



# Ultralight 403 A/AC 1103 AC

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Translation of the original operating instructions

Deutsch

English

## Foreword

### Dear Customer,

We are delighted that you have chosen our motor. Your Torqeedo Ultralight system delivers cutting-edge drive technology and efficiency.

It has been designed and manufactured with the utmost care, and with a special focus on convenience, user-friendliness and safety, and has been extensively tested before delivery.

Please take the time to read this operating manual carefully so that you can use the system properly and enjoy it for a long time.

We constantly strive to improve Torqeedo products. Thus, we welcome your comments on the design and use of our products.

Please feel free to contact us with any product inquiries. All points of contact are listed at the end of this manual. We hope you have a lot of fun with this product.

Your Torqeedo team

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# 1 Introduction

## 1.1 General information on the instructions

These instructions describe all major functions and activities of the Ultralight system.

### This includes:

- Provision of knowledge about structure, functioning, and characteristics of the Ultralight system.
- Information on possible dangers, their consequences, and on measures to avoid a hazard.
- Detailed instructions for execution of all functions throughout the entire life cycle of the Ultralight system.

These instructions are intended to make it easier for you to become familiar with the Ultralight system, and to use it safely in compliance with its intended use.

Every person using the Ultralight system should read and understand the instructions. For future reference, the instructions must be kept easily available and close to the Ultralight system at all times.

Ensure that you always use the most recent version of the instructions. The current version of the instructions can be downloaded on the Internet from website [www.torqueedo.com](http://www.torqueedo.com) under the "Service Centre" tab. Software updates may result in changes to the instructions.

### If you follow these instructions carefully, you will be able to:

- Avoid dangers.
- Reduce repair costs and outage times.
- Increase the reliability and service life of the Ultralight system.

## 1.2 Explanation of symbols



Magnetic field



Read the instructions carefully



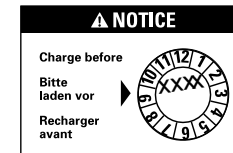
Keep away from cardiac pacemakers and other medical implants – minimum distance 50 cm.



Keep away from magnetic-strip cards (e.g. credit cards) and other magnetically sensitive information carriers – minimum distance 50 cm.



Time for inspection or disposal of the battery.



The battery must be fully charged at the latest by the date specified on the packaging.

### 1.3 Layout of the safety information

In these instructions, safety information is presented using standardised representation and symbols. Comply with the relevant information. The hazard classes explained are used according to the likelihood of occurrence and the severity of the consequences.

#### Safety information

#### DANGER!

Direct hazard with a high risk.  
Death or severe physical injuries may result if the risk is not avoided.

#### WARNING!

Potential hazard with moderate risk.  
Death or severe physical injuries may result if the risk is not avoided.

#### CAUTION!

Hazard with low risk.  
Slight or moderate physical injuries or material damage may result if the risk is not avoided.

#### Information

#### ADVICE

Mandatory instructions.  
User tips and other especially useful information.

### 1.4 About this operating manual

#### Instructions

Actions that require several steps are presented in a numbered list. Complete the steps in the correct order.

#### Example:

1. Action step
2. Action step

The result of an instruction is presented as follows:

- ▶ Arrow
- ▶ Arrow

#### Lists

Lists without a mandatory sequence are presented as a list of bullet points.

#### Example:

- Item 1
- Item 2

## 1.5 Name plate

On each Ultralight system, there is a name plate for recording key data according to machinery directive 2006/42/EC.



Fig. 45: Ultralight name plate

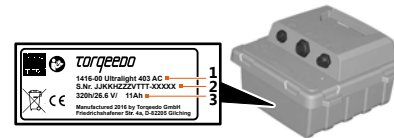


Fig. 46: Battery name plate

- 1 Item number and motor type
- 2 Serial number
- 3 Operating voltage/continuous power/weight

## 2 Registering the device

You can register your Ultralight system using the serial numbers; see **Chapter 1.5, "Name plate"**. You can carry out registration free-of-charge via the Torqeedo website: <https://www.torqeedo.com/de/service-center/device-registration.html>.



## 3 Equipment and controls

### 3.1 Scope of delivery

The complete scope of delivery of your Torqeedo Ultralight system includes the following components:

- Motor unit with shaft, pylon, propeller and 1.90 m (75 in) connection cable
- Accelerator lever with integrated display
- Lithium ion battery with integrated GPS receiver
- Magnetic kill switch
- Bracket with trim mechanism
- Motion link with quick clamp
- Clamping ring
- Control triangle
- Swing arm
- Power supply unit, including Euro power cable and US power cable
- Accessories (installation kit)
- Operating manual
- Warranty form
- Packaging

Ultralight 1103 AC model only

- Shaft with shaft profile
- Two clamping rings
- Cord pull
- Assembly paste for control triangle

### 3.2 Overview of controls and components



Fig. 47: Accelerator lever



Fig. 48: Battery



Fig. 49: Magnetic kill switch

Ultralight 403A/AC

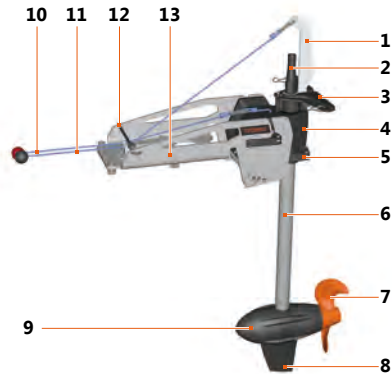


Fig. 50: Overview of Ultralight 403A/AC components

- |                                       |                                |
|---------------------------------------|--------------------------------|
| 1 Swing arm                           | 8 Fin                          |
| 2 Battery connection                  | 9 Pylon                        |
| 3 Control triangle with clamping ring | 10 Swivel cord                 |
| 4 Motion link with quick clamp        | 11 Cord for reverse fixing     |
| 5 Clamping lever                      | 12 Rubber expander             |
| 6 Shaft                               | 13 Bracket with trim mechanism |
| 7 Propeller                           |                                |

Ultralight 1103AC



Fig. 51: Overview of Ultralight 1103AC components

- |                                       |                                |
|---------------------------------------|--------------------------------|
| 1 Swing arm                           | 8 Shaft profile                |
| 2 Battery connection                  | 9 Propeller                    |
| 3 Control triangle with clamping ring | 10 Fin                         |
| 4 Motion link with quick clamp        | 11 Pylon                       |
| 5 Clamping lever                      | 12 Swivel cord                 |
| 6 Shaft                               | 13 Cord for reverse fixing     |
| 7 Clamping ring                       | 14 Bracket with trim mechanism |

## 4 Technical data

Type designation	Ultralight 403 A	Ultralight 403 AC	Ultralight 1103 AC
Max. input power	400 W	400 W	1100 W
Max. propulsive power	180 W	180 W	540 W
Max. overall efficiency	45 %	45 %	49 %
Comparable outboard petrol engine (propulsive power)	1 HP	1 HP	3 HP
Integrated battery	320 Wh Li-ion	915 Wh Li-ion	915 Wh Li-ion
Rated voltage	29.6 V	29.6 V	29.6 V
Final charging voltage	33.6 V	33.6 V	33.6 V
Final discharging voltage	24 V	24 V	24 V
Operating/storage temperature of battery	-20° C to +60° C	-20° C to +60° C	-20° C to +60° C
Battery charging temperature	0° C to +45° C	0° C to +45° C	0° C to +45° C
Total weight	8.8 kg	10.6 kg	15.3 kg
Shaft length	48 cm/18.9 inches	48 cm/18.9 inches	51 cm/20.1 inches
Dimensions motor without mounting approx. (L x W x H)	61.0 x 20.0 x 24.0 cm	61.0 x 20.0 x 24.0 cm	76.0 x 26.0 x 32.3 cm

Type designation	Ultralight 403 A	Ultralight 403 AC	Ultralight 1103 AC
Standard propeller (v = speed in km/h) (p = power in Watt)	v10/p350	v10/p350	v10/p1100
Max. propeller rotational speed	1,200 rpm	1,200 rpm	1450 rpm
Protection class IP67*	Yes	Yes	Yes

\*The Ultralight is protected from dirt and water ingress (max. 0.5 hours, max. 1 m).

### 4.1 Lithium-ion battery

Specification	320 Wh battery	915 Wh battery
Capacity	320 Wh	915 Wh
Operating/storage temperature	-20° C to +60° C (-4° F to 140° F)	-20° C to +60° C (-4° F to 140° F)
Storage temperature for storage > 3 months	5-15 °C (40-60 °F)	5-15 °C (40-60 °F)
State of charge when stored optimally	~50 % for storage up to 1 year ~100 % for storage longer than 1 year	~50 % for storage up to 1 year ~100 % for storage longer than 1 year
Self-discharge rate during optimal storage	approx. 3.6 % per month approx. 43 % per year	approx. 3.6 % per month approx. 43 % per year
Charging time (power supply unit)	3.5 hours	10.5 hours
Battery charging temperature	0° C to +45° C (32° F to 113° F)	0° C to +45° C (32° F to 113° F)

## 5 Safety

### 5.1 Safety features

Safety features	Function
Magnetic kill switch	Disconnects the energy supply immediately, and switches off the Ultralight system. The propeller then comes to a stop.
Electronic accelerator lever	Ensures that the Ultralight system can be switched on only in the neutral position, in order to prevent unintentional start-up of the Ultralight 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.
Position sensor	Motor switch-off from an angle of inclination of 90° (only on Ultralight 403).

