



**Information & operations manual for
Sun Odyssey 490 2020
'After Physics'**



Welcome



Welcome to Horizon Yacht Charters and your Sun Odyssey 490 "After Physics". 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 in's and out's 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,

Sylvia and Andrew
Directors

Office Hours:

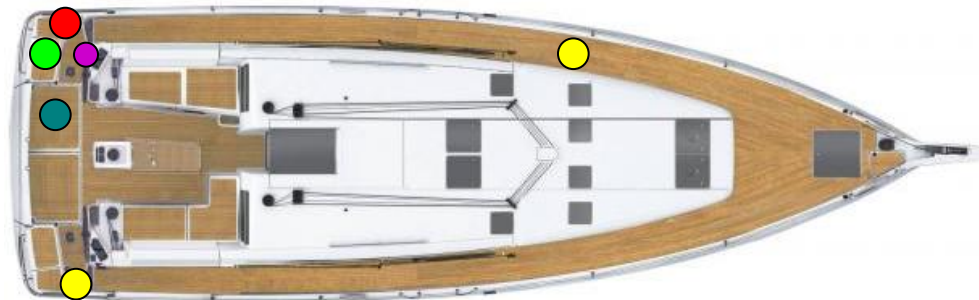
Monday – Sunday 08:30 – 17:30

Telephone: (284) 494 8787

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

- 1. Yacht specifications**
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1. Yacht specifications



Length	49'
Beam	14' 9"
Draft	5' 5"
Fuel	63 Gallons
Water	169 gallons (Starboard aft 87 gal + Port Mid 53 gal)
Engine	80 hp Yanmar
Generator	Onan MDKBJ/W

Location of:

- Fresh water refills (**1 Stbd aft and 1 port mid**)
- Diesel refill (**Port aft quarters**)
- Manual bilge pump (**Port helm**)
- Propane tank (**Port transom locker**)
- Windlass Breaker (**Port aft cabin bunk**)
- Diesel cut off valve (**under port aft bunk**)
- Water tanks change over valve (**Under stbd fwd saloon seat**)
- Generator (**Port transom locker**)

2. 12v & 110v Panel



Top Row:

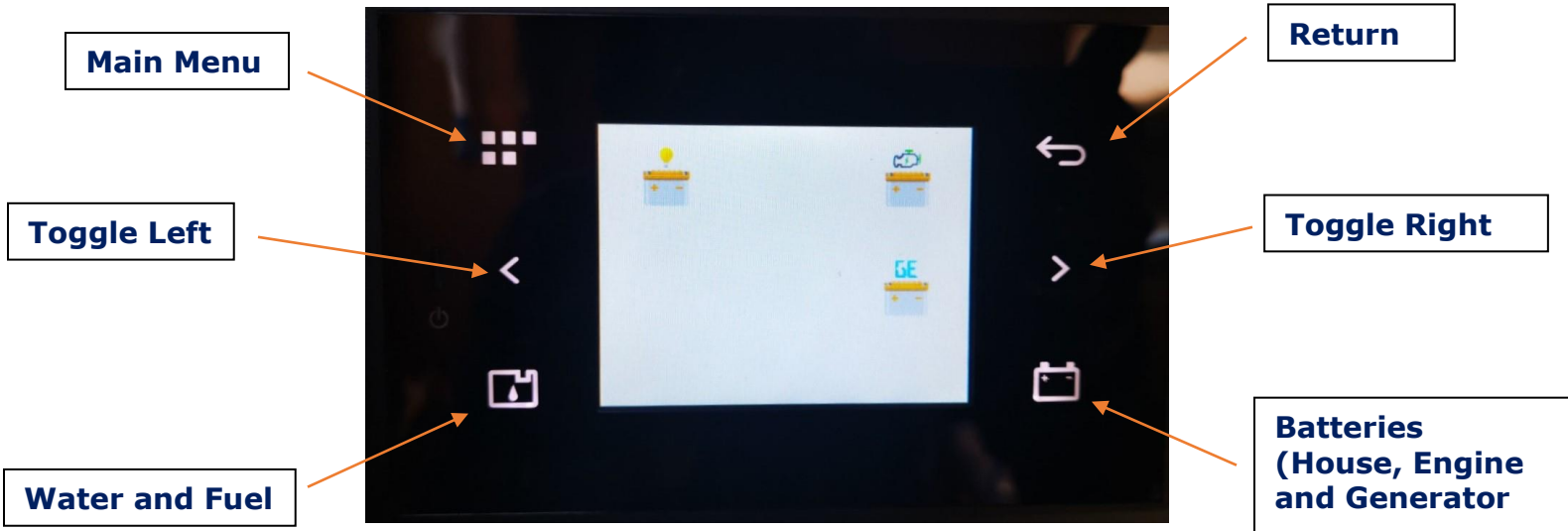
Electronics
Navigation Lights
Steaming Light
Deck Floodlight
Anchor Light

Lower Row:

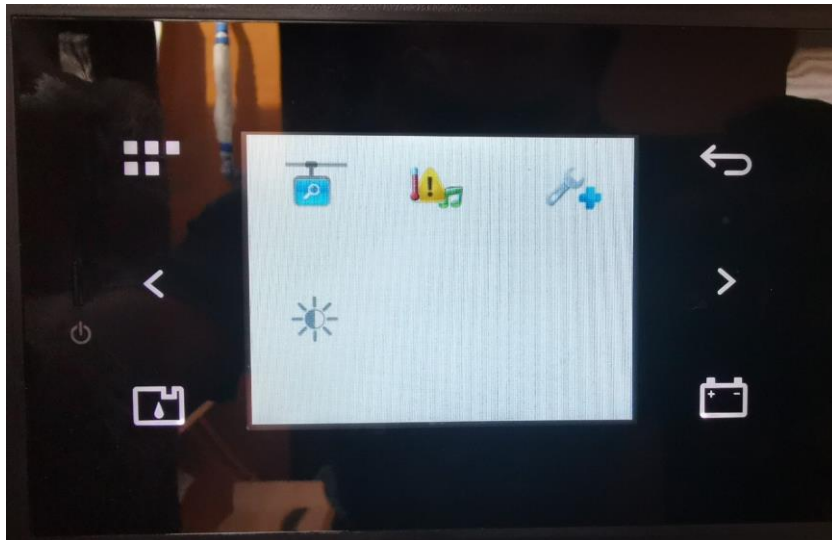
Cabin Lights
Primary Bilge Pump (**Press once for auto and twice for manual**)
Aux (Cockpit rope light)
Fresh Water Pump (**On when using heads**)
Refrigerator

Switches on panel flash if there is a fault, resettable fuses behind panel.

3. Voltmeter



Main Menu: Display and owner settings (Do not adjust owner settings)



4. Charging

Keeping your house batteries charged is essential to ensuring your 12volt 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 for 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.



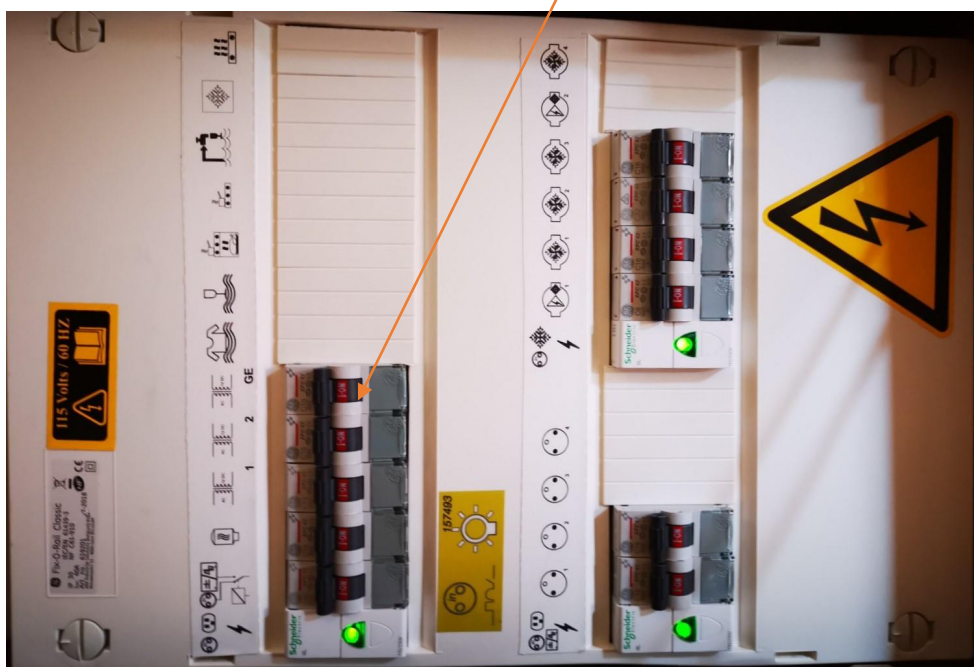
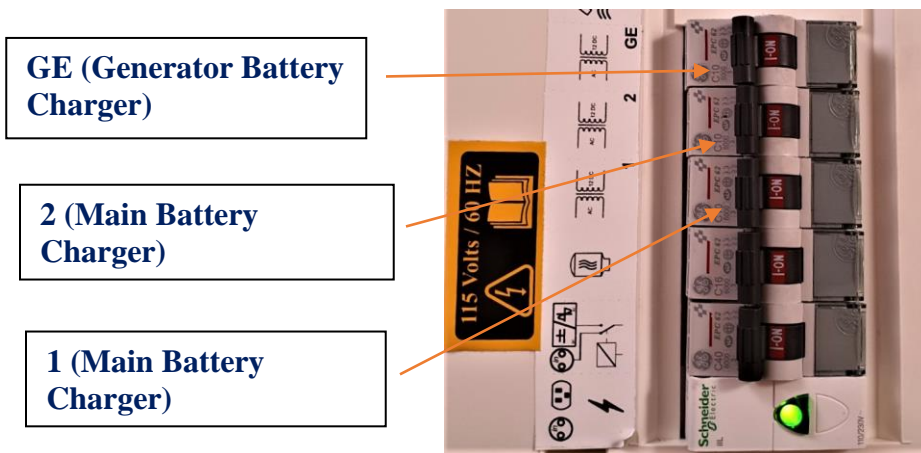
Hold button and move shifter to disengage transmission.

Charging with shore power and generator:

Using the 110volt 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.

