EN

www.molabo.com

User manual

ARIES i30 inboard
ARIES i50 inboard
ARIES R50 outboard

Firmware v. 1.7

MOLABO

1 CONTENTS

*R50 only

FOREWORD

Thank you for purchasing the ARIES i30 / i50 / R50. You are now the owner of the world's most powerful electric motor with touch-safe voltages.

The innovative MOLABO drives stand for safety and reliability. Thanks to the high efficiency of ISCAD technology, they not only enable economical operation in your application, but also make an important contribution to our natural environment.

Please take the time to read this operating manual thoroughly so that you can enjoy your product for many years to come.

The ARIES i30 / i50 / R50 has been developed with the utmost care in accordance with current standards and with particular attention to user-friendliness, safety, and comfort, and has been thoroughly tested before delivery. In addition to optimal product quality, fast and professional service is also very important to us. If you have any questions, please do not hesitate to contact us.

We are committed to continuous improvement and to providing you with a drive that is optimally tailored to your needs. However, we depend on your feedback. We would therefore be delighted to hear your comments on the use and installation of our drive. We hope you enjoy your ARIES i30 / i50 / R50.

Your MOLABO team

2 INTENDED USE AND COMPLIANCE WITH

2.1 INTENDED USE

The ARIES i30 / i50 / R50 drive system from MOLABO GmbH is an electric drive system for boats that is used as an inboard or outboard motor.

Knowledge of the basic safety instructions and safety regulations is a prerequisite for the intended and safe operation of the product. In addition, the rules and regulations for accident prevention applicable to the place of use must be observed.

Proper use also includes compliance with the conditions specified by the manufacturer for installation, removal, commissioning, operation, and maintenance.

All special safety instructions can be found in the Safety chapter and in the relevant chapters.

The following are considered unintended uses of the product:

- Operating the product with open, defective, bypassed, or tampered protective devices is prohibited!
- The product is not intended for use in potentially explosive atmospheres and is prohibited in such areas! On boats, gasoline cans and batteries that are prone to outgassing must not be stored in the same room as the drive unit.
- Tampering with the speed sensor to increase the engine speed and speed is prohibited.
- Tampering with the control software to achieve higher speeds is prohibited.
- Operation of the product without a propeller is prohibited.
- Operation of the product outside of or in liquids other than fresh or salt water.
- Manipulation of the communication interfaces.
- Manipulation of the temperature sensors.
- Replacing system components with products from other manufacturers.

If you wish to carry out work that is not described in this original operating manual, please contact the manufacturer.

2.2 FORESEEABLE MISUSE

Any use other than that described in the chapter "Intended use" at2.1 is considered improper. The operator is solely liable for damage resulting from improper use; the manufacturer accepts no liability whatsoever.

Among other things, the following is considered unintended:

- Towing a boat by attaching it to the outboard motor
- Pulling water skiers with a rope attached to the outboard motor
- Stepping on the cavitation plate and using it as a ladder
- Operating the propeller out of the water, even for a short time
- Using the ARIES i30 / i50 / R50 system underwater
- Tampering with safety devices such as the emergency stop switch
- Operation in waters to which chemicals (e.g., chlorine, active oxygen, etc.) have been added
- Using the ARIES i30 / i50 / R50 system outside of watercraft.

2.3 GENERAL INFORMATION ABOUT THE GUIDE

This manual describes all essential functions of the ARIES i30 / i50 / R50 system. This includes:

- Providing information about the structure, function, and characteristics of the ARIES i30 / i50 / R50 system.
- Information about possible hazards, their consequences, and measures to prevent hazards.
- Detailed information on the execution of all functions throughout the entire life cycle of the ARIES i30 / i50 / R50 system.

This manual is intended to help you familiarize yourself with the ARIES i30 / i50 / R50 system and use it safely and properly. Every user of the ARIES i30 / i50 / R50 system should read and understand this manual. Keep the manual handy for future reference and store it near the ARIES i30 / i50 / R50 system. Make sure you are always using the latest version of the manual. The latest version of the manual can be downloaded from the Internet at www.molabo.com. Software updates may result in changes to the manual.

If you follow these instructions carefully, you can:

- Avoid hazards.
- Reduce repair costs and downtime.
- Increase the reliability and service life of the ARIES i30 / i50 / R50 system.

2.4 EXPLANATION OF SYMBOLS

The following symbols, warnings, and instructions are used in this manual and on the ARIES i30 / i50 / R50.

Caution: fire hazard

Do not enter

Caution
Risk of crushing

Caution
Hot surface

Caution: electrical voltage

Caution: Danger

Follow the manual

Do not open

3 INSTRUCTIONS FOR USE

3.1 WORK AND PRODUCT SAFETY

The product complies with the EU directives applicable at the time of market launch and has been designed in accordance with the state of the art and recognized technical standards. Nevertheless, hazards to the health of operating personnel or third parties may arise during various phases, such as commissioning, use, maintenance, transport, storage, disposal, etc. etc. . In addition, damage to the product itself or to property may occur.

3.2 MEANING OF THE WARNING NOTICES

This original operating manual contains warning notices to indicate residual risks during operation of the product that cannot be avoided by design. The warning notices are classified according to the severity of the damage and its probability of occurrence.

⚠ DANGER!

Immediate danger!
Failure to comply may result in death or serious injury to persons!

- Countermeasure 1
- Countermeasure 2

⚠ WARNING!

Dangerous situation!
Failure to comply may result in death or serious injury to persons!

- Countermeasure 1
- Countermeasure 2

⚠ CAUTION

Potentially dangerous situation!
Failure to observe this warning may result in minor or moderate injury to persons!

- Countermeasure 1
- Countermeasure 2

NOTE!

Caution
Notes may refer to additional documents or indicate damage to the product.

- Note
- Note 2

3.3 GENERAL SAFETY INSTRUCTIONS

WARNING!

Danger to life due to unmaneuverable boat!
Serious injury or death may result.

- Before setting off, find out about the planned route and check the weather and sea conditions.
- Depending on the size of the boat, have the required safety equipment ready (life jackets, life rafts, anchors, paddles, communication devices, auxiliary propulsion if necessary).
- Check the system for any damage before setting off.

CAUTION!

Hot surfaces!
Failure to observe this warning may result in minor or moderate injury to persons!

- Do not touch the components of the electrical system (drive, power cable, MOLA*Connect* and battery system) after a long period of operation.
- Cables are hot and must cool down sufficiently after the journey.

- The ARIES i30 / i50 / R50 system may only be operated by people who are appropriately qualified and have the necessary physical and mental aptitude. Observe the applicable local regulations.
- As the boat operator, you are responsible for the safety of the people on board and for all watercraft and people in your vicinity. Therefore, it is essential that you observe the basic rules of boating and read these instructions carefully.
- Special caution is required when people are in the water, even when traveling at slow speeds.
- Observe the boat manufacturer's specifications regarding the permissible motorization of your boat. Do not exceed the specified load and performance limits.
- Ensure that the outboard motor housing is always closed during operation.

- Check the condition and all functions of the ARIES i30 / i50 / R50 system (including the emergency stop) before each trip.
- Familiarize yourself with all the controls of the ARIES i30 / i50 / R50 system. You must be able to stop the ARIES i30 / i50 / R50 system quickly if necessary.
- Familiarize yourself with the range of the boat and take into account range limitations in poor sailing conditions (headwinds, currents, or waves).
- Check the cooling performance of the system regularly.
- Do not place any body parts or objects in the steering and swivel range of the outboard motor.
- Do not swim behind the boat. When approaching a swimmer, turn off the system and remove the key.

3.4 SAFETY

3.4.1 Key switch and emergency stop switch

The ARIES i30 / i50 / R50 drive system has two electrical inputs for connecting a key switch and an emergency stop switch, which must be installed and properly connected to the engine for each application. The safety devices must be checked at the start of each trip.

The emergency stop switch must always be connected to the boat operator before the key switch is turned to "**ON**".

Please note that the key switch must be in the "**OFF**" position under the following conditions:

- During maintenance work on the drive. In this case, the battery must also be prevented from being switched on by pressing the emergency stop switch and the batteries must also be switched off with the safety relays / BMS.
- As soon as the outboard motor housing is opened.
- As soon as the boat is taken out of the water.
- When floats approach the boat.
- As soon as the emergency stop cable is released.
- As soon as the person steering moves away from the steering wheel.

The integrated monitoring functions of the ARIES i30 / i50 / R50 detect internal errors in the control system and reduce the available drive torque. This can happen in the event of deviations in the current or voltage sensors, insufficient power supply, overtemperature, overspeed, or hardware errors. The user can put the drive into a safe state by activating the emergency stop circuit and turning the key switch to **OFF**. Acknowledging the error via the display and then restarting the drive using the key switch resets all errors. For service purposes, the errors are stored in an error memory.

To ensure the integrity of the safety concept, all components of the boat that interact with the drive train must meet certain standards. In particular, the throttle must be approved by MOLABO GmbH.

Follow the maintenance schedule to ensure safety throughout the product's service life.

3.4.2 Derating function

In the event of an overload, the drive reduces the torque that can be requested. As soon as the cause of the reduction no longer applies, the full torque is available again. For safety reasons, however, the drive never increases the torque on its own.

Procedure for increasing the torque again:

1. Use the throttle to reduce the torque until the drive speed drops.
2. You can then increase the power again.

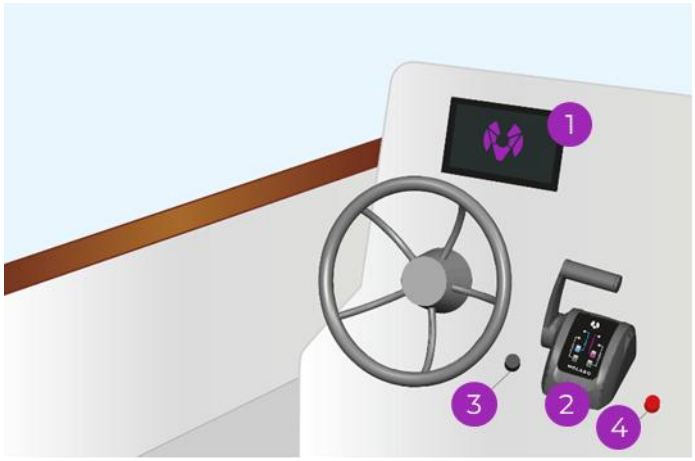
3.5 BEHAVIOR IN THE EVENT OF A MALFUNCTION

If any malfunctions occur during operation of the device, stop driving immediately.

For information on safe troubleshooting, refer to the chapter Troubleshooting . All work, especially troubleshooting on the electrical system, must be carried out by qualified and authorized personnel.

4 PRODUCT OVERVIEW

4.1 OVERVIEW OF THE SYSTEM COMPONENTS



1. System-Display
2. Throttle
3. Key switch
4. Emergency stop switch

THROTTLE

Throttle, side mounting

Throttle, top mounting

The throttle is available for side or top mounting. The throttle communicates with the ARIES i30 / i50 / R50 via the CAN bus.

DISPLAY

This display features a TFT graphic display with LED backlighting and a capacitive touch surface. The display communicates with the ARIES i30 / i50 / R50 via the CAN bus and shows current operating parameters and messages.

KEY Switch

Key switch*
Example image

The key switch activates the ARIES i30 / i50 / R50 system and makes it ready to drive.

*Selected and installed by your system integrator

EMERGENCY STOP SWITCH

Emergency stop switch*
Example

The spiral cable of the emergency stop switch must be securely connected to the boat operator while the boat is in motion. In an emergency, pulling the cable interrupts the electrical circuit and immediately disengages the outboard motor and propeller.

