



**Information & operations manual for  
Lagoon 50 Catamaran 2023  
'Echo'**



# Welcome



Welcome to Horizon Yacht Charters and your Lagoon 50 "Echo". We hope you had a pleasant journey and are looking forward to a fantastic holiday and some of the finest sailing in the world here.

This manual is here to guide you through the operation of your yacht. Please take the time to read this manual and do not hesitate to ask any of our professional, friendly staff if you have any questions.

All the yachts in the Horizon fleet are maintained to the highest standards so that you may enjoy a trouble-free vacation, on a beautiful yacht. Please remember that these yachts are all privately owned, and we ask that you care for it like it was your own.

Best wishes for a great vacation,

Andrew  
Director

**Office Hours:**

*Monday – Sunday 08:30 – 17:30*

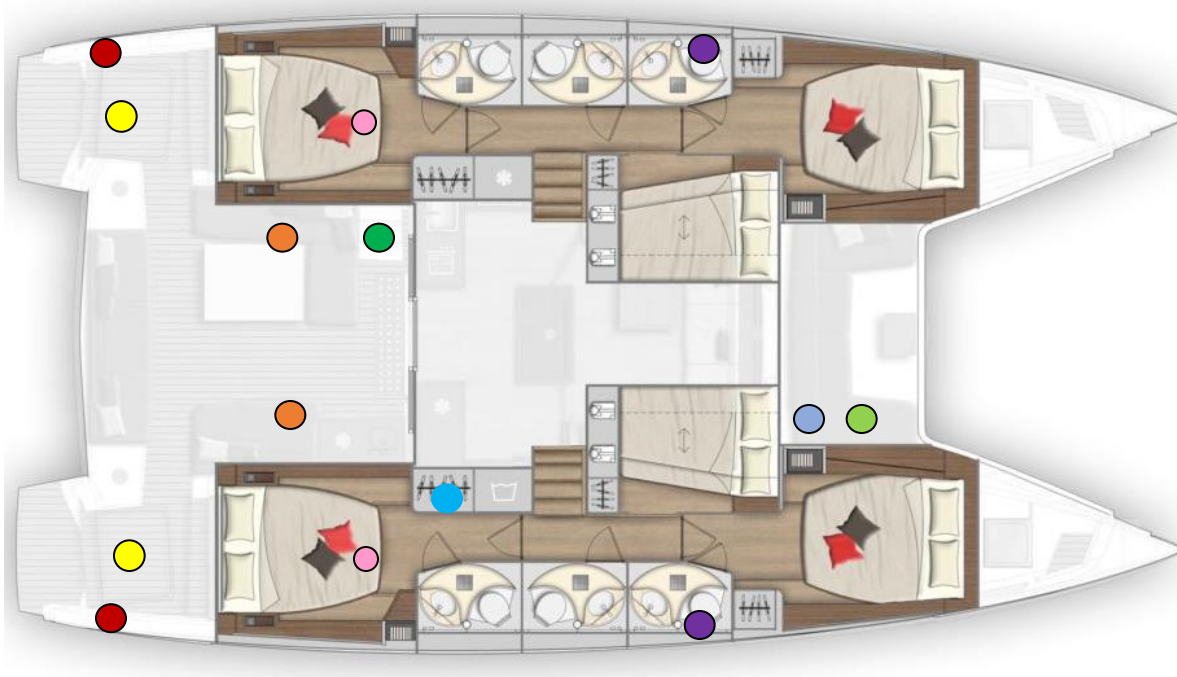
**Telephone:** (284) 494 8787

**Duty Manager:** (284) 542 8788 (*Technical questions, damage reports and emergencies*)

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## 1. Yacht Specifications



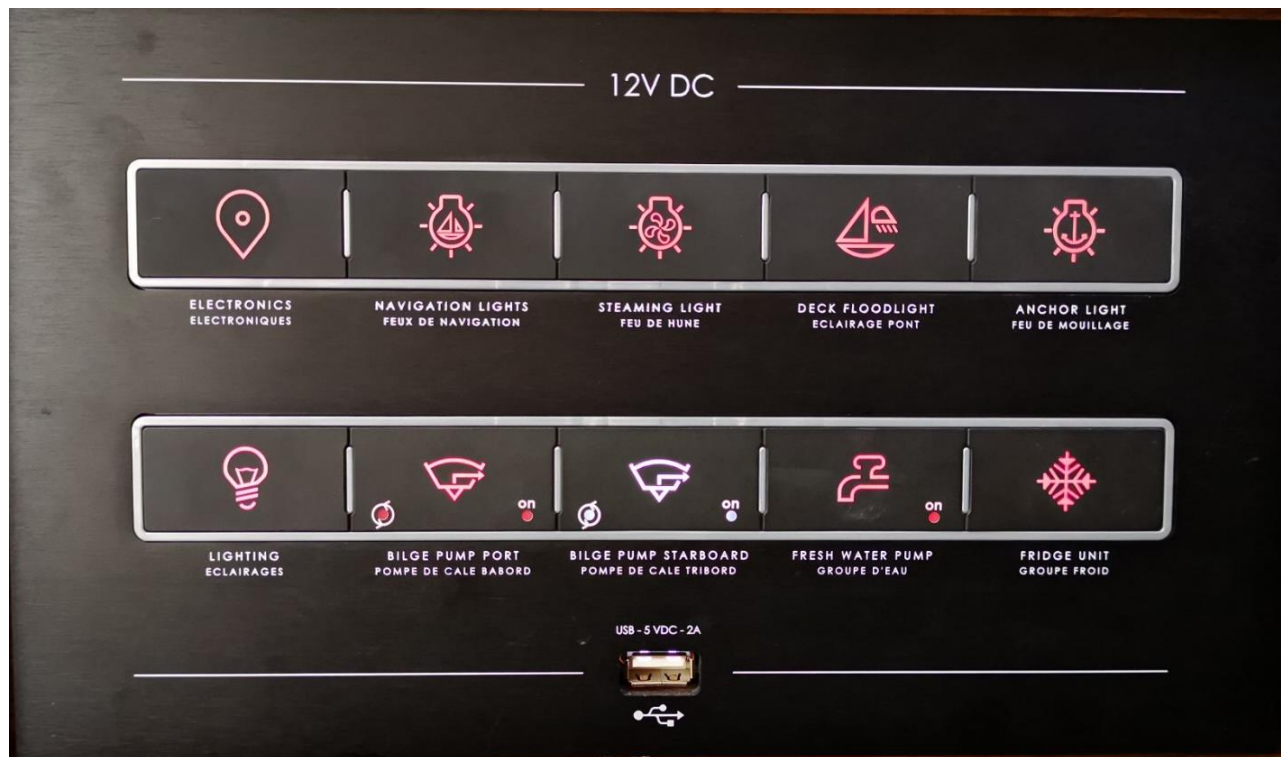
<b>Length</b>	50'
<b>Beam</b>	26' 7"
<b>Draft</b>	4' 9"
<b>Fuel</b>	Primary 137 Gallons, Secondary 137 Gallons
<b>Water</b>	X2 110 Gallons
<b>Engines</b>	2 x 80hp Yanmar
<b>Generator</b>	Onan MDKDN-8140A 13.5KW

### Location of:

- **Engines** (Starboard and port aft ENG rooms)
- **Generator** (Beneath starboard bow seating)
- **Manual bilge pumps** (Below port and starboard cockpit seating)
- **Propane tank** (Port cockpit below steps)
- **Water tank refill** (Port and Starboard midships)
- **Electric winch breaker** (Starboard hull locker)
- **Windlass breaker** (Starboard forward bow locker)
- **Diesel refills** (Port and starboard aft cockpit)
- **Fuel shut off valves** (below the port and starboard aft berths)

## 2. The 12-volt panel and breakers

### 12-volt panel:



### 12v switches:

#### Top Row:

Electronics  
Navigation Lights  
Steaming Light  
Deck Floodlight  
Anchor Light

#### Lower Row:

Cabin Lights  
Port Primary Bilge Pump (**hit once for auto and twice for manual**)  
Stbd Primary Bilge Pump (**hit once for auto and twice for manual**)  
Fresh Water Pump  
Refrigerator

**Note:** Switches flash if there is a fault. Fuses behind the 12V panel can be reset if there is a fault.

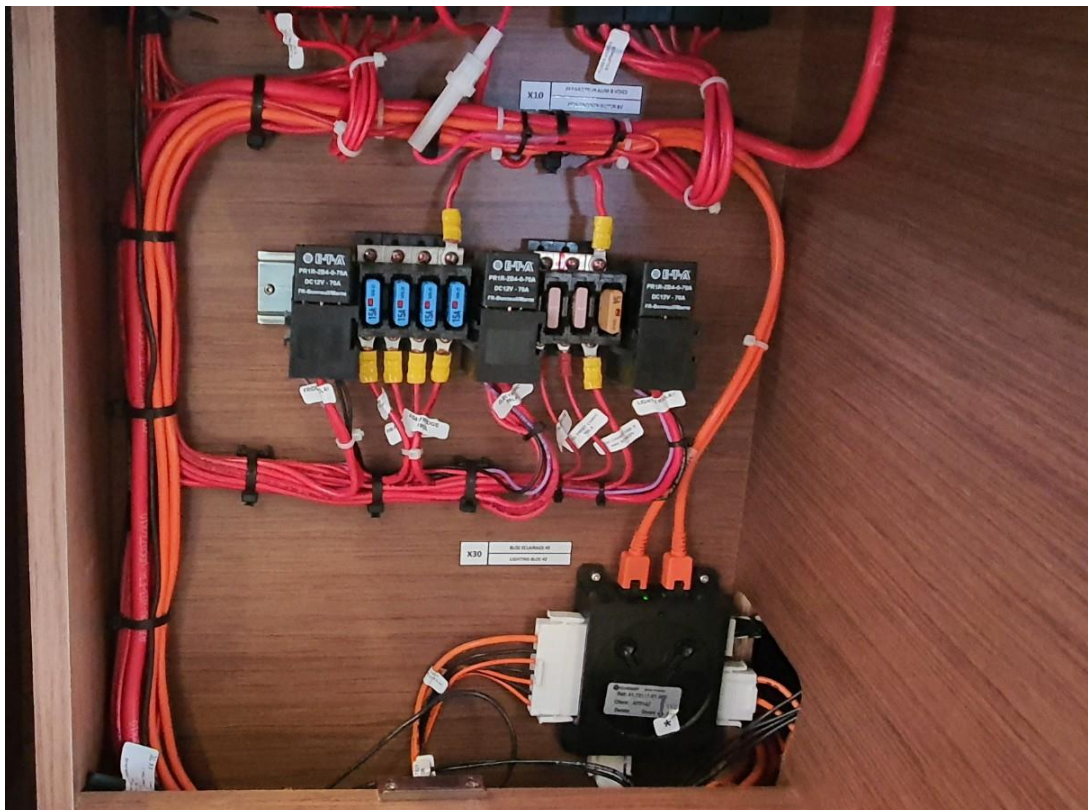


## Breakers and Fuses

### Fuses Behind 12V Panel



Fuses in the cupboard under the chart table.  
Labels and on the underside of cupboard door.











**110V/ Shore Power Breakers in starboard engine compartment**



**110V Outlets and Battery Charger Breakers**



**Battery Charger Breakers**

**Air Conditioning Breakers in Starboard Engine Compartment**



### 3. Inverter

**Warning:** Leaving the Inverter turned on will severely deplete the house batteries. For that reason, it is better to run the engines at the same time. **If you have the Generator running, there is no need to use the Inverter.**

Echo has a built-in Mastervolt 2000-Watt power inverter that allows you to have access to all outlets when the boat is underway. There is currently no remote installed for the inverter, the inverter must be turned on using the switch on the actual unit.

To avoid additional drain on your batteries while operating electrical appliances, the engine should be turned on and revved up to 1400 rpm **IN NEUTRAL**

**Switch the inverter off when you are not using it to help preserve battery power.**

**Mastervolt inverter starboard companion way below 12-Volt panel.**



**Inverter Switch Location**

**Three Green LEDs (Shows inverter is on)**

**Note:** The inverter will not operate the air conditioning unit; this is only available under generator power or shore power.



**Inverter breakers below the inverter**



#### 4. Engine start procedure

You have two engines and therefore two start panels. You must switch on both engines to manoeuvre the vessel.

- Make sure that the throttles are in neutral.
- Turn on the engine ignition by pressing the Power button on the panel.
- Press and hold the start button.
- Once the engines are running, check that you have cooling water coming out of the exhausts.
- To stop the engine, press and hold the stop button until the engine stops.
- Turn off the ignition panel by pressing and holding the Power button.



Hold black button in to disengage transmission

ENGINE START

ENGINE STOP

IGNITION ON/OFF

Should you have difficulty starting one of the engines then turn on the emergency parallel switch in the port engine room. **Remember to turn this off again after starting the engines.**

## Yanmar-YD42 Multi-Function (Tachometer)



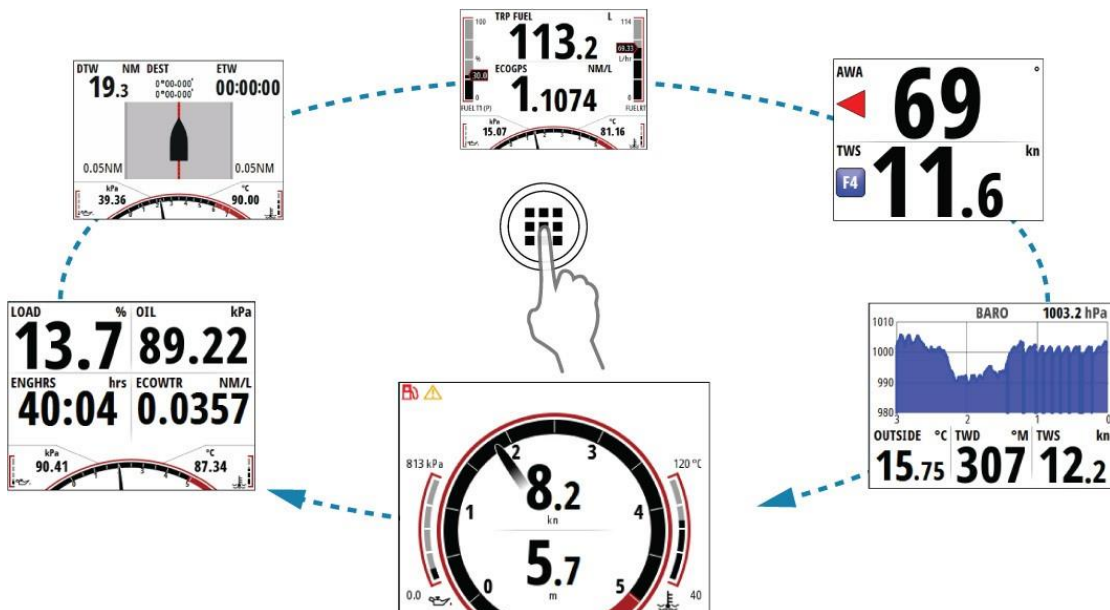
Engine RPMs

Toggle display

### Scrolling through enabled pages

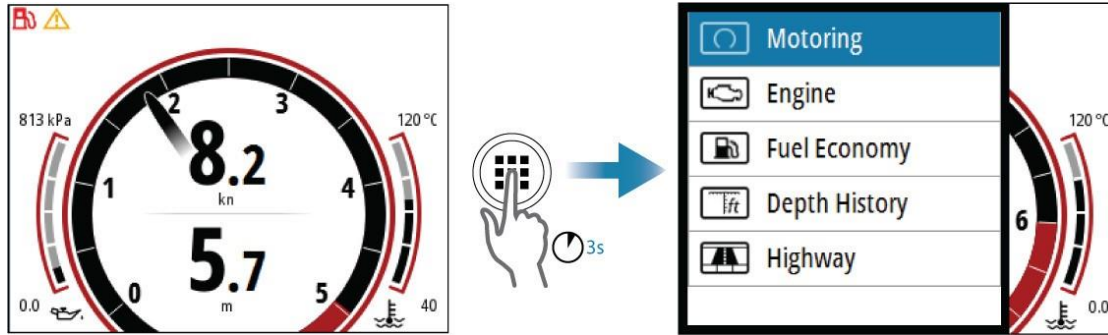
To scroll through the enabled data pages:

- Press the pages key





## Directly selecting a page



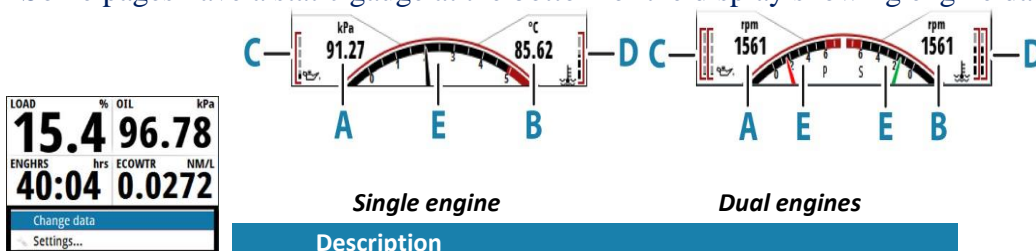
### To display the list of enabled pages:

- Press and hold the pages key

If you do not confirm your selection the menu will timeout and the highlighted page will be displayed.

