

# USER MANUAL

## V-Move M

Type: 24V 500W



This manual is composed for anyone who uses this V-Move / electric mover. Before you start working with or on the mover, any operative must read this manual.

The instruction manual contains important information/instruction for using the V-Move in a professional and safe manner, therefore it must always be available in an accessible place where the V-Move is used.

The user manual must be supplemented with existing national regulations with regard to accident prevention and environmental safety.

This user manual contains information about the operation of the V-Move with all possible options. Use only the information that applies to your V-Move

Depending on the customer requirements, the V-Move can be equipped with various options, consult your sales advisor for this.

## **Disclaimer**

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

Verhagen Leiden BV is not liable for damage and indirect damage as a result of operating errors, lack of expert maintenance and any other use than described in this manual.

Verhagen Leiden BV's liability also expires as soon as you or third parties make adjustments or adaptations to the V-Move without prior written permission.

The V-Move is only suitable for process and environmental conditions as stated in the "Specifications and Tolerances" section of this manual. Any other use is not permitted by Verhagen Leiden BV and this may endanger the operator and/or his environment.

## **Warranty**

Unless otherwise agreed in writing, the following warranty provisions apply:

- Verhagen Leiden BV provides a warranty to the first owner up to 12 months after delivery.
- Defects must be reported to Verhagen Leiden BV before the expiry of the guarantee period.
- The warranty applies to defects that:
  - occur during normal use of the V-Move.
  - caused by faulty construction or materials.
- The warranty expires in the event of defects that occur due to
  - normal wear and tear.
  - improper use.
  - use of other than prescribed consumables

- In the event of defects Verhagen Leiden BV will:
  - replace the parts. Verhagen Leiden BV becomes the owner of the replaced parts.
  - repair the defects.
  - opt for another replacement solution if recovery is not reasonably possible.
- The customer must give Verhagen Leiden BV the opportunity to remedy any defects.
- For built-in parts from third parties, the warranty conditions of the relevant supplier apply. This warranty period may differ from what is stated above.

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## 1. Technical specifications and tolerances



The Multi -Mover may only be used within the limits specified in the order, on the assembly drawing (if applicable) and in this manual for specifications and tolerances. If the V-Move is used outside these specifications, Verhagen Leiden BV can no longer take responsibility for the V-Move.



The V-Move has been developed to move heavy loads on wheels. The V-Move is only suitable for use with the switches on the handlebar grip.



Do not use the V-Move for other purposes such as those for which Verhagen Leiden BV has made it. This can lead to damage and danger to the driver and his environment



The control of the V-Move is delivered with a set of adjustable variables. Outside of setting these variables, no adjustments may be made to the control or the software thereof

| <b>Specifications</b>                 |   |
|---------------------------------------|---|
| Construction year                     | See type plate                            |
| Connection details                    | See type plate                            |
| Dimensions                            | L=590, B=480, H= 1140 mm                  |
| Speed empty                           | 0-5 km/hr                                 |
| Temperature limits                    | -20/60°C                                  |
| Weight standard                       | 130 kg incl. accu's                       |
| Axel pressure-front wheel             | Max 150 kg                                |
| Maximum tensile load                  | 3000 kg                                   |
| Maximum pulling force                 | 1800 kg                                   |
| Maximum slope angle with/without load | 10/20                                     |
| Motor controller                      | Curtis 1228-2901                          |
| Power                                 | 500W DC 24V                               |
| Options                               | Non-marking full rubber tyres at rear     |
|                                       | Non-marking full rubber tyres at front    |
|                                       | Tow bar, tow pin (for drawbar with eye)   |
|                                       | Draw pin with catch and automatic locking |
|                                       | Tow ball                                  |
|                                       | Counterweight front                       |
|                                       |   |