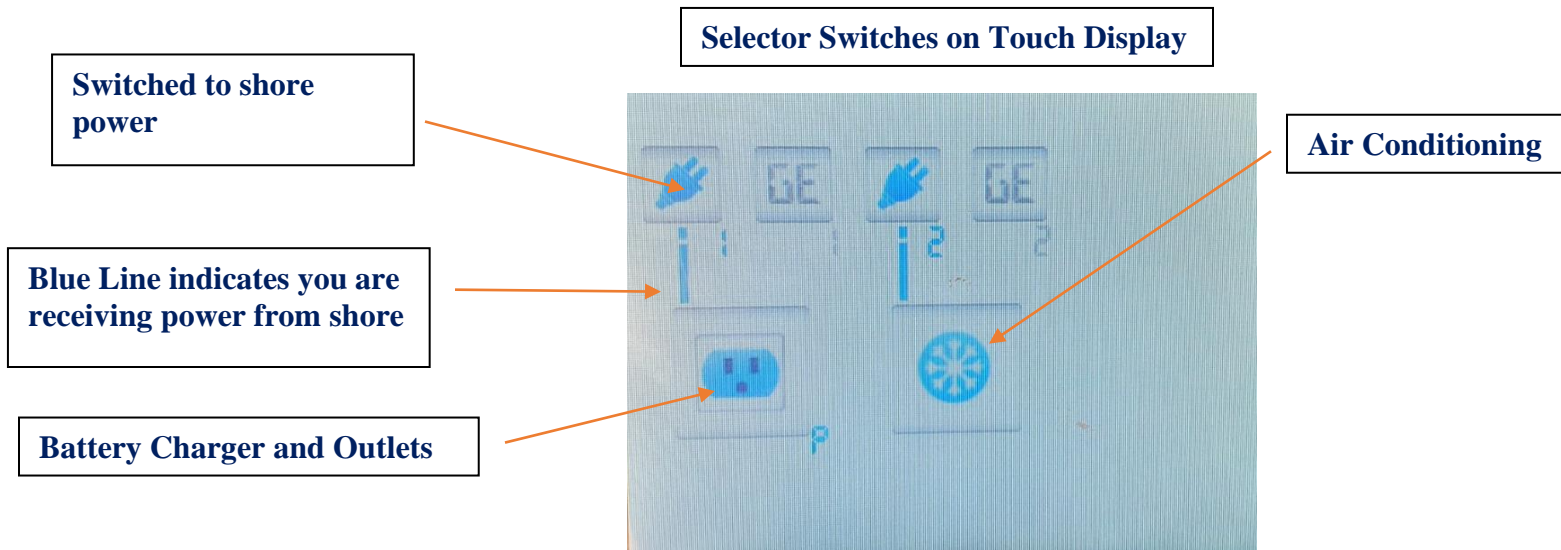
There are two selector switches in the port aft cabin generator locker should stay in the auto position (You can select shore or generator using the touch display at the nav desk). In the case of a system failure, the switches can be operated manually. **Call the manager on duty if there is a system failure.** On shore power you have air conditioning, 110v power to your outlets and you are charging your batteries.

Battery Charger Breakers



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 no power going to the chargers and air conditioning units.



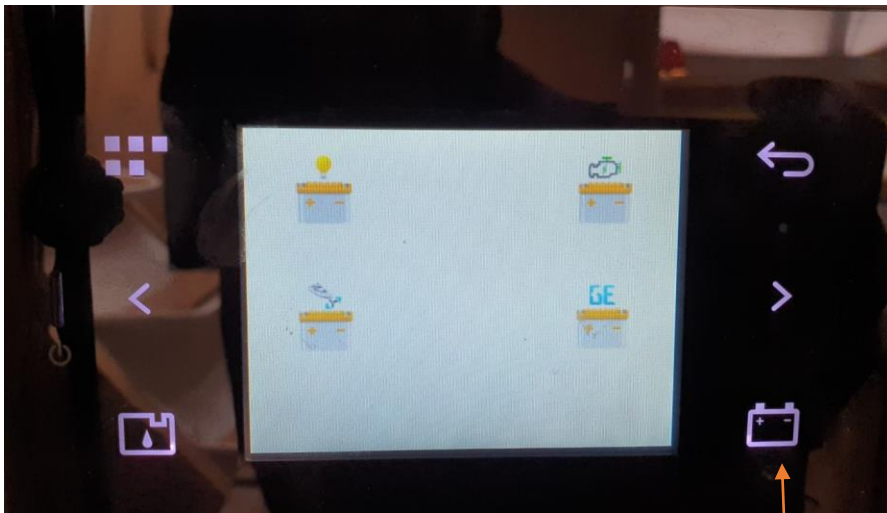
Selector Switches and removable handles in starboard aft cabin locker.



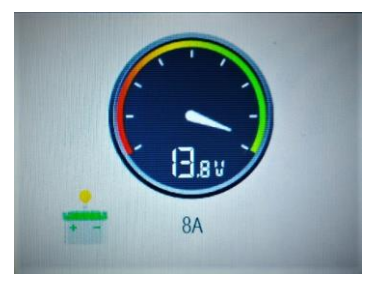
Not Receiving Power from Shore:

- 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.

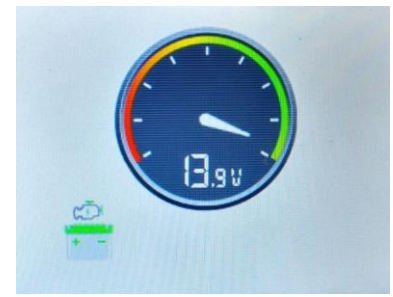
Batteries (Voltmeter and Switches)



Domestic/Main Battery



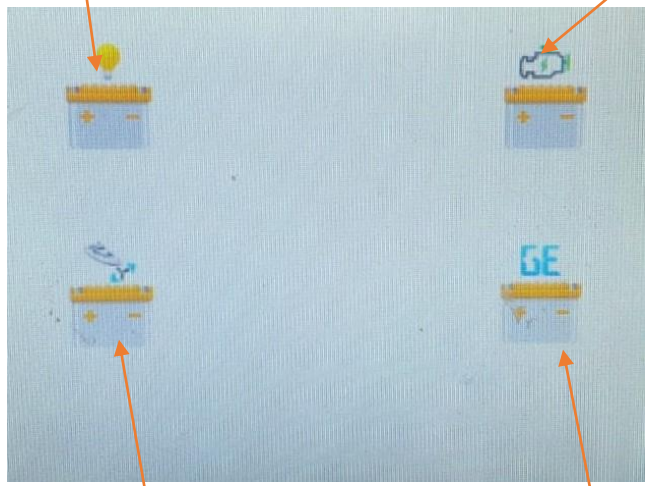
Engine Start Battery



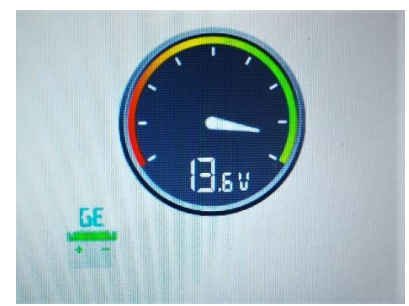
Batteries

Domestic/Main Battery

Engine start battery



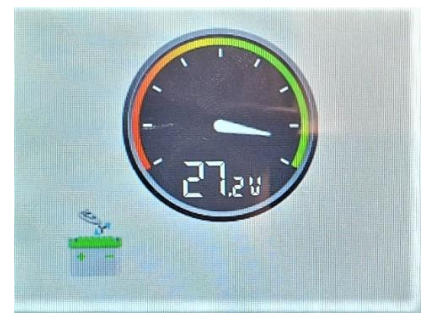
Generator Start Battery



Bow Thruster Battery

Bow thruster battery (Owner use only)

Generators start battery



Battery Switches:

Domestic (Main), Generator and Engine battery switches are in front of the port aft cabin bunk. The battery switches must remain in the on positions unless instructed to do otherwise.

Engine Battery Switch

Domestic (Main) Battery Switch



Generator Battery Switch



5. 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.**

After Physics is equipped with a built-in Xantrex Pro Watt inverter that allows you to have access to all outlets when the boat is underway. There is a remote switch **located in the port aft cabin** that enables you to turn the inverter on.

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

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



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

6. Breakers and fuses

All 12V system fuses are in the port aft cabin locker.

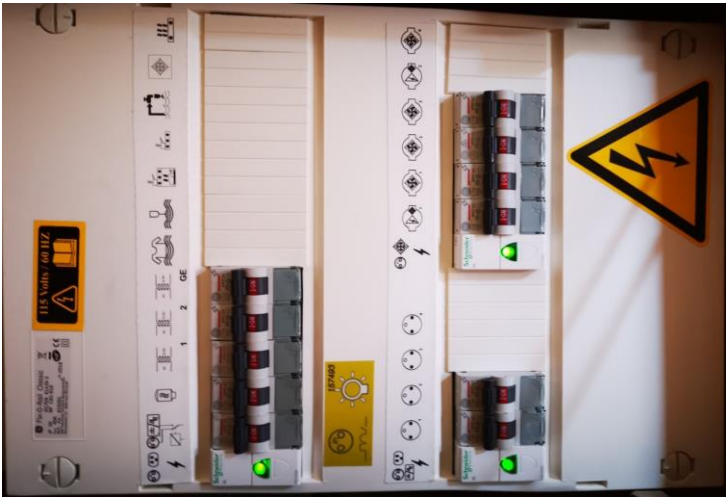


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

- | | |
|---|-----------------------------------|
| 1. 12 V Socket | 11. High water alarm |
| 2. Hifi | 12. Electric toilet |
| 3. Touch screen (Supply) Voltmeter | 13. Gas solenoid |
| 4. Propane dectector | 14. Spare |
| 5. VHF & AIS | 15. Stratum 5 |
| 6. Shower drain pump | 16. Freezer |
| 7. Shower drain pump | 17. Windlass |
| 8. Shower drain pump | 18. Engine comp ventilator |
| 9. Shower drain pump | 19. Spare |
| 10. Electric toilet | 20. Spare |

110V Breakers (In port aft cabin bedside locker)

Air Conditioning



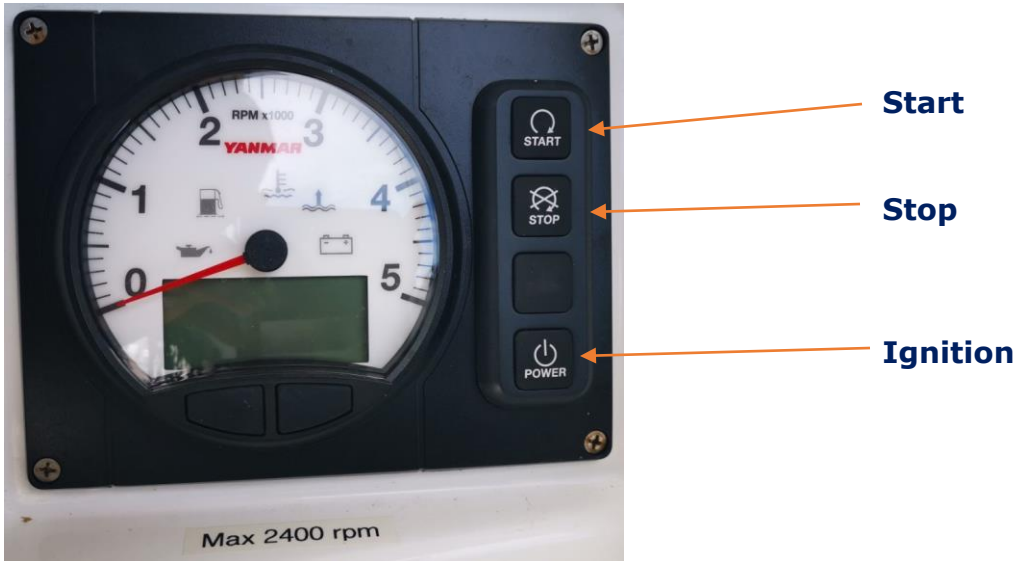
GFCI Breaker



If electrical outlets are inoperable, please reset the GFCI Breaker.