#### Static gauge

Some pages have a static gauge at the bottom of the display showing engine data.



*Single engine*

*Dual engines*

Description	
A	Engine oil pressure (single engine) / Port-side engine speed (Dual engines)
B	Engine coolant temperature (single engine) / Starboard side engine speed (Dual engines)
C	Engine oil pressure
D	Engine coolant temperature
E	RPM dial

### Changing page data

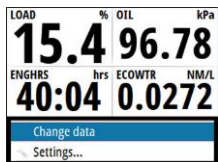
Some pages allow you to change which data is displayed on the page.

To change page data:

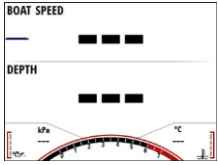
- 1 Press the menu key and select the change data option
- 2 If the page has multiple data fields, select the field you want to change
- 3 Select the data to be shown in the field
- 4 Repeat steps 2 and 3 to change additional fields
- 5 Press the menu key and save your changes

### Missing or faulty data

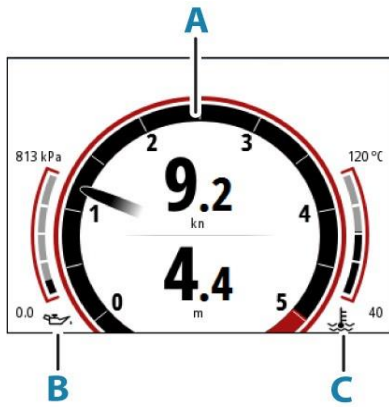
If a data type is missing or if the data is out of scale, there will be no data reading on the display. The example shows a page with missing information.



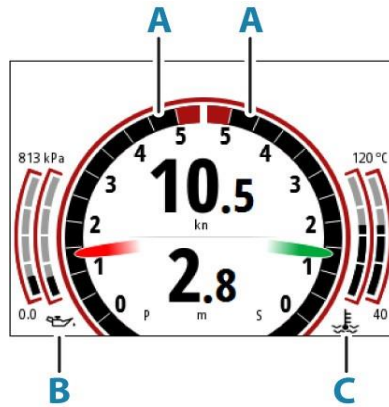
## Predefined pages



### Motoring



*Single engine*

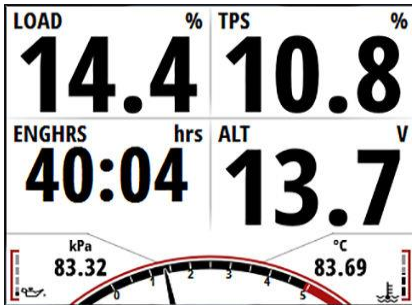


*Dual engines*

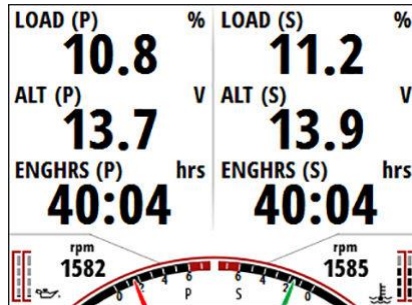
Description	
A	RPM dial
B	Engine oil pressure
C	Engine coolant temperature



## Engine digital

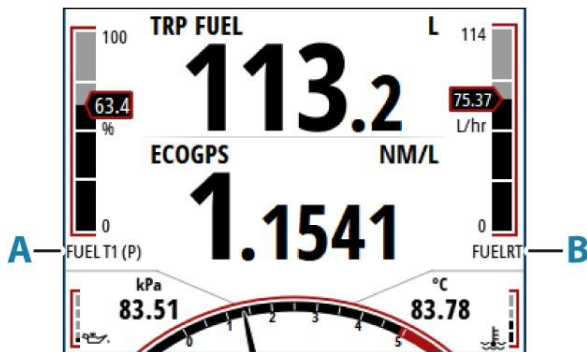


*Single engine*



*Dual engines*

## Fuel economy



Description	
<b>A</b>	Tank level for selected tank or vessel fuel remaining depending on configuration. Vessel fuel remaining shows the total amount of fuel remaining in all tanks.
<b>B</b>	Fuel rate

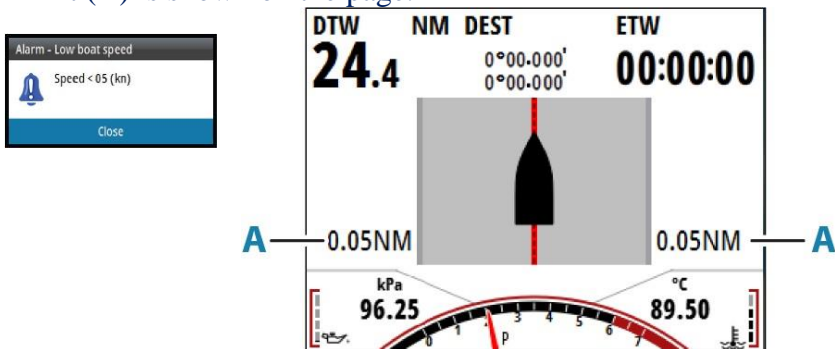
→ **Note:** Vessel fuel remaining will only be available when fuel flow data is available, and a Navico fuel storage device is connected to the NMEA 2000 network.

### Page menu

From the page menu you can access the refuel dialog by pressing the add fuel option.

### Highway

Shows navigation information, including visualization of the boat's position on the track. The cross-track error limit (A) is shown on the page.



→ **Note:** Requires a compatible navigational source connected to the network.

## System alarms

Type of messages

The messages are classified according to how the reported situation affects your vessel. The following colour codes are used:

Colour	Importance
<b>Red</b>	<b>Critical alarm</b>
<b>Orange</b>	<b>Important alarm</b>
<b>Yellow</b>	<b>Standard alarm</b>
<b>Blue</b>	<b>Warning</b>
<b>Green</b>	<b>Lite warning</b>



## Alarm indication

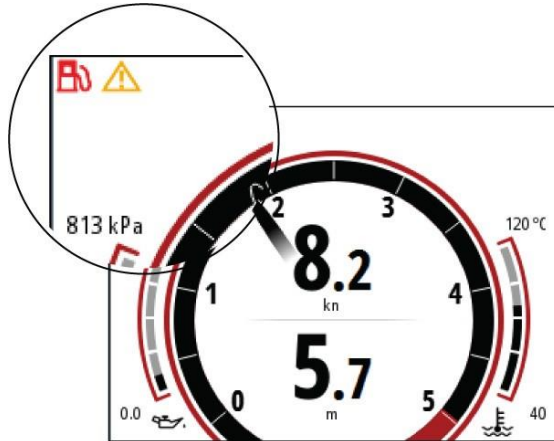
An alarm situation is indicated with an alarm pop-up. If you have enabled the siren, the alarm message is followed by an audible alarm.

A single alarm is displayed with the name of the alarm as the title, and details for the alarm.



If more than one alarm is activated simultaneously, the alarm popup can display 3 alarms. The alarms are listed in the order they occur with the last activated alarm at the top. The remaining alarms are available in the alarms dialog.

## Engine alarms

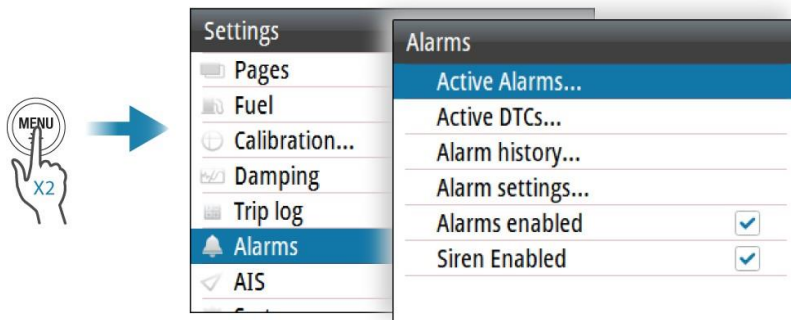
For engine specific alarms, an icon will appear on the page. The icon will remain active as long as that alarm instance is still valid.



**Note:** For dual engine configuration, the alarm icon will appear on the side of the display that the engine is configured.

Icon	Alarm description
	Engine alarm - Check active alarms / DTCs for available information
	Low fuel level < 25%

## The alarms dialog

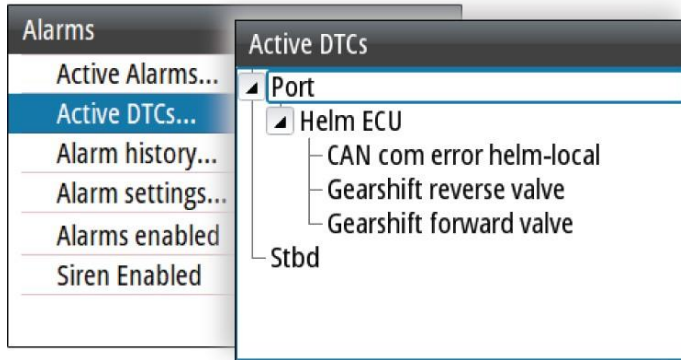


## Active alarms

Lists all active alarms.

## Active DTCs (Diagnostic Trouble Code)

Lists all active DTCs, to show details select the desired DTC.



## Alarms history

The Alarm history dialog stores alarm messages until they are manually cleared.

To show alarm details or to clear all alarms:

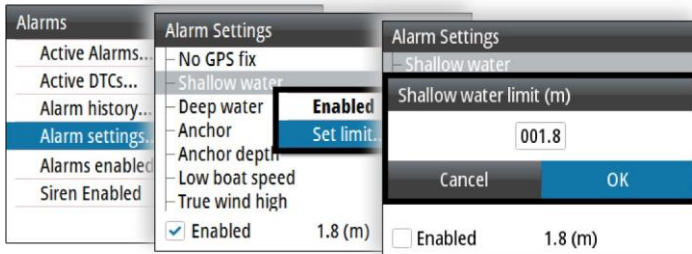
- Press the menu key and select the desired action

Alarm History		
Shallow water	Dsabl	13:59 22/03/18
Deep water	Ackd	13:59 22/03/18
Deep water	Raise	13:58 22/03/18
Low boat speed	Dsabl	13:58 22/03/18

## Alarm settings

To show the menu from where you can set the alarm limit and enable/disable an alarm:

- Press the menu key



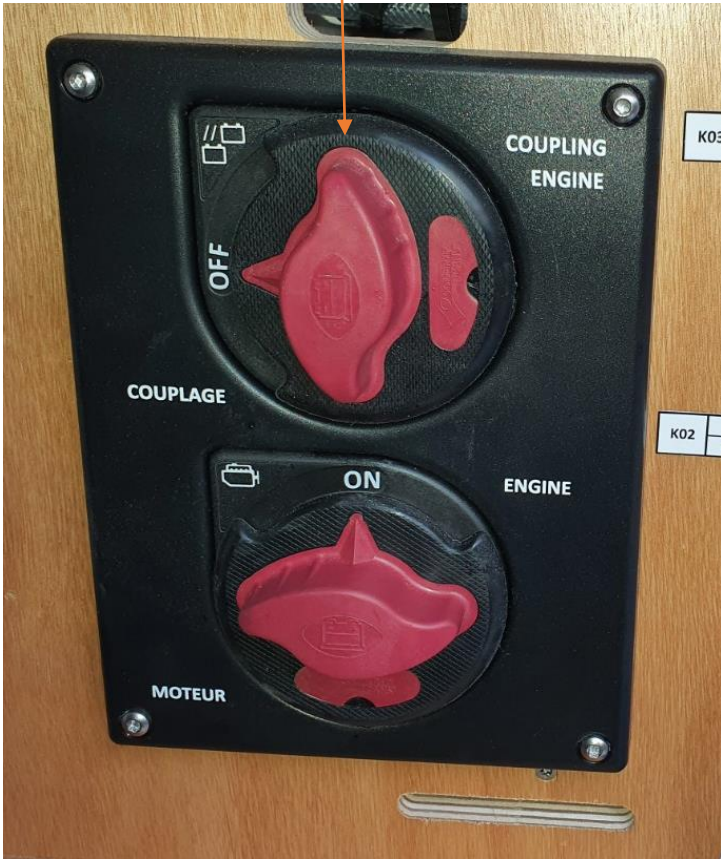
## Alarms enabled

Enables/disables all alarms.

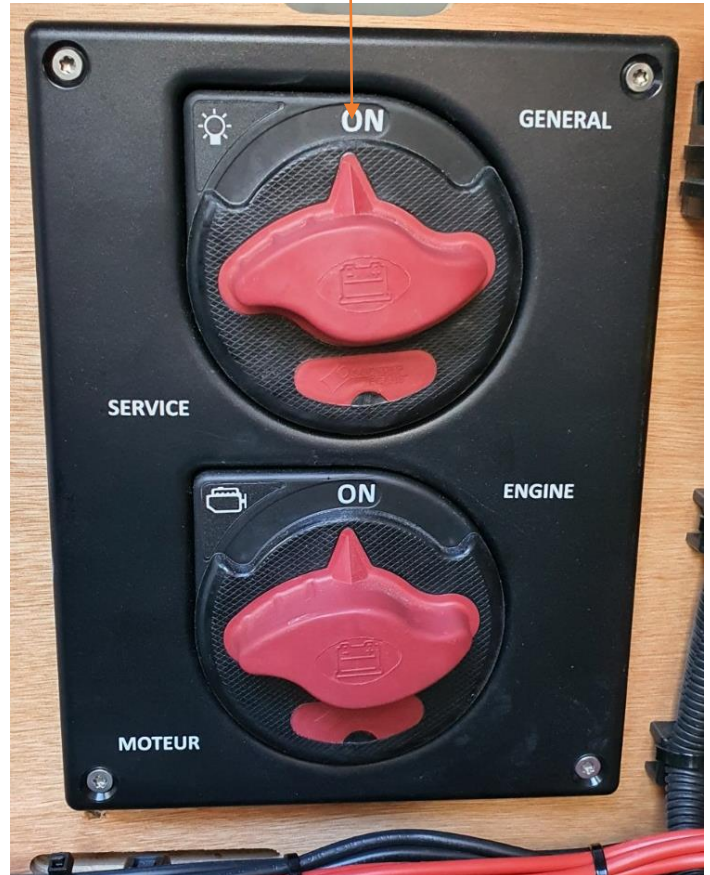
## Siren enabled

Enables/disables the alarm siren.

