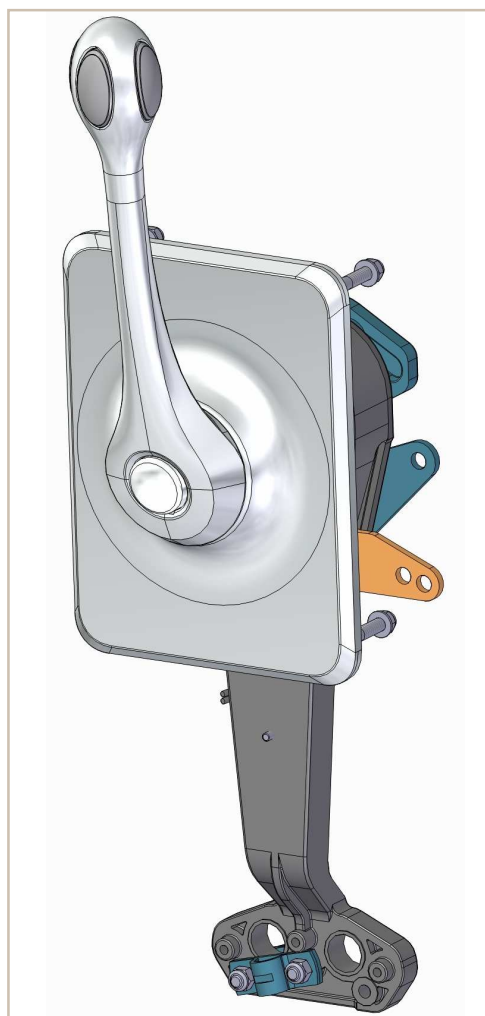


# Installation and maintenance manual

## SINGLE LEVER CONTROL



CE

**B400**



# ULTRAFLEX

ENGLISH





Dear Customer,

Thank you for choosing an **ULTRAFLEX** product.

**ULTRAFLEX** has been making steering and control systems for pleasure and working craft for many years. **ULTRAFLEX** has always been synonymous with reliability and safety.

All **ULTRAFLEX** products are designed and built to provide the best possible performance for the purpose for which they were designed.

To protect your safety and maintain top quality, **ULTRAFLEX** guarantees its products only if they are used with original parts (refer to "Application Spare Parts" annex).

**ULTRAFLEX** and **UFLEX**'s Quality Management Systems are CISQ-IQNet certified by RINA, the Italian Naval Registry, in accordance with standard UNI ES ISO 9001:2008. **ULTRAFLEX** Certificate no. 6669/02/S (formerly 420/96). **UFLEX** Certificate no. 8875/03/S.

The Quality System gets all company resources and processes involved, starting with design, in order to:

- provide customers with a guarantee of product quality;
- identify actions for maintaining and improving quality standards with time;
- continually improve the efficacy and efficiency of processes in order to respond to the demands of the market and improve customer satisfaction;
- ensure compliance with the requirements of directive 94/25 EC, standard ISO 10592 and ABYC (American Boat Yacht Council) standards.



"With more than 70 years of experience in boatbuilding, **ULTRAFLEX** is a world leader in the production of mechanical, hydraulic and electronic steering systems, control systems and steering wheels for motorboats for pleasure, fishing or working uses, of all sizes and with all types of engines.

The reliability of our products and our pre- and post-sales service, the quality of our company's organisation and use of human resources and our ongoing investment in research and development are key factors in explaining our products' growing success all over the world".

**ULTRAFLEX S.p.A.**

16015 Casella (Genova) Italia - Via Crose, 2

## TABLE OF CONTENTS



Use of this manual and symbols .....	4
Note .....	5
Warranty .....	5

### SECTION 1 - PRODUCT DESCRIPTION



1.1 Product description and recommendations for use .....	6
1.2 Dimensions .....	6

### SECTION 2 - TRANSPORTATION



2.1 General information .....	7
2.2 Package contents .....	7

### SECTION 3 - INSTALLATION



3.1 Tools required .....	8
3.2 Installation of the control box on the bulkhead .....	8
3.2.1 Installation from the inside of the bulkhead .....	8
3.2.2 Insertion from outside the bulkhead .....	9
3.3 Installation of the neutral safety switch X41 (optional) .....	11
3.4 Assembly of C2 – C8 – MACHZero cables .....	12
3.4.1 Connecting the inverter and accelerator cable to the frame .....	13
3.4.2 Connecting the inverter and accelerator cable to the rocker arms .....	14
3.4.3 Inverting the direction of accelerator control .....	14
3.5 Installing other types of cable (C5, C14...) .....	14
3.6 Assembling the lever unit .....	15
3.7 Adjusting the clutch .....	15

### SECTION 4 - USING THE LEVER



4.1 Using the lever .....	16
4.2 Accelerating in neutral .....	16

### SECTION 5 - SAFETY WARNINGS



5.1 Safety during installation and use .....	17
5.2 Clothing .....	17

### SECTION 6 - MAINTENANCE



6.1 Ordinary maintenance .....	18
6.2 Special maintenance .....	18

### SECTION 7 - DISMANTLING



7.1 Dismantling .....	19
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## USE OF THIS MANUAL AND SYMBOLS

THE INSTALLATION AND MAINTENANCE MANUAL is the document accompanying the product from sale to replacement and disposal, and should be considered an integral part of the product. Read the manual before undertaking ANY ACTIVITY involving the product, including movement and unloading from the vehicle on which it is delivered.

In order to protect the user's safety and guarantee correct functioning of the product, this manual uses the symbols described below.

 **DANGER**



Immediate damage **CAUSING** serious injury or death.

 **IMPORTANT**



Damage or unsafe practices which **COULD** lead to serious injury or death.

 **WARNING**



Damage or unsafe practices which **COULD** lead to minor injury or damage to the product or to property.

**NOTE**

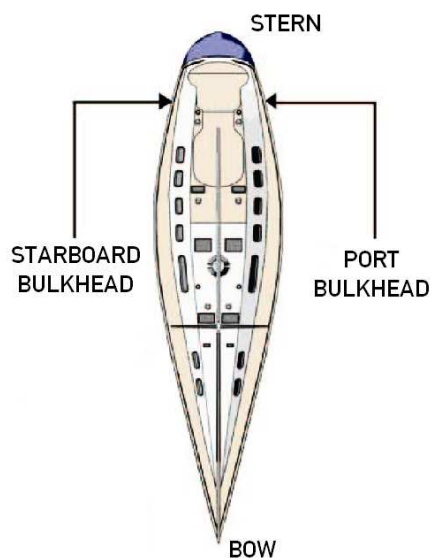


Information considered important for adequate installation and maintenance which cannot cause damage.



Operations which should be performed by qualified or specialized personnel to avoid risks are identified by the symbol shown here. Provide the personnel who will be installing the product with appropriate training and make sure that they understand and implement the instructions provided.

SAILBOAT



## NOTE

This installation and maintenance manual constitutes an integral part of the product and must be made easily accessible for personnel using the product and performing maintenance work on it.

**ULTRAFLEX** shall not be held liable for any inaccuracies due to printing errors contained in the manual. Without altering the basic features of the product described, **ULTRAFLEX** reserves the right to make any changes to descriptions, details and illustrations that it may consider appropriate for its improvement or for manufacturing or commercial reasons at any time, without being required to update this publication immediately.

