



INSTRUCTION MANUAL
FOR ASSEMBLY, USE AND MAINTENANCE



SICURAIR

sicurpal.it

EDITION 3_FEBRUARY 2022 - REV. 0

All rights reserved. Any use, total or partial, of the contents of this manual, including the reproduction, re-elaboration, diffusion or distribution of the contents themselves through any technological platform, support or telematic network, is forbidden without prior written authorization from **SICURPAL**.

Instructions in original language.

1. NORMATIVE REFERENCE	4
2. INTRODUCTION	4
2.1. WARRANTY	4
2.2. PACKAGING AND TRANSPORT	5
2.3. NOTES ON DELIVERY	5
3. DESCRIPTION AND FIXING OF THE ANCHOR DEVICES	6
3.1. DESCRIPTION OF THE ANCHOR DEVICES LINE SICURAIR	6
3.2. FIXING OF THE ANCHOR DEVICES	8
3.3. DESCRIPTION OF COUNTER PLATES	9
3.4. ASSEMBLY OF SZS DEVICES WITH COUNTER PLATES	9
3.5. ASSEMBLY OF SAR DEVICES WITH COUNTER PLATES	10
4. DESCRIPTION AND ASSEMBLY OF ACCESSORIES	11
4.1. LIFELINE ACCESSORIES	11
4.2. FOCUS ACCESSORIES	13
4.3. ACCESSORY ASSEMBLY	14
4.4. INSTALLATION AND ASSEMBLY OF THE SPACER (COD. 002994 AND 003314)	15
4.5. INSTALLATION, USE AND MAINTENANCE OF THE TRAVELLER (COD. 002957)	16
5. INSTRUCTIONS FOR THE ASSEMBLY OF THE LIFELINE	18
6. USE OF ANTYFALL SYSTEMS	21
6.1. RESTRAINT SYSTEMS	21
6.2. WORK POSITIONING SYSTEMS	22
6.3. FALL ARREST SYSTEMS SICURAIR	22
6.4. RESCUE SYSTEMS	22
7. TECHNICAL DATA	23
8. EXAMPLE OF MARKING	24
9. INSPECTION AND MAINTENANCE PROGRAM	25
9.1. ASSEMBLY INSPECTION	25
9.2. INSPECTION BEFORE USE	25
9.3. PERIODIC INSPECTION	26
9.4. EXTRAORDINARY INSPECTION	26
9.5. MAINTENANCE	26
10. WARNINGS AND RECOMMENDATIONS	27
10.1. INSTALLATION	27
10.2. USE	27
10.3. INSPECTIONS AND MAINTENANCE	28
10.4. EARTHING	28
11. MANUFACTURER'S INFORMATION NOTICE	29

1. NORMATIVE REFERENCE

This manual has been prepared in accordance with legal and regulatory requirements:

1. **Legislative Decree no. 81 of 9 April 2008** and subsequent amendments and additions
2. Certification standards, see Chapter 7:
 - **UNI EN 795:2012*** valid for max. 1 (one) operator
 - **CEN/TS 16415:2013*** valid for up to 4 (four) operators
3. Reference Standards:
 - **UNI EN 341:2011** - Descent devices
 - **UNI EN 353-2:2003** - Flexible cable vertical lines
 - **UNI EN 354:2010** - Cords
 - **UNI EN 355:2003** - Absorbers
 - **UNI EN 358:2019** - Positioning belts
 - **UNI EN 360:2003** - Hoose Reels
 - **UNI EN 361:2003** - Harnesses
 - **UNI EN 362:2005** - Connectors (carabiners)
 - **UNI EN 363:2019** - Stop systems
 - **UNI EN 365:2005** - Marking /labelling
 - **UNI EN 516:2006** - Working plans, steps on steep roofs
 - **UNI EN 517:2006** - Anchors for steep roofs
 - **UNI ISO 14713-1:2017**
 - **EC 1-2010 UNI AND ISO 1461:2009**
 - **EU Regulation 425/2016**



Please take the time to read this owner's guide carefully before using your system.



This manual should always be made available for reference.

2. INTRODUCTION

This "Instructions manual for assembly, use and maintenance" concerns **SICURAIR** devices made of AISI 304 stainless steel, so it is important to keep it for the entire life of the device as it is an integral part of it.

These devices meet the requirements of **UNI EN 795:2012, CEN/TS 16415:2013 Type C**.

SICURAIR anchor systems are designed and compliant to be used simultaneously by a **maximum of 1 (one) operator** according to EN 795:2012, and for a **maximum number of 4 (four) operators** using a trolley for each operator.