7. Engine start



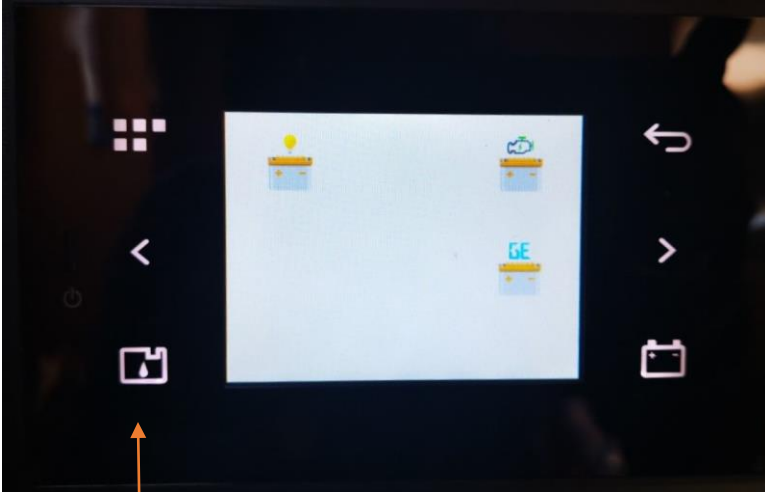
- Make sure the throttle is in neutral.
- Turn on the engine ignition by pressing the lower button on the panel (an audible alarm should come on).
- Press the start button at the top of the panel.
- Once the engine is running, check that you have cooling water coming out of the exhaust.
- To stop the engine, press the stop button until the engine stops and then turn off the ignition panel using the lower button (press and hold until you see all five red lights lit, then release).



Should you hear an engine alarm during normal operation, check the LCD display for an identifying symbol and immediately shut down the engine - **CALL HORIZON**

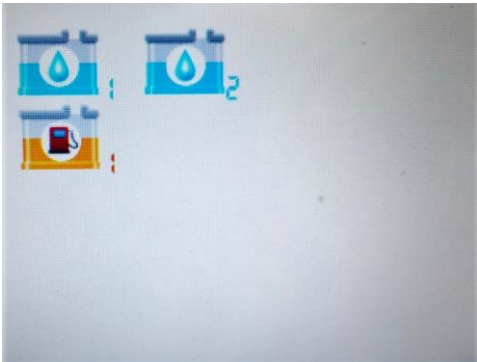
All our yacht engines run with diesel fuel. There is a diesel filler cap on each transom which is clearly marked "DIESEL" **DO NOT PUT WATER IN HERE.**

Fuel Gauge

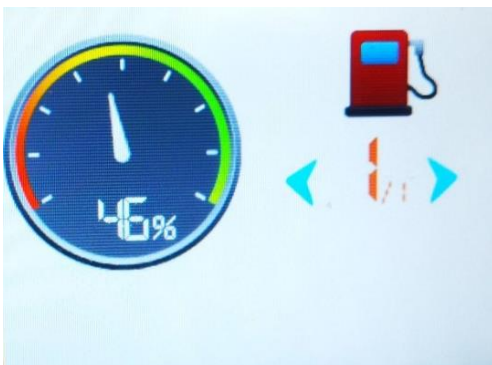


Water and Fuel

Options



Fuel Tank



8. Daily engine checks

- Check the oil level using dip stick located to the left side of the engine. Access the dip stick from the starboard cabin engine hatch. The level should be at least halfway between the empty and full marks. To add oil, open the oil filler cap on the top of the engine.
- Behind the engine is the seawater filter (Raw water strainer).
- Next to the seawater filter (Raw water strainer) is the coolant reservoir. The coolant level should be between the maximum and minimum lines.
- Check for any engine leaks or bilge water below engine.
- Check the fan belt, located at the front of the engine, for any damage and correct tension.

KEEP HANDS CLEAR OF ALL MOVING PARTS.

ANY PROBLEMS CALL HORIZON



Coolant reservoir

Engine raw water strainer

Oil Fill + Coolant fill



Engine access panel behind starboard cabin door.



Kill Switch (Leave in the Run position)

Oil dip stick

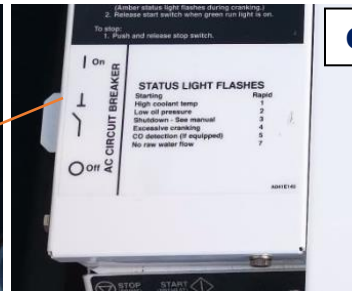
Access to engine raw water strainer and coolant reservoir in port aft cabin.



9. Generator

YOU MUST NOT RUN THE GENERATOR WHEN UNDERWAY.

After Physics is fitted with its own Onan generator which will run the 110v outlets, the air conditioning and will also charge the batteries instead of the engine. The generator is in the cockpit floor locker and is self-regulating and therefore there are no daily checks to perform.



Generator Reset Breaker



Generator Start panel

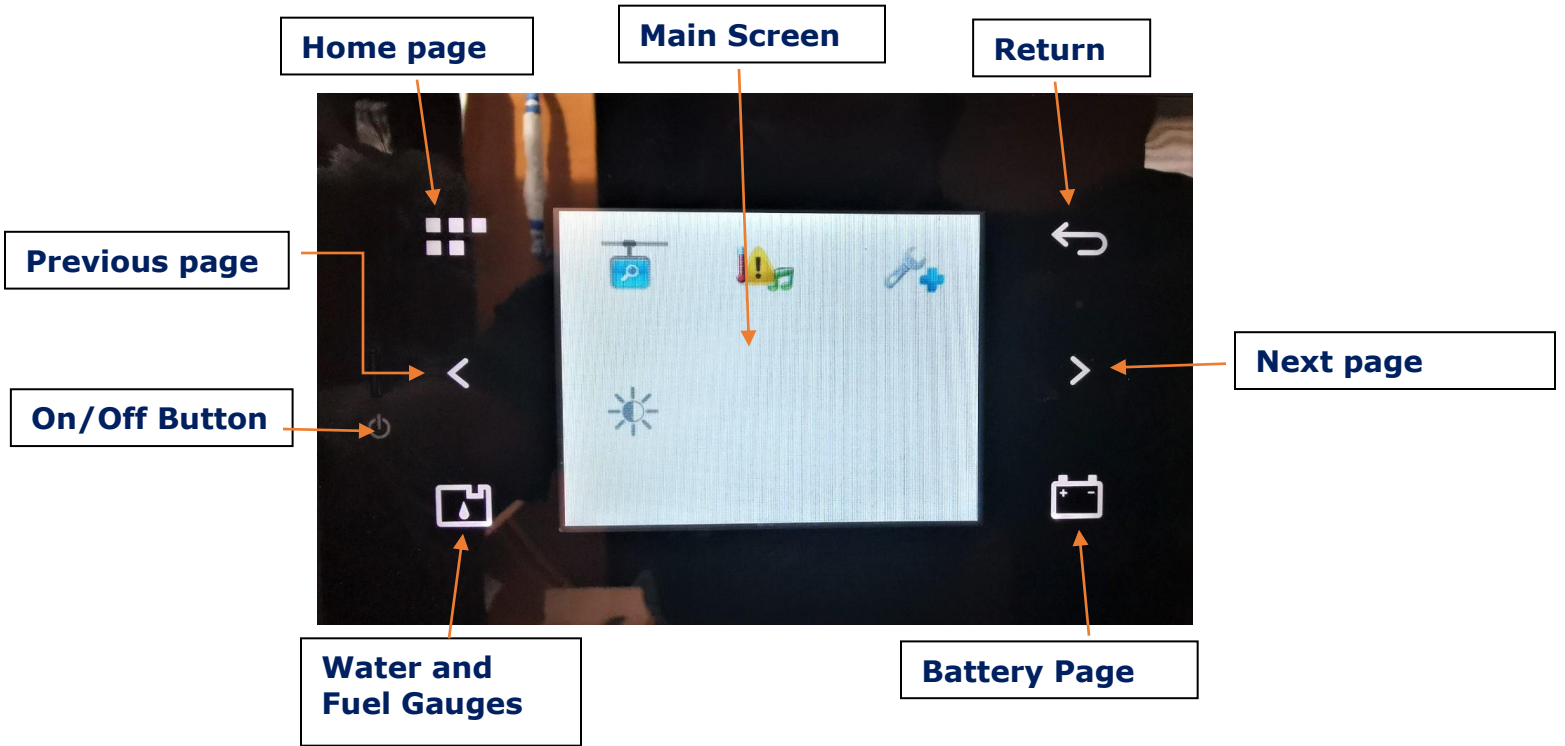
Starting the Generator:

- Make sure the 110v systems are off prior to starting the generator (Make sure all air conditioning units are off). Should be done prior to departure.
- Ensure that you have switched from shore power to generator power on the touch display at the 12V panel.
- 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.

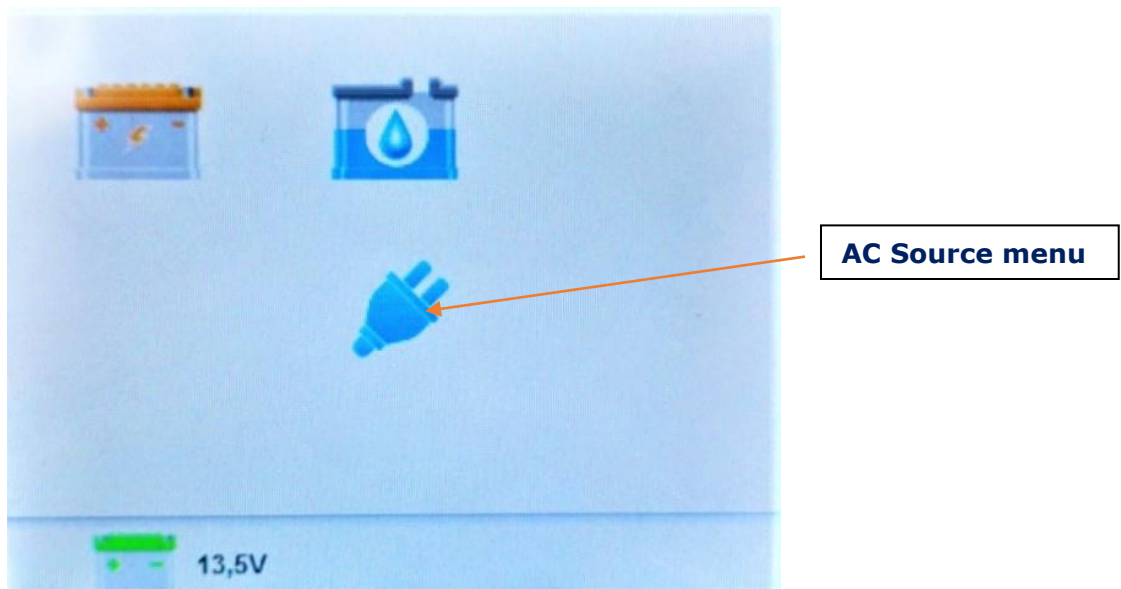
Stopping the generator

- Turn off all 110v systems (air conditioning units and battery charger).
- **Allow the generator to run for 5 mins without load to cool down.**
- Push down quickly on the bottom of the switch and release.
- The generator will shut down.