## 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 Ultralight 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 Ultralight system in compliance with all local safety and accident prevention regulations.

Before delivery, the Ultralight 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 Ultralight 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 Ultralight system must be operated in chemical-free waterways of sufficient depth.

**Intended use also includes:**

- The attachment of the Ultralight 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.
- Underwater use of the Ultralight system.
- Operation in waterways into which chemicals have been released.
- The use of the Ultralight system outside of marine crafts.
- The carrying and lifting of the kayak/boat using the bracket with trim mechanism.
- Transporting the kayak on a car or trailer when the kayak's motor is fitted.

### 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 Ultralight 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 kayak/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 kayak/boat. Do not exceed the stated loading and power limits.
  - Check the status and all functions of the Ultralight system (including Emergency Stop) at low power before every trip, see **Chapter 11.2, "Maintenance intervals"**.
  - Become familiar with all controls of the Ultralight system. Above all, you should be capable of stopping the Ultralight system quickly if necessary.
  - In the event of a person going overboard, stop the motor immediately.
  - 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.
  - 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.
  - 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 Ultralight 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.
  - In order to prevent damage to the electronics, the motor unit must be taken out of the water if the kayak/boat is moved by other means (towing, sailing, using other motors).
  - 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 danger of overheating the motor.
  - The carrying and lifting of the kayak/boat using the bracket with trim mechanism is not permitted.

### 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 Ultralight system yourself.
- Never touch frayed or severed wiring, or obviously defective components.
- If you suspect a problem, switch off the Ultralight 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 Ultralight 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 with cardiac pacemakers must keep a suitable distance from the motor.

#### **⚠ 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 Ultralight 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 Ultralight 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 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 areas of the body with clean water. Immediately visit a doctor.

## 6 Start-up

### 6.1 Installation of the bracket with trim mechanism

#### ADVICE

The bracket with trim mechanism must be used only in combination with the Ultralight 403 or 1103 pylons.

There are three fixing possibilities for the bracket with trim mechanism:

- Threaded inserts on the kayak/boat
- Adapter plate
- Unthreaded drill holes on the kayak/boat (drill template)

#### Threaded inserts on the kayak/boat

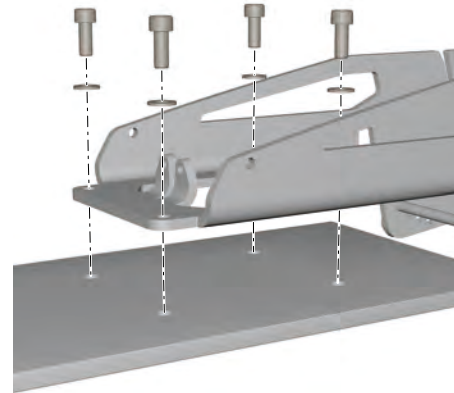


Fig. 52: Installation using existing threaded inserts

1. Place the bracket and trim mechanism flush on the existing threaded inserts.
2. Fix the bracket using four 1/4" x 5/8" screws and four washers over the threaded inserts, and tighten them to a torque of 16 Nm (140 lb/in).
3. Check that the bracket is tightly fitted.

## Adapter plate

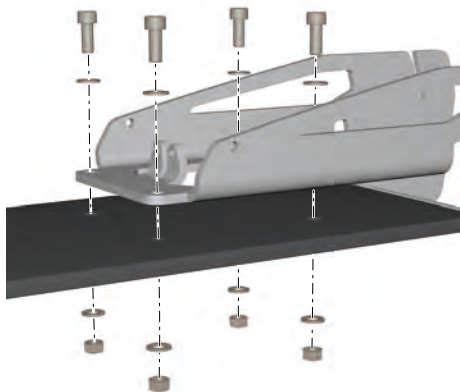


Fig. 53: Installation of adapter plate

1. Place the bracket with trim mechanism flush on the adapter plate.
2. Fix the bracket with trim mechanism using four M8 screws, eight washers (four on top, four on the bottom) and four nuts onto the adapter plate, and tighten to a torque of 16 Nm (140 lb/in).
3. Place the adapter plate in the intended location.
4. Attach the adapter plate.
5. Check that the bracket is tightly fitted.

## Unthreaded drill holes on the kayak/boat (drill template)

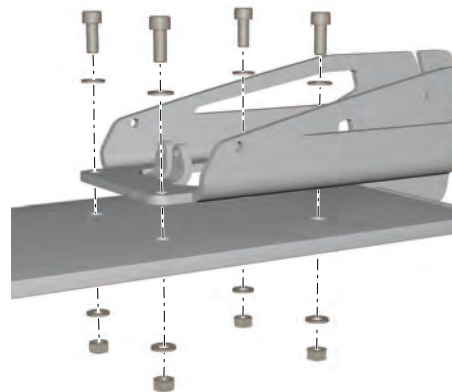


Fig. 54: Installation using a drill template

1. Place the drill template in a suitable location (flat, central) on the end of the kayak/boat. The drill template is at the end of the instructions.

**ADVICE**

The distance between the rear two drill holes and the rear must not exceed 105 mm (4.1 in).

2. Drill four holes, diameter 8.5 mm (0.35 in).
3. Place the bracket with trim mechanism flush on the holes.

4. Fix the bracket with trim mechanism using four M8 screws, eight washers (four on top, four on the bottom) and four nuts over the drill holes, and tighten to a torque of 16 Nm (140 lb/in).
5. Check that the bracket is tightly fitted.

## 6.2 Installation of the drive to the kayak/boat

### ⚠ CAUTION!

**Damage to the boat and system if the motor is removed when the boat is in the water!**

**Material damage can result.**

- Install/remove the motor only on land.

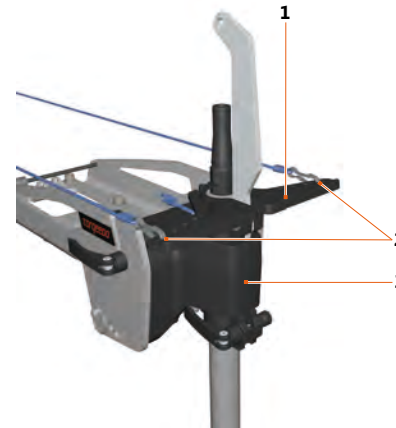
### ADVICE

In contrast to the Ultralight 403 A/AC models, the steering angle of the Ultralight 1103 AC model is restricted.

### ADVICE

Depending on the length of the control cords, there are two different options for mounting the control triangle and the clamping ring.

### 6.2.1 Top control cords



- 1 Control triangle
- 2 Top control cords
- 3 Motion link with quick clamp

If the control cords run on the top of the kayak/boat, or they run above the pivot point of the bracket out of the sleeve of the kayak, then proceed as follows:

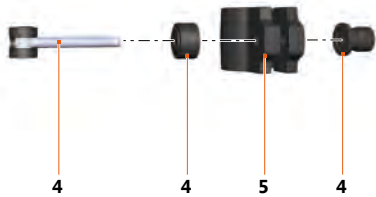


Fig. 55: Quick clamp and clamping ring

**4** Quick clamp

**5** Clamping ring

1. Insert the quick clamp (4) in the clamping ring (5) and screws the nut on, but do not tighten.

Ultralight 403A/AC

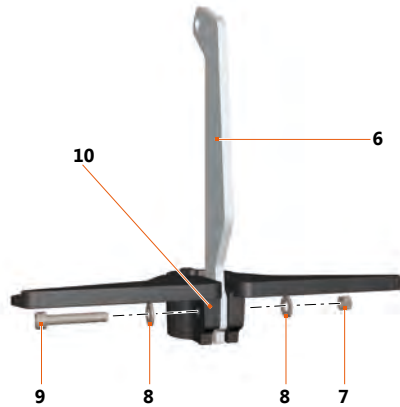


Fig. 56: Control triangle and swing arm

- |                    |  |
|--------------------|--|
| <b>6</b> Swing arm | <b>9</b> M5 screw                        |
| <b>7</b> Nut       | <b>10</b> Control triangle clamping unit |
| <b>8</b> Washers   |  |

2. Tighten the swing arm (6) hand-tight with a M5 screw (9), two washers (8) and a nut (7) to the clamping unit of the control triangle (10).