2.1. WARRANTY

The warranty period for **SICURAIR** anchor devices is a maximum of 10 years from the date of installation if this is verifiable (the declaration of correct installation is the proof); otherwise the 10-year warranty period runs from the date on the production lot indicated on the product label.

The **WARRANTY** covers **SICURAIR** devices in their entirety and in their individual components and covers in particular manufacturing, material and welding defects.

INSTALLATION ENVIRONMENTS

SICURPAL products (anchor devices and accessories) are conceived and designed for their use in environments with exposure classes C1 to C5 inclusive, according to UNI EN ISO 14713-1:2017 and therefore the warranty on these products is **10 years**.

For particularly aggressive environments, of which class CX of the above mentioned regulation, the warranty of hot-dip galvanized products, anchoring devices and possible accessories only, is **2 years** as per the minimum legal limit.

It is therefore recommended that the designer consult the tables in **Table 1** ("*Description of typical atmospheric environments in relation to the estimation of corrosivity categories*") of UNI EN ISO 14713-1:2017 and **Table 3** ("*Minimum coating thickness and mass values for non-centrifuged samples*") of EC 1-2010 UNI EN ISO 1461:2009 to determine the actual lifetime of the device depending on the characteristics of the specific installation environment.

EXCLUSIONS

The warranty does not cover damage caused by use not in accordance with the instructions in this manual.

LIMITATIONS

In all cases, the guarantee is limited to the replacement of elements or equipment formally recognized as defective following the evaluation of **SICURPAL**'s technical service.

All defective components must be returned to **SICURPAL**, which will evaluate their characteristics and, in the event of a positive finding of such defects, will replace them with compliant material.

The warranty applies only to returned items and does not cover the cost of removing and reinstalling the equipment in the system in which it is integrated.

The guarantee also lapses if the material has been installed and used contrary to **SICURPAL**'s assembly and technical instructions.

Unauthorized tampering with/replacement of anchor device components, use of unsuitable accessories, items or components, and/or misuse of the system will void the warranty.

Failure to perform a periodic inspection will void the product warranty.

MISUSE is defined as using the device:

- As a stand to fix the radio and television antenna;
- As a hook for moving objects and/or materials;
- As a lightning rod (however, it is possible to use the device for this purpose after authorization from a qualified technician who designs and certifies the connection to the Faraday cage);
- Any other use other than that of a fall arrest system anchor.

2.2. PACKAGING AND TRANSPORT

During storage in the warehouse, fall arrest systems must be properly protected.

SICURPAL assures that before transport they will be carefully packed and insured against:

- Unforeseen stresses
- Excessive heat or humidity
- Contact with sharp edges
- Contact with corrosive or other substances that could damage the devices.



For greater environmental protection, **SICURPAL** has decided to reduce packaging to a minimum, which is why it is possible for several products to be shipped in the same package.

2.3. NOTES ON DELIVERY

Upon receipt of the material verify that:

- The packages received are intact and properly packaged;
- The supply corresponds to the order specifications;
- The delivery note is present;
- The Declaration of Conformity of the product is present;
- The product manual is present;
- In case of damage, sign the transport document for unchecked goods and report the incident both to the courier and to **SICURPAL**'s logistics office within 48 hours of delivery. Detailed photographs are required in support of the report sent; otherwise, **SICURPAL** will not be liable for damages;
- In case of defective **SICURPAL** devices, contact the **SICURPAL** Logistics Manager (**SICURPAL** phone number 059-81.81.79, e-mail qualità@sicurpal.it).



This manual should be given to the installer, user, and maintainer of the anchor system who, before installing, using, or maintaining the system, must carefully read all instructions pertaining to it and obtain the materials and Personal Protective Equipment (PPE) necessary to operate it safely (refer to the the Technical Covering Report). This document must be part of the Technical File of the Work together with the design of the fall arrest system (Annex XVI of Legislative Decree 81/08)

3. DESCRIPTION AND FIXING OF THE ANCHOR DEVICES

The products in the **SICURPAL SICURAIR** line make it possible to create ceiling lifelines with lengths ranging from **5 meters to 120 meters**, with **minimum spans of 5 meters and maximum spans of 30 meters**. These devices must be used in combination with category III PPE, suitable for limiting the dynamic forces on the operator to 6 kN.