ALL RIGHTS RESERVED. Rights to publication, trademarks, logos and photographs of **ULTRAFLEX** products present in this manual are the property of **ULTRAFLEX** and may not be reproduced in full or in part. Great care has been taken to collect and verify documentation to make this manual as complete and easy to understand as possible. None of the information contained in this publication may be interpreted as a guarantee or an express or implicit condition – including, but not limited to, the guarantee of suitability for a particular purpose. None of the information contained in this publication may be interpreted as a change to or assertion of the terms of any contract of purchase.



### IMPORTANT

The product must be installed by experienced personnel to ensure correct functioning of the product and its components. In the event of breakage of components or malfunctioning, contact specialized personnel or our Technical Assistance Service.

ENGLISH

### TECHNICAL ASSISTANCE SERVICE

**UFLEX S.r.l.** Via Milite Ignoto, 8A  
16012 Busalla (GE)-Italia  
Tel: +39.010.962.0239 (Italy)  
Tel: +39.010.962.0244 (International)  
Fax: +39.010.962  
Email: [uf@ultraflexgroup.it](mailto:uf@ultraflexgroup.it)  
[www.ultraflexgroup.it](http://www.ultraflexgroup.it)

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6442 Parkland Drive  
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Fax: +1.941.360.9171  
Email: [uflex@uflexusa.com](mailto:uflex@uflexusa.com)  
[www.uflexusa.com](http://www.uflexusa.com)

## WARRANTY

**ULTRAFLEX** warrants that its products are built according to the standards of good workmanship and are free of defects in materials or workmanship.


This warranty is valid for two years starting on the date of manufacture, with the exception of cases in which products are installed and used on working vessels or on vessels for commercial use, in which case the guarantee is limited to 1 year from the date of manufacture.

This warranty is limited to free replacement or repair of the item, which must be returned carriage paid, provided we find it to be effectively defective in materials and/or workmanship.

The warranty does not cover any direct or indirect damages. The warranty specifically does not cover, and we shall not be held liable for (except for replacement or repair of defective items under the terms and conditions set forth above), malfunctioning of our products if their failure or poor functioning is attributable to incorrect installation or to negligent or improper use.

This warranty does not cover products installed on racing boats or used in a competitive context. The descriptions and illustrations in this manual are indicative only.

Please contact our Assistance Service for more detailed information.

The components of **ULTRAFLEX** steering and control systems are marked  as required by directive 94/25/EC and conform to ABYC standards (U.S.A.).

Note that on EC marked vessels it is obligatory to install steering and control systems with EC marked components. (See Art. 3 and Art. 5 of directive 94/25/EC.) Note that the **ULTRAFLEX** warranty shall be automatically forfeited if any **ULTRAFLEX** components are installed in a steering and control system along with products of other brands.



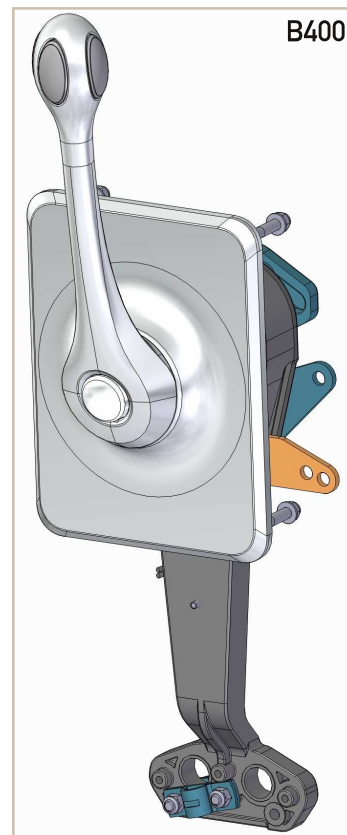
# 1 PRODUCT DESCRIPTION

## 1.1 Product description and recommendations for use

The single lever control is assembled on the starboard or port bulkhead closest to the vessel's helm. The lever has an adjustable clutch and a push-in button for throttle operation in neutral.

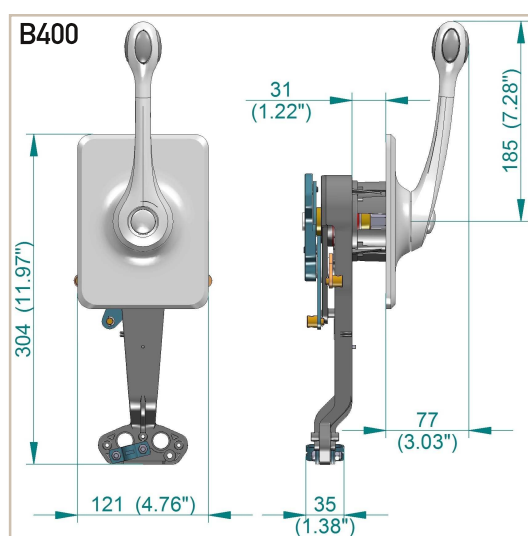
The B400 single lever control may use the following **ULTRAFLEX** cables:

- C2 – C8 – MACHZero no adaptation kit required;
- C5 – C16 – MACH5 with adaptation kit K72
- C14 – MACH14 with adaptation kit K71
- C36 – MACH36 with adaptation kit K73

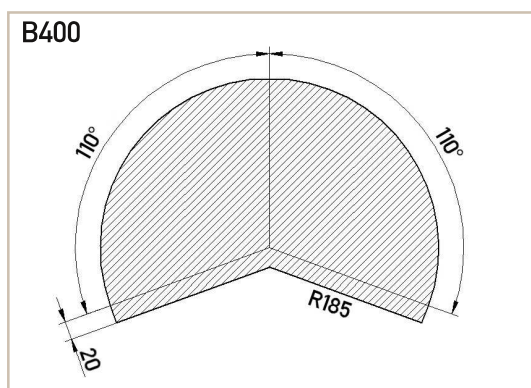


## 1.2 Dimensions

The figure below shows the dimensions of the B400 single-lever command.



### MINIMUM OVERALL DIMENSIONS FOR LEVER ROTATION



### NOTE

Make sure that the lever can turn freely and its travel is not blocked by obstacles on the bulkhead.



## 2 TRANSPORTATION

### 2.1 General information

The product and its packaging weigh about 2.5 Kg (5.5 pounds) and can therefore be moved by hand.

#### IMPORTANT

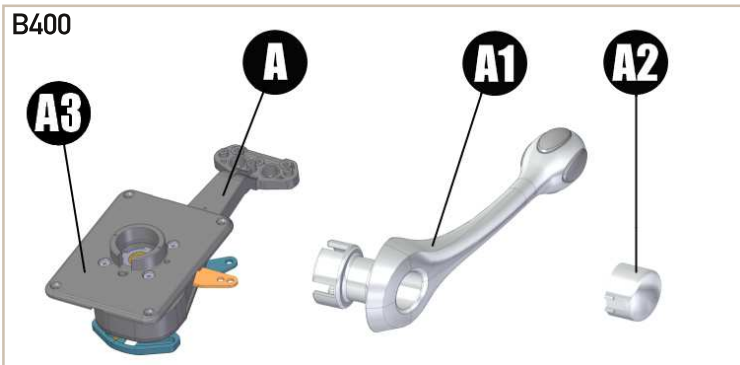
Personnel handling the load must work with safety gloves and footwear.

### 2.2 Package contents

Before using the device, check that it has not suffered damage during transportation or storage. Also check that all the components supplied with it are contained in the package (refer to list). If you identify any damage, notify the carrier and your supplier.

