E'dyn 1120 - Instructions Manual



e'dyn
by Podkrižnik

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1 TO THE OWNER

Dear Customer,

thank you for selecting an E'dyn outboard motor. The product was designed with care and precision by the family company Podkrižnik d.o.o. Although this is our first product in this market segment, we have more than 30 years of experience and tradition in the field of drive technology. Our goal is to provide safe and user-friendly systems. We hope the your new E'dyn will provide maximum enjoyment and an unforgettable user experience.

This Instructions Manual contains information you need for proper usage and maintenance of the product, so please take the time to read it. Taking the instructions in the manual into a count is necessary for smooth and appropriate function of the product.

We try to continuously improve our products. Therefore, if you have any comments, suggestions or questions about the outboard motor, please feel free to contact us.

Your E'dyn team

2 INTRODUCTION

2.1 General information

This manual describes all major functions of the electric propulsion system E'dyn. The main purpose of this manual is to give the user basic information about the usage of the selected product. The manual includes:

- basic information about the components and their main function,
- the characteristics of the outboard motor,
- warnings for possible dangers and their consequences,
- instructions for appropriate and safe usage, as well as the maintenance of the electric propulsion system E'dyn.

You can find the instructions manual among other useful information on the Internet on our website http://www.edyn-marine.com/. We suggest that you take a look.

To understand the basic functions of the system and the be aware of the possible danger, please read the instructions manual. The manual should be kept onboard in a waterproof bag when boating and should stay with the outboard motor if it is sold. With careful following of the instructions, you will be able to avoid potential dangers and their consequences, reduce the repair costs and increase the life time and reliability of the electric propulsion system E'dyn.

2.2 Used symbols

The manual contains descriptions of several warnings, which refer to the standard symbols down below.

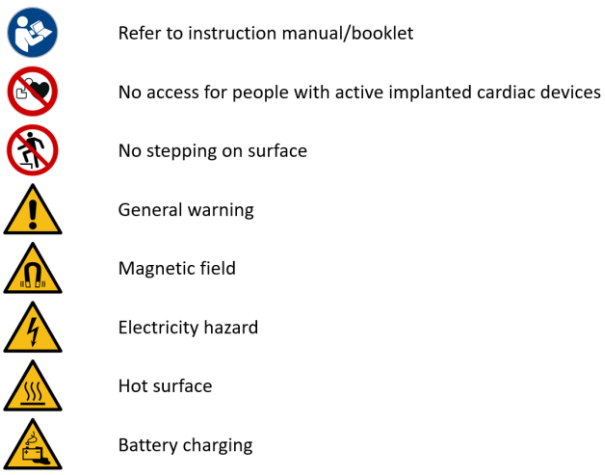
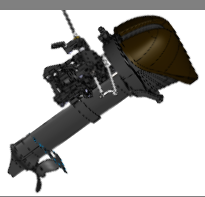
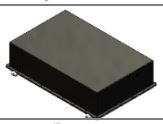
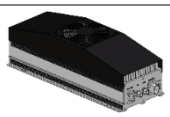
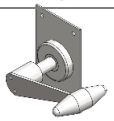
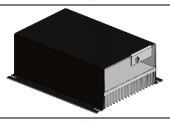
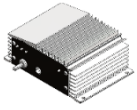


Fig. 1: Used symbols

3 COMPONENTS AND EQUIPMENT

3.1 Content of package

The complete package of delivery of your Electric propulsion system E'dyn includes components, which are listed down below:

COMPONENTS		QUANTITY	IDENT
Outboard		1	10006822
Battery system		1	10008058
Display		1	10008056
Battery charger		1	10008060
Communication cable 3,5 m		1	10008054
Battery cable		1	10008055
Cable harness		1	10008057
Communication cable 2m		1	10008061
Dsitribution box		1	10008062
Throttle lever		1	10008063
DC / DC Converter		1	10008064
Charger KOP		1	10008065

