

STERLING

SAPPHIRE LS²

4 Wheel Scooter



Owner's Manual

 **SUNRISE
MEDICAL**

ENGLISH

How to use this manual



How to use this manual

Sunrise Medical Limited want you to get the best out of your scooter. This Owner's Manual will familiarise you with the scooter and its features. It contains guidance on everyday usage and general care in addition to information on the high quality standards which we adhere to and details about the warranty.

Your scooter will reach you in excellent condition having been personally inspected before leaving our premises. By following the guidelines for maintenance on page 29 your scooter will maintain its first class condition and give you years of complete reliability and satisfaction.

Note: Sunrise Medical Limited will later be referred to as "we" in this document.

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Introduction

With over 30 years experience, we are one of the longest established mobility equipment manufacturers in the UK. All of our Scooters, Wheelchairs and Power Chairs undergo rigorous tests to ensure they meet our requirements for comfort, safety and durability.

Our success is based on the strong traditions of quality, value for money and genuinely caring for our customers. We pride ourselves not only on designing and building the most innovative products but also on our commitment to offer an excellent standard of customer service both during and after sale.

Before using your scooter please **read this manual carefully**. It will provide you with all the information you will require. However, if you have any queries about the use, maintenance or safety of your scooter please contact your local dealer. If you have any other questions please write to the address below.

The scooter is classified as a category B vehicle under the European wheelchair standard EN 12184.

It is intended for the use of people of all ages who may have difficulty walking distances or for periods of time. It is ideal for outdoor use and suitable for users up to 150kg in weight, 330lbs. Differing user weights can cause performance variation. Maximum user weight tested using a 150kg test dummy.

The scooter is designed to be driven on footpaths and to cross roads.

It has been manufactured to comply with the requirements of the Medical Device Directive 93/42/EEC, the radio interference requirements of EEC Directive 89/336/EEC and the battery charger requirements of EEC Directive 73/23/EEC and

89/336/EEC. Electro Magnetic fields, such as those emitted by shop alarms may be disturbed by use of the scooter. The function of the scooter may also be disturbed by Electro Magnetic fields emitted by shop alarms.

We are dedicated to providing products of exacting quality that conform fully and reliably to the requirements of their intended use. We are BS/EN ISO 9001 accredited which is the internationally recognised standard for quality management systems. This approval ensures we provide quality in all areas of our business from development through to final delivery. Should you require any further assistance then please contact your local dealer.

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GENERAL WARNINGS

DO NOT OPERATE THE SCOOTER BEFORE READING AND UNDERSTANDING THIS INSTRUCTION MANUAL.

IF YOU ARE IN DOUBT ABOUT THE MEANING OF THESE INSTRUCTIONS, OR ANY OF THE CAUTIONS AND WARNINGS, PLEASE CONSULT YOUR HEALTHCARE PROFESSIONAL, DEALER OR RELEVANT TECHNICAL PERSONNEL.

FAILURE TO FULLY UNDERSTAND THE SCOOTER OPERATION MAY RESULT IN AN UNEXPECTED RESPONSE FROM THE EQUIPMENT WHICH CAN IN TURN LEAD TO POSSIBLE INJURY OR DAMAGE.

NOTES

Warning and Caution notices used in this manual, apply to hazards and unsafe practices that could result in personal injury or damage to property.

WARNING

We supply an extensive range of mobility scooters to meet the varying needs of individual users. It is the responsibility of the individual user and their healthcare advisor qualified in making such choices, to decide which scooter is suitable for the user's intended purpose.

With regards to restraints, seat positioning straps, posture correction or other positional aids and accessories, it is the obligation of the qualified healthcare professional in conjunction with the dealer to ensure the suitability of such equipment for the safe operation of the scooter.

Serious injury can occur in the event of a fall from a mobility scooter.

We DO NOT RECOMMEND that a scooter user is transported in any type of vehicle when seated in the scooter.

At this time, there are no approved Tie-down Systems for the transportation of a user in ANY moving vehicle whilst seated in a scooter.

It is our opinion that users of mobility scooters should be transferred into the appropriate vehicle seating system and use should be made of the restraints available to the auto industry.

Quick Start Guide

Assembly

When lifting always keep the back straight, bend the knees and use the lifting handles provided.

Set the tiller by rotating the tiller adjustment knob anti-clockwise to release the tiller locking mechanism. Move the tiller to the desired position and rotate the tiller adjustment knob clockwise to lock the tiller.

Place the basket on the bracket on the front of the tiller.

Adjust the seat to the desired height by removing the seat post pin and sliding the seat post up or down. Fully reinsert the pin then lift the seat onto the seat post and press down to ensure it is fully engaged.

Battery Charging

The battery **MUST** be charged for 12 hours before first use. Do not be tempted to use the scooter unless the battery has been fully charged as failure to do this will result in battery damage.

Connect the battery charger to the mains supply and the charging socket located on the left hand side of the tiller fascia panel. Switch on the mains supply and then switch on the battery charger. RED Light = Power On, YELLOW Light = Charging and GREEN Light = Charge Complete. Charge the scooter overnight after each use to maintain battery condition (Approx. cost 0.20 euros, 15 pence).

If you are in any doubt then please turn to pages 12 and 13 of this manual.

Typical Use

Designed for use on footpaths, for crossing roads and shopping. It should not be driven through mud, water, snow, sand, loose gravel, long grass or any other unsound surfaces.

Quick Start Guide

Control Functions

Your scooter is equipped with the following features that can be found on the tiller fascia panel:

On/ Off Switch, Battery Gauge, Battery Charging Socket, Speed Control “Min to Max”, Front / Rear Light, Horn and Directional Control Levers.

If you have not used or owned a scooter before you **MUST** read the Owner’s Manual carefully to fully understand the controls and safety warnings.

If you are in any doubt of their functions then please turn to pages 7 and 8 of this manual.

Features



Fig. 1

Getting on and off your scooter

Getting on to your scooter

1. Ensure that the key switch is turned to the off position (Photo 6.1).
2. Push forward the seat swivel lever located under the seat on the right-hand side and rotate the seat to face you (Photo 6.2).
3. Put the armrests into the fully down position and use them to steady yourself as you gently lower yourself into the seat (Photo 6.3).
4. Push forward the seat swivel lever and gently swivel the seat to face forward (Photo 6.4).
5. Ensure that both feet are placed firmly on the floorboard of the scooter and the seat is secure (Photo 6.5).