## 2. Safety

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### 2.1 Regulations

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1. Operation and maintenance of the V-Move must be carried out by competent personnel with due observance of warnings on the V-Move and with due observance of the user manual.
2. The V-Move is suitable for outdoor use. Electrical components are only splash-proof.
3. The V-Move is only suitable for environmental conditions as stated in the “Specifications and Tolerances” section of this manual. Any other use is not permitted by Verhagen Leiden BV and this may endanger the driver and / or his environment.
4. Only transport safe and stable cargo. The V-Move is not suitable for the transport of trailers with people. Passengers may not be taken with the V-Move and on a towed vehicle.
5. Ensure that the weight of the load to be transported falls within the capacity of the V-Move.
6. The V-Move is not suitable for moving goods that contain toxic, explosive, dangerous or flammable substances.
7. The V-Move has no approval for driving on public roads.
8. The customer must check whether the V-Move is approved for driving in their area.
9. No connection or safety device may be removed as long as the V-Move is switched on. Only use the V-Move if all protective devices and safety-related devices are present and ready for operation.
10. Periodic checks and maintenance periods prescribed or specified in the user manual must be observed.
11. If a machine part is damaged or no longer works in the prescribed manner, the use of the V-Move must be stopped immediately. Resumption may only be made once the machine part has been repaired or replaced and checked
12. It is forbidden to modify the V-Move without the prior written approval of Verhagen Leiden BV.
13. In addition to the user manual, generally applicable legal and other binding regulations with regard to safety, accident prevention and environmental protection must be observed. This also includes, for example, the regulations for personal protective equipment and traffic rules.
14. Have the V-Move only serviced and repaired by competent and skilled personnel and only with original replacement parts.
15. Inform operating personnel before starting maintenance work. Interrupt the power supply before examining or maintaining the V-Move. For battery-powered machines, the battery supply must first be separated from the rest of the machine.
16. At the end of the service life, parts must be disposed of in accordance with local laws and regulations.

## 2.2 Icons

Explanation of common icons:

| Pictogram   | Betekenis  |
|---|--|
|    | Warning. Important points of attention and / or instructions regarding safety and / or damage prevention are marked with this warning sign.                                |
|    | Read and understand this manual before using the V-Move and / or carrying out maintenance.   |
|    | Switch off the ignition and remove the ignition key, disconnect the charging plug and press the emergency stop switch. Consult the user manual.                            |
|   | Danger of injury due to collision due to swiveling of the load.<br>Risk of crushing  |
|  | Danger of serious injury on slopes due to the heavy load tipping over. The V-Move is only intended for driving on flat, dry, paved and sufficiently load-bearing surfaces. |
|  | Wear safety shoes and other PPE during all work with the V-Move.   |

## 2.3 Definitions

**Driver:** The person who drives/operates the V-Move, checks, supervises its operation and can start, stop, etc. It is the responsibility of the company to adequately train and train the driver.

