INSTRUCTION FOR USE

BONEX-SCOOTER

ECOS
REFERENCE
DISCOVERY
REFERENCE RS
DISCOVERY RS

Version: 2016_08

Content

1. Safety Instructions

The Bonex-Scooter is a top quality product made in Germany. However, the product is only as good as can be guaranteed with proper, careful handling and care of all parts.
We therefore ask you to read the following instructions for use and care of the scooter carefully.

Please read and understand the instructions for use carefully, before using your Bonex-Scooter for the first time! (PRTFM ☺)

1.1 User Instructions

	Check that the scooter has been assembled properly before use. **All screw connections and seals must be checked carefully!**
	The scooter is pre-charged and ready to use. However the battery only reaches its maximum capacity after being charged three or four times!
	The scooter must be opened to charge the battery and for inspection purposes. **It is necessary to remove the Tube complete!**
	The scooter is fitted with an „ON“ / „OFF“ switch. However, the connecting cable must be connected to the battery before first use. ***DISCOVERY (RS) with 2 batteries and connecting cables!***
	The speed of the scooter can be regulated during normal operation mode by a rotary switch.
	Depending on model, the scooter is equipped with an emergency drive switch. The emergency drive switch is intended for operating in diving situations in which normal operation is no longer possible. **In such cases, the driving speed cannot be controlled!**

1.2 To Be Noted

	The scooter has double seals on all shaft openings and housing seals. **To ensure that the seals seal perfectly, the seals must be cleaned and greased regularly!**
	The scooter is supplied with a control voltage after switching on the main switch. The scooter therefore consumes power even when the scooter is not in use (approx. 3W). Make sure that the main switch is turned to „OFF“ after use. In case of longer transports we strong advise you to disconnect the plug from the battery. **Failure to do so may lead to a total discharge of battery over a prolonged time and this can cause irreparable battery damage!**
	The scooter must be locked according to the instructions prior to usage. **The scooter may only be operated closed and with the silver eccentric locking lever in the folded locked position!**
	**Battery should not be thrown in the domestic waste but disposed of separately!** Either return the used battery to the manufacturer (disposal is free of charge) or take them along to a collection point for used batteries.
	The battery may not be exposed to direct sunlight. Temperatures below freezing point should also be avoided during storage. **Heating or very low temperatures reduce the service life of the battery!** The battery should ideally be stored in a safe, dry place between 15°C and 20°C. **If you will store the scooter for a prolonged time, keep the battery partially charged, this will ensure a long service life of battery!**

1.3 Warning Instructions

	**In case any flooding, stop immediately the driving and use. In case of a flooded battery, the battery and the scooter can burn or explode. This is extremely dangerous. The extinguishing can only be done with the fire extinguishing device for lithium batteries.**
	**Battery may not come into contact with water!** **Do not attempt to drill through battery, disassemble or expose them to force!** Battery may only be recharged with suitable battery chargers. **Never leave the scooter unattended during charging!**
	Only operate the scooter in perfect condition! **Defective cables, switches, plugs, power packs, drive motors or seals must be replaced immediately!**
	Ensure that persons who use the scooter are instructed on how to do so. For a perfect, skilful handling of your scooter we strongly recommend a proper training course!
	When operating, make sure that no part of your equipment is hanging loose so that it gets caught in the propeller! When operating do not reach into the rotating propeller! **There is a danger of injury despite the saftey cut off!**
	**In case of undefined and vague terms of description the instructions mentioned in the „German-Version" of the „Instruction for use" are binding!** **Should the English translation differ from the German original, the German version is binding!**

2. Brief instructions for Bonex-Scooter

1. **Read the manual carefully before operating the device!**

2. **Storage:**
   - Main switch ***„OFF“*** (otherwise total damage of battery is possible!)
   - Place scooter with “Shroud“ down on flat ground or store it in the transport box with the label “TOP” on the top.
   - Place scooter in shadow (sun heats up the interior)!
   - Remove Tube O-rings before prolonged storage!
   - Store the battery in partially charged conditions!
     (Recharge battery immediately before intended usage)

3. **Transport (with parcel service etc.):**
   - Remove battery plug and put safety cap on battery connector!
   - Check the reliable fit of the battery inside the scooter!
   - Transport the scooter only in the original transport box or in the additional transport bag fitted in a carton with foam!

4. **Starting up:**
   - Charge battery (or check status with capacitance meter)!
   - Check the battery connector cable for proper connection to battery!
     ATTENTION AT DISCOVERY SERIES THERE ARE 2 BATTERIES!
     BOTH BATTERIES HAS TO BE CHARGED AND CONNECTED!
   - Remove all dirt (hair, dust, greenery, etc.) from the seal seats!
   - Lightly grease all Tube O-rings!
   - Lightly grease Tube at both seal seats!
   - For saltwater use, mount the salt water lead on top of the basic lead!
   - Mount the Tube with the „Bottom-Sticker” in direction to the shroud and align it towards the zinc anode!
     Wrong mounting of Tube can cause leakage!
   - Don’t place the scooter in direct sun (Battery can be damaged)!

5. Aftertreatment:

- Rinse the scooter completely well after operating in saltwater!
- After usage in saltwater remove the propeller and rinse the glide sealing from the outside!
  DO NOT ATTEMPT TO CLEAN GLIDE SEAL MECHANICALY!
- Switch ***„OFF“*** scooter on main switch!
- Check the inside of the scooter occasionally.
- **Remove Tube during charging operations!**
- Charge each battery separately (DISCOVERY series)!

6. Maintenance:

- Clean occasionally and wipe the scooter backend with silicon spray!
- Check Tube O-rings after 6 month and change them at least once a year (long storage will cause deformation of the O-rings)!
- Once a year grease the shaft of all switches (disassemble the knob)!
- Once a year grease the O-rings of the slide sealing!
- Once a year grease the O-rings of the shaft inside the nose!
  (Lift up the pressure plate)
- Exchange all O-rings every two to three years!
- Occasionally check or exchange the zinc anode.

Please heed the advice for a smooth run of the scooter and a long joy over your Bonex-Scooter! This is just a quick check. This does not show the complete maintenance.

If desired, Bonex will do the service for you.

3. Purpose

The Bonex-Scooter was designed and developed for use under water.

Use on land, or in media other then water, is not an intended use.

Operation in other media can lead to malfunctions or overheating of the motor and to damage or even destruction of the Bonex-Scooter.

