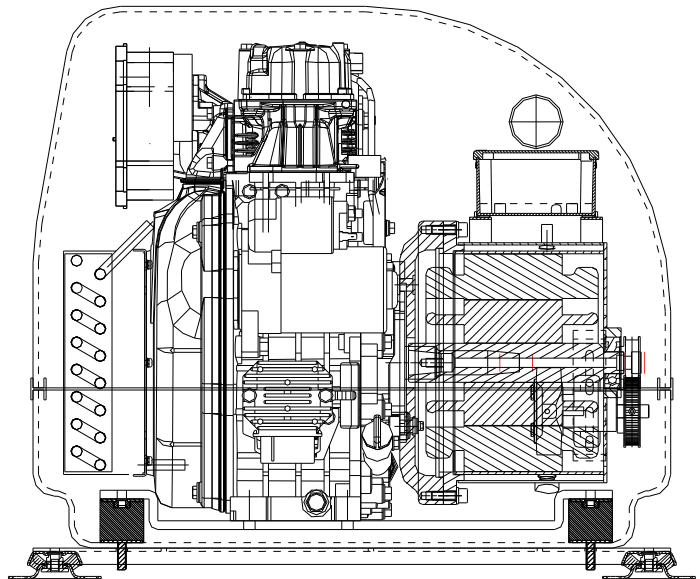
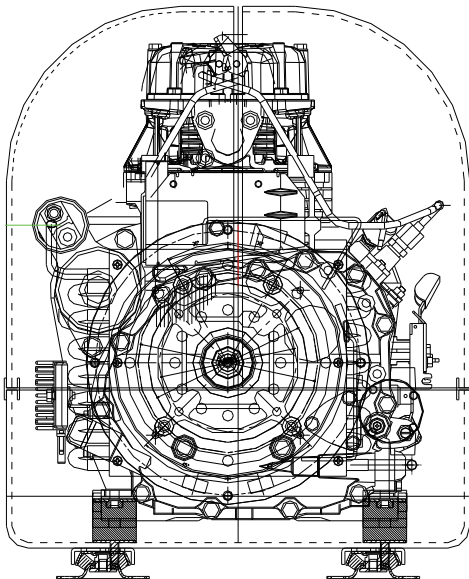




**allpa**  
marine equipment

## OWNERS MANUAL

### PAGURO 4 SY



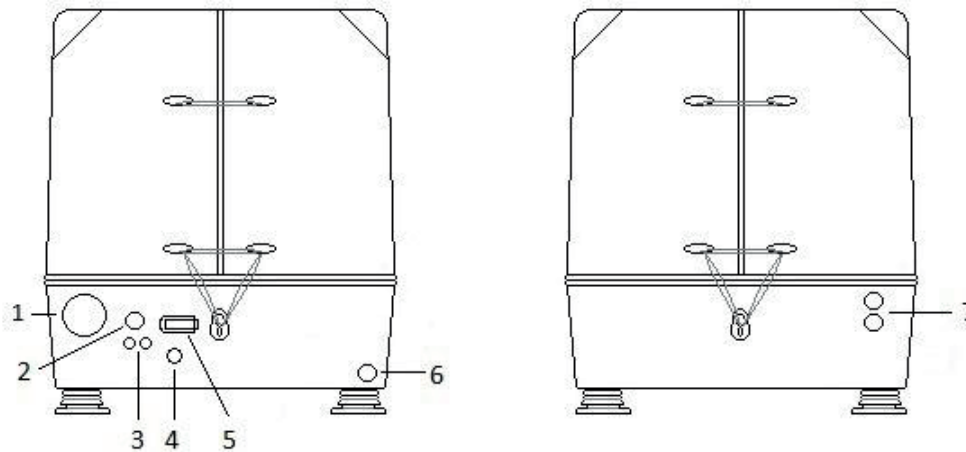
We thank you for the confidence you have shown in us, by purchasing the **PAGURO** for fitting in your boat.

