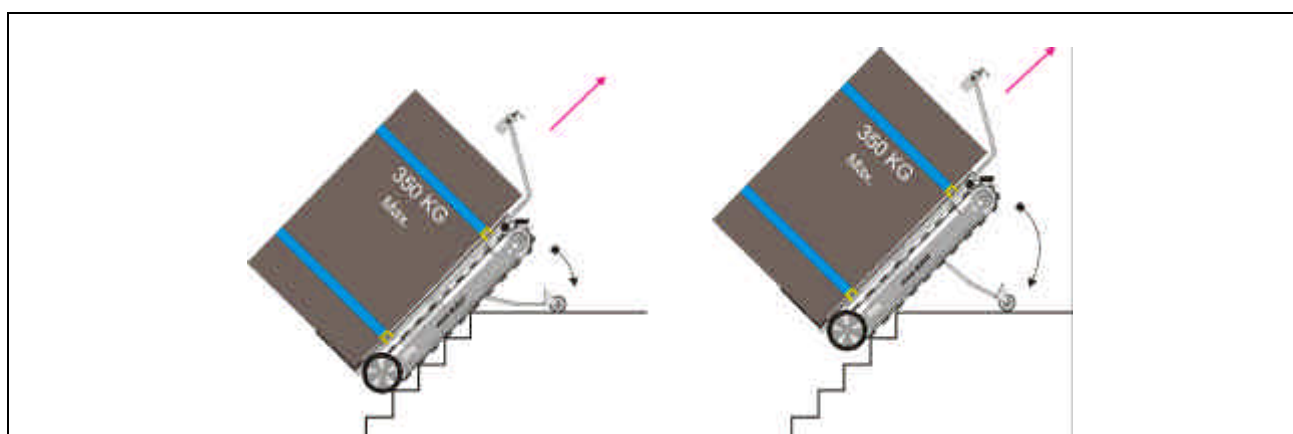

- Wheel the stairrobot to the foot of the stairway
- Block the side wheels using the brake
- Pull the stairrobot on the stairway and use the control handle to drive-up the stairway
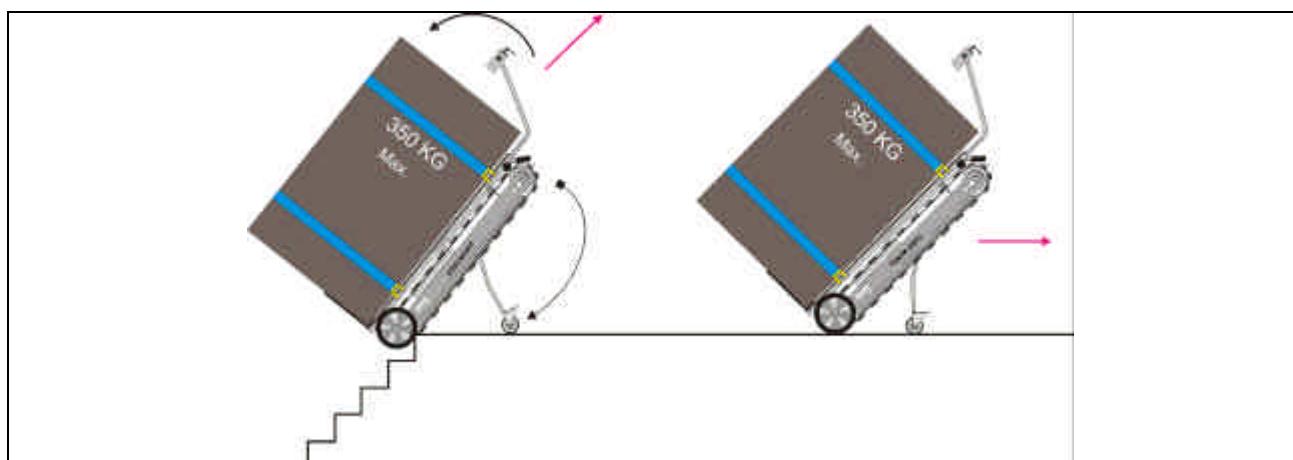
5.5.1. Landing