Contents of the control system package:

B400

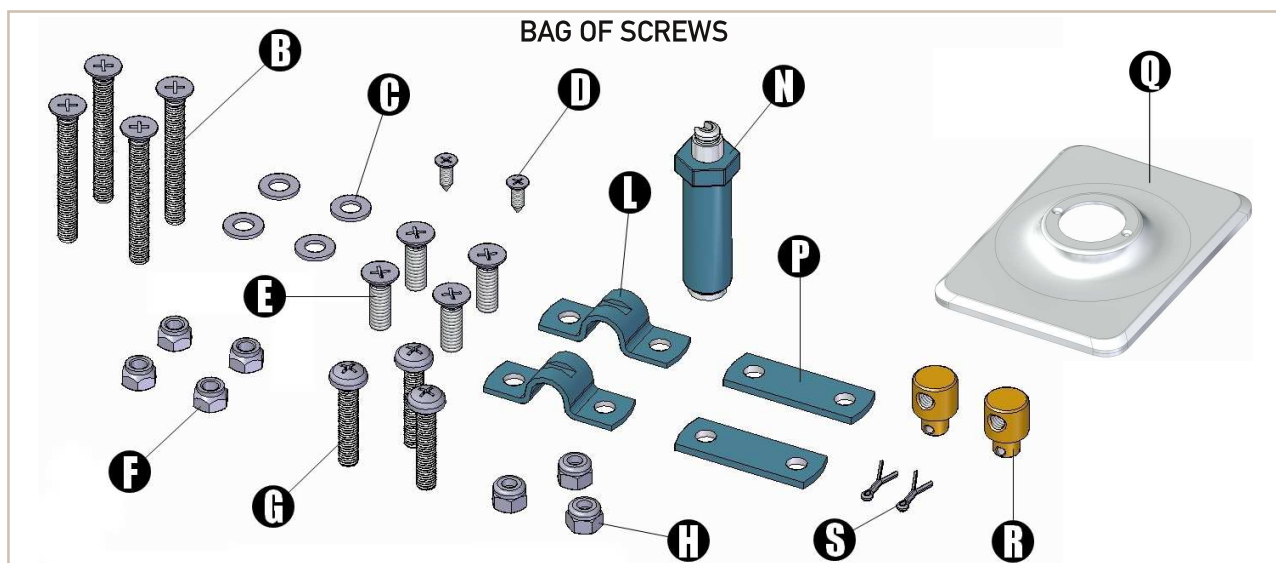


#### WARNING

Dispose of packaging in accordance with the law.

REF	COMPONENTS
A	control box
A1	lever
A2	push-in button
A3	flange
B	4 M5x40 screws
C	4 washers
D	2 TS 2,9 screws
E	4 M5x16 screws
F	4 M5 self-locking nuts
G	3 M5x25 screws
H	3 M5 nuts
L	2 U-bolts
N	perforated screw with pin for retaining lever
P	2 plates
Q	screw cover flange
R	cable terminals
S	cotter pin

ENGLISH





## 3 INSTALLATION

### 3.1 Tools required



Phillips screwdriver (ø6)  
and flat-tip screwdriver (ø2)



Pliers



14 mm tube wrench



Drill  
(5.5 mm tip)

ENGLISH

### 3.2 Installation of the control box on the bulkhead



#### 3.2.1 Installation from the inside of the bulkhead

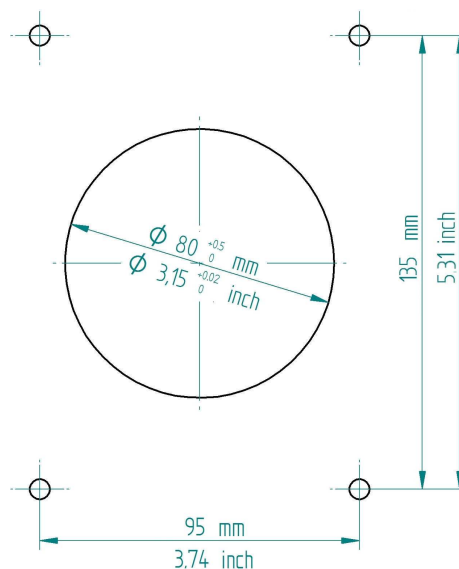
- 1 Refer to the footprint dimensions given in point 1.2 to check that the box can effectively be installed in the desired position. Assemble the mechanism, with its connected cables, from inside the vessel's bulkhead.



#### IMPORTANT

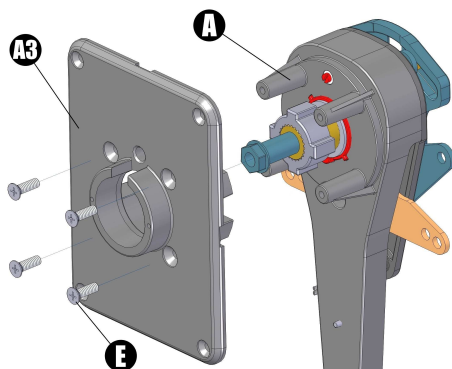
Make sure the cables are not bent too tightly (minimum radius: 200 mm – 8").  
We recommend use of **ULTRAFLEX** cables.

- 2 After determining the appropriate location, drill the holes required to assemble the control box using the template provided.

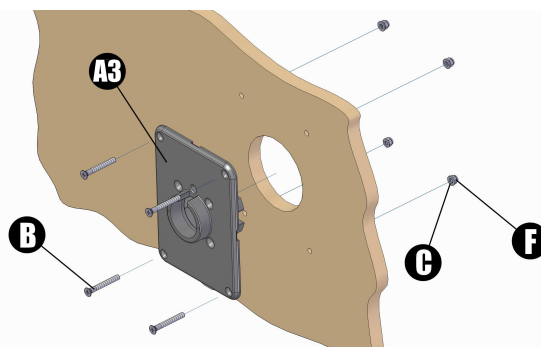




- 3 Remove the 4 locking screws (E) and the flange (A3) from the control box (A).



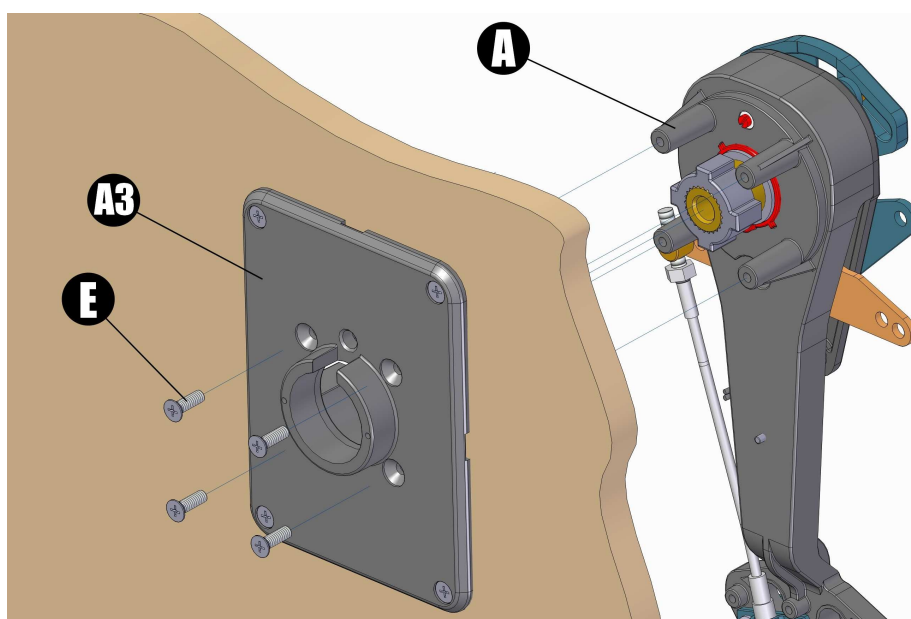
- 4 Fix the flange (A3) in place using the screws (B), washers (C) and nuts (F).