Photo 6.1

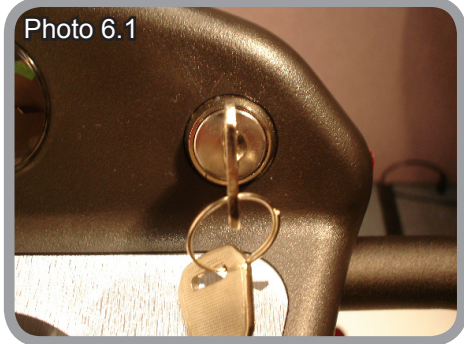


Photo 6.2



Photo 6.3



Photo 6.4



Photo 6.5



Getting off your scooter

1. Bring your scooter to a stop and turn the key switch to off .
2. Push forward the seat swivel lever located under the seat on the right-hand side and rotate the seat 90 degrees to exit (Photo 6.2).
3. Put BOTH feet on the ground and gently leave the seat using the arm rests to assist you out of the chair (Photo 6.3).

Tiller control functions

Hand Controls

All of the drive controls for the scooter are to be found on the Tiller Control Box (Photo 7.1).

The Preset Speed Knob

Turning this knob to the left, "MIN", reduces your available maximum speed. Turning it to the right, "MAX", increases the available maximum speed.

The Battery Gauge

This gives an approximation of battery charge and is illuminated for clarity.

The gauge is "RED" empty, to "YELLOW" charge required, to "GREEN" charged.

As the scooter moves over differing terrain, the Battery Gauge will dip up and down, this is normal. For a more accurate indication, stop the scooter and note the reading. In cold, damp weather the gauge will dip more often as the capacity and efficiency of all batteries drops in such conditions.

TIP: If your battery gauge has gone into the "RED" section you can increase your remaining range by reducing your maximum speed. Remember you **MUST** charge your battery overnight as soon as you can to prevent battery damage.

Operating the Lights

The lights are operated by pressing the blue button on the front fascia panel.

Press the button once to illuminate the lights, press the button again to switch the lights off. Switch the lights on to make yourself more visible in low levels of light, day or night.



Tiller control functions

Throttle Lever

The throttle lever offers finger-tip control of your scooter. It controls the speed as well as forward and reverse motion. To move the scooter in a FORWARD motion PUSH the RIGHT lever with the RIGHT THUMB (Photo 8.1).

To move the scooter in a REVERSE motion PUSH the LEFT lever with the LEFT THUMB (Photo 8.2). The lever will return by itself when released and the scooter will slow to a stop.

The more you move the lever, the more your speed increases up to its preset maximum.



Photo 8.1



Photo 8.2

Horn Button

Pressing the yellow Horn button operates an audible warning sound. Use this function to warn pedestrians of your presence when necessary (Photo 8.3).



Photo 8.3

Key Switch

The key switch switches the scooter ON and OFF.

Please note that it can't be removed when it is in the ON position (Photo 8.4.).

Make sure that this switch is in the OFF position BEFORE getting on or off the scooter. Remove the key to make sure the scooter is OFF (Photo 8.5).

Turning the key to OFF whilst driving will cause the scooter to stop very abruptly. This is not recommended except in emergency stop, as continual use of this function could result in damage to the scooter.



Photo 8.4

Off Board Charging Socket

The socket to connect the off-board charger is located on the left-hand side of the tiller fascia panel (Photo 8.6).

To use the socket, swivel the plastic cover to the left or right, to reveal the socket connections. The charger output plug can now be connected ready to accept charge current from the battery charger.

After use, ensure that the plastic swivel cover is rotated back into place. This action helps prevent water from entering the socket connections.

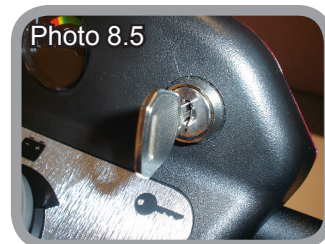


Photo 8.5



Photo 8.6

WARNING.

Do not attempt to charge your scooter outdoors or in damp/wet conditions. Failure to comply with this instruction may lead to a shock / fire hazard.

Freewheel Mechanism

Freewheel mechanism

A freewheel device disengages the power drive to allow manual operation (i.e. the scooter can be pushed at a walking pace).

The freewheel is selected by pushing **BACKWARD** the lever that is located on the left-hand side of the scooter rear panel. Once freewheel has been selected, the electronic drive control system is disabled to prevent driving. This is a safety feature to prevent you driving the scooter with the parking brake disengaged (Photo 9.1).

To turn off the freewheel and engage the motor, simply push the lever **FORWARDS** (Photo 9.2).

WARNING:

Use extreme caution in the freewheel mode, especially on slopes/inclines. Letting go of your scooter whilst it is in freewheel, can cause the scooter to roll unexpectedly.

ALWAYS re-engage the freewheel device after use, failure to do so may result in injury.



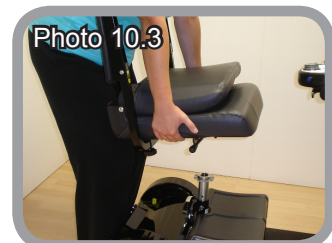
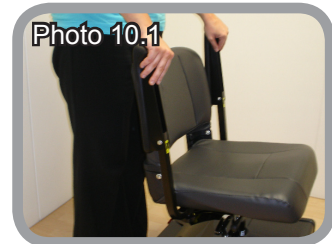
Seat Removal and Adjustment

Removing the Seat

Please note that these instructions are to be used as a guide only.

1. Lift armrests upwards for ease of access (Photo 10.1) .
2. Stand behind seat and fold the backrest down (Photo 10.2).
3. Grasp the seat base and keeping a firm grip, lift the seat vertically, keeping your back straight. Bend knees if required (Photo 10.3).
4. Place seat at desired location for stowage, keeping back posture straight at all times, bend knees where required (Photo 10.4).

Note: Exercise caution when lifting the seat



Seat Adjustment

To adjust seat height, remove the seat as described below.

1. Hold the top of the seat post and remove the seat post pin (Photo 10.5).
2. Move the seat post to the new position and refit the seat pin (Photo 10.6).
3. Refit the seat.



Armrest Adjustment

The width of the armrests can be adjusted by loosening the two thumbwheel knobs located under the seat base, moving the armrests to the desired position and re-tightening the thumbwheel knobs (Photo 10.7).