The Bonex-Scooter is designed to pull a diver and his personal and auxiliary equipment.

The maximum performance values depend on the weight and the streamlined arrangement of the equipment in the water.

With increased loads the maximal possible drive speed is reduced.

The Bonex-Scooter has been designed for private use.

All kinds of commercial use necessitate special precautions for instruction and use of the Bonex-Scooter!

4. Guarantee

Under consideration of the following instructions for use and care we provide the following manufacturer's guarantee for private users:

We provide a two year guarantee on all housing and control elements made of aluminium, plastic, carbon and stainless steel.

We provide a 12 month guarantee on all electronic components and battery.

Sensors, springs, propellers and seals are wearable parts and are excluded as such from this guarantee.

Intervention in the housing and electronic connections by unauthorised persons or workshops will lead to voiding of the guarantee.

Defective sealing elements must be replaced immediately.

Bonex will accept no liability for penetration by water (especially salt water) which is due to defective elements and poor maintenance.

The replacement or exchange of single parts (i.e. battery) does not extend the guarantee.

Severability Clause:

In case one clause should prove to be or become ineffective or incomplete these terms and conditions shall remain in legal effect.

5. Disclaimer

The owner is solely responsible for the trouble-free, proper and orderly operation of the Bonex-Scooter!

Bonex will accept no liability for damage due to improper use of the scooter. This includes damage to natural banks, jetties and harbours and diving in private, protected and security areas.

Bonex will not accept liability either for collisions which take place in restricted visibility conditions or due to failure to observe safety distances.

Liability for personal injury on exceeding the depth limits and failure to observe surfacing speeds and decompression obligations is also excluded.

Bonex will not be liable for consequential damage resulting from failure to function or malfunctioning of the Bonex-Scooter.

This includes property damage and personal injury.

Severability Clause:

In case one clause should prove to be or become ineffective or incomplete these terms and conditions shall remain in legal effect.

6. Technical Data

Model	ECOS	ECOS Plus	ECOS S	REFERENCE RS	DISCOVERY RS
Dimensions:	Ø 223/300 L 600 mm	Ø 223/300 L 600 mm	Ø 223/300 L 600 mm	Ø 218/300 L 690 mm	Ø 218/300 L 850 mm
Battery:	25,2 V 1x Akku	25,2 V 1x Akku	25,2 V 1x Akku	43,2 V 1x Akku	43,2 V 2x Akku
Weight:	15 kg	15 kg	15 kg	19 kg	25 kg
Battery weight:	3,2 kg	3,2 kg	3,2 kg	5,6 kg	11,2 kg
Operating depth:	120 / 200 m*	200 m	200 m	200 m	150 / 200 m*
Operating temp.:	0° - 40°C	0° - 40°C	0° - 40°C	0° - 40°C	0° - 40°C
Runtime Max.:	200 min	200 min	200 min	210 min	420 min
Runtime Min.:	110 min	100 min	90 min	105 min	210 min
Range Max.:	8 km	8 km	8 km	9 km	18 km
Thrust Max.:	220 N	260 N	270 N	330 N	330 N
Speed Max.:	60 m/min	67 m/min	70 m/min	85 m/min	85 m/min
Trim:	neutral	neutral	neutral	neutral	neutral
Charger:	230V-50Hz 110V-60Hz	230V-50Hz 110V-60Hz	230V-50Hz 110V-60Hz	230V-50Hz 110V-60Hz	230V-50Hz 110V-60Hz
Charging time:	4-5 hrs.	4-5 hrs.	4-5 hrs.	4 hrs.	8 hrs.

* **Standard Tube operating depth 120 / 150 m, 200 m Tube as optional order!**

7. Technical description

Illustration 7a (Scooter schematic drawing)