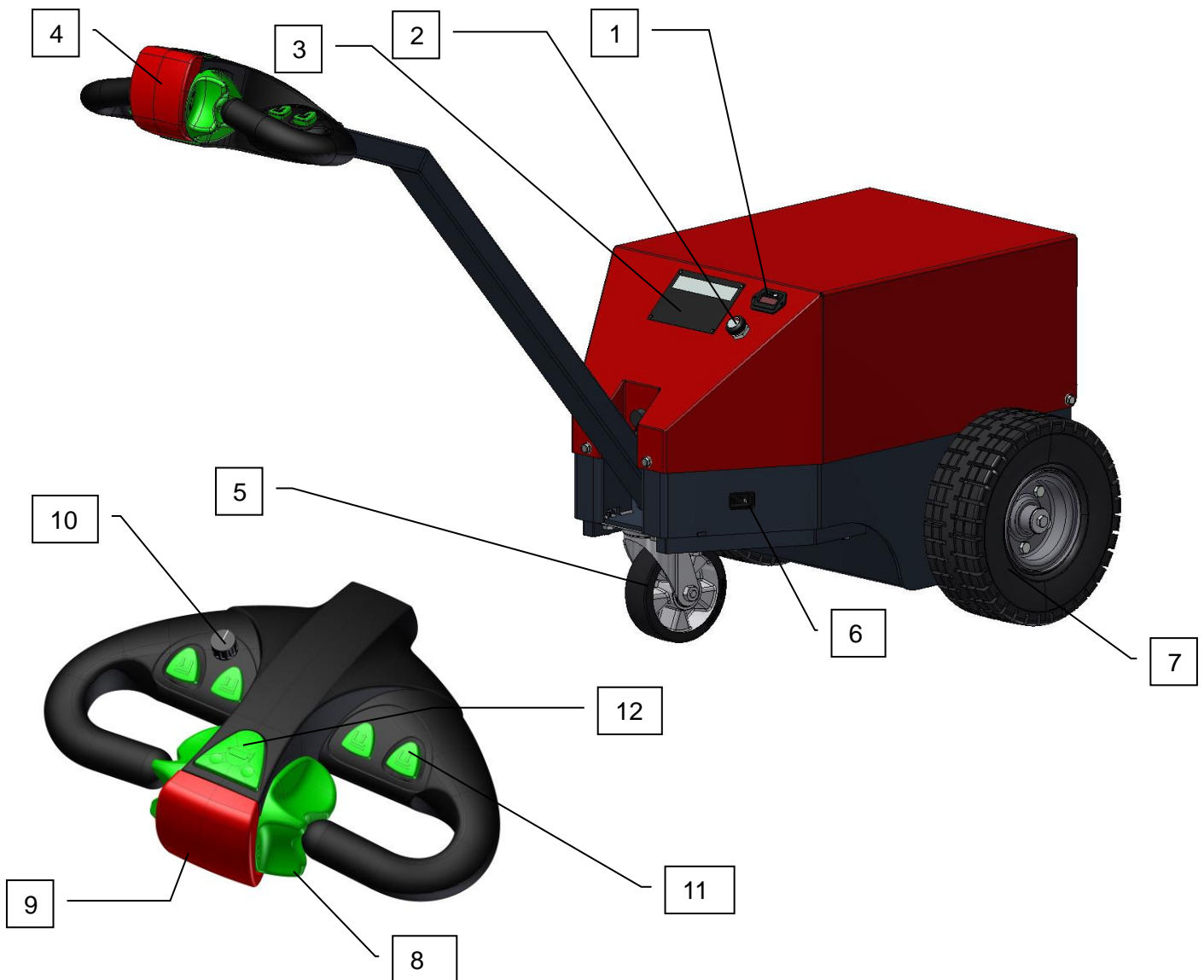
Only people with thorough (internal) theoretical and practical training for the control of the V-Move may drive the V-Move.

Drivers must strictly adhere to safety regulations.

**Maintenance engineer:** The person who knows the entire V-Move, can adjust the safety devices and can maintain the V-Move. The service engineer knows the functions, safety standards and is trained to maintain the V-Move. It is the responsibility of the company to ensure that maintenance personnel are adequately trained and trained.

### 3. Description of parts

#### 3.1 Machine overview



- |                                   |   |
|-----------------------------------|---|
| 1. Battery indicator              | 9. Anti-trap button (terminal block protection) |
| 2. Ignition                       | 10. Speed controller                            |
| 3. Information plate              | 11. Buttons for accessories                     |
| 4. Tillerhead.                    | 12. Horn (optional)                             |
| 5. Swivel castor.                 |   |
| 6. Battery charger connection     |   |
| 7. Drive wheel                    |   |
| 8. Travel switch forward/backward |   |



## 4. Transport

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Follow all instructions described in this manual, in particular the safety chapter.



The V-Move may only be moved by driving under its own power or by releasing the electric magnetic brake and pulling the machine manually.

Requirements:

1. Only a stable loading surface with sufficient load capacity must be used.
2. The V-Move must be secured against tilting, sliding or moving when transporting.

Upon initial delivery, the V-Move is secured with straps on a pallet, surrounded by a protective stretch film/pallet wrap.

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

## 5. Commissioning

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### 5.1 Unpacking

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The V-Move is secured with straps on support beams on a pallet, surrounded by a protective stretch film. Remove the clamping straps at the wheels.