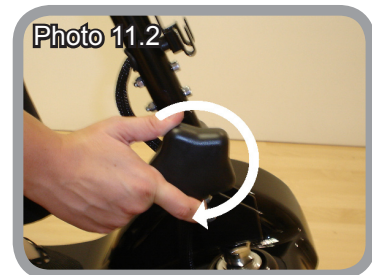
Tiller Adjustment and Battery Removal

Tiller Adjustment

The scooter features an adjustable tiller which allows you to lock the tiller in the most comfortable driving position. This feature also lets you fold the tiller down fully for stowage.

The tiller adjusting knob is located on the lower right-hand side of the tiller.

1. Support the tiller with your left-hand.
2. Rotate the adjusting knob anti-clockwise to release the adjustment mechanism (Photo 11.1).
3. Move the tiller to the desired location.
4. Rotate the adjusting knob clockwise to lock the tiller in position (Photo 11.2).

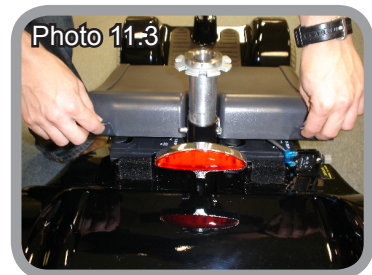


Battery Access

It is important to remove the seat first to allow better access to the batteries.

1. Lift the rear of the battery cover using the two tabs provided (Photo 11.3).
2. Pull the battery cover forwards onto the foot board (Photo 11.4).

Batteries should only be replaced by a qualified service engineer. Please contact your local dealer.



Batteries and charging

Off Board Battery Charger

Your scooter is supplied with an off-board charging facility (Photo 12.1). Please note that only chargers with a capacity of minimum 3.0 Amps and maximum of 6.0 Amps supplied by your local authorised dealer should be used.



1. Switch your scooter off at the key switch.
2. Swivel the charge connector cover located on the Tiller Fascia Panel and connect the charger (Photo 12.2).
3. **Ensure that the charger plug is dry and intact before connecting it to the mains and switching it on.**
4. A reset button is located on the right-hand side of the battery cover. Please check that the button is pressed in (Photo 12.3).



Note:

The charger is capable of charging from 230V or 110V by sliding the red tab on the end of the charger to the required setting using a small screwdriver. This setting is factory set to 230V.

The **5 Amp**, off-board charger has 3 possible indications (Photo 12.4):

1. **RED = Charger is On.**
2. **YELLOW = Charging.**
3. **GREEN = Fully Charged.**



Ensure the scooter is switched off before commencing the charging process.

After charging, always swivel the charging socket cover back into place. This helps prevent water getting into the socket (Photo 12.5).

Please note that the scooter has a safety circuit to prevent it from being driven off during charging. If your scooter fails to respond to normal control after a charging period, please check that the battery charger has been completely disconnected from the scooter.



Batteries and charging

The off-board charger must be kept dry in temperatures between -25°C and 40°C and not be subjected to mechanical damage.

In all cases, the charger must only be repaired by an authorised dealer.

! WARNING !

**NO SMOKING OR NAKED FLAMES WHEN CHARGING BATTERIES.
DON'T TOUCH BATTERY PACK TERMINALS WITH METAL OBJECTS.
ONLY USE APPROVED REPLACEMENT BATTERIES.
IF DAMAGE TO BATTERIES OR BATTERY COVER IS EVIDENT,
CONTACT YOUR LOCAL DEALER IMMEDIATELY - DO NOT ATTEMPT
TO SERVICE THE BATTERIES.**

! DEALER WARNING !

**REMOVE METALLIC JEWELLERY WHEN WORKING WITH BATTERIES.
WEAR GLOVES AND GOGGLES IF MOVING LEAKING BATTERIES.
REPLACE DAMAGED OR LEAKING BATTERIES IMMEDIATELY.
ONLY USE APPROVED REPLACEMENT BATTERIES.**

Fuses

There is a reset button as described previously. If a fault occurs, the button will pop out. Switch the scooter off, press the button in and switch the scooter back on.

There is a 125A fuse fitted to the positive terminal of each battery. These fuses must be replaced by an authorised service agent.

There is also a 10A cartridge fuse fitted on the charger and a fuse in the mains plug of the battery charger. If this blows, switch off at the mains, remove the plug and replace the blown fuse with a new fuse of the same value (Photo 13.1).



Guidance for safe operation and use

Basic Driving

Caution!

It is advisable that during the first few sessions of operating your scooter that the area around you is clear of obstacles and pedestrians.

Before operating your scooter, ensure the seat height and position has been adjusted to your satisfaction and the tiller angle has been set for optimum safety and comfort.

Please see the “General Warnings”, “Getting on Your Scooter” and “Tiller Adjustment” sections in this handbook.

1. Make sure you are properly seated on the scooter and that the Speed Control knob is turned fully to the left, towards “MIN”.
2. Turn the key switch to the “ON” position.
3. On the tiller, use the throttle lever as described earlier. You will gently accelerate. Release and you will gently stop. Practice these two basic functions until you get used to them.
4. Steering the scooter is easy and logical. Be sure to remember to allow enough clearance when turning corners so that the rear wheels clear any obstacle.
5. Shortcutting a pavement corner can cause the back wheel to go off the pavement, causing problems if the corner is very rough. Avoid this at all times by steering an exaggerated curve around the obstacle.
6. When steering in a tight spot, such as entering a doorway or when turning around, stop the scooter and turn the handlebar to where you want to go, then apply power gently. This will make the scooter turn very sharply. It is also recommended that the preset speed is set to a slower setting to aid control in tight spots.
7. Reversing requires attention - **exercise caution when reversing especially down slopes.**

When reversing, always turn the handlebars in the opposite direction to the way you want to go.

The more you operate the throttle lever, the faster you will go.

Reverse speed is 50% slower than forward speed. If the scooter does not move in reverse, carefully turn the speed control knob clockwise until the scooter moves gently backwards.

Important:

To preserve battery power there is a “sleep timer” feature built into the controller. Should the scooter be left ON, but not operated for 15 minutes the scooter will go into “sleep mode”. To reset this, switch the scooter OFF and then back ON again.

Guidance for safe operation and use

Hill climbing

This scooter has been tested to climb an incline of no more than **10° with a maximum user weight of up to 150kg (330 lbs) (Photo 15.1)**. Do not attempt to climb inclines in excess of this.

Always reduce your speed to the minimum setting. Do not reverse down hills in excess of 8° and always use extreme caution when reversing down hills.

Do not attempt to drive along with the wheels at different levels, e.g. along the footpath and road simultaneously.

