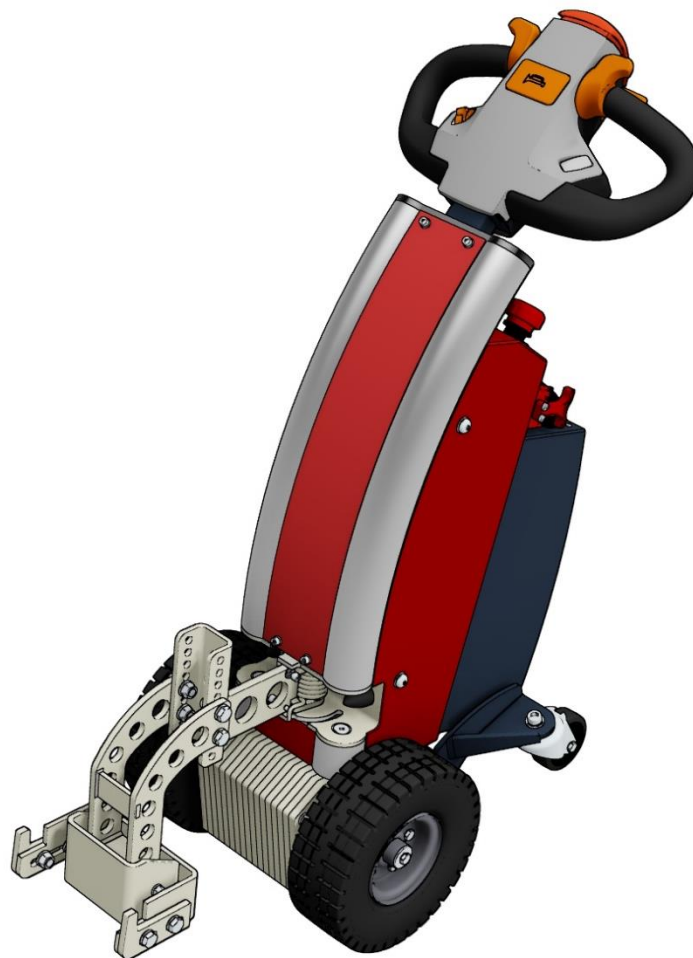


USER MANUAL

Original document

V-move® S



Version 2.0 August 2016

Introductory remarks

This user manual has been written for everyone who is to work on or with the V-move® S. You must first have read this manual before you start working with or on the V-move® S.

The user manual contains important instructions/information about how the V-move® S can be used in a safe, competent and economic way, and must always be available at the place where the V-move® S is used.

The user manual must be supplemented by existing national regulations with respect to accident prevention and environmental protection.

This user manual contains information about the operation of the V-move® S with all the possible options. Only use the information that is applicable to your V-move® S. This machine can be fitted with various options depending on the intensity of use and customer wishes. Consult your sales advisor for this.

Verhagen Leiden BV is not responsible for errors in this manual or for any consequences thereof.

Verhagen Leiden BV cannot be held liable for any direct or indirect damage as a result of operating faults, the lack of proper maintenance, or any use of the machine other than described in this manual.

The liability of Verhagen Leiden BV also no longer applies if you or third parties carry out activities such as adaptations or extensions on the V-move® S without prior written permission.

The V-move® S is only suitable for process and ambient conditions as mentioned in the "Specifications and Tolerances" section in this manual.

This product is supplied under the general delivery and payment conditions issued by the Metaalunie and designated as METAALUNIE CONDITIONS or as SMECOMA CONDITIONS.

The text applies from 1 January 2014 and was deposited at the Court Registry of the District Court of Rotterdam on 1 January 2014. Published by the Metaalunie, PO Box 2600, 3430 GA Nieuwegein, the Netherlands.

The following guarantee provisions apply unless otherwise agreed in writing:

- Verhagen Leiden BV provides a guarantee to the first user for a period of 12 months after delivery.
- Faults must be reported to Verhagen Leiden BV before the end of the guarantee period.
- The guarantee is applicable to faults that:
 - occur during normal use of the V-move® S.
 - originate due to defective construction or materials.
- The guarantee is no longer applicable to faults that occur due to:
 - normal wear.
 - incompetent or inappropriate use.
 - the use of other consumer goods than those specified.
- In the event of faults Verhagen Leiden BV will:
 - replace the parts. Verhagen Leiden BV becomes the owner of the replaced parts.
 - repair the faults.
 - choose another replacement solution if a repair is not reasonably possible.
- The customer must give Verhagen Leiden BV the opportunity to rectify any faults.
- For built-in parts from third parties the guarantee conditions of the supplier concerned are applicable. The guarantee period can differ from that stipulated above.