### NOTE

The accelerator cable and inverter must be connected to the frame and rocker arm according to the instructions in section 3.4.

- 5 Anchor the control box mechanism (A) to the flange (A3) with the screws (E).



### 3.2.2 Installation from outside the bulkhead

- 1 Refer to the footprint dimensions given in point 1.2 to check that the box can effectively be installed in the desired position. Assemble the mechanism, with its connected cables, from outside the vessel's bulkhead.

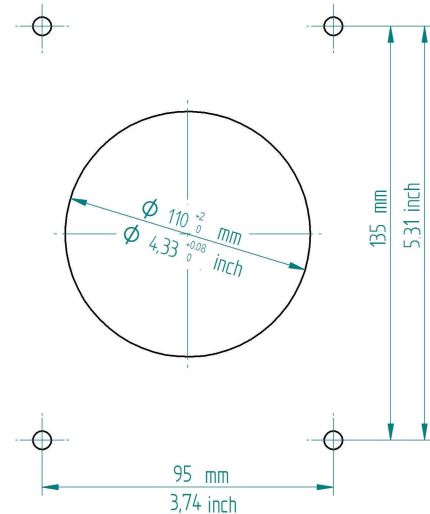


### IMPORTANT

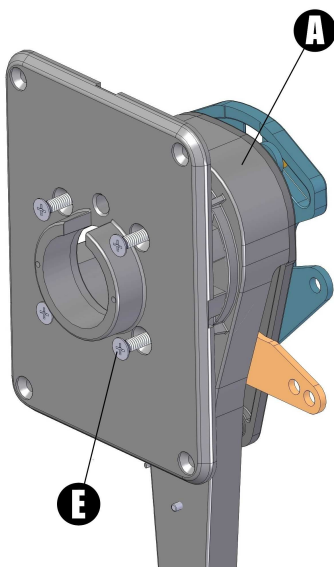
Make sure the cables are not bent too tightly (minimum radius: 200 mm – 8"). We recommend use of **ULTRAFLEX** cables.



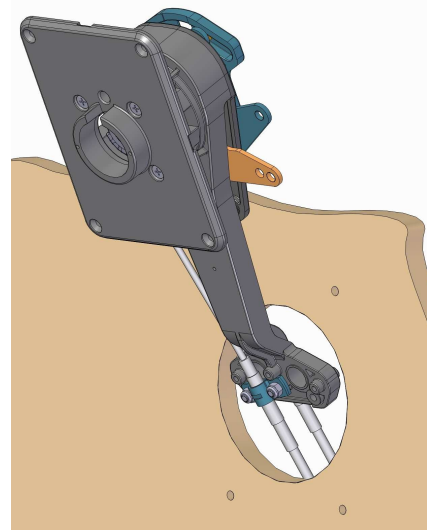
- 2 After determining the appropriate location, drill the holes required to assemble the control box using the template provided.



- 3 Slacken the 4 anchoring screws (E) on the control box (A).



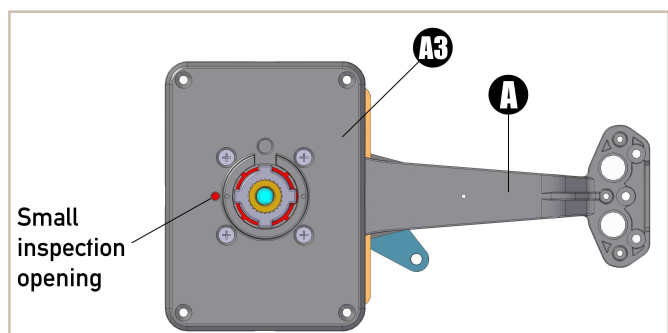
- 4 Pass the accelerator and inverter cables through the opening in the bulkhead and connect them with the frame of the mechanism and the rocker arms as described in points 3.4.1 and 3.4.2.



- 5 Partially tighten the 4 screws anchoring the internal flange to the frame of the mechanism to leave more room for maneuvering. Insert the lever mechanism in the bulkhead, being careful not to force the cables or rocker arms against any obstacles that may be present. Tighten the screws (E) anchoring the internal flange to the frame, and fix the flange inside the bulkhead using 4 self-threading screws with flared heads (the diameter of the flared holes is 5.1 mm).

### ! IMPORTANT

You may assemble the mechanism in the horizontal position as shown in the figure, turning the internal flange (A3) so that the small inspection opening is aligned with the screw for adjusting the clutch.





### 3.3 Installation of the neutral safety switch X41 (optional)

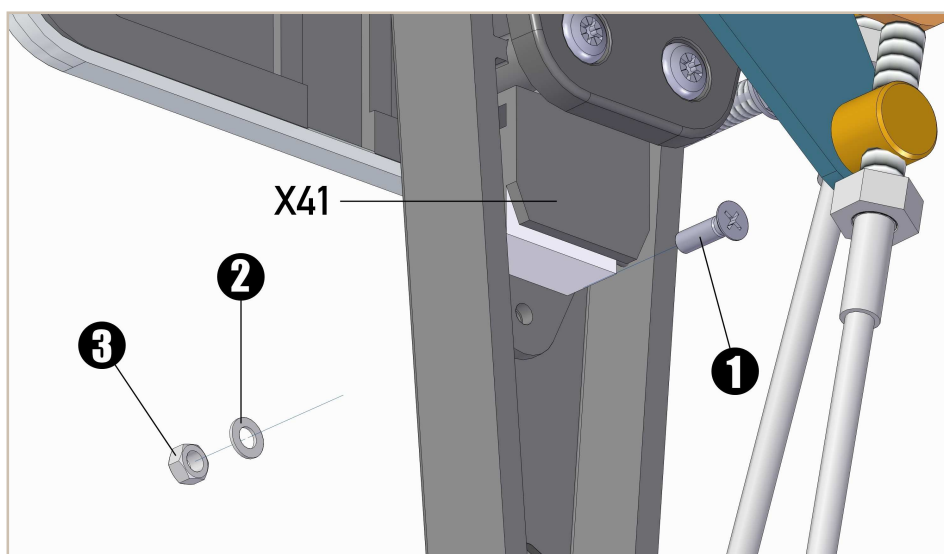
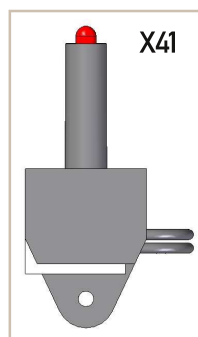
This optional device allows the engine to be started up only if the inverter is in the “neutral” position, preventing undesired movement of the vessel.

Proceed as follows to assemble:

Fix the safety switch X41 in place with the screw (1), washer (2) and nut (3) (included in kit X41), as shown in the figure.

#### NOTE

The screw head must rest against the surface of the switch.



