

5 Safety

5.1 Safety features

Safety features	Function
Magnetic kill switch	Disconnects the energy supply immediately, and switches off the Travel system. The propeller then comes to a stop.
Tiller	Ensures that the Travel system is started only from the neutral position, in order to prevent unintentional start-up of the Travel system.
Electronic circuit-breaker	Protects the motor from overcurrent, overvoltage, and reverse polarity.
Overtemperature protection	Automatic power reduction if the electronics or the motor overheats.
Motor protection	Protects the motor from thermal and mechanical damage if the propeller is blocked, e.g. by contact with the bottom, trapped cords.
Cable breakage protection	Immediate shut-down of the motor in the event of damage to a connection cable.
Acceleration control	Protection of the mechanical drive components and avoidance of brief peak currents by regulation of the rotational speed change of the propeller.

5.2 General safety provisions

ADVICE

- You must read and comply with the safety and warning information in these instructions.
 - Read these instructions carefully before you operate the Travel system.
- Failure to comply with these instructions can result in personal injury or material damage. Torqeedo accepts no liability for damage caused by actions which are contrary to these instructions.

The symbols are explained in detail in **Chapter 1.2, "Explanation of symbols"**.

Particular safety regulations may apply to certain activities. Safety and warning information for these activities is to be found in the relevant sections of the instructions.

5.2.1 Principles

Operate your Travel system in compliance with all local safety and accident prevention regulations.

Before delivery, the Travel system was designed and manufactured with the utmost care and with a special focus on convenience, user-friendliness and safety, and it has been extensively tested.

However, unintended use of the Travel system may result in danger to the user's life and limb or of third parties, in addition to extensive material damage.

5.2.2 Intended use

Drive system for marine crafts.

The Travel system must be operated in chemical-free waterways of sufficient depth.

Intended use also includes:

- The attachment of the Travel system to the attachment points specified for this purpose, and compliance with the specified torque values.
- Compliance with all directions in these instructions.
- Compliance with care and maintenance intervals.
- The exclusive use of original replacement parts.

5.2.3 Foreseeable misuse

Use other than, or going beyond, that defined in **Chapter 5.2.2, "Intended use"** is deemed to be unintended use. The operator bears the sole responsibility for damage arising from unintended use, and the manufacturer accepts no liability whatsoever.

Amongst others, the following are deemed to be unintended use:

- Operation of the propeller out of the water.
- Operation in waterways into which chemicals have been released.
- The use of the Travel system outside of marine crafts.
- Any modification to the product.

5.2.4 Before use

WARNING!

**Danger to life from a boat which is not manoeuvrable!
This can result in severe physical injuries or death.**

- Before starting a trip, inform yourself of the intended travel area, and take note of the predicted weather and water conditions.
 - Depending on the size of the boat, keep the typical safety equipment ready (anchor, paddles, means of communication, auxiliary drive if necessary).
 - Check the system for mechanical damage before setting out on a trip.
 - Do not use the system unless it is in proper working order.
- The Travel system may be handled only by appropriately qualified persons who have the necessary physical and mental aptitude. Comply with the relevant national regulations.
 - As the operator of the boat, you are responsible for the safety of the people on board, and for all marine craft and persons in your vicinity. It is therefore essential that you comply with the basic rules of conduct of navigation, and that you read these instructions thoroughly.
 - Particular care is required when people are in the water, even if the boat is moving at a slow speed.
 - Comply with the boat manufacturer's instructions regarding the permitted motorisation of your boat. Do not exceed the stated loading and power limits.
 - Check the status and all functions of the Travel system (including Emergency Stop) at low power before every trip, see **Chapter 11.2, "Maintenance intervals"**.
 - Become familiar with all controls of the Travel system. Above all, you should be capable of stopping the Travel system quickly if necessary.