**EMERGENCY PARALLEL SWITCH AND PORT ENG BATTERY SWITCH IN PORT ENG COMP.**



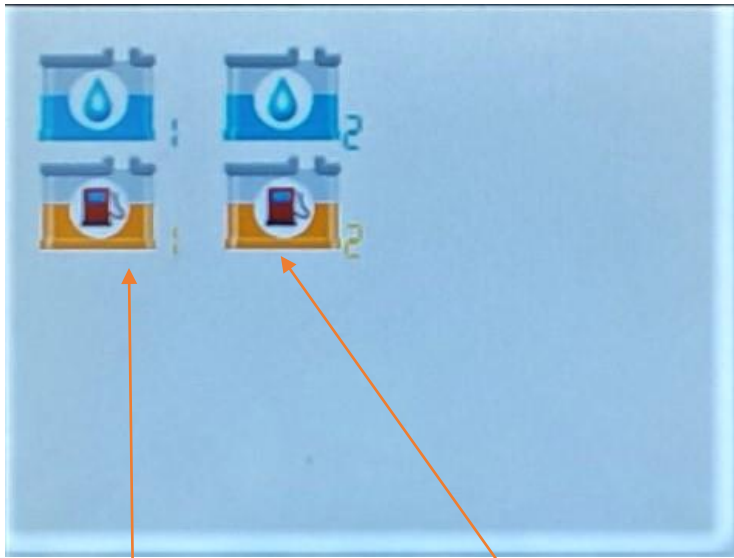
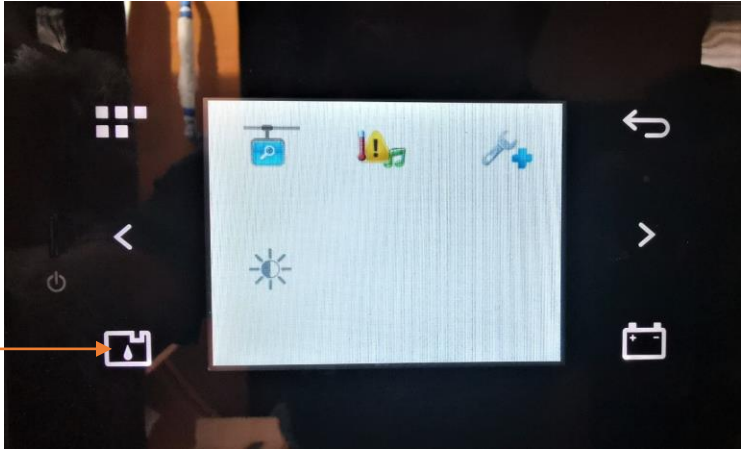
**SERVICE AND STARBOARD BATTERY SWITCH IN STBD ENGINE COMP.**



**Note:** Should you hear an engine alarm during operation, check the Simrad/Yanmar display to see the fault and immediately shut down the engine - **CALL HORIZON**

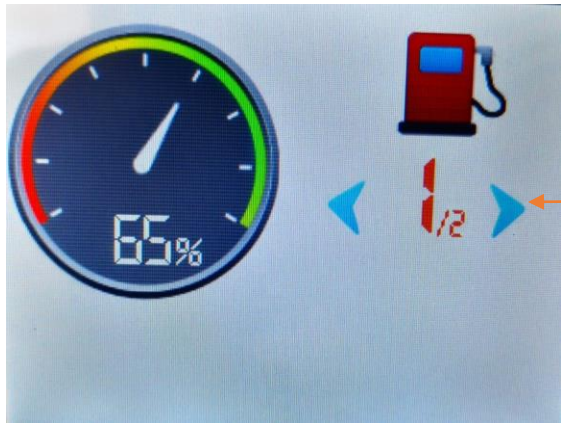
# Checking Diesel Fuel

Tank Menu



Diesel Tank 1

Diesel Tank 2



Toggle through tank 1 and 2



## 5. Daily Engine Checks

The engines are in the transoms, one in each hull. It is important that you complete the following checks on both engines.

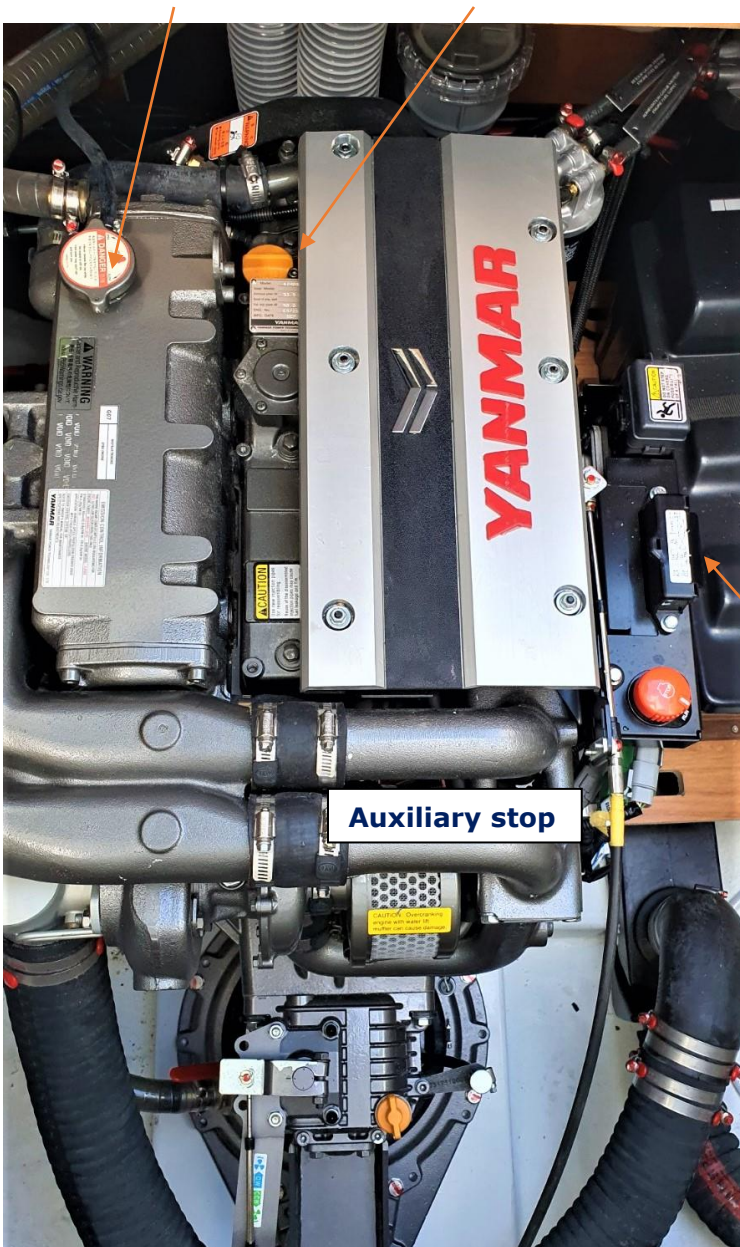
- Check the oil level using the dip stick located on the right of the engine. The level should be at least halfway between the empty and full marks. To add oil, open the orange oil filler cap on the top of the engine.
- In front of the engine, mounted on the bulkhead, is the engine coolant reservoir (hidden from view on the picture). The coolant level should be between the maximum and minimum lines.
- Check for any engine leaks or bilge water below engine.
- Check the belt for any damage and correct tension.

**KEEP HANDS CLEAR OF ALL MOVING PARTS.**

**ENGINE WILL NOT START IF THE AUXILIARY STOP IS IN THE OFF POSITION.**

COOLANT FILL

OIL FILL



Engine Raw  
Water Strainer

Engine Coolant  
Reservoir



OIL DIP STICK BELOW  
AUXILIARY STOP



## 6. Generator

### **YOU MUST NOT RUN THE GENERATOR WHEN UNDERWAY.**

The Echo is fitted with its own Onan generator which will run the 110v outlets, the air conditioning and will also charge the batteries. The generator is in the starboard bow locker, there are no daily checks to perform.

Before starting the generator ensure the air conditioning units are off (Turn off all AC Units before leaving the dock). The transfer switches are in the locker below the 12-Volt panel.



### **Starting the Generator:**

- Make sure the 110v systems are off prior to starting the generator.
- Ensure that you have switched from shore power to generator power (See Section 10)
- Press the Prime switch for 5 seconds.
- Press and hold the Start button until you hear the generator start.
- Allow the generator to warm up for 5 minutes and then gradually load up the system (battery charger and air conditioning units), adding one load every 2 minutes.





Once you have started the generator, gradually apply load by turning on the AC Units 5 minutes apart. This is to avoid overloading the generator.

**Before hitting the stop button on the generator ensure all the air conditioning units are off, let the generator run for 5 minutes (cool down).**

### Resetting the generator

**If the generator is running but the 110 sockets and Ac units are not powering up, reset breaker to the left of generator control panel.**

Generator Reset Breaker

Cummins Onan Generator, port bow locker



DC Circuit Breakers, Emergency Stop, Hour meter and Start/Stop (Prime)

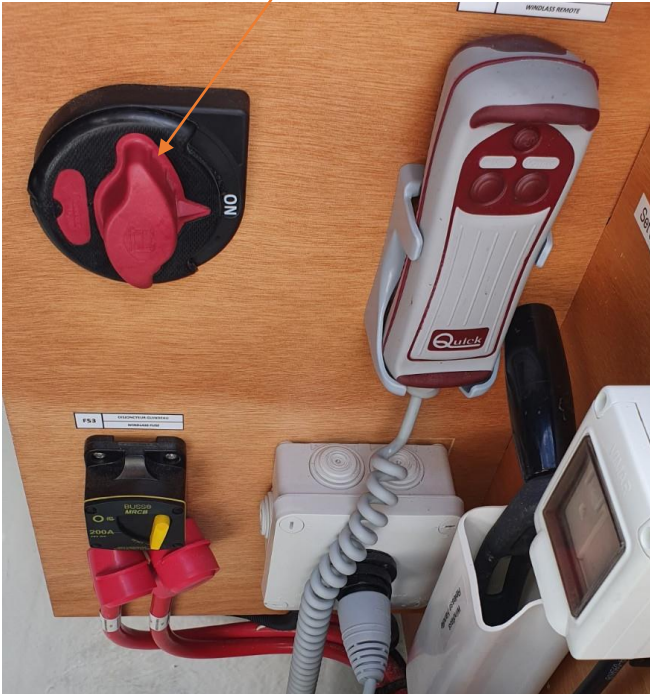


## Shore power/generator breakers

**Generator breakers just forward of the generator**



**Generator Battery Switch  
(Starboard Bow Locker  
Opposite Generator)**



**Pull Out to Switch Generator Fuel  
Supply**





## Generator raw water strainer:

Please do not run the generator when sargassum seaweed is present. The generator raw water strainer is in the generator compartment to the right of the genset and can pick up seaweed and other debris in the water. This can cause your generator to malfunction because of the lack of water flow.

### Cleaning the raw water strainer:

1. Before you clean the strainer ensure the raw water intake valve is closed.
2. Remove the housing cover, this can be done with a filter wrench.
3. Remove and clean the strainer.
4. Refit strainer.
5. Prime the strainer by pouring water into it until it overflows.
6. Refit housing cover.
7. Open the raw water intake valve.
8. Start the generator
9. Make sure water is coming out of the exhaust.

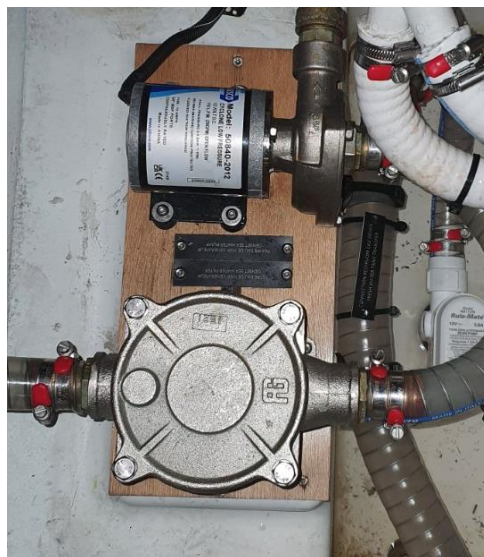
If you still have a problem running the generator after cleaning the strainer, check for water in the strainer. If there is no water in the strainer it means the raw water intake is blocked.

### Clearing a blockage from the generator raw water intake:

1. Get the dinghy air pump.
2. Close the intake valve.
3. Remove cover and strainer from the housing.
4. Place the nozzle of the dinghy pump into the opening that is connected to the intake hose.
5. Open the intake valve.
6. Use the pressure of the dinghy pump to force the blockage out.
7. Once you have cleared the blockage, prime the strainer by pouring water into it until it overflows.
8. Refit housing cover and start generator.
9. Make sure water is coming from the generator exhaust.

If you are unable to open the strainer, remove the intake hose where it is connected to the strainer by undoing the hose clamps and use the dinghy pump to force out the blockage.

### Generator raw water strainer, Starboard midship floorboard



## 7. Air conditioning

### Cabin Air conditioning

The air conditioning units will operate when the vessel is plugged in to shore power or when the generator is running. Each cabin has its own individual air conditioning unit and there are two units in the salon.



The air conditioning units should be turned on **after** the generator has been running for 5 minutes (or once the boat is plugged into shore power) and the breakers should be shut **off** before stopping the generator or unplugging from shore power.

Ensure the main saloon door and all hatches are closed; otherwise, the compressors will freeze up.

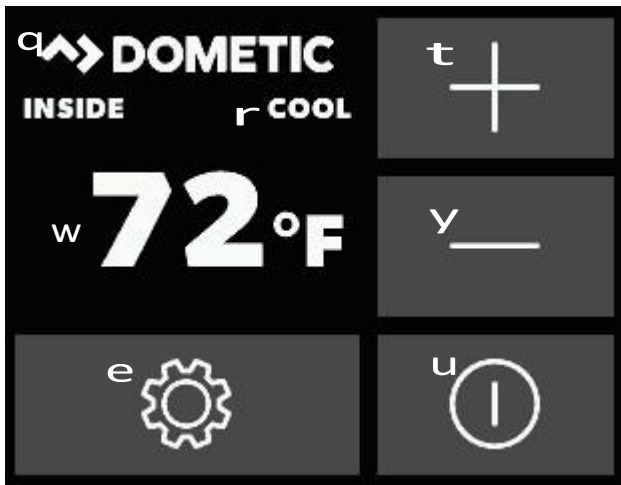
#### Starting the air conditioning:

- Switch on the required units 5 minutes apart.
- Each of these units also has an individual control which allows users to alter the settings for the individual units.