*Selected and installed by your system integrator

INBOARD ENGINE / OUTBOARD ENGINE ARIES i30 / i50 / R50

The ARIES motor is the heart of the system. Electrical power is converted into mechanical power with very high efficiency at a touch-safe voltage.

MOLA*Connect S* i30 /i50/R50 VICTRON

This box connects the ARIES motor to its system environment. Integrated fuses protect the components from short circuits or overload.

MOLA*Connect* i30 / i50 / R50 MASTERVOLT

This box connects the ARIES motor to its system environment. Integrated fuses protect the components from short circuits or overload.

MOLA*Link*

For service purposes, the system parameters are transmitted to the service department via MOLA*Link*. Software updates via radio are also possible.

12 V SYSTEM BATTERY*

A separate 12 V battery supplies the ARIES i30 / i50 / R50 system independently of the drive batteries and is required to switch on the system. It is not necessary to charge the 12 V battery using an external charger. The 12 V battery is recharged during operation of MOLA*Connect* or MOLA*Connect S*.

For longer storage (> 1 month) or winter storage, the battery should always be disconnected by a main switch*.

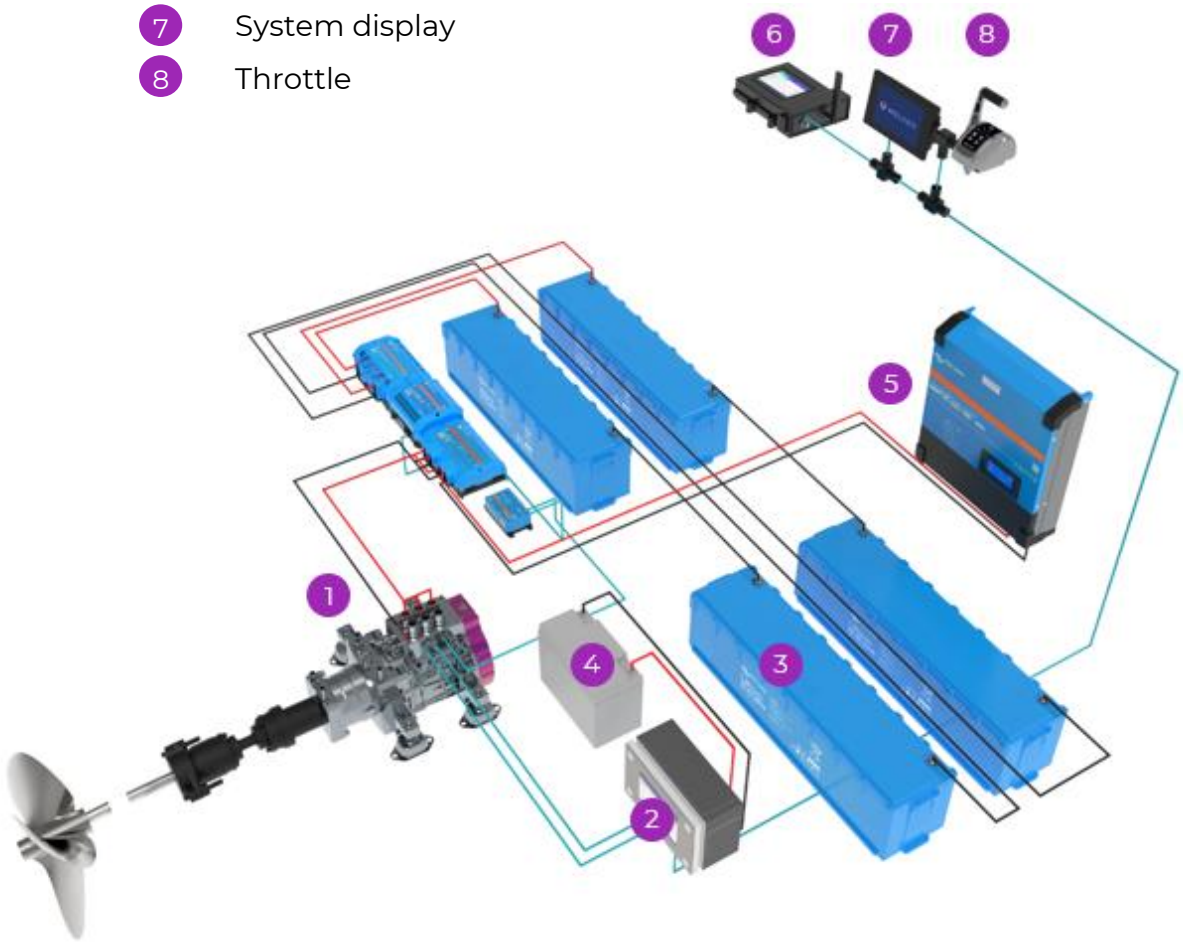
* Selected and installed by your system integrator

48 V BATTERY SYSTEM

A powerful 48 V battery bank from MASTERVOLT or VICTRON with varying capacities supplies the ARIES i30 / i50 / R50 system with power. The system consists of several strings connected in parallel. A safety relay is attached to each battery string, which must be switched off manually for maintenance or storage of the batteries. In the event of a fault, the battery strings can switch themselves off automatically. The 48 V battery system is recharged in a short time by one or three chargers.

4.2 SYSTEM STRUCTURE ARIES I30

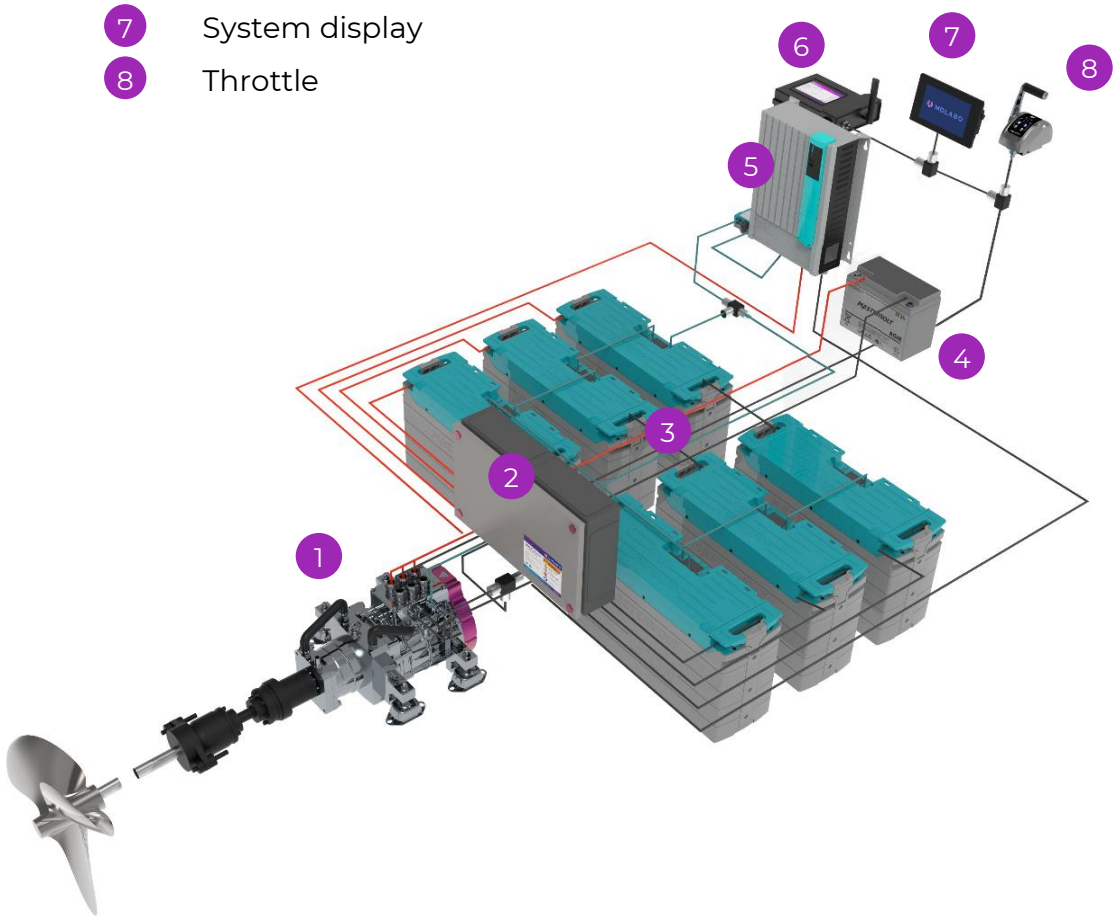
1. ARIES i30
2. MOLA*Connect* S
3. 48 V battery bank
4. 12 V system battery
5. 48 V charger
6. MOLA*Link*
7. System display
8. Throttle



Example image

4.3 SYSTEM STRUCTURE ARIES I50

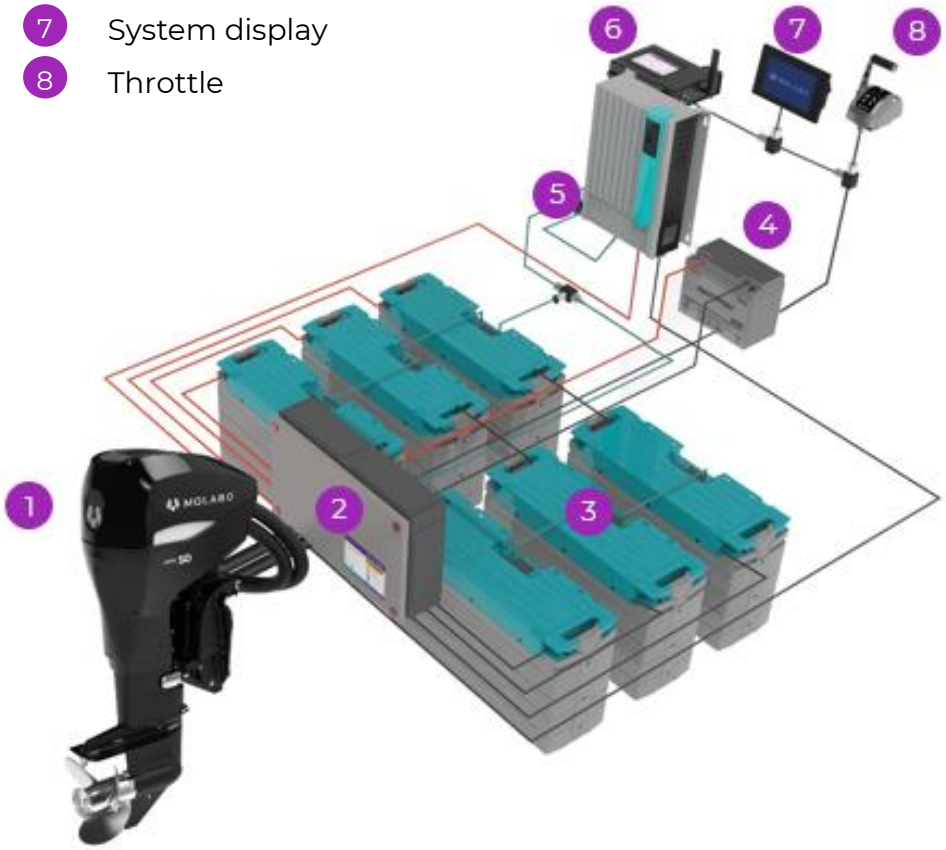
1. ARIES i50
2. MOLA*Connect*
3. 48 V battery bank
4. 12 V system battery
5. 48 V charger
6. MOLA*Link*
7. System display
8. Throttle



Example image

4.4 SYSTEM CONFIGURATION ARIES R50

1. ARIES R50
2. MOLA*Connect*
3. 48 V battery bank
4. 12 V system battery
5. 48 V charger
6. MOLA*Link*
7. System display
8. Throttle



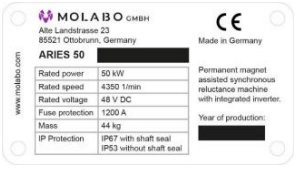
Sample image

5 SERIAL NUMBERS

You will find a sticker with the serial number on each component.