3.1. DESCRIPTION OF THE ANCHOR DEVICES LINE SICURAIR

SICURAIR devices are ideal for creating a ceiling lifeline that can give you the ability to by-pass intermediate points without detaching. They may be attached to the structure with bars/bolts/screws/welding as per designer's instructions.

For the choice of fixing refer to Chap. 3.2.

SZS - Wall plate Cod. 000189 (Galvanized) Cod. 000268 (Stainless steel)

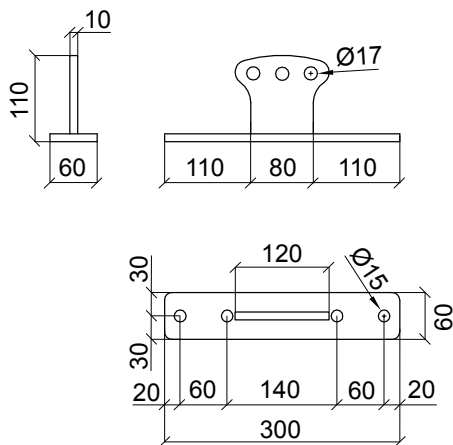


Figure 3.1 - SZS plate

- produced in AISI 304 stainless steel or hot-dip galvanized steel
- Base dimensions 300x60x10 mm
- 4 holes 15 mm for fixing
- Device height 110mm
- Ideal for lifelines on reinforced concrete structures.
- No. 3 holes for fixing the lifeline
- Not to be used with pulley cod. 000306
- Shed line derivative *
- **WARNING: INSTALL PLATE AS PER INSTRUCTIONS IN CHAPTER 6**

* This product, deriving from the SHED LINE, applied to the SICURAIR line, foresees LIMITATIONS in its use: IS INTENDED AS A TYPE C ANCHOR DEVICE ONLY.

SAR - end device Cod. 0003304 (Galvanized) Cod. 003305 (Stainless steel)

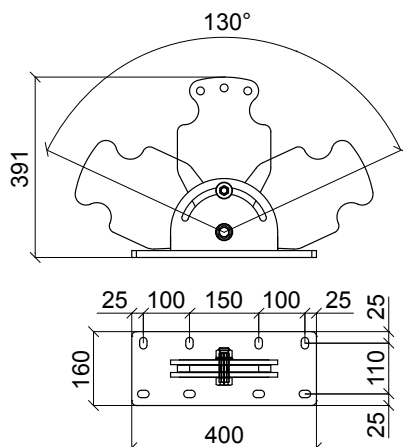


Figure 3.2 - SAR device

- Produced in AISI 304 stainless steel or hot-dip galvanized steel
- Base dimensions 400x160x15 mm
- 8 slotted holes Φ 15 mm for fixing
- 2 side holes to be used as anchor of the end of the line. The central hole is to be used only for tensioning the system during the assembly phase
- Plate designed for wall fixings with lifeline positioned not perpendicular to the wall
- Plate with possibility of rotation to position itself parallel to the lifeline.
- **WARNING: Do not use this product on the ceiling. See chapter 3.**

LVB CUSTOMIZED TEMPLATE

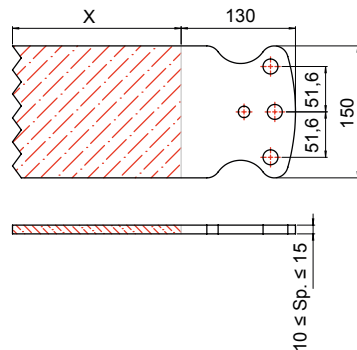


Figure 3.3 - LVB customized template, code on request

- Special product built on measure with possibility of integration inside the built carpentry
- Material of construction base AISI 304 stainless steel or 235 hot-dip galvanized steel
- The serrated part is customizable with the only feature that its behavior is rigid and does not plasticize
- The minimum thickness is 10mm and the maximum thickness is 15mm
- 3 holes for fixing the lifelines: the ends for the double lifeline and the middle for the single lifeline

SICURAIR C TRAVELLERod. 002957

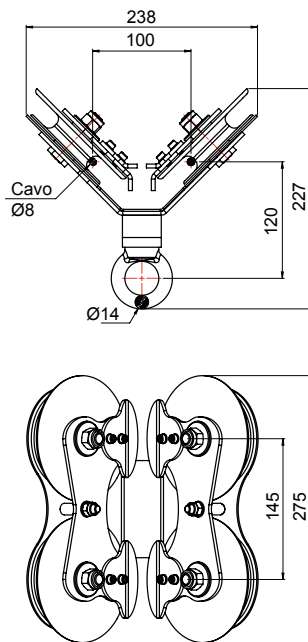


Figure 3.4 - Sicurair Traveller

- Produced in AISI 304 stainless steel
- Designed to work simultaneously on two cables diam. mm 8, cable spacing 10 cm
- Composed of four pulleys supported by eight bearings for perfect smoothness
- Constructed with three safety systems to prevent cable loss