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1. Technical specifications and tolerances



The V-move® S may only be used in accordance with the instructions in this manual. If the V-move® S is not used according to these instructions, Verhagen Leiden BV no longer bears any responsibility for the V-move® S.



The V-move® S is designed to transfer heavy loads on wheels. The V-move® S is only suitable as a walk-along tug by using driving switches on the tiller head. This tug is not intended for lifting loads.



Do not use the V-move® S for other purposes than those for which Verhagen Leiden BV has made the appliance. This can result in damage and danger to the driver and his/her environment.



The control unit for the V-move® S is supplied with a set of adjustable variables. Apart from setting these variables no changes may be made to the control unit or its software.

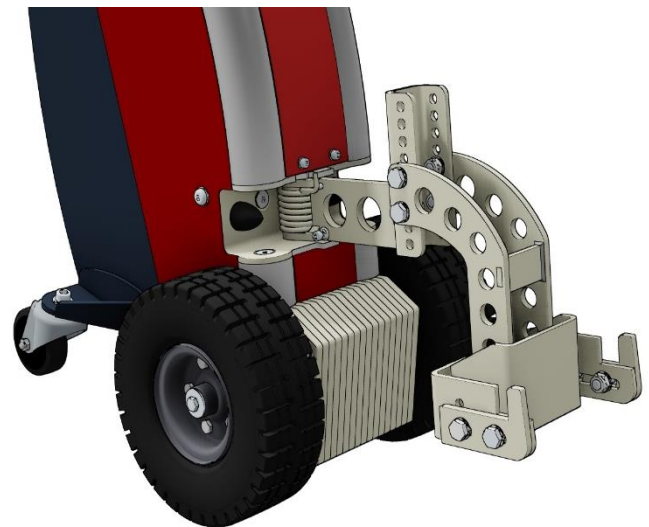
The coupling is specially designed to couple rolling containers and other small containers to the V-move® S. The user hooks the coupling under the container by pushing the tiller head (position 11 pag. 7) forwards, so the castors at the rear lift from the ground and the coupling can hook under the container. The coupling can then be hydraulically clamped tight to the container (optional).

The coupling is positioned at the end of a swivel arm that is kept in the neutral position by a spring when no container is coupled on. While driving the swivel arm enables driving around bends.

The coupling can be set in different ways to allow coupling different container types. First of all the coupling can be adjusted in height and the hooks can be adjusted to be able to clamp to different sizes of profiles. Different hooks can also be used. A spring device is built into the coupling to also allow smooth driving over uneven surfaces when a container is hooked on.

Besides height adjustment on the coupling side, it is also possible to adjust the springing of the castors in order to change the angle of the castors.

The pulling/pushing arm is adjustable in height and the battery pack is interchangeable.



Specifications	
Year of manufacture	See rating plate.
Connection details	See rating plate.
Dimensions	L= 935, W= 385, H= 985 mm
Speed	6 kph maximum
Temperature limits	-20/60°C
Weight incl. batteries	90 kg
Maximum pulling load	1,300 kg
Maximum pulling force	110 kg
Maximum gradient with/without load	10/20%
Motor type	24V DC
Motor configuration	2 motors with gearboxes
Total motor power	0.6 kW
Weight of batteries	18 kg
Battery configuration	2 x 12V
Total battery power	24 Ah
Charger	24V 5A internal
Wheel configuration	2 driven + 2 castors
Tyres	Solid, wheel size 250 mm
Brake	Motor braking and electromagnetic parking brake
Optional	Interchangeable battery pack
	External charger
	Non-marking tyres
	LED light
	PIN code login
	Various (hydraulic) couplings

2. Safety









The V-move® S is built using the latest technology and in accordance with the recognised technical safety regulations. Nevertheless, its use can cause danger of injury or death to the user or third parties. Its use can also cause damage to the V-move® S or other goods.

