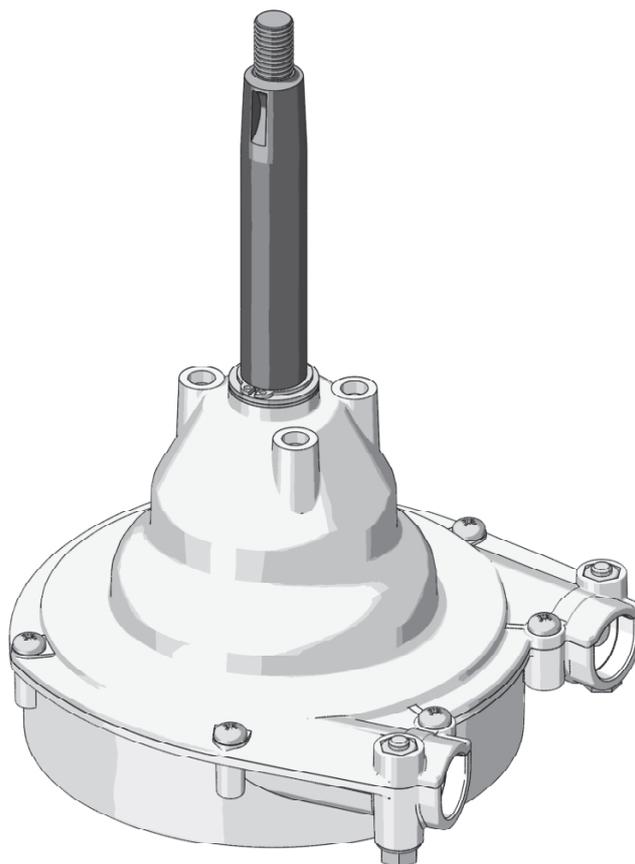


# Installation and maintenance manual

## STEERING SYSTEM

T93ZT



ENGLISH

ITALIANO

FRANÇAIS



**UK**  
page 2



# ULTRAFLEX<sup>CE</sup>

**I**  
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PARTNER

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**ABYC**  
Setting Standards for Safer Boating®

**F**  
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Dear Customer,

We would like to thank you for choosing an **ULTRAFLEX** product.

**ULTRAFLEX** has been a leader in steering systems for pleasure and professional boats for many years. **ULTRAFLEX** production is since ever synonymous of reliability and safety.

All **ULTRAFLEX** products are designed and manufactured to ensure the best performance. To ensure your safety and to maintain a high quality level, **ULTRAFLEX** products are guaranteed only if they are used with original spare parts.

**ULTRAFLEX** and **UFLEX** Quality Management Systems are certified by the Det Norske Veritas - Germanischer Lloyd (DNV-GL), in conformity with the UNI EN ISO 9001:2015 rule.

The quality management system involves all the company resources and processes starting from the design, in order to:

- ensure product quality to the customer;
- maintain and improve the quality standards constantly;
- pursue a continuous process improvement to meet the market needs and to increase the customer satisfaction

**ULTRAFLEX** Environmental Management System is certified by the Det Norske Veritas - Germanischer Lloyd (DNV-GL), in conformity with the UNI EN ISO 14001:2015 rule.

Products for pleasure boats are constantly tested to check their conformity with the 2013/53/EU.



"**ULTRAFLEX** has over 80 years of experience in the marine industry and is a world leader in the production of mechanical, hydraulic and electronic steering systems, control boxes and steering wheels for any kind of pleasure, fishing or commercial boats.

The key factors which explain the increasing success of our products all over the world are the reliability of our products and the before and after sale service, the quality of the company organization and of the human resources and the continuous spending in research and development".

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### MANUAL USE AND SYMBOLS USED

THE INSTALLATION AND MAINTENANCE MANUAL is the document given with the product from its sale to its replacement and discharge. The manual is an important part of the product itself. It is necessary to read carefully the manual, before ANY ACTIVITY involving the product, handling and unloading included.

**⚠ DANGER** → Immediate hazards which CAUSE severe personal injury or death.

**⚠ WARNING** → Denotes that a hazard exists which can result in injury or death if proper precautions are not taken.

**⚠ CAUTION** → Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components or to the environment.

**NOTICE** → Important information for the correct installation and for maintenance, that does not cause any damage.



→ The symbol aside indicates all the operations which must be carried out by qualified or skilled staff, in order to avoid hazards. We recommend training the staff in charge of the product installation and checking their knowledge.

STERN

STARBOARD

PORT

BOW

→ The picture aside explains the meaning of some nautical words contained in this manual.