- In case of motor malfunctions, an error code appears on the display. After the error has been eliminated, the motor can be continued to be driven from the neutral setting in most cases. See descriptions and details in **Chapter 10, "Error messages"**.
- In the event of a person going overboard, stop the motor immediately.
- Observe the manufacturer's instructions and/or the instructions for use when charging.
- Use the prescribed charger unit.
- Never use a battery that is not intended or designed for this device.
- Do not mix cells or use cells from different manufacturers, of different capacity, size or type within a single device.
- Remove the battery from the device when it is not in use.
- Do not remove the battery from its original packaging until it is to be used.
- Clean the contacts on the battery and the device before installing the battery.
- Cells and batteries must not come into contact with solvents e.g. thinners, alcohol, oil, anti-rust products, or agents which attack surfaces, e.g. detergents.
- Do not expose the battery to mechanical shocks.
- Do not open the battery housing.
- Protect the battery from mechanical damage. In case of damage to the battery housing, do not use or charge the battery any more.
- Charge the battery to 100 % before use.
- Do not charge the battery over a longer period of time if it is not needed.
- Always charge the battery under the supervision of an adult and on a fire-proof surface.
- Charge the battery at an ambient temperature between 0 °C and 45 °C.
- Keep the battery away from children.
- Do not store the battery in a location exposed to rain. High temperatures and humidity can lower the insulation resistance and lead to self-discharge and corrosion on the surface.
- Do not take the risk of storing batteries or cells in a box or drawer in which they can short-circuit each other or be short-circuited by other conductive materials.
- Note that lithium-ion batteries having a capacity of > 100 Wh have not been allowed to be carried as luggage on passenger planes since 2009. Your motor's battery exceeds the specified value and must not be carried in hand luggage or check-in luggage.
- The battery is declared as dangerous goods as per UN Class 9. It must be delivered by the transport company in the original packaging. This does not apply to private transport. During private transport, be careful not to damage the battery housing.
- The motor unit must be taken out of the water if the boat is driven by other means (towing, sailing, using other motors) to prevent damage to the electronics.
- Note that the motor automatically reduces its speed at full throttle at high ambient temperatures to prevent the battery from overheating. This is indicated by a flashing thermometer symbol on the display (overheat protection mode).
- The shaft seals which seal the motor to the gear shaft may be damaged if the motor is operated out of the water for longer periods of time. There is risk of overheating the motor.

5.2.5 General safety information

⚠ DANGER!**Risk of fatal electric shock!**

Contact with uninsulated or damaged parts can result in death or severe physical injuries.

- Do not use damaged power supply units.
- Do not undertake any repair work whatsoever on the Travel system yourself.
- Never touch frayed or severed wiring, or obviously defective components.
- If you suspect a problem, switch off the Travel system immediately, and do not touch any metal components.
- Prevent the electronic components from coming into contact with water.
- Prevent strong mechanical forces from working on the batteries and cables of the Travel system.

⚠ DANGER!**Risk of explosion due to formation of oxyhydrogen gas!**

Death or severe physical injuries may result.

- In case the battery is submerged more than one meter under water for a short period of time, contact Torqeedo Service and do not attempt to recover the battery.
- If the battery has been submerged in shallow water (<1 meter) for a more than 30 minutes, contact Torqeedo Service and do not attempt to recover the battery.

⚠ DANGER!**Risk of death from fire!**

The use of third-party charger units can cause fires.

- Always use the power supply unit supplied by Torqeedo.

⚠ DANGER!**Risk of death from lithium fire!**

Death or severe physical injuries may result.

- A lithium fire cannot be extinguished using water; if possible, smother the fire with sand.
- Use water to cool the battery and to prevent the fire from spreading.
- Move the battery to a position in which it causes the least amount of damage possible.

⚠ DANGER!**Risk of death from electromagnetic radiation!**

Death or severe physical injuries may result.

- Persons fitted with cardiac pacemakers must maintain a distance of at least 50 cm from the motor and the magnetic kill switch.

⚠ WARNING!**Danger to life from a boat which is not manoeuvrable!**

This can result in severe physical injuries or death.