7. Using the touch display to start generator:

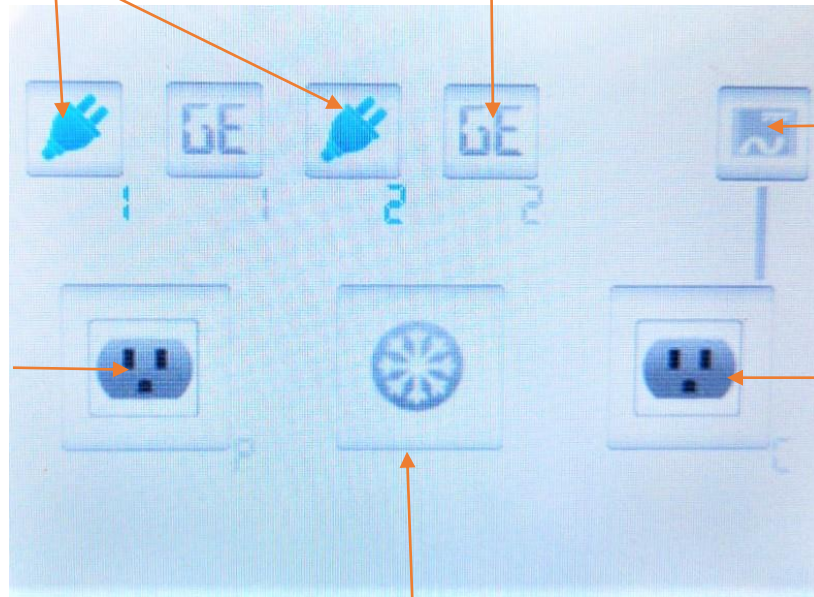


Hit the return button while on the main page to the screen below and then the AC Source menu to get to the next page.



Highlighted when shore power is selected.

Highlighted when generator is selected.



Inverter

Charger and Outlets power supply

Inverter voltage

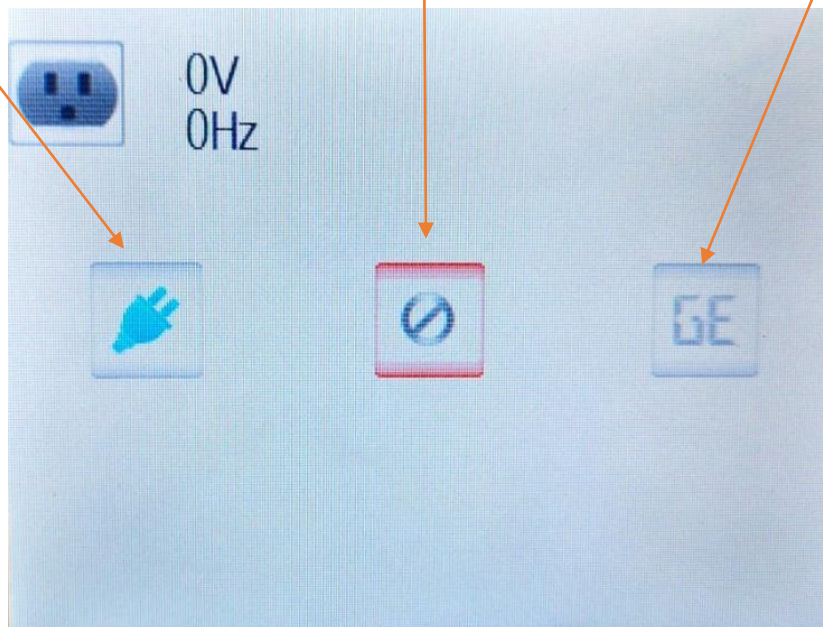
Air Conditioning circuit power supply

Hit 110V power supply or Air Conditioning to get to the individual transfer switch.

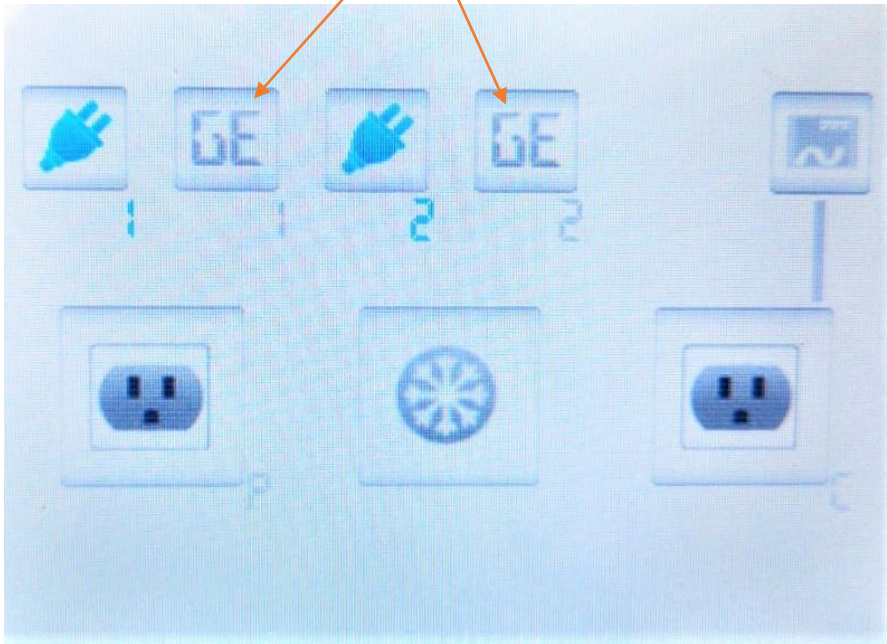
Touch to switch to shore power

Switch off

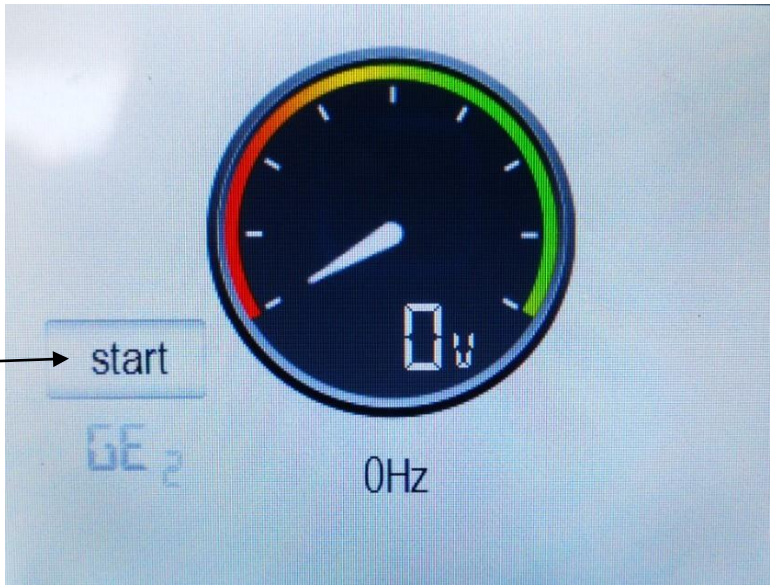
Touch to switch to generator



To start generator, touch the generator key on either side, 110V or Air conditioning to get to the voltage/start menu.

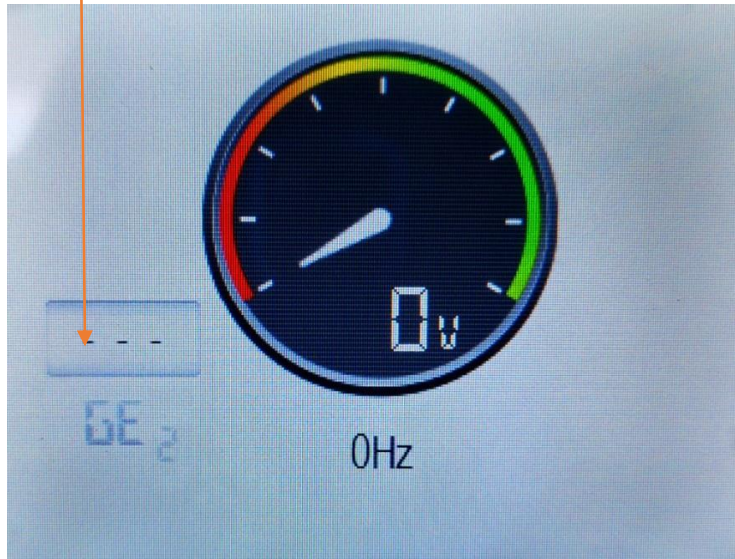


Generator voltage and start menu

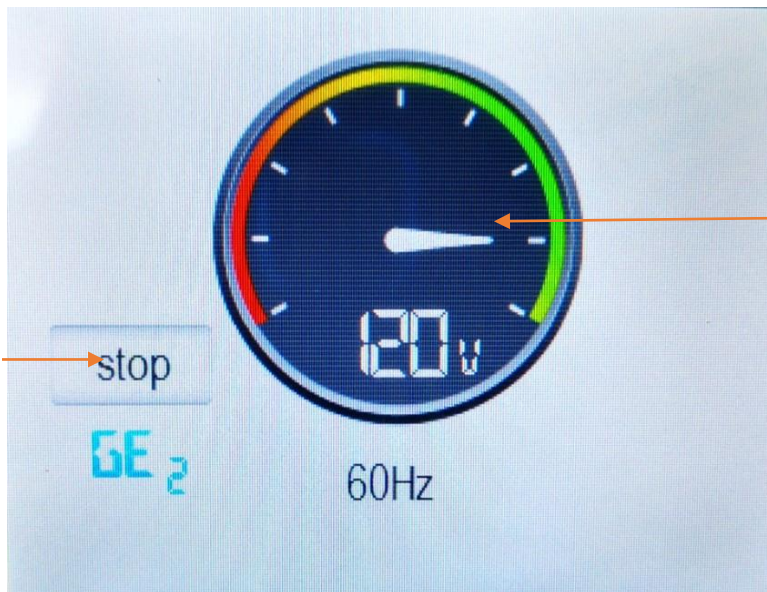


Touch start and the generator will automatically prime and start

Three dashes flashing when generator is starting.



Generator is running.



Generators stop button, touch and the generator will stop.

Generator voltage/output.