ENGLISH

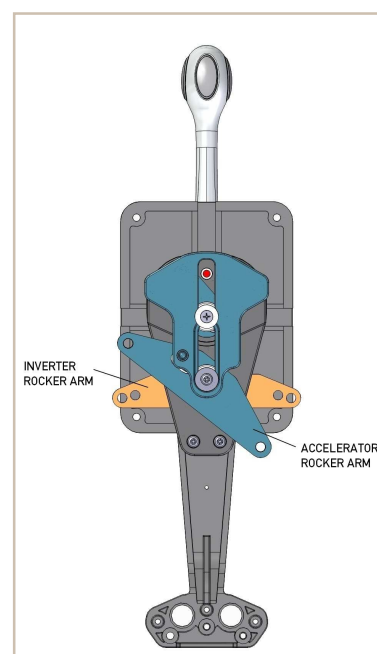
### 3.4 Assembly of C2 - C8 – MACHZero cables



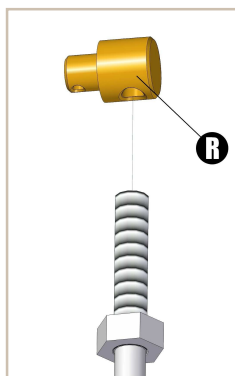
#### IMPORTANT

Before beginning the installation procedure, make sure that the inverter rocker arm is in the neutral (horizontal) position and the accelerator is in the minimum position (as shown in the figure).

Identify the side of the frame on which you will install the inverter cable and the accelerator if you need to pull or push the cable.



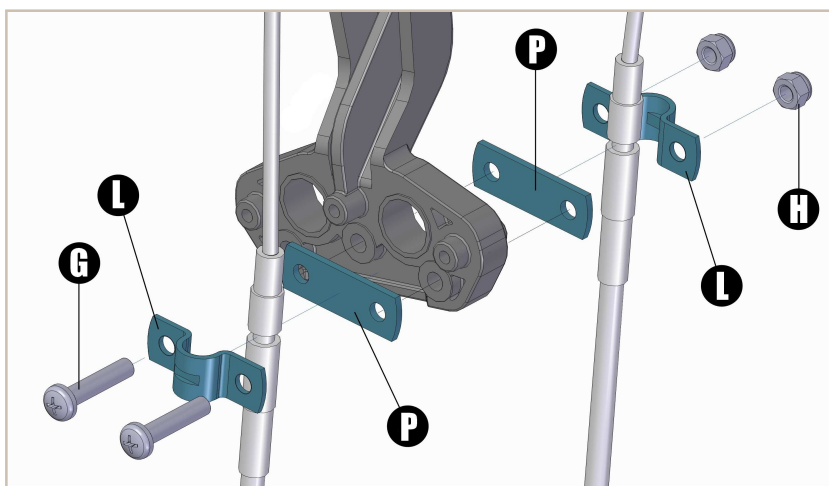
## 3.4.1 Connecting the inverter and accelerator cable to the frame



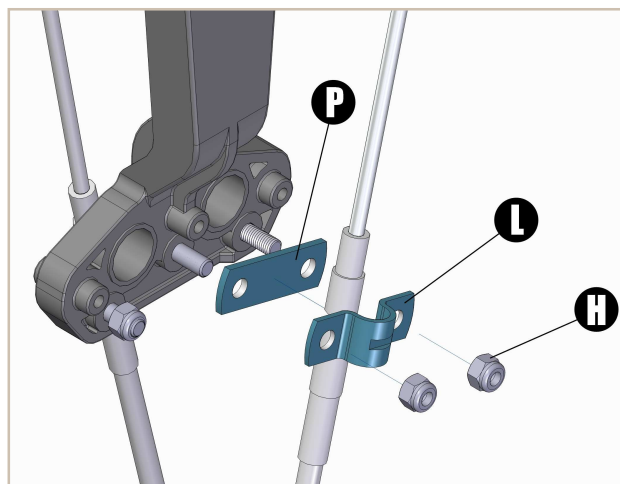
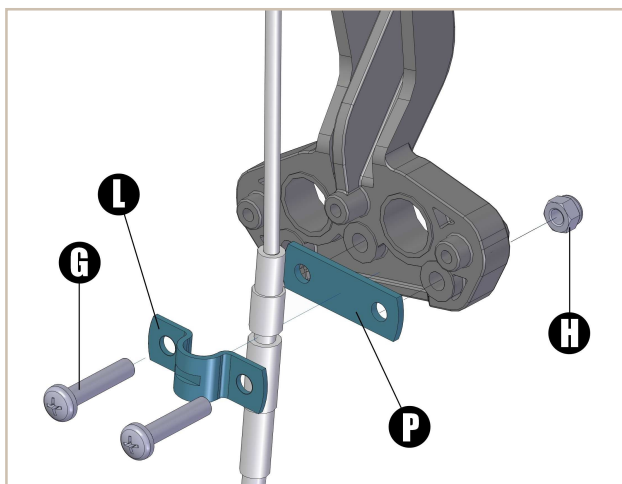
Screw the cable terminal (R) onto the thread at the head of the inverter and accelerator cable.

ENGLISH

If the inverter and accelerator are connected by the same side of the frame, anchor the inverter cable sheath terminal to the frame using the plate (P) and support (L) provided with the screws (G) and the accelerator sheath terminal on the opposite side with the second plate (P) and support (L) provided, then tighten with the nuts (G).

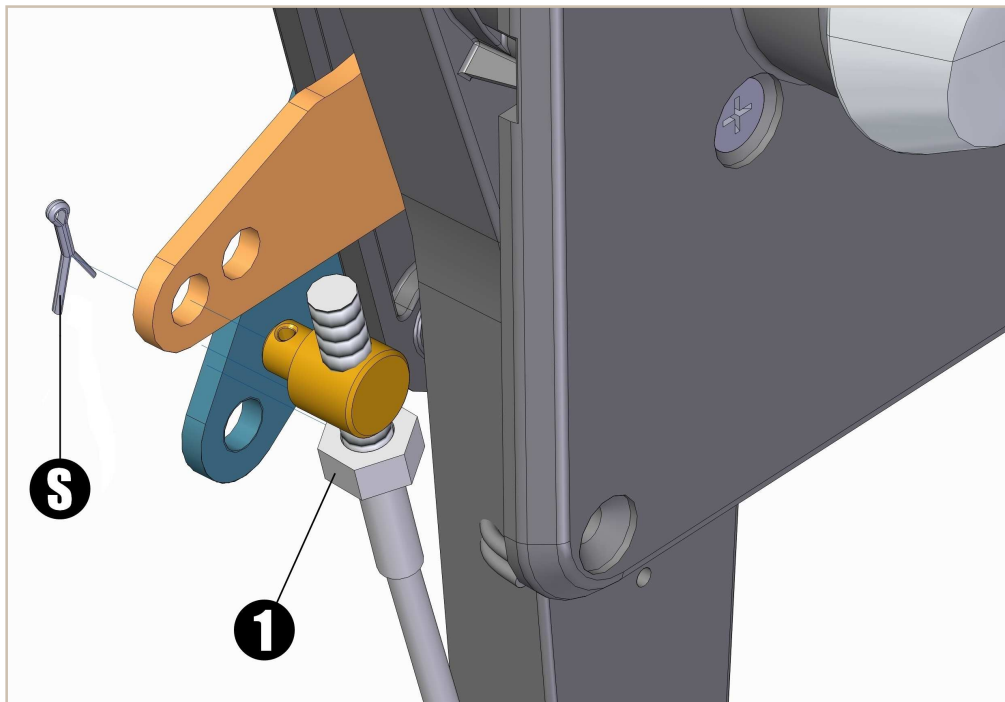


If the inverter and accelerator are connected to different sides of the frame, fasten the inverter cable sheath terminal to the frame using the plate (P) and support (L) provided with the screws (G) and tighten the outermost screw with the nut (H). Fix the accelerator sheath terminal onto the opposite face and side with the second plate (P) and support (L) provided, then tighten the outermost screw and the central shared screw with the nuts (H).