3.2. FIXING OF THE ANCHOR DEVICES

The installation of **SICURAIR** anchor devices must be carried out by qualified personnel, who are able to assemble and dismantle the anchor system (UNI 11560:2014) according to the indications contained in the Calculation Report drawn up by a qualified technician, containing all the detailed characteristics inherent to the chosen fixing (e.g. type of fixing, dimensions of bars/screws, depth of anchorage, distances from edges, etc.).

We report below some types to be considered as possible applications, subject to verification by a qualified technician.

DEVICES	FIXING MATERIAL	FIXING METHODOLOGY				
		Bars/Bolts * M12	Resin Bi-component	Countertop	Welding	Other mechanic solutions**
SZS/SAR/ CUSTOMIZED TEMPLATE LVB	SPECIAL STRUCTURES	✓		✓	✓	
	STEEL	✓		✓	✓	✓
	REINFORCED CONCRETE	✓	✓	✓		✓

*The manufacturer recommends that the designer evaluate the use of vibration dampening and self-locking systems (e.g., oversized washers, self-locking nuts, grower washers, etc.) for fastening.

** In the case of mechanical solutions, it is advisable to prefer systems certified for dynamic loads and whose duration is greater than or equal to the potential duration of the product (30 years), to avoid incurring additional costs in the future.

At the customer's request, the manufacturer can provide assistance from a technician on how to install **SICURPAL** devices. This manual is intended as an essential guide for the correct installation of the anchor system.

SICURPAL offers courses for designers, installers and testers in order to improve their understanding of these indications and to transmit their know-how for correct assembly and to minimize possible errors on site.

3.3. DESCRIPTION OF COUNTER PLATES

Securing the SZS plate using counter plates, threaded rods, washers and nuts may be used in the following cases:

1. When, on the basis of an assessment by the technician, the dimensions of the support structure are not suitable for fixing with resins;
2. When the structure is made of prestressed concrete and, therefore, cannot withstand drilling.

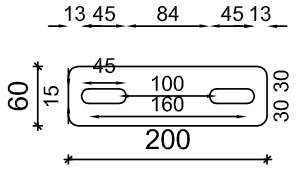


Figure 3.5 - Galvanized steel counter plate (Cod. 000196) for SZS products

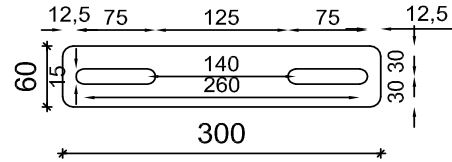


Figure 3.6 - Galvanized steel counter plate (Cod. 000039) for SZS products

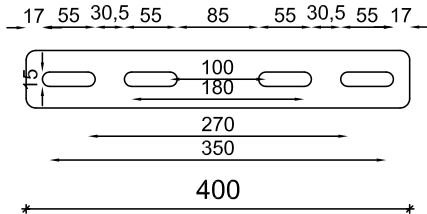


Figure 3.7 - Galvanized steel counter plate (Cod. 000203) for SAR products

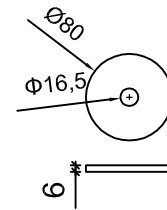


Figure 3.8 - Counter plate in stainless steel (Cod. 000174) for SZS and SAR products

3.4. ASSEMBLY OF SZS DEVICES WITH COUNTER PLATES

Reported below are the steps of the assembly with counter plates:

1. Place the anchor device on the support structure
2. Insert the threaded rods into the holes of the anchoring device
3. Position the counter plates at the bottom of the support structure in line with the bars
4. Insert washers and self-locking nuts
5. Tighten the self-locking nuts
6. Nuts must be tightened with the lifeline untensioned and attached.