2.1 Conditions

1. Operation and maintenance of the V-move® S must be carried out by qualified personnel while respecting the warnings on the V-move® S and according to the user manual.
2. The V-move® S is suitable for use outdoors. Electrical components are only splash-proof.
3. The V-move® S is only suitable for ambient conditions as mentioned in the “Specifications and Tolerances” section in this manual. Any other use is forbidden by Verhagen Leiden BV and can result in danger to the driver and/or his/her environment.
4. Only move safe and stable loads. The V-move® S is unsuitable for transporting persons. Passengers may not be transported with the V-move® S or on the tugged vehicle.
5. Make sure that the capacity of the V-move® S is sufficient for the weight of the load.
6. The V-move® S is unsuitable for moving goods containing toxic, explosive, dangerous or flammable substances.
7. The V-move® S is not approved for driving on public roads.
8. Check whether your V-move® S is approved for driving in your work environment or have this checked. This may be relevant in case of any fire hazard or danger of explosion in the environment. When driving, sparks can be caused when switching on and off.
9. No connection or safety provision whatsoever may be removed while the V-move® S is switched on. Only use the V-move® S when all protective devices and safety-dependent provisions are in place and ready for operation.
10. Terms for periodic inspections and maintenance prescribed or mentioned in the user manual must be complied with.
11. If a machine part becomes damaged or no longer works in the correct way, the work must immediately be stopped. Resumption is only allowed when the machine part has been repaired or replaced and has been checked.
12. The V-move® S may not be modified without prior written approval from Verhagen Leiden BV.
13. In addition to the user manual, generally applicable legal and other compulsory rules with regard to safety, accident prevention and environmental protection must also be complied with. These include, for example, rules for personal protection equipment and traffic regulations.
14. Only have the V-move® S maintained and repaired by qualified and skilled personnel and only use original replacement parts.
15. Inform operating personnel before starting maintenance work. Shut off the supply voltage before you start examining or maintaining the V-move® S. With battery driven machines the battery power must first be cut off from the rest of the machine.
16. At the end of the working life parts must be disposed of in accordance with the local laws and regulations.

2.2 Signs

Explanation of the signs:

Sign	Meaning
	Warning. Important points for attention and/or instructions concerning safety and/or damage prevention are marked with this warning sign.
	Read and understand this manual before bringing the V-move® S into use and/or maintaining it.
	Switch the ignition off and remove the ignition key, disconnect the charging plug and press the emergency stop button. Refer to the user manual.
	Danger of injury due to collision due to the load swinging out. Danger of trapping.
	Danger of serious injury due to heavy loads tipping over on gradients. The V-move® S is only intended for driving on flat, dry, paved and sufficiently load-bearing surfaces.
	Always wear safety shoes during all work with the V-move® S.

2.3 Definitions

Driver: Person who drives, controls, supervises the operation of and can start or stop the V-move® S, etc. It is the responsibility of the company to sufficiently train the driver.

