

# ANG-BOOST™

## “Premium Line”

### OPERATING AND INSTALLATION MANUAL



**25kVA / 30kVA**



**12.5kVA / 15kVA  
18kVA / 20kVA**

## MARINE ISOLATION BOOST TRANSFORMER VOLTAGE STABILIZER

# **ANG-BOOST™**

## **“Premium Line”**

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# IMPORTANT SAFETY INSTRUCTIONS



**READ CAREFULLY THE HANDBOOK BEFORE USING THE EQUIPMENT**



**USE AND INSTALLATION OF THIS EQUIPMENT ARE RESERVED TO QUALIFIED OPERATORS (MARINE CERTIFIED TECHNICIANS)**



**DANGEROUS VOLTAGES ARE PRESENT IN THE EQUIPMENT.  
DISCONNECT THE STABILIZER BEFORE OPENING THE DOORS.  
INSTALLATION MUST BE PROVIDED BY A QUALIFIED AND CERTIFIED MARINE TECHNICIAN.  
USE ONLY ISOLATED AND PROFESSIONAL TOOLS.**

## 1. WARNINGS



**The equipment cannot be used in zones that are potentially flammable or explosive.**



**The equipment should be used only when the boat engine is off.  
Disconnect AC shore power before opening the equipment.**



**Before installation make sure that adequate system of smoke or gas detector are provided.**



**The equipment cannot be used in parallel with co-generation system.**



**Follow all the safety instructions in this manual. Improper use could fully damage the equipment.**

- Degree of Protection: **IP 21**
- Operation Temperature: **0°C -/+ 50°C**
- Humidity not Condensed: **85%**

Install ANG-BOOST™ away from any heat. Proper ventilation around the unit is very important: allow at least 20 cm/8 inch on the front and rear side of the unit to ensure sufficient air circulation and cooling. During normal operation the equipment may reach high temperatures, install the ANG-BOOST™ in an area where people will not get in contact with it.

An appropriate periodic cleaning and maintenance program is recommended to keep the equipment in perfect condition.

If the equipment is installed in a particularly dusty environment, increase the cleaning and maintenance program, making sure that the ventilation system is working properly.

## 2. INTRODUCTION

ANG-BOOST™ combines an Isolation Transformer with a Boost Voltage Increase Circuit in order to provide the automatic rise of line voltage and the complete safety to your boat. The ANG-BOOST™ increases the boat's voltage when it decreases due to low shore voltage.

ANG-BOOST™ provides the correct voltage to the onboard equipment as well as to avoid turning off in the event of a sudden voltage drop or damage in case of excessive increase (within a given range).

ANG-BOOST™ ensures the protection of all the electrical equipment. The output voltage is boosted if the supplied voltage is too low.

Moreover, the SOFT START allows the boat to be safely powered by the shoreline, limiting the peak current that normally occurs when the transformers are inserted.

The special electronic circuitry keeps the boat's power supply at the right level, avoiding unpleasant voltage drops that can be seen in the lighting or in the installed equipments.

ANG-BOOST™ is equipped with a BY-PASS system, which allows the user to exclude the ANG-BOOST™ in the event of a failure or breakdown. The system will supply the power directly from the shore voltage and will also guarantee the isolation on the boat.

ANG-BOOST™ has the automatic Auto-Restart from high voltage, low voltage, blackout and overload.

## 3. FUNCTIONING

The ANG-BOOST™ is designed to power the boat from a nominal voltage of 240 V with three operating thresholds:

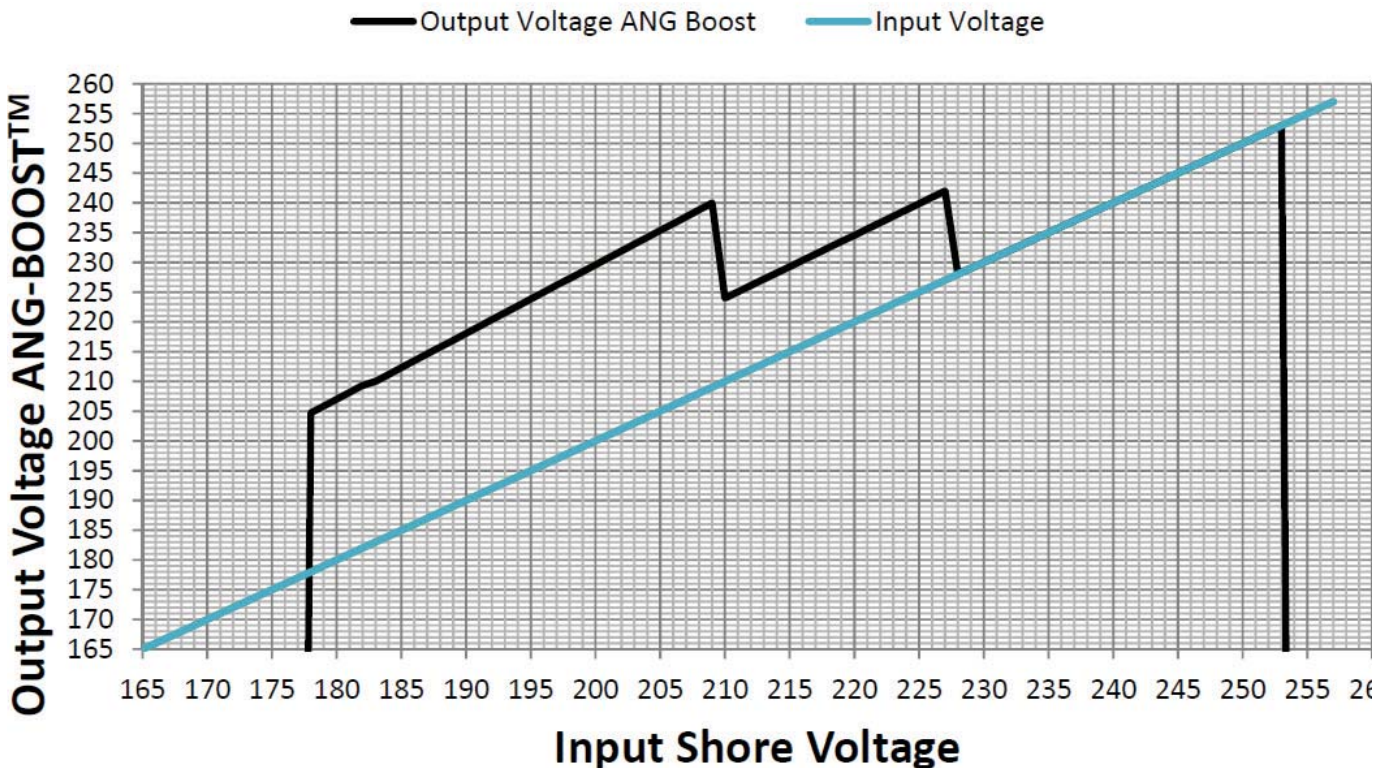
- Shore Voltage from 178 to 209 V (+/- 3V): output voltage from 210 to 240 V (+/- 3V)
- Shore Voltage from 210 to 227 V (+/- 3V): output voltage from 224 to 242 V (+/- 3V)
- Shore Voltage from 228 to 253 V (+/- 3V): output voltage from 228 to 253 V (+/- 3V)

If the input voltage is less than 178V or higher than 253V, the output is deactivated.

**The ANG-BOOST™ guarantees the maximum output current even in boost mode.**

The following chart shows the output voltage curve secured by ANG-BOOST™ compared to the Shore Voltage.

### ANG-BOOST™ - Voltage curve comparison



## 4. LED INDICATOR PANEL

ANG-BOOST™ is provided with a LED Control Panel that indicates the operating status of the equipment.

The LED lights indicate the operating status of the ANG-BOOST™:



The ANG-BOOST™ guarantees the maximum output current even in boost mode:

- **POWER: Green Led Light.** Non-Boost Mode. Boat Voltage equals Shore Voltage.
- **BOOST: Yellow Led light.** Boost Mode ON.
- **OVER TEMPERATURE: Red Led Light.** Thermal Protection automatically shuts down the system until the temperature returns to a safe operating level
- **LOW VOLTAGE: Solid Red Led Light.** Shore Input Voltage below 178VAC, the system shuts down to protect the boat's electrical equipment
- **HIGH VOLTAGE: Flashing Red Led Light.** Shore Input Voltage over 253VAC, the system shuts down to protect the boat's electrical equipment
- **BY-PASS: Red Led Light.** Manual By-Pass ON. NON-Boost Mode, Boat Voltage equals Shore Voltage. Isolation Protection ON.