1.a
- Drive the stairrobot over the top of the stairway until you reach the 'balance point'
- Pull the stairrobot forward and land the stairrobot on it's tracks

1.b
- Drive the stairrobot partway over the top, then stop and lower the folding wheel
- Start the forward movement again and use a foot to secure the folding wheel

- Drive the stairrobot over the top and keep the stairrobot balanced until the folding wheel locks into position; resume the forward movement
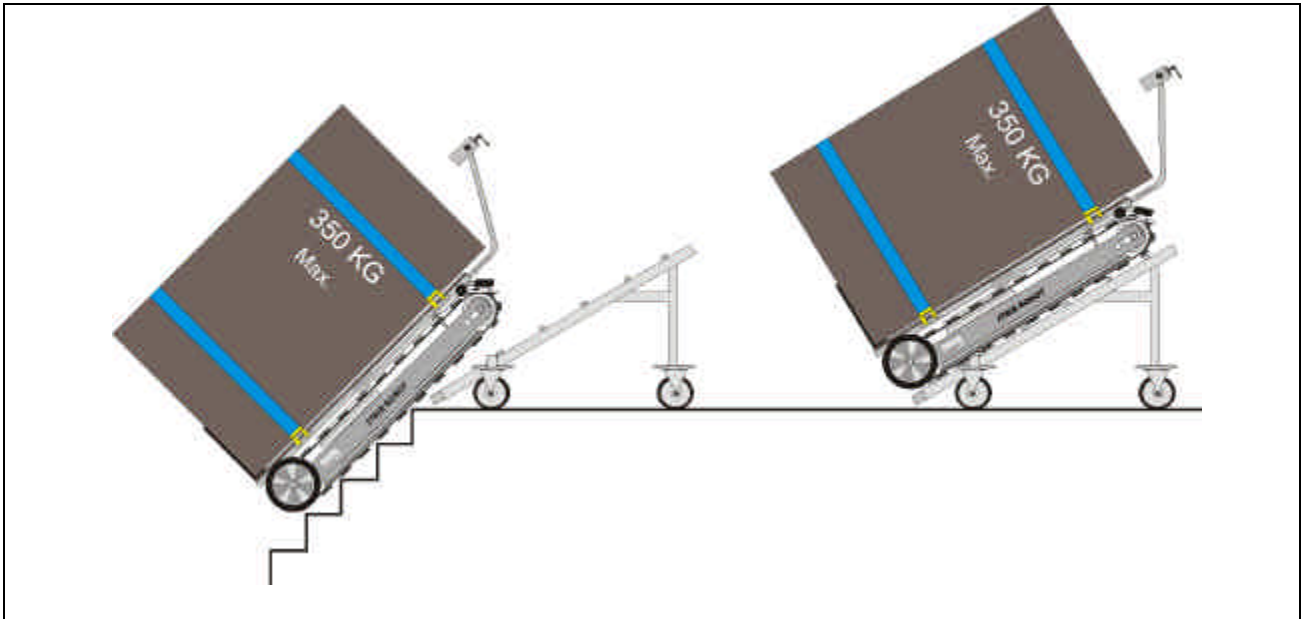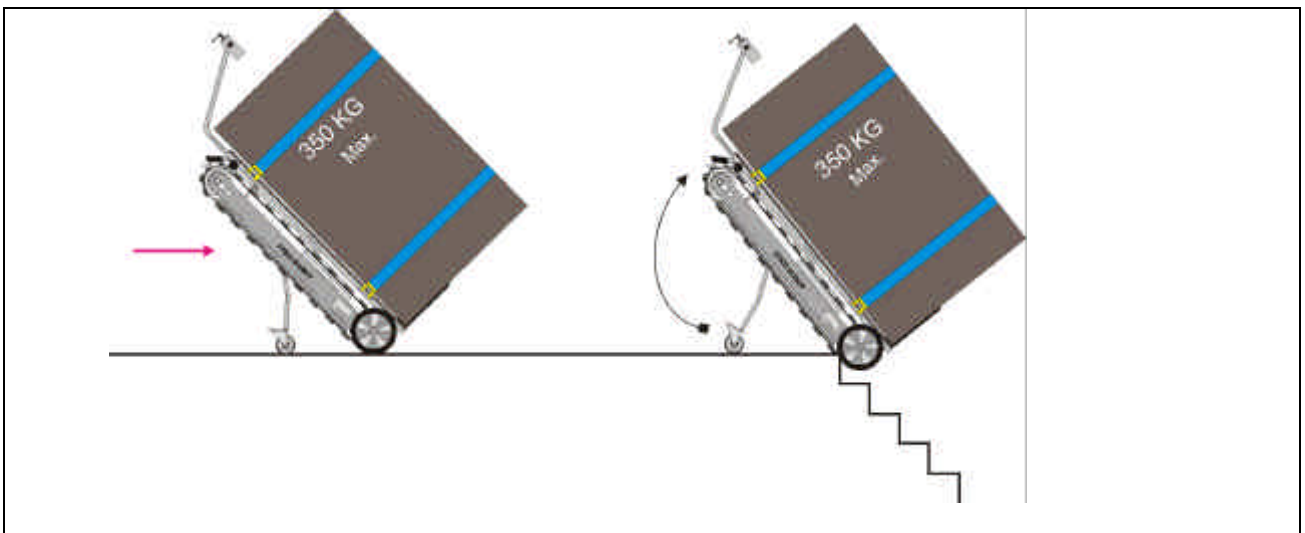
1.c
- Drive the stairrobot over the top of the stairway until you reach the 'balance point'
- Pull the stairrobot forward and land the stairrobot on the dolly
- Drive the stairrobot on the dolly and use the dolly to manoeuvre

