

## PRODUCT SPECIFICATIONS

### OPERATING AND MAINTENANCE INSTRUCTIONS

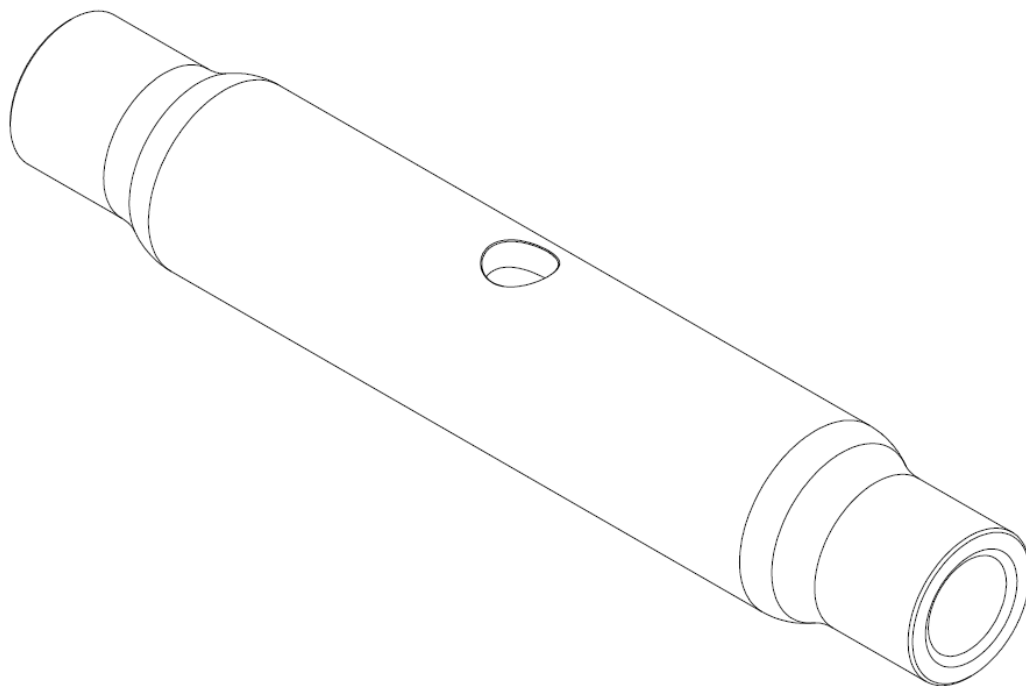
**Technical Specifications**

**Operating Conditions and Limits**

**Operator's Instructions**

**Residual Risks**

**How and how often periodical fitness inspections should be conducted**



**DIN 1478 TUBE TURNBUCKLE BODY  
ITEM 8001T**

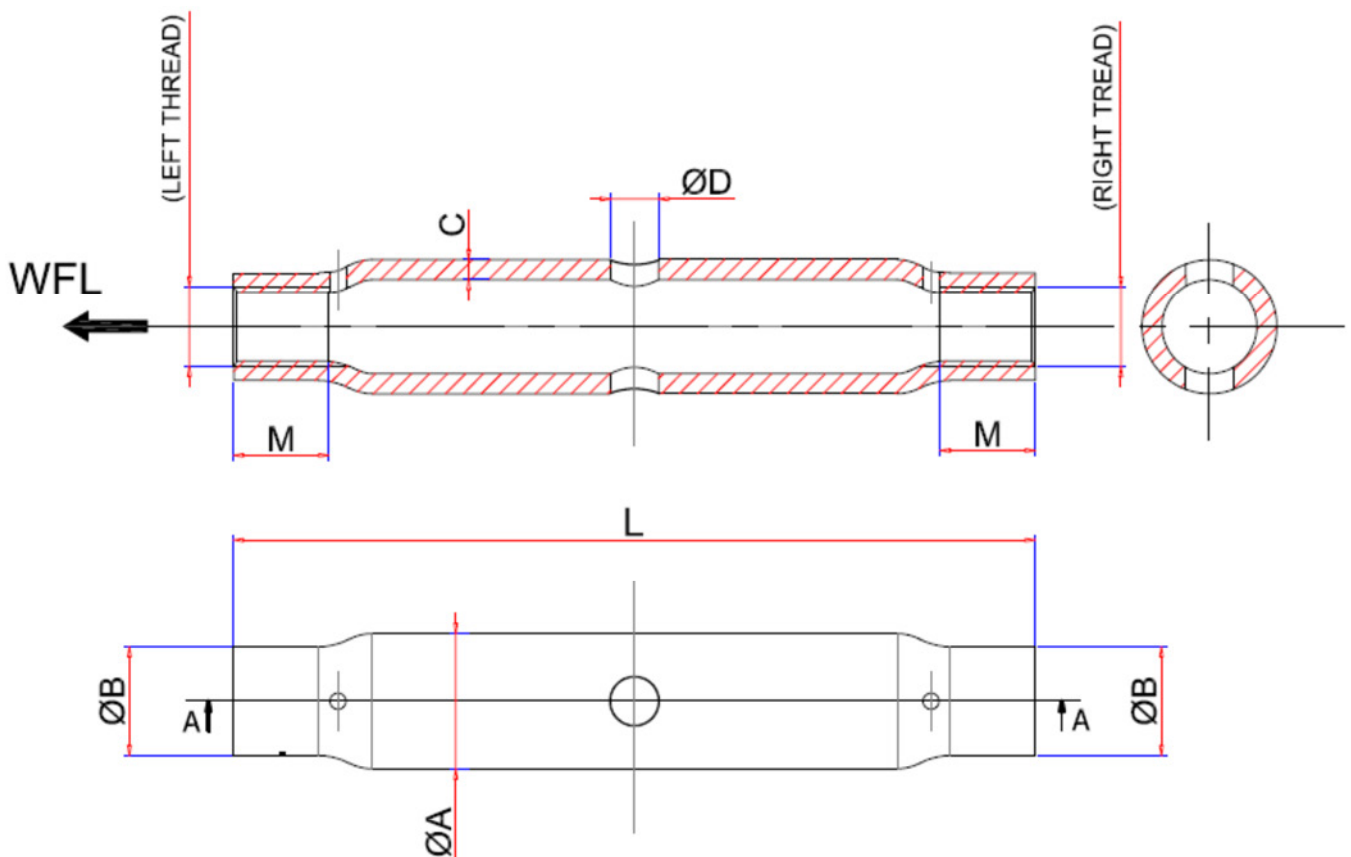
The original language of this technical specification is Italian

## 1) TECHNICAL SPECIFICATIONS OF ACCESSORY

<b>Material / Reference Standard:</b>	<p><b>Steel S235JR - UNI EN 10025-2 (size 12, 16, 20, 24, 27)</b> Mechanical property comply EN 1993-1-1 tab.3: <math>f_y = 235</math> N/mm<sup>2</sup>; <math>f_u = 360</math> N/mm<sup>2</sup>.</p> <p><b>Steel S355JR - UNI EN 10025-2 (size 30, 36, 42)</b> Mechanical property comply EN 1993-1-1 tab.3: <math>f_y = 355</math> N/mm<sup>2</sup>; <math>f_u = 490</math> N/mm<sup>2</sup>.</p> <p>Notes: in case of use the component in structural applications, its choice should be done according to the criteria of EN 1993-1-1.</p> <p>For dimensional considerations, nominal dimensions in table A in the following page could be used.</p>
<b>Reference standard:</b>	Turnbuckle body DIN 1478
<b>Heat Treatment:</b>	/
<b>Surface Treatment:</b>	<ul style="list-style-type: none"><li>• Item 8001TN: Black (untreated) just as drawn and machined</li><li>• Item 8001TZ: Electrolytic galvanizing A2E EN ISO 4042</li></ul>

The test is performed on the basis of in-house specifications and rules in accordance with UNI EN ISO 9001.

This item complies with Machinery Directive 2006/42/EC.

