



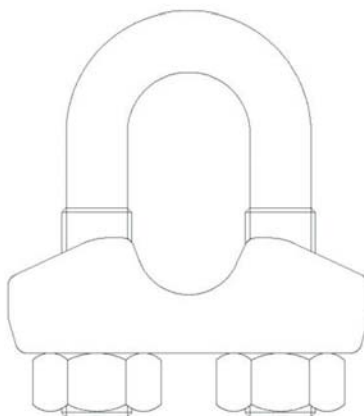
**R/SP/8016/10**  
**Date 03/11/2016**

## 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**



### **WIRE ROPE CLIPS WITH DROP-FORGED STEEL BODIES** **ITEM 8016**

The original language of this technical specification is Italian

Manufacturing site **ROBUR wire rope accessories**  
 Zona Industriale – C.da S. Nicola  
 I-67039 SULMONA (L'AQUILA)  
 Tel. +39.(0)864.2504.1 – Fax +39.(0)864.253132  
[www.roburity.com](http://www.roburity.com) – [info@roburity.com](mailto:info@roburity.com)

## 1) TECHNICAL SPECIFICATIONS OF ACCESSORY

**Material:** U-BOLT steel, strength class 4.6  
BRIDGE steel S235JR  
NUT steel, strength class 6

**Heat Treatment:** /

|                             |           |        |                |
|-----------------------------|-----------|--------|----------------|
| <b>Reference Standards:</b> | Material: | U-BOLT | EN ISO 898-1   |
|                             |           | BRIDGE | UNI EN 10025-2 |
|                             |           | NUT    | EN 20898-2     |

**Surface Treatment:** Galvanized A2E EN ISO 4042

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

The item complies with Machine Directive 2006/42/EC.

## DIMENSIONAL SPECIFICATIONS:

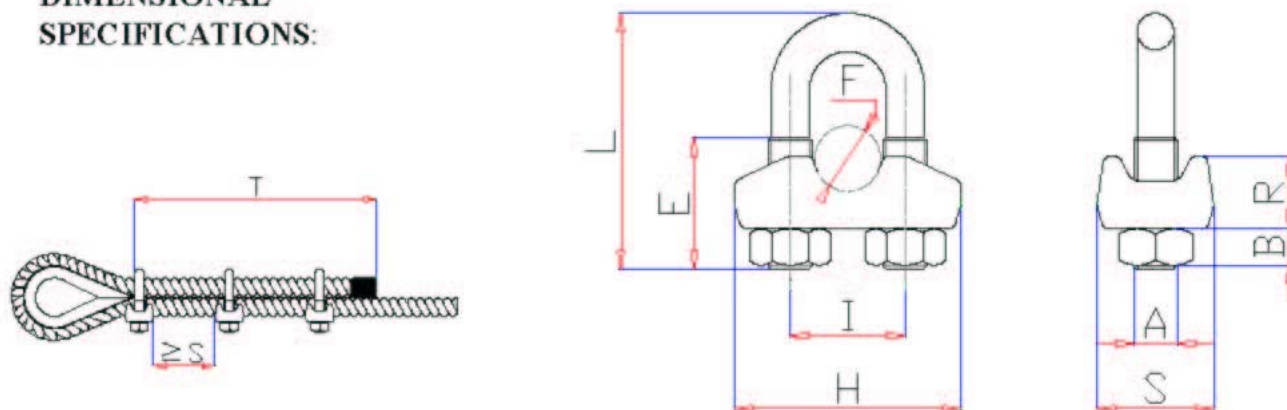




TABLE "A"