3.2 Outboard overview

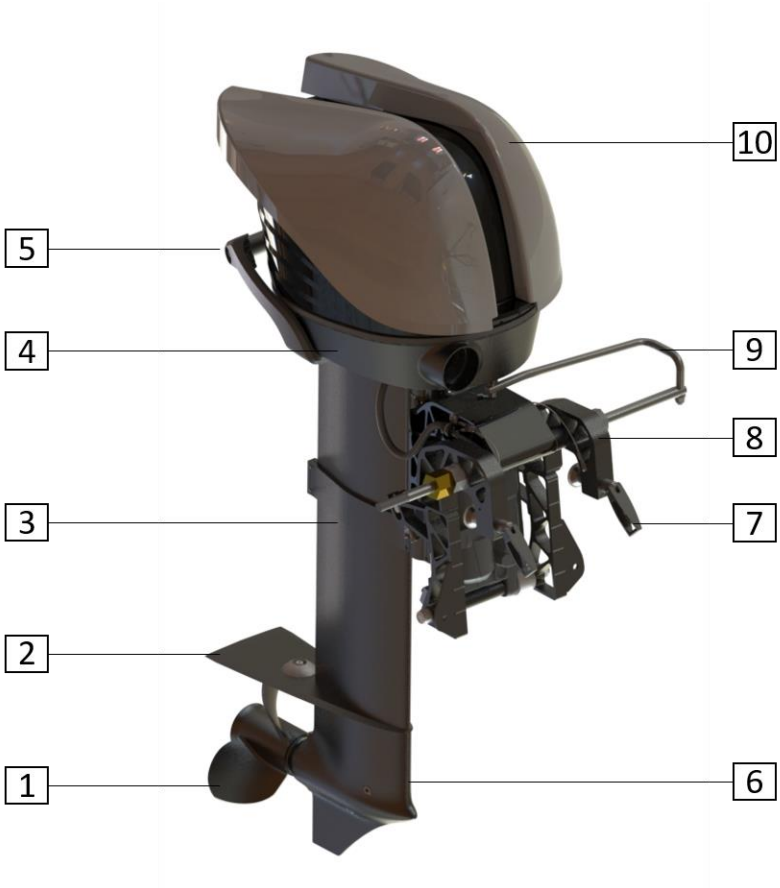


Fig. 2: Overview of drive parts and components

Position	Description
1	Propeller
2	Antiventialtion plate
3	Midsection
4	Head plate
5	Handle
6	Gearcase
7	Clamp bolt
8	Outboard bracket
9	Steering mechanism
10	Motor head

4 TECHNICAL DATA

4.1 Data sheet

Technical data Motor E'dyn 1120	
Outboard	
Rated Voltage	48 V
Rated power	11 kW
Nominal current consumption	220 A
RPM on output shaft	2400 rpm
System efficiency	> 90 %
Dimensions	670 mm x 405 mm x 1151 mm
Trim	Electric trim
Weight	~ 45 kg
Waterproof	IP65
Propeller shaft	Standard
Suitable batteries	Li-ion, Lead-acid
Battery system	
Rated voltage	50,4 V
Capacity	160 Ah, 8 kWh
Battery type	Li-ion
Charging time	From 80 % < 3 h, 100 % < 5 h
Dimensions	794 mm x 540 mm x 220 mm
Weight	67,3 kg
Display	
Supply voltage	12 – 75 VDC
Current measuring method	Shunt
Current measurement range	+/- 20 A to +/- 600 A, configurable in Setup
Display	LCD monochrome 128 x 64
Enclosure protection	IP65 (face), IP40 (rear)
Dimensions (L x W x H)	133 mm x 86 mm x 48 mm
Battery charger	
Supply voltage	1 – 75 VDC / 47 – 63 Hz
Rated current	Max. 13 A at 230 V (16 A at 120 V)
Socket type	F (single phase)
Output voltage	14 VDC – 58 VDC
Nom. Output current	45 A
Dimensions	407 mm x 159 mm x 140 mm
Weight	5,6 kg
Accessories	
Throttle	
Steering system	

4.2 Specification label

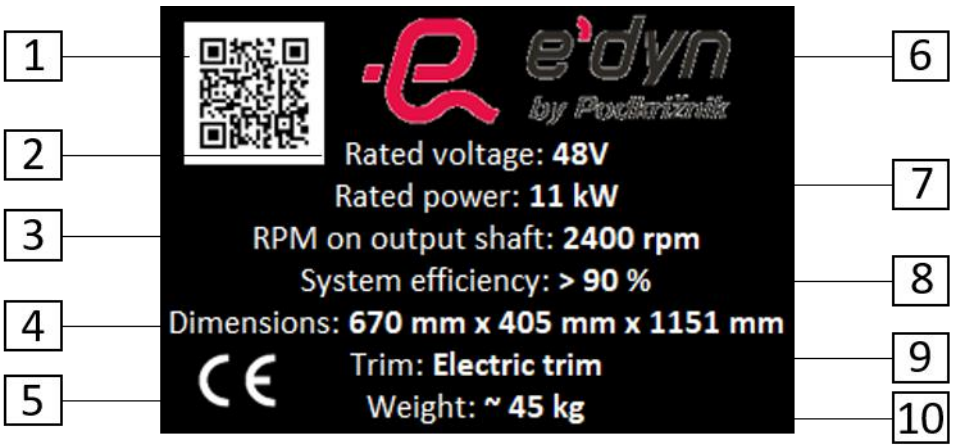


Fig. 3: Specification label

Position	Description
1	QR code
2	Rated voltage
3	RPM on output shaft
4	Dimensions
5	CE mark
6	Logo
7	Rated power
8	System efficiency
9	Trim
10	Weight

5 SAFETY

5.1 Functions

Reliability and safety are very important to use. That's why the electric propulsion system E'dyn is equipped with functions to provide safe usage for the customer.

Safety action	Description
Kill switch (optional)	Shuts the system down with disconnecting the energy supply.
Overtemperature protection	The power is reduced if any of the main components is overheating.
Electronic protection	Protects the whole system when reaching the electric limits (overcurrent, overvoltage, etc.)

5.2 Recommendations

In order of safe and effective usage please take the following steps into a count:

- read these instructions manual carefully before operating the system,
- comply with the instructions and safety recommendations.

In case of not taking the instructions in this manual and safety recommendations into a count, the company Podkrižnik d.o.o. is not responsible for any kind of accidents. The consequences of not following instructions are damage to the product or personal injury.

5.3 General recommendations

Despite all safety features of the electric propulsion system E'dyn, there are some possible dangers when using the system. The consequences can be fatal and can end in bad injury or even death. Therefore, using the E'dyn system properly is crucial for safety reasons. In order of preventing personal injuries please be aware of some of the dangers. The possible dangers are split in three main categories: »*Danger*«, »*Warning*« and »*Caution*«; and are described down below.