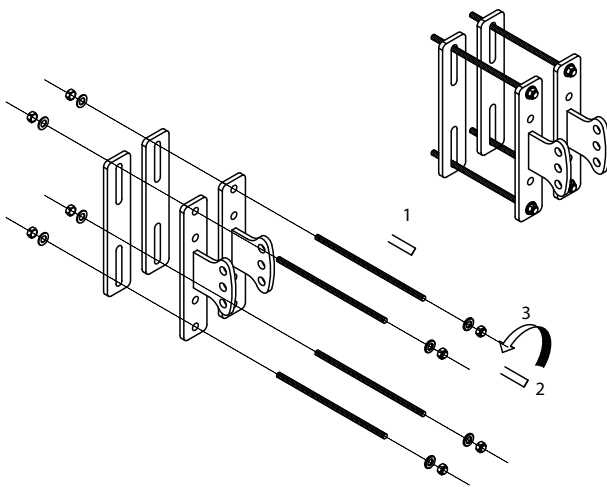


Figure 3.9 - Plate SZS with counter plate Cod. 000039

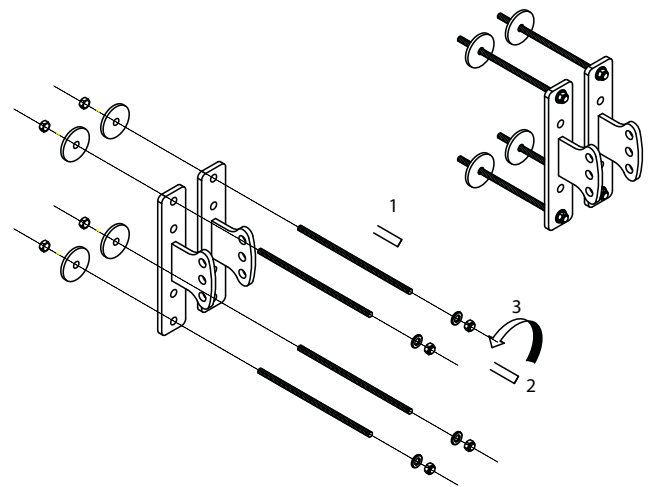


Figure 3.10 - Plate SZS with counter plate Cod. 000174



During assembly, make sure that the threaded rods protrude from the self-locking device by at least 3 cm in order to perform the anchorage test.

3.5. ASSEMBLY OF SAR DEVICES WITH COUNTER PLATES

Reported below are the steps of the assembly with counter plates:

1. Place the anchor device on the support structure
2. Insert threaded rods into holes in device Spacer designed to be crimped directly onto cable. There are no crimping release or cancellation systems. ivo anchorage
3. Position the counter plates at the bottom of the support structure in line with the bars
4. Insert washers and self-locking nuts
5. Tighten the self-locking nuts
6. Nuts must be tightened with the lifeline untensioned and attached.