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Fig. 57: Control triangle and swing arm

- |                      |  |
|----------------------|--|
| <b>4</b> Quick clamp | <b>10</b> Control triangle clamping unit |
| <b>6</b> Swing arm   |  |

3. Use a quick clamp (4) to attach the swing arm (6) hand-tight to the clamping unit of the control triangle (10).

Ultralight 403A/AC

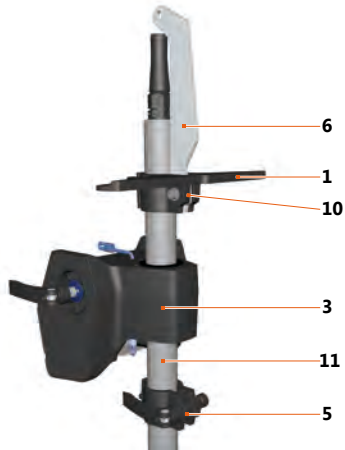


Fig. 58: Combination of control triangle, motion link and clamping ring

- |                                       |  |
|---------------------------------------|--|
| <b>1</b> Control triangle             | <b>6</b> Swing arm                       |
| <b>3</b> Motion link with quick clamp | <b>10</b> Control triangle clamping unit |
| <b>5</b> Clamping ring                | <b>11</b> Motor unit shaft               |

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Fig. 59: Combination of control triangle, motion link and clamping ring

- |                                       |  |
|---------------------------------------|--|
| <b>1</b> Control triangle             | <b>10</b> Control triangle clamping unit |
| <b>3</b> Motion link with quick clamp | <b>11</b> Motor unit shaft               |
| <b>5</b> Clamping ring                | <b>12</b> Clamping ring                  |
| <b>6</b> Swing arm                    |  |

4. Guide the clamping ring (5) over the motor cable and the shaft of the motor unit (11).
5. Guide the motion link with quick clamp (3) over the motor cable and the shaft of the motor unit (11).
6. Guide the control triangle (1) with assembled swing arm (6) over the motor cable and the shaft of the motor unit (11).
7. Slide the control triangle (1), the motion link with quick clamp (3) and the clamping ring (5) together.

### ADVICE

For the Ultralight 1103AC model, the assembly paste is used to increase the friction of the control triangle on the shaft tube.

Under no circumstances should the assembly paste be used on the part of the shaft tube positioned in the motion link.

8. Place the combination of control triangle (1), motion link with quick clamp (3) and clamping ring (5) in the desired position.

The position of the motion link with quick clamp (3) determines the height of the motor. The highest point of the propeller must be at least 5 cm below the surface of the water. The height can also be adjusted at a later time, see

**Chapter 6.3, "Setting for optimum depth of water".**

### ADVICE

Perform the alignment of the following components, as per "**Fig. 58: Combination of control triangle, motion link and clamping ring**":

- Control triangle (1)
- Motion link with quick clamp (3)
- Clamping ring (5)

The swing arm is alongside the propeller. The above components must be aligned accordingly.

9. Tighten the control triangle (1) with the already hand-tight tightened M5 screw (9) to 3.5 Nm (31 lb/in).

### ADVICE

The swing arm (6) must be fixed in such a way that it can no longer move freely.

10. Tighten the clamping ring (5) with the quick clamp (4) so that this axially fixes the motion link with quick clamp (3) between the control triangle (1) (3.5 Nm/31 lb/in).



### 6.2.2 Bottom control cords



Fig. 60: Bottom control cords

- 1 Control triangle
- 2 Motion link with quick clamp
- 3 Bottom control cords

If the control cords come out of the skin of the kayak under the motion link, or if they come directly out of the stern, proceed as follows:



Fig. 61: Quick clamp and clamping unit control triangle

- 4 Quick clamp
- 5 Control triangle clamping unit

1. Insert the quick clamp (4) in the clamping unit of the control triangle (5) and screw the nut on, but do not tighten.

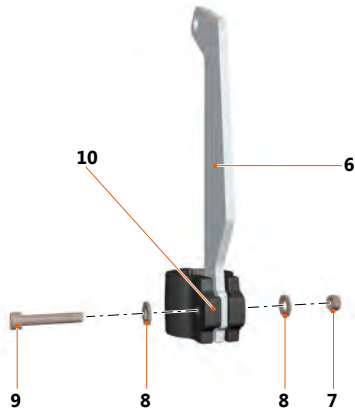


Fig. 62: Clamping ring and swing arm

- |                    |                         |
|--------------------|-------------------------|
| <b>6</b> Swing arm | <b>9</b> M5 screw       |
| <b>7</b> Nut       | <b>10</b> Clamping ring |
| <b>8</b> Washers   |                         |

2. Attach the swing arm (6) hand-tight to the clamping ring (10), using a M5 screw (9), two washers (8) and a nut (7).



Fig. 63: Combination of clamping ring, motion link and control triangle

- |   |                            |
|---|----------------------------|
| <b>1</b> Control triangle               | <b>6</b> Swing arm         |
| <b>2</b> Motion link with quick clamp   | <b>10</b> Clamping ring    |
| <b>5</b> Control triangle clamping unit | <b>11</b> Motor unit shaft |

3. Guide the control triangle (1) over the motor cable and the shaft of the motor unit (11).
4. Guide the swing arm with quick clamp (2) over the motor cable and the shaft of the motor unit (11).
5. Guide the clamping ring (10) with fitted swing arm (6) over the motor cable and the shaft of the motor unit (11).

- Push the control clamping ring (10), the motion link with quick clamp (2) and the control triangle (1) together.

### ADVICE

For the Ultralight 1103AC model, the assembly paste is used to increase the friction of the control triangle on the shaft tube.

Under no circumstances should the assembly paste be used on the part of the shaft tube positioned in the motion link.

- Place the combination of control triangle (10), motion link with quick clamp (2) and clamping ring (1) in the desired position.

The position of the motion link with quick clamp (2) determines the height of the motor. The highest point of the propeller must be at least 5 cm below the surface of the water. The height can also be adjusted at a later time, see **Chapter 6.3, "Setting for optimum depth of water"**.

### ADVICE

Perform the alignment of the following components, as per "**Fig. 63: Combination of clamping ring, motion link and control triangle**":

- Clamping ring (10)
- Motion link with quick clamp (2)
- Control triangle (1)

The swing arm is alongside the propeller. The above components must be aligned accordingly.

- Tighten the clamping ring (10) using the already hand-tightened M5 screw (9) to 3.5 Nm (31 lb/in).

### ADVICE

The swing arm (6) must be fixed in such a way that it can no longer move freely.

- Fix the clamping unit of the control triangle (5) with the quick clamp (4) so that this fixes the motion link with quick clamp (2) between the clamping ring (10) axially (3.5 Nm/31 lb/in).

### 6.2.3 Inserting the motion link in the bracket

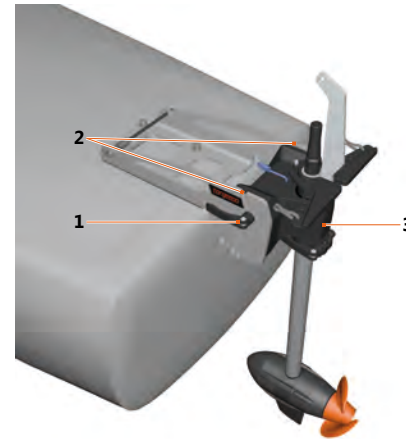


Fig. 64: Motion link fitted

- |                                      |                      |
|--------------------------------------|----------------------|
| <b>1</b> Bracket with trim mechanism | <b>3</b> Motion link |
| <b>2</b> Quick clamp                 |                      |

- Insert the motion link (3) through the quick clamp (2) into the bracket (1).
- Close the quick clamp (2).
- Check that the combination is fitted correctly.

### 6.3 Setting for optimum depth of water

The highest point of the propeller must be at least 5 cm below the surface of the water.

1. Release the M5 screw on the clamping ring/control triangle.
2. Release the quick clamp on the clamping ring/control triangle.
3. Place the combination of control triangle, motion link, and clamping ring in the desired position.
4. Fix the clamping ring/control triangle onto the shaft by closing the quick clamp.
5. Tighten the clamping ring/control triangle using the M5 screw to 3.5 Nm (31 lb/in).

#### ADVICE

Exclusively for the Ultralight 1103 AC model, an additional clamping ring is present; this is used for fixing the shaft profile downwards.

### 6.4 Attaching the steering



Fig. 65: Small fixing pin

#### 1 Small fixing pin

The small fixing pin (1) fixes the steering if the kayak/boat is to be steered via rudder or a pre-installed steering system.

1. Fix the small fixing pin (1) to the bracket using a cord.
2. Locate the drill hole in the control triangle above the drill hole in the motion link.
3. Push the small fixing pin (1) through the drill hole up to the stop.
4. Check the fixing.

**ADVICE**

Bend the small fixing pin (1) upwards if it is not seated properly.

**6.5 Connecting the cords****ADVICE**

- The cords must not pass over sharp edges or pointed objects.
- The cords must move freely and should be diverted by as few points as possible on the kayak/boat.