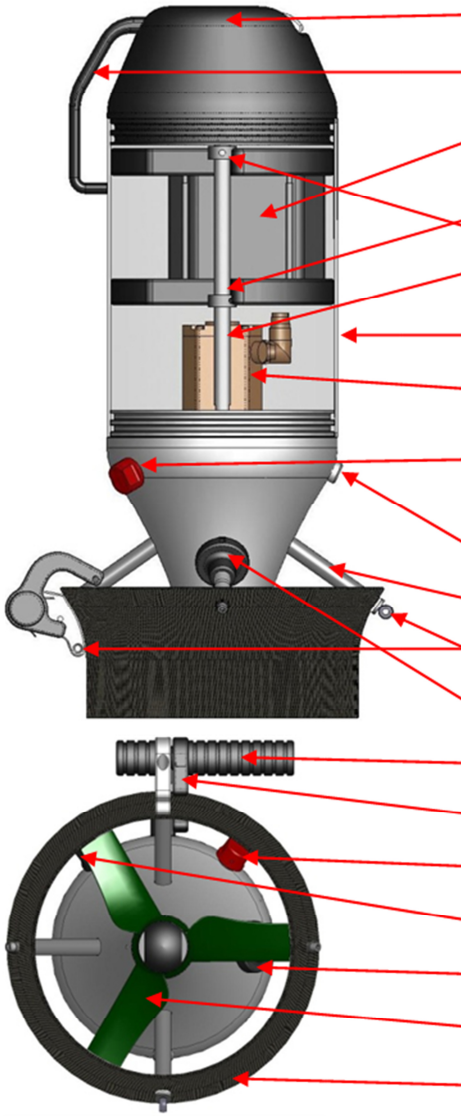
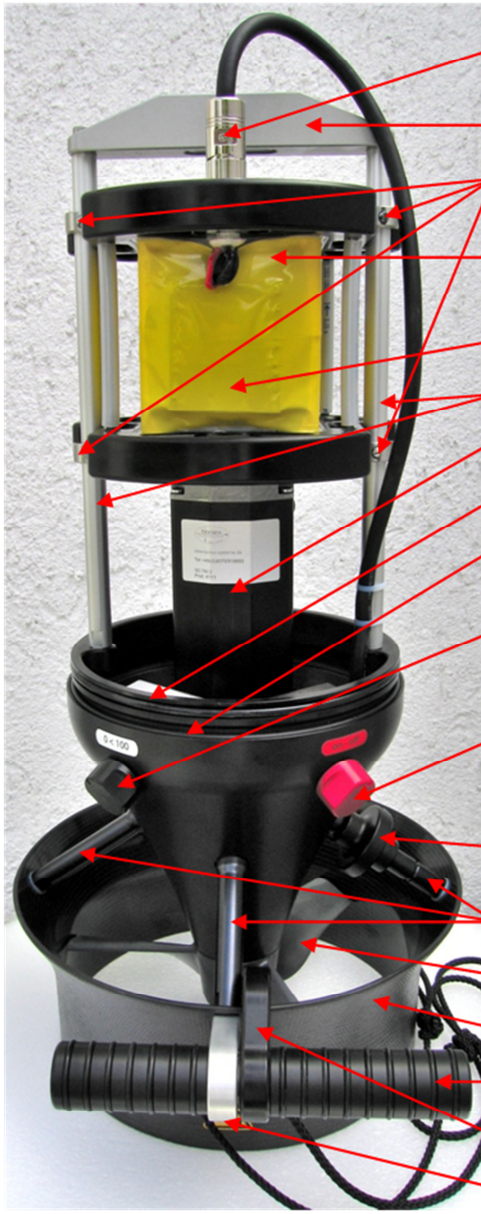
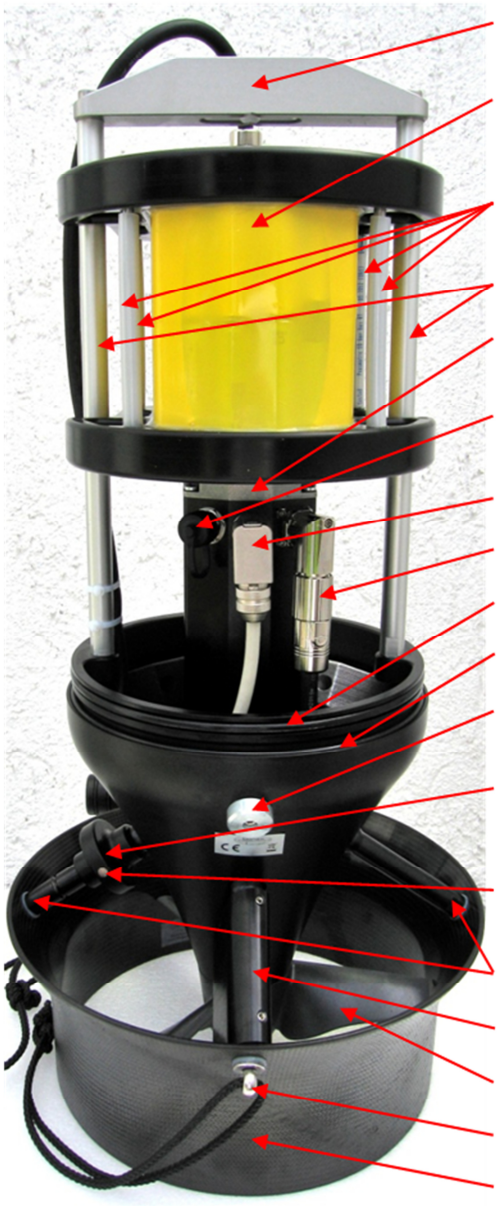


Illustration 7b (Scooter top side)



- Battery plug (2X at DISCOVERY series!)
- Traverse
- Stop ring (Battery fixation)
- Battery (2X at DISCOVERY series!)
- Battery controller
- Connecting rod
- Motor
- Lower radial seal
- Lower axial seal
- Speed governor (NOT at ECOS)
- Main switch (ECOS with 5 speed steps)
- Emergency drive switch (NOT at ECOS)
- Cross member
- Propeller
- Shroud
- Round handle
- Drive switch (Trigger)
- Tow cord (upper fixation point)

Illustration 7c (Scooter bottom side)



8. Starting up

The Bonex-Scooter is prepared for starting already prior to delivery.

The battery is charged and the scooter is parameterized with the latest software.

On manufacture, the scooter is subjected to a function and pressure test.

Before using for the first time, remove the scooter from the transport packaging.

Please keep the original transport packaging for further usage (return of scooter in case of maintenance / repair)!

Open the scooter at the silver eccentric lever.

To do this, set down the scooter with the jet on a level surface and pull the lever up so that it is pointing vertically upwards, turn it 90° and pull out completely.

To pull off the nose, fix the scooter on the jet with one foot to obtain sufficient holding force.

The nose can then be pulled up and off together with the lock.

Hold the Tube tight with both hands and also pull this up.

NOSE CLOSED

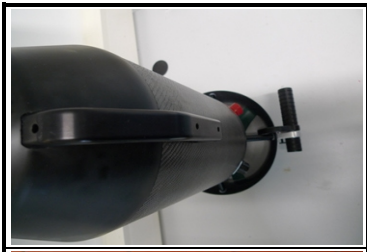
NOSE OPEN

Below you will find an illustrated instruction for proper „Opening“ and „Closing“ procedure of Bonex-Scooters.

8.1 Proper opening / closing procedure of Bonex-Scooters

	Closed state of scooter in „Nose view”
	Lift the silver eccentric lever up to complete vertical position. Now two red dots arranged in alignment are visible.
	Turn the silver eccentric lever to left or right side for 90°. Now the two red dots lose their alignment: One stays fix at 6 a clock, the inner red dot moves right to 3 a clock or alternative left at 9 a clock.
	Now lift the silver eccentric lever complete. Performing this way you can hear a sort of „venting noise“. Now you are able to pull off the nose.
	For removing the nose put one hand at the silver eccentric lever the other hand at the system handle and one foot on the shroud, fixing the scooter for obtaining a sufficient holding force. Now you can lift he nose straight upwards.

	View of scooter with nose removed.
	If Tube has not been removed for a longer time it is possible that the two O-ring, displace the smear layer and you need an intensified force to remove the Tube. In case of this, use the proper fixed „Tube-Remover“ as shown in the picture.
	View of the lower Tube edge after Tube has been lifted slightly. You will find the „Bottom-Sticker” normally at the inner surface of the Tube and it is aligned to the zinc anode.
	View of the scooter after removing the nose and the Tube
	Inner view of the Tube with the „Bottom-Sticker“ at lower edge. This edge must be aligned downwards in direction to the propeller. It is advised to align the „Bottom-Sticker“ towards the zinc anode.