The target of our design, to achieve a diesel unit with the power usually supplied in a small flat, in a compact size and light weight, is completely reached. So there is not the need to waste a large room in your boat, and even if the chosen place is away from the centre line of the boat, the reduced weight of the **PAGURO** will not influence the stability.

#### TECHNICAL SPECIFICATION AND PERFORMANCES

	<b>PAGURO 4 SY</b>
Engine manufacturer	YANMAR ITALY S.P.A.
Engine type	L70N5
Cylinders n.	1
Mechanical continuous power 50 hz	4.5 KW
Engine speed	3000 rpm
Specific fuel consumption	0.35lt./KW/h
Engine cooling system	Heat exchanger water /air
Cooling pump	Self priming
Starting and shut-off system	12 V electrical starter, remote controlled
Generator manufacturer	V.T.E. - Italy
Alternator type	Synchronous, single-phase, brushless, capacitor regulation
Alternator cooling system	Through Stainless Steel AISI 316 L heat exchanger
Continuous electrical power 50 hz	4 KVA – 3.5 KW
Voltage output	Single-phase 230 V
Battery charger for starting battery	12V 8A
Control panel	fitted with hour meter, load indicator, automatic shut-off device in case of low oil pressure and over temperature, starting motor self disengagement, 10 m cable and socket
Noise level at 7 m	53dB(A)
Weight capsule included	90 kg

## EXTERNAL CONNECTIONS



1. EXHAUST OUTLET
2. BATTERY CABLES
3. FUEL IN AND FUEL RETURN
4. MAIN VOLTAGE OUTPUT
5. CONTROL PANEL
6. RAW WATER INTAKE
7. SIPHON- BREAK HOLES

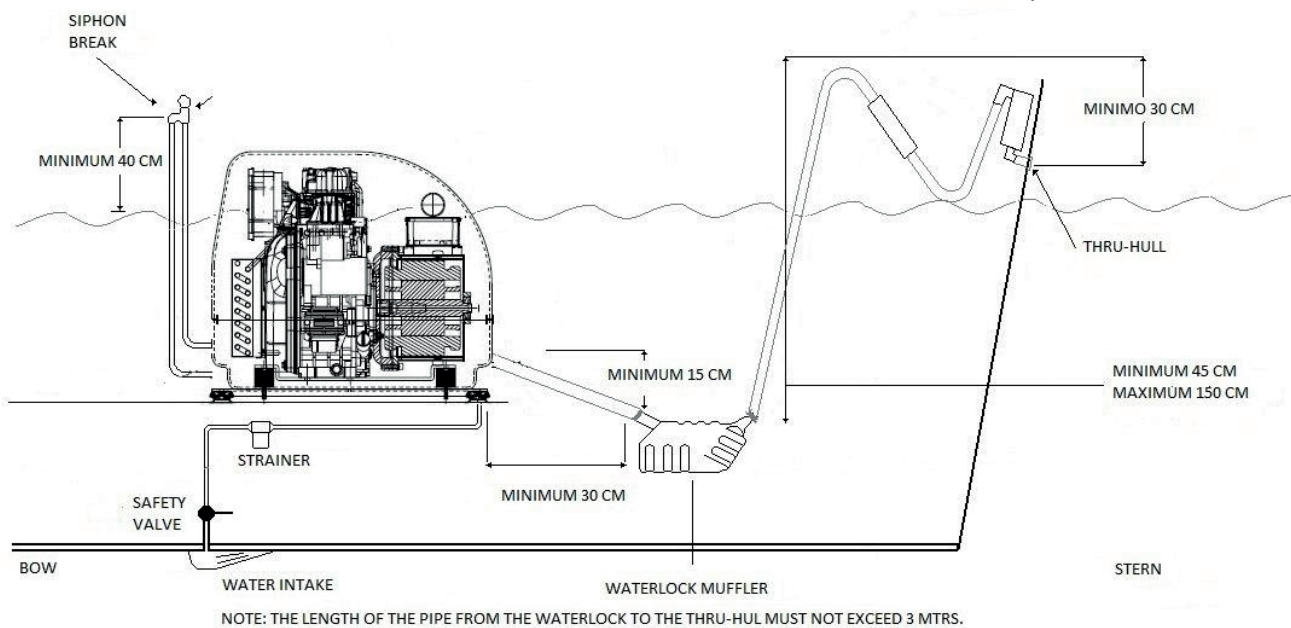
The internal diameter of the pipes have to be respected to avoid untightening and leakage, but the external diameter is important too, because the correct size avoids a noise way-out from the sound-proof capsule.