Hill climbing capability and distance travelled between battery charges will be adversely affected by such things as:

1. The weight of the user.
2. Terrain (e.g., grass or gravel).
3. Steepness of hills.
4. Level of charge and the age of the batteries.
5. Extremes of temperature.
6. Use and weight of accessories.

Photo 15.1



Please note that lap belts must only be obtained and fitted by an authorised dealer and used according to the advice of your healthcare professional.

Travelling across slopes

Care should be taken traversing across a slope. Do not traverse across the face of a slope, in excess of **10° (Photo 15.2)**.

Note: Where possible always travel up or down hills or ramps directly facing the slope of the hill.

Do not traverse across the face of a slope in excess of 10°. Disregard of this advice could result in your scooter tipping.

Photo 15.2



Guidance for safe operation and use

Braking

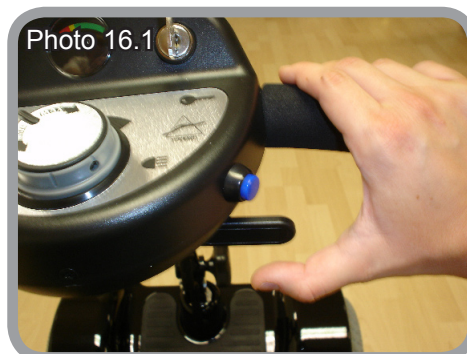
To bring the scooter to a standstill simply let go of the throttle control lever (Photo 16.1).

Remember to keep both of your hands on the handlebars whilst the scooter is braking.

Two types of braking are used.

- (a) Automatic regenerative braking, which slows the scooter to a stop.
- (b) Automatic braking which will operate a couple of seconds after releasing the control lever and holds the scooter in position, even if you are on a hill.

Note: Automatic braking is not instantaneous and will engage within 1/2 a wheel turn once the scooter has stopped.



Emergency Braking

In the unlikely event of an unwanted movement of the scooter or other emergency, switching off the key switch will bring the scooter to a stop.

Though very effective, emergency braking is extremely abrupt and must never be used under normal circumstances.

Letting go of the throttle lever will slow the scooter to a controlled stop.

Switching off

The scooter must always be switched off at the key switch.

When the scooter is stowed or not in use for a long period of time, always charge the batteries for 12 hours and then disconnect the battery pack before storing. If the scooter is to be stored for a long period of time, remove the fully charged battery packs and store out of freezing conditions i.e. greater than 0°C.

Use on the footpath

When using your scooter on the footpath always be aware of pedestrians and situations which might require extra care. For example, young children and pets. Remember, especially when driving in public places, to drive with caution and regard for others at all times. When manoeuvring in confined areas, including shops, ensure the minimum speed is selected (Photo 16.2). If you leave your scooter outside a shop ensure that it does not obstruct the footpath or vehicular access.

Always switch off and take your key with you.



Guidance for safe operation and use

Crossing roads

Your scooter is not capable of mounting and dismounting kerbs and other obstacles in excess of 3" (76mm) (Photo 17.1). Always use pedestrian crossings or drop downs. Be aware that some drop downs may be entrances to driveways. Use caution if this is the case.

Remember before crossing the road, drive forwards and position the scooter at 90° to the road, stopping about 30 - 60cm (1 - 2 feet) away from the edge of the footpath (Photo 17.2). Check that it is clear to cross. Select a medium to high speed setting and when safe to do so, drive across without stopping.

Note: Heavier users will require higher speed settings.

Low speed settings are recommended when travelling down hill, particularly in reverse. Also, reduce your speed when turning corners. The anti-tip devices fitted to the scooter must not be removed.

Photo 17.1



Turning corners

Always reduce your speed when turning corners, particularly when travelling downhill. Disregard of this advice could lead to your scooter tipping over.

Use of mobile phones

Mobile telephones or two way radio devices must not be used while operating the vehicle.

Use of mobile phones or two way radios can cause excessively strong electromagnetic fields. This may interfere with the vehicle's electronic systems.

If mobile phones or mobile radios are required to be used, the vehicle must be brought to a halt and the power turned off before any such device is used.

Photo 17.2



Guidance for safe operation and use

Tyres

Your scooter has pneumatic tyres all round. It is good practice to inspect the tyres for damage or wear regularly. The maximum inflation pressure is 35 P.S.I. (2.40 Bar) and this should never be exceeded. For typical use we recommend inflation to 25 P.S.I. (1.71 Bar) maximum (Photo 18.1).



Emergency Braking

Turning off the power switch whilst moving will switch off the power causing immediate and full braking. This method of stopping is not recommended except in an emergency.

Caution!

Routine use of emergency braking will cause damage to your scooter.

Freewheel mechanism

Caution!

Transporting the scooter along a slope in freewheel mode can be dangerous. Take extra care if this is necessary. Always re-engage the freewheel device after use.

Never sit on your scooter whilst in freewheel since the scooter will no longer automatically stop.

Battery and charging information

General information

Batteries are the power source for almost all of the modern mobility products available today. The design of batteries used in mobility products is significantly different from the batteries used to start a car for example. Car batteries are designed to release a large amount of power over a short period of time, whilst mobility batteries (commonly called deep cycle batteries) release their power evenly over a long period of time. Therefore, due to the lower production volumes and increased technological requirements, mobility batteries are typically more expensive. Commonly two 12 volt batteries are used together in a mobility product giving a total voltage of 24 volts. The size of the battery, (e.g. its available power) is expressed in amps per hour (e.g. 10amp/hr). The higher the number, the bigger the battery size, weight and, potentially, the greater the distance you can travel.

Batteries

Your scooter is fitted with batteries that require no maintenance, other than regular charging.

If a battery is physically damaged, please use extreme caution when handling it. **Beware!** battery fluids are corrosive and care should be taken at all times to avoid contact with it. If it comes into contact with the skin or clothing, wash immediately with soap and water. If it comes into contact with the eye, immediately flood the eye with running cold water for at least 10 minutes and seek medical attention.

In such an event, call your local dealer for assistance.

Please do not dispose of batteries in normal waste, always recycle in accordance with local laws.

Maintenance free

This is the type of battery used in the battery pack. It uses GEL electrolyte which is totally sealed within the battery's outer case. As the name implies, no maintenance is required other than regular charging. As the battery case is sealed, you can safely transport this type of battery without fear of acid spilling. Furthermore, they are approved for transportation on aircraft, boats and trains. It is recommended that the batteries are always transported and stored upright.