### 3.4.2 Connecting the inverter and accelerator cable to the rocker arms

Close or extend the cable to insert the terminal in the hole in the rocker arm. Check that the cable travels as far as necessary. If its travel is correct, tighten the counter-nut (1) and insert the cotter pin (S) in the cable terminal to prevent it from coming off the rocker arm. If the travel is not as desired, screw the terminal in or out on the threading at the head of the cable to obtain finer adjustment, and then tighten the counter-nut (1) and insert the cotter pin provided (S) in the cable terminal.



ENGLISH

#### IMPORTANT

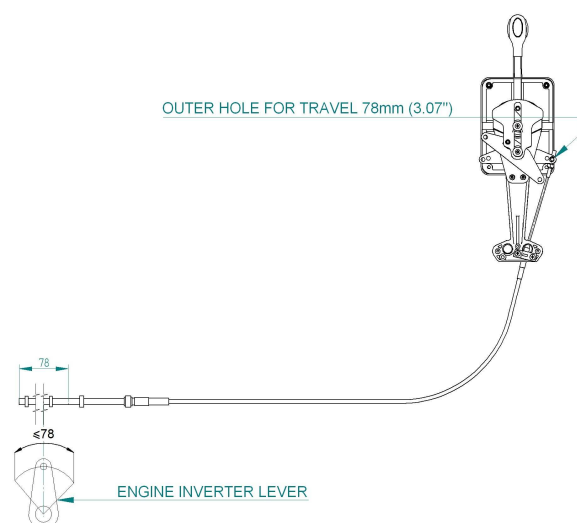
- Proper functioning of the control depends on precise regulation of the inverter's travel.

#### IMPORTANT

In no case may the travel of the single-lever control (67 mm (2.64") on the internal hole; 78 mm (3.07") on the external hole of the rocker arm) be greater than the travel measured on the engine lever.

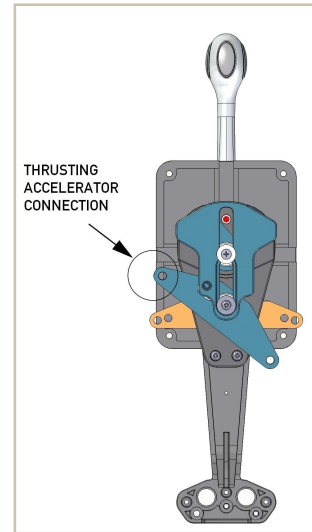
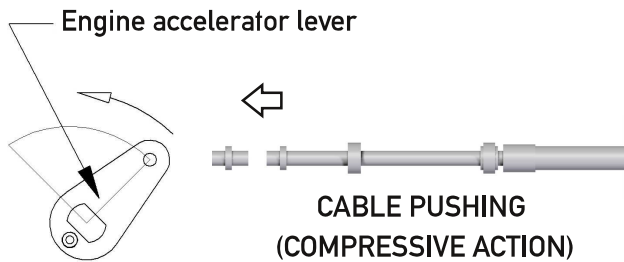
This could damage both the cable and the control.

- The cable sheaths coming out of the lower part of the control may be bundled in a group or anchored at a minimum distance of 500 mm (19.7") from the control.

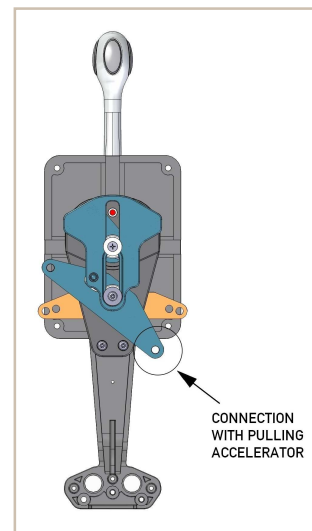
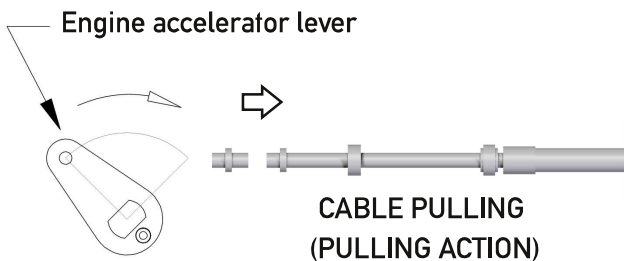


## 3.4.3 Inverting the direction of accelerator control

If the vessel's engine has a pushing engine accelerator lever (compressive action), as the boat's speed increases the cable must be connected to the top part of the rocker arm (see figure).



If the vessel's engine has an engine accelerator lever which must be pulled (pulling action), when speed increases the cable must be connected to the lower part of the rocker arm (see figure).



## 3.5 Installing other types of cables (C5, C14...)



The standard B400 and B401 controls can only be connected to Ultraflex cables C2, C8 and MACHZero, but you can use an adapter kit to connect other types of cables. The kits available are:

- Kit K71 for cables C14 and Mach 14 (code 42082 T)
- Kit K72 for cables C5, C16 and Mach 5 (code 420083 V)

### NOTE

For information on kit installation, refer to the instructions contained in the kits.





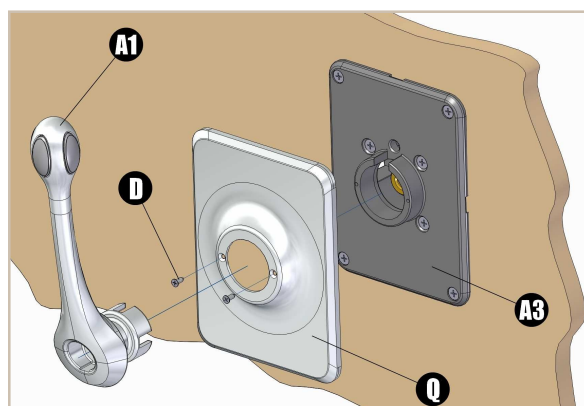
## 3.6 Assembling the lever unit

Fix the external flange (Q) with the screws (D) to the flange (A3).

Insert the lever (A1).

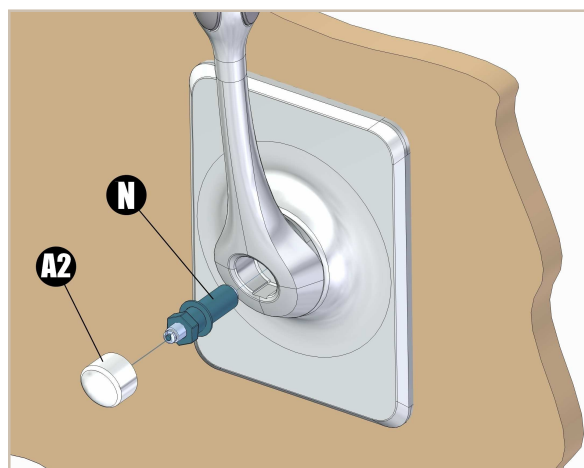
Keep the lever in neutral position and insert it in the control box (A) on the drive shaft spline.

Tighten the screw (N) using the 14 mm tube wrench and insert the pushbutton (A2) in its housing in the lever hub (see figure).



### NOTE

Press the push-in button at least 3 times to ensure proper anchorage.