| SIZE | F mm.<br>Ø rope | F" Ø rope | A   | B    | E  | H   | I  | L   | R  | S  | T    |  g | C Nm | N° pc |  n | ITEM NUMBER |
|------|-----------------|-----------|-----|------|----|-----|----|-----|----|----|------|---|------|-------|---|-------------|
| 3    | 3               | 1/8       | M4  | 3.2  | 12 | 20  | 9  | 20  | 7  | 12 | 80   | 12  | 1.5  | 3     | 500   | 080160003   |
| 5    | 5               | 3/16      | M5  | 4.0  | 13 | 24  | 12 | 24  | 9  | 15 | 110  | 22  | 3.0  | 3     | 300   | 080160005   |
| 6    | 6               | 1/4       | M6  | 5.0  | 15 | 27  | 14 | 28  | 10 | 16 | 120  | 35  | 5.2  | 3     | 200   | 080160006   |
| 8    | 8               | 5/16      | M6  | 5.0  | 19 | 31  | 17 | 34  | 11 | 18 | 210  | 44  | 5.2  | 5     | 150   | 080160008   |
| 10   | 10              | 3/8       | M8  | 6.5  | 25 | 37  | 20 | 42  | 13 | 22 | 240  | 75  | 12.5 | 5     | 70  | 080160010   |
| 11   | 11              | 7/16      | M8  | 6.5  | 22 | 41  | 22 | 44  | 14 | 24 | 260  | 86  | 12.5 | 5     | 70  | 080160011   |
| 13   | 12-13           | 1/2       | M10 | 8.0  | 33 | 44  | 25 | 55  | 16 | 26 | 300  | 140   | 25   | 5     | 40  | 080160013   |
| 14   | 14              | 9/16      | M10 | 8.0  | 33 | 47  | 27 | 57  | 18 | 27 | 295  | 150   | 25   | 5     | 35  | 080160014   |
| 16   | 16              | 5/8       | M10 | 8.0  | 33 | 51  | 29 | 63  | 20 | 28 | 335  | 180   | 25   | 5     | 30  | 080160016   |
| 18   | 18              | 11/16     | M12 | 10.0 | 44 | 56  | 32 | 72  | 22 | 32 | 380  | 260   | 42   | 5     | 30  | 080160018   |
| 20   | 20              | 3/4       | M12 | 10.0 | 44 | 62  | 35 | 75  | 22 | 33 | 540  | 300   | 42   | 5     | 30  | 080160020   |
| 22   | 22              | 7/8       | M12 | 10.0 | 52 | 65  | 39 | 85  | 25 | 35 | 595  | 350   | 42   | 7     | 25  | 080160022   |
| 26   | 24-26           | 1"        | M14 | 11.0 | 50 | 72  | 42 | 95  | 27 | 40 | 700  | 480   | 67   | 7     | 40  | 080160026   |
| 28   | 28              | 1"1/16    | M14 | 11.0 | 50 | 75  | 45 | 100 | 30 | 42 | 840  | 525   | 67   | 8     | /   | 080160028   |
| 32   | 30-32           | 1"1/8     | M14 | 11.0 | 50 | 80  | 47 | 110 | 33 | 44 | 990  | 605   | 67   | 8     | /   | 080160030   |
| 36   | 34-36           | 1"1/4     | M16 | 13.0 | 55 | 88  | 53 | 120 | 37 | 48 | 1155 | 805   | 106  | 8     | /   | 080160034   |
| 40   | 38-40           | 1"1/2     | M16 | 13.0 | 60 | 98  | 59 | 140 | 40 | 54 | 1320 | 1120  | 106  | 8     | /   | 080160040   |
| 50   | 45-50           | 2"        | M20 | 16.0 | 80 | 120 | 72 | 150 | 57 | 60 | 1500 | 1920  | 206  | 8     | /   | 080160050   |

All measurements are expressed in mm.

**C** = Nut tightening torque (Newton metre)

**N** = Minimum number of wire rope clips recommended to mount on wire rope

**T** = Minimum length of end section of rope (see figure 1, page 1/2)

**NB** = The nut tightening torque was calculated on the basis of a nut/screw coupling friction coefficient of 0.14, which applies to standard terms and conditions. Using the wire rope clip under any conditions other than standard terms and conditions involves a different, hardly measurable friction coefficient, which results in a different tightening torque value.

When making a greasing of the thread, the tightening couples in the table must be reduced by 20%.