- Before starting a trip, inform yourself of the intended travel area, and take note of the predicted weather and water conditions.
- Depending on the size of the boat, keep the typical safety equipment ready (anchor, paddles, means of communication, auxiliary drive if necessary).
- Check the system for mechanical damage before setting out on a trip.
- Do not use the system unless it is in proper working order.

⚠ WARNING!

Mechanical hazard from rotating components!
This can result in severe physical injuries or death.

- Do not wear jewellery or loose clothing in the vicinity of the drive shaft or the propeller. Tie up long, loose hair.
- Switch off the Travel system when there are people in the immediate vicinity of the drive shaft or the propeller.
- Do not carry out maintenance or cleaning work on the drive shaft or propeller if the Travel system is engaged.
- Operate the propeller only when it is under water.

⚠ WARNING!

Danger to life from overestimating the remaining range.
This can result in severe physical injuries or death.

- Before starting a trip, make yourself familiar with the travel area, because the range displayed on the onboard computer does not take wind, current, and direction of travel into account.
- Build in a sufficient buffer for the necessary range.

⚠ CAUTION!

Danger of burns from hot surfaces or liquids.
Slight or moderate physical injuries may result.

- Use appropriate personal protective equipment.
- Do not touch the drive components or batteries of the Travel system immediately after use.
- Allow the Travel system to cool down before working in the immediate vicinity.

⚠ CAUTION!

Danger of crushing if motor tilts.
Minor or moderately severe physical injuries may result.

- When tilting the motor, ensure that no-one is present in the vicinity of the motor.
- Do not reach into the mechanical parts when tilting the motor.

⚠ CAUTION!

Rare danger of battery leaking electrolyte gases!
Minor or moderately severe physical injuries may result.

- Avoid skin contact.
- Do not inhale the expelled gases.
- Immediately rinse the affected area of the body with clean water. Immediately visit a doctor.

6 Start-up

6.1 Installation of the drive to the boat

⚠ CAUTION!

**Danger of crushing when components are inserted!
Minor or moderately severe physical injuries may result.**

- Never put hands or fingers between the components.

ADVICE

Ensure that you have steady footing when installing the outboard. Connect the tiller and the battery only after installing the drive onto the boat.

Outboard installation

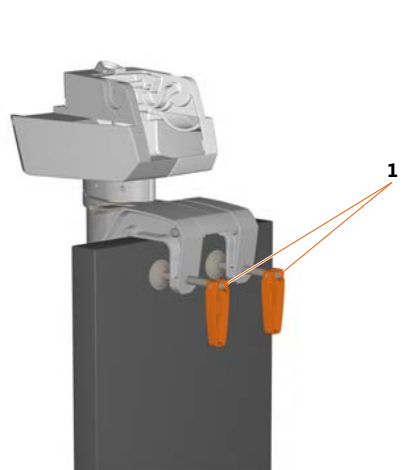


Fig. 42: Transom clamp bolts

1 Transom clamp bolts

1. Place the outboard on the transom of the boat.
2. Fasten the outboard to the transom of the boat using the two transom clamp bolts (1) and tighten the bolts.
3. Check that the outboard is fitted securely.

Start-up

Locking the battery

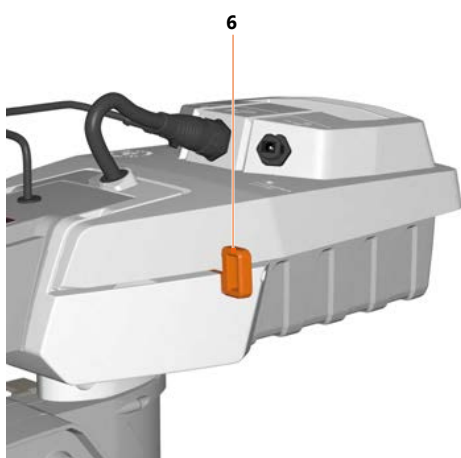


Fig. 45: Locking pin

6 Locking pin

1. Push the locking pin (6) in to fix the battery in place (4).
2. Check that the battery (4) and tiller (3) are securely fitted.