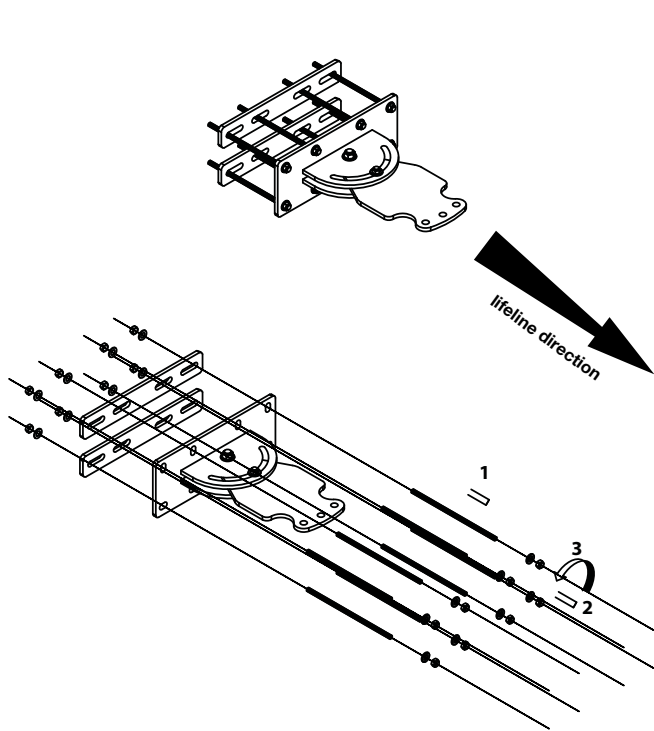


Figure 3.11 - Plate SAR with counter plate Cod. 000203

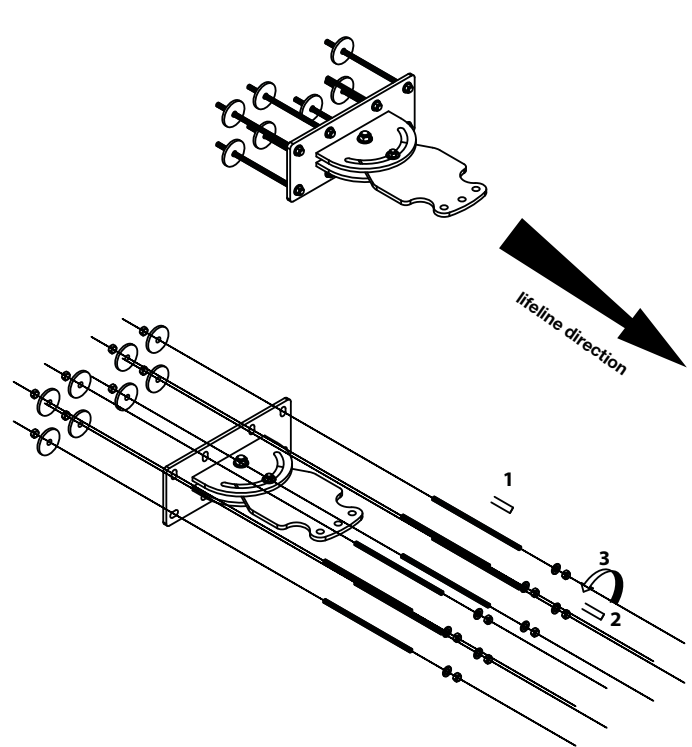
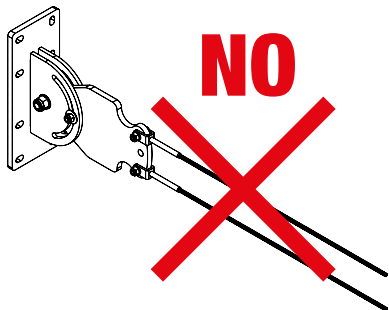


Figure 3.12 - Plate SAR with counter plate Cod. 000174

INCORRECT INSTALLATION



SAR plate and Sicurair lifeline must NOT be installed as shown in the picture on the side

In order to better understand the use of counterplates with the various devices, we recommend downloading the file "application examples" at the address:

<http://www.sicurpal.it/it/prodotti/accessori/materiale-per-il-montaggio/sistemi-di-fissaggio/contropiatti> or take a picture of the QR-code here.



4. DESCRIPTION AND ASSEMBLY OF ACCESSORIES

Accessories are to be installed on the plates to complete **the SICURAIR anchor devices and/or the fall arrest system.**

4.1. LIFELINE ACCESSORIES

CABLE Ø8



Figure 4.1

Fiscal 002835

In stainless steel
AISI 316 Ø 8 mm
with 19 wires
with identification
band for product
traceability

END PLATE



Figure 4.2

Cod. 003555

Limit switch device
for 8 mm cable
including two fixing
clamps.

The device
prevents the
operator from
continuing beyond
the point defined
by the end plate

SPACER FOR FIXED/MOBILE CABLE



Figure 4.3

Cod. 002994

FIXED spacer
designed to be
crimped directly
onto the cable.
There are no
crimping release
or cancellation
systems.

Cod. 003314

MOBILE spacer
designed to be
crimped directly on
the cable including
release system for
sliding on the cable
with a load ≥ 70
kg

TURNBUCKLE FORK/TUBE



Figure 4.4

Cod. 000294

AISI 316 stainless
steel turnbuckle
with 250 mm
closed tube.
Composed by
jointed fork with
closing bolt
Ø12X40 mm on
one end and tube
to crimp on the
other end



Figure 4.5

Cod. 002494

AISI 304 stainless
steel turnbuckle
with 150 mm
closed tube.
Composed by
jointed fork with
closing bolt
Ø12X40 mm on
one end and tube
to crimp on the
other end

FORK TERMINAL



Figure 4.6

Cod. 000292

AISI 316 stainless
steel terminal and
fixed fork with
locking bolt Ø
12X40 mm



Figure 4.7

Cod. 000293

AISI 316 stainless
steel terminal with
jointed fork and Ø
12X40 mm bolt

SEAL



Figure 4.8

Cod. 000290
Seal for turnbuckle block

LIFELINE ID



Figure 4.9

Cod. 000291
Life line identification code

ACCESS SIGN



Figure 4.10

Cod. 000296
Aluminum access sign to be placed near each access to the secured area

DOCUBOX



Figure 4.11

Cod. 003334
Document holder with fixing kit

PLANT BOOKLET



Figure 4.12

Cod. 002562
For lifeline activity records

SICURAIR CABLE GLAND



Figure 4.13

Cod. 003011
Straight intermediate cable gland for double cable line.