# 5. TECHNICAL SPECIFICATIONS

## ANG-BOOST™ “PREMIUM LINE” WITH SEAMLESS TECHNOLOGY

ANG-BOOST™	12.5 kVa	15 kVa	18 kVa	20 kVa	25 kVa	30 kVa
Input Current (A)	52	62.5	74.8	83.2	104	125
Input Voltage (Vac)	208/240	208/240	208/240	208/240	208/240	208/240
Boost Voltage Correction	15%+7%	15%+7%	15%+7%	15%+7%	15%+7%	15%+7%
Operating Voltage (Vac)	178/255	178/255	178/255	178/255	178/255	178/255
Operating Frequency (Hz)	50-60	50-60	50-60	50-60	50-60	50-60
Output Voltage nominal (Vac)	120/240+N	120/240+N	120/240+N	120/240+N	120/240+N	120/240+N
Output Current Boost Mode (A)	49.5	59	71	79.5	99	119
Output Current No Boost (A)	50.5	60.6	73	82	100	121
Output Connection (Terminal Block)	L1+L2+N+G	L1+L2+N+G	L1+L2+N+G	L1+L2+N+G	L1+L2+N+G	L1+L2+N+G
kVA Continuous	12.1	14.5	17.5	19.3	24	29
Automatic Thermal Protection	110°C	110°C	110°C	110°C	110°C	110°C
Operating Temperature (°C)	50	50	50	50	50	50
Noise Level (Dba)	40	40	40	40	40	40
Insulation Transformer Class	H	H	H	H	H	H
Degree of Protection	IP21	IP21	IP21	IP21	IP21	IP21
SEAMLESS TECHNOLOGY	YES	YES	YES	YES	YES	YES
SOFT START	YES	YES	YES	YES	YES	YES
Manual BY-PASS	YES	YES	YES	YES	YES	YES
Automatic Thermal Protection	YES	YES	YES	YES	YES	YES
ALARMS: Over temperature/ Over Voltage/Low Voltage	YES	YES	YES	YES	YES	YES
Signal LEDs	YES	YES	YES	YES	YES	YES
Tropicalization Circuit	YES	YES	YES	YES	YES	YES
Aluminium Construction/Anti-Rust	YES	YES	YES	YES	YES	YES
Cooling	Forced	Forced	Forced	Forced	Forced	Forced
Approximate Weight (Lbs/Kg)	187.3/88	207.2/94	247/112	275.5/125	344/156	385/175
Lenght (inch/cm)	18in/46cm	18in/46cm	18in/46cm	18in/46	18in/46cm	18in/46cm
Width (inch/cm)	16.5in/42cm	16.5in/42cm	16.5in/42cm	16.5in/42cm	16.5in/42cm	16.5in/42cm
Height (inch/cm)	17.5in/45cm	17.5in/45cm	17.5in/45cm	17.5in/45cm	23.6in/60cm	23.6in/60cm
Auto-Restart	YES	YES	YES	YES	YES	YES
Galvanic Isolation	YES	YES	YES	YES	YES	YES
Low Peak Transformer	YES	YES	YES	YES	YES	YES
Paralleling	YES	YES	YES	YES	YES	YES