- ✓ Water inlet: 13 mm
- ✓ Exhaust system: 40 mm
- ✓ Fuel in: 8 mm
- ✓ Fuel return: 8 mm
- ✓ Siphon break: 13 mm
- ✓ Battery positive: 35 mm<sup>2</sup>
- ✓ Battery negative: 35 mm<sup>2</sup>
- ✓ Main out put voltage: 4 mm<sup>2</sup>

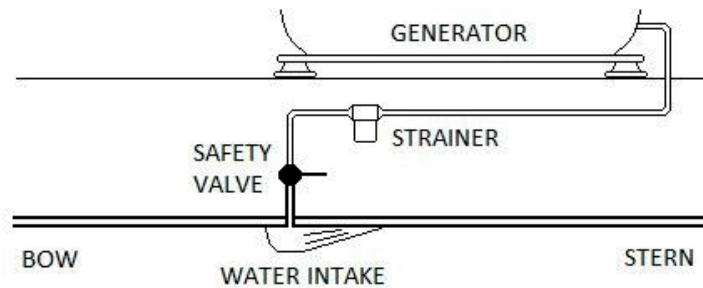
## EXHAUST LINE (on request)

**STANDARD SYSTEM:** the best dumping result is obtained fitting the 3 typical "Vetus" exhaust mufflers:

1. the first as water lock avoids the risk of water return into the engine and dumps 50% of noise so it must be installed;
2. ; the second reduces a further 20% noise and must be fitted with a gradient towards the out let in order to avoid water return;
3. ; the third dumps a further 10% and avoids the risk of external seawater entrance due to waves.



## COOLING CIRCUIT



- Note 1:** The unit can be installed below the sea level; in that case the safety cooling vacuum valve has to be fitted on a wall at generator side at least 50 cm above the external sea water line. On the hoods are foreseen two additional holes to be employed for the siphon break pipes.
- Note 2:** The sea water intake shape is usually designed asymmetrically, so that depending from the fitting direction can cause, when the boat is sailing, pressure or vacuum in the water circuit connected.  
 For a generator the water intake must be fitted into the direction causing vacuum, because on the contrary a self water entrance can be caused when the boat is sailing and the set is not running, flooding the exhaust line with water that finally reaches the engine oil sump causing severe damages to the engine

## FUEL LINE

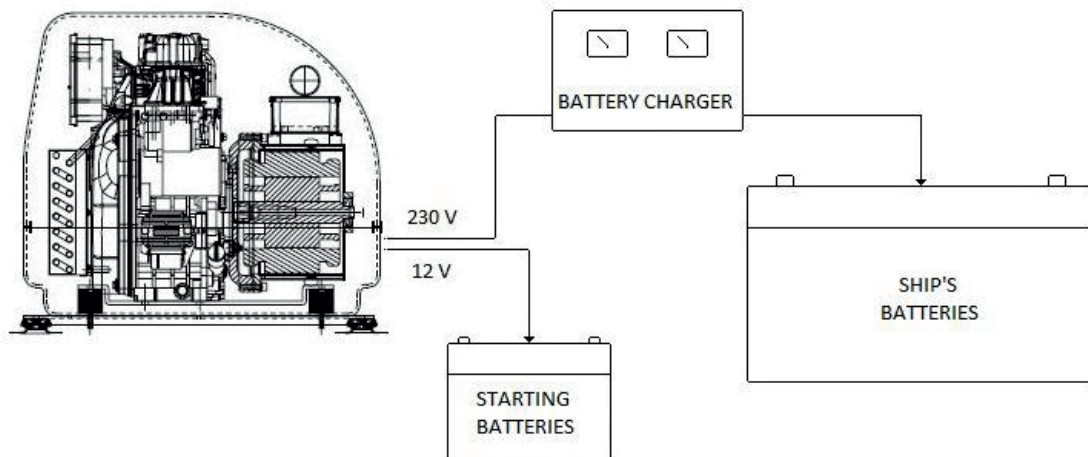
It is usually employed the main fuel tank of the boat: the feeding pump driven by the engine assure a suction from a maximal height of 1 m, no length limits.  
 A separate line coming from the tank avoids air bubbles troubles.