Cable connections

ADVICE

- Do not use excessive force when plugging in the cables, since this may bend the pins.
- The union nut on the plugs must be put on straight in order to prevent damage to the thread during tightening.

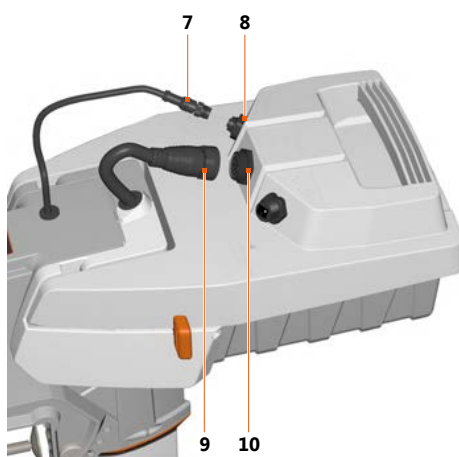


Fig. 46: Electrical connections

7 Tiller cable

8 Tiller cable connection

9 Motor cables

10 Motor cable connector

1. Connect the motor cable (9) to the motor cable connector (10).
2. Tighten the union nut on the motor cable.
3. Connect the tiller cable (7) to the tiller cable connector (8).
4. Tighten the union nut of the tiller cable.

6.2 Fixing the steering in place

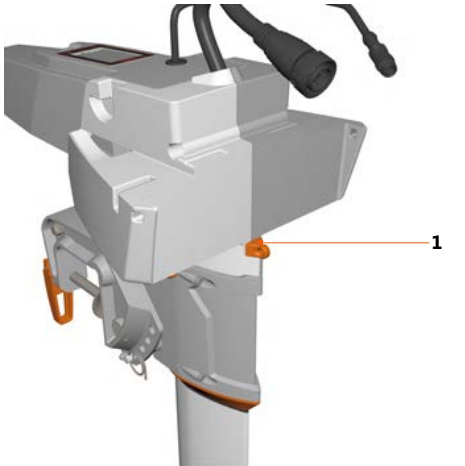


Fig. 47: Small fixing pin position

- 1** Small fixing pin

The small fixing pin (1) can be used to prevent the motor from making steering movements. The boat can then be steered via the rudder (e.g. with sailboats). Locking the steering is optional.

1. Remove the battery.
2. Push the small fixing pin (1) into the opening provided for it.
3. Install the battery, see **Chapter 6.1, "Installation of the drive to the boat"**.

6.3 Trimming the motor

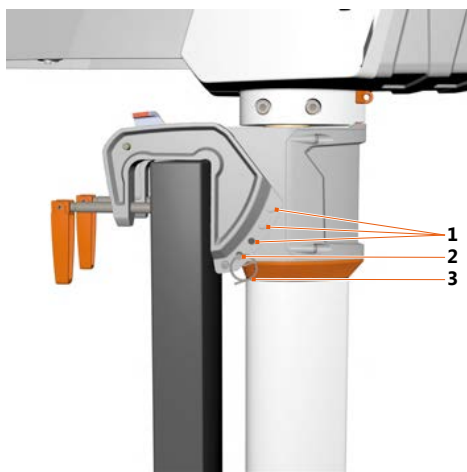


Fig. 48: Trimming positions

- | | |
|--|------------------------------|
| 1 Additional trimming positions | 3 Securing cotter pin |
| 2 Trim rod | |

Trimming allows the motor to be positioned optimally relative to the water surface. For this purpose, four trimming positions (1) are available.