**DIMENSIONAL SPECIFICATIONS (NOMINAL DIMENSIONS):**

**TABLE "A"**

SIZE	Thread	Ø A mm	Ø B mm	C mm	Ø D mm	L mm	M mm	g	WFL kg	CODE	
										BLACK	GALVANIZED
12	M12 x 1,75	25,0	18,0	4,0	10	125	15,0	230	690	080010412	080010512
16	M16 x 2	30,0	22,5	4,5	10	170	20,0	460	1290	080010416	080010516
20	M20 x 2,5	33,7	27,0	5,0	12	200	24,0	650	2130	080010420	080010520
24	M24 x 3	42,4	32,0	5,6	12	255	29,0	1200	3060	080010424	080010524
* 27	M27 x 3	42,4	34,6	5,6	12	255	40,0	1220	4000	080010427	080010527
30	M30 x 3,5	51,0	38,0	6,3	16	255	36,0	1650	4860	080010430	080010530
36	M36 x 4	63,5	47,5	8,0	16	295	43,0	2860	6500	080010436	080010536
42	M42 x 4,5	70,0	57,0	8,8	20	330	51,0	4100	9700	080010442	080010542

\*Sizes, not shown in the standard DIN 1478

**WFL = WORKING FORCE LIMIT**

**SAFETY COEFFICIENT: 5**

**CAUTION:** WFL is the maximum load that can be applied with a safety factor of 5 compared to breaking force, according to Machinery Directive 2006/42/CE. The material is guaranteed with mechanical properties listed below, according UNI EN 10025-2:

- $f_y = 235 \text{ N/mm}^2$  ;  $f_u = 360 \text{ N/mm}^2$  (sizes 12-16-20-24-27 steel S235JR);
- $f_y = 355 \text{ N/mm}^2$ ;  $f_u = 490 \text{ N/mm}^2$  (sizez 30-36-42 steel S355JR).

Definitions:

- **WFL** (working force limit): the maximum force the item can support (along the main axis, if not otherwise specified) under operating conditions.
- **Safety coefficient:** guaranteed minimum breaking force to working force limit ratio.
- **Inspection:** visual testing of the state of the turnbuckle, to check for clear damage or wear which may affect its use.
- **Accurate examination:** visual inspection performed by a trained person, supported, if need be, by any other instruments, including non-destructive testing, to check for damage or wear which may affect the use of the turnbuckle.
- **Trained person:** a designated, suitably trained person who has proper know-how and practical expertise and has been given the instructions needed to perform any required tests and examinations.

## 2) TESTING SPECIFICATIONS

The accessory is subjected to several stringent spot checks for serviceability, performance and compliance with specifications.

The number of samples and the related sampling plans are chosen according to the characteristic to test under UNI ISO 2859/1, and the results are filed in the quality department of the factory in Sulmona.

### 2.A Dimensional test

Making sure that the dimensions of the item meet such tolerances as established in in-house working drawings.

### 2.B Visual test

Testing for defects resulting from forming, mechanical working, surface coating and correspondence between the marking and in-house drawings.

### 2.C Chemical analysis

Making sure that the chemical composition of the material complies with the limits established under the relevant standards.

### 2.D Tensile stress tests

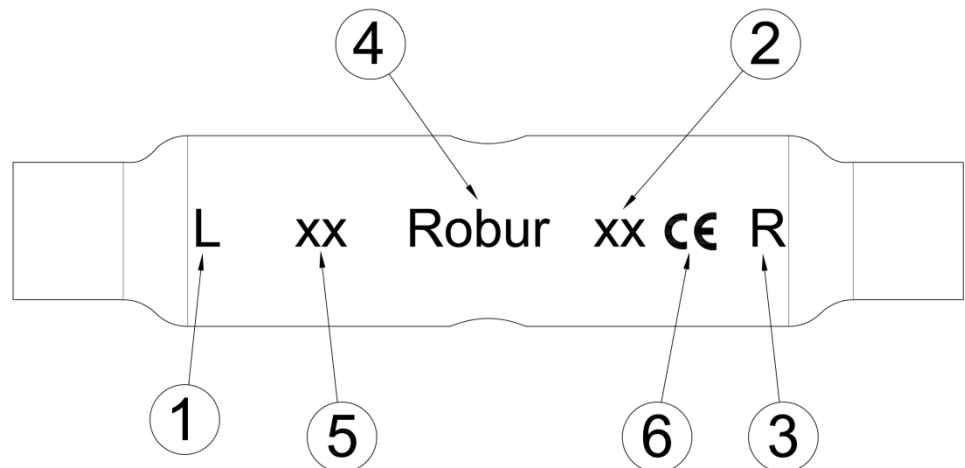
Making sure that the accessory subjected to tensile stress will break, after the applied force has at least exceeded the working load as multiplied by the safety coefficient.