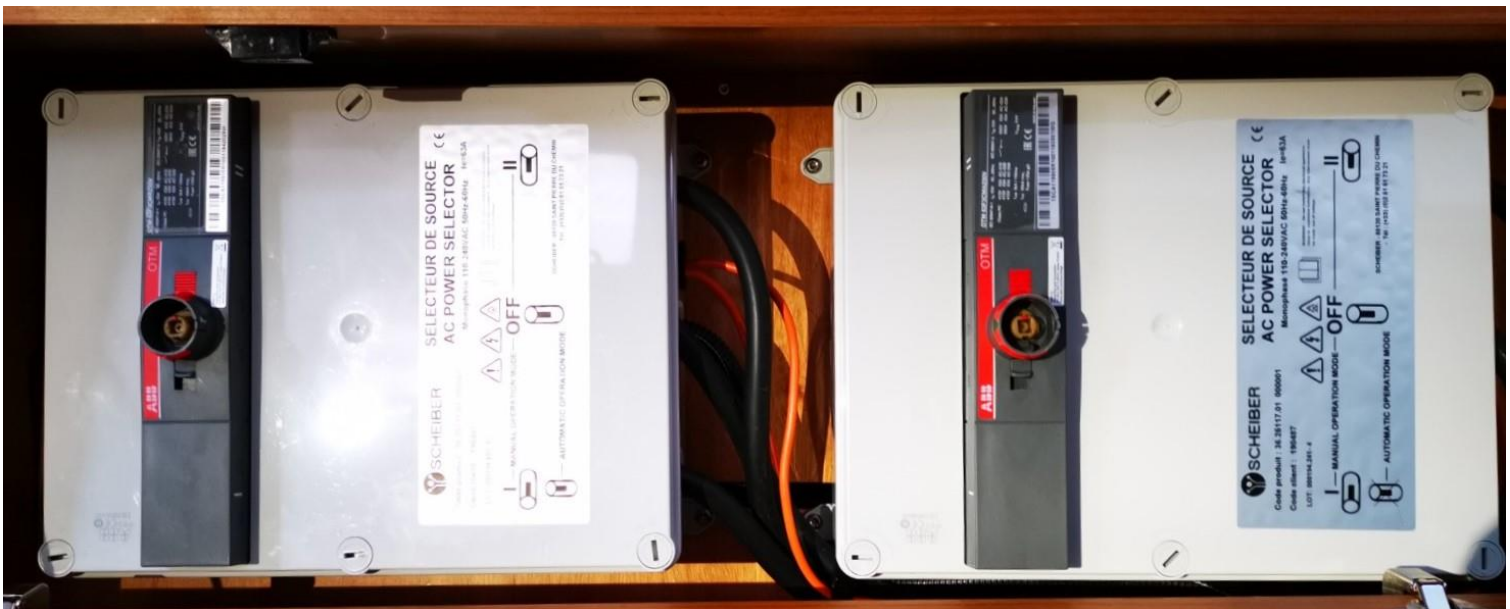
Once you have started the generator, gradually apply load by turning on the AC Units 5 minutes apart. This is to avoid overloading the generator.

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).

There are two selector switches in the stbd aft cabin locker which should stay in the auto position (select shore or generator using the touch display at the nav station). In case of system failure, the switch can be operated manually. **Call the manager on duty if there is a system failure.** On Generator you have air conditioning, 110v power to your outlets and you are charging your batteries.

In all instances, ensure the battery charger switch on the 110v panel is on.

**AC selector switches stbd
aft cabin bedside locker.**



Removable handles are in the same locker.

Generator raw water strainer:

Please do not run the generator when sargassum seaweed is present. The generator raw water strainer is **in the engine compartment** 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 in closed position.
2. Remove the housing cover by removing the four bolts.
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 and secure the four bolts.
7. Open the raw water intake valve.
8. Start the generator
9. Make sure water is coming out 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.

Please contact the manager on duty for further instructions.



Generator strainer

10. Air conditioning

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 companionway and all hatches are closed; otherwise, the compressors will freeze up.

Starting the air conditioning:

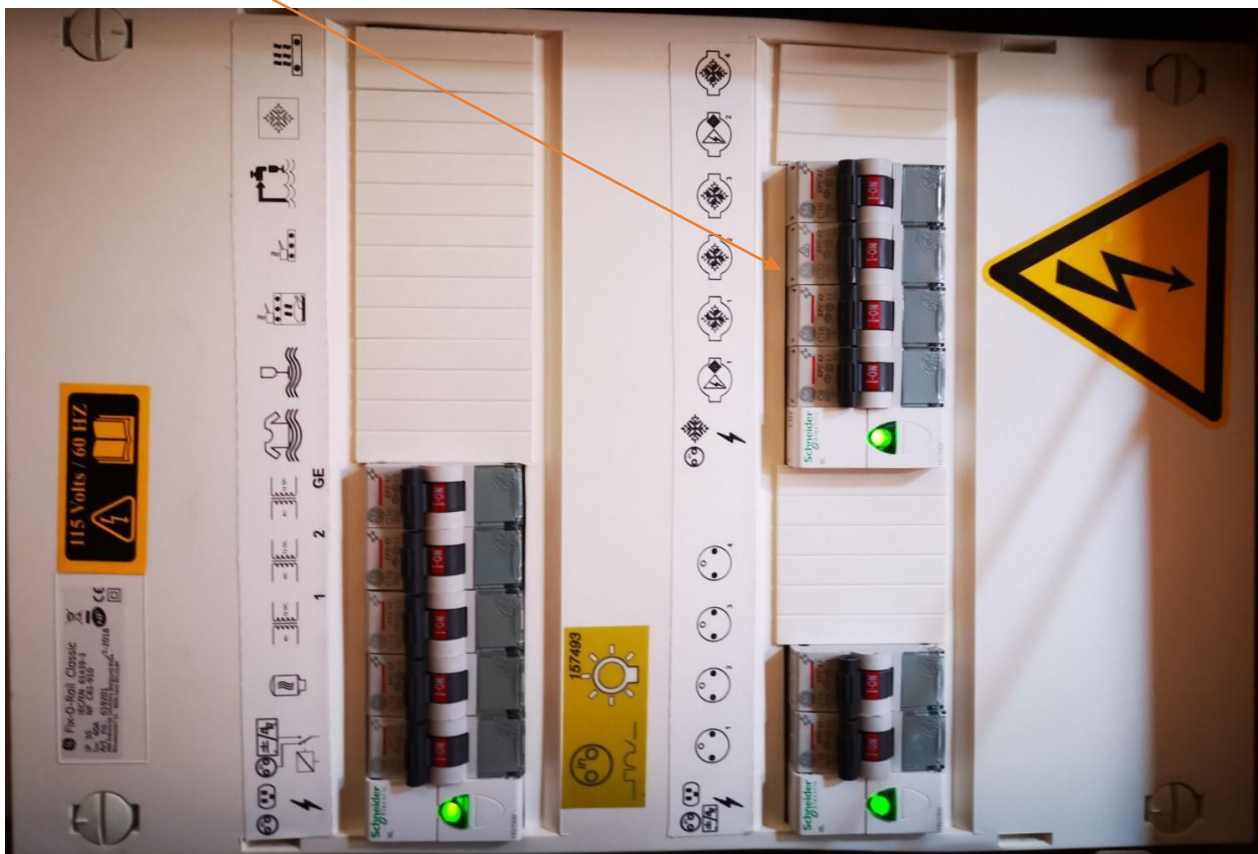
- Switch on the required units 5 minutes apart.
- Each of these units also has an individual control which allows users to alter the settings for the individual units.

Using the unit control panels:

- Switch the remote units on using the 'power' button.
- Set the temperature using the 'temp' arrow 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.

AC Breakers:

AC Breakers are in the starboard aft cabin beside locker.



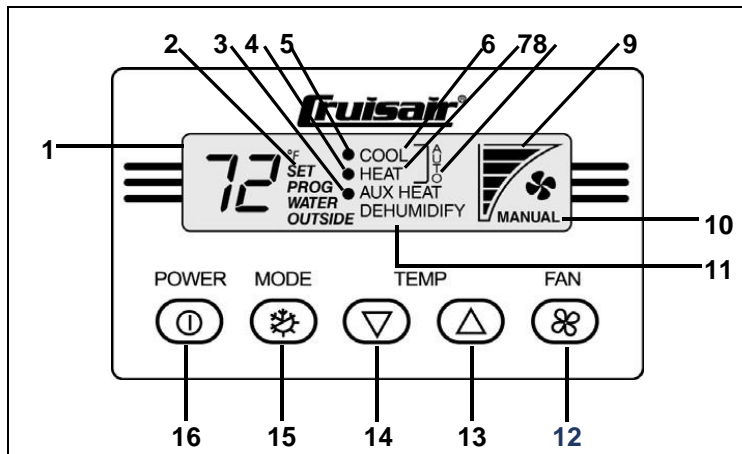


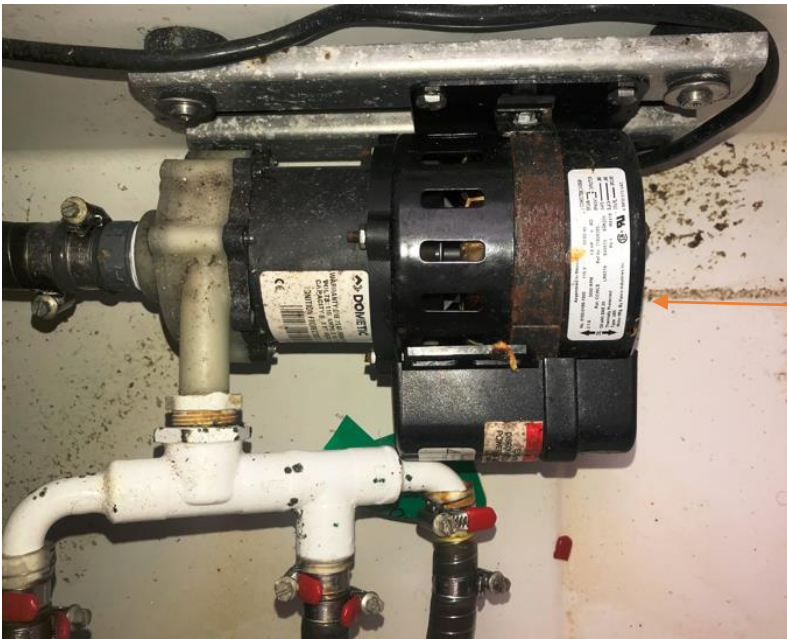
Diagram Description of Control Display Panel and Indicators