- Note 1:** The injection pump of the **PAGURO** is self-bleeding, it means that in case the engine shut-off for lack of fuel, after fuel tank filling up there is no need of disconnecting the pipes for bleeding, because this operation is simply obtained acting by hand on the lever of the feeding pump.
- Note 2:** Even if a small fuel filter is contained in the capsule, an external strainer and water separator is suggested to delay the replacement time.

### Starting battery connection

The **PAGURO** is negative grounded, and can be connected to the main board batteries 12 V or to a separate small battery 12 V of about 60 Ah; in this second case its internal charging device takes care of feeding the battery with 8 A

- Note :** In case of connection to the main board batteries the 8 A are available as well, but are not enough to charge them: a static high power battery charger fed by the 230 V (115 V) of the set must be present on board (on request).



### Remote control (supplied)

It allows to start and stop the unit, to verify if there is a cooling or oil pressure failure, (in this case the engine is shut-off automatically) and the power supplied control.

- Note 1:** The load indicator is designed for avoiding to overcharge the unit feeding too many electrical loads; it begins to show the load after the first half power supplied and has to be considered normal when the bar is green. The last red LED lighted means an overcharge: switch-off the exceeding load to return at normal conditions.
- Note 2:** Do not forget the starter knob switched ON if the engine is not running for aborted starting attempt (yellow LED blinking) because the engine shut-off valve remains energized and takes useless power from the starting battery.
- Note 3:** If the yellow LED remains flashing when the set normally runs, it means that the internal battery charger protection is shut-off, so the starting battery is no more loaded. In that condition the automatic protection shut-off system is not operative, so **do not operate the set with the yellow light flashing.**  
 Reset the device pushing the button located on the grey box corner fitted on the set.
- Note 4:** If for operator's mistake the starting knob is pushed whilst the engine is already running, an electrical safety device avoids the gears reengagement, protecting the starting motor preventing failures.

### **WHAT CHECKING BEFORE FIRST STARTING**

- that the lubricating oil level in the engine reaches the upper line on the deep stick
- that the valves of the following feeding pipes are properly open:
  - cooling sea water
  - fuel oil suction
  - fuel oil overflow return
- that the main AC safety switch is SHUT-OFF
- that the commutator GENERATOR / SHORE LINE is fitted in GENERATOR mode

### **AFTER FIRST STARTING CHECK THAT**

- inside the capsule there is no leakage from the connections of the several pipes
- the cooling water is flowing properly from the exhaust outlet, outboard

When everything is in order, close carefully the capsule and your **PAGURO** is ready for supply trouble less energy.