Only use batteries supplied by an authorised dealer.

Battery care

We have set out a battery care plan for maintenance free batteries. If a different care plan is followed, this may result in lower than expected performance from your mobility vehicle.

Note: Do not expose any part of the battery to direct heat and when charging always place on a hard surface in a room with good ventilation. You should not charge the batteries in outdoor conditions. Do not smoke when in the vicinity of charging batteries. Exclude all naked flames from the area. Do not allow the batteries to freeze.

Battery and charging information

Battery pack care plan

1. Only use the approved battery charger compatible with the vehicle to be charged.
2. Charge your batteries over night, regardless of the amount of use your mobility device has had during the day.
3. Do not interrupt the charging cycle.
4. If your mobility device is not required for use, it should remain on charge. This will not damage the batteries, so long as the mains socket/plug is left switched on.

Do not leave the charger still connected to the batteries when the mains has been switched off. This will eventually deplete the battery charge.

5. If you leave your vehicle for an extended period (more than 5 days) first charge your batteries for 12 hours, then remove charger and ensure the batteries are disconnected.
6. Failure to allow for recharge will damage the batteries and can lead to shortened distances and permanent failure.
7. Do not top up the charge of your batteries during the day except in an emergency. Wait until the evening for a full overnight charge.

Caution

Remember to remove the plug from your scooter when charger is off, to prevent driving away whilst attached.

The scooter can not be operated when being charged.

8. The batteries need to be checked regularly for signs of damage. If any damage is apparent, contact your local mobility dealer.

Caution!

Take care not to short circuit the battery terminals. Remove all conductive jewellery (e.g. watches, necklaces etc.) before handling exposed batteries.

9. Following all the eight points above should result in a healthier battery, greater range for the vehicle user and a longer life for your batteries.

Battery and charging information

The range of your vehicle

Most manufacturers of mobility products state the range of their vehicles either in the sales literature or within the Owner's Manual.

The range stated sometimes differs from manufacturer to manufacturer even though the battery size is the same. We measure the range of our vehicles in a consistent and uniform manner, but variances still occur due to motor efficiencies and overall product load weight.

The range figures are calculated to I.S.O. Standard 7176, Part 4: Scooter Energy Consumption Theoretical Range.

The range figures stated should be seen as a theoretical maximum and could be reduced if any single, or combination, of the following circumstances occur:

1. User weight heavier than 100kg.
2. Batteries whose age and condition are less than perfect.
3. The terrain is difficult or unsuitable e.g. very hilly, sloping, muddy ground, gravel, grass, snow and ice.
4. The vehicle climbs ramps regularly.
5. The ambient temperature is very hot or very cold.
6. Damage occurring to one or more tyres.
7. Lots of start/stop driving.
8. Also thick pile carpets within the home can affect range.

Always check that the batteries are sufficiently charged before setting off.

Always ensure that your batteries are in good condition and that no leakage has occurred.

Do not expose any part of your charger, battery or scooter to direct heat (i.e. Gas fires or naked flame).

Note: If you are out on your scooter and the battery gauge is reading low the remaining range can be increased slightly by decreasing the maximum available speed.

GENERAL WARNINGS

PERSONAL & OPERATIONAL GUIDELINES

Drive profiles should only be adjusted by healthcare professionals and approved agents/dealers, who are totally conversant with the process. They must also fully understand the user's capabilities and the user's ability to operate the scooter safely.

Incorrect settings may cause injury or damage to the user, bystanders the scooter and/or nearby property.

To determine personal mobility limitations, practice combinations of bending, reaching, mount and dismount techniques, whilst in the presence of a healthcare professional. Practice the above techniques BEFORE actively using the scooter.

For users with balance problems, practice the above techniques with the aid of an assistant, in the presence of a healthcare professional.

DO NOT attempt to pick up objects that cause you to shift your weight in the seat or require you to bend excessively in any direction. Such action may result in the scooter tipping over or in injury to the person or both.

DO NOT use an escalator to move the mobility scooter between floors as serious bodily injury could arise from such actions.

DO NOT drive on the road, dual carriageways or motorways.

DO NOT drive up, down or across inclines that have water, ice, oil or any other slippery substance on the surface. Failure to note the above conditions could cause loss of control.

DO NOT attempt to drive over kerbs or obstacles in excess of 3" (76mm). Disregarding this warning could cause the mobility scooter to tip resulting in possible bodily harm.

DO NOT make sharp turns in forward or reverse at high speeds.

DO NOT lift the mobility scooter by its Tiller, Seat, Body Panels or by any detachable assemblies. Always disassemble the scooter into its stowable parts and then lift each assembly one at a time.

DO NOT carry passengers on your scooter.

DO NOT attempt to tow another vehicle.

DO NOT operate the mobility scooter without first checking that it is safe to do so. Always be aware of your surroundings.

DO NOT attempt to use your mobility scooter without first checking that all wiring harnesses are connected and all detachable parts/assemblies are correctly aligned and firmly fixed in place.

GENERAL WARNINGS

PERSONAL & OPERATIONAL GUIDELINES

DO NOT use your mobility scooter without the anti-tipper wheels attached.

DO NOT attempt to fit parts, accessories or adapters that are not authorised.

DO NOT mount or dismount your mobility scooter without first withdrawing the ignition key. This will ensure that the power is off and the scooter cannot move unexpectedly.

DO NOT leave the ignition key in your scooter whilst it is unattended. Children or inexperienced people may attempt to drive your scooter which may result in damage or personal injury.

DO NOT connect any medical device, such as a ventilator, life support machine etc. to the scooter's electrical system. Failure of the equipment may result from such connections.

DO NOT operate your mobility scooter whilst under the influence of alcohol, drugs or prescription medication that may impair judgement.

DO NOT operate your mobility scooter if you feel acutely unwell.

DO NOT operate your mobility scooter if your vision is seriously impaired.

If you have any doubts about medical conditions, health problems or treatments that may affect your ability to operate the mobility scooter safely, please consult your healthcare professional.

We specifically disclaim responsibility to all personal injury and property damage that may occur during use which does not comply with the relevant national or local statutes.

Do not attempt to operate your scooter whilst standing next to it.

Always ensure that you are able to operate all the controls from a seated position, that the rear view mirror (if fitted) is set correctly and that the seat is securely locked into place.

Attention: Switch on the scooter lights (if fitted) to make yourself visible when there are low levels of light, day or night.

The rear body panel (where fitted) is designed to cover the Drive Assembly, Wiring Harness and Electrical Connectors.