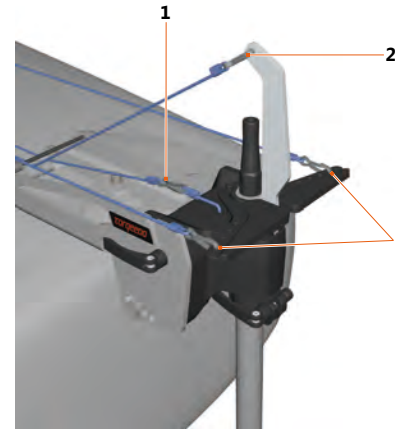
**Overview of cords**

Fig. 66: Overview of cords

- 1 Cord for reverse fixing
- 2 Swivel cord
- 3 Control cords (possibly already present on the kayak/boat)

Preparation of the swivel cords/control cords and cord for reverse fixing

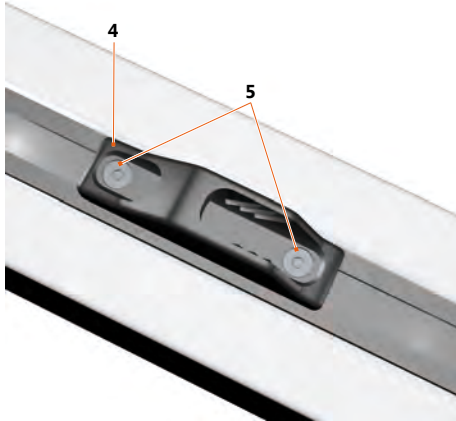


Fig. 67: Clamp

- 4 Clamp
- 5 Screws with counter-plate

1. Fix the clamp (4) using screws and counter-plates (5) in the rail on the starboard side of the kayak.
2. Cut the cord provided into sections of the appropriate length.
  - ▶ Make sure that the cords reach from the bracket to the clamp position.
3. Melt the ends of the cords.

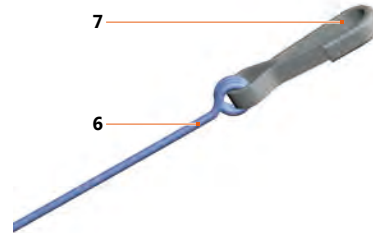


Fig. 68: Cord with carabiner

- 6 Cord
  - 7 Carabiner
4. Attach a carabiner (7) to each end of the cords (6).

**ADVICE**

Make sure that the knot is tight and cannot come loose.

## Connecting the control cords

## ADVICE

The control cords are not included in the delivery, and you need to fit them yourself.

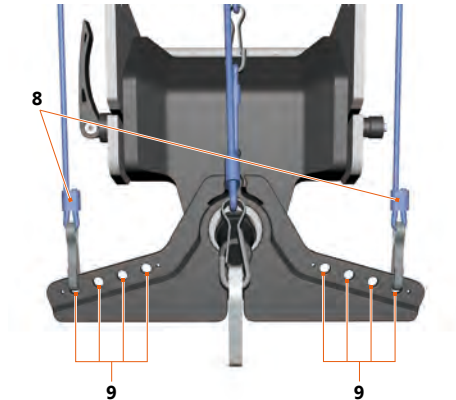


Fig. 69: Fitting the control cords

**8** Control cords with carabiner

**9** Drill holes

The drill holes in the control triangle (9) determine the ease of movement of the steering. The further out the control cords (8) are fixed, the easier it will be to steer for the effort applied, and the lock increases.

1. Using the carabiner (8), fix the first control cord in a suitable drill hole (9) on the control triangle.
2. Using the carabiner (8), fix the second control cord in the same drill hole (9) on the opposite side.

## Connecting the swivel cord

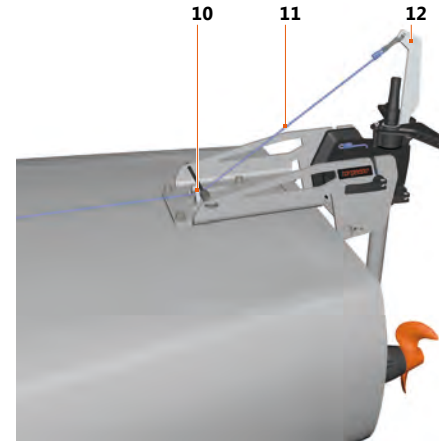


Fig. 70: Fitting the swivel cord

**10** Guides

**11** Swivel cord

**12** Swing arm

1. Hook the carabiner on the swivel cord (11) into the swing arm (12).
2. Thread the swivel cord (11) through one of the two guides (10).

For the model 1103 AC you must thread the swivel cord (11) through the cord pull, see "[Fig. 71: Cord pull 1103 AC models](#)".

3. Attach the ball handle to the front end of the swivel cord (11).

### ⚠ CAUTION!

**Beware of damage to the bracket when lowering the motor.  
Material damage can result.**

The pylon of the Ultralight 1103AC model is significantly heavier than those of the other Ultralight models. The bracket may therefore be damaged if the swivel cord is suddenly released.

- Lower the motor carefully.
- Do not release the swivel cord suddenly.

### ADVICE

For the model 1103 AC you must install a pull cord (included in scope of delivery) for tilting using a swivel cord.



Fig. 71: Cord pull 1103 AC models

#### 13 Cord pull

4. Install the cord pull (13) using the two screws at the front end of the bracket to give you the best possible leverage.
5. The swivel cord is guided to the supplied deflector in the area of the foot controller, and is rerouted there. The swivel cord is then run approx. 40 cm back to the supplied clamp, which is installed in the slotted rail (see [Fig. 67: Clamp](#)).



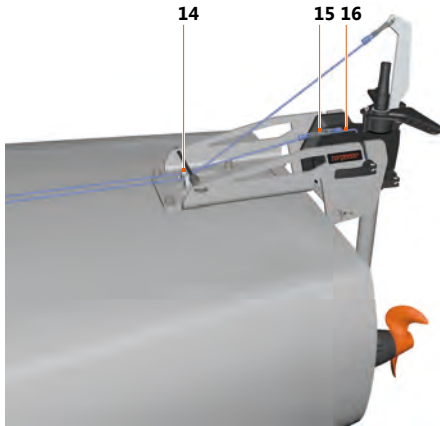
**Cord for reverse fixing**

Fig. 72: Fitting the reserve fixing

**14** Guide

**16** Loop for reverse fixing

**15** Cord for reverse fixing

1. Hook the carabiner on the cord for reverse fixing (15) into the loop for back fixing (16).
2. Thread the cord for reverse fixing (15) through the unoccupied guide (14).
3. Fix a red ball handle on the front end of the cord (15).

## 6.6 Trimming the motor

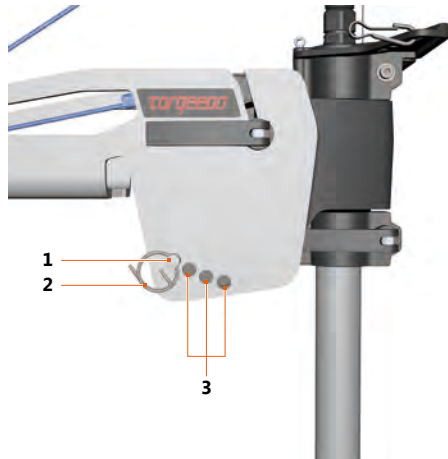


Fig. 73: Trim mechanism

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

Trimming allows the motor to be positioned optimally relative to the water surface. For this, four possible trimming positions (3) are available.

In order to position the motor optimally relative to the water surface, several steps are required:

1. Tilt the motor upwards, see **Chapter 7.4, "Tilting the motor"**.
2. Remove the securing cotter pin (2) of the trim rod (1), and pull the trim rod (1) out of the transom bracket.
3. Insert the trim rod (1) in the desired trimming position (3) of the transom bracket.
  - ▶ The trim rod (1) must be pushed through both side walls of the transom bracket.
4. Fix the trim rod (1) using the securing cotter pin (2).

## 6.7 Connecting the accelerator lever

1. Mount the accelerator lever at your desired position close to the control location.
2. Before finally screwing tight the accelerator lever, screw the plug for the connection cable, using the socket provided, to the underside of the accelerator lever.
3. Connect the data cable, see **Chapter 6.8.1, "Connecting cable to Lithium ion battery with integrated GPS receiver"**.

## 6.8 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.

The batteries of models 403 A and 403 AC/1103 AC differ in their capacity. All motors can be operated using the two different batteries.

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.

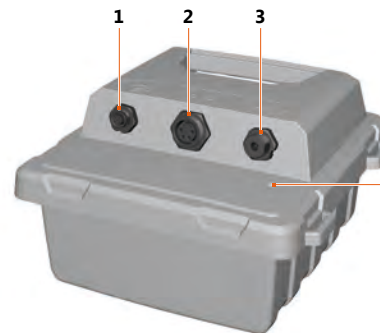


Fig. 74: Battery overview

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

### 6.8.1 Connecting cable to Lithium ion battery with integrated GPS receiver

1. Attach the battery to the kayak/boat in your preferred position. When doing so, ensure that the cable does not come under tension during any steering movement.
  - ▶ To ensure GPS function, the top surface of the battery (aerial symbol) must point upwards.
2. Connect the motor cable to the connection on the motor unit (2).
3. Connect the data cable to the connection on the accelerator lever (1).