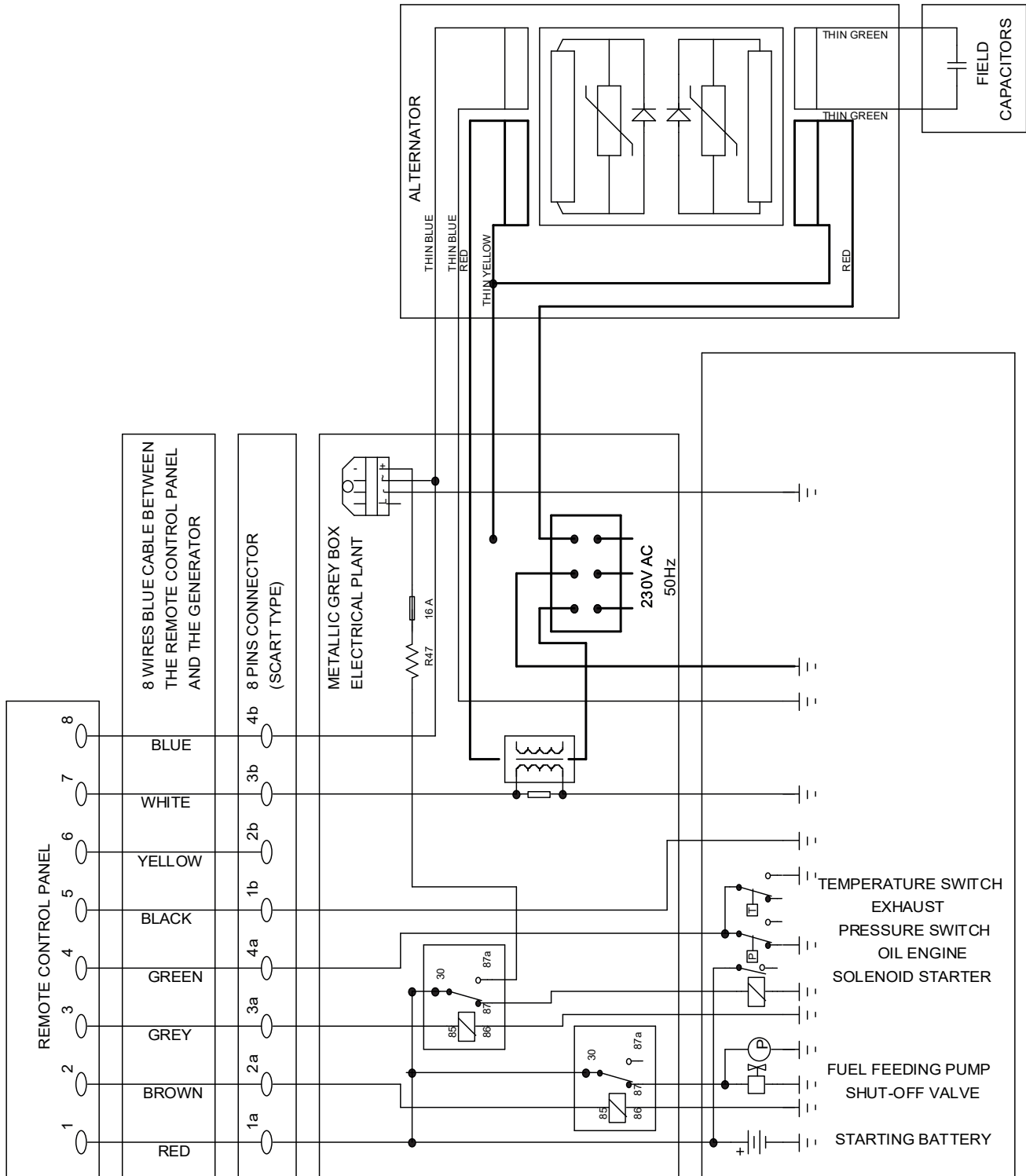
## FAILURES

Each unit is carefully tested in our factory and the performances are verified; even so a readjustment can be sometime necessary according to the following suggestions.