5.3.1 Danger

To avoid possible danger, please follow the instructions in the table down below:

Nr.	Danger	Description	Possible consequences
1	Battery gas	Danger from battery gases; do not use the system if the battery is damaged!	Severe physical injuries, death
2	Fire	Danger from overheating; if you see the smoke turn the system off!	Severe physical injuries, death
3	Breaking away from holder	Danger of outboard motor breaking away from the holder!	Severe physical injuries, death

5.3.2 Warning

In order to take warnings into a count, please follow the instructions in the table down below:

Nr.	Warning	Description	Possible consequences
1	Electric shock	Prevent contact with damaged or uninsulated parts!	Physical injuries, death
2	Rotating parts	Prevent contact with rotating parts of the motor!	Physical injuries, death
3	Short circuit	Prevent contact of metal components with battery!	Physical injuries, death
4	Overheating	Use the E'dyn and no other cable set for connecting the components!	Physical injuries, death
5	Cutting by propeller	Prevent contact with propeller, beware of people in water!	Physical injuries, death

5.3.3 Caution

In order to take cautions into a count, please follow the instructions in the table down below:

Nr.	Caution	Description	Possible consequences
1	Heavy loads	Do not lift the system on your own!	Physical injuries, property damage
2	Damaged battery	Check that no-one is present when tilting the motor!	Physical injuries, property damage
3	Risk of burns	Prevent contact with motor during or after a trip!	Physical injuries, property damage

5.3.4 Advice

In order of making a trip with the E'dyn system as safe as possible, we suggest you follow the advices described down below:

Nr.	Advice	Description	Possible consequences
1	Life jackets	We suggest all members of the trip to put on a life jacket!	Physical injuries, property damage
2	Noticed damage	We suggest not starting the trip if you notice any damage on the system!	Physical injuries, property damage
3	Emergency STOP	We suggest putting on the emergency STOP string!	Physical injuries, property damage
4	Battery charge	We suggest you check the state of charge of the battery before starting a trip!	Physical injuries, property damage

6 START-UP

6.1 Mounting the outboard motor

When mounting the outboard motor to the boat, please be aware of the following dangers:

- Danger Nr. 1
  - Description: Danger of breaking away the outboard motor from the holder!
  - Possible consequences: Severe physical injuries, death.
- Caution Nr. 1
  - Description: Do not lift the system on your own!
  - Possible consequences: Physical injuries, property damage.



Fig. 4: Bracket components – Part 1

Component positions on the Figure 5 and Figure 6:

1. Outboard bracket
2. Clamp bolt

Follow the steps described down below when mounting the outboard motor to the boat:

1. Remove the packaging of the required components
2. Set the drive with the **Outboard bracket (Pos. 1)** to the holder on the boat
3. Fix the outboard to the boat with tightening the **Clamp bolts (Pos. 2)**

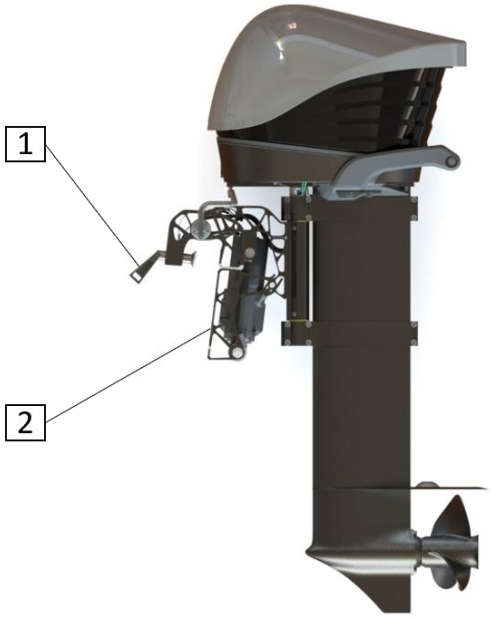


Fig. 5: Bracket components – Part 2

6.2 Mounting a different propeller

When mounting a different propeller on the propeller shat of the outboard motor, please be aware of the dangers:

- Warning Nr. 5
    - Description: Prevent contact with propeller, beware of people in water!
    - Possible consequences: Physical injuries, death.

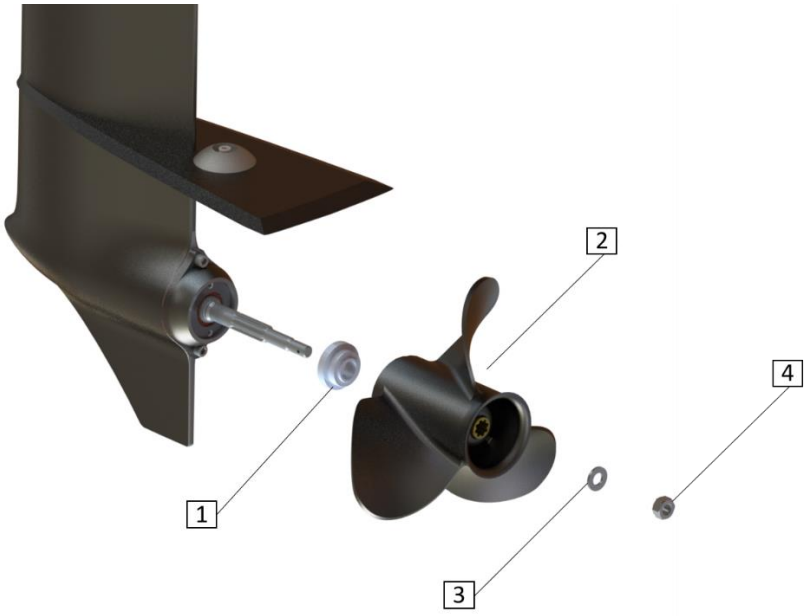


Fig. 6: Propeller mounting

Component positions on the Figure 7:

1. Thrust washer
2. Propeller
3. Plain washer
4. Hex nut

Follow the steps described down below when mounting a different propeller on the propeller shaft of the outboard motor:

1. Remove the **Hex nut (Pos. 4)** and Plain washer **(Pos. 3)** from the propeller shaft. With these two components removed, the propeller is not mounted to the shaft anymore
2. Remove the **Propeller (Pos. 2)** from the shaft by pulling it down
3. Replace the propeller with the desired and place it on the propeller shaft. Adjust the new propeller to the **Thrust washer (Pos. 1)**
4. Fix the propeller to the shaft by mounting the **Plain Washer (Pos. 3)** and **Hex nut (Pos. 4)** on the propeller shaft

6.3 Mounting the steering mechanism

Component positions on the Figure 8:

1. Head plate
2. Steering rod
3. Washer
4. Plain Washer 1
5. Screw M6
6. Main rod
7. Bracket axis
8. Nut 7/8-14
9. Teleflex Nut cover
10. Plain Washer 2
11. Base Nut

Follow the steps described down below when mounting the steering mechanism on the outboard motor:

1. Mount the first end of the **Steering rod (Pos. 2)** to the **Head plate (Pos. 1)** with the help of the **Washers (2x Pos. 3)**, **Plain Washer 1 (Pos. 4)** and **Screw M6 (Pos. 5)**
2. Insert the **Main rod (Pos. 6)** into the **Bracket axis (Pos. 7)** and fix it with **Nut 7/8-14 (Pos. 8)** on one end and with **Teleflex Nut cover (Pos. 9)** on the other end
3. Mount the second end of the **Steering rod (Pos. 2)** through the hole of the **Main rod (Pos. 6)**
4. Mount the second end of the **Steering rod (Pos. 2)** to the **Main rod (Pos. 6)** with help of the **Plain Washer 2 (Pos. 10)** and **Base Nut (Pos. 11)**

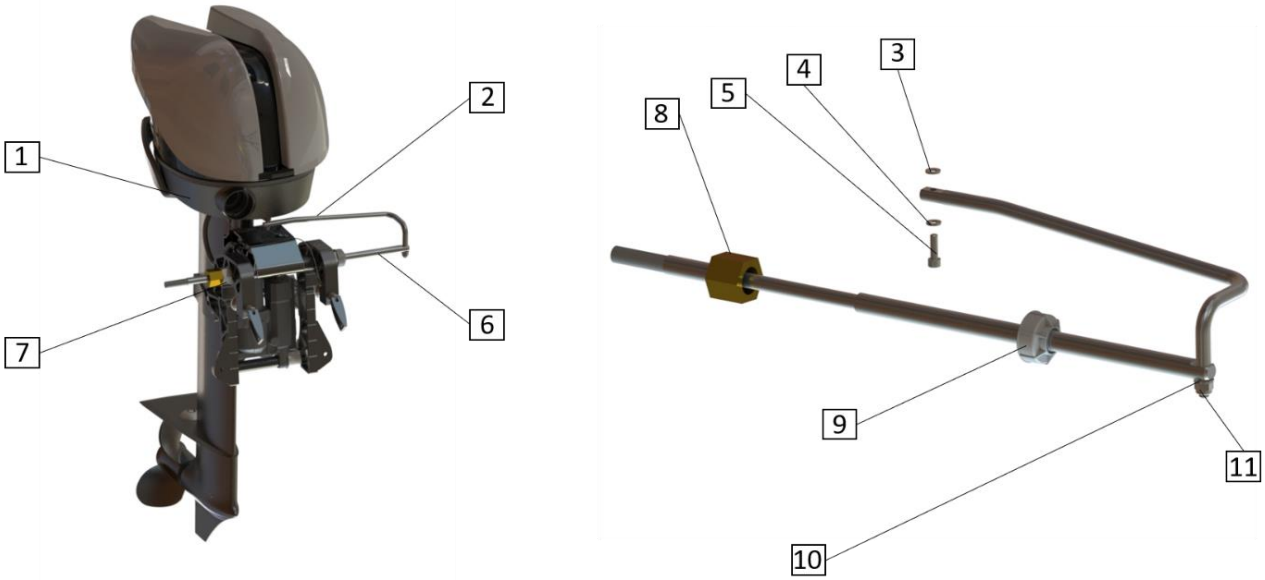


Fig. 7: Steering mechanism mounting

6.4 Trimming the motor

The angle of the outboard can be changed with help of the trim function.

Component positions on the Figure 9:

1. Fixing Screw
2. Fixing Nut
3. Trim pin

If you want to adjust the angle by adjusting the position of the pin, follow the steps, which are described down below:

1. Untighten the **Fixing Screw (Pos. 1)** and **Fixing Nut (Pos. 2)**
2. Set the desired position of the outboard by adjusting the **Trim pin (Pos. 3)**
3. After setting the position, tighten up the **Fixing Screw (Pos. 1)** and **Fixing Nut (Pos. 2)**