In order to position the motor optimally relative to the water surface, proceed as follows:

1. Tilt the motor upwards, see **Chapter 7.3, "Tilting the motor"**.
2. Remove the securing cotter pin (3) of the trim rod (2), and pull the trim rod (2) out of the transom bracket.
3. Insert the trim rod (2) in the desired trimming position (1) of the transom bracket.
 - ▶ The trim rod (2) must be pushed through both side walls of the transom bracket.
4. Fix the trim rod (2) using the securing cotter pin (3).

6.4 Battery power

ADVICE

The charger unit connection must be sealed off using the provided cap if charging is not taking place.

ADVICE

The battery and power supply unit must not be covered during the charging process.

ADVICE

Charge the battery to 100 % before first use, or after a storage period of several months, in order to calibrate the charge status display. 99 % charge is not sufficient for calibration.

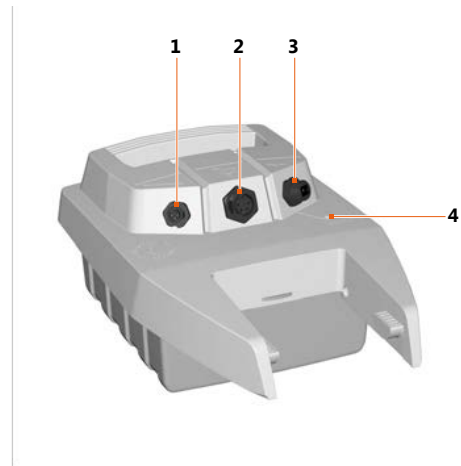


Fig. 49: Battery overview

- | | |
|-------------------------|-------------------------------|
| 1 Tiller connection | 3 Charger unit connection |
| 2 Motor unit connection | 4 Charge status display light |

The batteries of models 503 S/L, 1003 S/L and 1003/1103 CS/CL differ in their capacity. All motors can be operated using the three different batteries. You will find further information in **Chapter 4.1, "Lithium-ion battery"**.

Travel 1003/1103 motors are reduced in power by 50 % when using the 320 Wh battery. The lithium-ion battery is very insensitive to charging cycles (1 cycle = discharge and recharge). After the battery has been discharged 500 times its full capacity, the cells lose approximately 20 % of their capacity (e.g. after 500 complete discharges, 1,000 50 % discharges or 2,000 25 % discharges). This indication for the operating life, however, applies only under normal conditions (particularly with respect to an ambient temperature of approx. 20 °C). The battery has no memory effect.

Start-up

The battery can be charged during use (charge and discharge at the same time). The power display shows only the power being drawn from the battery in this case. If the charging current is greater than the current drawn by the motor, the power display shows 0 W and the battery is being charged. The charge status display takes into account the charging current as well as the current drawn by the motor.

6.4.1 Charging the battery using the power supply unit

1. Connect the power supply unit to the socket and the charger unit connector (3).
 - ▶ The charge status display light (4) flashes.
2. The charging process is complete as soon as the charge status display light (4) comes on all the time.

For more detailed information, the tiller can be connected to the battery during the charging process. In this case, the display shows the **Charging** function as well as the state of charge in percent.

6.4.2 Charging the battery from the onboard power supply

- Charge using a DC power supply in the range of 9.5 V to 50 V.
The DC power supply must be able to provide at least 4 A.
- Use the Torqeedo 12/24 V charging cable (item number 1128-00) for charging.

6.4.3 Powering a device using the USB supply connection

ADVICE

- The USB adapter must not be exposed to any (lever) forces.
 - The USB adapter must be protected from water.
 - The USB adapter must be removed when not in use.
- You can charge USB-compatible devices using the provided adapter.
 - The output voltage is 5 V, and the maximum output current is 1 A.
 - The charging current for smartphones is 1 A according to the Apple™ standard.

1. Plug the adapter into the charging socket and tighten the union nut.
2. Plug your device's USB-A plug into the adapter.
3. Switch on the battery via the tiller.

The device will be powered for up to four hours after the display switches off.