### 6.8.2 Charging the battery using the power supply unit

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

### 6.8.3 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.

### 6.8.4 Powering a device using the optional 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.
1. You can power USB-compatible devices using the optional adapter.
  2. The output voltage is 5 V, and the maximum output current is 1 A.
  3. 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.

## 6.9 Start-up of the on-board computer

### 6.9.1 Displays and symbols

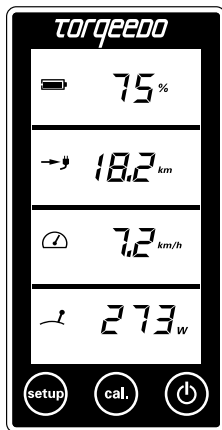


Fig. 75: Multifunction display

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

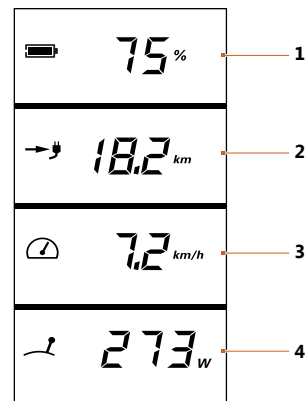


Fig. 76: Overview of multifunction display

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

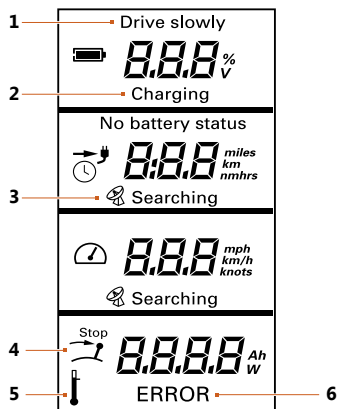


Fig. 77: Multifunction display – Set-up menu

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

#### Drive slowly (1)

Displayed when the battery capacity is <30 %.

#### 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 accelerator lever needs to be placed in the neutral position. This is necessary before you can move off.

#### Temperature (5)

This symbol appears in the event of excess temperature of the motor or battery (320 Wh battery/915 Wh 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"**.

## 6.9.2 Display settings

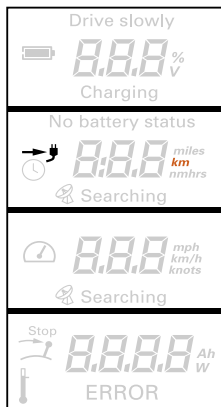


Fig. 78: Multifunction display – Set-up menu

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.



## 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 Ultralight 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 two different options for stopping the Ultralight system rapidly:

- Place the accelerator lever in the neutral position.
- Pull off the magnetic kill switch.

### **ADVICE**

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

## 7.2 Travel mode

### 7.2.1 Starting a trip

#### ADVICE

- If there is visible damage to components or cables, do not turn on the Ultralight system.
- Ensure that all people on board wear a life jacket.
- Before starting, attach the lanyard of the Emergency Stop to your 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 prevent unintentional operation of the Ultralight system.

#### Starting the motor

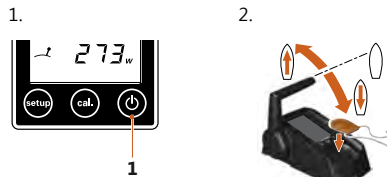


Fig. 79: On/Off button

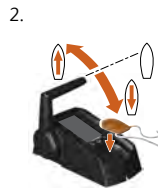


Fig. 80: Accelerator lever

1. Switch the motor on by pressing the On/Off button (1) for one second.
2. Place the magnetic kill switch on the accelerator lever.
3. Move the accelerator lever from the neutral position to the desired position.

### 7.2.2 Forward/reverse motion

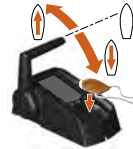


Fig. 81: Accelerator lever

1. Operate the electronic accelerator lever accordingly.
  - ▶ Forward
  - ▶ Reverse

#### Tilt support for reverse

#### ADVICE

Make sure that the motor is vertical to the water level to prevent tilting of the motor unit.

1. Fix the motor with the tilt support for reversing, see **Chapter 7.3, "Block for reversing"**.
2. Ensure that the motor unit is vertical to the water surface and is not tilted.  
If that is not the case, push the kayak/boat forwards and repeat the first step.

### 7.2.3 Steering

#### ADVICE

Never actuate the control cords at the same time, since this can lead to material damage.

1. Pull the cord on the control triangle to the right, looking in the direction of travel.
  - ▶ The boat turns to the right.
2. Pull the cord on the control triangle to the left, looking in the direction of travel.
  - ▶ The kayak/boat turns to the left.

### 7.2.4 Ending the trip

#### Switching the motor off



Fig. 82: Accelerator lever

1. Bring the accelerator lever into the neutral position.
2. Press the On/Off button for one second.
3. Remove the magnetic kill switch.

You can switch the motor off in any operating condition. The Ultralight system switches off automatically after one hour of inactivity.

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 Block for reversing

1. Pull the cord with the red ball handle until the reversing block engages.
2. Ensure that the motor unit is vertical to the water surface and is not tilted.

If the motor unit is not vertical to the water surface, push the kayak/boat forwards and repeat the first step.

3. Fix the cord in the clamp.

## 7.4 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.

### ⚠ CAUTION!

**Material damage from falling motor unit!**  
**Material damage can result.**

- Lower the motor slowly and in a controlled manner on land using the swivel cord.

### ⚠ CAUTION!

**Material damage from unsecured motor unit!**  
**Material damage can result.**

- Remove the motor unit when transporting or towing the kayak/boat.

The tilting mechanism allows the motor to be tilted.

The motor can be taken out of the water by tipping (e.g. when not in use, when landing the boat, and in shallow water).

### Tilting upwards

### ADVICE

Always unhook the reverse fixing before tilting up.

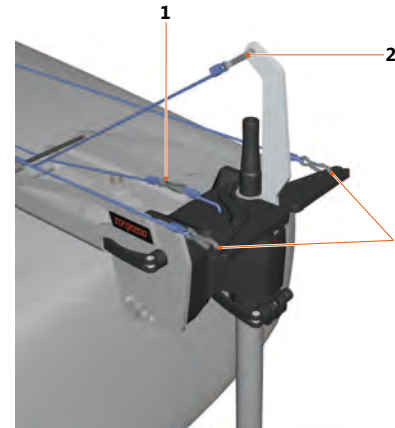


Fig. 83: Overview of cords

- |   |  |
|---|--|
| <p><b>1</b> Cord for reverse fixing</p> <p><b>2</b> Swivel cord</p> | <p><b>3</b> Control cords (possibly already present on the kayak/boat)</p> |
|---|--|

1. Pull the swivel cord (2) until the motor unit is out of the water.
2. Fix the swivel cord (2) in the clamp.
3. Make sure that the motor is securely fixed by the clamp and cannot tilt downwards in an uncontrolled manner.

**Park position****ADVICE**

The park position can be used only for the model 403 A/AC.



Fig. 84: Park position

**4 Rubber expander**

1. Open the clamping ring/control triangle under the motion link using the quick clamp.
2. Direct the shaft upwards through the motion link.
3. Tilt the motor upwards.

4. Insert the heel of the control triangle/clamping ring into the recess provided between the guide hole, the swivel cord, and the guide hole of the cord for reverse fixing.
5. Fix the shaft using the rubber expander (4) on the bracket.
6. Fix the clamping ring/control triangle using the quick clamp.

**ADVICE**

Clamp the rubber expander (4) above the control triangle and the clamping ring.

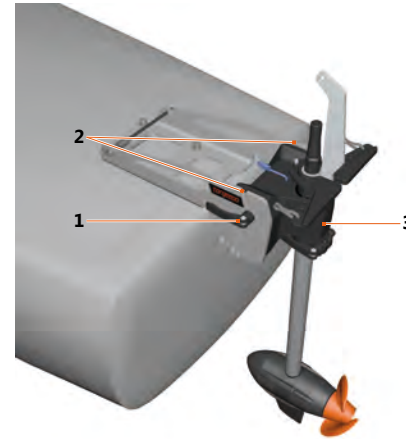
## 8 Removal

### ⚠ CAUTION!

**Damage to the boat and system if the motor is removed when the boat is in the water!**

**Material damage can result.**

- Install/remove the motor only on land.



- 1 Bracket with trim mechanism      3 Motor unit with motion link  
2 Quick clamp

1. Move the accelerator lever to the neutral position and remove the magnetic kill switch from the accelerator lever.
2. Switch off the motor.
3. Disconnect all electric connections between the accelerator lever, battery, and motor.