	When refitting the Tube pay attention to the correct position of the “Logo-Signs”. Push the nose with slight force downwards to refit it to the scooter. To do this way, the system handle must be aligned to the drive switch (trigger).
	To close the nose, the red dot on the pressure plate must be aligned to a position at 3 a clock or a position at 9 a clock. During this procedure the second red dot remains at 6 a clock.
	Push the silver eccentric lever downwards until it gets in contact to the pressure plate. During this procedure the lever is orientated backwards.
	Now turn the silver eccentric lever to the right or the left side for 90°, until the two red dots are aligned again. To do so, the lever must be aligned into a complete vertical position.
	At least force the silver eccentric lever downwards until it becomes contact to the nose surface. The scooter is now closed. ### NEVER USE EXTREME FORCE TO CLOSE THE SCOOTER ### If necessary control complete mounting!

8.2 Scooter Trim:

For using our scooters in saltwater, please use the additional lead balance weights as follows:
For determination of the needed quantity of lead, please put your scooter into saltwater and put some of the big lead (thin and/or thick) on the front of the tube. Only until the tube of the scooter is under water. For a slight positive trim, the system handle should stay outside of the water.

Please repeat this with the back/bottom of the scooter – put here the small lead onto the shroud. The main handle should stay half outside of the water (as you can see in the attached picture).

Now you know the exact amount of lead to be added. Now take your scooter out of the water, dry it, open the scooter and screw the big front lead plates into the nose and the rear lead onto the motor bracket.

Please, keep attention, that the lead will only be added on top of the inside existing lead.
For the assembling please use an Allen key with ball button, so as not to damage the screws.

For military use, it might be necessary to trim the scooter negative. In this case, add more lead.

8.3 Controls to perform before starting up

Ensure that the power pack is sitting tight and connect the battery plug. The battery plug only fits in one position so that the union nut also engages. Screw the union nut of the battery plug to the end of its thread so that the plug is also tight.
Make sure that the cable is laid without twisting and in one loop upwards.
Look at Illustration 7b (Scooter top side) page 11.

(ATTENTION: DISCOVERY series owns 2 battery connectors)
Make sure that all balancing weights are firmly in place and no loose parts fall around in the scooter. Check visually that all the cable plugs are tight and the cables are not damaged.
Check the firm fitting of the battery pack(s).
Grease the sealing rings and the inside edge of the Tube lightly with silicone grease. Push the Tube downwards **(„Bottom-Sticker“ must be aligned towards the zinc anode)** until it came in contact to the housing. Please act in same procedure with scooter nose. In the nose there are two center poles to be aligned to the traverse. Please note that the scooter housing cannot be closed correctly if the center poles in the nose are not aligned in correct position and the tube isn´t assembled in the right direction. While mounting the nose the System handle has to be on the opposite side of the zinc anode!
Hold the silver eccentric lever up when setting down the nose and push the nose in up to the mechanical stop.
To close the nose, the red dot on the pressure plate must be aligned to a position at 3 a clock or a position at 9 a clock. During this procedure the second red dot remains at 6 a clock. Push the silver eccentric lever downwards until it gets in contact to the pressure plate. Now turn the silver eccentric lever to the right or the left side for 90°, until the two red dots are aligned again. At least force the silver eccentric lever downwards until it becomes contact to the nose surface.
NEVER USE EXTREME FORCE TO CLOSE THE SCOOTER
If necessary control complete mounting procedure!
At the delivery the scooter is trimmed a little bit positive (approx. 50gr). If you assemble additional gear at the scooter, it could become necessary to trim it again. Also you have to trim the scooter again if you intend to use it in saltwater. For this option you can add some additional balance weights inside the scooter nose and in the back tail underneath the screws. Optimal trim is reached if front system handle is approx. 25mm outside water and round handle at tail is approx. 15mm outside water surface. Please take care that the flattened lead plate inside the nose are assembled at last!

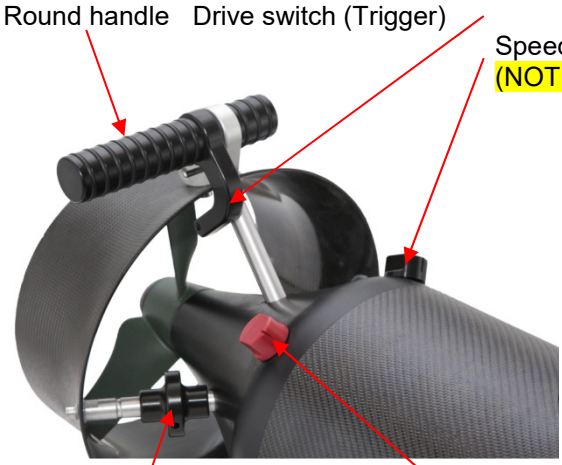


Abb.: 8a

The Bonex-Scooter is now ready for operation.

To check the correct function, place the scooter on a flat surface and secure it against accidentally rolling away. Switch the main switch to „ON“. to get scooter ready for operation. In models with two separate battery packs (DISCOVERY series) the respective pack can be activated by turning the main switch in position 1 | 2. The position in the middle is means „OFF”. The propeller starts to turn when you activate the drive switch. The revs of the prop and therefore the pulling speed can be varied by adjusting the speed governor. When the mark on the governor switch is at 12 a clock you reach a pull speed of approx. 60%. The main switch of the ECOS model also functions as a five speed step switch. After releasing the drive switch press the emergency drive switch by pushing the round piece to its outer rest position. When performing this way the propeller turns at a constant speed. Now push the emergency drive switch back to its initial position. The model ECOS is not equipped with this option. You can choose the speed on the central knob in five positions.
The scooter has now been tested again for all functions and is ready to go.

Schalten Sie den Hauptschalter wieder in die Stellung „OFF“.

In case off malfunctions or failure occur please proceed as described in chapter (14. Troubleshooting) at page 355.

9. Use

You should use a backplate with harness and crotch belt for riding the scooter. When using an ADV or stabilizing jacket you can attach a crotch strap additionally to your lead belt, or use a separate waist belt with crotch strap while using a lead-integrated jacket.
Prepare your equipment as for a normal dive. Make sure to attach or place loose objects such as inflator pipes, reels, knives, lamps etc. so that they cannot get caught in the propeller during operation!
Make sure that pipes and cables are laid close to the body because protruding parts can increase the resistance and flap during riding!
Make your first test runs under expert supervision. Reduce your equipment to a minimum and increase the objects you will need for your dives gradually from trip to trip!

Important: These short instructions are NO REPLACEMENTS for a professional practical course!