DO NOT stand on any of the body panels, only the footboard.

DO NOT stand on the scooter seat.

DO NOT attempt to transfer into or out of the scooter seat without first checking that it is LOCKED into position. Attempting unsafe transfers can result in bodily injury and/or damage.

GENERAL WARNINGS

PERSONAL & OPERATIONAL GUIDELINES

DO NOT drive your scooter if the seat is not LOCKED in the FORWARD position. The seat must be secured in the FORWARD facing position BEFORE and DURING operation of the scooter. Attempting to operate the scooter with the seat not secured in the front facing position, could result in damage and/or bodily injury.

DO NOT operate the scooter without ensuring that the Tiller is properly adjusted and secured. After making any adjustment to the Tiller position you must check that the Tiller is locked and secured into position BEFORE driving. To check, gently push and pull the Tiller to make sure it is secured.

An unsecured Tiller could result in damage and/or bodily injury.

DO NOT attempt to climb, ascend or descend ramps greater than 10 degrees, or transverse slopes with a gradient greater than 10 degrees.

DO NOT attempt to reverse down slopes in excess of 8 degrees.

When negotiating ramps or inclines, if the throttle lever is released a roll back will occur.

In FORWARD or REVERSE motion the scooter will ROLL BACK approximately 30cms. (1ft) before the brake engages.

Check that all electrical connections are secure before using your scooter.

DO NOT under any circumstances, disconnect, cut, extend or otherwise modify ANY of the wiring harnesses installed within or connected to your mobility scooter.

DO NOT under any circumstances, disconnect, cut, extend or otherwise modify ANY of the wiring harnesses installed within or connected to your mobility scooter battery charger.

It is important that your mobility scooter battery charger is connected to a properly installed electrical socket with an earthed outlet.

Failure to comply with the above requirements could result in a possible SHOCK HAZARD.

DO NOT use any batteries that are not DEEP CYCLE GEL, AGM or SEALED LEAD-ACID type. Other types of batteries are NOT SUITABLE.

Please read battery/battery charger information before installation.

This scooter has been tested to ISO 7176 Part 9 “Climatic Tests for Electric Wheelchairs.”

The test provides the scooter user or their attendant, sufficient time to remove the mobility scooter from a rain storm, whilst retaining normal operation of the mobility scooter.

GENERAL WARNINGS

PERSONAL & OPERATIONAL GUIDELINES

DO NOT operate your mobility scooter during an electrical storm.

DO NOT leave your mobility scooter in a rain storm of any kind.

DO NOT use your mobility scooter in a shower or leave it in a damp bathroom or sauna.

DO NOT leave your mobility scooter in a damp area for any length of time.

DO NOT jet wash, hose down or use an automated car-wash on your mobility scooter.

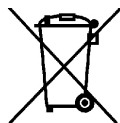
Direct exposure to rain, sea spray or moisture could cause the mobility scooter to malfunction electrically and mechanically and may cause rusting.

Maximum User Weight Limitations.

SAPPHIRE LS² = 150Kg (330lbs).

Front basket = 4.5Kg (10lbs).

DISPOSAL



The symbol above means that in accordance with local laws and regulations your product should be disposed of separately from household waste. When this product reaches the end of its life, take it to the collection point designated by local authorities. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects the environment.

Ensure you are the legal owner of the product prior to arranging for the product disposal in accordance with the above recommendations.

EMC (EMI) WARNINGS

CAUTION:

IT IS VERY IMPORTANT THAT YOU READ THIS INFORMATION REGARDING THE POSSIBLE EFFECTS OF ELECTRO MAGNETIC CONTAMINATION (EMC) ON YOUR MOBILITY SCOOTER. SOMETIMES THIS EFFECT IS ALSO KNOWN AS ELECTRO MAGNETIC INTERFERENCE (EMI).

EMC (EMI) FROM RADIO-WAVE SOURCES.

Mobility scooters may be susceptible to EMC, which is interference from electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur (HAM) radio transmitters, two way radios and mobile phones. The interference (from radio sources) can cause the mobility scooter to release its brakes, move by itself or move in an unintended way. Permanent damage can also be done to the mobility scooter's control system.

The intensity of the interfering EM energy can be measured in volts per meter, (V/m.).

Each mobility scooter can resist EMC up to a certain intensity.

This is known as the scooter's "immunity level".

The higher the immunity level, the greater the protection.

Current technology offers useful protection of at least 20 V/m. which provides protection from the more common sources of radiated EMC.

There are a number of relatively strong electromagnetic fields present in the everyday environment. Most of these sources are obvious and easy to avoid, others are not so obvious and can be unavoidable.

By following the warnings listed, your risk of exposure to EMC will be minimised.

EMC sources can be broadly classified into three types:

1. Hand-held portable transceivers (transmitter-receivers with on-board antenna). Examples are Walkie-Talkie, CB Radio, security, emergency services, Mobile phones. Note that some cellular phones can transmit signals while they are switched on but not being used.
2. Medium range mobile transmitters such as those used on emergency services vehicles, taxis etc. These usually have antennae mounted on the outside of the vehicle.
3. Long-range transmitters and transceivers, such as commercial broadcast transmitters (radio and TV broadcast antenna towers) and amateur (HAM) radios.

EMC (EMI) WARNINGS

Note: Other types of hand-held devices such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, cassette players and small appliances, such as electric shavers and hair dryers, are not likely to cause any EMC problems to your mobility scooter.

Mobility scooter electromagnetic contamination (EMC).

EM energy rapidly intensifies the closer one moves to the transmitting antenna, the source. Because of this it is possible to bring strong EM fields unintentionally close to your mobility scooter's control system. Mobile hand-held radio type transceivers are of particular concern.

Whilst such devices are in use, it is possible that the EM radiation can affect the mobility scooter's movement and braking.

The following warnings are recommended to help prevent possible interference with your mobility scooter's control system.

1. Do not operate hand-held transceivers, such as CB radio or turn ON cellular phones, whilst your mobility scooter is turned ON.
2. Be aware of nearby radio or television transmitters and try to avoid coming too close to them.
3. If you experience unintended movement or brake release, switch your scooter OFF as soon as it is safe to do so.
4. Adding accessories, components or modifying the mobility scooter, may increase susceptibility to EMC (EMI).

Note: There is no easy way of assessing the effect of any modification on a scooter's EM immunity.

5. If you experience any EMC (EMI) related incidents, please report them to your dealer, noting if there is a possible source of EM transmission nearby.