4. Release all cords.
5. Release the quick clamp (2) on the motion link, and remove the motor unit with motion link (3) from the bracket (1).

## 9 Towing the kayak/boat

When the boat is towed, the motor must always be removed, see **Chapter 8, "Removal"**.

Comply with the applicable national regulations for towing kayaks/boats.



## 10 Error messages

Display	Cause	What to do
E02	Stator excess temperature (motor overheated)	After waiting for a short period (approx. ten minutes), the motor can be operated slowly again. Contact Torqeedo Service.
E03 (UL 403 only until end of 2021)	Motor tilted in operation	Motor can continue to run after tilting down and switching off and on.
E04 (UL 403 only until end of 2021)	Travel command with tilted motor	Motor can continue to run after tilting down from the neutral position.
E05	Motor/propeller blocked	<ol style="list-style-type: none"> <li>1. Move the main switch to the "OFF" position.</li> <li>2. Disconnect the battery from system.</li> <li>3. Release the blockage.</li> <li>4. Turn the propeller one more turn by hand.</li> <li>5. Reconnect the battery to the system.</li> </ol>
E06	Voltage to motor is too low	Battery state of charge low; motor may possibly continue to be driven slowly from the neutral position.
E07	Overcurrent to motor	Continue at reduced power. Contact Torqeedo Service.
E08	Circuit board excess temperature	After waiting for a short period (approx. ten minutes), the motor can be operated slowly again. Contact Torqeedo Service.

Display	Cause	What to do
E21	Incorrect calibration of accelerator lever	Recalibrate: <ol style="list-style-type: none"> <li>1. Press the CAL button for 10 seconds.               <ul style="list-style-type: none"> <li>▶ <b>cal up</b> appears on the display.</li> </ul> </li> <li>2. Set the accelerator lever to full throttle forwards.</li> <li>3. Press the CAL button.               <ul style="list-style-type: none"> <li>▶ <b>cal stp</b> appears on the display.</li> </ul> </li> <li>4. Set the accelerator lever to the neutral (stop) position.</li> <li>5. Press the CAL button.               <ul style="list-style-type: none"> <li>▶ <b>cal dn</b> appears on the display.</li> </ul> </li> <li>6. Set the accelerator lever to full throttle reverse.</li> <li>7. Press the CAL button.</li> </ol>
E22	Magnetic sensor defective	Recalibrate; <b>see "E21"</b> . If the error code appears several times, then contact Torqeedo Service.
E23	Value range incorrect	Recalibrate; <b>see "E21"</b> .
E30	Communication error with motor	Check the cables and the plug connections of the data cables. If necessary, contact Torqeedo Service and tell them the error code.
E32	Communication error for accelerator lever	Check the plug connections of the data cables. Check the cables.
E33	General communication error	Check the plug connections on the cables. Check the cables. Switch the motor off and on again.

Display	Cause	What to do
E36	Overvoltage battery/motor	When powered by other means (towing the kayak/boat, sailing, travel using a different motor) the propeller must be taken out of the water. If the error arises while or after charging the battery, contact Torqeedo Service
E41	Charging voltage/charging current too great	If this error occurs despite the use of a Torqeedo power supply unit, contact Torqeedo Service.
E42	Power fuse defective	Battery can be started only if the charging cable is plugged in. Contact Torqeedo Service.
E43	Battery flat	Charge the battery. It may be possible to restart the motor slowly from the neutral position.
E45	Battery overcurrent	Switch the motor off and on again. The battery status display and range display are no longer definitive after this error until the battery is fully charged again.
E46	Battery operating temperature error	Battery cells are outside the operating temperature range of -20 °C to +60 °C. It is possible to operate the motor again after the temperature has stabilised.
E48	Charging temperature error	Let the battery cool down. Charging continues when the cell temperature is between 0 °C and +45 °C.
E49	Battery deep-discharged	Contact Torqeedo Service.
Other error codes	Defect	Contact Torqeedo Service and provide error code. Check power source, main fuse, and main switch. If power supply is working correctly: Contact Torqeedo Service.
Nothing is shown on display	Defective, or no voltage	Check power source, main fuse, and main switch. If power supply is working correctly: Contact Torqeedo Service.

## 11 Care and service

### ADVICE

Maintenance tasks must be carried out exclusively by qualified specialist personnel. Contact Torqeedo Service or an authorised Service Partner. Before maintenance or cleaning tasks, ensure the following:

- The magnetic kill switch must be disconnected.

### 11.1 Care of the system components

#### ⚠ WARNING!

**Danger of injury from propeller!  
Moderate or severe physical injuries may result.**

- The motor must always be disconnected from the power source.

### ADVICE

Clean the bracket after use in sandy and dirty water.

### ADVICE

Flush the motor with fresh water after use in salt water.

### ADVICE

Have corrosion and paintwork damage corrected by a specialist if it occurs.

For cleaning the motor, any cleaning agent suitable for plastic may be used as per the manufacturer's instructions. Commercially available vinyl cleaners used for cars achieve a good effect on the plastic surfaces of the Ultralight system.

Use a contact spray every two months to maintain all electronic contacts.

If cell or battery terminals are contaminated, they can be cleaned using a clean, dry cloth.

#### 11.1.1 Corrosion protection

A high level of corrosion resistance was ensured when selecting the materials. As is usual for maritime products in the leisure sector, most of the materials incorporated into the Ultralight system are classed as sea-water-resistant, not sea-water proof.

Do the following to prevent corrosion:

- Store the motor only when it is dry.
- Regularly apply a suitable contact spray (e.g. Wetprotect) to cable contacts, data sockets, and data plugs.
- Have corrosion and paintwork damage corrected by a specialist if it occurs.
- After use in salt water, rinse the motor and fresh water.

#### 11.2 Maintenance intervals

Service is to be performed in a five-year cycle (private use) by Torqeedo Service or authorised Service partners.

##### 11.2.1 Replacement parts

### ADVICE

For information on replacement parts and their installation, contact Torqeedo Service or an authorised Service partner.

##### 11.2.2 Battery maintenance

#### ⚠ CAUTION!

**Damage to the battery due to deep discharging!  
Storing the battery with a state of charge below 20 % can result in deep discharging.**

- Make sure the state of charge always remains ~ 50 % during storage.

**ADVICE**

It is important for the operating life of your battery for it to not be permanently exposed to excessive heat. In case of longer storage times, it should be stored in a cool location if possible.

**ADVICE**

Using the motor in a hot climate or at high daytime temperatures is unproblematic. After use, the battery should be taken out of the sun.

Monitor the state of charge of the battery in case of longer storage times:

- ~50 % for storage up to 1 year
- 6-monthly check of the state of charge; recharge to 50 % if necessary

When stored for multiple years, the battery's state of charge should be recharged once a year to prevent deep discharging.

## 11.3 Replacing the propeller

### ⚠ WARNING!

**Danger of injury from propeller!**  
**Moderate or severe physical injuries may result.**

- When working on the propeller, always switch the system off at the main switch.

#### Propeller Ultralight 403 A/AC

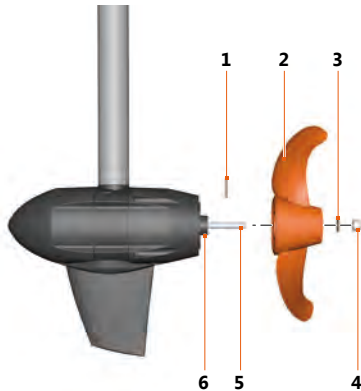


Fig. 85: Propeller attachment for Ultralight 403 A/AC

- |                       |                 |
|-----------------------|-----------------|
| 1 Cylindrical pin     | 4 Hexagonal nut |
| 2 Propeller           | 5 Motor shaft   |
| 3 Outer spring washer | 6 Cap washer    |

1. Remove the cable between motor and battery.
2. Release the hexagonal nut (4) and outer spring washer (3).
3. Disconnect the propeller (2) from the motor shaft (5).
4. Pull off the cylindrical pin (1) and the cap washer (6) from the motor shaft (5).
5. Connect the cable between motor and battery.
6. Check that the motor shaft (6) runs smoothly.
7. Remove the cable between motor and battery.
8. Place the cap washer (6) onto the motor shaft (5).
  - ▶ The inner edge of the cap washer is in contact with the motor shaft flange.
9. Push the new cylindrical pin (1) into the motor shaft (5).
10. Slide the new propeller (2) onto the motor shaft (5) up to the stop.
11. Rotate the groove of the propeller (2) until it is congruent with the cylindrical pin (1).
12. Push the outer spring washer (3) onto the motor shaft (5) behind the propeller (2).
13. Hand-tighten the hexagonal nut (4) (6 Nm).