**LEGEND**

m.p.h. = miles per hour  
 km/h = kilometers per hour

10 m.p.h. = 8,69 knots  
 10 m.p.h. = 16,1 km/h  
 10 knots = 11,5 m.p.h.  
 10 knots = 18,5 km/h  
 10 km/h = 6,21 m.p.h.  
 10 km/h = 5,4 knots



## INTRODUCTION

This installation and maintenance manual represents an important part of the product and must be available to the people in charge of its use and maintenance.

The user must know the content of this manual.

**ULTRAFLEX** declines all responsibility for possible mistakes in this manual due to printing errors.

Apart from the essential features of the described product, **ULTRAFLEX** reserves the right to make those modifications, such as descriptions, details and illustrations, that are considered to be suitable for its improvement, or for design or sales requirements, at any moment and without being obliged to update this publication.

ALL RIGHTS ARE RESERVED. Publishing rights, trademarks, part numbers and pictures of **ULTRAFLEX** products included in this manual are **ULTRAFLEX** property.

Great care has been taken in collecting and checking the documentation contained in this manual to make it as complete and comprehensible as possible. Nothing contained in this manual can be interpreted as warranty either expressed or implied - including, not in a restricted way, the suitability warranty for any special purpose. Nothing contained in this manual can be interpreted as a modification or confirmation of the terms of any purchase contract.

### WARNING

To ensure the correct product and component operation, the product must be installed by qualified staff. In case of part damage or malfunction, please contact the qualified staff or our Technical Assistance Service.

#### TECHNICAL ASSISTANCE SERVICE

##### **UFLEX S.r.l.**

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16012 Busalla (GE)-Italy  
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## WARRANTY

**ULTRAFLEX** guarantees that its products are well designed and free from manufacturing and material defects, for a period of two years from the date of manufacturing.

For the products which are installed and used on working or commercial boats the warranty is limited to one year from the date of manufacturing.

If during this period the product proves to be defective due to improper materials and/or manufacture, the manufacturer will repair or replace the defective parts free of charge.

Direct or indirect damage is not covered by this warranty. In particular the company is not responsible and this warranty will not cover the damage resulting from incorrect installation or use of the product (except for replacement or repair of defective parts according to the conditions and terms above).

This warranty does not cover the products installed on race boats or boats used in competitions.

The descriptions and illustrations contained in this manual should be used as general reference only.

For any further information please contact our Technical Assistance Service.

**ULTRAFLEX** steering system components are marked  according to the Directive 2013/53/EU.

We remind you that only  marked steering systems must be used on the boats marked . We inform you that the **ULTRAFLEX** warranty is null if some **ULTRAFLEX** components are installed on a steering system together with products of other brands.



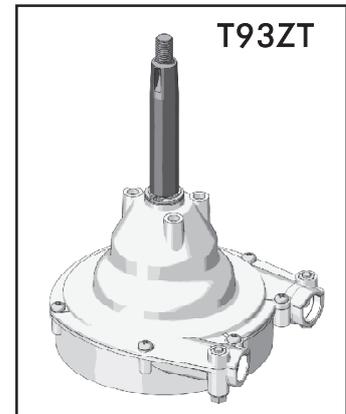
## 1 DESCRIPTION OF THE PRODUCT

### 1.1 Description of the product and warnings for the correct use

T93ZT (Zero Torque) mechanical steering system, used with **ULTRAFLEX** M90 Mach single cable, is designed to control boats equipped with outboard, inboard or non power assisted stern drive engines.

T93ZT steering system uses a Planetary Gear Design: three satellite gears rotate on their axis and at the same time rotate around the central helm axis. This allows for equal distribution of engine torque over three points of the central gear, dividing and balancing the system loads. The benefits of this special design are increased system longevity, increased efficiency and less engine feedback compared to single pinion gear helms.

T93ZT steering system is also equipped with a non-reversible system. It is made up of a special patented device which allows the helm shaft to lock until turned by the driver, maintaining the boat direction and neutralizing the feedback loads on the steering cable. The Ultraflex non-reversible mechanism makes driving a boat safer and easier.



ENGLISH

#### ⚠ WARNING

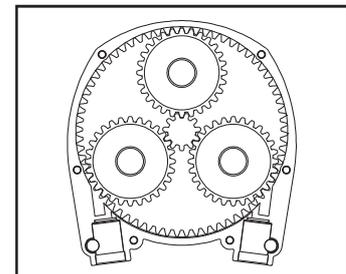
DO NOT USE ON POWER ASSISTED ENGINES.