ENGLISH

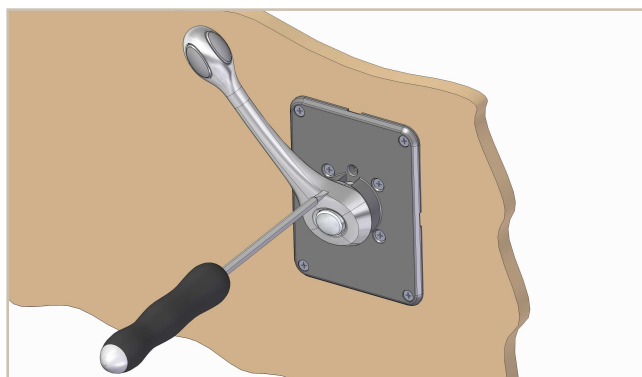


## 3.7 Adjusting the clutch

Turn the clutch control screw clockwise with a flat-tipped screwdriver to increase friction, anticlockwise to decrease it.

### N.B.

THE CLUTCH MUST ALWAYS BE ADJUSTED WITH THE ENGINE TURNED OFF AND THE LEVER IN ACCELERATED POSITION.

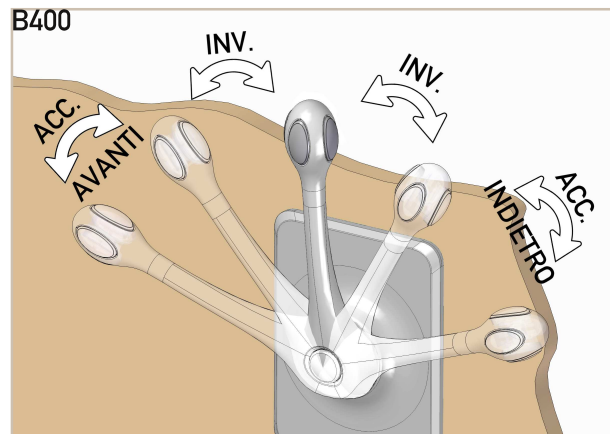




## 4 USING THE LEVER

### 4.1 Using the lever

The lever's travel is divided into two movements: in the first 30° phase the inverter is used; in the second 80° phase the accelerator is used. When the lever is moved forward the vessel moves forward, whereas when it is moved backward it proceeds in reverse.



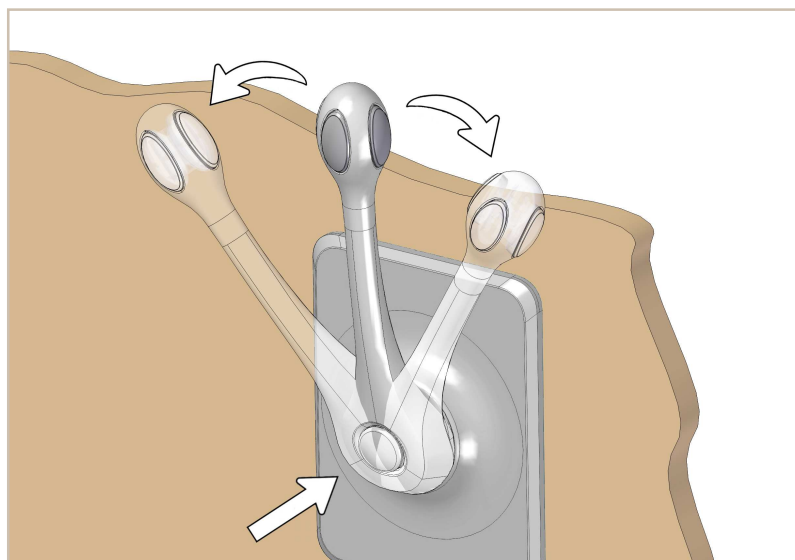
#### DANGER

Make sure the lever is in the neutral position before starting the engine if the control does not have a neutral safety switch.

### 4.2 Accelerating in neutral

Press the central button and, while holding it down, turn the single lever clockwise or anticlockwise to obtain the desired acceleration.

Reposition the lever in neutral and the recall spring will bring the push-in button back to its initial position.



## 5 SAFETY WARNINGS

This section illustrates the safety regulations to be applied for proper use of the apparatus. Read this section very carefully and also read the manuals supplied with other components of the single lever control.

### 5.1 Safety during installation and use



OBLIGATORILY FOLLOW the precautions and safety criteria indicated below.

**ULTRAFLEX** shall not be held liable for the user's failure to observe these precautions and criteria and shall not be held liable for any negligence in use of the system.

ENGLISH



#### DANGER

- NEVER PUT YOUR HANDS BETWEEN MOVING PARTS
- Do not deactivate safety devices or render them inoperative.
- Do not modify the system or add devices to it without written authorization or the intervention of an **ULTRAFLEX** technician describing the change made in the description of the work performed.
- Do not use the apparatus for any purpose other than its intended purpose as specified in the installation and maintenance manual.
- Do not allow untrained personnel to perform installation.



#### IMPORTANT

- During installation of the system, take particular care to keep everything clean to ensure that no foreign bodies can get into the system. Even a tiny object can cause permanent damage which may not be immediately obvious.
- Avoid cable curve radiuses of  $< 200\text{mm}$  (8").
- Do not let cables come into contact with sharp corners or edges.
- Do not let cables come into contact with heat sources.

### 5.2 Clothing



#### IMPORTANT

DO NOT wear necklaces, bracelets or any loose garments that could get caught in moving parts during installation, inspection or maintenance work.



## 6 MAINTENANCE

### 6.1 Ordinary maintenance



#### IMPORTANT

Failure to apply maintenance controls may result in loss of control when driving, which can result in damage to property and/or injury.

Maintenance requirements will vary depending on climate and frequency and type of use. Inspections must be conducted at least every two years by an experienced nautical mechanic.

Perform the following maintenance operations:

- Periodically wash components with fresh water and remove any salt deposits.
- Once a month, check all nuts holding the system in place and tighten if necessary.



#### DANGER

Loosening or separation of nuts holding the system in place can cause not only malfunctioning of the single lever control but damage or injury.

- Periodically check that there is no corrosion on metal parts of the cable terminals or abrasion on the sheath.
- Replace damaged parts that may compromise the integrity of the single lever control.

### 6.2 Special maintenance



#### Technical assistance

For any information or assistance with particular applications, you are invited to contact our technical assistance service (refer to "Note").



## 7 DISMANTLING

### 7.1 Dismantling

If you intend not to use the single lever control system any more, dispose of it in an environmentally sound way.

Sheaths, hoses and components made of plastic or other non-metallic materials must be dismantled and disposed of separately.