On the first run fasten your items of equipment such as computer, watch, depth gauge and lamp so that you can operate the scooter with your right hand. Connect the tow cord with the bolt snap on the ring of the crotch belt. The pull of the scooter should pull the diver with the tow cord by means of the D-ring. You therefore need little strength to steer the scooter.
During the first test runs try to keep your right arm slightly bent on the round handle whilst being pulled. You can now operate the drive switch with your thumb. You can also steer with your left hand on the handle stub to the left of the drive switch to take the strain off your right arm during long trips.
Set the speed regulator to a medium speed for the first run.

The scooter should pull you exactly horizontally in a balanced state.

This can be adjusted with the positioning of the bolt snap on the tow cord.
If the scooter pulls **UP**, the **UPPER TOW CORD** must be extended.
If the scooter pulls **DOWN** the **LOWER TOW CORD** must be extended.
In both cases you can also shorten the opposite site of tow cord!

If necessary you can also adjust the lead amount for trimming the Bonex-Scooter.

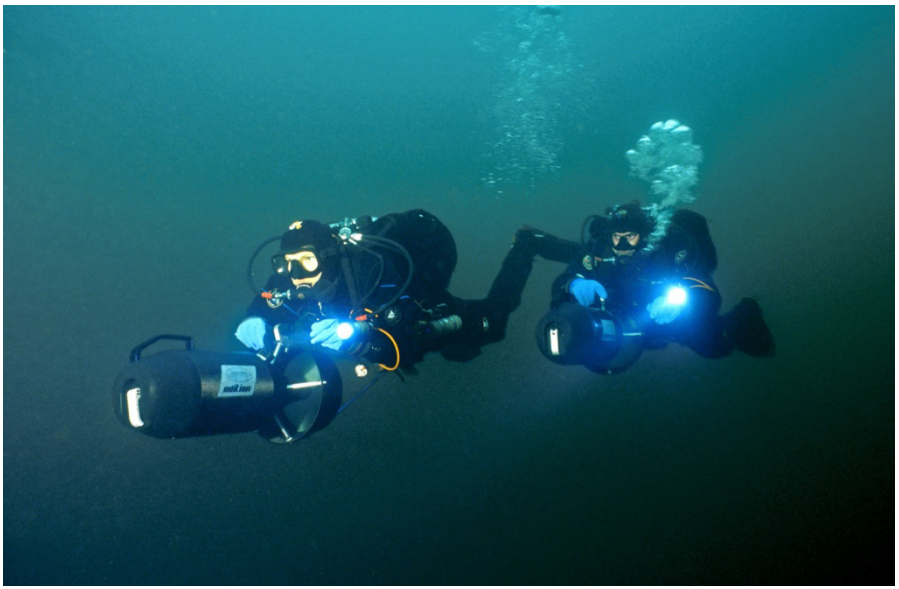
9.1 Most important points to be mentioned

Increase your speed gradually. Make sure that the use of electric powered scooters is not prohibited in the waters you are using. Look out for other divers or swimmers. When using the scooter near to marine and wildlife sanctuaries, be careful to keep a good distance to avoid entering these areas under water.

Please bear in mind that while operating a scooter much greater distances can be covered. This circumstance has to be taken into account in your range planning and gas logistics too.

Make sure you stay a safe distance from the bottom and note that the water jet can whirl up sediment which can considerably restrict visibility under some circumstances. If you use the scooter in caves or wrecks we strongly recommend the appropriate training or courses!

Secure your retreat with a buddy with a scooter or a back-up scooter. Also bear in mind that additional equipment slows down the scooter and may reduce your range.



Scooters in buddy formation

9.2 Average performance and range

9.2a UNIVERSAL-Model „ECOS“

ECOS	Slow	Medium	Fast
Little equipment			
Speed:	45 m / min	53 m / min	60 m / min
Run time:	200 min	150 min	110 min
Range:	8-9 km	8 km	6,6 km
Double unit with 1-2 stages			
Speed:	45 m / min	50 m / min	55 m / min
Run time:	170 min	140 min	110 min
Range:	7,6 km	7 km	6 km
Heavy equipment or towing			
Speed:	40 m / min	45 m / min	50 m / min
Run time:	140 min	110 min	100 min
Range:	5,6 km	4,9 km	5 km
ECOS +	**Slow**	**Medium**	**Fast**
Little equipment			
Speed:	45 m / min	53 m / min	60 m / min
Run time:	200 min	150 min	100 min
Range:	8-9 km	8 km	6 km
Double unit with 1-2 stages			
Speed:	45 m / min	50 m / min	55 m / min
Run time:	170 min	140 min	100 min
Range:	7,6 km	7 km	5,5 km
Heavy equipment or towing			
Speed:	40 m / min	45 m / min	50 m / min
Run time:	140 min	110 min	90 min
Range:	5,6 km	4,9 km	4,5 km

ECOS S	Slow	Medium	Fast
Little equipment			
Speed:	45 m / min	53 m / min	60 m / min
Run time:	200 min	150 min	90min
Range:	8-9 km	8 km	5,4 km
Double unit with 1-2 stages			
Speed:	45 m / min	50 m / min	55 m / min
Run time:	170 min	140 min	90 min
Range:	7,6 km	7 km	5 km
Heavy equipment or towing			
Speed:	40 m / min	45 m / min	50 m / min
Run time:	140 min	110 min	80 min
Range:	5,6 km	4,9 km	4 km

9.2b „EXPLORER“ Models

No longer in program

9.2c „PERFORMANCE“ Models (RS)

REFERENCE RS	Langsam	Mittel	Schnell
Little equipment			
Speed:	45 m / min	60 m / min	85 m / min
Run time:	210 min	150 min	105 min
Range:	9,4 km	9,0 km	8,9 km
Double unit with 1-2 stages			
Speed:	45 m / min	55 m / min	70 m / min
Run time:	200 min	140 min	105 min
Range:	9,0 km	7,7 km	7,3 km
Heavy equipment or towing			
Speed:	40 m / min	50 m / min	55 m / min
Run time:	160 min	125 min	95 min
Range:	6,4 km	6,2 km	5,2 km

DISCOVERY RS	Langsam	Mittel	Schnell
Little equipment			
Speed:	45 m / min	60 m /min	85 m / min
Run time:	420 min	300 min	210 min
Range:	18,8 km	18,0 km	17,8 km
Double unit with 1-2 stages			
Speed:	45 m / min	55 m / min	70 m / min
Run time:	400 min	280 min	210 min
Range:	18,0 km	15,4 km	14,6 km
Heavy equipment or towing			
Speed:	40 m / min	50 m / min	55 m / min
Run time:	320 min	250 min	190 min
Range:	12,8 km	12,4 km	10,5km

10. Transport and storage

The battery should be disconnected from the scooter at the plug for storage and transport. This also prevents the scooter from being accidentally switched on.
This is absolutely essential for transport by courier or parcel service.
Always put the box straight up if stored or transport it in a transportation box. The label TOP must stay at the top or rather the scooter should stand inside the box on his shroud.