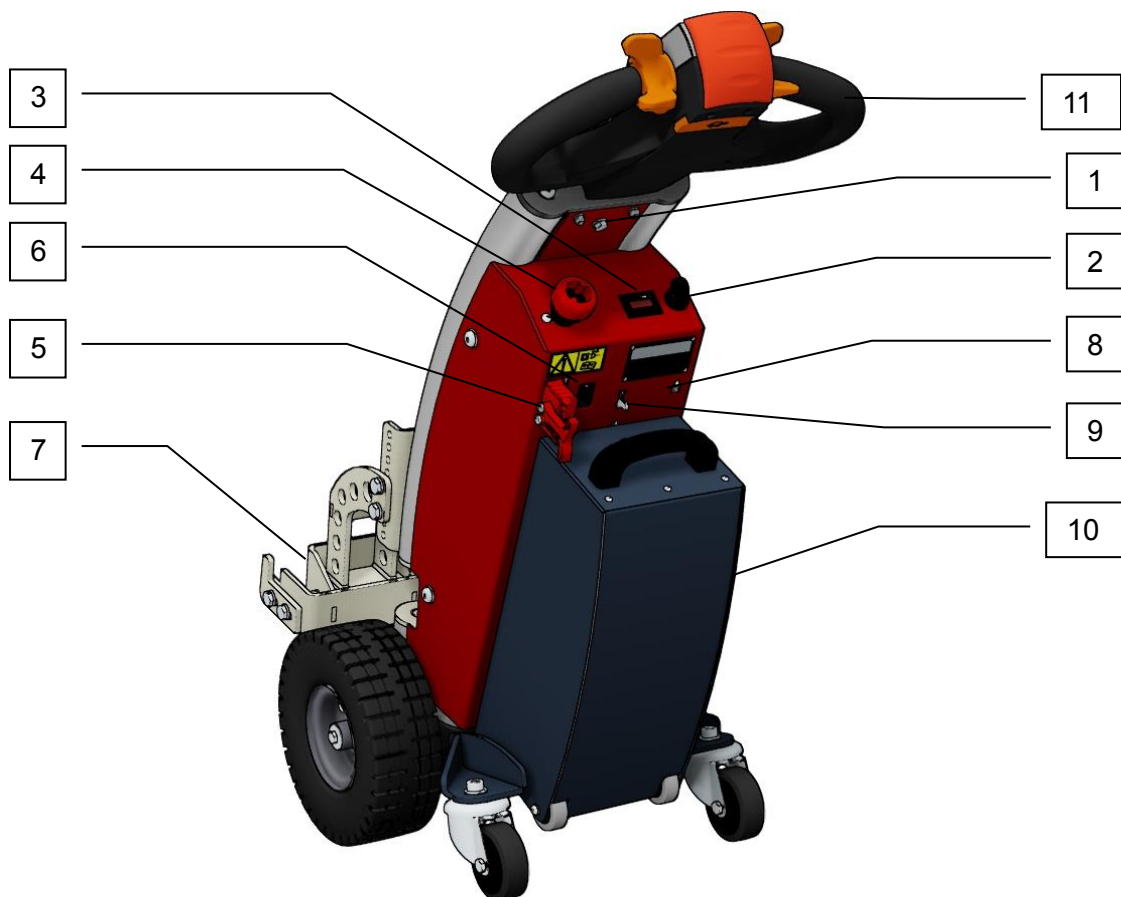
Only persons with thorough (internal) theory and practical training for driving the V-move® S may drive the V-move® S.

Drivers must strictly comply with the safety instructions.

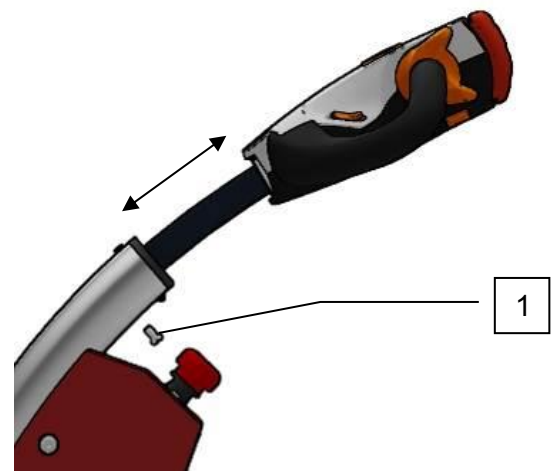
Maintenance mechanic: Person who is familiar with the whole V-move® S, can adjust the safety devices and can maintain the V-move® S. The maintenance mechanic is familiar with the functions and safety standards and is trained to maintain the V-move® S. It is the responsibility of the company to ensure that maintenance personnel are sufficiently schooled and trained.