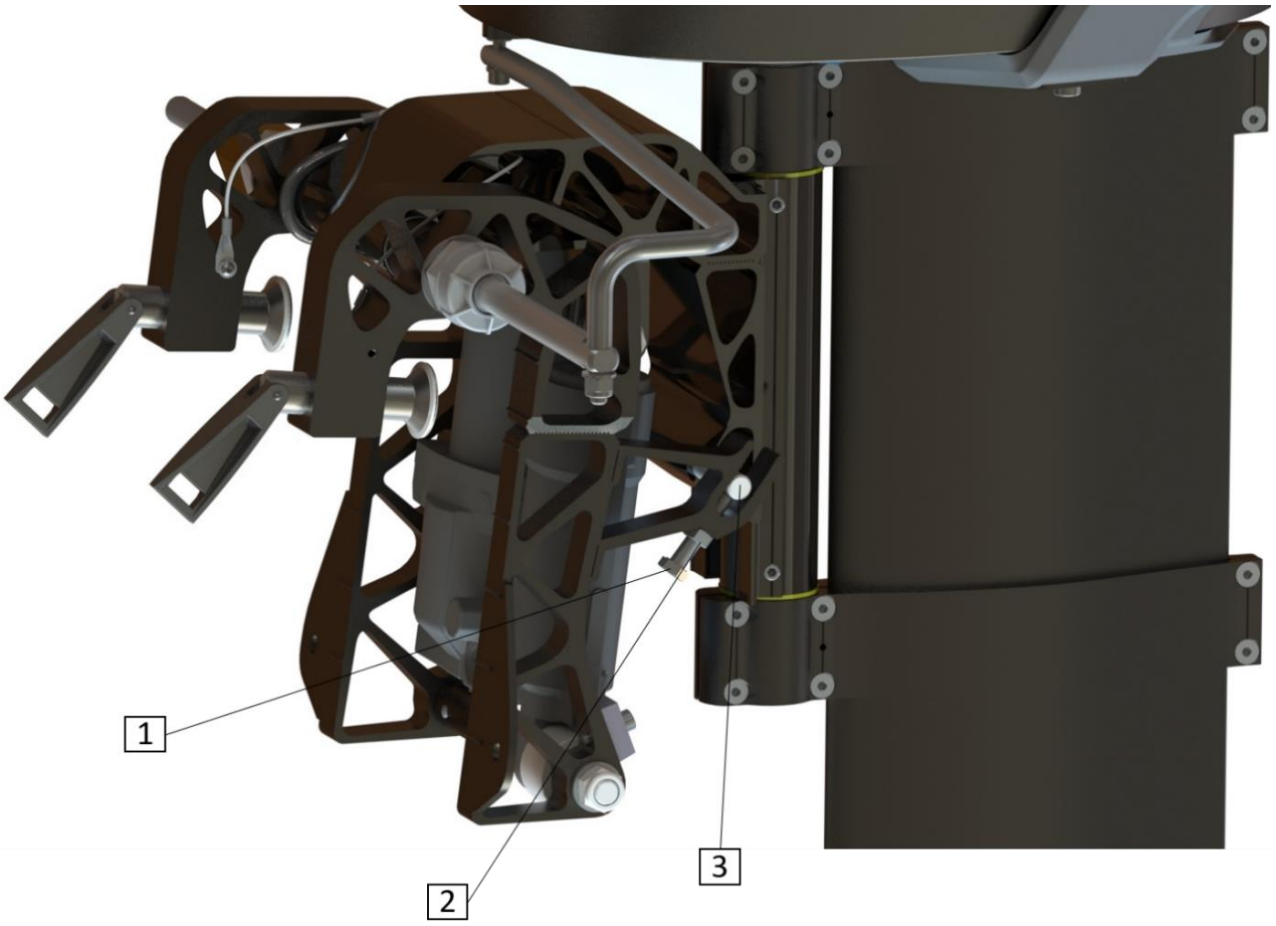


Fig. 8: Trim setting components

6.5 Connecting the battery

When connecting the battery to the outboard motor, please be aware of the following dangers:

- Danger Nr. 3
  - Description: Danger of breaking away the outboard motor from the holder!
  - Possible consequences: Severe physical injuries, death.
- Caution Nr. 1
  - Description: Do not lift the system on your own!
  - Possible consequences: Physical injuries, property damage

In addition of using the outboard motor, the drive has to be connected to the battery.

Component positions on the Figure 10:

1. Battery connector +
2. Battery connector –
3. Cable set connector +
4. Cable set connector –
5. CAN communication connector

When connecting the E'dyn drive to the battery system, follow the steps, which are described down below:

1. Connect **Cable set connector + (Pos. 3)** to **Battery connector + (Pos. 1)**
2. Connect **Cable set connector - (Pos. 4)** to **Battery connector - (Pos. 2)**
3. Connect **CAN communication cable to CAN output on battery output plate (Pos.5)**