5.6.   Descending

- Move the loaded stairrobot to the stairway until the blocks of the tracks grip on the stair nosing; balance the equipment on the top of the stairway
- Push the lever in to retract the folding wheel; the folding wheel will swing-up and lock automatically

⚠️ Important! If you retract the folding wheel make sure that you are out off the swing- range

- Drive the stairrobot downstairs until the two fixed wheels hit the floor
- Use forward command on the control handle and balance the equipment into an up-end position

5.6.1. Descending landing

• Up-end the stairrobot	
• Drop the folding wheel by pushing the lever and lock into position	

- Place one foot on the folding wheel and pull the stairrobot on it's three wheels

5.7. Unloading

- Start the procedure by securing the area for unloading
- Place the dolly on it's tracks or up-end position with the rear-end of the stairrobot on the floor
- Remove securing straps
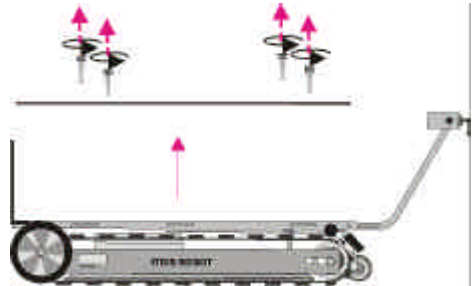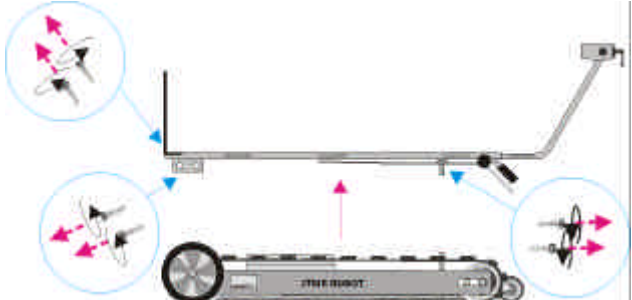- Remove the load or pull the stairrobot from under the load