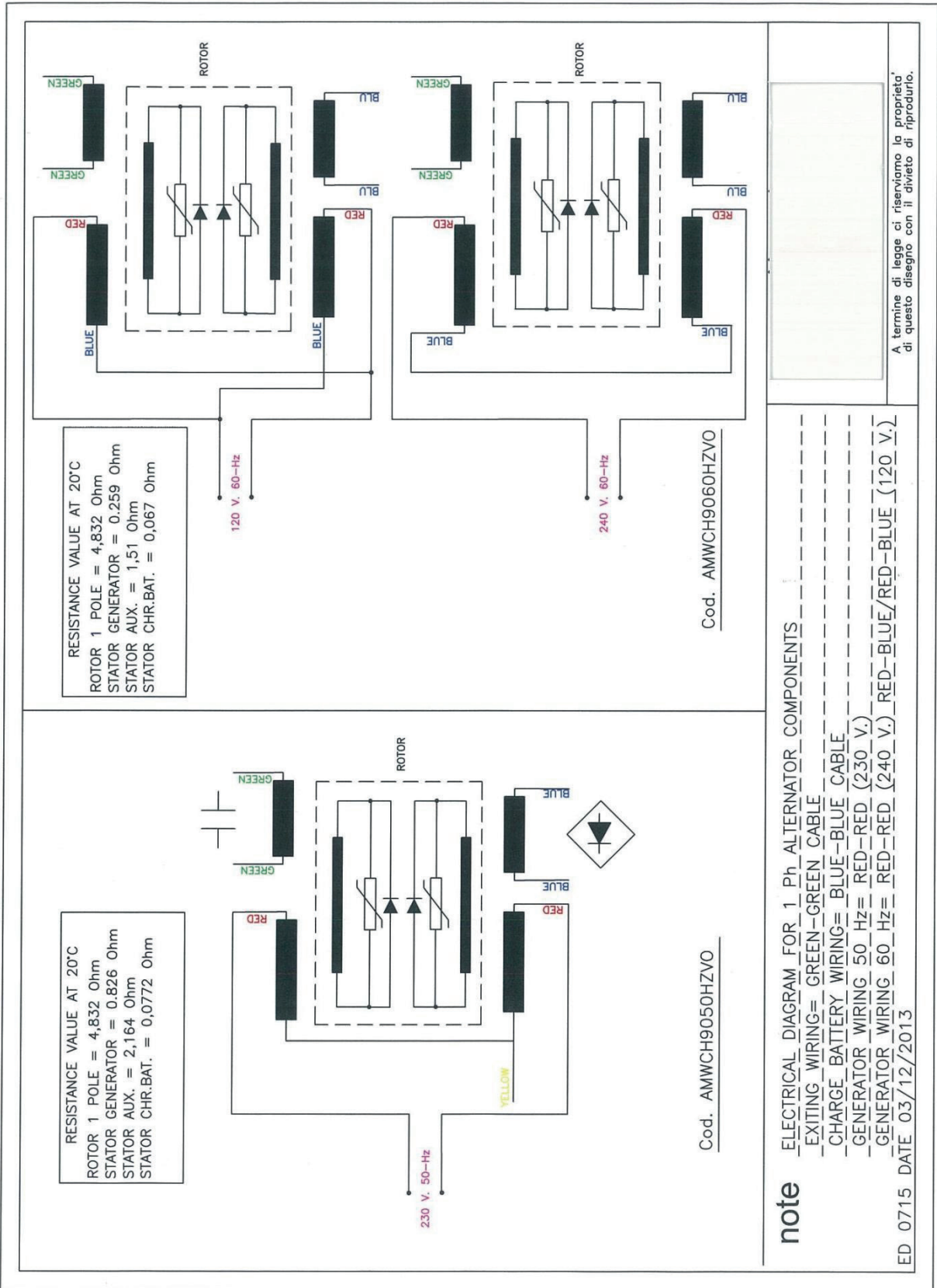
PROBLEMS	CAUSES	REMEDIES
Alternator excitation failure	1. Low engine speed	1. Check rpm and set at the nominal value of 3100 rpm without load (3700 for 60 cycles)
	2. Faulty capacitor	2. Check and replace
	3. Faulty windings	3. Check that winding resistance as follows:
High no-load voltage (over 240 V)	1. Engine speed too high	1. Check and adjust rpm
	2. Capacitor with too high capacity	2. Check and replace
Low no-load voltage (under 230 V)	1. Engine speed too low	1. Check and adjust rpm
	2. Faulty rotating diodes	2. Check and replace
	3. Beak down in windings	3. Check windings resistance as above
	4. Capacitor with low capacity	4. Check and replace with a new one
Proper no-load but low under load voltage	1. Low loaded engine speed	1. Dirty fuel filter
	2. Overload	2. Check the load indicator
	3. Rotating diodes short circuited	3. Check and replace
Unstable voltage	1. Loose contacts	1. Check connections
	2. Uneven rotation	2. Check for uniform rotation speed (dirty fuel filter)
Noisy generator	1. Broken bearings	1. Replace
	2. Loose coupling	2. Check and repair