1	Data Display - Large LCD readout displays current temperature, set point, programmed values and error messages.	9	Fan Speed Indicator - A row of five bars indicate the current fan speed, with more bars indicating a higher fan speed and fewer bars indicating a lower fan speed.
2	Set Point Indicator - Display shows SET when set point is being adjusted. Normally display defaults to inside temperature.	10	Fan Mode Indicator - The word MANUAL displays when the fan is running in Manual Fan Mode. The word MANUAL does not display when the fan is running in Automatic Fan Mode.
3	Aux Heating Indicator and Aux Heat Mode Indicator (optional) - A solid dot displays next to the words AUX HEAT when the electric heater is on and running in Aux Heat mode. The words AUX HEAT display when you are in Aux Heat mode. (Press the MODE button to select the optional Aux Heat Mode.) See Programmable Function "23: Aux Heat Enabled/Disabled" on page 12.	11	Dehumidify Mode Indicator - The word DEHUMIDIFY displays when you are in Dehumidification Mode. It flashes if optional humidity sensor is connected and operating in the Cooling Mode. (Press the MODE button to select Dehumidification Mode.)
4	Heating Indicator - A solid dot displays next to the word HEAT when the compressor is on and running in Heat mode.	12	FAN Button - Press to select Manual or Automatic Fan Mode, indicated by the word MANUAL displaying or not displaying. In Manual Fan Mode, additional presses of the FAN button will adjust fan speed higher, then lower, then back to Automatic. In Automatic Fan Mode, fan speed is controlled by the microprocessor as a function of the difference between set point and inside temperature. See Programmable Function "4: Fan Response Differential" on page 9.
5	Cooling Indicator - A solid dot displays next to the word COOL when the compressor is on and running in Cool mode.	13	UP Button - Press to adjust set point up. In programming mode press to scroll through program modes and adjust values.
6	Cool Mode Indicator - The word COOL displays when you are in Cool mode. (Press the MODE button to select Cool Mode.)	14	DOWN Button - Press to adjust set point down. In programming mode press to scroll through program modes and adjust values.
7	Heat Mode Indicator - The word HEAT displays when you are in Heat mode. (Press the MODE button to select Heat Mode.)	15	MODE Button - Press to cycle through the modes of operation (refer to indicators). Mode sequence selections are COOL, HEAT, AUTO, AUX HEAT (optional), and DEHUMIDIFY.
8	AUTO Mode Indicator - A bracket and the word AUTO display to the right of the words COOL and HEAT when you are in Auto Mode. If optional Aux Heat is enabled (see Programmable Function "23: Aux Heat Enabled/Disabled" on page 12), a bracket and the word AUTO display to the right of the words COOL and AUX HEAT. (Press the MODE button to select Auto Mode.)	16	POWER Button - Press to turn the system on and off. Note that the Data Display remains on in the Off mode. You can continue to adjust set point, display temperature readings and activate the manual fan to circulate air while the system is in the Off Mode.

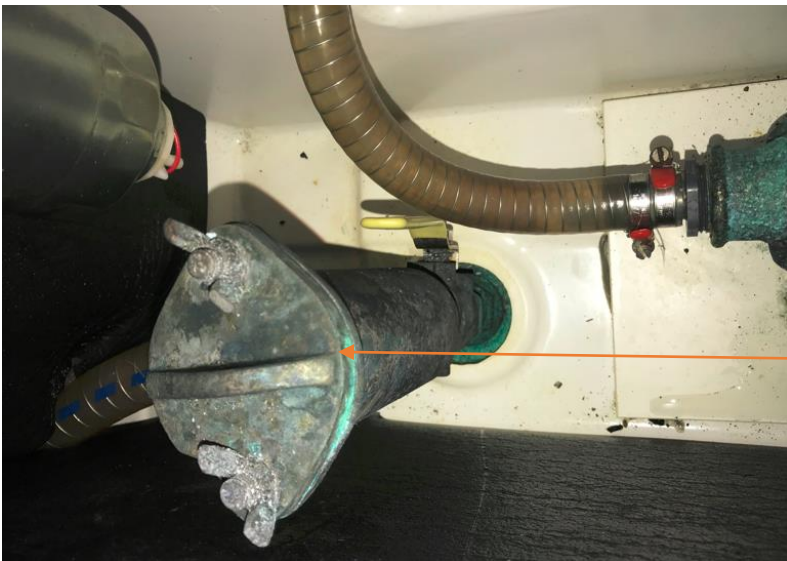
Bleeding the system

If the air condition unit shuts down with a 'HI PF' error code, that means there is an air lock in the cooling system. This problem can be resolved by bleeding the air out of the line, but it is important that you **call the Horizon Duty Manager before attempting to do this.**

Ac pump under saloon floorboard



AC Pump



AC Strainer

11. Cockpit electronics

Raymarine I70s multifunction (Only at Nav Desk)

At the helm you can use one of the chart plotter displays for Windspeed direction, depth and Boat speed.

Up:
Move up through pages,
Increase adjustment
values

Power:
Power on, Power off,
Open brightness menu,
Cancel, Back



Down:
Move Down through
pages, Decrease
adjustment values

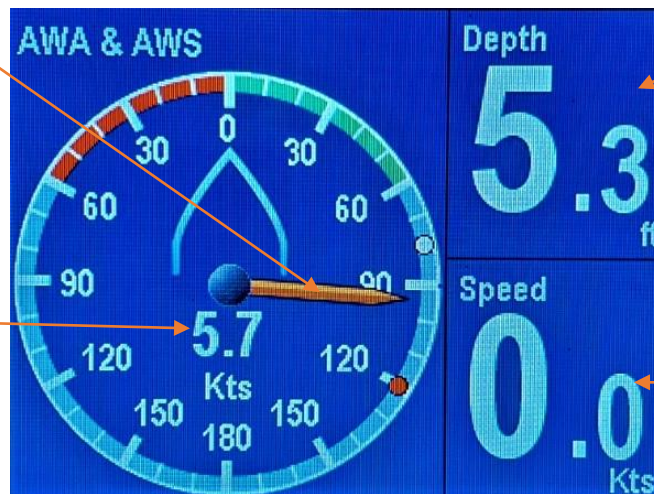
Menu:
Open menu, OK, Save

Note: When powered off, the unit will still draw a small amount of power from the battery, if this is a concern switch off instruments at 12-Volt panel.

Raymarine I70s Pages:

Apparent Wind Angle

Apparent Wind Speed



Depth (In Feet)

Speed (In Knots)

Depth (In Feet)

Note: Depth is read from below the keel and not the water surface.



Wind Speed and Direction (True):

Note: Reef 1 at 18Kts
Reef 2 at 23Kts



Raymarine P70s Autopilot control

Up/-1:
Up navigation, adjust up, Decrease angle

Down/+1:
Down navigation, adjust down, Increase angle

Left Soft:
Cancel, Back, Mode Selection

Right Soft:
Menu, Select, OK, Save

Standby:
Disengage pilot, Manual control, Power, Brightness

Auto:
Engage Auto Pilot

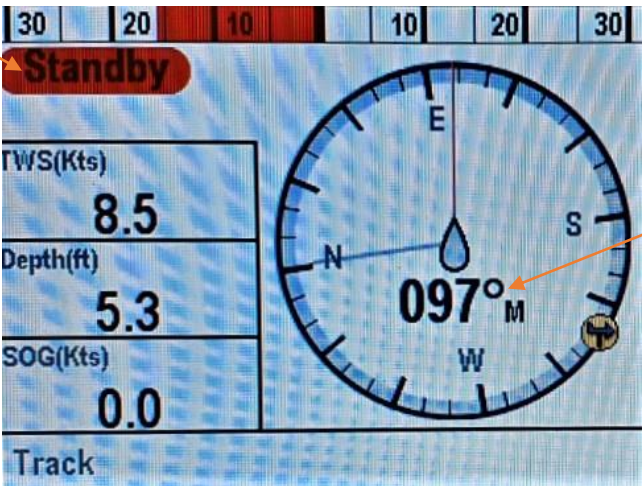


-10:
Decrease angle

+10:
Increase angle

Rudder position

Standby (Auto pilot disengaged) You have the helm



Heading

Raymarine Axiom 7-7" Multifunction Display (Stbd Helm)



Dashboard:
Displays data from Nav instrument (Wind, Depth, Boat Speed)

Select chart



Man Overboard/Waypoints

Dashboard



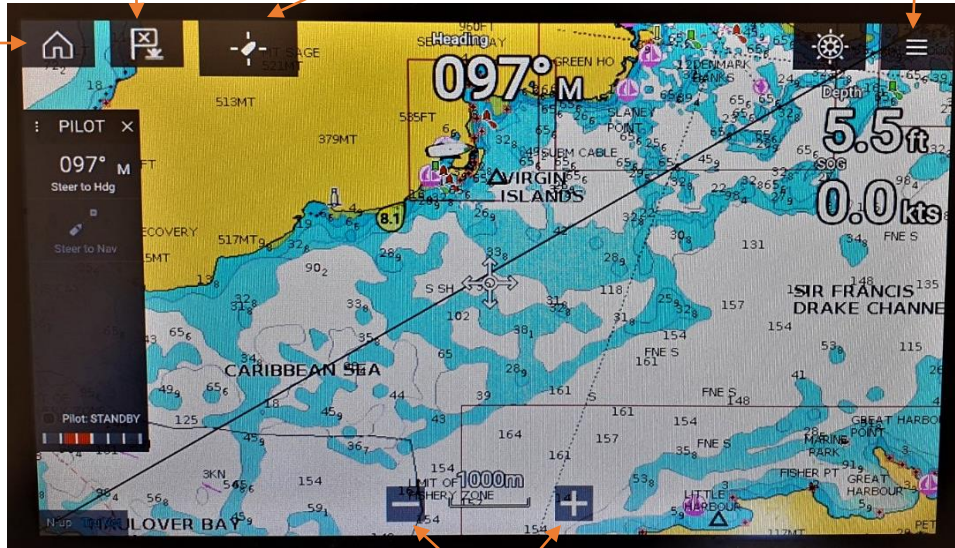
MOB/Waypoint:

Hold to do a man overboard,
tap to put in a waypoint

Find Ship

Options/Menu

Home



Zoom

Note: Man overboard will alarm until it is cancelled. Please do not test the man overboard as it will send an alert to other AIS vessels.

Cancel man overboard





BOW THRUSTER (Owner Use Only):

Press and hold in the red and green button simultaneously for several seconds to turn on.

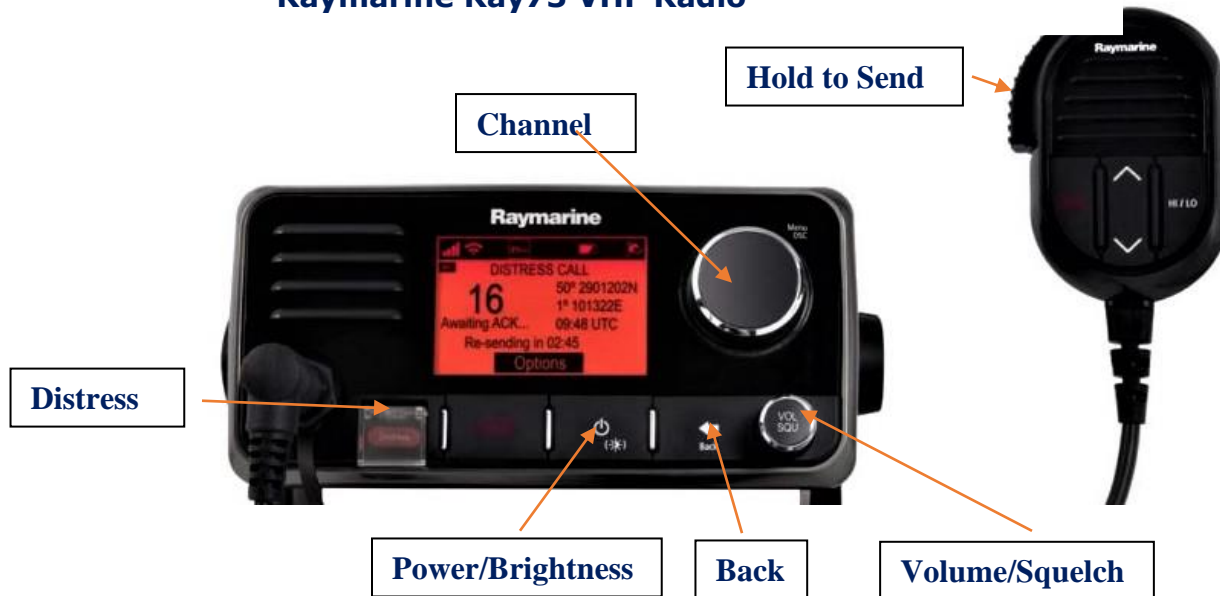


Electric swim platform switches at the rear of the cockpit table



12. VHF procedures

Raymarine Ray73 VHF Radio



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 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, then 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 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 is also useful)

Wait 1 minute for a response, repeat message

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

13. Stereo

Fusion Entertainment MS-RA70N Marine Entertainment System with Bluetooth



Connecting your device via Bluetooth:

Hit the source button and select BT (Bluetooth).