BRACKET FOR FASTENING THE CABLE GLAND TO THE CEILING



Figure 4.14

Cod. 004021
The cable gland fixing bracket is to be provided for all ceiling fixings where the cable gland does not require to be suspended. The part number includes a pair of left-right brackets and locking bolts.

Special codes available for the Sicurair line:

004035 line tensioning clamp

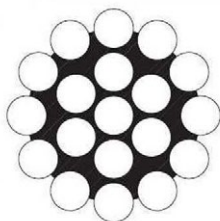
003471 fixing angle bracket (custom device, evaluation by designer)

4.2. FOCUS ACCESSORIES

CABLE - Steel cable Sicurpal Cod. 002835

AISI 316 stainless steel cable with 19 wires, 1x19 spiroidal formation with right cross winding. Packaged on a 500 meter reel or sold in custom lengths as desired.

Technical characteristics:



Nominal rope diameter (mm): 8.0
 Nominal mass (kg/m): 0.310
 Wrapping: REINFORCED CONCRET
 Pretraining: YES
 Construction: 1x19 - EN 12385-10
 Minimum breaking load kN 52,89
 Surface/Coating: STAINLESS STEEL

Figure 4.15

TURNBUCKLES fork/tube

The following is a focus on the various types of turnbuckles offered by SICURPAL.