#### ⚠ WARNING

T93ZT steering system is not to be used on boats equipped with engines that exceed the maximum horsepower rating of the boat and/or the speed of 50 knots (57.5 mph).

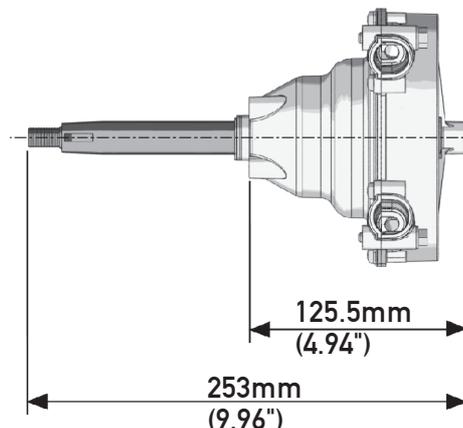
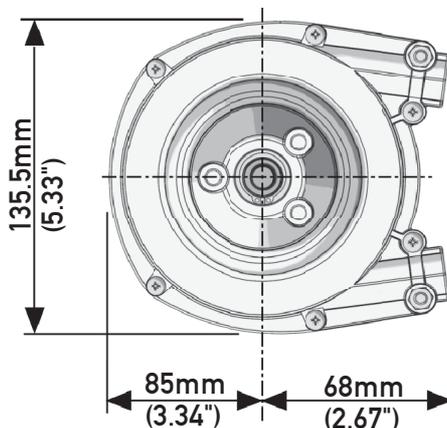
#### ⚠ DANGER

DO NOT DISASSEMBLE ANY PART OF THE HELM DURING THE INSTALLATION OF THE CABLE. THE DISASSEMBLY OF THE COMPONENTS CAN GENERALLY CAUSE SERIOUS DAMAGE TO OBJECTS OR PEOPLE. THIS PROCEDURE CAUSES THE WARRANTY LOSS OF THE PRODUCT.



## 1.2 Dimensions

The following pictures show the dimensions of T93ZT steering system.



## 2 TRANSPORT

### 2.1 General warnings

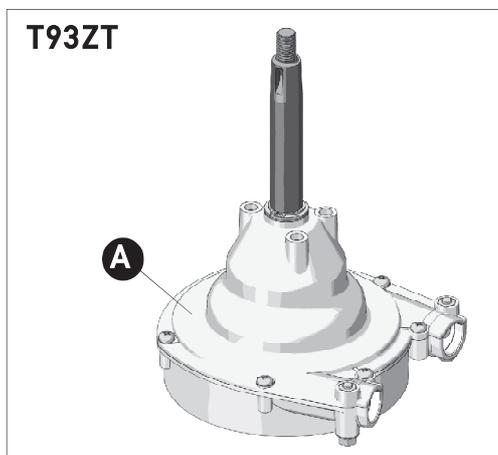
The product weight with its packaging is 2kg (4.4 pounds); therefore, it can be manually handled.

#### **⚠ WARNING**

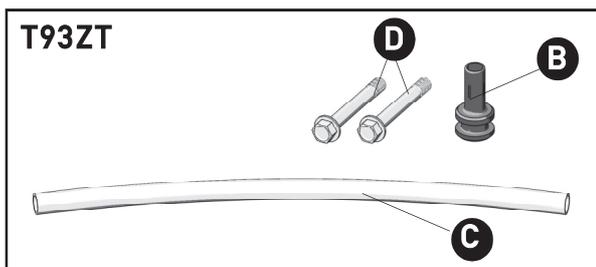
The staff in charge of handling must wear protective gloves and safety shoes.

### 2.2 Packaging contents

Before using the equipment check that the product has not been damaged during transport or storage. Also make sure that all the standard components are in the packaging (see list). In case of damage, notify the claim to the forwarder and inform the supplier.



REF	T93ZT
A	1 helm
B	1 retrieving bushing
C	1 retrieving pipe
D	2 screws M6



#### **⚠ CAUTION**

The packaging must be disposed of according to the existing laws.