#### Using the unit control panels:

- Switch the remote units on using the 'power' button.
- Set the temperature using the **+ and -** controls.
- The units will work best if the minimum temperature is set no lower than 70 degrees. Set it below this and you risk frosting up the unit and causing it to shut down.
- Only select the 'cool' mode. Press the mode button until the cool option is displayed on the unit.
- The remote panel will automatically display the ambient temperature.
- Control the fan strength using the 'fan' button.
- Switch the units off by pressing the 'power' button.

This starting screen displays when the Smart Touch Cabin Control is turned on.

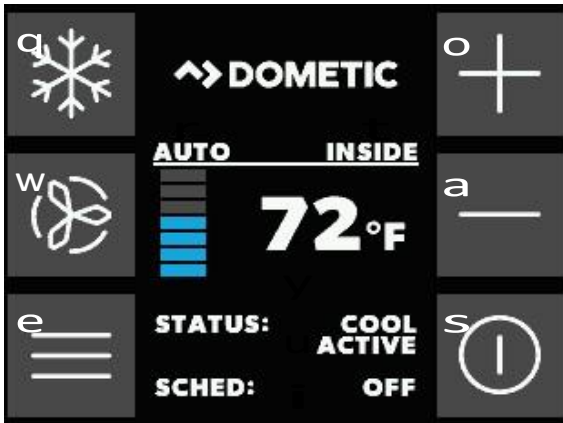


**3** • Main Screen Icon Functions

No.	Button	Description
q	Force Sleep	Forces the sleep mode to initiate immediately, if sleep delay is on/enabled with a press and release
w	Temperature	Cycles through available set point(s) (inside, outside, service, water, and humidity temperatures) with a press and release
e	Main Screen	Displays the main screen with a press and release
r	Status	Indicates the system status (off, pending, active, standby, or fault)
t	Up	Displays the set point with a press and release. Press and release the up icon as many times as desired to increase the set point. The set point increases one degree with each press and release.
y	Down	Displays the set point with a press and release. Press and release the down icon as many times as desired to decrease the set point. The set point decreases one degree with each press and release.
u	Power	Toggle between On and Off with a press and release

## Understanding the Main Screen

Enter from the home screen to access the most basic functions as well as the menu for more options.



### 4 Main Screen Icon Functions

No.	Button	Description
q	<b>Mode</b>	Changes the currently active mode with a press and release
	<b>Auto</b>	Switches to cool or heat to satisfy the temperature set point
	<b>Cool</b>	Indicates the system is in cooling mode or when the unit is in an automatic mode cooling cycle
	<b>Heat</b>	Indicates the system is in heating mode or when the unit is in an automatic mode heating cycle
	<b>Auxiliary Heat</b>	Indicates aux heat-only mode or when the unit is in an automatic mode auxiliary heating cycle
	<b>Dehumidification</b>	Controls humidity when the vessel is unoccupied
w	<b>Fan Mode</b>	Cycles through low, medium, high, and auto fan speeds with a press and release
e	<b>Main Menu</b>	Displays the main menu with a press and release



<b>r</b>	<b>Fan Speed and Mode Indicator</b>	Above the line, indicates if the fan speed is automatic or manual. Displays the current speed below the line.
<b>t</b>	<b>Sensor Indicator</b>	Specifies which temperature is displayed (inside, outside, service, or water temperature) based on the sensors installed.

No.	Button	Description
<b>y</b>	<b>Temperature Indicator</b>	Displays the temperature based on the sensor indicator.
<b>u</b>	<b>Status</b>	Shows if a fault has occurred
<b>i</b>	<b>Schedule</b>	Shows a schedule program is active and the specific times and days
<b>o</b>	<b>Up</b>	Increases the set point one degree with a press and release
<b>a</b>	<b>Down</b>	Decreases the set point one degree with a press and release
<b>s</b>	<b>Power</b>	Toggles between On and Off mode

## Operational Specifications (Environmental)

Set Point Operating Range	65–85 °F (18–29 °C)
Ambient Temperature Operating Range Displayed	5–150 °F (-15–66 °C)
Sensor Accuracy	±2 °F @ 77 °F (±1 °C @ 25 °C)
Minimum Operating Temperature	0 °F (-18 °C)
Maximum Ambient Operating Temperature	180 °F (82 °C)

## AC troubleshooting:

**Iced up unit:** You can tell a unit is iced up when it is running but there is no air coming out of the AC vent. You can also look at the actual unit, it will be covered in ice. Turn off unit and let defrost. You can also move the mode from cooling to heat for about 5 to 10 mins until you feel air coming out the vent again.

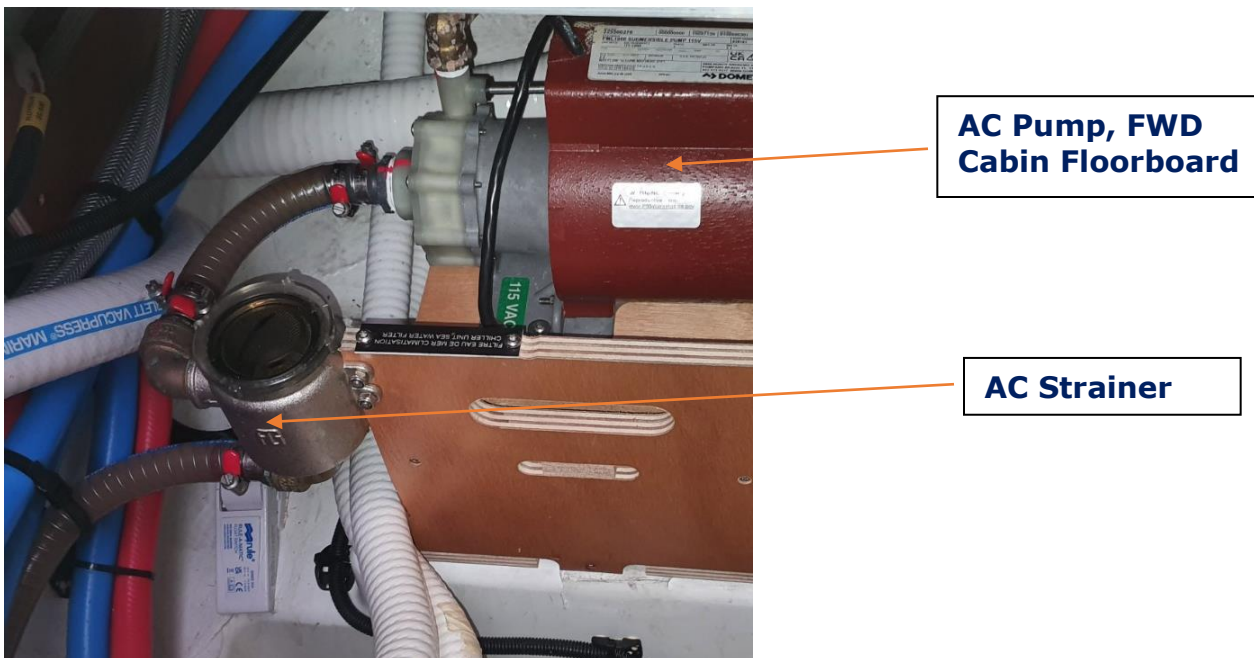
**Unit not cooling:** Check temperature settings. Ensure mode is set to cool.

**HPF (High pressure fault):** The AC units on the Echo are water cooled. A high-pressure fault means that there is air in the system (lack of water flow). Check the sides of the vessel and make sure water is coming out of the AC outlets on the hull. If there is no raw water flow the unit will need bleeding.

**Bleeding AC unit:** Bleeding the unit means letting the air out the system until there is a steady flow of water to cool unit. On Echo the unit is bled from the line connected to the AC pump. First turn the unit on to restart the Air conditioning pump. Undo the hose clamps on the line connected to the pump and remove it enough to let air and water out. Once there is a steady flow of water refit the hose and retighten the hose clamps, check if water is coming out the side of the vessel. The AC strainer can also pick up seaweed and debris and might require cleaning at times.

**Speak to the manager on duty before attempting to bleed AC-Unit.**

### Ac pump under port and starboard floorboards



## 8. Electronics:



**B&G Triton<sup>2</sup> digital display and autopilot controller X2**



**B&G Triton<sup>2</sup> Autopilot control**



**B&G Zeus<sup>3</sup> 16 Chartplotter**



## 1. Pages key

- With no menu active:
- Press to scroll through the enabled data pages (Wind speed + Direction, depth, boat speed and autopilot)
- Press and hold to display a list of enabled pages from where you can directly select the page to display
- Menu and dialog operation: Press to return to previous menu level or to exit a dialog.

## 2. Arrow keys

Press to move up and down in menus and dialogs. Press to adjust a value.

## 3. Enter key

Press to select a menu option and to enter the next menu level.  
Press to activate/deactivate a menu/dialog option.

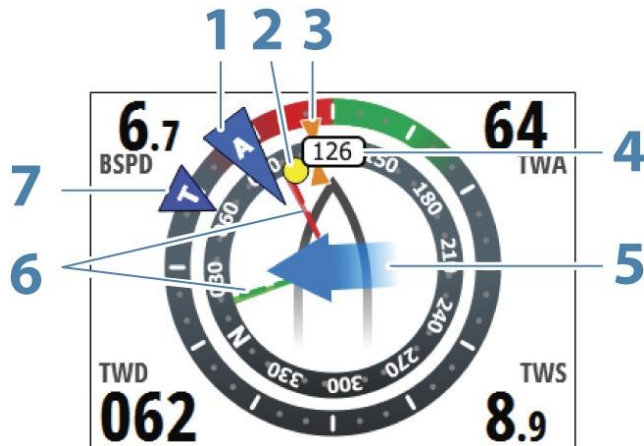
## 4. MENU/Backlight key

Press once to display the page menu.  
Double press to display the Settings menu.  
Press and hold to display the Display setup dialog from where you can adjust the display backlight.



## SailSteer page (Wind Speed and Direction)

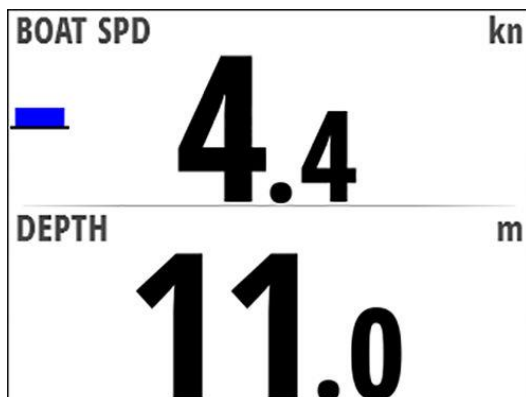
Core Sailing data displaying all key data relative to the yacht's bow for easy visualization.



- 1 Apparent wind \*
- 2 Bearing to current waypoint \*
- 3 COG (Course Over Ground) \*
- 4 Vessel heading
- 5 Tide rate and relative direction \*
- 6 Port (red) and Starboard (green) Laylines \*
- 7 TWA (True Wind Angle) - Green if on TWA upwind or downwind. Blue if off target by 10° or more, or on a free leg. The indicator will fade from blue to green the closer you get to the exact angle

## Speed/Depth page

Basic speed in knots and depth (Depth on Luna is in ft). **Depth is read from under the keel.**



## Autopilot:

### Safe operation with the autopilot

**⚠ Warning:** An autopilot is a useful navigational aid but DOES NOT replace a human navigator.

**Note:** You can disengage the autopilot at any time by pressing the **STBY** key on the Triton<sup>2</sup> Pilot controller.

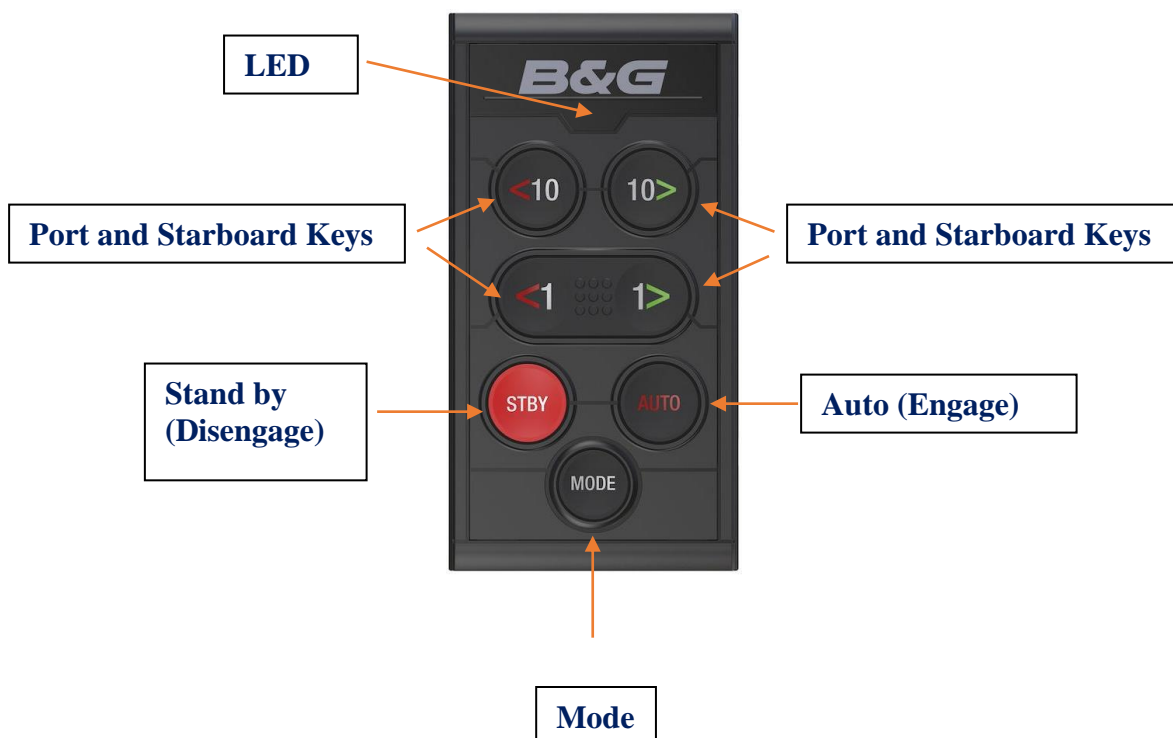
### Do not use automatic steering when:

- In heavy traffic areas or in narrow waters
- In poor visibility or extreme sea conditions
- When in areas where use of an autopilot is prohibited by law

### When using an autopilot:

- Do not leave the helm unattended
- Do not place any magnetic material or equipment near the heading sensor used by the autopilot system
- Verify at regular intervals the course and position of the vessel
- Always switch to Standby mode and reduce speed in due time to avoid hazardous situations

### B&G Triton<sup>2</sup> Autopilot control



**LED:**

Mode and alarm indicator

**Port and starboard keys:**

**In Standby mode:** press to activate Non-Follow Up mode (NFU).

**In AUTO mode:**

- Press a key to change set heading 1° or 10° to port or starboard
- For boat type set to SAIL: Press and hold both port keys or both starboard keys to start a tack/gybe

**In NoDrift mode:**

- Press a key to change set heading 1° or 10° to port or starboard

**In Wind mode:**

- Press to change set wind angle 1° or 10° to port or starboard
- Press both 1° keys to start a tack/gybe

**AUTO key:**

Press to activate AUTO mode.