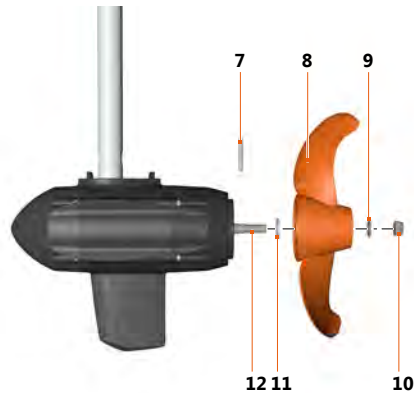
**Propeller 1103 AC**

Fig. 86: Propeller attachment for Ultralight 1103 A/AC

- |                              |                               |
|------------------------------|-------------------------------|
| <b>7</b> Cylindrical pin     | <b>10</b> Hexagonal nut       |
| <b>8</b> Propeller           | <b>11</b> Inner spring washer |
| <b>9</b> Outer spring washer | <b>12</b> Motor shaft         |

1. Remove the cable between motor and battery.
2. Release the hexagonal nut (10) and outer spring washer (9).
3. Disconnect the propeller (8) from the motor shaft (12).
4. Pull off the cylindrical pin (7) and the inner spring washer (11) from the motor shaft (12).
5. Connect the cable between motor and battery.

6. Check that the motor shaft is running concentrically.
7. Remove the cable between motor and battery.
8. Place the inner spring washer (11) onto the motor shaft (12).
  - ▶ The inner edge of the inner spring washer (11) is in contact with the motor shaft flange.
9. Push the new cylindrical pin (7) into the motor shaft (12).
10. Slide the new propeller (8) onto the motor shaft (12) up to the stop.
11. Rotate the groove of the propeller (8) until it is congruent with the cylindrical pin (7).
12. Push the outer spring washer (9) onto the motor shaft (12) behind the propeller (8).
13. Hand-tighten the hexagonal nut (10) (11 Nm).





## 12 General conditions of warranty

### 12.1 Warranty and liability

The statutory warranty runs for 24 months and includes all components of the Ultralight system.

The warranty period starts from the day of delivery of the Ultralight system to the end customer.

### 12.2 Scope of warranty

Torqueedo GmbH, Friedrichshafener Strasse 4a D-82205 Gilching, guarantees the end customer of a Ultralight system that the product is free from material and manufacturing defects during the period of coverage defined below. Torqueedo will indemnify the end customer for the costs of correction of a material or manufacturing defect. This indemnification obligation does not apply to any incidental costs caused by a warranty case or to any other financial detriment (e.g. costs for towing, telecommunication, accommodation, subsistence, loss of use, lost time, etc.).

The warranty terminates two years from the day of handover of the product to the end customer. Products used – even temporarily – for professional or official purposes are excluded from the two year warranty. For these uses, the statutory warranty applies. The warranty claim expires six months after the discovery of the defect.

Torqueedo decides whether defective parts are repaired or replaced. Distributors and dealers who carry out repair work on Torqueedo motors have no power to make legally binding statements on behalf of Torqueedo.

Wearing parts and routine maintenance are excluded from the warranty.

#### **Torqueedo has the right to refuse warranty claims if**

- the warranty was not submitted correctly (especially failure to make contact before dispatching goods under complaint, absence of a fully completed warranty form and of proof of purchase; see warranty process).
- the product has been used in a manner contrary to instructions.

- the safety, operating, and care information in the instructions were not followed.
- prescribed maintenance intervals were not complied with and documented.
- the purchased item was in any way converted, modified, or equipped with parts or accessory items which are not expressly authorised by Torqueedo or which do not form part of recommended equipment.
- previous maintenance or repair was undertaken by companies not authorised by Torqueedo, or parts other than original replacement parts were used. This applies unless the end customer can prove that the circumstances resulting in the refusal of the warranty claim have not encouraged the progress of the defect.

In addition to the claims arising from this warranty, the end customer has statutory warranty rights arising from his purchase contract with the relevant dealer; these are not restricted by this warranty.

## 12.3 Warranty process

It is a prerequisite that the warranty process described below is followed for the fulfilment of warranty claims.

**For the problem-free handling of warranty cases, we request that the following instructions are complied with:**

- In the event of a claim, please contact Torqeedo Service. The service representative will give you an RMA number if necessary.
- Please have your service check folder, proof of purchase, and a completed warranty form ready so that Torqeedo Service can process your claim. The printed template for the warranty form is attached to these instructions. The information in the warranty form must include contact details, details of product under claim, serial number, and a brief description of the problem.
- Should it be necessary to transport products to Torqeedo Service, please note that inappropriate transport is not covered by guarantee or warranty.

For queries regarding the warranty process, we can be contacted by means of the details given on the back page.

## 13 Accessories

Item no.	Product	Description
1416-00	Spare battery Ultralight 403, 320 Wh	High-performance Lithium battery with integrated GPS receiver, 320 Wh, 29.6 V, 11 Ah for all Ultralight models (1404-00, 1405-00, 1406-00 and 1407-00)
1417-00	Spare battery Ultralight 403, 915 Wh	High-performance Lithium battery with integrated GPS receiver, 915 Wh, 29.6 V, 31 Ah for all Ultralight models (1404-00, 1405-00, 1406-00 and 1407-00)
1133-00	90 W charger unit for Travel and Ultralight batteries	90 W charger unit for sockets between 100-240 V and 50-60 Hz. (Use only with batteries having Item No. 1146-00, 1147-00, 1148-00, 1416-00 and 1417-00)
1912-00	Spare propeller v10/p350	For the models Ultralight 402, 403 and 403 A/AC (Ø 200 mm)
1972-00	Propeller v10/p1100 resistant to fouling	For Ultralight 1103 AC, resistant to fouling
1973-00	Spare propeller v10/p1100	Standard propeller for Ultralight 1103 AC
1132-00	Sunfold 50	Folding 50 W solar panel, handy format, high efficiency, Plug-n-Play connections for watertight charging of Ultralight 403, 403 A/AC and 1103 AC models. (Use only with batteries Item No. 1416-00 and 1417-00)
1920-00	Motor cable extension Travel and Ultralight, 2 m	Cable connection extension between battery and motor for the Ultralight 403, 403 A/AC, 1103 AC and Travel 603/1103 models; allows a greater distance between battery and motor; with watertight plug connections
1921-00	Cable extension for accelerator lever, 1.5 m	Extension cable for Travel, Ultralight and Cruise models; allows a greater distance between accelerator lever, tiller, and motor
1922-00	Cable extension for accelerator lever, 5 m	Extension cable for Travel, Ultralight and Cruise models; allows a greater distance between accelerator lever, tiller, and motor
1924-00	TorqTrac	Smartphone App for Travel, Cruise T/R and Ultralight models. Enables larger display of the onboard computer, display of ranges on the chart, and more. Requires Bluetooth Low Energy®-capable smartphone
1128-00	12/24 V charging cable for Travel models and Ultralight 403	Enables charging of the Travel 603/1103 and Ultralight 403, 403 A/AC and 1103 AC models from a 12/24 V power source

Item no.	Product	Description
1914-00	Magnetic kill switch	Emergency Stop switch and immobiliser for all Travel, Cruise and Ultralight models
1971-00	Ultralight ball bracket	Ball bracket for Ultralight models 403 A/AC from 2019 (only for Item No. 1405-00 and 1407-00)

## 14 Disposal and environment

Torqueedo motors are manufactured in compliance with WEEE Directive 2012/19/EU. This directive governs the disposal of electrical and electronic devices, with the aim of sustainable protection of the environment.

You can hand over the motor to a collection point in accordance with regional regulations. There, it will be disposed of properly.

### Disposal of waste electrical and electronic equipment



Fig. 88: Crossed out waste bin

#### For customers in EU countries

The Ultralight system is subject to European Directive 2012/19/EU relating to Waste Electrical and Electronic Equipment – WEEE, and to the corresponding national laws. Here, the WEEE Directive forms the basis for handling waste electrical equipment across the whole of the EU. The Ultralight system is marked with the symbol of a crossed out waste bin, **see "Fig. 88: Crossed out waste bin"**. Waste electrical and electronic equipment must not be disposed of as normal household waste, because this could allow entry of pollutants to the environment which have effects injurious to health on humans, animals, and plants, and which build up in the food chain and in the environment. In addition, valuable raw materials are lost in this way. Please therefore direct your waste equipment for separate collection in an environmentally-friendly way; to do so, contact your Torqueedo Service team or boat builder.

#### For customers in other countries

The Ultralight system is subject to European directive 2012/19/EU regarding waste electrical and electronic equipment. We recommend that the system is not discarded as normal household waste, but is disposed of via separate collection in an environmentally friendly way. Your national laws may also prescribe this. Please therefore ensure appropriate disposal of the system as per the regulations which apply in your country.