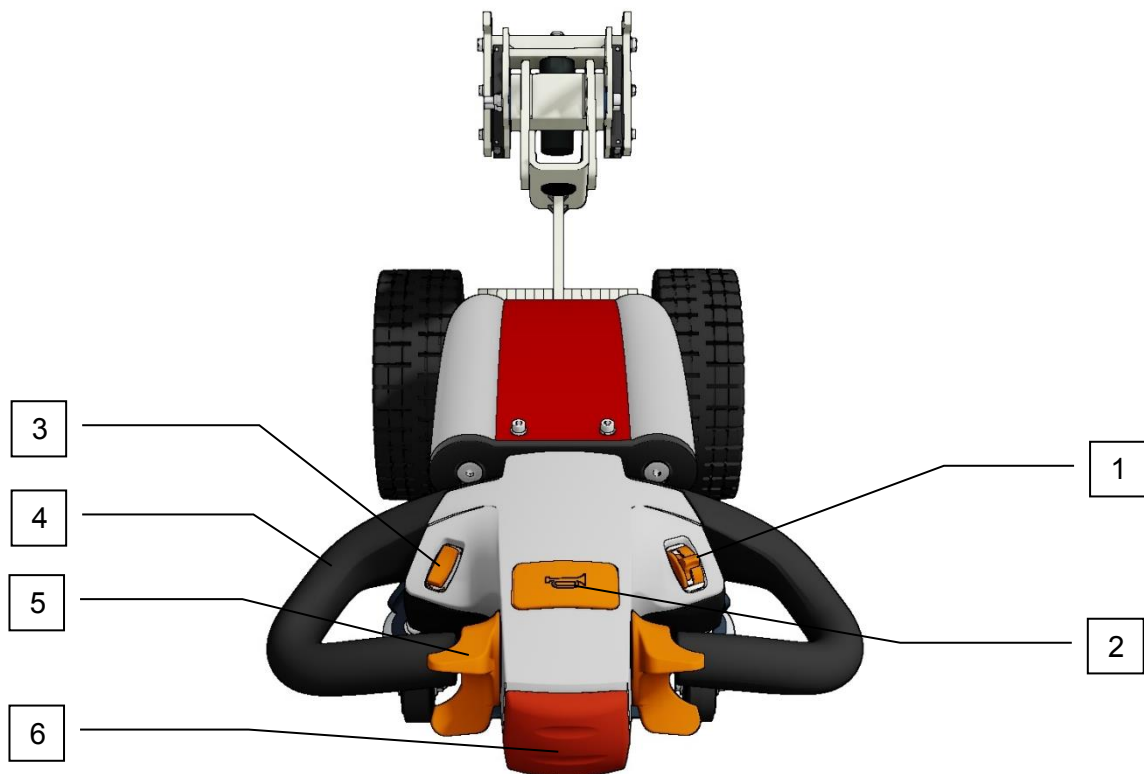
3. Description of parts

3.1 Machine summary V-move® S

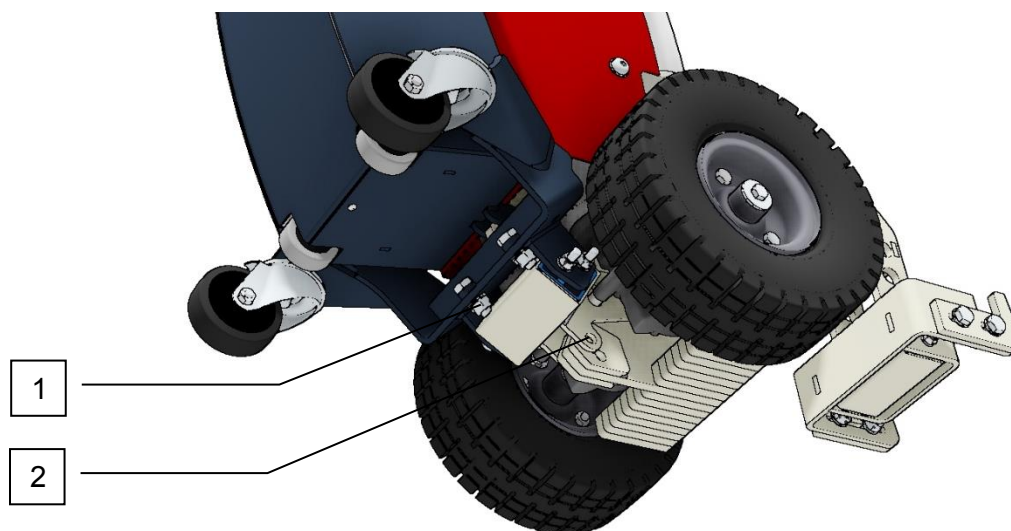


1. Bolt for arm adjustment.
2. Ignition.
3. Battery status indicator.
4. Emergency stop button.
5. 24V connection battery holder.
6. 230V AC connection for internal charger.
7. (Hydraulic) coupling.
8. Programming connection.
9. Decoupling lever for battery holder.
10. Battery holder.
11. Tiller head





1. Continuously variable speed control
 - a. Fast: hare.
 - b. Slow: tortoise.
2. Horn.
3. Button coupling open/close (optional).
4. Tiller head handle.
5. Driving switch forwards/reverse.
6. Anti-trapping switch (belly button).