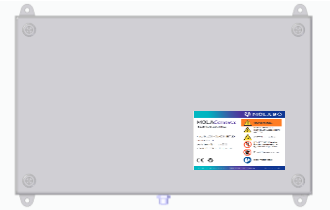
These are required for support purposes, so please make a note of the serial numbers in an accessible place, e.g. in the service booklet.

ARIES i30 / i50



ARIES R50

MOLA*Connect*



MOLA*Connect* S

MOLA*Link*

6 OPERATION

⚠ WARNING!

Danger to life due to unmaneuverable boat!
Serious injury or death may result.

- Before setting off, find out about the intended area of operation and pay attention to the weather conditions.
- Depending on the size of the boat, have the prescribed safety equipment ready (life jackets, anchors, paddles, means of communication, auxiliary propulsion if necessary).
- Check the system for any damage before setting off.
- Check the steering every time before setting off. It should not be too stiff or have too much play.

6.1 STARTING THE SYSTEM

Before starting the system, you must prepare the system:

- Switch all Mastervolt safety relays or Victron BMS to the "**ON**" position.
- Switch the 12 V battery main switch to the "**ON**" position.
- Connect the spiral cable of the emergency stop switch to the boat operator

To start the ARIES i30 / i50 / R50 system, you must:

- Move the throttle lever to the neutral position.

Turn the key switch to the "**ON**" position to start the system. The display and throttle are switched on. After a few seconds, the ARIES system switches to drive mode.

*Key in the "**OFF**" position.*

*Key in the "**ON**" position.*

As soon as the ARIES i30 / i50 / R50 is ready to drive, a green indicator light illuminates on the display and "READY" appears in the status bar.

6.2 START SCREEN

If an error occurred during the self-test, this is indicated by the warning symbol "⚠ " on the display. The chapter "10 " describes how to proceed in the event of a malfunction. The system will only start if the emergency switch is not activated!

6.3 THROTTLE

Depending on the boat, a throttle for side or top mounting is used.

7 DRIVING

7.1 FUNCTIONS OF THE THROTTLE

NOTE!

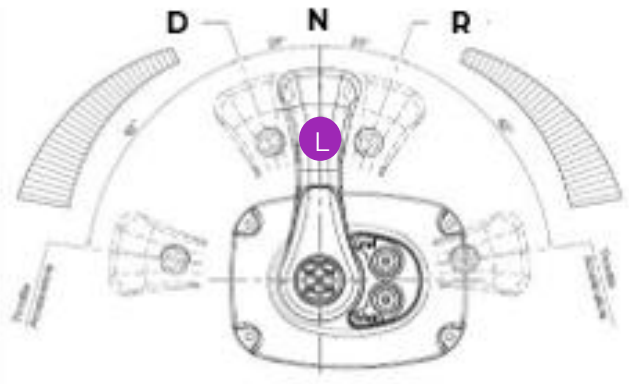
For persons in the vicinity of the floating boat:

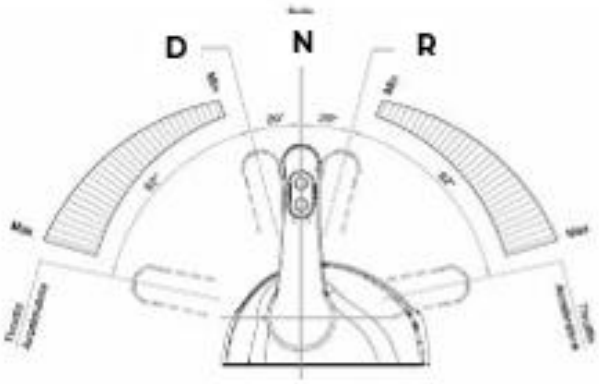
- Make sure that the system is **switched off** to prevent accidental operation of the throttle lever.

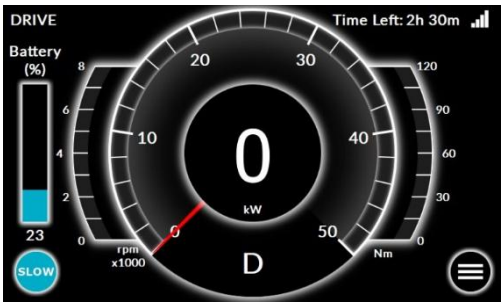
Forward travel: Press and hold the shift lock L (only with side-mounted throttle) and move the throttle lever approx. 20° forward from **N** to the noticeable detent point in **D**. From this position, where the drive range begins, the engine torque changes proportionally to the throttle lever travel.

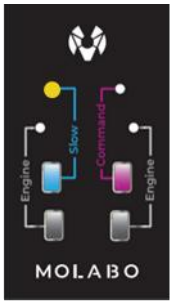
Reverse driving: Press and hold the shift lock L (only with side-mounted throttle) and move the throttle lever approx. 20° backwards from the neutral position **N** until you feel it click into **position R**. From this position, the driving range begins and the engine torque changes proportionally to the throttle lever travel. The maximum engine torque for reverse driving is limited.

First reduce your speed before changing direction.









This additional function enables safe harbor maneuvers with a limited maximum speed. For this purpose, the available engine torque is limited. Harbor mode can only be activated by pressing the "SLOW" button on the throttle in neutral for 3 seconds. If the throttle is mounted on the side, the SLOW button lights up blue; if the throttle is mounted on the console, it flashes yellow. The SLOW field is highlighted in blue on the display. To return to normal driving mode, the harbor mode must be deactivated in neutral by pressing the "SLOW" button on the throttle for 3 seconds.

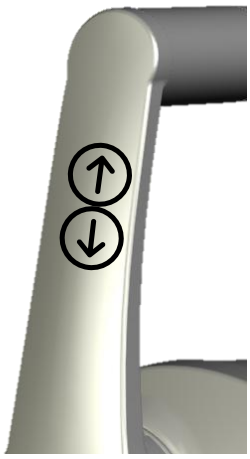
7.2 ELECTRIC TRIM AND TILTING OF THE OUTBOARD MOTOR*

*R50 only

The trim and tilt function can be operated either with the trim/tilt buttons on the throttle lever or the trim buttons on the display.

The trim hydraulics only work when the 12 V main switch is set to **ON**

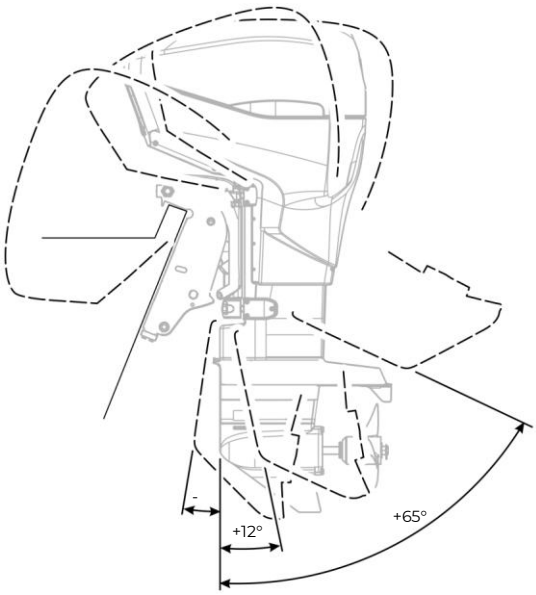
7.2.1 Trim and tilt buttons



The trim and tilt function can be operated either with the trim/tilt buttons on the lever or with the trim/tilt buttons on the display.

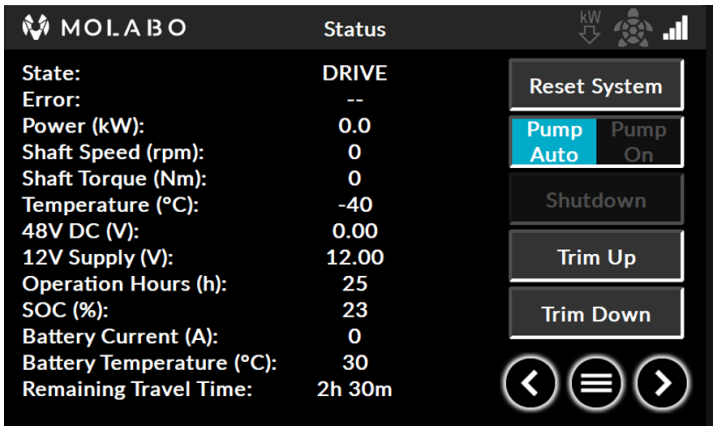
The trim function is available within a range of the outboard motor from -4° to 12° to the vertical (slow movement). The tilt function is available in a range from 12° to 65° (fast movement).

The propeller must be in the water for operation.



NOTE!

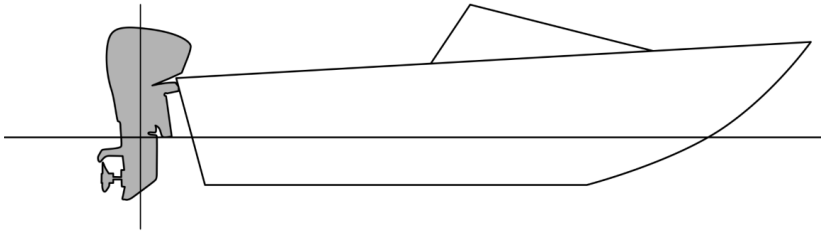
It is not permitted to operate the outboard motor in the tilt range (+12° to +65° from vertical) and/or outside the water.



The trim buttons in the status screen can also be used (configurable).

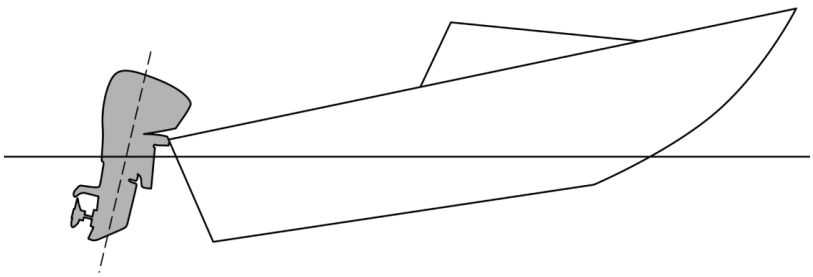
7.2.2 Setting the boat trim

When the boat is planing, raising the bow reduces drag, improves stability and efficiency. This is generally the case when the keel line of the boat points upwards by about 3 to 5 degrees. With the bow lowered, it is easier to accelerate from a standstill into planing.



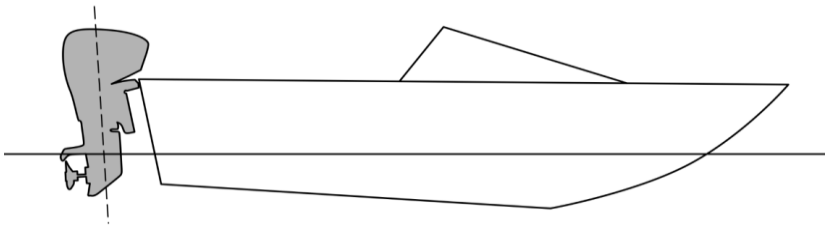
Bow too high

If the trim is too high, the bow is too high. This reduces performance and efficiency. Excessive trim can also cause propeller cavitation, which further reduces performance. If the boat is bouncing on the water, the driver or a passenger may be thrown overboard.



Bow too low

Excessive trim causes the boat to plow, prevents planing, and reduces maximum range. The risk of undercutting increases, making the boat uncontrollable and dangerous to operate. Excessive negative trim causes the bow to dive too low, prevents planing and reduces maximum range. This can make the boat uncontrollable and dangerous.