Specifications

MEASUREMENTS ARE FOR GUIDANCE ONLY. SMALL DIFFERENCES MAY OCCUR

| PARAMETER | SAPPHIRE LS² |
|------------------------|--|
| LENGTH | 117 cms (46") |
| REAR WIDTH | 59 cms (23") |
| MAX. USER WEIGHT | 150 kg (330 lbs) |
| BATTERY CAPACITY | 35 AH |
| MAX. SAFE SLOPE | 14 degrees at 113 kg (250 lbs) 10 degrees at 150 kg (330 lbs) |
| TURN RADIUS | 140 cms (56") |
| SEAT - BASE HEIGHT | 43-54 cms (17"-21") |
| MAX SPEED | 6.4 kph (4 mph) |
| WHEEL DIAMETER FRONT | 22.5 cms (9") |
| WHEEL DIAMETER REAR | 26.5 cms (10.5") |
| TYRES - PNEUMATIC | 25 P.S.I. (1.7 Bar) |
| CHARGER OFF-BOARD | 5 Amps |
| RANGE | 30 km (19 mls) |
| OVERALL WEIGHT | 71 kg (156 lbs) |
| SEAT WEIGHT | 12.5 kg (28 lbs) |
| FRONT BASKET LOAD MAX. | 4.5 kg (10 lbs) |
| GROUND CLEARANCE | 8.0 cms (3") |
| CONTROLLER (PGDT) | S-DRIVE (Programmable by Dealer) |



Routine maintenance

The following table gives an indication as to when routine maintenance checks should be made.

| <i>There is no service manual available. Maintenance, fault finding and servicing should be carried out by an authorised dealer unless otherwise indicated.</i> | Daily | Weekly | Quarterly | Annually |
|--|-------|--------|-----------|----------|
| The checks below can be carried out by the user | | | | |
| Battery charge check (Fig. D) Look at battery charge indicator on tiller before use to ensure batteries are fully charged. | ● | | | |
| Inspection of connectors (Fig. C) Remove the battery cover and ensure all connectors are secure. | | ● | | |
| Wipe over with a damp cloth Use a damp soft cloth and mild detergent on panels, battery wells, tiller and seat. | | ● | | |
| Check tyres & tyre pressures, (25 P.S.I., 1.71 Bar) Each tyre should be free of debris, oil, deep cuts or distortion. | | ● | | |
| Long overnight battery charge Please ensure that the batteries are charged for a minimum of 8 hours. | | ● | | |
| Check tyres for wear (See Fig. A and Fig. B) Look at the tyres to ensure that the tread is visible and continuous. | | | ● | |
| The checks below must be carried out by an authorised dealer | | | | |
| Seat swivel, seat slide (where fitted) | | | | ● |
| Inspection of wiring and connectors for chafing and wear | | | | ● |
| Battery terminals Clean and protect with petroleum jelly. | | | | ● |
| Ensure parking brake (where fitted) is correctly adjusted | | | | ● |
| Check stabiliser wheels for wear | | | | ● |
| Inspect motor brushes | | | | ● |
| Full service by dealer | | | | ● |



Fig. A



Fig. B



Fig. C

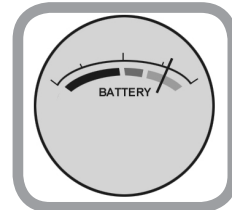


Fig. D

Storage

When storing your scooter for long periods (in excess of one week), charge batteries for 12 hours and then disconnect the batteries to minimise battery discharge.

Electronic faults

Do not attempt to investigate faults in the control box, the control pod or charger as the design and set up of the electronics is of a safety critical nature.

Spare parts are available from authorised dealers.

Replacing LED`s (where fitted)

Caution! Disconnect batteries before changing LED`s.

Rear light - Contact Dealer

Headlight - Contact Dealer

Wheels

Note: Wheels should only be removed and refitted by an authorised dealer.

Service history

This section is designed to assist you in keeping a record of any service and repairs to your scooter. Should you decide to sell or exchange your vehicle in the future, this will prove most helpful to you. Your Service Agent will also benefit from a documented record and this manual should accompany the scooter when service or repair work is carried out. The Service Agent will complete this section and return the manual to you.

| | | | | | | | | | |
|----------------------|--|--|--|--|------------------------------|--|--|--|--|
| Customer Name. _____ | | | | | Date scooter purchased _____ | | | | |
| Address _____ | | | | | Model _____ | | | | |
| _____ | | | | | Colour _____ | | | | |
| Postcode _____ | | | | | Serial No. _____ | | | | |

| YEAR | 1 | 2 | 3 | 4 | YEAR | 1 | 2 | 3 | 4 |
|-----------------------|---|---|---|---|-------------------------------------|---|---|---|---|
| Service dates | | | | | Service dates | | | | |
| Controller | | | | | Upholstery | | | | |
| On/off switch | | | | | Seat | | | | |
| Output plug | | | | | Back | | | | |
| Operation | | | | | Armrests | | | | |
| Dynamic braking | | | | | Electrics | | | | |
| Programmable settings | | | | | Condition of loom | | | | |
| Batteries | | | | | Connections | | | | |
| Levels | | | | | Lights (where fitted) | | | | |
| Connections | | | | | Test run | | | | |
| Discharge test | | | | | Forwards | | | | |
| Wheels/tyres | | | | | Reverse | | | | |
| Wear | | | | | Emergency stop | | | | |
| Pressure | | | | | Left turn | | | | |
| Bearings | | | | | Right turn | | | | |
| Wheel nuts | | | | | Up/down slope | | | | |
| Motors | | | | | Over obstacle | | | | |
| Wiring | | | | | Parking brake (where fitted) | | | | |
| Noise | | | | | List items repaired/adjusted | | | | |
| Connections | | | | | | | | | |
| Brake | | | | | | | | | |
| Brushes | | | | | | | | | |
| Chassis | | | | | | | | | |
| Condition | | | | | | | | | |
| Steering | | | | | | | | | |

| | |
|---|---|
| Dealer stamp Date: _____ Signed: _____ | Dealer stamp Date: _____ Signed: _____ |
| Dealer stamp Date: _____ Signed: _____ | Dealer stamp Date: _____ Signed: _____ |