**MODE key:**

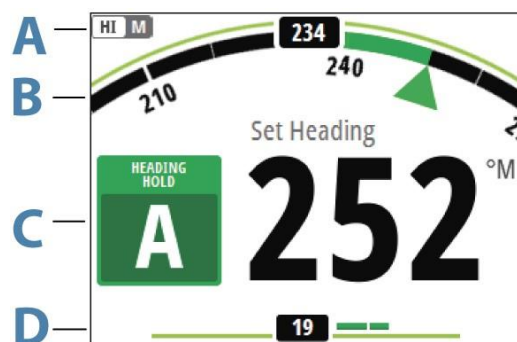
*Note:* Only used when the autopilot is in AUTO or NoDrift mode.

**Press once to select mode:**

- For boat type set to SAIL: activates Wind mode (A)
- Press and hold to activate NAV mode (C)

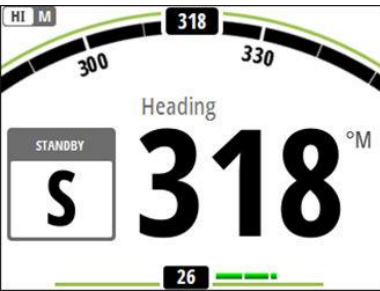
**STBY (Stand by) key):**

Press to activate Standby mode.



- A.** Performance/Response/Profile mode
- B.** Heading indicator, analog and digital
- C.** Autopilot mode indication
- D.** Rudder indicator, analog and digital

## Autopilot modes

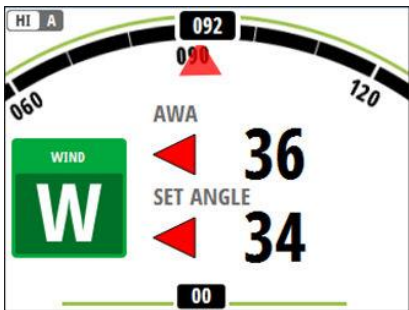


### Standby mode:

Standby mode is used when you steer the boat at the helm.

- Switch to Standby mode by pressing the **STBY** key.

**Note:** If you press one of the port or starboard keys while in Standby mode, the autopilot will switch to Non-Follow Up mode.



### Wind mode:

**Note:** Wind mode is only available when the boat type is set to SAIL. It is not possible to activate wind mode if wind information is missing.

When wind mode is engaged, the autopilot captures the current wind angle as steering reference and adjusts the heading of the

boat to maintain this wind angle.

Prior to entering wind mode, the autopilot system must be operating in AUTO mode and with valid input from the wind transducer.

- Switch to Wind mode by pressing the MODE key when the autopilot is in AUTO mode.

The autopilot will now keep the boat on the set wind angle until a new mode is selected or a new wind angle is set.

**⚠ Warning:** In wind mode the autopilot steers to the apparent or true wind angle and not to a compass heading. Any wind shift could result in the vessel steering on an undesired course.



## B&G Zeus<sup>3</sup> Chartplotter



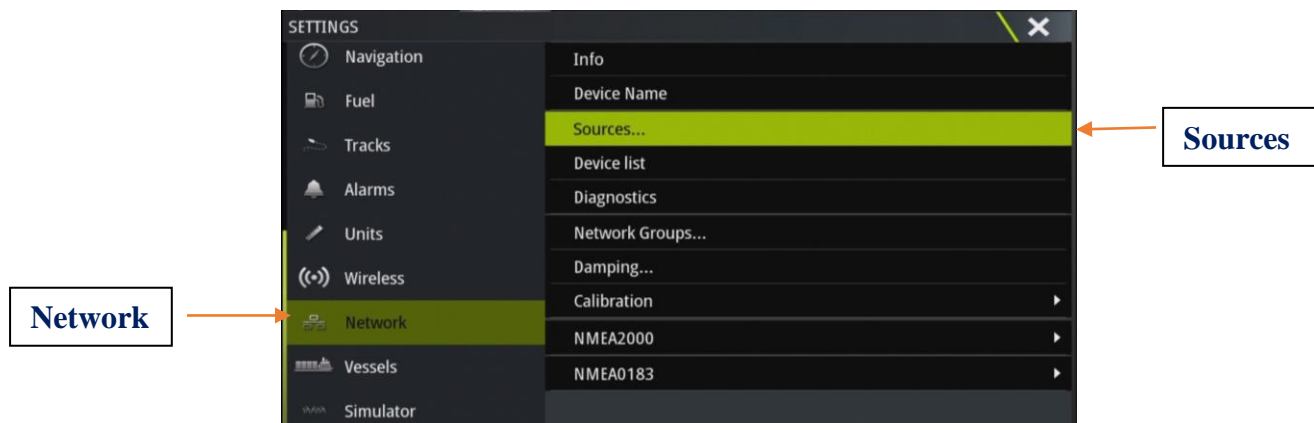
**The aft cameras must not be relied upon as your primary viewpoint. Always have a crewmember assist in your blind spots.**

### Trouble Shooting Nav Instruments:

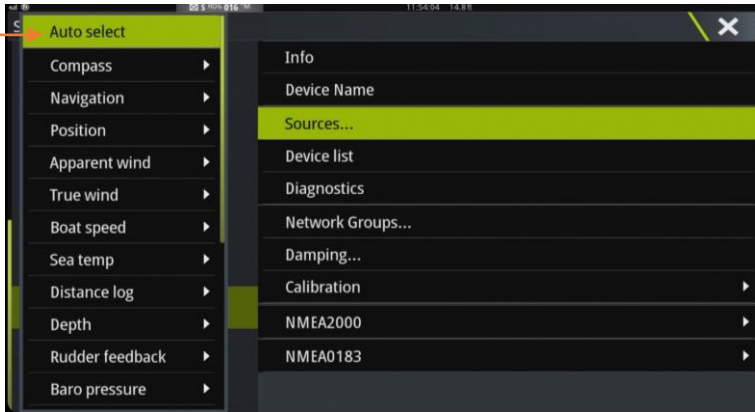
If you are no longer seeing data for specific sources (Depth, Windspeed, rudder position) on the chart plotter or the Triton digital display it means the data sources are no longer communicating with the system. This is an easy fix, just follow the steps below.

1. Select Settings.
2. Select Network.
3. Select Sources.
4. Hit Auto select.
5. Hit Start.

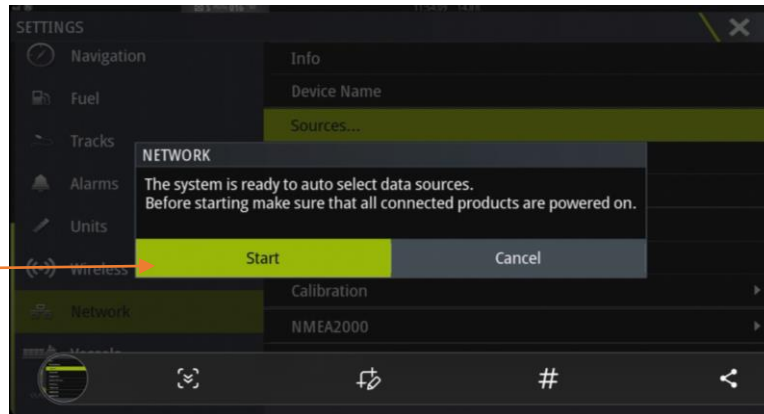
The system will then auto select all the relevant data sources. Hit okay to complete.



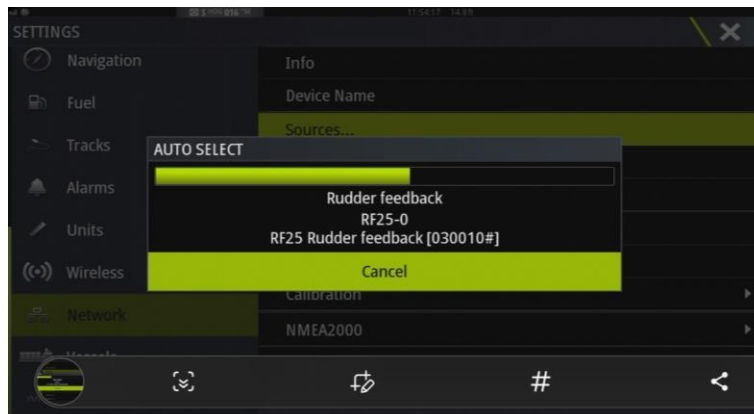
**Auto select**



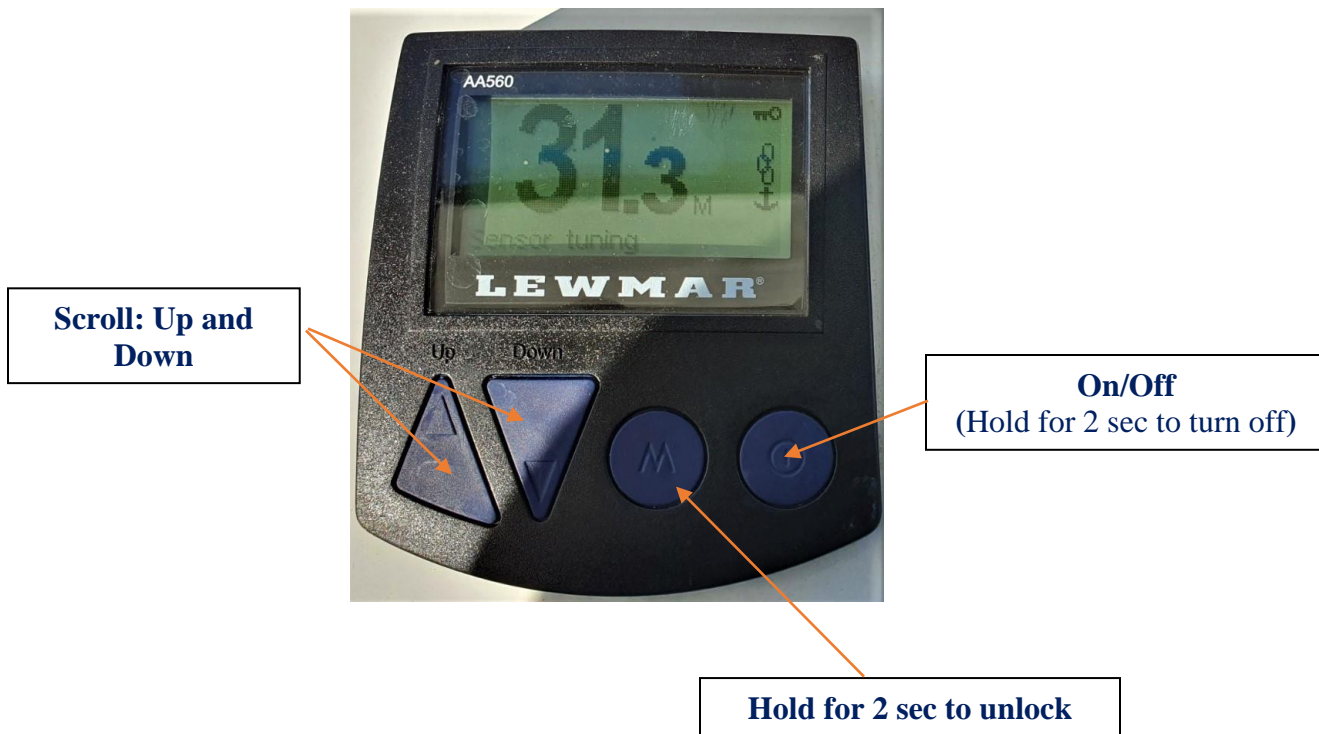
**Start (System is ready to auto select data sources)**



**System auto selecting data sources**



## Lewmar AA560 Chain Counter/remote (Owner Use Only)



## Simrad QS80 Quickstick remote unit with display

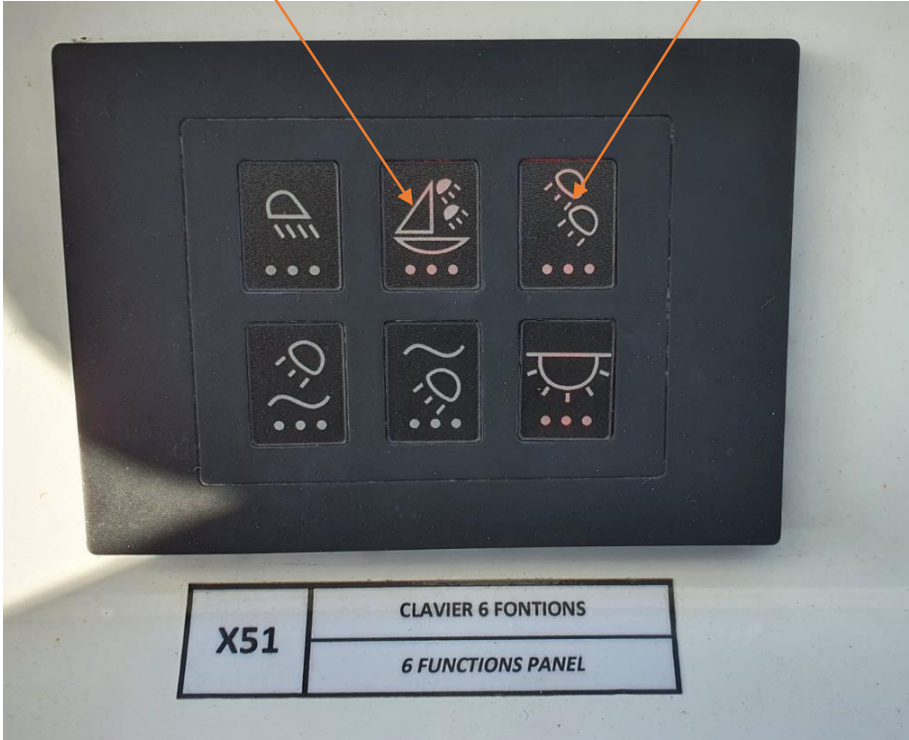
(Owner use only)



**Light Switches at Helm**

**Courtesy Lights**

**Deck lights**



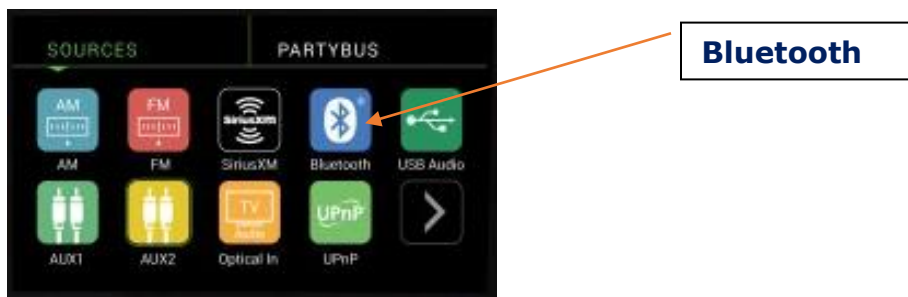


## *Fusion® MS-RA210 Marine Stereo*



### Connecting to Bluetooth

1. Select BT (Bluetooth) Source in the source menu.



2. Select menu to open the Bluetooth menu/settings.



3. Select BT, enter connections and select discoverable.



4. Enable Bluetooth on your compatible device.
5. On your device search for Bluetooth devices.
6. Select Patches from your list of Bluetooth devices.
7. Follow the onscreen instructions on your device to pair and connect.