NOTE!

Depending on the hull shape, the trim angle of the outboard may only have a limited effect on the trim of the boat during operation.

7.2.3 Tilting the engine

WARNING!

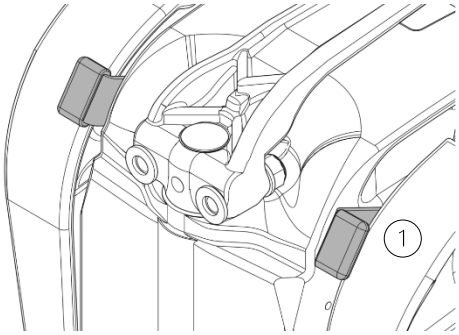
Dangerous situation!
Failure to observe this warning may result in death or serious injury to persons!

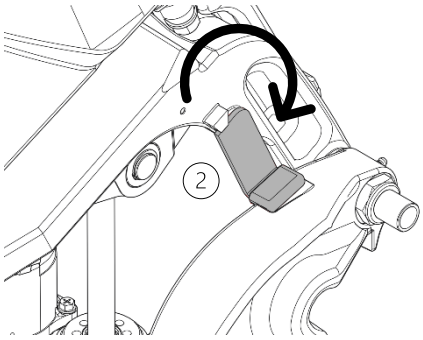
- Ensure that no persons are standing near the ARIES R50 when it is tilted up or down and that no body parts are trapped between the drive and the bracket.

If the motor is moored in the harbor for a long period of time without being used, the ARIES R50 should be tilted upward to protect the propeller and housing from corrosion damage.

To do this, use the trim/tilt buttons on the throttle lever or in the display and wait until the motor has reached the upper end position.

Then fold the tilt support lever (1) into the lower position and carefully lower the motor until the tilt support lever (2) rests on the brackets.





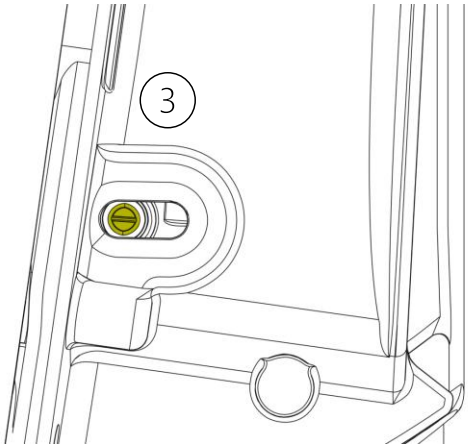
7.2.4 Manual tilting

If the ARIES R50 cannot be tilted hydraulically, the outboard motor can be tilted manually.

NOTE!

The valve must be closed if you want to put the boat back into operation. Otherwise, it will not be possible to reverse, as the engine may tilt upwards.

A slotted screw (3) is located in a long hole in the bracket on the side of the transom bracket.



Turn the screw three turns counterclockwise. This allows the outboard motor to be tilted manually. Tilt the motor to the desired position and tighten the screw again by hand.

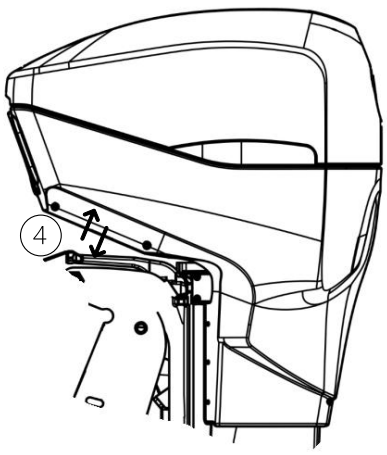
7.2.5 Additional tilt switch

As soon as the 12 V power supply to the drive is switched on, the switch (4) can be used to tilt the outboard motor up or down.

⚠ WARNING!

The rotating propeller is life-threatening!
Serious injury or death may result.

- The key switch must be in the **OFF** position and the emergency stop switch **must not be inserted**.
- Ensure that no people are standing near the ARIES R50 when it is tilted up or down and that no body parts are trapped between the motor and the bracket.



7.2.6 Operation in shallow water

When operating your boat in shallow water, you can tilt the ARIES R50 beyond the maximum trim range to prevent it from touching the bottom.

1. Tilt the motor upward. Make sure that the intake openings and the propeller remain submerged at all times.
2. Reduce the engine speed to below 2000 rpm.
3. Operate the boat with caution.

7.2.7 Trim tab with anode

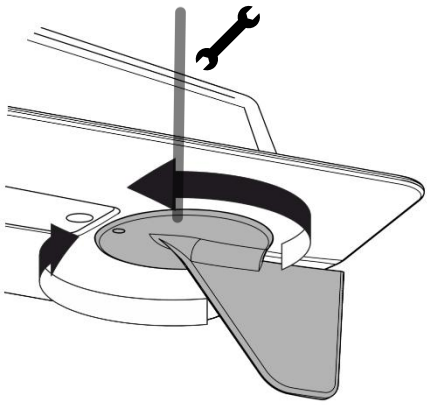
The trim tab is located below the anti-cavitation plate of the ARIES R50.

The trim tab should be adjusted so that the steering can be turned in both directions with the same force.

⚠ WARNING!

Danger to life due to unmaneuverable boat!
Serious injury or death may result.

- An incorrectly installed trim tab can cause steering difficulties. Always perform a test run after adjusting or replacing the trim tab.
- Make sure that you have tightened the bolt after adjusting the trim tab.



If the boat tends to drift constantly to port or starboard, adjust the trim tab in small increments.
To adjust, open the mounting screw. After adjustment, this screw must be tightened to 15 Nm.

NOTE!

The trim tab is also an anode to prevent corrosion. Never paint the trim tab, as this will render it ineffective as an anode.

7.3 END OF TRIP

NOTE

Tilt the outboard motor out of the water when you have finished your trip.

Key in the "**ON**" position.

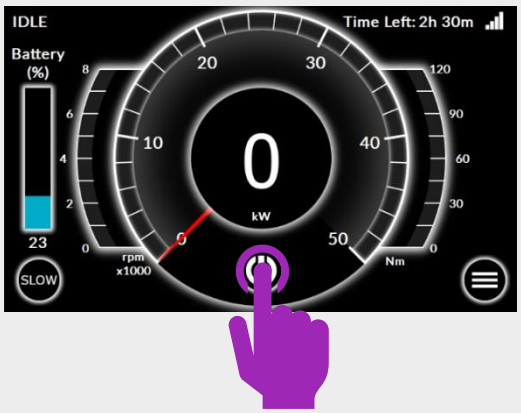
Key in the "**OFF**" position.

Move the throttle lever to the neutral position and turn the key switch to "**OFF**".

NOTE!

Switching off

- When leaving the boat, you should switch off the system using the "SHUTDOWN" function in the STATUS menu or on the MAIN SCREEN.
- The system does not need to be switched off to charge the batteries.



7.4 CHARGING THE BATTERY

Switch the system to "**IDLE**" by turning the key switch to the "**OFF**" position.

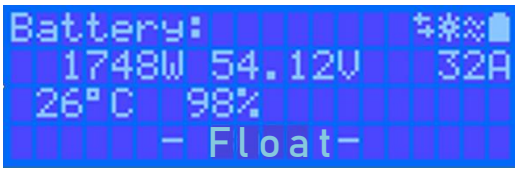
Connect the shore power cable to the boat.

The installed chargers charge and balance the batteries.

> **NOTE!**
>
> **Charging**
>
> - It is not possible to operate the boat when the charger is switched on. The ARIES i30 / i50 / R50 system is locked against use.
> - When the system is in charging mode (CHARGE), it can remain switched on.

> **NOTE**
>
> **Remaining charging time**
>
> - The remaining charging time depends on the ambient temperature. The charger delivers full charging current up to +40 °C.
> - The remaining charging time also depends on the battery temperature. If this is too high, charging will not start until the battery has cooled down.

Once the batteries are fully charged, the chargers switch to the "FLOAT" charging mode to maintain the batteries at this level.



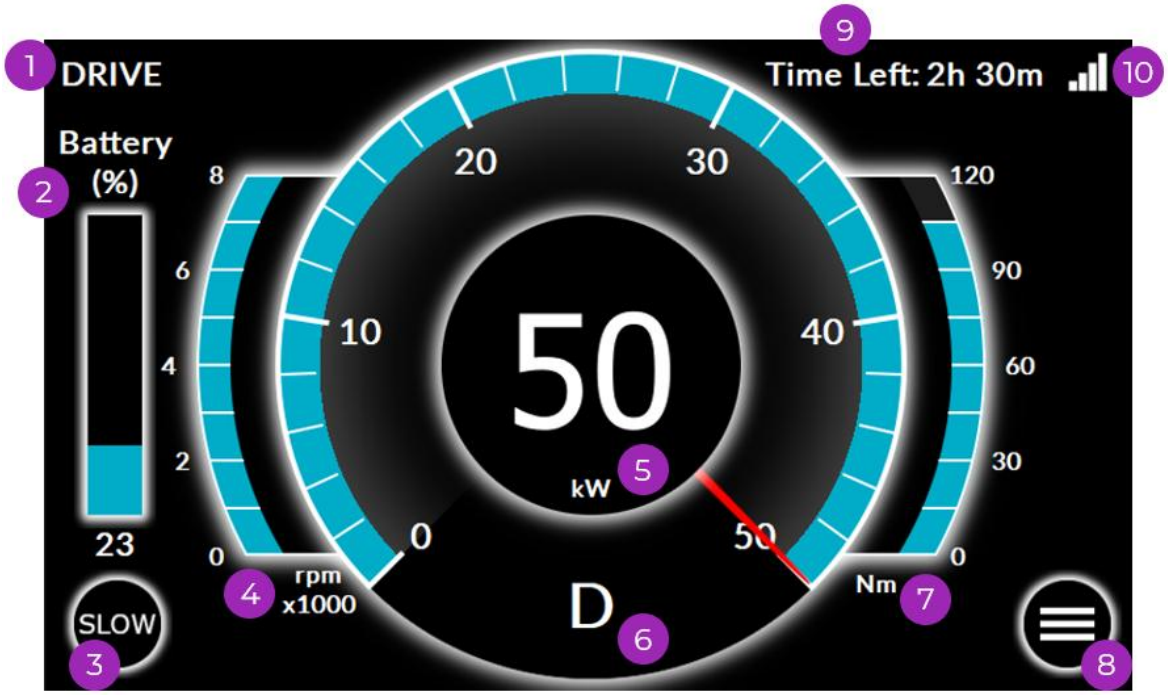
Mastervolt charger Victron charger

Before your next trip, disconnect the shore power cable to stop the charging process.

8 DISPLAY

The display offers you a convenient and safe way to monitor the ARIES i30 / i50 / R50 system. The display can be operated via the touchscreen and offers various views.