## 6. MAIN FEATURES

- **ANG-BOOST™ is CE and ISO 9001 certified**, it is manufactured with **UL CERTIFIED** components and complies with **ABYC E-11** Standards.
- **SEAMLESS SYSTEM:** ANG-BOOST™ is provided with SEAMLESS transfer system in order to avoid power interruption during the switching. The system automatically chooses the optimal point of switching without loss of power.
- **OVERLOAD ENDURANCE:** ANG-BOOST™ is designed to withstand 30% overload for at least one hour.
- **ELECTRICAL PROTECTION:** ANG-BOOST™ is provided with a protective shield. The shore grounding conductor is connected to a shield between primary (shore) and secondary (boat) transformer windings. This shield assures isolation on the boat for electrical protection.
- **BY-PASS SYSTEM:** ANG-BOOST™ is provided with manual By-Pass system that allow to manually disconnect the Boost mode in case of breakdown and supply power from the shore. The by-pass system guarantees the isolation protection on the boat.
- **SOFT START SYSTEM:** ANG-BOOST™ is provided with Soft Start System that assures the minimal current in-rush during the power up of the system.
- **FULL OUTPUT POWER GUARANTEED:** ANG-BOOST™ ensures full output power even in boost mode. The output voltage is always stable.
- **AUTOMATIC THERMAL PROTECTION:** ANG-BOOST™ is provided with a thermal protection that automatically shuts down the system until the temperature returns to a normal level. The unit will automatically restart when the temperature returns to a safe operating level.
- **AUTO-RESTART:** ANG-BOOST™ automatically restart after high voltage, low voltage, blackout, and overload. ANG-BOOST™ is equipped with very low peak transformers.
- **The ANG-BOOST™ is provided with cooling fan system.**
- **STATIC SYSTEM:** The static switch doesn't need any maintenance, the only required maintenance is the filter cleaning.
- **ANG-BOOST™ increases the output voltage in two steps up: 15% (1<sup>st</sup> step) and 7% (2<sup>nd</sup> step).**
  - 1<sup>st</sup> Step: from 175V to 209V + 15%
  - 2<sup>nd</sup> Step: from 210V to 227V + 7%
  - 3<sup>rd</sup> Step: from 228V to 253V non-Boost Mode (Shore Supply)

The result is a more balanced power supply, eliminating over-voltages in the range 200/205 Vac and increasing the voltage in the range 205/227 Vac.

- **ANG-BOOST™ covers a wide voltage range gradually increasing the output voltage.** (See graph pg.4)
- **Aluminum Construction, Anti-Rust.**
- **2 year International Warranty.**



## 7. INSTALLATION

Before proceeding with the installation you should check that no damages occurred to the ANG-BOOST™ during the shipping and immediately notify the shipper.

Before installing the ANG-BOOST™ check the presence of other transformers on board and remove or by-pass them.

Before installing the ANG-BOOST™ you should read the manual carefully and ensure that the equipment is installed in a secured and safe place away from rain exposure, excessive moisture or excessive heat, in order to preserve the personal safety of users and the correct functioning.

The ANG-BOOST™ is intended for hard-wiring in a permanent location. The terminal block inside the equipment is accessible once the right cover side is removed.

The cable passage from the shore to the load is provided by two cable glands.

Follow the ABYC standards for “installation of an isolation transformer”.

For a correct and safe installation you need to install a breaker before (input) the ANG-BOOST™ and a breaker right after (output).

### **The breaker must be of adequate size and a CURVE C:**

- AB 12.5 Kva: 50 amp CURVE C
- AB 15 Kva: 63 amp CURVE C
- AB 18 Kva: 100 amp CURVE C
- AB 20 Kva: 100 amp CURVE C
- AB 25 Kva: 100 amp CURVE C
- AB 30 Kva: 100 amp CURVE C