## 10. VHF Procedures



### Using the VHF radio:

Familiarize yourself with the method for switching channels, and with the squelch and volume controls on your radio. Most radios have a button to instantly select Channel 16 – ensure you understand how this operates or you could end up speaking on Ch. 16 when you think you are on some other channel.

1. Make sure the radio is switched on, volume quite high, power to high unless the station you are calling is very close.
2. Squelch up until loud hissing, and then back a little until the noise *just* stops.
3. Select the channel for calling (Channel 16, unless specified otherwise).
4. Press switch on microphone when speaking. Release immediately.

If no response, wait two minutes and repeat the call. If still no response, wait a further two minutes before trying again. If calling on Channel 16, it is very important to switch to a working channel after the contact is established. Do not use Channel 16 for your conversations – this channel is for hailing and distress only.

### Channels to use:

- 16** Hailing and Distress
- 74** Contact Horizon Yacht Charters (when in range)
- 12** Yacht Charter Companies working channel – assigned for yacht breakdown servicing and emergency only
- 68** Marinas and Yacht Clubs – for lunch/dinner reservations etc
- 06** Ship to Ship – along with Channel 68 and 77 can be used for contact between boats

If your vessel is involved in a non-life-threatening incident with an object or with another vessel, it is important that you contact the Horizon Office immediately at 494 8787 or 542 8788. Please remember to get as much information as possible about your location, the other vessel's description and what damage has been done to your vessel so that we can best assist you.

**Failure to report any accidents or incidents in a timely manner may result in nullification of your hull damage insurance.**

## **Types of emergencies:**

In the unlikely event that you are involved in an emergency stay calm and follow these steps. You will also have an Emergency Procedure card next to your VHF.

**Distress:** "MAYDAY, MAYDAY, MAYDAY." This is an International Distress signal and an imperative call for assistance. It is used only when a life or vessel is in grave and imminent danger.

**Mayday Relay:** used to summon help for a vessel which is either too far offshore to contact the coastguard directly, without radio capabilities or whose radio has been damaged or destroyed.

**Urgency:** "PAN-PAN, PAN-PAN, PAN-PAN" This is the International Urgency Signal and is used when a vessel or person is in some jeopardy but is not considered to be in grave and imminent danger.

**Medical emergency:** "PAN-PAN MEDICO, PAN-PAN MEDICO, PAN-PAN MEDICO" (Pronounced med-ick-oh). This is an International Urgency Signal that should be used when medical advice is needed.

**Safety:** "SECURITE, SECURITE, SECURITE" (Pronounced Say-cure-it-tay). This is an International Safety Signal and is a message about some aspect of navigational safety or a weather warning.

## **How to issue an emergency message**

Select Channel 16 and press transmit button on handset.

Say slowly and clearly 'MAYDAY, MAYDAY, MAYDAY, CALLING ALL STATIONS.

This is.... (Vessel name) ....' and repeat vessel name 3 times.

**Give position** – vessel's position in degrees of latitude and longitude or nautical miles from, and bearing to, a navigational landmark.

**Describe emergency** – list the problem, the type of assistance needed; number of passengers aboard (boat length, hull colour and type are also useful).

Wait 1 minute for a response, repeat message.

**ALTERNATIVELY:** Dial either 767 or 999 from any BVI mobile phone or call 494- HELP (4357).

## 10. Batteries

There are 3 ways to recharge your batteries.

**Engine Tachometer (Will power up with engine start)**



**Hold to disengage transmission and rev in neutral**

Keeping your house batteries charged is essential to ensuring your 12-volt systems will work. Fridges, lights, fans, stereos, and Navigation instruments are some of the most important ones and of course using them draws power from your house batteries. If you conserve energy, you will not need to charge as often. If something is not being used, then turn it off. We often explain that 12-volt power is like water; you need to replace what you use. You can recharge your batteries with the auxiliary engine(s) or your 110-volt battery charger when running the generator or on shore power.

### **Engines:**

Motoring to a destination will automatically charge your batteries. When anchored or moored you can run your engine(s) in neutral at 1400 RPMs to charge your batteries.

If your batteries get to 12.2 volts, then it is time to recharge your batteries. At 12.2 volts it should take about 1.5 hours of charging to get them back to a good charge. It is important that you recharge the batteries completely every day. This may take 2 or 3 charges per day. But you can break this up into more charges of shorter periods of time. Once you think you have charged enough or you just want to go for a sail, turn off the charging system. Wait about 15 minutes and then check the voltage of your house battery. A fully charged battery should come to rest around 12.8 volts. If the batteries do not get to this level, then they need more charging. Please note that you will see elevated voltage readings when charging and just after charging. The latter is why you should wait 15 minutes before checking your voltage after charging.

### **Charging with shore power and generator:**

Using the 110-volt charger via generator or shore power will charge your batteries; Just check that the battery charger is turned on as this is not completely automatic. And check that you see your house battery has an elevated charge level, 13 volts or more whilst charging.



### **Generator not charging batteries:**

- Check battery charger breakers are in the on position.
- Check transfer switches. Ensure selector switches are turned to generator and not shore power.
- Check the main breaker on the left side of the generator. When this breaker is off the generator will run but there is no power going to the chargers and air conditioning units.

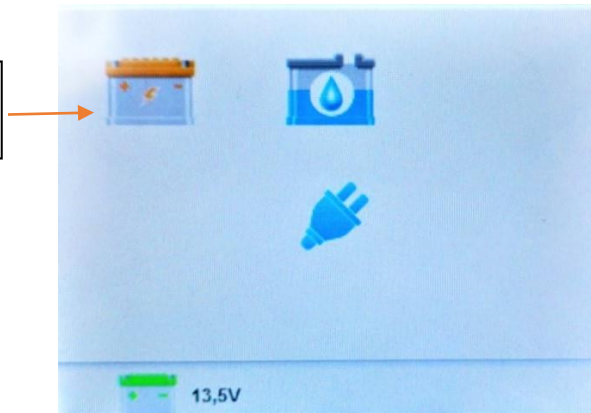
### **Not Receiving Power from Shore:**

- Check the cable is plugged in all the way, you should be able to twist the cable clockwise on both ends.
- If you are still not receiving power from shore, move the shore cable to another pedestal and ensure the breakers on the pedestal are in the on position.

### **Not Receiving Power from Shore:**

- Check selector switches are set to shore power and not generator.
- Check the cable is plugged in all the way, you should be able to twist the cable clockwise on both ends.
- If you are still not receiving power from shore move the shore cable to another pedestal and ensure the breakers on the pedestal are in the on position.

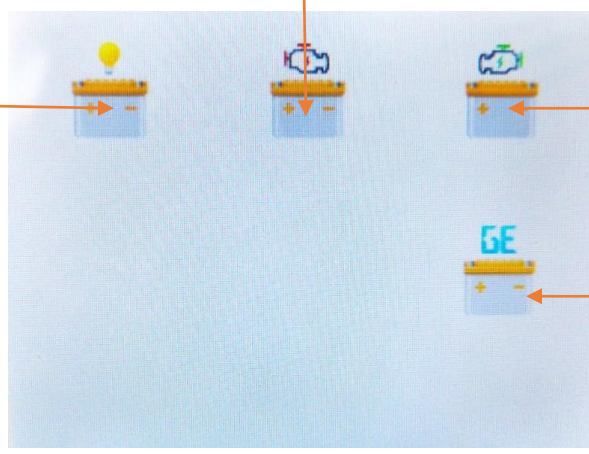
**Touch to open battery menu**



**Port engine battery**

**Domestic/house battery**

**Starboard engine battery**



**Generator battery**

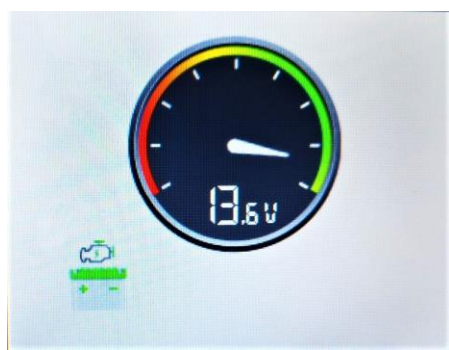
**Domestic/House battery voltage**



**State of charge**



**Port engine battery voltage**



**Starboard engine battery voltage**



**Generator battery voltage**

## 11. Anchoring & the windlass



**Minimum scope: 5:1**  
**Always use bridle**  
Test anchor in reverse 1500rpms

### Setting your anchor:

#### Preparation:

- Establish a nonverbal communication system between helmsperson and windlass operator, as with the noise of the engine and wind, verbal communication proves difficult.
- Shorten the painter so that it cannot go under the yacht and wrap around the prop.

#### Location:

- Choose a clear area to anchor in and you can see the bottom. A white bottom is sand and perfect for anchoring. A brown or green bottom will be grass, rock, or coral. **Only anchor in sand**. Maximum depth would be 1/5<sup>th</sup> of your anchor rode. Remember the depth is set from the bottom of your keel so keel draft should be added to the reading of your depth gauge.
- Anchoring on a lee shore is not recommended and would recommend using both your primary and secondary anchor if you choose to anchor off a lee shore. (See below)

#### Action:

- Always have your engine revs increased to @ 1400 rpms before windlass operator touches the windlass remote. The windlass needs optimum energy to operate correctly.
- Minimum scope is 5:1. In heavy weather you may want to increase that, always ensuring your swing area is clear of any obstacles.
- Use the elements; approach from downwind or current, whichever prevails.
- Have the anchor ready to deploy. This may require you to slack the chain and manually push the anchor slightly overboard so that it will go deploy when you press down on the remote.
- Once the yacht is stationary use the electric windlass to drop the anchor to the sea floor. The elements will push you back and away from the anchor. Keep deploying chain until you have acquired the correct scope. Attach the snubbing line.



- Always attach the snubbing line before setting the anchor with the engine and whilst you are anchored. The snubbing line protects the windlass, and it is important that you attach the snubber every time you set the anchor. Attach the hook around the chain link (the hook is too big to go through the link) and cleat off the end of the line to a bow cleat. Pay out enough chain so that the snubbing line becomes taut.
- If the hook falls of the chain, it means that there is not enough tension on the line. You may need to hold slight tension on the snubbing line as you deploy more chain until the snubber takes the load of the anchorage. Engage reverse, slowly building up to 1500 rpm to really drive your anchor into the sand. Take transits as you set the anchor so that you know that the anchor is not dragging.
- It is always advisable to snorkel the anchor and ensure it is bedded in correctly and not just lying on its side or hooked on a rock.

### **Retrieving Primary Anchor:**

- Never use the windlass to pull the yacht to the anchor. The windlass operator should point in the direction of the anchor chain so that the helmsman can move slowly in that direction. As soon as there is some slack on the anchor chain the bowman tells the helmsman to put the engine in neutral and then increase RPMs. Bowman then retrieves all the slack chain. When the chain becomes taut then you repeat the process from the beginning. Ensure the anchor does not swing into the bow of the yacht.

### **Setting a secondary anchor:**

- Your secondary anchor is a quick set type of anchor and is usually stored in the cockpit locker. It has 30 feet of chain and about 170 feet of line. For this reason, we have always found it easiest to put this chain in the dinghy with two people and deploy it from there. Take note where your primary is and drive away from the yacht at a 45-degree angle of the primary. Drop the anchor with the shank pointed at the yacht and deploy the rode as you drive back to the bow of the yacht. Tie off at the bow. Once back on the yacht and dinghy secured, manually take the slack out of the 2<sup>nd</sup> rode and tie off. Now engage reverse to 1500 RPMs as before.

### **Manual operation of the windlass**

If you lose power to your windlass, start the engine and rev to 1500 rpms to make sure you have not got low battery voltage. **Check that the breaker shown below has not tripped in the STBD cabin behind the door.** If you still have no power, you can operate the windlass manually.

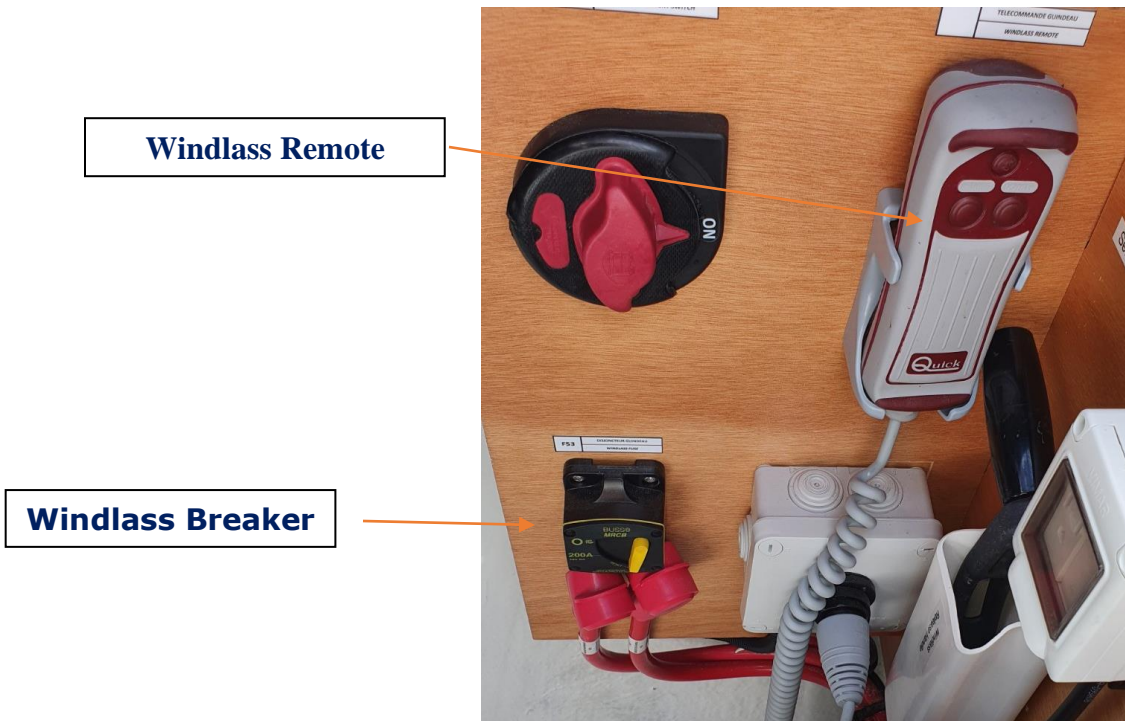
To drop the anchor, insert the windlass handle into the central hole on the top of the windlass.

Turn the handle anti-clockwise so that the gypsy loosens its grip on the chain. Your anchor is now ready to drop.

Remove the safety line or safety pin, and push the anchor over the bow, keeping hands and feet clear. Control the rate the chain pays out by tightening or loosening the wing nut with the stainless handle.

When you have paid out enough chain, between 5 to 8 times the water depth, push the handle forward to tighten the wing nut. Next, fit the bridle and release more chain on the gypsy so that the load is taken up on the snubbing line.

To raise the anchor, put the handle in the outer hole and turn the whole drum clockwise, this will wind in the chain. However, it is quicker if you pull the anchor up by hand as the helmsperson motors forward a little at a time, to give you slack on the chain. If you are fit and strong, it is possible to heave an anchor aboard.