6.5 Start-up of the on-board computer

6.5.1 Displays and symbols

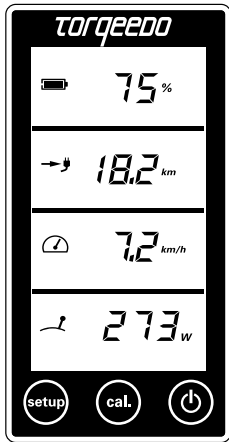


Fig. 50: Multifunction display

The tiller is fitted with an integrated display or onboard computer and three buttons.

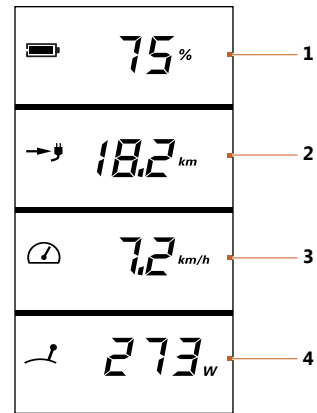


Fig. 51: Overview of multifunction display

- | | |
|------------------------------------|--------------------------------------|
| 1 Battery charge state in percent | 3 Speed over the ground |
| 2 Remaining range at current speed | 4 Present power consumption in Watts |

Start-up

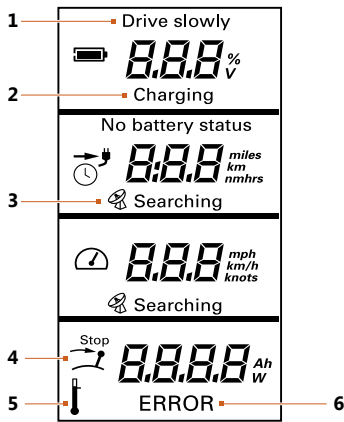


Fig. 52: Multifunction display – Set-up menu

- | | |
|-----------------|---------------|
| 1 Drive slowly | 4 Stop |
| 2 Charging | 5 Temperature |
| 3 GPS searching | 6 Error |

Drive slowly (1) Displayed when the battery capacity is <30 %. Three beeps will sound. The beep will sound again once the state of charge drops below 20 % and 10 %.

Charging (2) Displayed during charging.

GPS searching (3) The integrated GPS module searches for satellite signals in order to calculate speed. If no GPS signal is received, then the second field of the display continuously shows the "Remaining run time at current speed" (time value) and a clock symbol. If the remaining run time is greater than 10 hours, then the remaining run time is displayed in complete hours. If it is less than this, then hours and minutes are displayed.

The GPS module stops searching if no signal is received for five minutes. In order to reactivate the search, the system must be switched off and on again using the On/Off button.

Stop (4) This symbol appears if the tiller handle needs to be placed in the neutral position. This is necessary before you can move off.

Temperature (5) This symbol appears in case of excess temperature of the motor or battery. In this case, the motor itself reduces the power independently.

Error (6) In the event of an error, the **Error** symbol appears in the bottom box, and an error code is displayed. The code indicates the component which triggered it, and also the component error. Details of the error codes are found in **Chapter 10, "Error messages"**.

6.5.2 Display settings

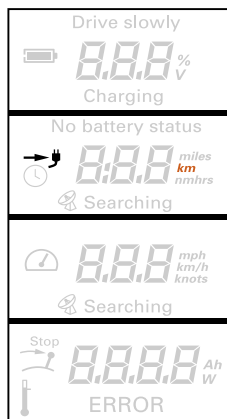


Fig. 53: Multifunction display – Set-up menu

In the Set-up menu, you can select the units to be displayed on screen (in orange).

1. Press the Set-up button in order to access the Set-up menu.
2. Use the CAL button to set the unit in which the remaining range is to be displayed.
 - ▶ You can select between kilometres, American miles, sea miles, and hours.
3. Confirm your selection using the Set-up button.
 - ▶ The setting for the speed display is shown.
4. Use the CAL button to set the unit in which the speed is to be displayed.
 - ▶ You can select between kilometres per hour, miles per hour, and knots.
5. Confirm your selection using the Set-up button.
 - ▶ The setting for the battery status display is shown.
6. Use the CAL button to set the unit in which the battery status is to be displayed.
 - ▶ You can select between Volts and percent.
7. Confirm your selection using the Set-up button.