A transport backpack is available as an option for safe transport. The scooter is centred at the front and rear and bedded in foam padding. It is therefore optimally protected against knocks and bumps.
If extreme external influences are to be feared, the battery and the charger should be removed and stored separately.
A carton should be used for additional outer protection if the scooter is transported by a parcel service or courier.
Please observe the valid regulations regarding the transport.

You should dry the scooter thoroughly before opening after use. Open the scooter after every dive to remove dirt and any moisture which may have penetrated. Water can lead to corrosion spots on aluminium surfaces which can be avoided if they are removed immediately. Keep your scooter in a safe, dry place. It should be stood on the jet. The silver eccentric lever should be left in the open position during longer periods of storage.

The battery should be tested after long breaks. Pay attention to formation of corrosion or oxidation on the power pack. A white coating may be an indication of defective cells. If the power pack does not work perfectly after restarting, it must be sent to the manufacturer for inspection.

Store the battery at a save place at approx. 15°C – 20°C.

If you intend to store the scooter for a prolonged time (> 4 weeks), store the battery in partially charged conditions! Recharge battery immediately before intended usage. You should also remove the Tube O-rings before prolonged storage. Store the O-rings in a bag inside of the scooter.
Attention: Keep in mind to reinstate the O-rings before intended usage!

Risk of damage due to inrush of water!

11. Charging the battery

Only use the Bonex-Scooter charger to charge the battery!

Always remove the tube during charging!

Disconnect the battery from the battery plug with the plug system.

Connect the charger to the power supply before you switch it on (switch at backside) LED_1 red (Voltage ready); LED_2 green (Charger ready to charge), now connect the charger plug with battery connector. LED_2 light changes green to red and indicates start of charging. Charging procedure is finished when LED_2 lights green.

The connection can be operated in Europe on the 230V DC mains or in other countries with 110V.
The charging time may increase under such conditions.

Standard-Charger for ECOS models – 110 / 230V charger switches automatically
The charger has 1 diode (red / green).
The diode lights „RED“ when charging starts.
Afterwards the diode changes to „GREEN“. Charging is complete.

QCS Quick-Charger – 110 / 230V
The charger has 2 diodes (red and red / green).
1. diode lights „RED“ when charger is connected to the power supply and / or charger is connected to battery.
2. diode lights „RED“ when the main switch of the charger is on and charger operates.
2. diode lights „GREEN“ when charging is complete.
During the charging process the vent in the charger will operate all time.

Do not cover the charger during the charging process!

The charger serves exclusively for charging lithium-ion batteries!

Charger cannot be used to charge a lead gel, NiCd or NiMh battery!

Never leave the scooter unattended during charging!

In the event of excessive heating of the battery pull out the main plug, disconnect battery from charger and contact the manufacturer!

12. Maintenance and care

Rinse the scooter with fresh water after every dive, especially after using it in salt water or brackish water. The outside of the scooter can be cleaned with mild soapy water. A toothbrush can also be used to get into inaccessible places. After being used several times the aluminium housing should be sprayed with a thin viscous silicone spray. This closes the fine pores and protects against dirt and corrosion.

The propeller should be removed after using in salt water. While watching from shroud side, turn the prop nut clockwise to release it. Wash the propeller and drive shaft with fresh water and spray with a silicone spray.

After longer use, the spring of the sliding ring seal should be removed and its O-rings greased.

12.1 Maintenance intervals of Bonex-Scooter

Maintenance point	Interval	To be done by
Oil housing with silicone	Occasionally	Diver
Visually inspect battery and cable	Before every dive	Diver
Oil rotary switch	Occasionally	Diver
Change housing O-rings	Annually	Diver
Change scooter nose O-rings	Every 2 years	Diver
Change O-rings axles / shaft	Every 2 years	Diver
Change sliding ring seal	Every 5 years	Diver
Change pressure disk	As required	Diver
Check cable for breaks	Annually	Diver
Check propeller for wear	Occasionally	Diver
Check housing for wear	Occasionally	Diver
Renew battery	Appr. 500–1000 cycles	Diver
Performance upgrade (Motor performance curve)	As required	Bonex
Pressure and performance test	All 2 years	Bonex

12.2 Table of performed maintenance

Wartung	Date	Date	Date	Date
Oil housing with silicone				
Check battery and cable				
Oil rotary switch				
Change housing O-rings				
Change scooter nose O-rings				
Change O-rings axles / shaft				
Change sliding ring seal				
Change pressure disk				
Check cable for breaks				
Check propeller for wear				
Check housing for wear				
Renew battery				
Performance upgrade (Motor performance curve)				
Pressure and performance test				

Notes:

13. Accessories and spare parts

13.1a Accessories

	Article	Article-No.
	Spare battery ECOS LiMn	SC-710
	Spare battery REFERENCE, DISCOVERY (RS) LiMn	SC-705-2
	System handle	SC-501
	Round handle extension “Left-Side”	SC-514
	Standard-Charger ECOS	SC-504
	QCS-Charger REFERENCE, DISCOVERY (RS)	SC-506
	Capacitance meter	SC-513
	Transport case (Special order only)	
	Transport bag	SC-510
	Transport cradle	Sc-516
	Navigation unit (Compass + Bottom timer)	SC-509
	Hip belt with crotch strap	SC-508
	Torque Control	SC-512
	Saltwater lead for nose and stern	SC-511
	Video mounting for GoPro© camera	SC-517