## ELECTIC WINCH

Two speed electric winches at helm. Lift cap to expose the buttons or the cover the buttons to prevent accidental use of the winch. When using the electric winch keep an eye on the sail as it is going up to make sure battens do not get caught in the lazy jack lines.

Three two-speed winches at helm



Two-way winch for travellers



## Winch Breakers

The electric winch breakers will trip if a unit is overloaded. It is in the starboard hull locker. To reset a winch breaker simply push down the yellow lever to the '1' position.



## 12. Picking up a mooring buoy

- Ensure dinghy painter tied off short on the bow or amidships and clear of the prop.
- 
- Ensure there are two long dock lines at the bow, one attached to each bow cleat.
- Approach mooring buoy, keeping the bow into the wind or current, whichever prevails.
- Have a crew member on the bow to pick up the mooring pennant with the boat hook.
- The bowman will direct the helmsman to the mooring, using the already established non-verbal communication system. Once at the mooring, inspect the buoy and pennant for any signs of wear and tear - the overnight moorings are well maintained, the day balls to a lesser degree. If you are ever unsure about a mooring buoy's integrity, choose another location to moor up.
- Pick up the mooring pennant using the boat hook. Pass one dock line through the pennant and fasten the dock line back on its cleat. Repeat with the second line.
- Once you have secured your lines remember to centralize the wheel and lock in place to avoid the yacht sailing around the buoy.
- Now set up a back-up line. The line should lead from a bow cleat to the mooring buoy and fasten on to the buoy itself. It is always easier to do this from the dinghy.
- To depart, slowly motor the yacht forward to create slack, release one end of the dock lines from their cleats and allow to slip through the pennant eye. Allow the pennant to fall into the water. Fall back with the wind or current and be careful not to foul your prop on any moorings.
- **Remember to tie your dinghy on a short painter and away from the stern whenever you are manoeuvring in close quarters**



### 13. Bilge Pumps

Your yacht is equipped with two manual bilge pumps and two electric bilge pumps (one in each hull). The primary bilge pumps are on float switches and operate automatically providing that the bilge pump switch on the 12v panel is left in the center position. If the float switch fails, the pumps can be forced to operate by pushing the switch located on the 12v panel. It is important that you check all the bilges once a day.

**Note:** The engine compartments drain into the main bilges.



**MANUAL BILGE PUMP (Below Port and starboard cockpit cushions)**



The manual pumps are located either side of the cockpit under the cushions and the handles for these are towed under the central cockpit locker lid.

**Manual Bilge Pump Handle in Port and Starboard Cockpit Lockers**





## 14. Freshwater system

Echo has two inter-connected water tanks for each hull with a combined capacity of 160 gallons.



Seawater faucet



Before filling the tanks let the water run from the hose for a while before placing the end into the filler located amidships on the bow, just in front of the salon windows. Please ensure that the correct filler is used, NOT the waste tanks or the diesel fills.

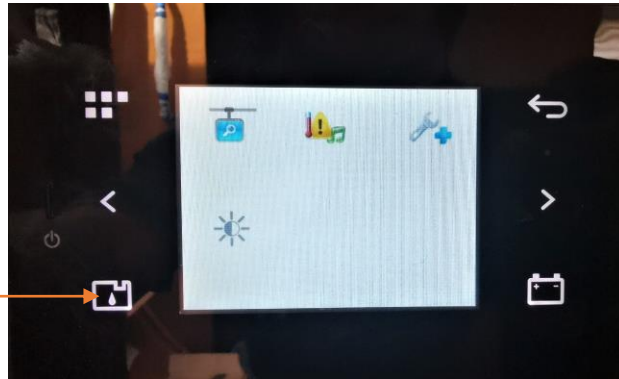
To use the freshwater system, turn on the freshwater breaker on the 12v panel and open a faucet. When the tanks run out of water the pump will run at high speed and the faucet will start to cough air.

If the pump is running continuously first check if a crew member is using water, if not then check your water levels. If you are out of water in only one tank you should switch off the freshwater pump immediately and switch to the next tank. The water level can be read by pressing the top button under the LCD display on the 12v panel.

The pump running continuously can also mean that there is air in the freshwater system. There might be air in the lines because you switched from an empty to a full tank or after refilling your water supply. If there is air in the freshwater system open different faucets to let the air out.

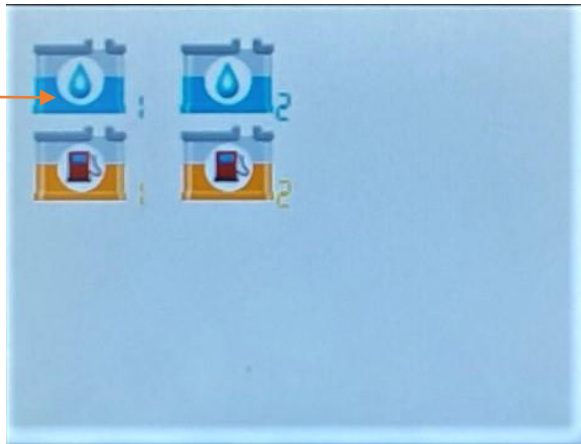
**Note:** If you are not out of water nor do you have air in the system, but the pump is running or cycling it could mean you have a freshwater leak. If you believe there is a freshwater leak, please check your deck shower. Most times it was not put away properly and if it is leaking you can shut it off using the mixer and continue using the rest of your freshwater system.

## Water Gauges

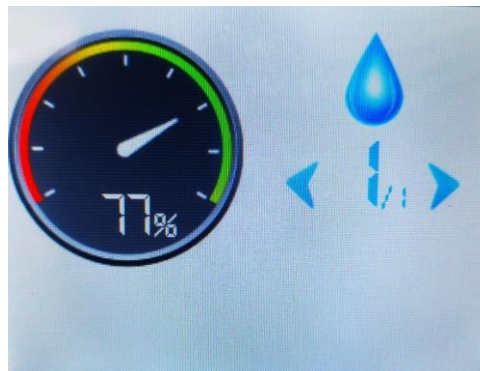


Water & Fuel Gauges

Touch to open  
water gauge



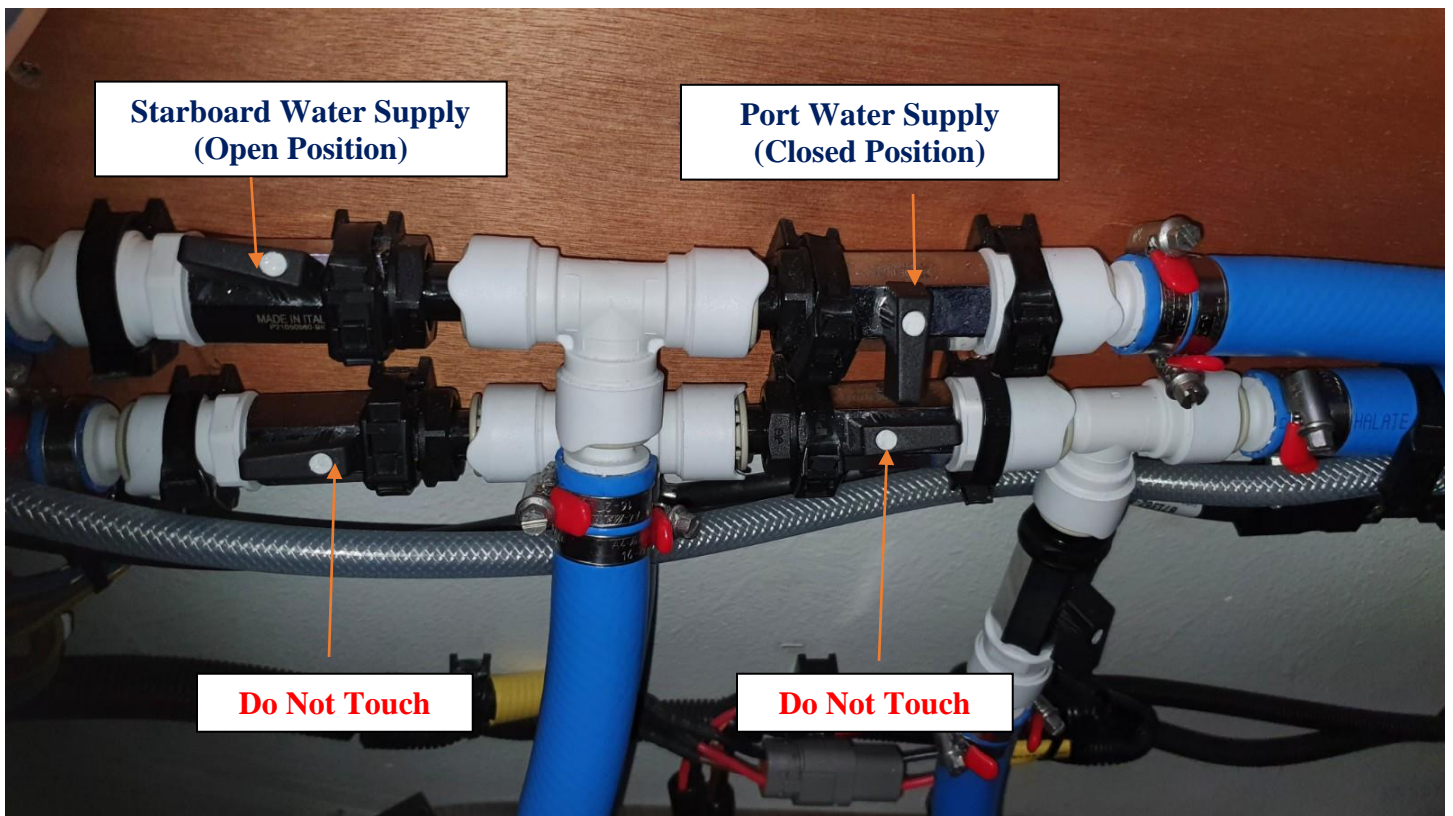
## Water gauge



## Water Change Over Valves

### Switching your freshwater tanks:

- Switch off the freshwater pump at the 12-Volt panel.
- Open the bilge compartment below the port companion way.
- Facing aft you should see your water change over valves. You are only using the two upper valves.
- Close the valve that is in the open position and open the valve that is in the closed position.
- Turn on the freshwater pump at the 12-Volt panel and open a faucet to prime the system.



## 15. Heads

Slide Sink to use the head



- Nothing is to be put down the head unless it has been digested first.
- Echo is fitted with electric heads.





**Blocked heads due to any other blockage other than mechanical failure of parts is at the charterer's expense as per your charter contract. This includes the chase boat and technician's fee.**



Flush/ Rinse Bowl

Wet Bowl (Left) Dry Bowl (Right)



- Before use, ensure that there is enough water in the bowl.
- If the bowl is empty, hold the lower Flush Control Switch on Wet Bowl  position until the flushing pump is primed, and water enters the bowl.
- During use, pump as necessary to keep the contents of the bowl low enough for comfort.
- After use, hold the upper Flush Control Switch Flush/Rinse bowl  until the water in the bowl is clear (Flush for as long as possible so the waste travels all the way through the lines).
- When the water in the bowl is clear, hold the lower Flush Control Switch on the Dry Bowl  side  until the bowl is empty. Always leave the bowl empty to minimize odour and spillage.

AFTER USE DRY BOWL (SHUT) (  ) THE FLUSH CONTROL.

Echo has four holding tanks, two blackwater tanks and two Greywater tanks. Waste goes directly to the holding tank and can only be discharged by holding down the button below the 12-Volt panel that corresponds with the holding tank you want to empty. Always remember to flush your holding tanks when sailing or motoring since on Echo the holding tanks are always accumulating waste and must be flushed manually.

**Check that the holding tanks are empty before returning the vessel and please flush each one through to minimize residual odors.**

### Black Water and Grey Water Tank Gauges and Alarm





**Hold down the button that corresponds to the tank you want to empty. (Located below holding tank gauges)**



**Discharging port Grey water tank**

## 16. Showers

Your yacht has a hot & cold, fresh-water shower in each head and on each of the transoms. If the engine has been running, the hot water can be very hot – be cautious! Hot water is generated automatically through running the main engines. Hot water can also be created by turning on the water heater breaker on the 110v panel with the generator running or on shore power.

To use the showers, the fresh-water pump must be activated on the 12v panel.



**Shower Drain with Automatic Float Switch**



## Deck Shower

The valve next to the shower head will switch the water on and off and control the temperature.

To use the shower head, simply pull it out and press the lever on the back. If no water comes out, make sure that the 12V water switch is on and the shower hose is not kinked.



## 17. Propane and stove

The propane tank locker is in the cockpit beneath the fwd locker. There are two propane tanks, one connected to the supply and one spare.



Propane Tank Is Below Port Cockpit Steps



### To use:

- Turn on the Propane switch in locker below the galley sink. This opens the solenoid on the tank.
- To light, turn the knob that corresponds to the burner that you wish to use through 90 degrees anticlockwise, push the knob in and light the burner using the matches provided.
- Hold the knob in for 10-15 seconds, then release. Make sure that the flame goes all the way around. Reduce any wind that may hinder this by closing hatches or switching off fans.
- Light the oven in the same way, pressing the knob in whilst holding your match to the bottom burner.
- If you cannot get it to light, check the manual valve on the propane tank itself.

Propane Solenoid



The 12v solenoid system is USCG approved device. You do not need to shut any manual valves unless you wish.

**FOUR BURNER STOVE**



**OVEN**



### Gas safety

All our yachts are fitted with propane detectors. On Echo, the display is located to the right of the 12V panel. The propane 'sniffer' has been placed in the bilge (propane is heavier than air and so will sink into the bilge). The detectors are sensitive to several types of gas and will trigger the alarm. The alarm can also be triggered if there is moisture in the bilge. If the alarm sounds it does not necessarily mean that the propane system is leaking, so do not panic!!

### If the alarm goes off, follow these steps:

- Close the valve on the propane tank.
- Check the stove and surrounding area for propane smell.
- If detected, open all the bilges and hatches. Point the boat downwind and use the manual bilge pump to pump out the bilges.
- Call Horizon immediately

**Propane detector is located portside galley above solenoid**



**Under no circumstances should you use the electrical bilge pumps or any other electrical system if you suspect a gas leak. Call Horizon immediately.**



## 18. Refrigeration

There are two 12-volt refrigerators and a 12-volt freezer on board your vessel. This system is designed to run 24hrs a day if you wish. To ensure that it does not fail there are two things you should do.

- Firstly, keep your batteries charged. If the level goes below 12v the system will malfunction. Refer to section 10 for charging instructions.
- Secondly, do not puncture the cold plate in your fridge! Do not chip at the ice or use any other sharp items in the fridge. If something is frozen to the side of the fridge do not force it away. Pour warm water on it if you need to melt the ice.

Each unit can be individually controlled using the thermostats located in each unit. On your arrival, the dials will all be set to their coolest setting. Keep it on this setting until all your food has chilled thoroughly. Then you can turn the system down or off if you wish. Or if it is not cold enough you can augment the system with ice.

Ask one of our staff for a deck cooler if you would like one for storing your drinks. It will keep the drinks cooler and the refrigeration colder, as people will not be going in it every 5 minutes for a drink. There is also an in-built cooler for drinks just forward of the salon seating.

Please note that we are in the tropics, and we cannot guarantee that items will remain frozen when placed in the fridge and that fruit, vegetables and other fresh produce may have a shortened shelf life.