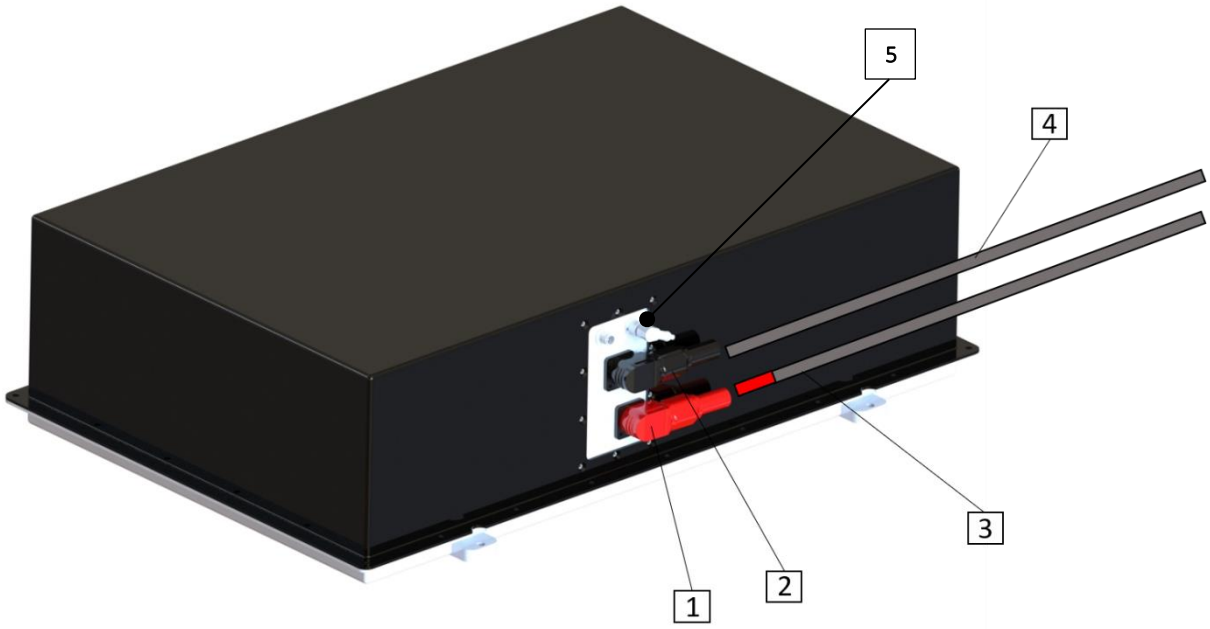


Fig. 9: Battery connection

7 OPERATION

7.1 Safety guidelines during operation

When operating the electric propulsion system E'dyn, please be aware of the following dangers, warnings and cautions:

- Danger Nr. 1
  - Description: Danger from battery gases; do not use the system if the battery is damaged!
  - Possible consequences: Severe physical injuries, death.
- Danger Nr. 2
  - Description: Danger from overheating; if you see the smoke urn the system off!
  - Possible consequences: Severe physical injuries, death.
- Warning Nr. 1
  - Description: Prevent contact with damaged or uninsulated parts!
  - Possible consequences: Physical injuries, death.
- Warning Nr. 2
  - Description: Prevent contact with rotating parts of the motor!
  - Possible consequences: Physical injuries, death.
- Warning Nr. 3
  - Description: Prevent contact of metal components with battery!
  - Possible consequences: Physical injuries, death.
- Warning Nr. 5
  - Description: Prevent contact with propeller, beware of people in water!
  - Possible consequences: Physical injuries, death.
- Caution Nr. 1
  - Description: Do not lift the system on your own!
  - Possible consequences: Physical injuries, property damage.
- Caution Nr. 2
  - Description: Check that no-one is present when tilting the motor!
  - Possible consequences: Physical injuries, property damage.
- Caution Nr. 3
  - Description: Prevent contact with motor during or after a trip!
  - Possible consequences: Physical injuries, property damage.

7.2 Turning the power ON/OF

The electric propulsion system E'dyn should be turning the power ON/OFF with a boat master ignition key. If you want to turn the power ON/OFF, put the key into the key lock and the rotate it to ON position as shown in the Figure 11. After turning system ON, wait a few seconds for system to normalize.

Component positions on the Figure 11:

1. Key
2. ON rotation
3. OFF rotation

When turning your electric propulsion system E'dyn ON/OFF follow the steps, which are described down bellow:

1. Put the **Key (Pos. 1)** into the key lock
2. Use the **Right rotation (Pos. 2)** to turn the system ON
3. Use the **Left rotation (Pos. 3)** to turn the system OFF

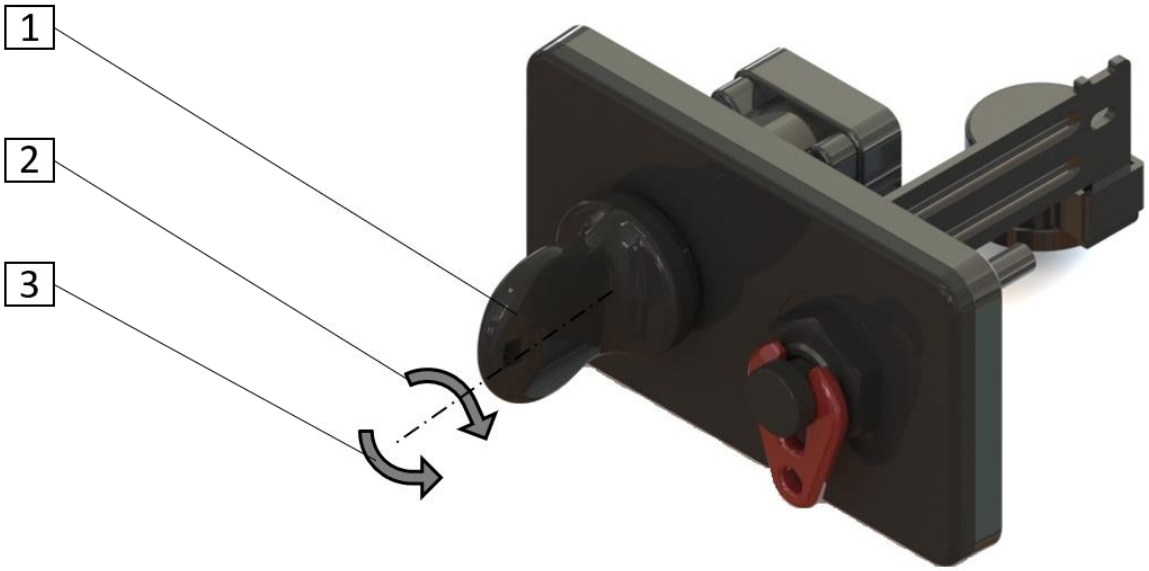


Fig. 10: Key lock usage

7.3 Travel mode

7.3.1 Starting a trip

In order to have a safe trip while using the system E'dyn, please follow the advices, which are described down below:

- Advice Nr. 1
  - Description: We suggest all members of the trip to put on a life jacket!
  - Possible consequences: Physical injuries, property damage.
- Advice Nr. 2
  - Description: We suggest not starting the trip if you notice any damage on the system!
  - Possible consequences: Physical injuries, property damage.
- Advice Nr. 3
  - Description: We suggest putting on the emergency STOP string!
  - Possible consequences: Physical injuries, property damage.
- Advice Nr. 4
  - Description: We suggest you check the state of charge of the battery before starting a trip!
  - Possible consequences: Physical injuries, property damage.

7.3.2 Driving

After turning the E'dyn system ON, you can stat driving with the help of the gas lever. You can use the motion forward and backward described down below and as you can see at the Figure 12. Direction can be inverted if needed:

1. Backward
2. Forward

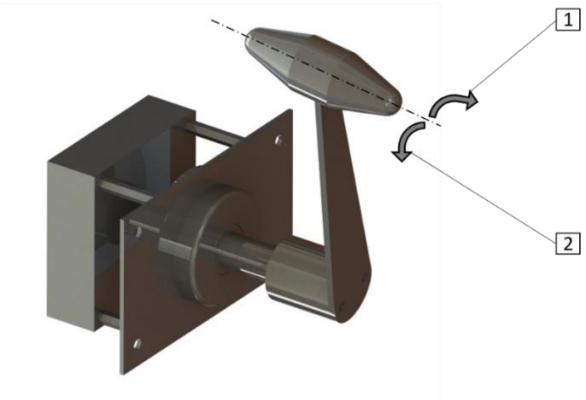


Fig. 11: Gas lever usage

7.3.3 Ending a trip

When ending a trip, the proper storing is very important. In order of maintaining the system in the best possible way, please follow the steps which are described down below:

1. Put the **Gas lever** into neutral position
2. Turn the power OFF by rotating the **Key** into OFF position
3. Take the motor out of the water using the **Trim**
4. Flush the motor, if you used it in saltwater

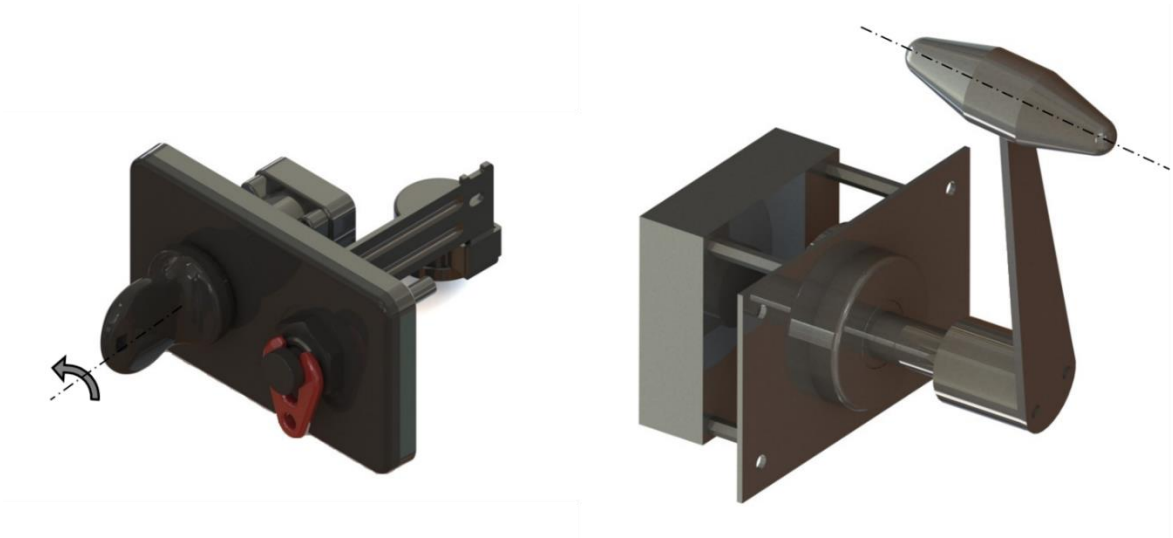


Fig. 12: Gas lever neutral position and power OFF



Fig. 13: Trimming the motor

8 ERROR MESSAGES

8.1 Controller error messages

Error	Name
CONTROLLER ERR 001	Over current
CONTROLLER ERR 002	Over voltage
CONTROLLER ERR 003	Under voltage
CONTROLLER ERR 004	Voltage low at start
CONTROLLER ERR 005	Potentiometer error during operation
CONTROLLER ERR 006	Potentiometer not zero at start
CONTROLLER ERR 007	Controller over-temperature
CONTROLLER ERR 008	Controller under-temperature
CONTROLLER ERR 009	Controller temperature sensor error
CONTROLLER ERR 010	Current offset error
CONTROLLER ERR 011	DC link charging error
CONTROLLER ERR 012	Replay error
CONTROLLER ERR 013	PDPINTA (shortcut or mosfet/driver error)
CONTROLLER ERR 014	Bad user parameter CRC
CONTROLLER ERR 015	Bad system parameter CRC
CONTROLLER ERR 016	Bad flash CRC
CONTROLLER ERR 017	Wrong parameter version
CONTROLLER ERR 018	Invalid motor type
CONTROLLER ERR 019	Auto tuning error
CONTROLLER ERR 020	Boost error
CONTROLLER ERR 021	Motor over-temperature
CONTROLLER ERR 022	Motor temperature sensor failure
CONTROLLER ERR 023	Internal error