It should be considered that using the clips will cause the wire rope to lose approximately 20% of its resistance. Standard reference: UNI EN 13411-5, point 6.2.2.

Definitions:

- **Wire rope clip:** a unit composed of a threaded U-bolt, a body and nuts which allow two wire rope parts to be pressed together when tightening the nuts.
- **Tightening torque:** the product of the amount of force applied to tighten a screw and the length of the lever used to apply it.
- **Thimble:** a ring placed in the slot of a cable to protect it from wear caused by friction with other parts, thereby preserving it in time. It has a drop shape and a U section, which should suit the cable to fit in.
- **Inspection:** visual testing of the state of the wire rope clip, 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 part.
- **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.

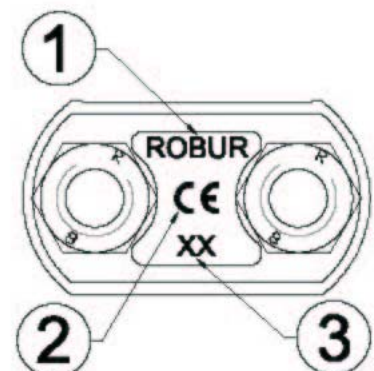
### 2.C Control tightening torque

Verify that after the application of proper tightening torque, the coupling nut-screw preserves its functionality

## 3) HOW TO READ MARKINGS

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

- 1) Manufacturer's mark (R-ROBUR)
- 2) CE mark
- 3) Size



#### 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. should it be lost or damaged, the manual can easily be retrieved on the constructor's web site: [www.roburitaly.com](http://www.roburitaly.com)  
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 wire rope clips 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 wire rope clips:

##### 5.A WIRE ROPE DIAMETER

The wire rope clips should be chosen according to the diameter of the wire rope to use (the wire rope diameter should match the wire rope size).

**WARNING:** These grips are for use with 6 stranded right hand lay ropes in 6 x 19 and 6 x36 classes WS + IWRC 1960 N/mm<sup>2</sup>.

To use the grips with other kind of ropes, please first verify the ropes suitability.

##### 5.B CONNECTING PART

It should be considered that using the clips will cause the wire rope to lose approximately 20% of its resistance. Standard reference: UNI EN 13411-5, point 6.2.2.

##### 5.C OPERATING TEMPERATURES

The maximum operating temperature is +80 °C.

For applications under 0 °C please use our inox items 8216, etc.

##### 5.D LIFE AND FREQUENCY OF USE

The accessory is perfectly serviceable as long as its geometric and physical characteristics remain unchanged and the applied tightening torque remains constant.

Hence periodically check the wear and tightening torque according to use.

## 6) NONPERMISSIBLE CONDITIONS

The wire rope clips should not be operated under the following circumstances:

- when the applied tightening torque exceeds the tightening torque stated in "TABLE A";
- in the configuration of slots with a number of wire rope clips smaller than the number stated in "TABLE A";
- when the wire rope clips are operated under any temperatures other than the permissible temperatures;
- when the directrix of forces does not develop along the main axis of the wire rope.

## 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 wire rope clips; in particular make sure that they are 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 application.
- 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.

Use the wire rope clips to make slots of metal wire ropes for use in anchoring and pulling.

Fit suitable thimbles into the slots, to prevent wear as caused by friction with other parts.

It should be considered that the end part of the wire rope should have a T-length (fig. 2), enough to hold at least a minimum number of wire rope clips, placed at a distance which exceeds or is equal to their S-width from each other, as specified in the enclosed table (Table "A").

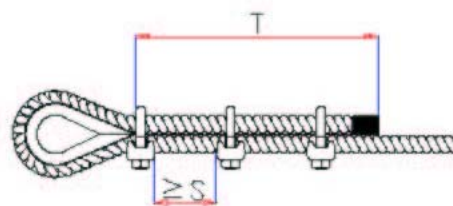


Fig. 2

Mount the wire rope clip correctly, placing the U-bolts on the end part of the wire rope (dead end) and the bridges on the pulled part, as shown in fig. 3.