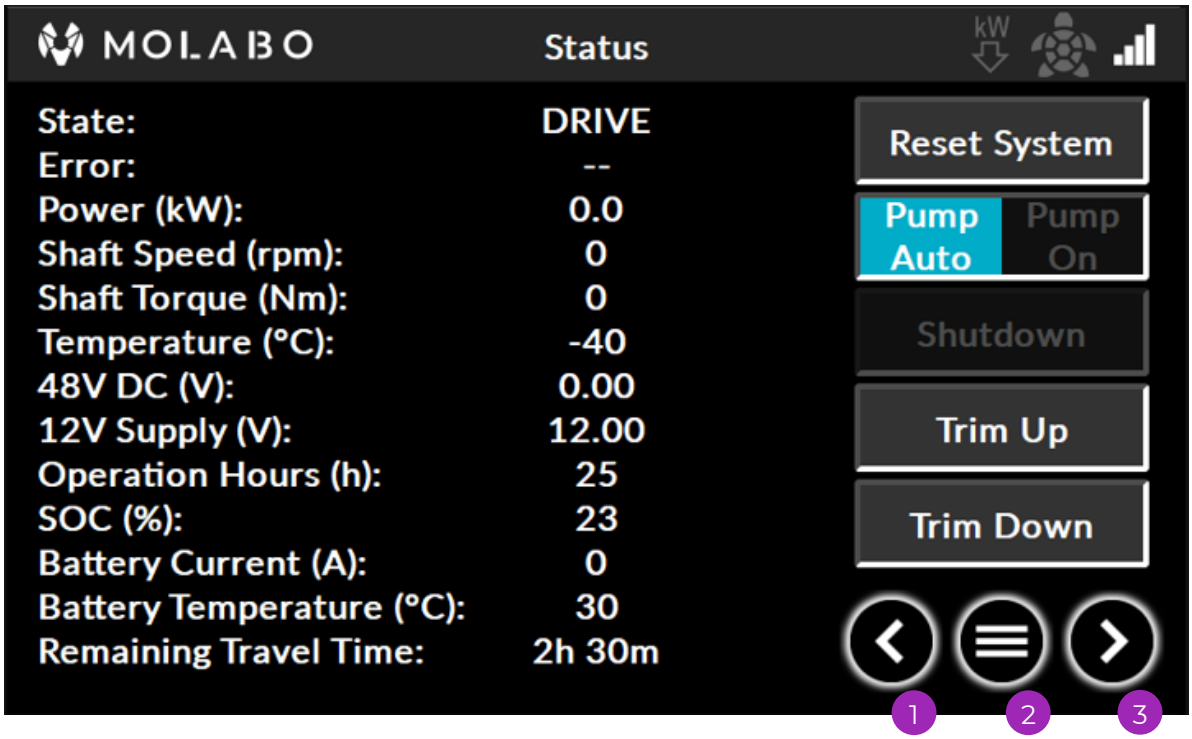
8.1 MAIN SCREEN



Main screen		
1		This field displays the operating status of your ARIES i30 / i50 / R50 system: **IDLE:** The system has started, the key switch is still off **READY**: System is ready to drive **DRIVE**: A driving direction has been selected with the throttle lever. **CHARGE**: The batteries are charging; the drive is locked. **ERROR**: There is a warning or error
2	**Charge status in % (SOC)**	The bar shows the charge status of the emptiest drive battery. The SOC is also displayed in %. If the charge status is below 10%, the color of the SOC bar changes to RED. Below 5% SOC, the torque of the drive is reduced to . Recharge the batteries immediately.
3	**Harbor mode active (SLOW),**	Pressing the "SLOW" button on the throttle allows safe harbor maneuvers to be performed at reduced speed. To do this, the available drive torque is reduced.

		To return to normal driving mode, the harbor mode must be switched off again when the boat is stationary. This can only be done using the throttle.
4	**Engine speed in 1/min (rpm)**	This graphic shows the engine speed.
5	**Central area for speed, engine power, or displays**	The engine power and/or GPS speed over ground can be displayed in the central area. You can change the setting in the SETTINGS submenu. If there is a fault, this is indicated by the warning symbol "  " on the display. If there is a system-related power limitation, the symbols  are displayed.
6	**D-N-R**	The selected driving direction in which the throttle lever is currently positioned is displayed: **D**: Forward **N**: Neutral **R**: Reverse
7	**Engine torque in Nm**	This graphic shows the current torque.
8	**Menu button**	Open various menus by pressing
9	**Remaining time in h : min**	Display of remaining time at current engine power
10	**Signal strength**	Displays the 4G signal strength of MOLA*Link*

8.2 SCREEN: STATUS

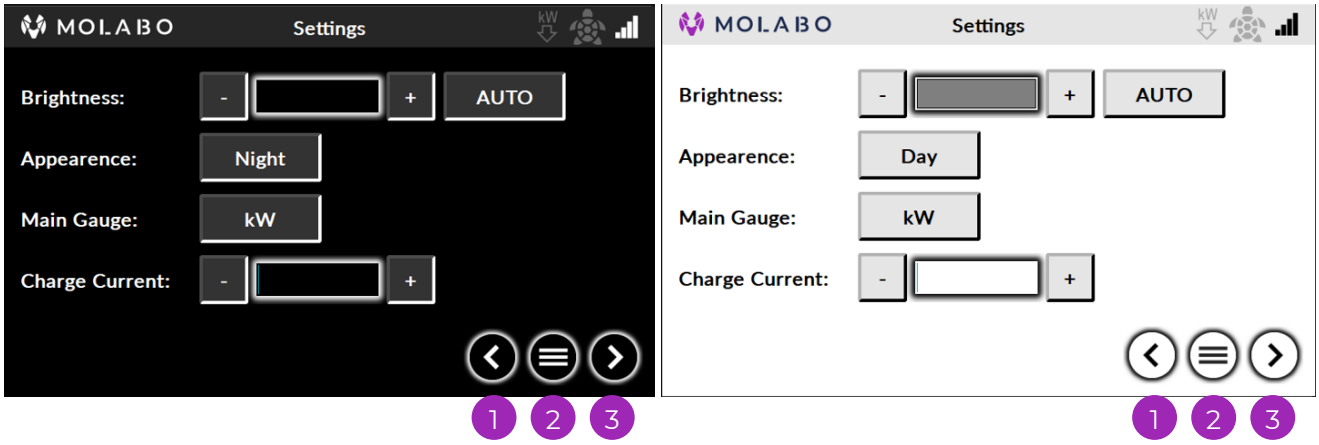


1. Call up the previous menu level
2. Back to main screen
3. Call up the next menu level

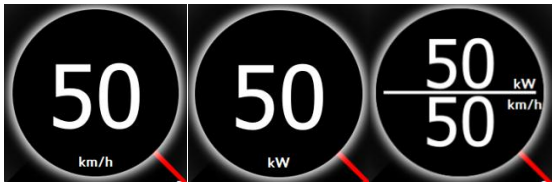
Status screen	
Status	This field displays the operating status of your ARIES i30 / i50 / R50 system: **IDLE:** The system has started, but the key switch is still off **READY**: System is ready to drive **DRIVE**: A drive direction has been selected with the throttle lever and the engine is supplying the required torque. **CHARGE**: The batteries are charging; the drive is locked
Error	The error code is displayed
Power (kW)	Mechanical shaft power
Shaft speed (rpm)	Shaft speed
Shaft torque (Nm)	Torque in Nm
Temperature (°C)	Temperature of the motor electronics
48 V DC (V)	Battery voltage of the 48 V system battery
12 V supply (V)	Battery voltage of the 12 V system battery
Operating hours (h)	Total operating hours
SOC (%)	Lowest charge level of a 48 V battery string
Battery current (A)	Current in amperes flowing to the motor
Battery temperature (°C)	Highest temperature inside a battery module
Remaining travel time: (h : min)	Remaining travel time at current power consumption.
Reset system	Confirms an error message
Pump Auto / Pump On	Activate the cooling pumps in automatic mode or manually for flushing
Shutdown	ARIES i30 / i50 / R50 begins shutdown and switches off
Trim up *	Press this button to trim or tilt the outboard motor
Trim down *	Pressing this button allows you to trim or tilt the outboard motor.

*R50 only

8.3 SCREEN: SETTINGS

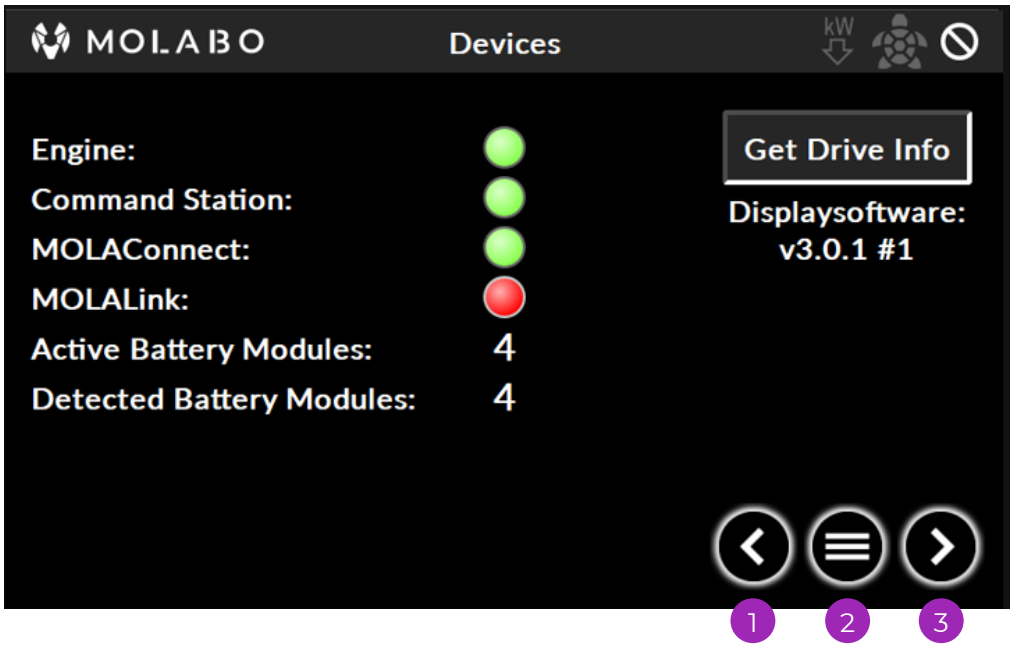


1. Call up the previous menu level
2. Back to main screen
3. Call up the next menu level

Settings screen	
Brightness	Use the - or + buttons to change the brightness of the backlight. Alternatively, this can be done automatically by pressing the AUTO button.
Appearance	You can switch between night (black) and day (white) backgrounds.
Main Gauge	A scroll-down menu opens. To change the units of the speed displayed on the main screen, you can choose between km/h or kn. Alternatively, the engine power in kW can be displayed instead of the speed. Speed and power can be displayed simultaneously. 
Charge Current	The charging power can be set using the - or + buttons to prevent the shore power fuse from tripping. This function can only be used in the "Idle" or "Charge" status.

8.4 SCREEN: DEVICES

This screen displays the current status of the connected components in green or red.



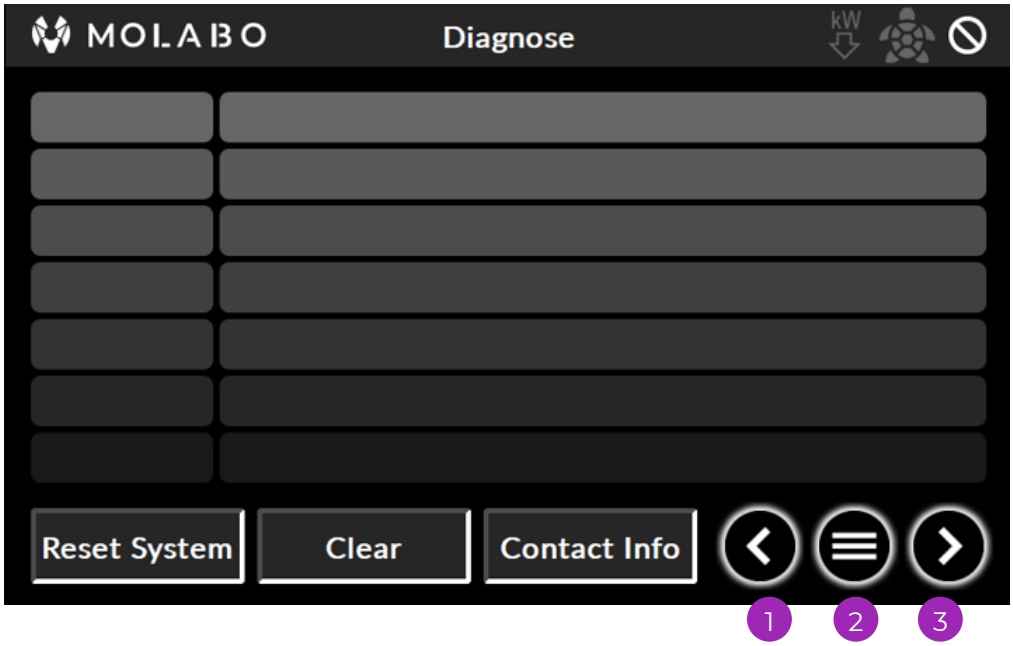
1. Call up the previous menu level
2. Back to main screen
3. Call up the next menu level

GREEN = ready for operation

RED = Malfunction

The number of active battery strings is displayed behind "Active Battery Modules"; the number of battery strings present in the system can be read in the "detected Battery Modules" line.