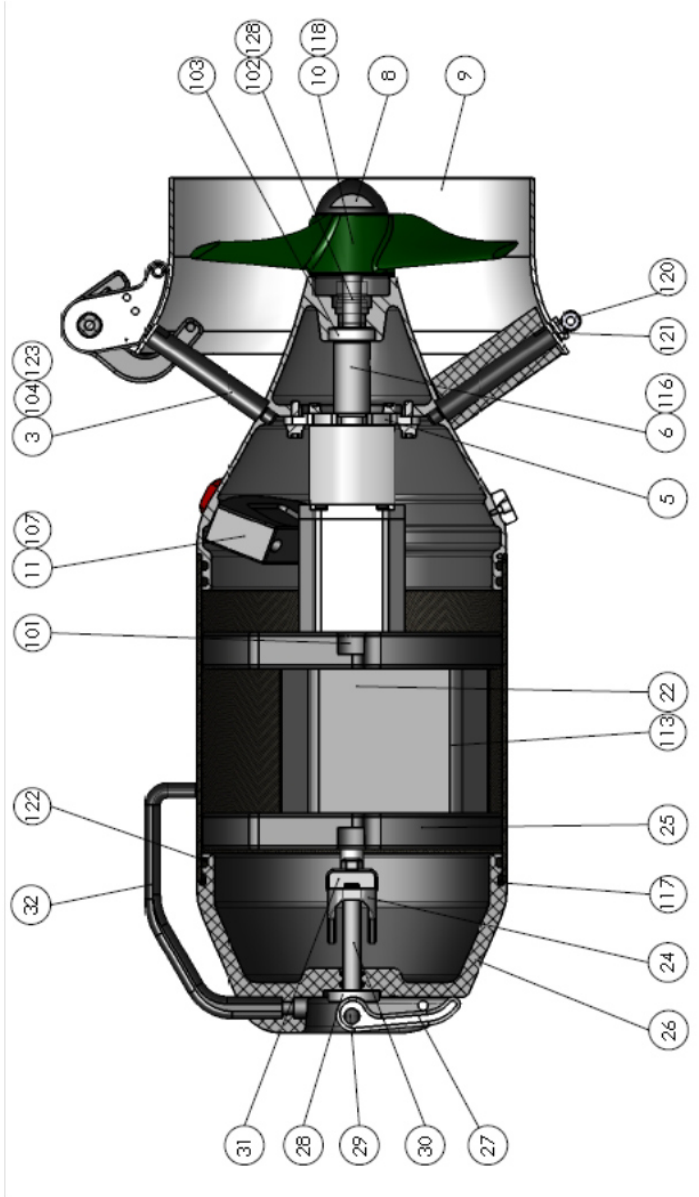
13.1b Accessories

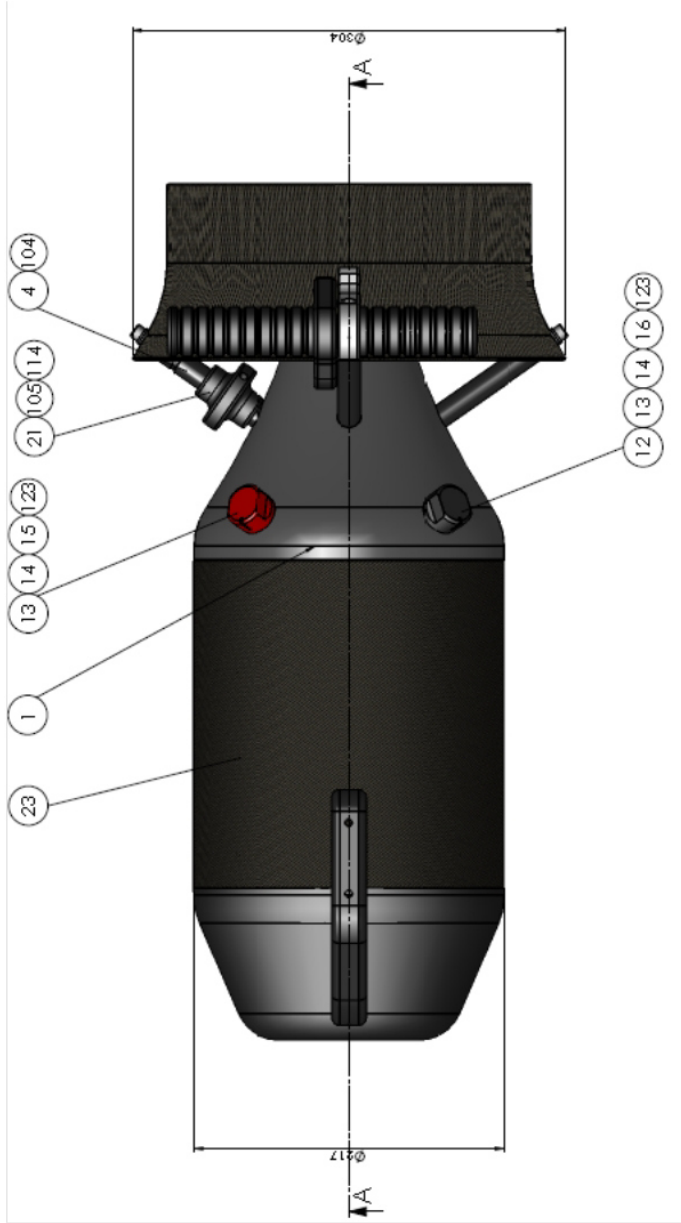
	Article	Article-No.
	Spare parts - Travel	SC-701
	Spare parts - Maintenance	SC-708
	Maintenance fluids	SC-709
	O-ring Tube	ET-00120
	Standard propeller	SC-702
	Propeller 5 Blades (THRUST)	SC-706
	Propeller 3 Blades (SPEED)	SC-707
	Upgrade set REFERENCE (RS) > DISCOVERY (RS)	SC-205
	Upgrade set DISCOVERY (RS) > REFERENCE (RS)	SC-207
	Bonex ECOS Scooter - Set	SC-007
	Bonex REFERENCE Scooter - Set	SC-002
	Bonex **REFERENCE RS** Scooter - Set	SC-003
	Bonex DISCOVERY Scooter - Set	SC-005
	Bonex **DISCOVERY RS** Scooter - Set	SC-006
	Performance upgrade (Motor performance curve)	SC-801

13.2 Spare parts

Pos.	Count	Name	Order number
2	1	Zinc anode	11-11009
8	1	Locking screw	11-11007
10	1	Propeller	11-13003 / -13007
28	1	Pressure disc	19-41006
101	1	Synchronous motor; 48V	
102	1	Sliding ring seal; D=12mm	
103	1	Grooved ball bearing; D=15mm	
104	2	Reed sensor; D=6mm	
105	2	Magnet; D=6mm;	
106	1	Speed governor;	
107	1	Mainswitch unit;	
108	2	Power plug; 4-pole	
111	1	Control plug; 12-pole	
114	1	Pressure piece M8	
115	1	Arm spring	11-31004
118	1	Locating pin; D=3mm;	
119	1	Locating pin; D=5mm;	
120	1	Eyebolt; M=6;	
121	8	Polyamid washers; M=6mm	
122-1	2	O-ring; D=190 x 5,3mm	
122-2	2	O-ring; D=190 x 4,0mm	
123	4	O-ring; D=12 x 2,5mm	
124	4	O-ring; D=12 x 2,5mm	
125	4	O-ring; D=6 x 1,5mm	
126	12	O-ring; D=25 x 3,0mm	
127	1	O-ring; D=18 x 3,0mm	
128	1	O-ring; D=15 x 3,0mm	
131	4	Stop ring; D=15mm	