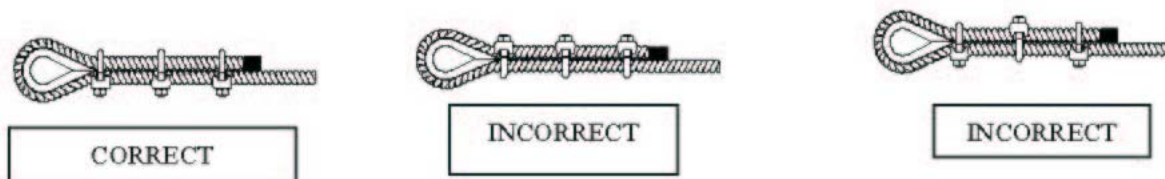


Fig. 3

CAUTION: If the wire rope clip is not mounted correctly, resistance will be reduced by 60% compared to the breaking load of the wire rope.

Fit the thimble into the slot end of the metal wire rope. Apply the first wire rope clip at a distance which equals the S-width of the body from the dead end of the wire rope (fig. 4).

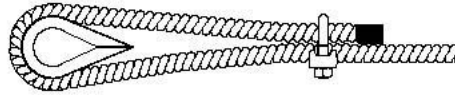


Fig. 4

Apply the threaded U-bolt to the end part of the rope (dead end); the active part of the wire rope – that is, the pulling one – is supported by the body of the wire rope clip.

Tighten the nuts uniformly, alternating torque application, until the value stated in “TABLE A” is reached.

The second wire rope clip should be applied as near as possible to the loop or thimble, locking the nuts firmly, without tightening them (fig. 5).

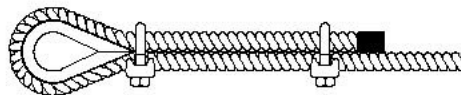


Fig. 5

The other wire rope clips should be mounted between the first and second clips, at a distance which exceeds or is equal to their S-width from each other (fig. 6).

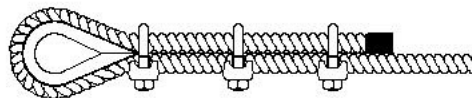


Fig. 6

Tighten in such a way as to avoid creating folds or loose parts in the wire rope; then tighten the nuts of each threaded U-bolt uniformly, alternating from one nut to the other, until the recommended torque is reached.

## 9) USING ACCESSORY – GRIP AND HANDLING

Apply the first load to test the unit; the weight of such load should exceed or be equal to the weights of operating loads.

Then check the nuts and retighten them to the recommended torque.

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 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 wire rope clips with metal wire ropes covered in plastic;
- DO NOT use the wire rope clips to make “slot-slot” tie rods for use in lifting;
- DO NOT use the wire rope clips to join two wire rope parts together;
- 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.

| Maintenance jobs and inspections   |                   |      |
|------------------------------------|-------------------|------|
| Types of inspection                | Frequency of jobs |      |
|                                    | Quarter           | Year |
| Visual inspection, state of thread | x                 |      |
| Tightening torque                  | x                 |      |
| Deformation                        | x                 |      |
| Wear                               | x                 |      |
| State of preservation              |                   | x    |

If the wire rope clip has been used for heavy-duty jobs, both wear and the state of preservation should be tested for more frequently.

Check the tightening torque at regular intervals.

## 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.



**SIRTEF**

**SIRTEF s.r.l.**

Zona Industriale - Via dei Lavoratori, 1 (ang. Via delle Industrie)  
Tel. +39.02.90059273 (6 linee ric. aut.) - Telefax +39.02.90059258  
20088 Calvignasco (MI)

**SEDE DI ROMA:**

Via Libero Leonardi 4  
Tel. +39.06.266098 - Fax +39.06.2677606 - Cell. +39.334.8109251  
00173 Roma

**FILIALE DI UDINE:**

Via G.D'Annunzio, 9 - Loc. Crosada  
Tel. +39.0432.685022 - Fax +39.0432.685033  
33050 Santa Maria la Longa (UD)