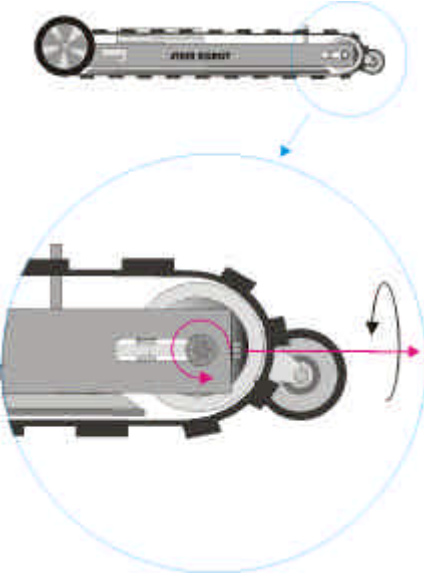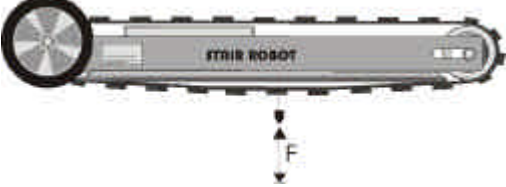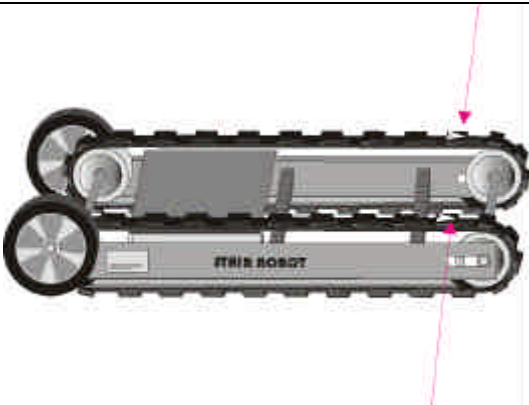- All operators techniques should be practised with a light load first

6 Trouble shooting chart

The stairrobot SR 450 is designed and built to function for several years with little maintenance. In case a problem occurs please make the following checks. If the problem continues to exist please contact your local dealer

Symptom	Possible course	Solution
• Main motor does not work	• No current	• Check electrical wires and connections • Check batteries
• Main motor stops	• Motor overheated	• Wait several minutes
• Batteries do not charge	• Batteries damaged • Battery charger is not working	• Replace batteries • Check mains supply • Replace charger

7 Track replacement

• Place the stairrobot on it's tracks	
• Unscrew the four screws on the platform and remove the plate	
• Remove the platforms chassis and replace tracks	

⚠ • Loosen axle bolts and loosen the track stretch-bolts on both sides
• Replace tracks with the > mark pointing in the same direction and place

Proper track tolerance at point F is +/- 10 mm (pulled by hand)

8. Parts list

Art.nr.:	Article
450.001	Main motor
450.002	Gearbox
450.003	Folding leg incl. swivel wheel
450.004	Spring folding leg
450.005	Main switch
450.006	Plastic handle main switch
450.011	Battery-pack complete 4 x 12V monobloc
450.012	Charger (built-in)
450.013	Charger 220V/24V
450.014	Led battery indicator
450.016	Front axle
450.017	Drive axle
450.018	Main cable
450.020	Plastic handle
450.050	Gearwheel bearing
450.200	Caterpillar track
450.400	Heavy duty dolly
450.410	Dolly wheels

9. CD-Rom video

Content:

- Stair robot general promotion video (mpeg1)
- Instruction video SR 1750 HE (mpeg1)
- Instruction video SR 450 (mpeg1)

cd-rom