**No other operation is allowed except for the input and output wires connections to the terminal block.**

**Before inserting the by-pass contact the ANG assistance.**

**Before inserting the by-pass, turn off the ANG-BOOST™ (Turn off the input breaker).**

**Open only the terminal block access cover on the right side to proceed with the connection.**

**No other cover side, including the roof, must be open.**

**The unauthorized opening of the ANG-boost will void the warranty.**

**The following connection terminals are provided:**

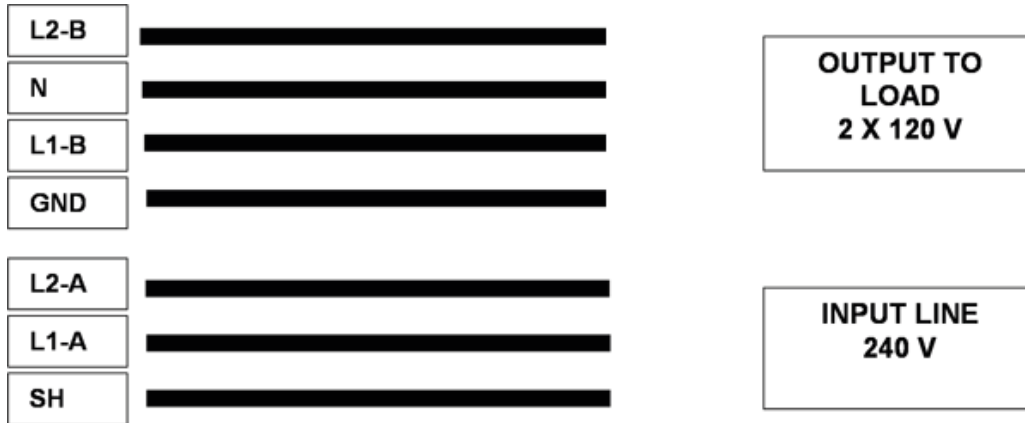


Connection terminals

- **L1-A:** Line Input phase
- **L2-A:** Line Input phase
- **SH:** Shore Grounding
  
- **L1-B:** Output to load phase
- **L2-B:** Output to load phase
- **N.** Output to load Neutral
- **GND:** Boat Grounding: it is necessary for user safety and for the safety of the connected equipment.

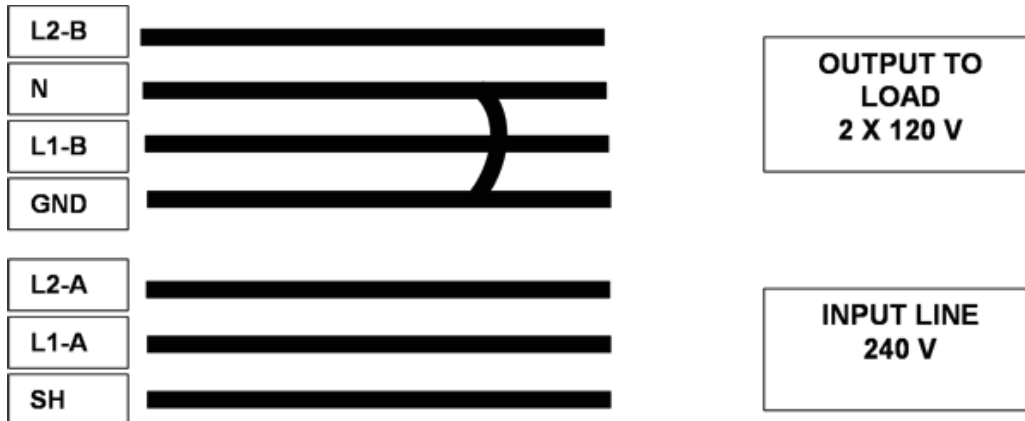
## 8. WIRING METHODS

### Standard Connection (USA/EU):

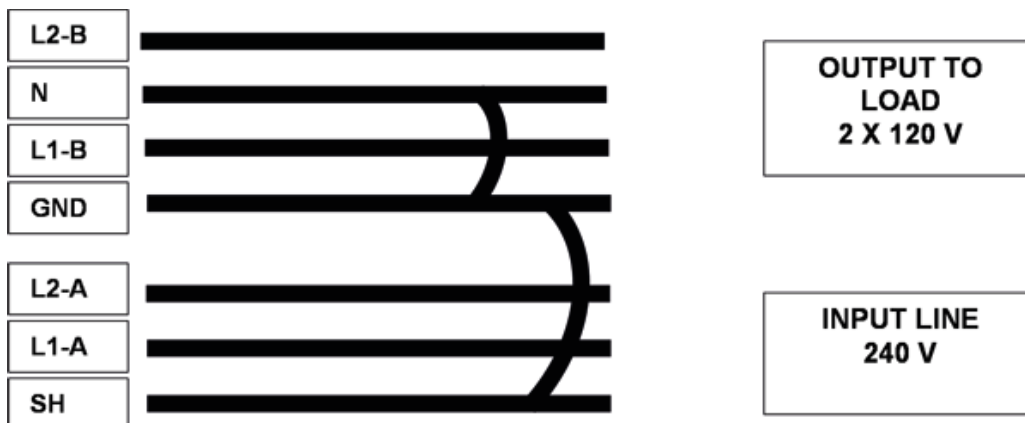


You can choose 4 (four) different Wiring Methods as follows:

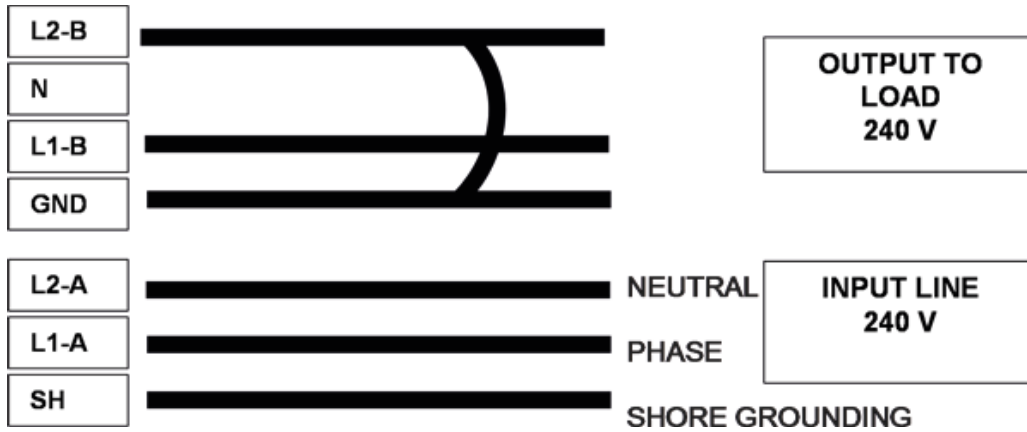
### 8.1 - Isolated Ground Connection (USA):



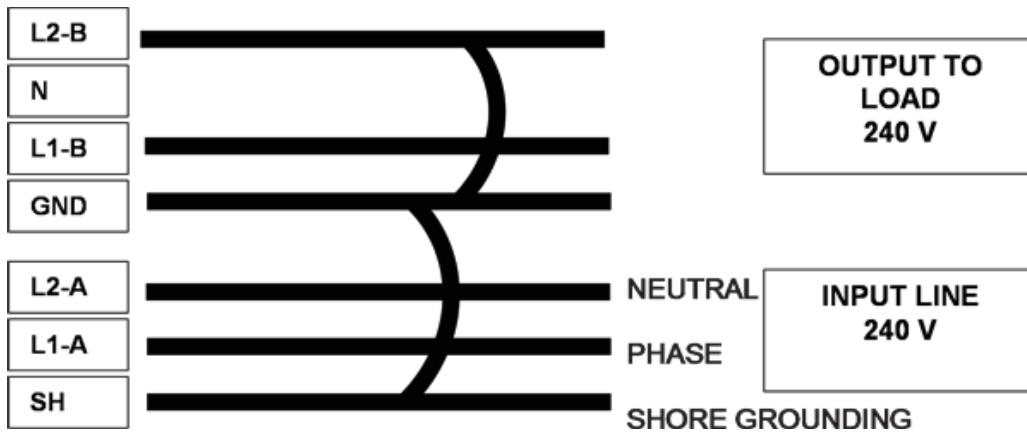
### 8.2 - Common Ground Connection (USA):



### 8.3 - Isolated Ground Connection (EU):



### 8.4 - Common Ground Connection (EU):



**Power should be applied after all connections and terminations have been made and the terminal access cover is secure.**