### Disposal of batteries

Remove spent batteries immediately, and comply with the following specific disposal information relating to batteries and battery systems:

#### For customers in EU countries

Batteries are subject to European directive 2006/66/EC relating to (waste) batteries, as well as to the corresponding national laws. Here the Battery Directive forms the basis for handling batteries throughout the EU. Our batteries and accumulators are marked with the symbol of a crossed-out waste bin, **see "Fig. 88: Crossed out waste bin"**. The designation of the pollutants contained, i.e. "Pb" for Lead, "Cd" for Cadmium, and "Hg" for Mercury, is located beneath this symbol. Waste batteries and waste accumulators may not be disposed of through regular household waste, because pollutants that have harmful effects on the health of humans, animals and plants may discharge into the environment and accumulate in the food chain or environment. In addition, valuable raw materials are lost in this way. Please therefore dispose of your waste batteries and waste accumulators exclusively via specially set-up collection points, your dealer, or the manufacturer. There is no charge for handing them in.

### For customers in other countries

Batteries are subject to European directive 2006/66/EC regarding (spent) batteries. The batteries are marked with the symbol of a crossed out waste bin, **see "Fig. 88: Crossed out waste bin"**. The designation of the pollutants contained, i.e. "Pb" for Lead, "Cd" for Cadmium, and "Hg" for Mercury, is located beneath this symbol. We recommend that the batteries are not discarded as normal household waste, but are disposed of via separate collection. Your national laws may also prescribe this. Please therefore ensure appropriate disposal of the batteries as per the regulations which apply in your country.

## 15 Copyright

These instructions and the texts, drawings, images, and other representations which they contain are protected by copyright. Reproduction of any type or form whatsoever - even as extracts - as well as the use or publication of the content are not permitted without the written statement of agreement of the manufacturer.

Contraventions create an obligation to compensate for damages. The right to further claims is reserved.

Torqueedo reserves the right to modify this document without advance notification. Torqueedo has made significant efforts to ensure that these instructions are free from errors and omissions.

Version 1.1 12/2020

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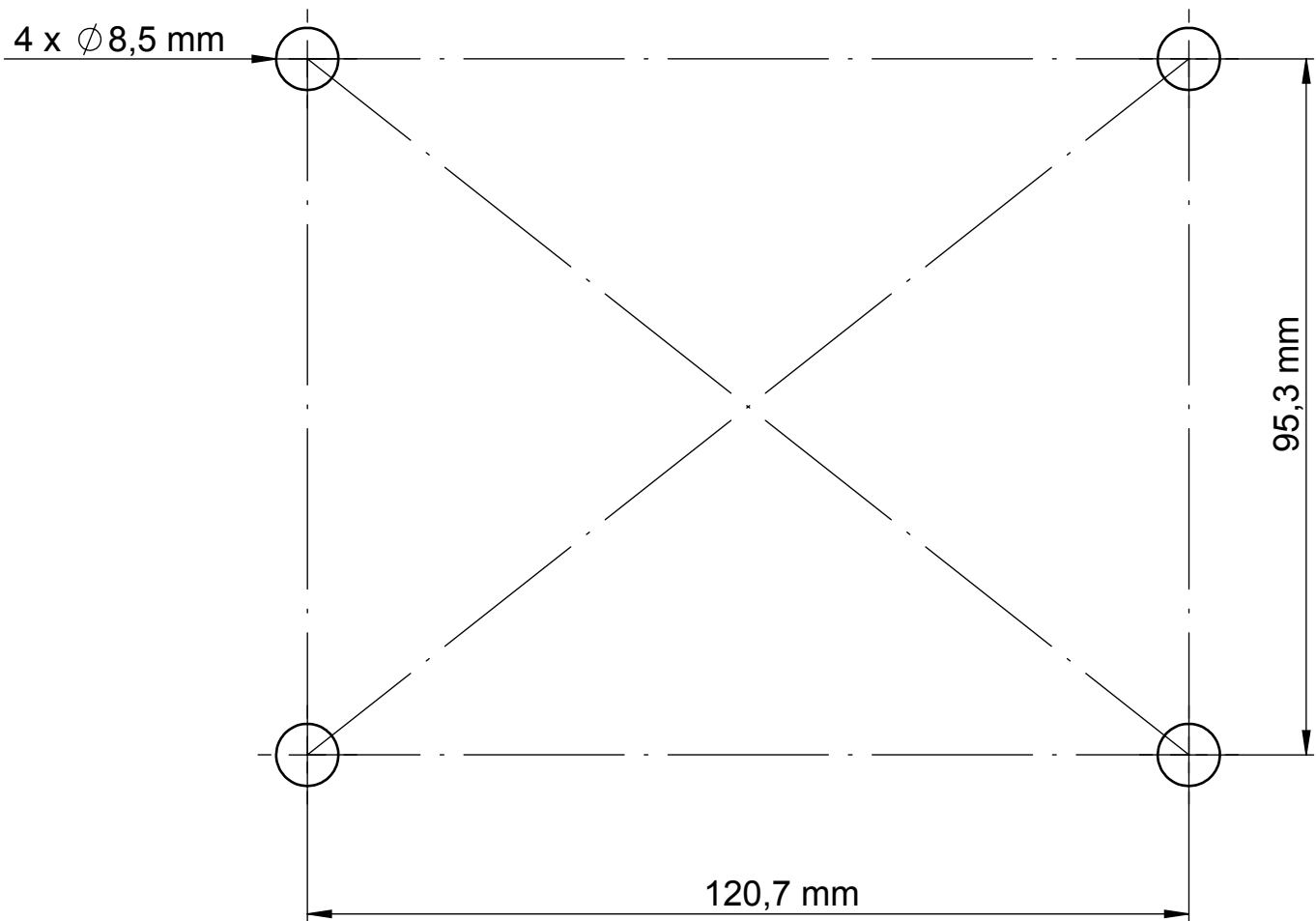
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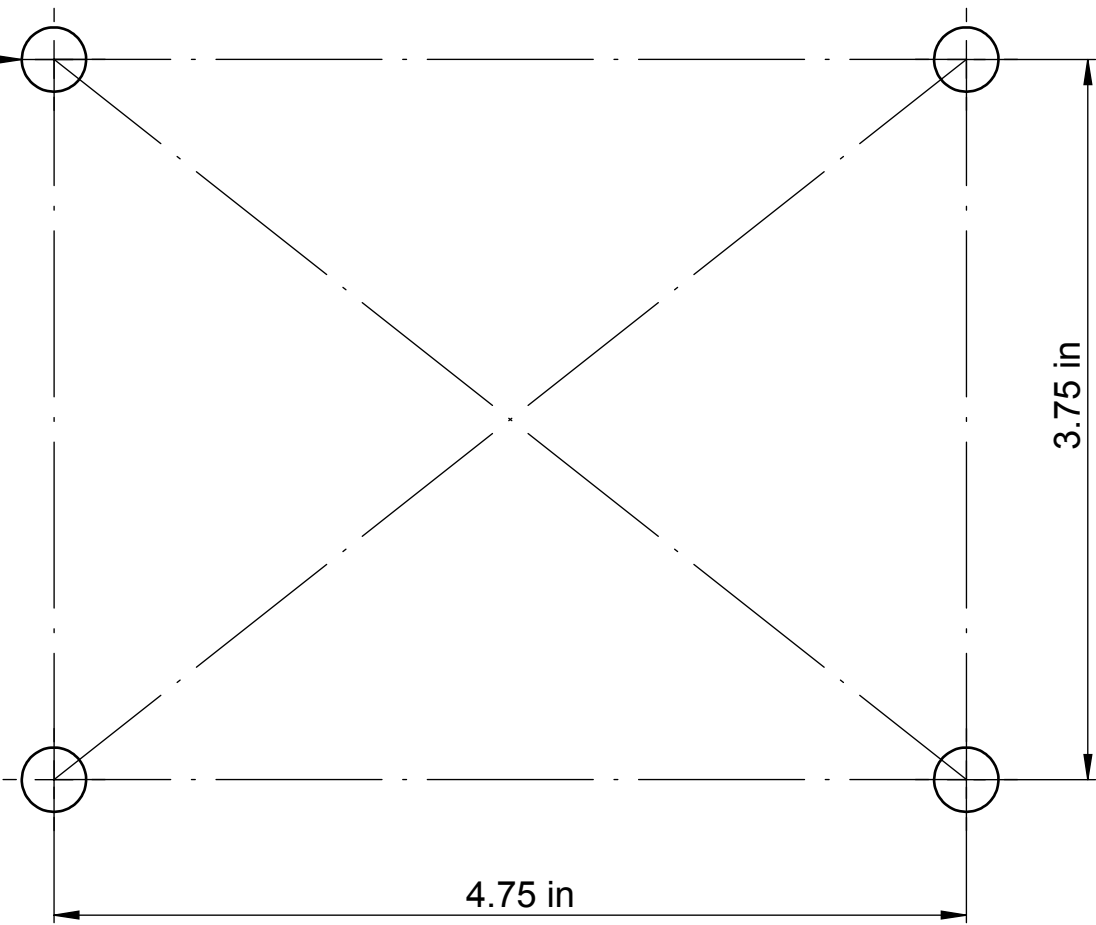
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Item number: **039-00354**





4 x  $\phi$  0.33 in



4.75 in

3.75 in