## 3 INSTALLATION

### 3.1 Necessary tools



Phillips screwdriver



Open end wrench  
10mm [0.39"]



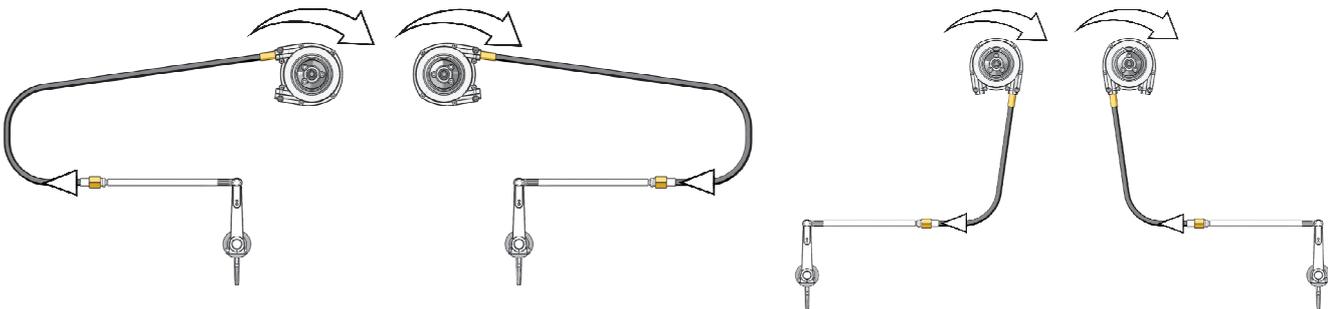
### 3.2 Helm positioning

To install the helm on the boat, please refer to the assembly instructions supplied with **ULTRAFLEX** X34 - X35 - X90 bezel kits.



### 3.3 Connection of the cable to the helm

- 1 Determine the correct entry position of the cable into the helm according to the proper steering system.

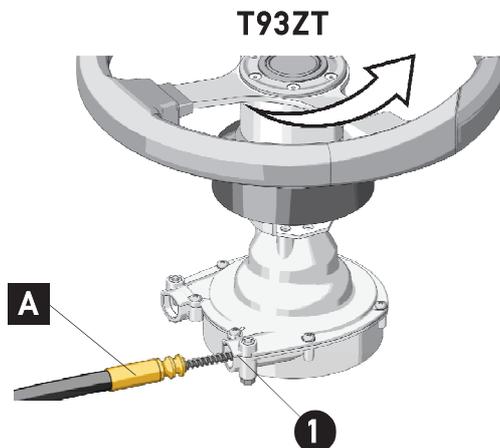


PUSH OR PULL TURNING DIRECTIONS

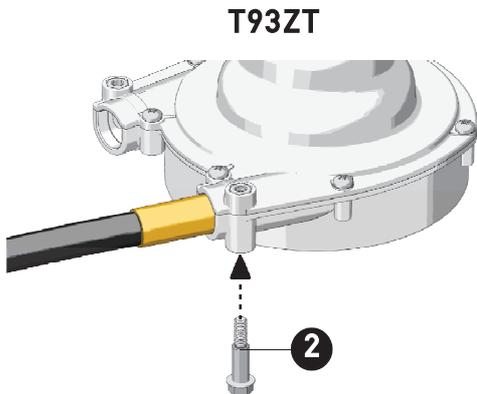
- 2 Remove protective pipe from cable **ULTRAFLEX** M90 Mach and insert the helix cable into the helm.



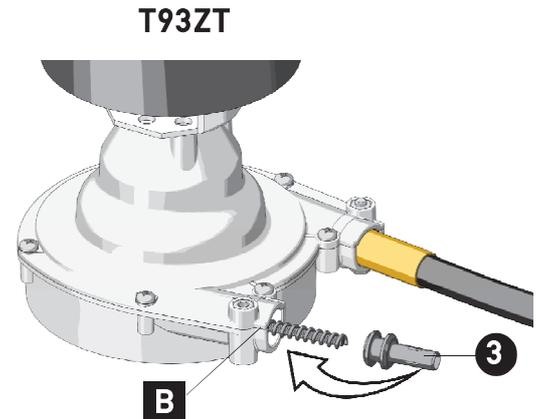
- 3 Turn the steering wheel so as to "pull" the cable into the helm, aligning the end fitting recess (A) with screw hole (1).



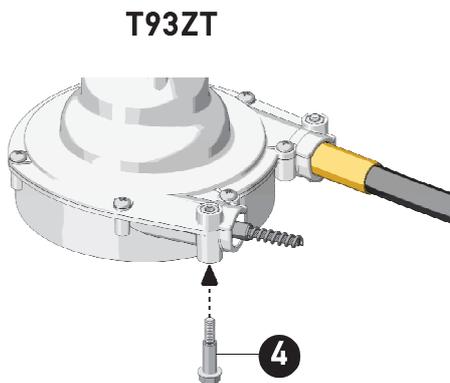
4 Lock the end fitting with screw (2). Torque: 6 Nm (53 inch lbs).