Save the packaging for possible further transports. If you want to dispose of the packaging, you must comply with local and national rules regarding plastic waste disposal.

### 5.2 Loading and Unloading

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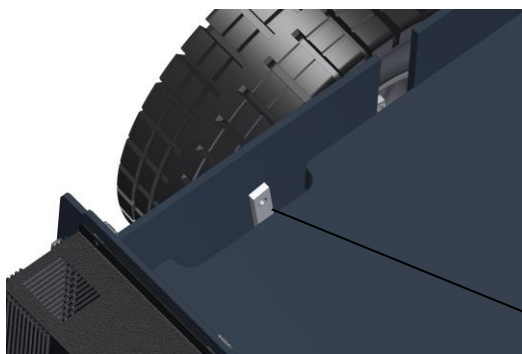
If the V-Move must be moved with a forklift truck, the lifting forks must be positioned so that the center of gravity lies between the forks. The easiest way is to lift the V-Move from one side. Normally the center of gravity is between the front wheel and the rear axle. This depends on any counterweights used.

### 5.3 Moving, dragging V-Move

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The V-Move may only be moved by driving under its own power or by releasing the electric magnetic brake and pulling the machine manually.



Magnetic brake release

### 5.4 Unintended use

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The V-Move is not suitable for the transport of trailers with people.

The V-Move is not suitable for moving goods that contain toxic, explosive, dangerous or flammable substances.

The V-Move has no approval for driving on public roads.

The electrical components and wiring are splash-proof and therefore the V-Move must be stored in a dry place.

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## 5.5 Check before commissioning

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In addition to proper maintenance, the driver of the V-Move must pay attention to the following points after each work period:

- Check for damage to the outside of the vehicle.
- Check the towing eye and towing pin, coupling point and other options for bending or damage.
- Check whether the batteries are sufficiently charged.
- Drive forwards and backwards and check the braking effect.
- Slowly check the total maneuverability of the V-Move.
- Check the anti-trap button on the handlebar/tiller head by pressing the safety switch; the V-Move should not start.



If you notice a defect or have doubts about the functioning of the V-Move, the V-Move may no longer be used. Immediately notify Verhagen Leiden BV.

## 6. Operation

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Follow all instructions described in this manual, in particular the safety chapter.



The V-Move may only be moved by driving on its own or with the help of a forklift. Serious damage is caused to the drive when towing

### 6.1 Linking of products to be moved

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The V-Move is equipped with a standard towing eye with towing pin or a ball coupling point, to which the product to be moved can be connected.

Procedure:

1. Carefully reverse the V-Move to the connector of the product to be moved.
2. Place the drawbar eye or coupling of the drawbar between the draw eyes or coupling point of the V-Move and place the draw pin.
3. Secure the tow pin with a locking spring

### 6.2 Start

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Keep a good view of the driving area. At crossings and in places where there is no good view; reduce your speed and give a signal. Drive slowly on narrow lanes and passages. Avoid bends if unnecessary and pay attention to hills, thresholds, etc. Reduce speed on sharp bends.



The V-Move may only drive at a speed that can be stopped safely.



Raising, stopping, steering and turning should always be done slowly and in control, so that the stability of the vehicles to be towed is not compromised



Always be careful when the vehicle is driving on a slope or on slippery terrain.

Procedure:

1. Switch on the ignition switch.
2. Follow the traffic rules.
3. Drive carefully by operating the handlebar controls and switches.
  - a. Only switch the driving direction forwards or backwards when the V-Move is stationary.



When the anti-trap safety switch is pressed (risk of getting jammed), the V-Move immediately moves in the opposite direction.

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## 6.3 Stop

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Procedure:

1. Release the travel switches.
2. Switch off the key switch.
3. When leaving the V-Move, always remove the ignition keys.

If the V-Move is not used for a certain period, it is necessary that you:

- Connect the battery charger.
- Place the V-Move on blocks so that the tires do not touch the ground.

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## 6.4 Emergency stop

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An emergency stop device is fitted to the unit.