1. Spring adjustment.
2. 3 positions to adjust the orientation angle of the tug.

4. Transport

Follow all instructions as described in this manual, in particular section 2 on safety.



The V-move® S may only be moved by driving under its own force or lifting using a fork-lift truck. Towing causes serious damage to the drive gear.

Instructions:

1. A stable loading surface with sufficient carrying capacity must be used.
2. The V-move® S must be secured against tipping over or slipping.
3. The following is forbidden:
 - a. Proceeding under the V-move® S when it is being lifted.
 - b. Proceeding within the tipping range of the V-move® S when loading.

The V-move® S is fixed on a pallet using straps and is covered with a box.

Report damage during or immediately after delivery to the transporter and to Verhagen Leiden BV. Take all the necessary measures to prevent further damage.

5. Bringing into use

5.1 Unpacking

The V-move® S is fixed on a pallet using straps and is covered with a box.



Prevent injury and damage by wrongly positioning the lifting forks of the fork-lift truck.

Save the packaging for possible further transport. If you want to dispose of the packaging, you must comply with the local and national regulations relating to plastic waste processing.

5.2 Moving, towing the V-move® S



The V-move® S may only be moved by driving under its own force or lifting using a fork-lift truck. Towing causes serious damage to the drive gear.

5.3 Inadvertent use

The V-move® S is unsuitable for transporting trailers with persons.

The V-move® S is unsuitable for moving goods containing toxic, explosive, dangerous or flammable substances.

The V-move® S is not approved for driving on public roads.

The electrical components and wiring are splashproof so the V-move® S must be stored in a dry place.

5.4 Checks before bringing into use

Besides good maintenance, the driver of the V-move® S must check the following points after each work period:

- Check whether there is damage to the exterior of the vehicle.
- Check the coupling point for bending or damage.
- Check whether the batteries are sufficiently charged.
- Drive forwards and backwards and check brake performance.
- While slowly driving check the total manoeuvrability of the V-move® S.
- Check the trapping protection device on the tiller head handle by pressing the stop button (belly button); the V-move® S should then not start.



If you observe a defect or are in doubt about the functioning of the V-move® S, the V-move® S may no longer be used. Immediately alert Verhagen Leiden BV.

Operation



Follow all instructions as described in this manual, in particular section 2 on safety.



The V-move® S may only be moved by driving under its own force or lifting using a fork-lift truck. Towing causes serious damage to the drive gear.

5.5 Coupling the vehicle to be moved

The V-move® S has a coupling point to which the vehicle to be moved is coupled.

Procedure:

1. Drive the V-move® S carefully with the coupling in the direction of the coupling point on the vehicle to be moved.
2. Position the coupling point of the V-move® S under the vehicle to couple up.



Never put your hands between the V-move® S coupling. The coupling opens and closes hydraulically (optional) with great force.

3. Connect the coupling with the “coupling open/close” button (optional).

5.6 Start



Pay close attention to the driving area. At crossings and in places where there is not a good view reduce your speed and sound a signal. Drive slowly in narrow lanes. Avoid bends if possible and exercise caution at gradients, thresholds, etc. Reduce speed at sharp bends.



The V-move® S may only drive at a speed at which it can be stopped in good time if, for example, there is an obstacle in the driving area.



Accelerating, stopping, steering and making manoeuvres must always be done slowly so the stability of the vehicle(s) being towed is not endangered.



Exercise care if the vehicle is driving on a slight gradient or on slippery ground.

Procedure:

1. Switch the ignition on.
2. Follow the traffic rules.
3. Drive carefully by operating the driving switches.
 - a. Only switch the driving direction to forwards or backwards when the V-move® S is standing still.



When pressing the safety switch (danger of trapping) the V-move® S immediately drives in the opposite direction.