7 Operation

WARNING!

Danger to life from a boat which is not manoeuvrable!
This can result in severe physical injuries or death.

- Before starting a trip, inform yourself of the intended travel area, and take note of the predicted weather and water conditions.
- Depending on the size of the boat, keep the typical safety equipment ready (anchor, paddles, means of communication, auxiliary drive if necessary).
- Check the system for mechanical damage before setting out on a trip.
- Do not use the system unless it is in proper working order.

WARNING!

Danger to life from overestimating the remaining range.
This can result in severe physical injuries or death.

- Before starting a trip, make yourself familiar with the travel area, because the range displayed on the onboard computer does not take wind, current, and direction of travel into account.
- Build in a sufficient buffer for the necessary range.

ADVICE

Always take the motor out of the water after use. This can be achieved by tilting the motor.

7.1 Emergency Stop

⚠ DANGER!

**Risk of death if the Emergency Stop is not triggered!
Death or severe physical injuries may result.**

- Attach the cord on the magnetic kill switch to the skipper's wrist or to his life jacket.

⚠ DANGER!

**Risk of death from electromagnetic radiation!
Death or severe physical injuries may result.**

- Persons fitted with cardiac pacemakers must maintain a distance of at least 50 cm from the motor and the magnetic kill switch.

ADVICE

- Test the functioning of the Emergency Stop switch at low motor power before every trip.
- In emergency situations, actuate the Emergency Stop immediately.
- At high power, use the Emergency Stop only in emergency situations. Repeated actuation of the Emergency Stop switch at high power stresses the Travel system, and can cause damage to the battery electronics.

ADVICE

The magnetic kill switch can delete magnetic data media (especially credit cards, bank cards, etc.). Keep the magnetic kill switch away from credit cards and other magnetic data media.

There are various options for stopping the Travel system rapidly:

- Place the tiller in the Stop position.
- Pull off the magnetic kill switch.
- Remove the motor cable from the battery.

ADVICE

If you have pulled out the magnetic kill switch, you must first bring the tiller handle to the neutral position before continuing your trip. Then place the magnetic kill switch in position. After a few seconds you can continue your trip.

Operation

7.2 Travel mode

7.2.1 Starting a trip

ADVICE

- If there is visible damage to components or cables, the Travel system must not be switched on.
- Ensure that all people on board wear a life jacket.
- Before starting, attach the lanyard of the Emergency Stop to the skipper's wrist or life jacket.
- The state of charge of the battery must be checked at intervals while on the move.

ADVICE

During breaks in a trip, if there are swimmers near the boat while at anchor: remove the magnetic kill switch in order to avoid unintentionally starting the Travel system.



Fig. 54: On/Off button

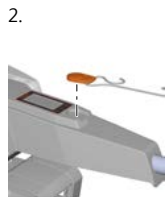


Fig. 55: Magnetic kill switch

Starting the motor

1. Switch the motor on by pressing the On/Off button (1) for one second.
2. Place the magnetic kill switch on the tiller.

7.2.2 Forward/reverse motion



Fig. 56: Tiller

1. Operate the tiller handle as follows:
 - Turn the tiller handle to the right.
 - ▶ Forward drive
 - Turn the tiller handle to neutral position.
 - ▶ Neutral position
 - Turn the tiller handle to the left.
 - ▶ Motion reverse

7.2.3 Steering

1. Operate the tiller handle as follows:
 - Tilt the tiller to starboard.
 - ▶ The boat turns left.
 - Tilt the tiller to port.
 - ▶ The boat turns right.
 - Hold the tiller straight.
 - ▶ The boat moves straight forwards.