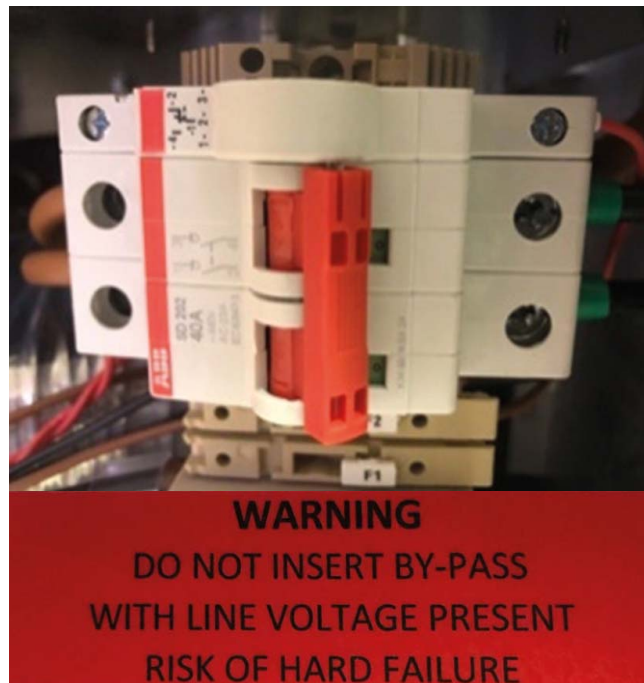
## 9. PROTECTIONS

There are two fuses above the terminal block (5 x 20 1,6 A – T) marked with F1, F2 to protect the ventilation system and the power supply.

## 10. BY-PASS

The ANG-BOOST™ is equipped with a by-pass which allows the power supply directly from the shore voltage, in the event of electronic system failure.

To operate the by-pass, turn off the power to the ANG-BOOST™ by turning off the breaker, then simply remove the right side and manually turn it ON.



**WARNING:**

Do not insert the by-pass switch with line voltage present, risk of hard failure!

## 11. QUALITY ASSURANCE

The entire production cycle of our equipment is subject to surveillance regarding quality assurance. The quality assurance system complies with ISO9001-2008 standard.

## 12. PRECAUTIONS

The ANG-BOOST™ is intended for installation inside a boat (engine room or elsewhere in the interior). Make sure the location is safe and secure.

Do not operate the ANG-BOOST™ if it has dropped, damaged, immerse in water, etc..  
Do not disassemble.

Only Certified and Qualified Technicians (Marine Certified ABYC Technicians) are allowed to operate the ANG-BOOST™.

## 13. WARRANTY

This product and all its components have been tested and accurately checked before exiting production and is warranted for a period of 24 months (2 year) after the purchase date. (Purchase date is the one that appears on the invoice).

Warranty covers substitution or repair free of charge of all the components that are acknowledged by the producer as inefficient or faulty. The product must be delivered to the manufacturer and all data concerning the defect product must be included. Transportation to the manufacturer is at the owner expenses and at its own risk. The warranty repair will be performed as soon as possible and eventually shipped to the customer at its own expenses and risks.

Warranty doesn't cover accidentally broken parts, natural events, improper use or installation of the product. Travel expenses, shipping, installation and disinstallation costs are not covered by warranty. Warranty is not granted when the product has been opened, tempered or repaired by personnel that is not authorized by the manufacturer.

**Only Marine Certified technicians are allowed to operate the equipment.**

Substitution of the product or prolongation of the warranty period is not granted by the manufacturer, as well as the manufacturer will not be considered responsible of direct and indirect damages to people, animals or things due to the use or lack of use of the product.

**Notes:**

- **A.N.G. USA Inc.** is responsible only for the performance of the equipment.
- Any other factor within the yacht that might cause the equipment not to perform efficiently isn't to be considered our responsibility.
- **A.N.G. USA Inc.** guarantees all systems designed by us.
- All main replacements are always available in our head quarter in Fort Lauderdale and in Italy.
- Prompt assistance and technical support are always guaranteed.

## 14. RULES

### DECLARATION OF CONFORMITY

- All **A.N.G. USA Inc.** equipments are in conformity with UNI CEI EN ISO/IEC 17050-1:2005 and UNI CEI EN ISO/IEC 17050-2:2005 standards.
- We, A.N.G. USA Inc. 3200 S. Andrews Ave, suite 207 Fort Lauderdale, FL 33316, Hereby declare that the product below conforms to the relevant requirements of the appropriate EU directive.
- All components are UL CERTIFIED.
- Complies with ABYC E-11 Standards.

**Applicable UE Directives:**

- 2006/95/CE (EU Directive on Electrical equipment designed for use within certain voltage limits).
- 2004/108/CE (EU Directive on Electromagnetic Compatibility).

**Applicable UE Directives:**

- CEI EN 55022:2006 Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement.
- CEI EN 61000-4-2/A2:2001 Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test.
- CEI EN 62040-1-1:2003 Uninterruptible power systems (UPS). Part 1-1: General and safety requirements.
- CEI EN 62040-1-2:2003 Uninterruptible power systems (UPS). Part 1-2: General and safety requirements.