Procedure:

1. Press the emergency stop button in case of imminent danger. The emergency stop ensures that the batteries are disconnected, so that the electrical system is no longer supplied with power. The V-Move will therefore stop immediately.

The V-Move can be restarted after the emergency stop situation has been resolved.

Procedure:

1. Turn off the ignition
2. Turn off the emergency stop button.
3. Turn on the ignition

## 6.5 Charging the battery



The charging station must be well-ventilated because gases and fumes are emitted during charging.



Avoid open flames or sparks at the charging station during charging.

If the batteries are discharged below 30% of their capacity, the V-Move will only run 50% of its normal speed. The V-Move must then be charged. When the batteries are discharged below 20% of their capacity, the V-Move stops.



The battery indicator shows the status of the batteries by means of an LED. When the batteries are being charged, the LED of the indicator flashes. When the LED is towards the right of the indicator the batteries are fully charged.

The connection plug for the battery charger is located on the right in a recess in the housing. The V-Move has an internal charger.

The internal battery charger works fully automatically.

Procedure:

1. Insert the plug into the socket on the housing and insert the plug into the socket.
2. The automatic battery charger will charge all elements at maximum voltage.
- 3 The battery charger switches off automatically.

## 6.6 Cleaning



Do not use a high-pressure cleaner or hard water jet for cleaning, as the electrical and electronic system is not watertight and can be damaged.

When used indoors and outdoors, the bottom will become contaminated with parts from the environment. It is necessary to remove this contamination regularly because the contamination it operation of the drive.

## 7. Maintenance



Follow all instructions described in this manual, in particular the safety chapter.



The V-Move may only be moved by driving on its own or with the help of a forklift. Serious damage is caused to the drive when towing.



Maintenance of the V-Move must be carried out by competent personnel in accordance with warnings on the V-Move and in compliance with the user manual.



Before dismantling the batteries, always shut off all power consumers, i.v.m. spark formation. When dismantling the batteries, first disconnect the earth cable (-). When mounting, finally connect the earth cable (plus (+ = red) to plus and minus (- = black) to minus).



The batteries are filled with acid and sealed. They are completely closed and maintenance-free. Distilled water cannot and may not be topped up.



Battery fluid is a corrosive acid agent. Avoid contact with clothing, skin and eyes. Possible splashes of battery acid on clothing or skin, wash immediately with soap and water, then rinse with plenty of water. Acid splashes in the eyes, rinse with clear water for at least 5 minutes and consult a doctor immediately

### 7.1 Preventive maintenance

The V-Move is lubricated, adjusted and has been tested by your supplier.

Normal use is assumed for the following maintenance instructions. With intensive use or use under extreme conditions, maintenance must be carried out at shorter intervals.

| Item                              | 1x per... | Comments   |
|-----------------------------------|-----------|--|
| Batteries                         | Day       | Check level.   |
| Handlebar grip                    | Day       | The handlebar grip (swivel wheel) must be able to turn smoothly left and right without jerking.                      |
| V-Move                            | Day       | Check for externally visible damage or defects.  |
| Drive tires                       | Week      | Watch out for wear on drive tires. If the wheels slip due to sudden braking, they must be replaced.                  |
| Icons                             | Week      | Check legibility and replace if necessary.   |
| To clean                          | Year      | See section 6.4.   |
| Maximum speed                     |           | The maximum speed must be attainable when moving slowly. If this is not the case, please contact Verhagen Leiden BV. |
| Lubricate                         | Year      | Lubricate grease nipples on bearings, drive wheels and castors.  |
| Bolts, pivot points, pivot points | 6 Month   | Check that all bolts are still tight and check the pivot and hinge points and guides for wear and play.              |

## 7.2 Malfunctions and repair



Repairs are prohibited during the warranty period, changes and to make adjustments to the V-Move, the warranty then automatically expires.