5.7 Stop

Procedure:

1. Release the driving switches.
2. Switch the ignition off.
3. When you leave the V-move® S always remove the ignition keys.

If the V-move® S is not to be used for a certain period, you must:

- Connect the battery charger.

5.8 Emergency stop

There is an emergency stop button on the dashboard.

Procedure:

1. Press the emergency stop button if there is a possible danger. The emergency stop disconnects the battery voltage so the electrical system is no longer powered. The V-move® S will then immediately stop.

After the emergency stop situation has been resolved the V-move® S can be started up again.

Procedure:

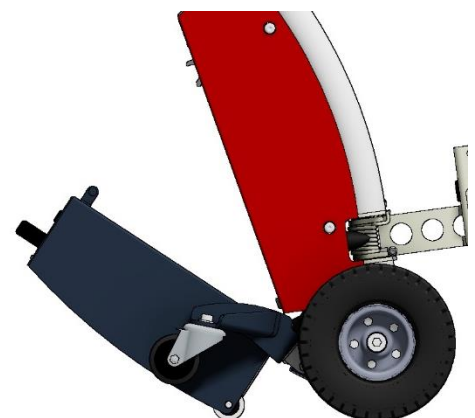
1. Pull out the emergency stop button.

5.9 Changing the battery

Batteries of the V-move® S are interchangeable.

Procedure:

1. Switch the machine off.
2. Remove any connected charging plug from the machine.
3. Grasp the battery holder handle and move lever (1) upwards.
 - a. The upper part of the battery now comes loose.
4. Lower the battery to the ground on its wheels and roll the battery away from the machine.
5. Connect a new battery holder in the reverse order (to described above).



5.10 Charging the battery



The charging location must be well ventilated because during charging explosion-dangerous gases (fulminating gas) are continuously released.



Avoid naked flames or sparks at the charging location during charging. An explosive gas can be released during charging.

When the batteries have discharged to 30% of their capacity, the V-move® S will only drive at 50% of its normal speed. The V-move® S must then be charged. When the batteries have discharged to 20% of their capacity, the V-move® S will stop.

The V-move has an internal battery charger as standard. If one uses the optional replacement battery packs, an external charger is always supplied.

The connection plug for the battery charger is inside a recess in the housing:

1. Plug to connect battery pack to the machine.
2. 230V AC connection for external battery charger.



There is a battery indicator on the dashboard of the V-move® S. This displays the following value:

- Battery capacity with an LED. Right is full. Left is empty.
- Charged level. If the machine is started during charging, the battery indicator shows the charged level of the battery charger. The ignition can stay on during charging.

The battery charger works fully automatically and has a trickle function.

Procedure with internal battery charger:

1. First insert the charging lead plug in the machine and then in the plug socket.
2. Make sure that the batteries are always fully charged (check battery indicator) and never interrupt charging.
3. When the batteries are fully charged, the trickle function is automatically activated.

Procedure with external battery charger:

1. Insert the red plug of the battery charger in the plug of the battery pack.
2. Insert the plug of the mains cable in the battery charger and then in the plug socket.
3. There are three red lights on the battery charger. Red = charging Orange = trickle charging Green = ready
4. Make sure that the batteries are always fully charged (check on battery charger) and never interrupt charging.
5. When the batteries are fully charged, the trickle function is automatically activated.

5.11 Cleaning



When cleaning do not use a high pressure cleaner or hard water jet because the electrical and electronic system is not waterproof and can be damaged.

The bottom side will become soiled after use inside and outside.
It is necessary to regularly remove this soiling because this can impede the operation of the drive gear.

6. Maintenance



Follow all instructions as described in this manual, in particular section 2 on safety.



The V-move® S may only be moved by driving under its own force or lifting using a fork-lift truck. Towing causes serious damage to the drive gear.



Maintenance of the V-move® S must be carried out by qualified personnel while respecting the warnings on the V-move® S and according to the user manual.



Before you remove the batteries, always shut off all current consumers because of spark formation.



The batteries are filled with acid and sealed. They are fully enclosed and maintenance-free. Distilled water can and may not be added.



Battery fluid is a corrosive acid. Avoid contact with clothing, skin and eyes. Immediately wash off any splashes of battery acid on clothing or the skin with soap and water, then rinse with copious amounts of water. Rinse acid splashes in the eyes for at least 5 minutes with clean water and immediately see a doctor.