8.2 Battery warnings and error messages

Warning	Name
BMS WARN 01	Cell voltage high
BMS WARN 02	Cell voltage low
BMS WARN 03	Temperature high
BMS WARN 04	Temperature low
BMS WARN 05	Battery warning

Error	Name
BMS ERR 01	Cell over voltage
BMS ERR 02	Cell under voltage
BMS ERR 03	Temperature high
BMS ERR 04	Temperature low
BMS ERR 05	Over current
BMS ERR 05	Battery error

8.3 General error messages

Error	Name
ERR 001	Move throttle position to neutral position
ERR 002	Throttle error/disconnected
ERR 003	CAN bus timeout
ERR 004	Battery low
ERR 005	Motor temperature high. Reducing power
ERR 006	Hight voltage PCB timeout/no link

9 CARE AND SERVICE

9.1 General information

Your e'dyn system is design with low customer maintenance in mind. All components used in this product are of exceptional quality, materials and within tight specified manufacturing standards.

9.2 Service requirements

E'dyn 1120 outboard motor uses closed loop cooling system which by nature does not require regular maintenance if used correctly. However due to high torque and speeds generated by outboard electric motor it is required to regularly replace oil in the outboard lower unit gearcase to reduce components wear and prolong operational life of outboard motor.

- Oil change should be done every **250 hours** or **1 calendar year**, whichever comes first.
- Replacement oil should be **Shell Omala s4 gx 220.**
- Outboard motor must have routine check by authorized service person every **1000 hours** or 4 **years**, whichever comes first, and performed any necessary maintenance to insure further safe operation of outboard system.

Operating hours are automatically logged within controller log file and will be noted at each service.

9.3 Service operation

Service and maintenance should only be done by qualified professional! Failing to do so can result in damage to outboard system, personal injury or death!

Please contact salesperson or authorized dealer of e'dyn outboard motors to help with your outboard maintenance. Please check official webpage www.edyn-marine.com for further information if required.

10 GENERAL WARRANTY CONDITIONS

10.1 Warranty information

As a customer of the electric propulsion system E'dyn, you have a possibility of a obligated warranty. The warranty of the system includes all the components of the whole system. The warranty starts from the date of delivery with the duration of 24 months.

10.2 Warranty scope

In order of the warranty enforcement, the E'dyn team guarantees that the purchased outboard motor product has not been damaged in the phase of production and has no material in manufacturing defects. If such kind of defect is detected, the E'dyn team will take over the costs of repair. However, the warranty does not include costs, which is a result of another detriment reason.

The warranty duration is two years starting with the day of delivery to the customer. If the purchased products are used for official or professional purposes, the warranty no longer applies.

When enforcing the warranty of the purchased product, the E'dyn team has the right to decide whether the damaged parts are repaired or replaced with new ones. Also, wearing parts are excluded from the warranty.

The E'dyn team will not accept the warranty in the following cases:

- the purchased product must not be modified with parts, which are not include in the package in any way,
- the product was used in a way, which is not in accordance with the instruction manual,
- the warranty voucher was submitted in a wrong way,
- the safety instructions described in this manual were not respected,
- previous product maintenance services were made by another company.

11 DISPOSAL AND ENVIRONMENT

11.1 Electric and electronic waste

The electric propulsion system E'dyn is accordance with the European Directive 2012/19/EU, which describes waste management and handling the waste of electrical and electronic devices.

11.2 Battery waste

Battery uses LiNMC technology and should only be discarded in special recycling facilities that handles recycling of this type of batteries. Batteries and battery components should NEVER be disassembled, damaged or disposed of by unqualified personnel.

To protect environment, we strive to use as much nontoxic and recyclable materials as we can, so we urge you to follow these instructions.

12 DECLARATION OF CONFORMITY

We, the E'dyn team, state that the electric propulsion system E'dyn 1120 fits to the protection requirements, which are specified in the directives/standards listed down below:

- Directive 2014/30/EU:
  - Directive of the European Parliament and the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast),
- EN6100-2: 2005:
  - Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments,
- EN6100-6-3:2007 + A1:2011
  - Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments,
- Directive 2014/35/EU:
  - Directive of the European Parliament and the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (recast),
- 2006/42/EC:
  - Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast),
- EN 12100-1:2010:
  - Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010).

The upper statement applies to all manufactured parts and the corresponding technical drawings of the electric propulsion system E'dyn 1120.

Contact data of the responsible person for the documentation:

Name:
Address of the contact person:
Position in the manufacturer's operation:

13 COPYRIGHT

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Your E'dyn team

WARRANTY VOUCHER

Dear Customer,

If you notice a defect despite all the continuous testing, development and improvement of our electric propulsion system E'dyn, please feel free to contact us. In order of processing the defect and taking your warranty into a count, please fill in the form down below. Only fully completed forms will be processed.

Name:	
Adress:	
Postal code:	*Country:*
Email:	*Phone Nr.:*
Serial Nr.:	*Part Nr.:*
Operating hours:	*Purchase date:*
Detailed deffect description:	