The test is performed in accordance with UNI 10002/1.

### 3) HOW TO READ MARKINGS

The accessory carries indelible marks and codes which identify the product and define the specifications and applications.

- 1) Left thread indication
- 2) Batch code
- 3) Right thread indication
- 4) Manufacturer's mark (ROBUR)
- 5) Size (e.g. M24)
- 6) CE Mark



### 4) GENERAL WARNINGS

The manual must be kept by the person in charge in a suitable place and readily available for consultation, in optimal conditions.

The constructor retains all material and intellectual rights on the manual, and restricts its modification, albeit partial, for any commercial use.

As regards the information provided in these operating instructions, BETA UTENSILI SPA will accept no responsibility in the event of:

- any use of the accessories other than the uses under national safety and accident prevention laws;
- mistaken choice or arrangement of the apparatus they are going to be connected to;
- failure to comply with, or properly follow, the operating instructions;
- changes to the accessories;
- misuse or failure to carry out routine maintenance jobs;
- use with noncompliant accessories.

**!CAUTION: The marking data should not be removed by grinding or abrasion (whether accidental or not – any turnbuckle bodies that do not carry any identification references should be made unusable and scrapped).**

**No characters other than the manufacturer's may be affixed.**

## 5) SELECTION CRITERIA

The following parameters should be carefully considered in choosing the turnbuckle:

### 5.A WORKING FORCE LIMIT

The tensile stress exerted by the turnbuckle **should be lower than or equal to** the working force limit (WFL) recommended for the item being considered, and shown in Table “A”.

### 5.B CONNECTING PART

Make sure that the connecting part suits the load capacity of the turnbuckle body.

### 5.C OPERATING TEMPERATURES

The maximum operating temperature is +80 °C.

For applications under 0 °C please use our Inox pipe bodies (Item 8201T), etc.

### 5.D LIFE AND FREQUENCY OF USE

The accessory is perfectly serviceable as long as its geometric and physical characteristics remain unchanged.

Hence the turnbuckle should be replaced in case of reduced section, deformation, corrosion or connecting instability.

## 6) NONPERMISSIBLE CONDITIONS

The turnbuckle bodies should not be operated under the following circumstances:

- when the applied force exceeds the permissible “WFL”;
- when dynamic stresses or swinging loads may result;
- when the turnbuckles are operated under any temperatures other than the permissible temperatures;
- when the directrix of forces does not develop along the main axis crossing the two terminals.

## 7) PRELIMINARY TESTS

Before the accessories are operated and/or assembled, they should be tested by a suitably trained person.

- Check the state of the accessory; in particular make sure that it is free from cuts, bends, indentations, abrasions, cracks, irregular threads, corrosions, sharp burrs, wear or defects resulting from improper storage.
- Measure and record the dimensions according to **Table “A”**.
- Check the state of all the parts of the marking, so that the accessory can be accurately identified according to the working force.
- Make sure that the threads fit.

## 8) INSTALLATION – ASSEMBLY INSTRUCTIONS

During the installation of the accessory please use adequate Personal Protective Equipment: gloves, safety shoes, helmet, etc.

Screw the selected terminals onto the end of the turnbuckle body, so that maximum opening can be achieved, and connect them to the parts to pull.

Insert one rope or one part for each terminal.