**Ice maker** (Water for icemaker is only supplied by the starboard tank)

**Cockpit Fridge**





**Galley Fridge**



**Freezer (Port Aft )**



## 19. BBQ

- When using the BBQ, tie your dinghy off at the side of the yacht, not off the stern.
- Never use the BBQ while sailing.
- Never use the BBQ on a dock.
- Never change propane tanks when using the BBQ.
- Make sure someone is always tending the BBQ when hot.
- Call us if you have too much food.

### Magma Propane Grill



### Regulator



### Propane canisters needed for Grill



## 20. Fire Safety

Fire extinguishers are installed in each cabin, under the salon seating and in the central cockpit locker.

Prevention is the best answer to fire safety.

- Always switch off the safety solenoid when stove is not in use
- Never leave the stove or oven burning unattended.
- Never change propane tanks whilst barbequing.
- Never smoke below decks.
- Never smoke when changing propane tanks.
- Safely store any flammable liquids (for example charcoal lighter fuel).
- Keep matches away from children.

### Engine compartment fire:

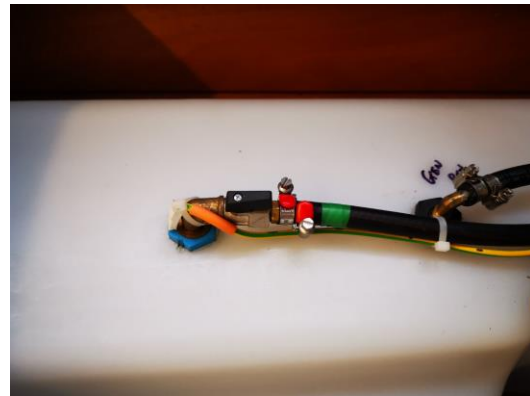
In the event of a fire in the engine compartment use the fire extinguisher positioned closest and discharge it through the access hole located centrally on each aft cabin headboard. There is a fully automatic fire extinguisher in each engine compartment.

- Pull the yellow key out.
- Press down on the red button until all the contents of the extinguisher have been discharged.
- Fuel shut-off valves are under each aft bunk.
- Do not open the engine compartment even if you think the fire has been extinguished, dying embers can easily be re-ignited by a fresh supply of oxygen (air).



**Fuel shut off valves  
under aft cabin  
bunks**

**Engine Fire Access Hole**





### Open fire:

- Pull out the yellow safety tab.
- Point the extinguisher at the base of the fire and press down on the red button to discharge contents.
- Generously cover the base of the fire and surrounding area to ensure the fire is under control and cannot spread. Continue discharging extinguisher until the fire is out.



### Galley fire:

- Shut off the propane at the tank.
- Take the fire blanket out of its container.
- Carefully lay the blanket over the fire, laying the blanket away from you and keeping yourself always protected from the flames.
- Ensure hands and limbs are protected from the fire by the blanket.
- Once in place leave the blanket until all heat has gone from the scene of the fire, this way you can be sure that the fire has gone out and will not re-ignite.

### Smoke alarm:

- There is a battery-operated smoke alarm mounted in the salon. This alarm will be triggered by smoke caused by cooking or burnt toast. Opening a hatch to allow ventilation will minimize triggering the alarm. For safety purposes, the 9v battery should not be removed from the smoke alarm.



## 21. Dinghy & Outboard

**The driver of the dinghy must be over 18 and must always be wearing the kill cord. Never operate the dinghy under the influence of alcohol or drugs.**

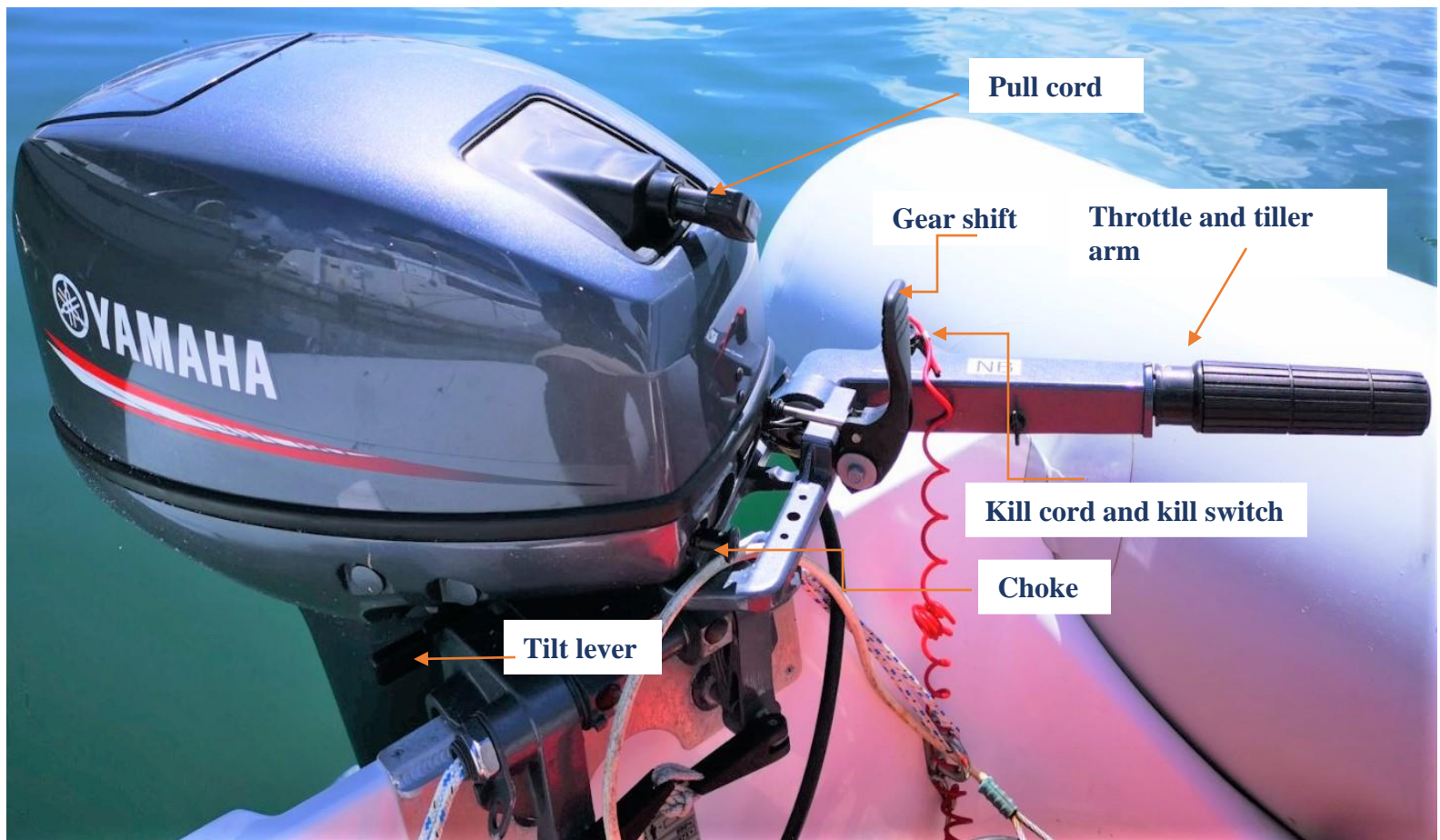
- Always tow your dinghy on a short line while motoring and a long line while sailing, always tow with the engine leg up as it gives you an extra half knot.
- If conditions are very rough, the outboard needs to be mounted on the push-pit.
- When going ashore for an evening's entertainment allocate a dinghy captain, someone who will bring the whole crew back to the boat safely, allowing the rest of the crew to enjoy various local cocktails and concoctions.
- To start the engine, lower the motor into the water using the lever on the starboard side of the engine. The lever position corresponds to the motor position, up and fwd for towing and back and down for driving. Check you are in neutral, and **the safety cord is in place**. For starting an engine that has been at rest for 3 or more hrs use the choke. Pull the choke out and set a few revs with the throttle. Do not twist the throttle trying to prime the engine. You will only flood it. Face the engine and pull the start cord and push the choke back in as soon as it runs. If it runs for a second but cuts out, try again without the choke.
- To stop the engine, press the button on top of the kill cord, or pull the kill cord out.
- Keep the kill cord with you to prevent anyone from borrowing it. You have been provided a dinghy lock and cable. Use them.
- Do not drag the dinghy onto a beach; anchor it off or put it on a dock with a stern anchor to prevent damage from going under or hitting the dock.
- Do not speed in and around other yachts, speeding fines have been introduced.
- At night, an all-round white light must be displayed along with red & green side lights, and it is always a good idea to have a flashlight with you, to show the way, and warn other vessels of your presence.
- Wear the life preservers provided in the cockpit lockers when in the dinghy.
- **GAS to OIL ratio, 1 gallon: 3 ounces.**



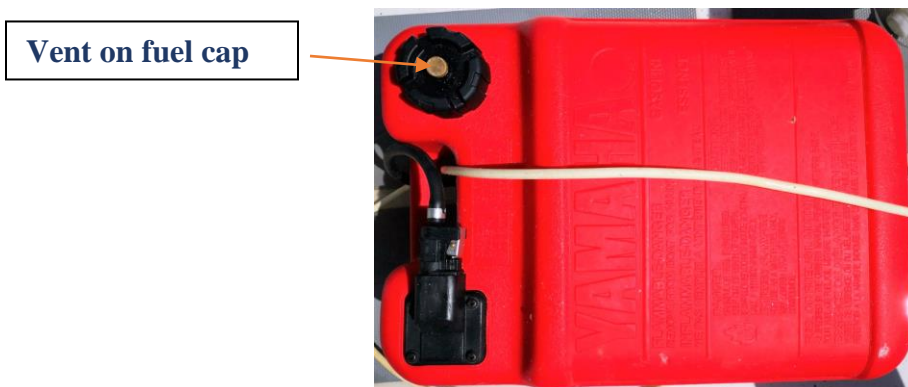
## Outboard start procedure:

1. Place Kill cord under kill switch (Dinghy driver must always wear the kill cord).
2. Open vent on fuel tank cap (this vent can stay open; it allows air out but will not allow water to go in). **The fuel in the tank expands in this climate and if the vent is left closed it can damage the tank and cause a fuel leak.**
3. Few pumps on fuel line bulb.
4. Make sure the outboard is neutral.
5. Add some revs using throttle on tiller handle.
6. Pull on start pull cord.
7. If the outboard does not start then pull choke and try again, as soon as the outboard starts push choke back in.

### Outboard



### Fuel tank



## 22. Dinghy lift

### Lowering the Dinghy Lift:

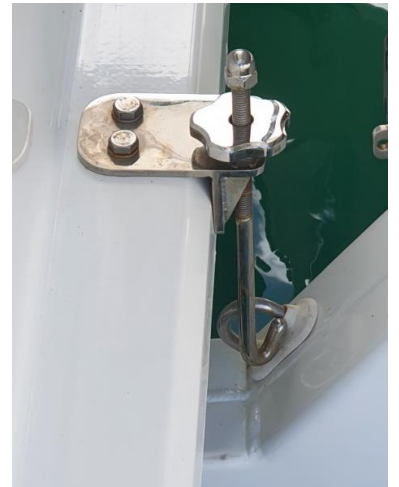
- Refit the dinghy plug if it was removed.
- Undo the safety locks on both sides (port and starboard).
- Holding down the switch until the platform just over the water.
- Undo the dinghy safety straps.
- With the dinghy painter in hand continue lowering the dinghy until it is afloat.
- Once the dinghy is off the platform, lift platform out of the water.

### Raising the Dinghy Lift:

- Move dinghy over the lift platform.
- Raise platform until dinghy is resting on the two holsters.
- Secure dinghy safety straps.
- Raise platform all the way up.
- Refit and secure safety locks on both sides.



**Dinghy Lift Turnbuckle**





**Dinghy Lift Control**



## 24. Watermaker



Time Bandit is equipped with a water maker unit from Rainman **which fills the Stbd water tank ONLY**. The unit is installed under the stbd fwd bunk. The remote control, which is used to start and stop the unit, is in the fwd locker in the stbd fwd cabin.

**IMPORTANT:** The water maker will only function when the generator is running. Time Bandit has two 80-gallon freshwater tanks. The water maker will produce approximately 20 gallons of fresh water per hour. We recommend running the unit for two to three hours every other night when the generator is in use. You do not need to bring Time Bandit back with a full tank of fresh water as it is preferable to fill the water tank with shore water.

## Using Control Panel

### Salinity Sensor

The Rainman control panel has an integrated salinity sensor to indicate the water quality. It incorporates a salinity probe and related electronics to power a tri-colour LED to be green, yellow, or red.

Normal operating procedure is to have the product water three way valve set to “Divert” when you start your system. Pressurise the watermaker as per normal operating procedures. When the water quality LED turns

yellow or green, the product water has sufficiently low total dissolved solids (TDS) and the product water valve can be switched to “Tank”. At this point, product water is flowing into the vessel’s water tank.

LED colour:

- **Red** – High TDS – Consider not using the product water. It is expected that the LED will be red for at least a minute from when water is being made. This is to flush the stale product water or pickle solution out of the watermaker. If it stays red, there is a TDS issue to resolve. This may be related to worn RO membranes or a mechanical issue with your watermaker.
- **Yellow** – Medium TDS – Product water has slightly higher than normal TDS, but is within operating range. If the LED stays yellow for an extended period of time, there may be a minor mechanical issue or the RO membranes may be ageing. If this is due to the membranes ageing, consider changing them within the next year.
- **Green** – Good TDS – A normally operating system with young membranes and operating in seawater should reach green within two minutes of reaching full pressure. The system is operating within specification for water purification. It is not a comprehensive indicator that everything is perfect within your watermaker.
- **Off** – No TDS reading – Either extremely pure water is flowing through the system or no water at all is flowing. This may commonly indicate that the system has not been pressurised yet.



## Tank Divert Valve

This three way valve controls the flow of product water. The system should always be started with the valve set to Test (Divert) when the water is being diverted overboard. After the water quality light changes from red to either green or yellow, the product water is sufficiently pure and the valve can be changed to send water to the vessel’s tank.





## Fresh Water Flush Trigger

If the optional fresh water flush system is installed, the control panel adds some functionality. If the autoflush is not installed, the features described below sit without function.

The power switch on the control panel has more function than the simple on-off switch on the pressure supply unit (PSU). The switch itself is powered by 12-24VDC and it controls a relay located either in the PSU capacitor box or the compatibility kit.

**ON** – The PSU is powered and the motor will be running. At the same time, the autoflush timer box gets unpowered, so it is not possible for a flush cycle to initiate while making water.

**OFF** – The PSU is off and the autoflush is not enabled.

**AUTOFLUSH** – A flush cycle will be triggered and then the flush timer will be set for a seven day cycle.



The blue flush timer LED is effectively an extension of the blue LED in the flush timer box. It will not be illuminated during water making or when the system is off. When the control panel is switched to autoflush, the blue LED will be flashing to indicate the number of days remaining until the next flush cycle.



## Low Pressure Gauge

This gauge is monitoring the pressure at the outlet of the prefilter. The actual reading of this gauge is not particularly important, so long as it reads at least 0.2 bar (2.5psi). This is the pressure required to feed the high pressure pump.

If the pressure drops below this level, it typically indicates one of three issues.

1. Prefilter is getting dirty and restricting flow.
2. Impeller is wearing and not providing sufficient pressure.
3. There is a blockage in the intake stream.

**Watermaker and watermaker filters in Tech spares box.**