13.3 Blow-up drawing Scooter

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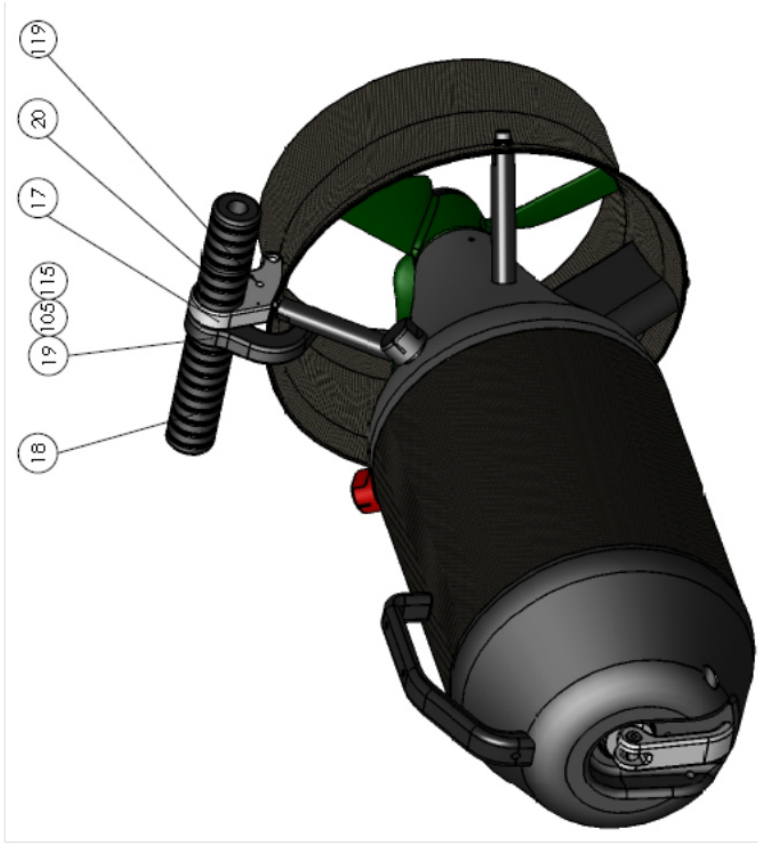
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14. Troubleshooting

In case of malfunctions or failure, the table below presents a list of the most typical problems.

Fault	Cause of failure	Remedy
Scooter does not operate	>Battery plug not connected	>Connect
	>Battery empty	>Recharge battery
	>Main switch „OFF”	>Switch main switch to „ON”
	>Fuse defective	>Replace fuse
	>Reed sensor defective	>Replace reed sensor
	>Main switch defective	>Replace main switch unit
	>Cable break	>Replace cable / switch unit
	>Motor defective	>Return to manufacturer
	>Magnet of drive switch is missing	>Glue a new magnet
Speed governor does not work	>Speed governor defective	>Replace speed governor unit
	>Emergency drive switch activated	>Deactivate emergency switch
Emergency drive switch does not work	>Reed sensor defective	>Replace reed sensor
	>Magnet removed from round piece	>Stick magnet in round piece
Scooter immediately starts after switching main switch „ON”	>Emergency drive switch activated	>Deactivate emergency switch
	>Drive switch (Trigger) pressed	>Release drive switch
Drive immediately stops again after starting	>Torque control	>Switch „OFF” and „ON”
	>Temperature controlg	>Switch „OFF” and „ON”
	>Battery voltage too low	>Recharge battery
Charger diodes does not light	>No current at socket	>Choose other socket
	>Charging plug not connected	>Insert plug
	>Charger defective	>Return to manufacturer
	>Battery defective	>Return to manufacturer
Inrush of water	>O-rings leakage	>Replace O-ring
	>Sliding ring seal leakage	>Replace sliding ring seal
	>Broken housing	>Return to manufacturer

Fault	Cause of failure	Remedy
Switches sluggish	>Dirt / sand on axle	>Rinse with water and >oil axle afterwards
Housing, tube sluggish	>O-rings soiled	>Clean grooves
		>Clean / change O-rings
		>Grease housing with silicone
Eccentric lever sluggish	>Axle dry	>Achse mit Silikon fetten
	>Pressure disc worn	>Replace pressure disc
Eccentric lever loose	>Pressure disc worn	>Replace pressure disc
	>Eccentric lever worn	>Replace eccentric lever
	>Pressure disc, Eccentric lever greasy	>Clean and degrease
Main switch does not turn off	>Temporarily malfunction of main switch	> turn a few times slowly the switch until you hear a click sound
		> Disconnect all batteries and repeat turning the switch
Scooter has reduced power	>Battery capacity too low	>Replace battery
	>Propeller defective	>Replace propeller
	>Contacts corroded	>Return to manufacturer
	>Drive defectivet	>Return to manufacturer

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Declaration of Conformity

CE

EC – Declaration of Conformity

According to addition II A of EC-directive 2006/42

	Bonex GmbH & Co. KG
Hersteller	Am Kroit 19 D-83123 Amerang

We herewith declare that the underwater scooter:

Product description	**ECOS, ECOS +, ECOS S, REFERENCE, DISCOVERY, REFERENCE RS, DISCOVERY RS**

Correspond to the following appropriate directives:

2006/42	EC-machinery directive
89/336/EWG	EC-directive for electromagnetic compatibility

The following harmonized norms apply:

DIN EN ISO 12100 T1 / T2	DIN EN 983
DIN EN ISO 13857	DIN EN 1037
DIN EN ISO 14121-1	DIN EN 60204-1
DIN EN 349	

The declaration of conformity loses validity in case of any change at the underwater scooter, which is not coordinated with the manufacturer.

This declaration contains no warranty of characteristics.

Amerang, 05.07.2016

Location, date

Ramin Mirbaha
Executive board