Exert tensile stress through the main body, making sure that, after the operating condition has been reached, the terminals have been inserted into the body at least throughout the length of its thread, checking inside the two holes placed on the junctions between the end and the body of the turnbuckle.

While exerting tensile stress, make sure that the turnbuckle can freely move and position itself; hence no forcing or interference should occur, to prevent any lateral force components from being produced.

Tensile stress should be checked after a short period, to make up for any system adjustments.

Particular attention is required while tensioning, to prevent the working force limit (WFL, see Table “A”) from being exceeded, which would result in permanent deformation, especially if any levers or mechanical means are used.

## 9) USING ACCESSORY – GRIP AND HANDLING

The accessory is designed to be used in static situations; periodically check tensile stress, the state of preservation of the parts and their connection, according to the Table “Maintenance jobs and inspections”.

## 10) NONPERMISSIBLE USE

Using the accessory for any purposes other than the purposes it has been designed for, using it under extremely dangerous conditions and performing poor maintenance may pose **a severe hazard to the safety of the people being exposed** and cause severe damage to the working environment, while affecting the actual serviceability and safety of the product. The precautions mentioned below, which, obviously enough, cannot cover the whole spectrum of potential “**misuses**” of the accessory, should be “reasonably” deemed to be the most common steps to take. Therefore:

- DO NOT connect the accessory to any apparatus which does not match its specifications in terms of size, temperature, hook-up point and shape;
- DO NOT use the accessory for direct lifting purposes;
- DO NOT stretch any apparatus that may change its static configuration, centre of gravity or chemical and physical state;
- DO NOT use the accessory to lift or carry people or animals;
- DO NOT use the accessory to pull restrained loads;
- DO NOT work in areas where any explosion/spark-proof parts are expected to be used or in the presence of big magnetic fields;
- DO NOT weld any metal parts to the accessory; do not use any filling welds; do not use the accessory as mass for any welder.

## 11) FITNESS FOR USE

The accessory was subjected to spot check in order to test serviceability and performance at the manufacturer’s. The certificate supplied with it states that the tests were passed. However, before starting working, the user should test the installed accessory for serviceability and performance, to prove the entire system is fit for use.

## 12) INSPECTION AND MAINTENANCE

Inspections and maintenance jobs should be carried out by trained personnel, who should perform accurate tests during operation.

Below is a list of tests to perform at such intervals as stated in the table “**Maintenance jobs and inspections**”.

- **VISUAL TEST:** making sure that the accessory is free from surface defects, including cracks, indentations, cuts, fissures and abrasions.
- **THREAD TEST:** making sure that the thread is free from wear, deformation and dents, that its fit is accurate and stable, and that there is not too much clearance.
- **DEFORMATION TEST:** making sure that the accessory has not got deformed, using a gauge to measure such critical dimensions as shown in **Table “A”**. **NO DEFORMATIONS** will be tolerated compared to the measurements made when the accessory was **first put into operation**.
- **WEAR TEST:** making sure that the points of contact are not worn, using a gauge to measure such critical dimensions as shown in **Table “A”**.
- **PRESERVATION TEST:** making sure that the accessory is free from oxidation and corrosion, especially in case of outdoor use; using suitable methods (e.g. liquid penetrants) to make sure that it is free from cracks.

The results of the above-mentioned tests should be stored.

<b>Maintenance jobs and inspections</b>			
<b>Type of inspection</b>	Whenever used	Month	Year
	General visual inspection	<b>X</b>	
Thread state	<b>X</b>		
Deformation	<b>X</b>		
Wear		<b>X</b>	
State of preservation			<b>X</b>

If the lifting eye nut has been used for heavy-duty jobs, both wear and the state of preservation should be tested for more frequently.

## 13) SCRAPPING ACCESSORY

The accessory should be scrapped by cutting, so that it can no longer be used, whether at the end of its expected lifetime or if:

- it is permanently worn compared to the original size;
- any cracks or distortions are shown, and/or the sections have become small compared to the original size;
- the state of the thread is such that the parts do not fit perfectly, any threads are worn, deformed, irregular etc.