Trouble Shooting Guide

| SYMPTON | POSSIBLE CAUSE | SOLUTION |
|---|--|--|
| Shortened range | Batteries not charged for long enough | Charge batteries for eight hours or more |
| | Batteries weak and cannot hold charge | Replace battery pack |
| Battery pack not charging or battery gauge shows empty after charging | Battery fault | Replace battery |
| | Charge fault | Replace charger |
| | Charger loom or plug damaged | Contact local mobility dealer |
| | Loose connection | Check plugs and looms |
| | No output from wall outlet | Try a wall socket in a different room |
| | Fuse in charger mains plug blown | Unplug from wall & change fuse |
| Battery charging current high | Button on battery cover has popped out | Switch off and press button back in |
| | Faulty batteries | Replace battery/s |
| No drive | Scooter switched on during charging | Turn Scooter off |
| | Brake-release lever disengaged | Re-engage brake-release lever |
| | Flat batteries | Charge battery pack |
| | Scooter not switched on with key | Ensure the key is switched on |
| | Charger plugged in | Unplug charger |
| | Button on battery pack popped out | Switch off and press button back in |
| | Disconnected loom or plugs | Check all plugs & looms |
| Motor runs irregularly and/or noisily | Control system fault | Contact dealer |
| | Electrical malfunction | Contact dealer |
| DO NOT ATTEMPT TO OPEN ANY PARTS OF THE SCOOTER CONTROL SYSTEM, BATTERY PACK, LOOMS, PLUGS OR BATTERY CHARGER. THE CONTROL SYSTEM IS SAFETY CRITICAL AND THERE ARE NO USER SERVICEABLE PARTS | | |

Trouble Shooting Guide

Your scooter is fitted with a self diagnostic controller that will give a sequence of audible beeps when an error is detected to help you, or the authorised service agent, determine the drive electronics fault.

Should you switch on the scooter and hear the beeps note the number of beeps, separated by a short delay between each sequence, and refer to the table below.

| NUMBER OF BEEPS | POSSIBLE CAUSE | SOLUTION |
|-----------------|------------------------------|--|
| 1 | Low battery voltage | The battery needs charging or there is a bad connection on the battery. Check the connections to the battery. If the connections are good, try charging the battery. |
| 2 | Motor disconnected | The motor has a bad connection. Check all the connections and leads between the motor and S-Drive. Check the position of the freewheel lever. |
| 3 | Motor wiring trip | The motor has a short circuit to the battery. Check all the connections and leads between the motor and the battery. |
| 4 | Freewheel switch trip | The freewheel switch is activated or the manual brake disengagement mechanism is operated. Check the position of the switch or lever and all connections between the switch and the S-drive. |
| 5 | Not used | |
| 6 | Charger Connected | The S-drive is being inhibited from driving. This may be because the battery charger is connected or the seat is not in the driving position. |
| 7 | Throttle trip | A throttle trip is indicated. Make sure that the throttle is in the neutral position before switching on the scooter. |
| 8 | Possible control system trip | A control system trip is indicated. Make sure that all connections are secure. |
| 9 | Solenoid brake trip | The parking brakes have a bad connection. Check the parking brake and motor connections. Make sure all the system connections are secure. |
| 10 | High battery voltage | An excessive voltage has been applied to the S-drive. This is usually caused by a poor battery connection. Check the battery connections. |

Guarantee

Warranty condition

- 1 The repair or replacement will be carried out by an authorised Sunrise Medical Dealer/Service Agent.
- 2 To apply the warranty conditions should your scooter require attention under these arrangements, notify the designated Sunrise Medical Service Agent immediately giving full information about the nature of the difficulty. Should you be operating the scooter away from the locality of the designated Sunrise Medical Service Agent work under the "Warranty Conditions" will be carried out by any other service agent designated by the manufacturer.
3. Should any part or parts of the scooter require repair or replacement as a result of a specific manufacturing or material defect within two years from the date on which the possession of the scooter was transferred to the original purchaser, and subject to it remaining in that ownership, then the part or parts will be repaired or replaced completely free of charge if returned to the authorised service agent.
Note: This guarantee is not transferable.
- 4 Any repaired or replaced part will benefit from these arrangements for the balance of the warranty period applicable to the scooter.
- 5 Parts replaced after the original warranty has expired are covered for a further three months.
- 6 Items of a consumable nature will not generally be covered during the normal warranty period unless such items have clearly suffered undue wear as a direct result of an original manufacturing defect. These items include amongst others upholstery, tyres, inner tubes, batteries, armpads, hand grips and other similar parts.

- 7 The above warranty conditions apply to all scooter parts for models purchased at full retail price.
- 8 Under normal circumstances, no responsibility will be accepted where the scooter has required repair or replacement as a direct result of:
 - (i) The scooter or part not having been maintained in accordance with the manufacturer's recommendations, where such exist. Or failing to use only the specified original equipment parts.
 - (ii) The scooter or part having been damaged by neglect, accident or improper use.
 - (iii) The scooter or part having been altered from the manufacturer's specifications, or repairs having been attempted prior to the Service Agent being notified.

Please keep a note of your local Service Agent's address and telephone number in the space provided. In the event of a breakdown, contact them and try to give all relevant details so they can help you quickly.

The scooter shown and described in this manual may not be exactly the same in every detail as your own model. However, all instructions are still entirely relevant, irrespective of detail differences.

The manufacturer reserves the right to alter without notice any weights, measurements or other technical data shown in this manual. All figures, measurements and capacities shown in this manual are approximate and do not constitute specification.

THIS IN NO WAY AFFECTS YOUR STATUTORY RIGHTS.

Your local service agent:

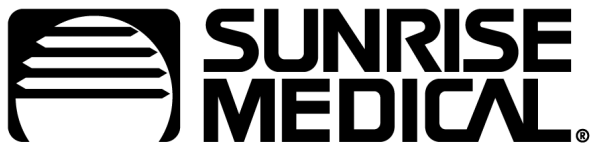
Your local service agent:



Sunrise Medical Limited

Sunrise Business Park, High Street, Wollaston, West Midlands
DY8 4PS England
Tel 01384 44 66 22 Fax 01384 44 66 44
E-mail: sunmail@sunmed.co.uk
www.sunrisemedical.com

Sunrise Medical Limited recommend that you do not undertake maintenance tasks other than those explained in this manual. Your local authorised Sunrise Medical service agent is fully trained by Sunrise Medical to carry out detailed maintenance as and when required. **Use only genuine Sunrise Medical replacement parts.**



Sunrise Medical Limited

Sunrise Business Park, High Street, Wollaston, West Midlands
DY8 4PS England

Tel 01384 44 66 22 Fax 01384 44 66 44

E-Mail: sunmail@sunmed.co.uk

www.sunrisemedical.com