8.5 SCREEN: DIAGNOSIS



1 Call up the previous menu level

2 Display main screen

3 Call up the next menu level

The "Diagnostics" error history lists the last 7 warnings and error messages.

You must confirm any existing warning or error messages by clicking the "Reset System" button. A message confirming that the error has been reset will appear.

The error history can be deleted using the "Clear" button.

NOTE!

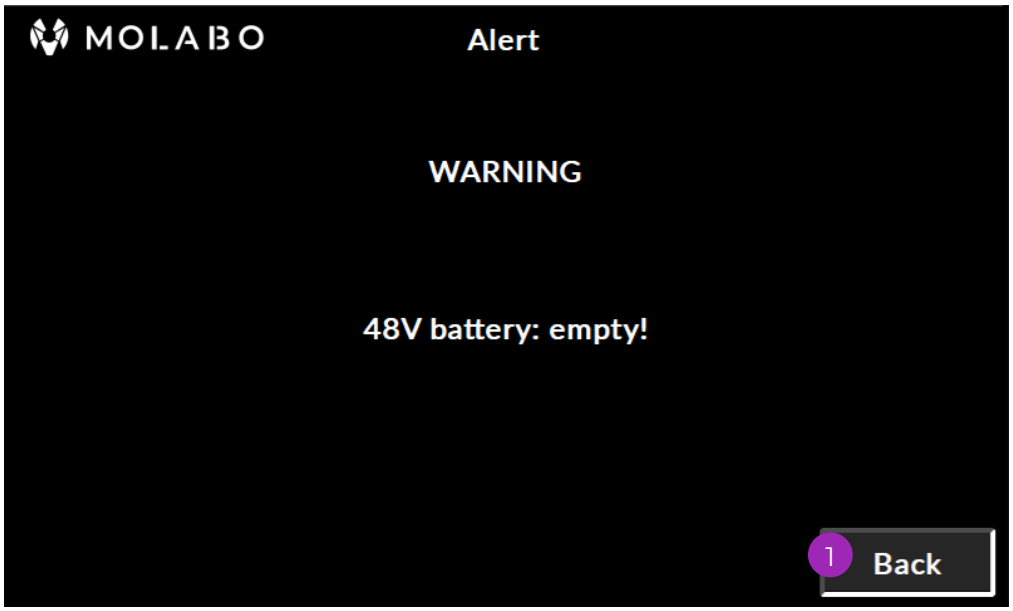
Delete error history

- Only delete this when prompted by MOLABO Service.

Contact info shows you the contact details for MOLABO Service.

8.6 SCREEN: ALERT

The ARIES i30 / i50 / R50 system can display the following messages:



1 Close the message.

> NOTE!
>
> **Error reset performed**
>
> - You must confirm any existing warning or error messages by clicking the "Reset System" button. A message confirming that the error has been reset will appear.

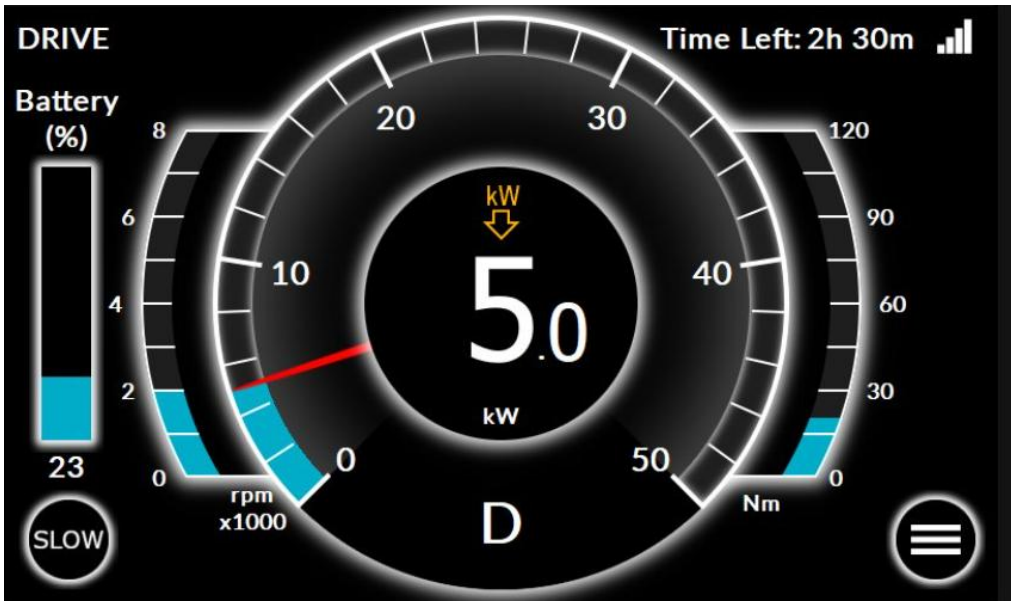
> NOTE!
>
> **48 V battery: empty!**
>
> - Stop your trip and return to a port **immediately** to recharge if the charge status is below 10% SOC! If the battery is completely empty (SOC = 0%), the boat is no longer seaworthy. External assistance is required.

This screen is displayed when the emergency stop switch has been activated while the engine is running.

Reset the emergency stop switch and confirm the error message by pressing the Reset System button.

8.6.1 Derating

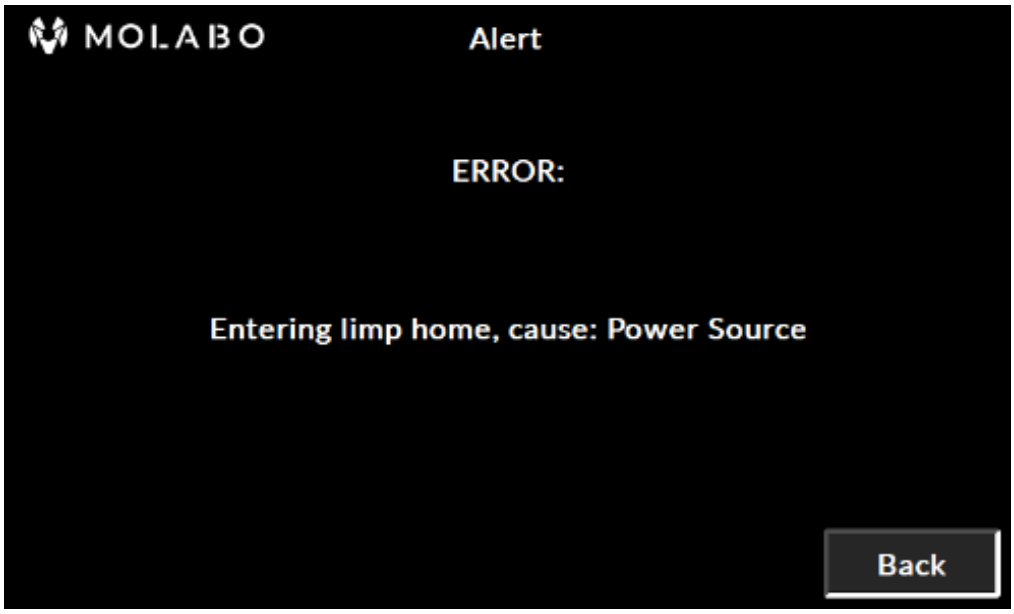
The ARIES i30 / i50 / R50 drive system protects itself from damage by temporarily limiting the maximum motor torque when certain parameters are exceeded. Once the parameters are below the limit again, the torque can be increased again.



These parameters include:

- Low charge state
- Motor and battery temperature too high
- Exceeding the permissible current limit

8.6.2 Limp home



If torque reduction does NOT solve a problem over a certain period of time, an ECU error occurs, or a communication problem occurs between the main components, the LIMP HOME function is automatically activated.

This maximum torque reduction by the ARIES system maintains the maneuverability of the vessel, allowing it to return safely to port. The Limp home mode can only be deactivated after troubleshooting using the "Reset System" button.

8.7 SLEEP MODE

When the ARIES i30 / i50 / R50 system is not in use, the display enters sleep mode after 3 minutes. The system is still active! Two blue LEDs indicate this status. Briefly touching the display reactivates the screen, as does switching from **N** to **D** or **R**.

9 WINTER STORAGE AND STORAGE

9.1 MOTOR

Clean the water filter. Then flush the primary cooling circuit of the outboard motor with a biodegradable antifreeze. The cooling water pump can be switched on in the status menu for this purpose. Use a suitable container to collect the coolant.

⚠ CAUTION

Do not allow the cooling water pump to run dry.

- Use suitable containers and hose pieces to prevent dry running.

⚠ CAUTION

Antifreeze must not be released into the environment!

- The cooling circuit must not be emptied into the environment. Observe the safety instructions of the coolant manufacturer.

The closed cooling circuit does not need to be flushed as it is already filled with antifreeze. Check the antifreeze level in accordance with the maintenance intervals.

9.2 48 V BATTERY

⇨ NOTE

Storage

- Please observe the battery manufacturer's instructions for storing the battery. Incorrect storage can lead to deep discharge of the battery.

Connect the boat to the shore power supply.

The batteries are charged to 100% SOC and the charger switches to trickle charge. If the voltage drops after a while, the charger starts again.

If there is no shore power supply:

Charge the batteries to >80% of their capacity before storage. Switch off the ARIES i30 / i50 / R50 system with the key switch and remove the key.

Charge the battery to >80% of its capacity at least every 100 days.

9.3 12 V BATTERY

Switch off the drive system completely and disconnect the 12 V battery using the main switch.

10 TROUBLESHOOTING

10.1 SAFETY RULES FOR TROUBLESHOOTING AND FAULT ELIMINATION

⚠ CAUTION

Risk of injury from electric shock

During troubleshooting and fault rectification, there is a risk of injury from electric shock.

- Switch off the motor before carrying out this work.
- If you are not familiar with this work, it must be carried out by a qualified specialist.

⚠ CAUTION

Risk of injury from contact with hot components

During troubleshooting, contact with hot components may result in injury.

- Ensure that the motor and MOLA*Connect* are allowed to cool down before working on them.

⚠ CAUTION!

Risk of injury from hot coolant

Contact with hot coolant may cause scalding.

- Allow the engine to cool for at least one hour before working on the cooling system and check the coolant temperature before starting work.

NOTE

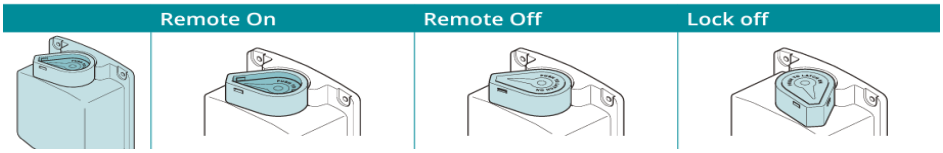
Never open any parts of the ARIES drive housing

- Do not open the motor.
- Do not remove the cover with the connection cables and do not open the electronics housing.
- There are no components under the cover that can be serviced by the customer.