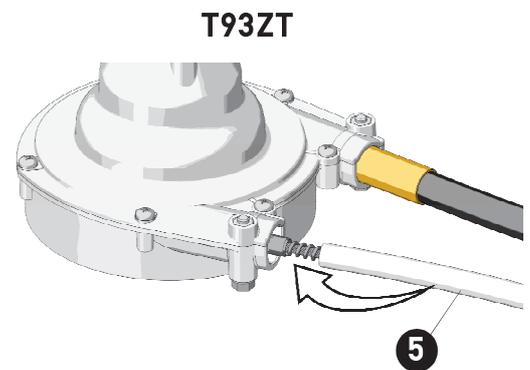
5 Slide bushing (3) over the helix cable and introduce it into hole (B) of the helm.



6 Insert bushing (3) completely and lock it by means of screw (4). Torque: 6 Nm (53 inch lbs).



7 Insert protection pipe (5) on bushing (3).



8 Fix the conduit every 2 m (6"). The conduit must not be fixed to the electric wires. Bulkhead openings require a minimum 38mm (1½") hole diameter.

**⚠ DANGER**

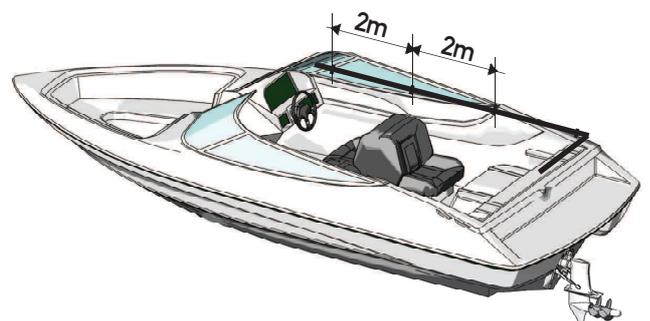
Prevent any dust or foreign material from contacting the cable end to avoid damages to the helm.

**⚠ DANGER**

Make sure the conduit does not enter in contact with cutting edges that could damage it.

**⚠ DANGER**

This control must be carried out before the boat is operated in the water.



9 Make sure the direction of the steering wheel rotation corresponds to the boat direction.



## 4 SAFETY WARNINGS

This section shows the safety rules which must be followed for the correct equipment operation. We recommend reading carefully this section and also the other manuals supplied with the steering system components.

### 4.1 Safety rules during installation and use

OBSERVE STRICTLY the following safety rules:

**ULTRAFLEX** declines all responsibility in case the user does not follow these rules and it is not responsible for negligence while using the system.

#### DANGER

- DO NOT PUT YOUR HANDS BETWEEN MOVING PARTS.
- Do not disable the safety devices.
- Do not modify or add devices to the system, without **ULTRAFLEX** written authorization or technical intervention which will prove the modification in the report.
- Do not use this equipment for a purpose different from the one it has been designed for, which is specified in the installation and maintenance manual.
- Do not let unskilled staff perform the installation.

#### WARNING

- During installation, keep the system clean, to prevent any foreign body to damage it. Even the smallest object could cause permanent but not immediately perceivable damages.
- Avoid cable bends < 200 mm (8").
- Avoid contact of cables with sharpened edges.
- Avoid contact with sources of heat.

### 4.2 Clothing

#### WARNING

During installation, inspection or maintenance, IT IS STRICTLY FORBIDDEN to wear necklaces, bracelets or clothes which could get caught in the moving parts.



## 5 MAINTENANCE

### 5.1 Routine maintenance

#### WARNING

Poor installation and maintenance may result in loss of steering and cause property damage and/or personal injury. Maintenance requirements change according to climate, frequency and the use. Inspections are necessary at least every year and must be carried out by specialized marine technicians.

Carry out the following maintenance operations:

- Periodically wash with water and soap the components removing any salt deposit.
- Every month check and if necessary tighten all the nuts fastening the system.

#### DANGER

**Release or separation of one of the fasteners can cause failure of steering system resulting in property damage, injury or death.**

- Periodically check the absence of corrosion on the metal parts of the cable end fittings and of abrasions on the conduit.
- Replace the damaged parts that could compromise the steering system integrity.

### 5.2 Extraordinary maintenance

#### Technical Support

*For any information or for assistance with unusual applications please contact our technical support staff (See paragraph "Introduction").*

## 6 DISMANTLING

### 6.1 Dismantling

When for any reason, the system is put out of service, it is necessary to follow some rules in order to respect the environment.

Conduits, pipelines, plastic or non-metallic components must be disassembled and disposed of separately.



**RECYCLE**  
BECYCLE