The screen should display the select device option. Hit the menu button and select discoverable.



Open Bluetooth devices on the device you want to pair (Cell phone, Tablet, or laptop). Select After Physics to complete the pairing process.

14. Anchoring & the windlass



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.** The maximum depth would be 1/5th 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 bitter end of the line to a bow cleat. Pay out enough chain so that the snubbing line becomes taut.

- If the hook falls off 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 thirty 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 2nd 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 do not have low battery voltage. **Check that the breaker shown below has not tripped behind the panel at the nav desk.** 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.

Windlass Breaker

The windlass breaker is the 100A breaker in front of the port aft cabin bunk.



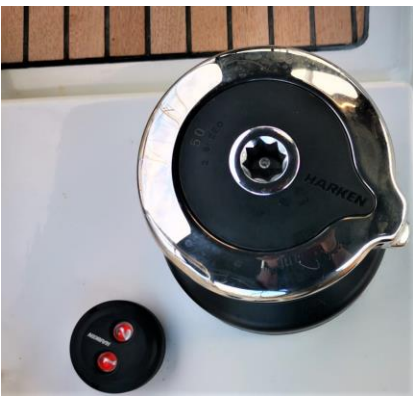
Electric Winches:

Your yacht has powerful winches making raising, setting, and trimming the sails a breeze! However, it is very tempting to grind away or just press the button and enjoy the effortless feeling **BUT** it is also important for **you** to monitor the halyards, furling lines, sheets, and sails.

If you continue to grind on a winch or press the electric winch button longer than necessary and over-tension the halyards, sheets, or other control lines, you can cause severe damage to the sails, or even the mast. When using a winch, it is imperative that you watch the sails being hoisted or unfurled/furled and **DO NOT OVER-TENSION** on the winch. On roller mainsails, do not take the clew beyond the black band on the boom. Ease the inhaul line as you pull on the outhaul and vice versa when putting the sail away. Set the jib by easing the furling line and pulling on the sheet and furl it by pulling on the furling line with two turns around the winch, pulling by hand on a broad reach – you should only need a winch handle (and two more turns on the winch) if it is very windy. Look at your sails when they are set – do they look good? Remember, a flappy sail is an unhappy sail! Check all the reefing lines, check the lazy jacks, the topping lift tension – none when you are sailing. Remember to re-tension it before you drop the sail though. Do not open clutches under load, always take the load onto a winch first. Ask us for any tips to get the most out of sailing your yacht.

Any damage caused by the misuse of winches is negligence and is **NOT** covered on your HDW Insurance and repairs must be paid for in full by yourselves. The resultant damage may also result in immediate cancellation of your charter.

Two speed electric winch



15. In-Mast furling mainsail

Unfurling the mainsail:

1. Open the line clutch labeled "Main Furl" and put one wrap around the winch. This will enable you to control the speed of pulling out the sail in breeze.
2. Check the outhaul clutch is closed.
3. Ensure the yacht is pointing into the wind and the vang is eased a little so the boom is horizontal/perpendicular to the mast.
4. Open your mainsheet clutches and ease mainsheet a foot or two. *Most of the Horizon Yacht Charters vessels will have X2 mainsheets and no travelers.*
5. Pull on the "Outhaul" whilst you ease the "Main Furl" line, always keeping an eye on the mainsail coming out of the slot in the mast and keeping tension on the "Main Furl" line. It is recommended you unfurl the sail by hand and not with an electric winch to reduce damage to the sail if something were to go wrong.
6. When unfurling the main all the way, do not tension the outhaul so that the clew goes beyond the black marker near the end of the boom.

Do not open any clutch labeled "Do not touch" as it is the halyard. Releasing the halyard will make it difficult to furl and unfurl the sail.

"Main Furl" line clutch



Unfurling- Open the "Main Furl" clutch, keep tension via X2 turns on the winch with.



Pull on the outhaul to unfurl mainsail always keeping an eye on the sail as it unfurls.



Black marker on boom, do not furl beyond this marker.



Reefing the mainsail:

Pull the main sail out as above.

- 1.** To reef the main sail, close the "Main Furl" clutch and take in any slack on that line.
- 2.** To flatten the Main Furl reefed position put the outhaul around the self-tailing winch tension slightly then open the "Outhaul" clutch. You will then need to ease this as you reduce sail.
- 3.** To reduce sail size start winching the "Main Furl" line while keeping tension on the "Outhaul" to keep the line in solid contact on the mast winch. (Ensure Outhaul line clutch is open)
- 4.** Once the desired sail area is achieved and you have achieved a good tension on the foot of the main, close the "Out Haul" and "Main Furl" clutches.

18 Knots "Reef 1"

24 Knots "Reef 2"

Furling in the mainsail:

Turn the vessel slightly up wind and ease your vang and mainsheet slightly so the boom is above the mast, ensure your boom is horizontal/perpendicular to the mast. Open the "Outhaul" clutch, pull on the "Main Furl" line while keeping slight tension on the "Outhaul." Ease the "Outhaul" as you furl in the main. Keep an eye on the furl-in line when putting away your mainsail, ensure the line is running smoothly on the furling drum. Pay special attention to how much line is on the drum, if you have only one or two wraps left on the drum you might have furled the sail in a bit too much.

Take note of the different color of the triangle of sail at the clew. Do Not furl this into the mast.

16. Picking up a mooring buoy

- Ensure the dinghy painter is tied off short on the bow or amidships and is clear of the prop.
- Approach the 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; if you are unsure about a mooring buoy's integrity, choose another location to moor up.
- The bowman should ready a line to a bow cleat to slip through the eye of the mooring pennant. This line is then shortened and brought back to the same cleat.
- Once set your mooring buoy will be attached either on the port or starboard cleat and the yacht will be head to wind. Remember to centralize the wheel and lock in place to avoid the yacht sailing around the buoy.
- Next attach a second back up line to the mooring. Attach a line from the opposite bow cleat and if possible, attach it directly to the mooring buoy. It is always easier to do this from the dinghy. Do not try to make the lines of equal length, the first line should be taking all the weight of the boat.
- To depart, release the back up line first. Slowly motor the boat forward to create slack, release the line from the cleat and allow the pennant to slip from the line into the water. Fall back with the wind or current and be careful not to foul your prop on the pennant.
- **Remember to tie your dinghy away from the stern whenever you are maneuvering in close quarters.**

17. Bilge pumps

Your yacht has an automatic and a manual bilge pump. The primary electric pump is operated by the switch on the 12v panel which should be left in the **'AUTO'** position as the pump is operated by a float switch which will automatically operate the pump when there is water in the bilge. If the float switch fails, hit the switch at the 12v panel once to manually bypass the float switch and run the pump. You should see a green LED at on when the switch is set to manual override.



The manual bilge pump is operated from the cockpit and is located at the port helm.



Manual Bilge Pump Handle

Manual Bilge Pump

Fully automatic bilge pump below saloon floorboard



18. Freshwater system

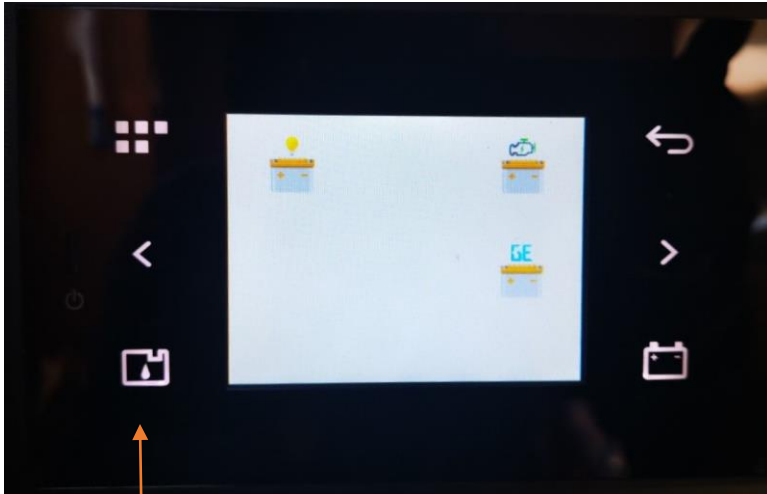
After Physics is equipped with two water tanks with a capacity of 169 gallons split between them. To fill the tanks, let the water run from the hose for awhile before placing the end into the fillers that are located port fwd and starboard amidships. Please ensure that the correct fillers are used, NOT the refills labeled waste or diesel.