10.2 ERROR MESSAGES AND COUNTERMEASURES

Error message	Description and countermeasure
"WatchDog: CAN control input (throttle): communication interrupted - check cables!"	Communication with the throttle is disrupted or interrupted. Please check the CAN cabling. Then check whether the error reappears after a reset.
"WatchDog: MOLA*Connect* box: communication interrupted!"	Communication with the MOLA*Connect* box is disrupted or interrupted. Please check the CAN cabling. Then check whether the error reappears after a reset.
"12 V Supply: Low voltage!"	Warning: The voltage of the 12 V battery is low. If this message appears frequently, there may be a problem with the 12 V charger or the battery. A port must be sought immediately to prevent system failure.
"48 V battery: error! Please check connections."	Communication with the 48 V battery is disrupted or interrupted. The system can only be operated to a limited extent. Please check the CAN cabling. Then check whether the error reappears after a reset.
"48 V battery: Missing string detected."	At least one battery string has switched over for self-protection. The available power is limited depending on the number of strings present. To reactivate the missing string, please contact MOLABO Service.

For Mastervolt batteries:



*Operating status "**ON**"* | *Operating status "**OFF**"* | *Operating status "**SERVICE**"*

For Victron batteries, one or three separate switches* are installed:

*selected by your system integrator

BMS ON / OFF

"Functional safety error! Try reboot or contact customer service."	A functional error has occurred. This error cannot be resolved by "Reset System." A system restart is required. If the error still occurs after restarting, please contact MOLABO Service.
"Emergency switch (HW) triggered! Once cause is cleared, issue reset request."	Reset the emergency switch and press "Reset System" on the display.
"Power source: not ready! Check connections. Entering limp home mode."	Communication with the battery is disrupted. Limp Home is still available to ensure maneuverability. Please check the cable connections and try to fix the error.
"PreCharger failure - cannot start drive! Check fuses and/or contact service"	The system is unable to precharge the DC capacitors. Please check whether the battery strings are activated and the DC fuses in the MOLA*Connect*.

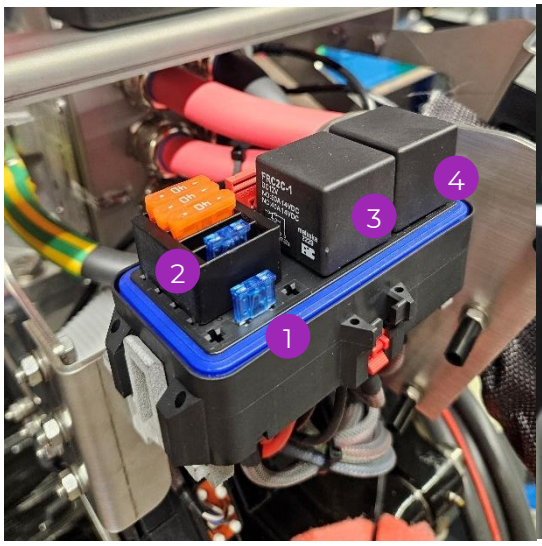
10.3 FAULT DIAGNOSIS AND MEASURES

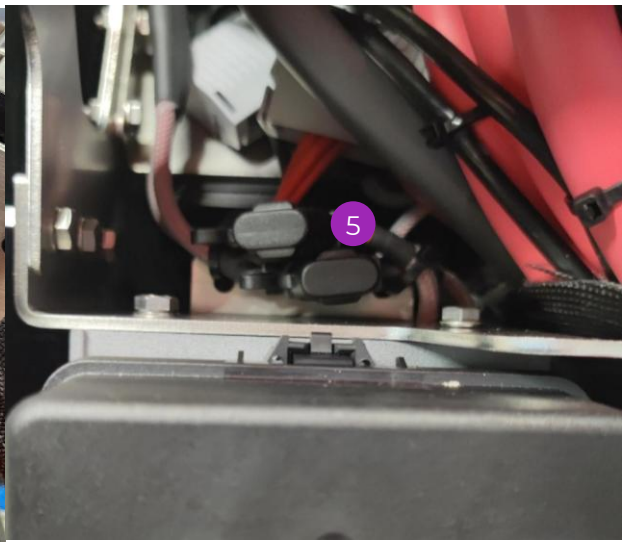
Fault	Possible cause	Action
ARIES i30 / i50 / R50 System does not start, display remains off	Key switch defective	**1.** Switch the system off and on again using the key switch **2.** Contact MOLABO service
ARIES i30 / i50 / R50 system does not start, display remains off	Insufficient voltage from the 12 V battery	**1.** Fully charge the 12 V battery using a separate charger. For Victron batteries, please turn the key switch to the

		right to start the built-in 12 V charger.  2. Have the internal charging function of the ARIES i30 / i50 / R50 system checked by a specialist.
Display lights up, but motor does not turn	Charging mode is activated	1. Disconnect the shore power cable
Display lights up, but motor does not turn	The shift lock button on the throttle is not pressed	1. To start the engine from the neutral position of the throttle lever, the shift lock button on the throttle lever must always be pressed and held. This must also be observed when switching from **D-N-R** during maneuvering.
Display is lit, but engine does not turn	Emergency stop switch is activated, warning light " ⚠ " is lit on the display	**1** Check that the kill clip is correctly seated on the emergency stop switch **2** Contact your boat dealer
Boat only moves slowly	SLOW mode activated	1. Deactivate port mode by pressing the "SLOW" button on the throttle.
Boat is moving slowly	⚠ warning light illuminated on the display	1. The charge status of the drive battery is low. 2. Derating is active, allowing the drive to cool down
Boat only moves slowly, vibrations and noises	Propeller not moving freely or bent	1. Check the torque consumption of the motor in the service level on the display

		2. Check the propeller for free movement **3.** Have the propeller repaired or replaced
Regular overheating messages, too little or no cooling water outlet	Blockage in the cooling water inlet system	**1.** Check the water filter and hose lines Check the intake strainer for blockages Check the impeller
	Failure of the coolant pump in the seawater circuit	**2.** Check the fuses for the cooling water pump, see section 9.3.1 Check the voltage at the pump Contact your boat dealer
Regular overheating warnings	Coolant pump failure in the secondary circuit / water-glycol circuit	Check the fuses of the cooling water pump Contact MOLABO service
	Too little coolant in the secondary circuit	Check the expansion tank and top up if necessary. Pay attention to the mixing ratio and use the correct product. We recommend mixing Glysantin G40 with water with a ratio of 40:60. Check whether the secondary cooling circuit is leaking.
Trim and tilt buttons not working	Hydraulic pump not working	Check fuses, see Chapter 9.3.1
Main fuses blown	Drive system overloaded or power electronics defective	Switch off the system completely. Check the cable connections for tightness Contact MOLABO Service.

10.3.1 Fuses and relays





1. Main fuse 15 A (flat plug fuse, mini type)
2. Spare fuses 15 A / 40 A (standard / mini)
3. Relay ON
4. Relay OFF
5. Trim and tilt protection 40 A (flat plug fuse, standard type from Littelfuse, Inc.)

11 CLEANING

11.1 SAFETY INSTRUCTIONS FOR CLEANING

⚠ CAUTION

Risk of injury from electric shock

Improper cleaning can result in injury from electric shock.

- Switch off the motor and batteries before cleaning.

⚠ CAUTION

Risk of injury from contact with hot components

During cleaning, contact with hot components may result in injury.

- Make sure that the drive can cool down before cleaning.

⚠ CAUTION

Risk of injury from hot coolant

Contact with hot coolant may cause scalding.

- Allow the motor to cool for at least one hour before working on the cooling system and check the coolant temperature before starting work.

11.2 CLEANING

Procedure

1. Clean all components and controls with a damp cloth.
2. Use a suitable, neutral cleaning agent if necessary.

NOTE!

Damage to the product caused by strong cleaning agents!

The use of aggressive cleaning agents such as scouring powder or petroleum can cause damage!

- Use a neutral, non-aggressive, lukewarm cleaning agent.
- Do not use solvent-based cleaners, as these can destroy the drive seals!
- If necessary, test the cleaning agent on an inconspicuous area.

12 SERVICE AND MAINTENANCE

12.1 SAFETY RULES FOR MAINTENANCE AND SERVICE

⚠ CAUTION!

Risk of injury from electric shock

Improper maintenance can result in injury from electric shock.

- Switch off the motor and batteries before performing maintenance and servicing.

⚠ CAUTION

Risk of injury from contact with hot components

During maintenance, contact with hot components can result in injury.

- Make sure that the motor and MOLA*Connect* can cool down before working on them.

⚠ CAUTION

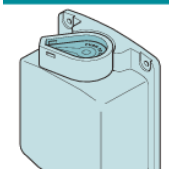
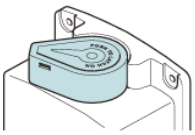
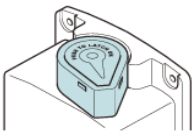
Risk of injury from hot coolant

Contact with hot coolant may cause scalding.

- Allow the engine to cool down for at least one hour before working on the cooling system and check the coolant temperature before starting work.

For maintenance purposes, the Mastervolt safety relays can be opened by turning the yellow rotary lever, which disconnects the individual circuits from the battery bank.

Always set **ALL** relays to the same operating status.

Remote On	Remote Off	Lock off
		
Operating status *"**ON**"*	*Operating status* *"**OFF**"*	*Operating state* *"**SERVICE**"*

For Victron batteries, switch off the Victron Smart BMS.

BMS ON / OFF

Always switch **ALL** to the same operating status.

12.1.1 Maintenance schedule for the owner

Maintenance interval	Component	Action to be performed
Before every trip	Water hoses, coolant pump	Visual inspection for leaks
	Water filter	Visual inspection for contamination
	Emergency stop switch	Function test
	Seawater valves*	Function check
After every trip	Engine, hoses, filters, seavalves*	Visual inspection for leaks
Annually	Cable sheaths and cable lugs	Visual inspection for discoloration, cracks, damage
	Water filters	Clean
	Trim and steering**	Lubricate grease nipples with Quicksilver 2-4-C
	Heat exchanger	Clean
	Coolant	Check glycol content, target value -27 °C. Use Glysantin G40 or water

*Only i50; **Only R50

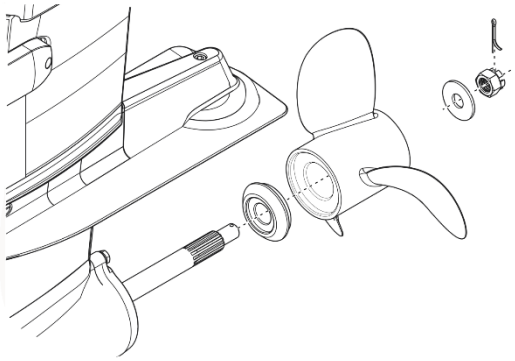
Note

Damage to the product due to unsuitable replacement parts!

The use of unauthorized replacement parts may cause damage to the product! This will void the warranty!

- Only use original replacement parts and fluids

12.2 REPLACING THE PROPELLER*



In the event of damage to the propeller, you must check the propeller shaft for concentricity.
Replace the defective propeller with an identical model. The propeller disc is a special item available from your MOLABO dealer. The tightening torque for the crown nut is 45 Nm. Always use a new locking pin.