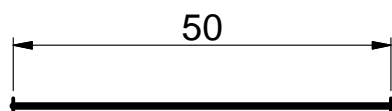
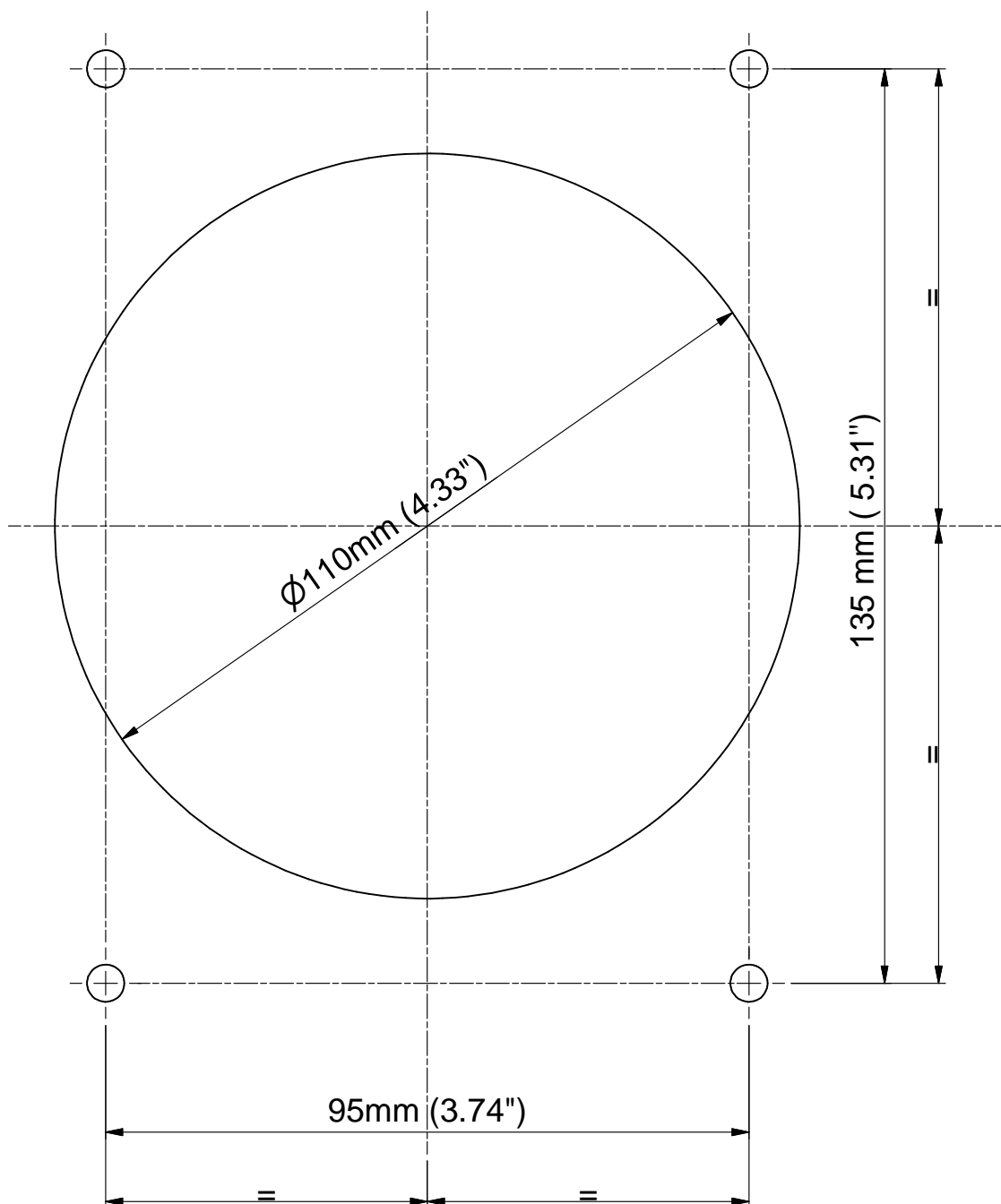


# DIMA B400

## B400 Template

Solo per installazione da esterno paratia/  
For outside bulkhead installation only

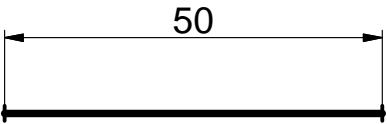
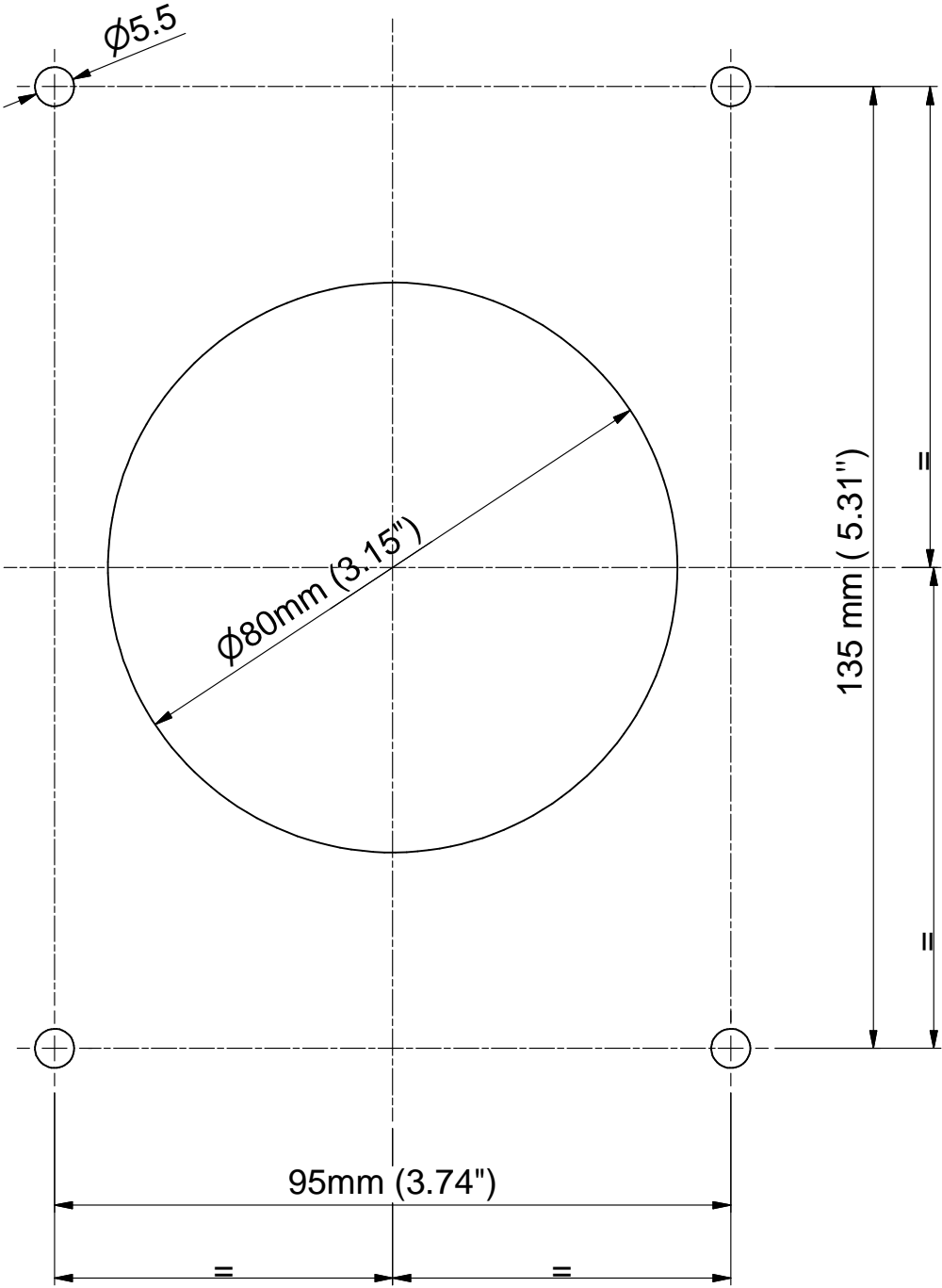
Utilizzare viti autofilettanti /  
Use Selfthreading Screws



Measure for scale  
reference

# DIMA B400

## B400 Template



Measure for scale  
reference