To use the freshwater system, turn on the freshwater breaker on the 12v panel and open a faucet. When the tank runs out of water the pump will run at high speed, the faucet will start to cough air. As soon as you hear the pump running continuously, check to see if anyone is using water. If not, switch off the pump immediately to prevent the pump from drawing more air into the system or the pump overheating, and proceed as follows:

- Switch off the pump.
- Locate the changeover valves below the stbd fwd saloon seat. Close the tank currently in use and open the other.
- Switch on the freshwater pump.
- Open cold-water faucet at galley and purge system of air, approx 45 second.
- Turn off faucet, pump will continue to run until adequate pressure has built up to operate pressure switch to cut the pump out.
- If the pump does not cut out, it may be necessary to repeat the purging process and open other faucets.
- If you have any problems, call Horizon.
- **The engine heats the water.**

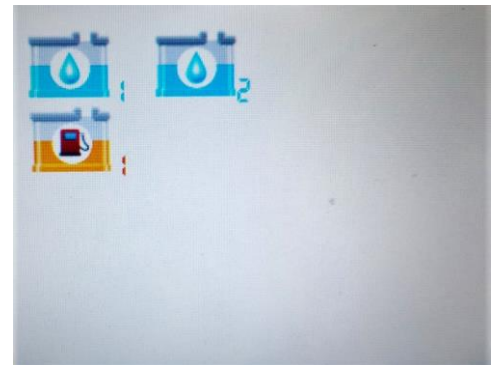


Water Gauges

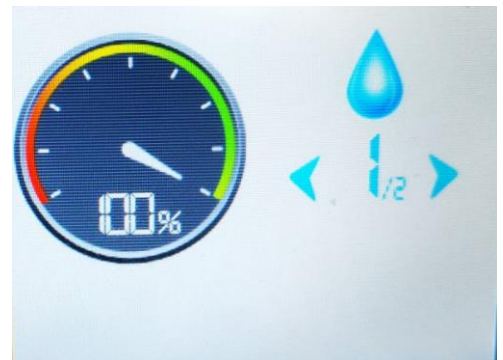


Water and Fuel

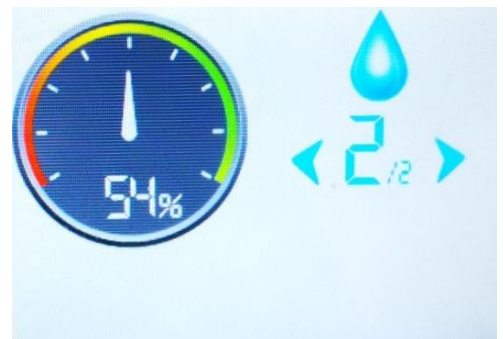
Options



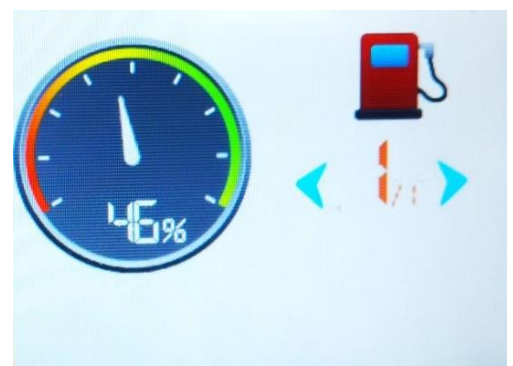
Water Tank 1



Water Tank 2



Fuel Tank



19. Heads





After Physics is fitted with two electric heads. **Both use fresh water only.**

Nothing is to be flushed down the head unless it has been digested first.

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 fee.

Electric Heads:



- Before use, ensure freshwater pump is on at the 12-Volt panel.
- 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 odor and spillage.

Holding Tanks

Each head on After Physics has a fully operational holding tank which can be used by closing a valve on the waste seacock. The holding tank valves are behind the white access panel in the aft head/shower and below the sink in the forward head/shower. These are located as shown below. Check that the holding tanks are empty before returning the vessel and please flush each one through to minimize residual odors.



Aft holding tank handle
access panel below sink.



Fwd holding tank handle
locker panel below sink.

20. Showers

Your yacht has a hot & cold, fresh-water shower in each head and on the transom. If the engine has been running, the hot water can be extremely hot – be careful!

To use the shower, the fresh-water pump must be activated at the 12v panel.

The interior shower drains are fully automatic and will drain on their own.

The transom shower is located behind the port helm. There is a toggle switch located next to the shower head which controls the flow and temperature of the water. To switch the water on or off move the switch up and down. To change the water temperature, turn it clockwise or anti-clockwise.

Press down on the small button located on top of the shower head to release the water from the hose.

Before putting away the shower hose, turn off the water by toggling the mixer handle and releasing the water in the line. Do not put away the transom shower with line still pressurized.

Please test the water temperature before use as the engine heats the water and it can be extremely hot.

Transom Shower



21. Refrigeration

This boat has an upgraded 12v refrigerator and freezer. This system can run 24hrs a day if you wish. To ensure that it does not fail, keep your batteries charged. If the level goes below 12.2v the fridge will automatically go in standby mode. If you get excessive ice on your cooler plate **do not** chip away at the ice. If something is frozen to the cooler plate do not force it away. Use warm water if you need to melt the ice.

The thermostats are on the front of the units. If necessary, you can turn the system down or off if you wish. If it is not cold enough augment the system with ice. We are in the tropics so please note that fruit, vegetables, and other fresh produce might not last if you expect.

Ask one of our staff for a deck cooler if you would like one for storing your drinks. It will keep the drinks cold and help maintain the temperature in the fridge, as people will not be going in it every 5 minutes for a drink.

Galley 12V refrigerator



Galley Freezer



22. Propane and stove

After Physics is fitted with a three-burner stove and oven.



The propane tank is below the port helm seat.

To use:

- The solenoid control switch is left of the stove. Hold the red safety switch down and press in on the top of the button. A green led will indicate that the solenoid is now open.
- To light, push and turn the knob you wish to use through 90 degrees anticlockwise and light the burner using the automatic igniter.
- 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.
- If you cannot get it to light, check the valve on top of the connected tank is open.
- When you are finished with the burners, or the stove, switch off the solenoid **before** you turn off the knob on the stove. This will burn the gas out of the lines, and you can test whether the solenoid is working. If the burner remains lit after switching the solenoid off, **you must** manually close off the tank in the cockpit.

Propane safety

After Physics is fitted with a Xintex S-1 Propane detector. This device will detect propane and any other noxious gas or fume. The propane 'sniffer' has been placed in the bilge (propane is heavier than oxygen and 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 don't panic!!

Xintex S-1 Propane detector



Propane Locker



Different elements can set off the propane alarm, if there is a propane leak you should smell propane. In the event of a propane leak, follow these steps:

- Close the valve on the propane tank.
- Switch off everything electrical especially the electric bilge pump. Propane will settle in the bilge.
- Check the stove and surrounding area for propane smell.
- If detected, open the bilges and hatches. Point the boat downwind and use the manual bilge pump to pump out the bilges.
- Call Horizon immediately

Under no circumstances should you use the electrical bilge pump or any other electrical system if you suspect a gas leak.

23. Fire Safety

Fire extinguishers are installed in each cabin, in the galley, at the Nav desk and in the 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:

- Shut off the fuel supply to the generator and engine in the port aft cabin under the mattress.



Access to fuel shut off valves below the port aft cabin mattress.

Engine fire port



- Locate the nearest fire extinguisher. (There is a fire extinguisher in each aft cabin locker, in the galley and a fully automatic fire extinguisher installed in the engine compartment.
- Locate the engine fire port behind the starboard aft cabin door and remove the cover.

- Pull the yellow key out, stick the nozzle into the fire port.
- Press down on the red button until all the contents of the extinguisher have been discharged.
- 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).

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:

- 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.

Generator compartment fire:

If there is a generator fire do not open the generator compartment. There is a red handle in the propane locker, pull on the handle to activate the fire extinguisher in the generator compartment.



Generator fire extinguisher with pull cord



Pull cord to activate generator fire extinguisher



24. BBQ (Propane)

- 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



Swim Platform

After Physics has an electric swim platform which is controlled by switches at the rear of the cockpit table.

- The swim platform is either all the way up or all the way down.
- Stay clear of the swim platform when it is motion.
- No sailing or motoring of the yacht with the swim platform down.
- Swim platform should be down when on a mooring ball or anchored, the transom is extremely high when the swim platform is up.



Swim Platform Up and Down switches



Swim platform reset breaker (Port aft cabin). #14 (Purple)

25. Dinghy & Outboard

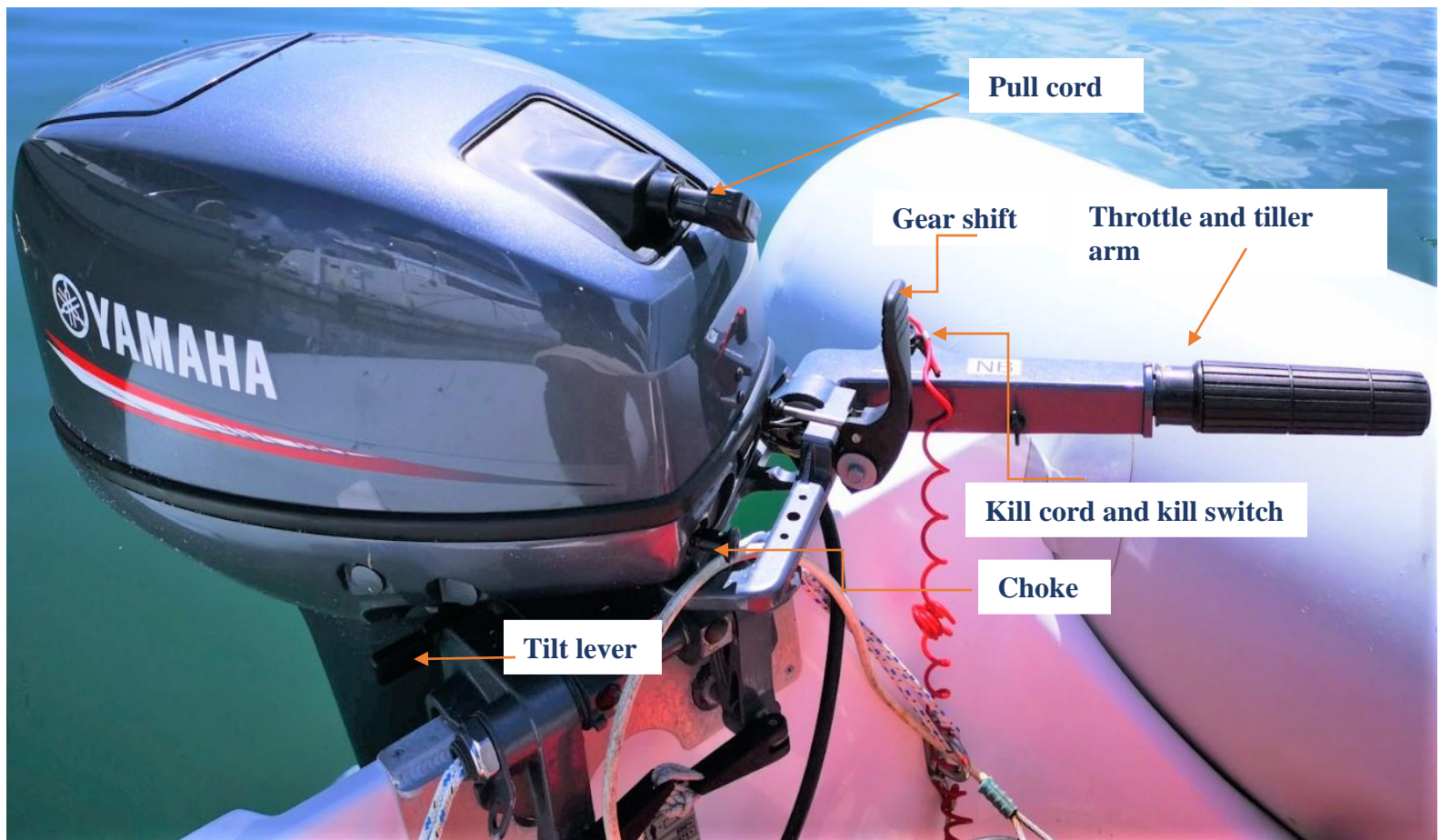
The driver of the dinghy must be over 18 and must always be wearing the kill cord. Never operate the dinghy under the influence of alcohol or drugs.

- 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 vent is left closed it can damage the tank and cause a fuel leak.**
3. Few pumps on fuel line bulb.
4. Make sure outboard is in 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 start push choke back in.

Outboard



Fuel tank