*R50 only

12.3 PROPELLER LIST

A selection of compatible propellers from SOLAS:

Dimension	Blades	Rotation	Material	Item #
14x9	3	clockwise	Aluminum	9411-140-09
14x11	3	clockwise	Aluminum	9411-140-11
13.75x13	3	clockwise	Aluminum	9411-138-13
13.5x15	3	clockwise	Aluminum	9411-135-15
13.25x17	3	clockwise	Aluminum	9411-133-17

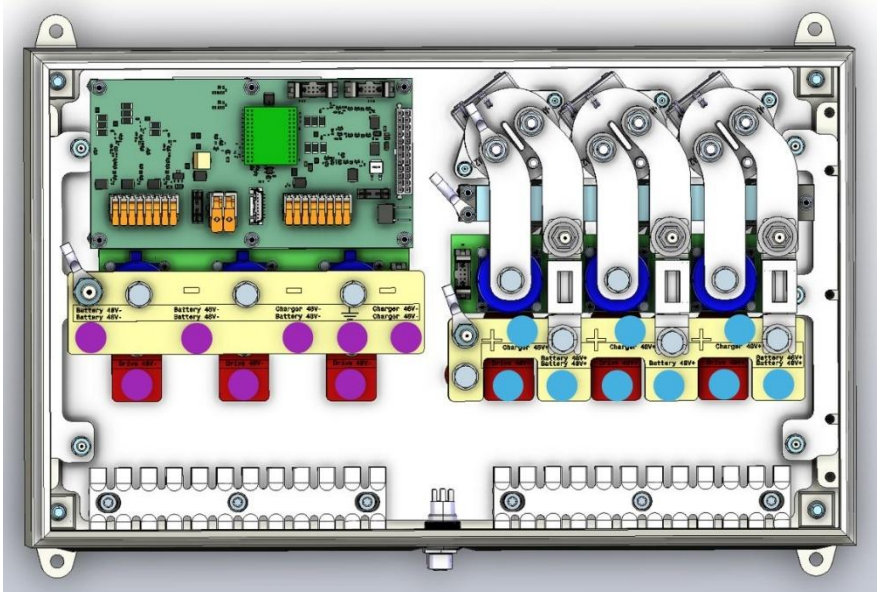
Dimension	Blades	Rotation	Material	Item #
13 ¾ x 13	3	clockwise	Stainless steel	9431-138-13
13 ½ x 15	3	clockwise	Stainless steel	9431-135-15
13 ¼ x 17	3	clockwise	Stainless steel	9431-133-17

12.4 MAINTENANCE SCHEDULE FOR CERTIFIED MOLABO SERVICE PARTNERS

Maintenance interval	Component	Task to be performed
Annually	Cable sheaths and cable lugs	Check tightening torques in *MOLAConnect* and Victron *LYNX* according to specifications, visual inspection for discoloration, cracks, damage
	Coolant, internal circuit	Check frost protection, setpoint -27°C. Use Glysantin G40 or water
	Sacrificial anodes on outboard motor**	Check for wear, replace with new anodes.
Every 400 operating hours or after 3 years (whichever comes first)	Gearbox Engine mounts, decoupling elements (joint discs, cardan shafts) *	Oil change with Quicksilver High Performance gear oil** Check alignment, visually inspect for cracks, replace if necessary *
Every 400 operating hours or after 5 years (whichever comes first)	Coolant	Replace with Glysantin G40 and water
After 5 years	Coolant pump	Replace with Marco UP9-P

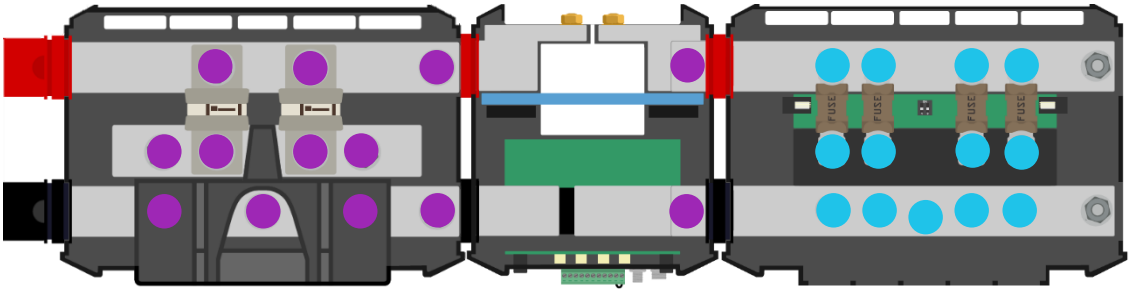
*Only i30 / i50; **Only R50

Torque setting MOLA*Connect*



- 35 Nm
- 15 Nm

Torque setting Victron BMS / LYNX (M10)



- 33 Nm
- 14 Nm

13 STORAGE AND DISPOSAL

13.1 STORAGE

Clean the product thoroughly before storing it. Please refer to the chapter Cleaning , p.46 . We recommend covering the product with a suitable cover to protect it from external influences. Please also note the following points:

- The storage surface must be level and stable.
- The motor must be stored in a dry and clean place and should be protected from direct sunlight.
- The storage temperatures must be between -20°C and +70°C.
- The coolant should be removed for storage, especially if stored in cold conditions.
- Seal the coolant connections with adhesive tape.

13.2 DISPOSAL

Dispose of the product properly or have it disposed of by a specialist company. Observe all regulations of the national legislation applicable in your country.

Be sure to separate metal and electrical waste.

Dispose of the coolant properly at a local waste disposal company.

14 WARRANTY

MOLABO GmbH warranty conditions for watercraft with an ARIES system

1. Scope of Warranty
MOLABO GmbH, Alte Landstrasse 23, 85521 Ottobrunn, Germany ("MOLABO GmbH") warrants to the end user ("Customer") of a watercraft with an ARIES propulsion system worldwide with the exclusion of Canada and the United States of America ("Territory") that the propulsion system (ARIES i50 or R50), the IoT device (MOLALink), the connection box (MOLAConnect) and the peripherals (display, control lever and communication cable set) (collectively the "Product") are free from material and manufacturing defects ("Warranty Claim") during the Warranty Period specified below.

In addition, MOLABO GmbH guarantees the Customer that the battery system of the watercraft with an ARIES drive system has a remaining capacity of at least 80% of the original capacity after a period of 5 years or 1000 operating hours after delivery, whichever comes first.

The following three criteria are prerequisites for the Warranty Claim to apply with regard to the Product and the battery system:

1. the Customer has registered the Product with MOLABO GmbH within 6 months from the date of purchase and prior to the occurrence of a Warranty Claim.
2. the Product and the battery system were installed exclusively with standard components from MOLABO GmbH.
3. the installation of the Product has been qualified with the *MOLABO Approved* mark by MOLABO GmbH or an authorized service partner.

Wear parts and routine maintenance are excluded from the warranty. MOLABO GmbH is entitled to refuse Warranty Claims if

- the inspection booklet is not completely maintained,
- the warranty has not been properly submitted,
- the defect was caused by improper handling of the Product or the battery system,
- the Product or the battery system indicates repairs or other interventions by workshops not authorized by MOLABO GmbH,
- the safety, handling, care and maintenance instructions in the operating manual have not been followed,
- the Product or the battery system shows signs of damage or wear caused by use that deviates from the normal purpose and the specifications of MOLABO GmbH (in accordance with the user manual) or excessive use, e.g. during sporting competitions,
- the battery system has been opened or removed from the watercraft with ARIES propulsion system,
- the Product or the battery system has been altered, modified or equipped in any way with parts or accessories that are not part of the original equipment expressly approved or recommended by MOLABO GmbH,
- the battery system has been operated at battery temperatures outside the range of -10 °C to +45 °C,
- the manufacturing/serial number, the *MOLABO Approved* mark, warranty seal or other MOLABO GmbH markings have been removed or made unrecognizable,

- previous maintenance or repairs have not been carried out by workshops authorized by MOLABO GmbH or non-original spare parts have been used, unless the Customer can prove that the circumstances justifying the rejection of the Warranty Claim have not supported the development of the defect.

In the event of a Warranty Claim, MOLABO GmbH shall rectify any faults at its own discretion and at its own expense by repairing or supplying new or refurbished parts.

MOLABO GmbH shall not be liable for any additional costs caused by a Warranty Claim and any other financial disadvantages (e.g. costs for towing, telecommunications, meals, accommodation, loss of use, loss of time, sea rescue, water rescue, fire department, etc.). Other claims of the Customer against MOLABO GmbH, in particular for damages, are expressly excluded.

The warranty of the Product and the Mastervolt components ends two (2) years after the date of delivery of the Product and Mastervolt components to the Customer ("Warranty Period"). The warranty of the Victron components ends five (5) years (three (3) years for Victron Lithium batteries) after the date of delivery of the components to the Customer ("Warranty Period"). Products used for commercial or governmental purposes are excluded from this extended warranty. For these, a limited statutory warranty applies in accordance with the GTC's of MOLABO GmbH.

The Warranty Claim expires six (6) months after discovery of the defect.

MOLABO GmbH shall decide whether defective parts are to be repaired or replaced. Distributors and dealers who carry out repair work on ARIES systems, the Product or battery system are not authorized to make legally binding declarations on behalf of MOLABO GmbH.

In addition to the claims arising from this warranty, the Customer has statutory warranty claims arising from his purchase contract with the respective dealer, which are not restricted by this warranty.

This warranty shall also apply to any successive future owner of the Product, including the battery system, residing within the Territory, to the extent and under the conditions set out above (including submission of proof of purchase in the event of resale).

2. Severability clause
Should one of the provisions of these warranty conditions be or become ineffective, this shall not affect the remaining provisions of this warranty.

3. Warranty Process
Compliance with the warranty process is a prerequisite for the fulfillment of Warranty Claims. In the event of a Warranty Claim, the Customer shall contact MOLABO GmbH or authorized service partners of MOLABO GmbH and submit a detailed description of the Warranty Claim.

Contact can be made by telephone or e-mail. Warranty Claims must be submitted in writing.

MOLABO GmbH can be contacted by e-mail at the following e-mail address: service@molabo.com or by telephone at the following number: +49 89 1792510-79.

MOLABO GmbH requires proof of purchase to verify the Warranty Claim and to process the warranty.

The place of performance for the fulfillment of Warranty Claims is the registered office of MOLABO GmbH.

This warranty is subject to the law of the Federal Republic of Germany.

Version: 12.02.2025

15 TECHNICAL DATA

ARIES	i30	i50	R50
Constant mechanical output power	30 kW	50 kW	50 kW
Supply voltage	48 V (44 V - 54 V full operation)		
Max. voltage	58 V		
Logic supply voltage	14 V		
Motor speed at rated power	2,610 - 6,500 rpm	4,350 - 6,500 rpm	4,350 - 6,500 rpm
Engine torque	110		
Gear ratio	4:1	4:1	2.46:1
Max. propeller torque	440	440 Nm	270 Nm
Propeller speed	653 - 1,625 rpm	1,087 - 1,625 rpm	1,767 - 2,640 rpm
Efficiency	94% (motor: 97%, control unit: 97%)		
Communication	CAN		
Protection	IP6		IP65
Weight of motor	69		L: 145 kg XL: 151 kg
Dimensions (L x W x H)	⌀ 254 mm; L: 457.5 mm		L: 780 x 370 x 1,447 mm XL: 780 x 370 x 1,574 mm
Shaft length			L: 20" / 51 cm XL: 25" / 63.5 cm
Propeller hub			13-tooth spline (4 1/4" gear case) Evinrude/Johnson/Selva 40-140 hp Hub adapter XHS206
Trim/tilt system			Hydraulic
Trim / tilt angle			Trim: -4° to 12 Tilt: 12° to 65°

Max. steering angle		± 28
Water cooling	Dual-circuit cooling, 12 l/min, max. 35° C	
Coolant	GLYSANTIN BASF G40®	

MOLABO GmbH

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Translation of original operating instructions

ARIES i30 / i50 / R50 (Firmware v. 1.7)

D1000405

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