7.2.4 Ending the trip

Switching the motor off



Fig. 57: Magnetic kill switch

1. Move the tiller to the neutral position.
2. Push and hold the On/Off button for three seconds.
3. Remove the magnetic kill switch.

You can switch the motor off in any operating condition. The Travel system switches off automatically when inactive.

Proceed as follows after every use:

- Take the motor out of the water.
- In salt water or brackish water: Rinse the motor in fresh water.

7.3 Tilting the motor

⚠ CAUTION!

**Danger of crushing if motor tilts.
Minor or moderately severe physical injuries may result.**

- When tilting the motor, ensure that no-one is present in the vicinity of the motor.
- Do not reach into the mechanical parts when tilting the motor.

Grounding protection

ADVICE

The auto kick-up setting protects the motor in the event of grounding. It provides no guarantee that potential grounding will not cause damage to the propeller or even the motor. This applies particularly in the event of grounding on stones or rock.

Operation

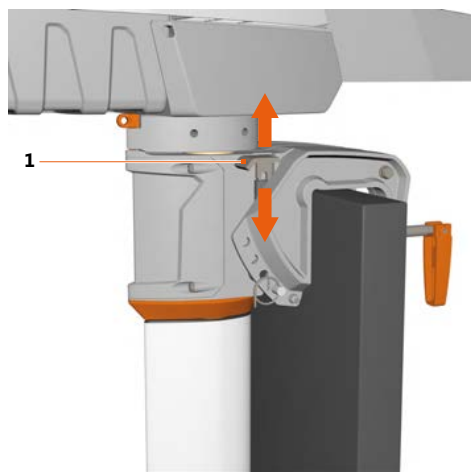


Fig. 58: Tilt lever

1 Tilt lever

The tilt lever (1) allows the motor to be tilted up in the event of grounding when it is in the tilt/auto kick-up position (lever up). In this position, reversing and braking are not possible.

In the Lock position (lever down), automatic tilting up is switched off. Reversing is possible.

Tilting up the motor

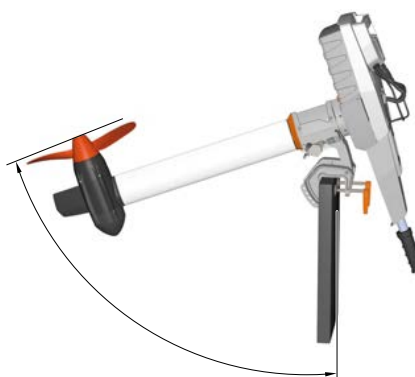


Fig. 59: Tilting position

1. Set the tilt lever (1) to the Tilt / Auto kick-up position (lever up).
2. Grasp the Travel system's battery handle and tilt the motor unit up to the stop.
 - ▶ The tilt lever locks in position.
3. Ensure that the motor unit is locked in position.

ADVICE

Ensure that the tilted motor does not turn in an uncontrolled manner in order to prevent damage to the battery, tiller or the boat.

Tilting the motor down

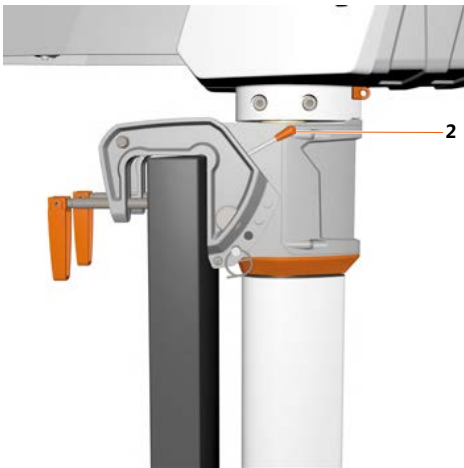


Fig. 60: Travel 1103 locking lever



Fig. 61: Travel 503/1003 locking lever

2 Locking lever

1. Lift the motor and release the locking lever (2).
2. Slowly tilt the motor down.