6.1 Preventive maintenance

The V-move® S is lubricated, set and has been test run at your supplier.

Normal usage is assumed for the following maintenance instructions. For intensive use or use in extreme conditions, the maintenance must be performed at shorter intervals.

Item	Once every	Remarks
Batteries	Day	Check the battery voltage using the battery indicator.
V-move® S	Day	The V-move® S must turn smoothly to the left and the right without juddering.
V-move® S	Day	Check for external damage or faults.
Driven tyres	Week	Check for wear of the driven tyres. If the wheels skid on sudden braking, they must be replaced.
Signs	Week	Check their legibility and replace if necessary.
Maximum speed		It must be possible to reach the maximum speed with gentle acceleration. If this is not the case, contact Verhagen Leiden BV.
Lubrication	Year	Lubricate grease nipples on bearings, drive wheels and castors.
Bolts, turning points, hinge points	½ year	Check that all bolts are still tight and check the turning and hinge points and guides for wear and clearance.
Cleaning	Year	See section 5.11

6.2 Faults and repairs



During the guarantee period it is forbidden to perform repairs, changes and modifications on the V-move® S. The guarantee automatically becomes inapplicable if these instructions are not followed.

V-move® S does not drive:

Cause	Solution
Batteries empty	Charge batteries.
Emergency stop button pressed in.	Pull out emergency stop button.
Battery terminals have poor contact.	Clean, place back.
Driving direction switch defective.	Replace switch.

V-move® S works intermittently:

Cause	Solution
Loose wiring.	Check wiring.
Relay does not properly "switch" due to soiling or defect.	Clean or replace.

The speed is not (properly) adjustable or the V-move® S immediately drives at high speed:

Cause	Solution
Speed regulator defective.	Have replaced.
Relay defective.	Have replaced.

In case of a fault with the cause not immediately clear, we advise you to contact Verhagen Leiden BV by telephone.

6.3 Spare parts and parts subject to wear

The following details must be mentioned when ordering (spare) parts from Verhagen Leiden BV: order number, description, article number and the required quantity.

Only original Verhagen Leiden BV parts and accessories may be used for the maintenance of the V-move® S.

6.4 Battery life



Batteries can wear quickly if they are not used correctly. Fast wear falls outside the guarantee.

Tips for a long battery life:

1. It is recommended to never drive the batteries fully flat.
2. Immediate charging of an empty battery considerably lengthens the working life. Discharging more than 20% affects the working life.
3. Never interrupt charging and allow the battery to fully charge.
4. If the V-move® S is put out of use (for a longer time), it is advisable to keep the battery charger connected. This automatically keeps the battery in a charged state.
5. If the batteries are too heavily loaded this will greatly shorten the working life. It is then necessary to adapt the load.
6. It is advisable to not fully discharge the batteries. If this happens too often, faster wear will be the result. Keep a close eye on the battery condition meter. Connect the battery charger in good time.
7. The batteries must be charged with the correct charger and for a certain time. If the duration of charging is too short, the batteries will not be fully charged and the capacity of the batteries will be too low for your application, with faster wear as a consequence.
8. The temperature of the battery may not become too high. This makes the acid more aggressive. Working and charging in a cool space lengthens the working life.
9. A battery gradually empties by self-discharging. If a battery remains in a discharged state, it will sulphate and can be irreparably damaged. We therefore recommend recharging a stored V-move® S at least once a month.

When replacing the battery, the old battery must be disposed of according to the locally applicable regulations.

7. CE declaration of conformity

Declaration of conformity for complete machinery
(Directive 2006/42/EC, Annex II, sub A)



Verhagen Leiden B.V.
Hoge Rijndijk 267
2314 AG Leiden
The Netherlands

declares that:

V-move® S

- is in conformity with Machinery Directive 2006/42/EC;
- meets the requirements of harmonised European Standards:

Harmonised European Standard	Description	Harmonised European Standard	Description
NEN-EN-ISO 12100_2010	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology	NEN-EN-ISO 13857	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
NEN-EN-IEC 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements		

The Netherlands, Leiden
August 2016

A.W.J.M. Verhagen

Director