# ELECTRICAL PLANT

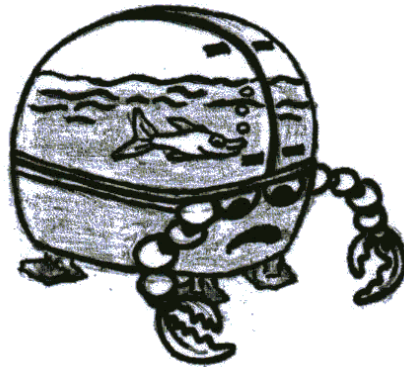


# ELECTRICAL PLANT



## WARNING

A great marine sets number of any type and manufacture, after first installation on board are flooded by sea water causing severe damages to the unit with high replacement or repairing costs, improperly claimed in warranty but gently refused, because it always depends from a critical installation, made compromising some physical rules.



We draw your attention on the most common mistakes to be avoided.

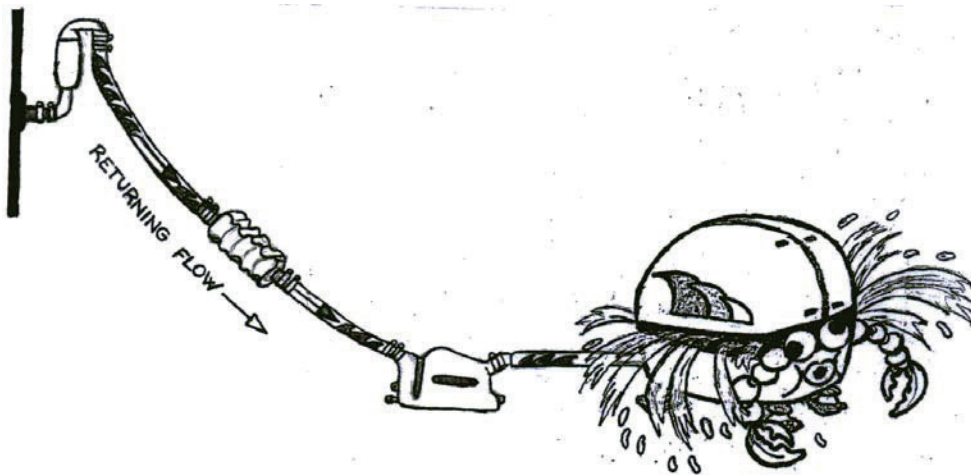
### MISTAKE

- Sea water intake oriented towards sailing direction, causing a dynamical pressure that, when the generator is not running, let flow sea water through the cooling pump, reaching the exhaust pipe and consequently the engine exhaust valve, flooding the cylinder and the oil sump.



### MISTAKE

- An exhaust line trapping too much water for length excess or negative gradient course, that return back into the engine when the set is shut off.



- The first water lock muffler is designed for avoiding that risk, but if fitted not enough lower than the engine manifold either reversing the entrance with the outlet, or of too reduced capacity for the return water volume that has to contain, can be unable avoiding the problem.
- Particular care must be taken in designing the exhaust pipe course, preferring the alternatives that keep self draining towards outside as more pipe stroke as possible.
- In any case, to be sure of a correct and safety installation, especially during the first employment season, check often the lubrication oil integrity watching the engine steak level: a transparent yellow oil if new or a black colour if old, mean no water entrance, but an emulsion similar to milk white/yellow not transparent or worst an increased level into the sump mean water flooding.