V-Move does not run:

| Cause  | Solution  |
|--|---|
| Batteries empty                              | Charge batteries.   |
| Emergency stop switch pressed                | Pull out the emergency stop switch.   |
| Battery terminals make poor contact.         | Clean, re-secure.   |
| Driving direction switch defective.          | Replace switch.   |
| An electric motor is thermally switched off. | The V-Move is protected against overload due to thermal protection.<br>Search for the cause of the overload. If, after checking and reset, the safety resumes, warn Verhagen Leiden BV. |

V-Move occasionally works:

| Cause  | Solution              |
|--|-----------------------|
| Loose wiring.  | Check the wiring.     |
| Relay is not properly "in" due to contamination or defect. | Cleaning or renewing. |

The speed is not (properly) adjustable or runs directly at high speed:

| Cause                       | Solution           |
|-----------------------------|--------------------|
| Speed controller defective. | Have it refreshed. |
| Relay defective.            | Have it replaced.  |

In the event of malfunctions, the cause of which is not immediately clear, we recommend that you contact Verhagen Leiden BV by telephone.



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### 7.3 Spare and wearing parts

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When ordering (spare) parts at Verhagen Leiden BV, the following information must be stated: order number, description, drawing number, position number, Amperage (if applicable) and the desired number of pieces.

Only original Verhagen Leiden BV parts and accessories may be used on the V-Move.

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### 7.4 Battery life

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Misuse of the batteries can cause them to wear out quickly. Rapid wear is not covered by the warranty.

Tips for long life:

1. We recommend never draining the battery completely. It is also not good to continue charging an almost full battery.
2. The direct charging of an empty battery considerably improves the service life. Discharging further than 20% adversely affects the service life.
3. Never interrupt charging, completely complete the charging.
4. If the V-Move is out of service (for a longer period of time), it is advisable to keep the battery charger connected, it will keep the battery in a charged state automatically.
5. If the batteries are overloaded, this will greatly shorten the service life. It is therefore necessary to adjust the load.
6. It is advisable not to fully discharge the batteries. If this happens a lot, this will also result in faster wear. Pay close attention to the battery condition meter, connect the battery charger in time.
7. The batteries must be charged with a correct charger and for a certain time. If the charging current is too low or the duration of the charging is too short, the batteries will not be fully charged and the capacity in the batteries will become too low for your application, resulting in faster wear. If the charging current is too high or the duration of the charging is too long, the battery will be overcharged. The plates of your battery will overheat and be damaged.
8. If the batteries are only 60% empty and connected to the charger, the batteries will not have the time to unwind. The temperature of the batteries will rise, resulting in faster wear. The voltage of the battery will also become higher than the actual energy condition, so that a discharge limiter will no longer work correctly.
9. The temperature of the battery must not rise too high, as the acid becomes more aggressive. Working with and loading in a cool room improves the lifespan.
10. If the batteries are used more than 3 days a week, they will wear out faster. When choosing the batteries, it is important to take into account the frequency of use.
11. A battery slowly discharges due to self-discharge. If a battery remains in a discharged state, it will sulphate and can be irreparably damaged. We therefore recommend reloading a V-Move that is stored at least every 3 months.

When replacing the battery, the old battery must be disposed of in accordance with local regulations

## 8. CE conformity

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



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explains that:

### ***V-Move M type 24V 500W***

- is in compliance with the Machinery Directive 2006/42 / EC;
- complies with the harmonized European Standards:

| Harmonized European Standard | Description  | Harmonized European Standard | Description  |
|------------------------------|--|------------------------------|--|
| NEN-EN-ISO 12100_2010        | Safety of machinery - Basic concepts, general design principles - Part 1: Basic terminology, methodology       | NEN-EN 349                   | Safety of machines - Minimum distances to prevent crushing of human body parts |
| NEN-EN-ISO 13857             | Safety of machines - Safety distances to prevent the reaching of dangerous zones through upper and lower limbs | NEN-EN 13850                 | Safety of machines - Emergency stop - Design principles                        |
| NEN-EN-IEC 60204-1           | Safety of machines - Electrical equipment of machines - Part 1: General requirements                           |                              |  |

Nederland, Leiden  
August 2019

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