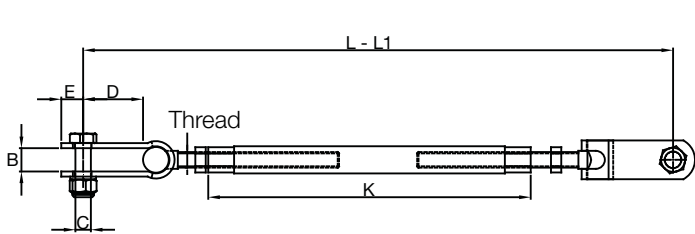


Figure 4.16 - Cod. 000032 Double fork turnbuckle stainless steel AISI 316

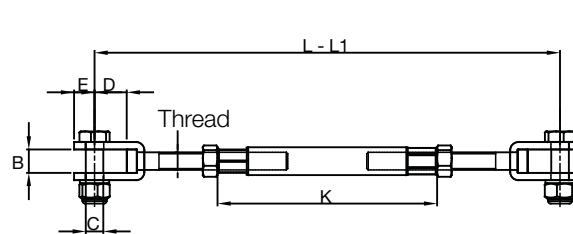


Figure 4.17 - Cod. 002493 Double fork turnbuckle stainless steel AISI 304

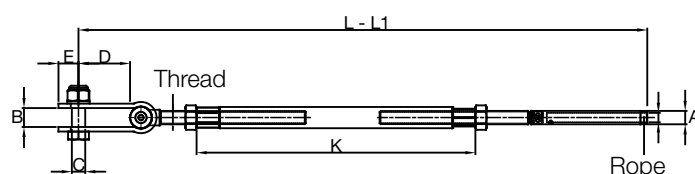


Figure 4.18 - Cod. 000294 Fork turnbuckle stainless steel AISI 316

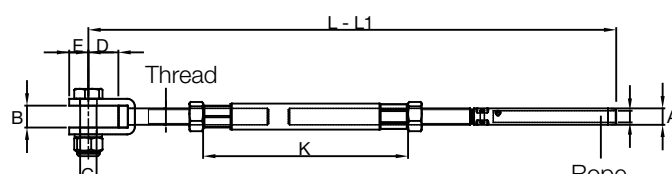


Figure 4.19 - Cod. 002494 Fork turnbuckle stainless steel AISI 304

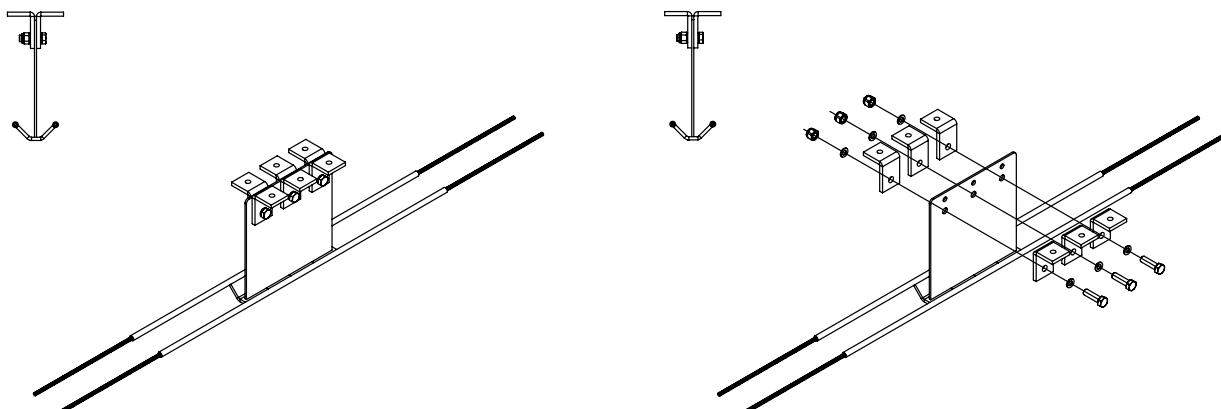
Turnbuckle dimensions shown in the table below:

ART.	000294	002494	000032	002493
ROPE	ø8	ø8	ø8	ø8
THREAD	M12	M12	M12	M12
A [mm]	12.5	12.5	-	-
B [mm]	17	15.5	18	15.5
C	M12 x 40	M12 x 40	M12 x 40	M12 x 40
D [mm]	46	23	46	23
E [mm]	18	14	17	14
L [mm]	451	372	413	264
L1 [mm]	650	478	604	370
K [mm]	250	150	250	150
WEIGHT [kg]	0.860	0.5925	1.0835	0.762
BROKEN LOAD [kg]	6,650	6,250	6,650	6,250

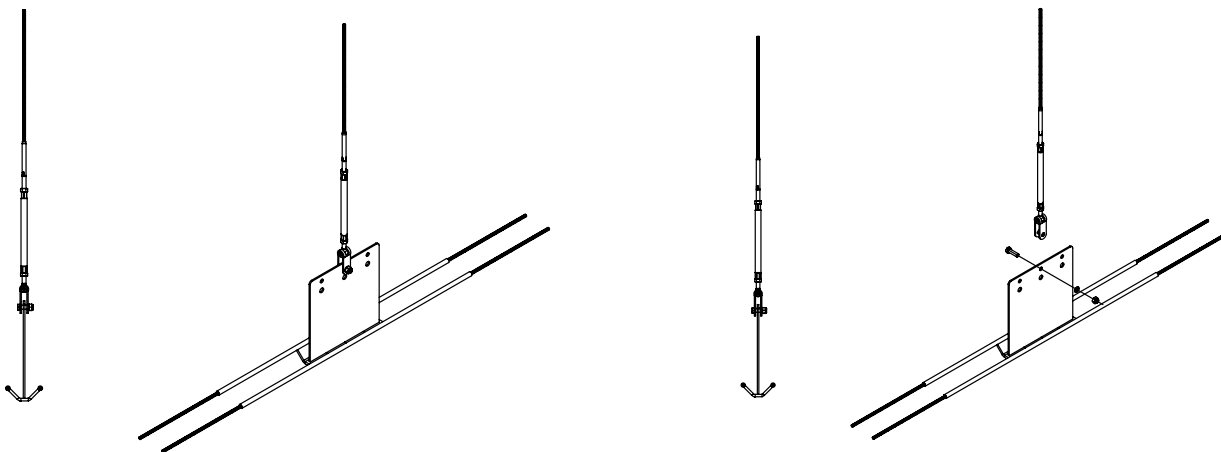
4.3. ACCESSORY ASSEMBLY

SICURAIR devices can be combined with a variety of accessories to meet the different needs that arise on construction sites. Here are the most significant examples with their installation steps:

1. Attach the plate according to the directions in the Chap. 3.2.
2. For wall fixing, combine in a single system the straight intermediate cable gland cod. 003011 with the fixing angle bracket code 003471 (special order item). Use the 2 outer holes.
3. Once the two previous components have been tightened, fix the fixing angle bracket code 003471 to the supporting structure by means of four threaded bars M12.



4. For suspension fastenings use the center hole for tie rod attachment.
5. The following items can be used as the tie rod attachment: 000293-000292-000294-002494.



4.4. INSTALLATION AND ASSEMBLY OF THE SPACER (COD. 002994 and 003314)

In order to guarantee the perfect stability of the system and the aforementioned smoothness of the shuttle, we list below the installation steps of the "Spacer" accessory.



Remember to provide a spacer every 1.5-2 m max. For a cable length of 20 m, for example, provide a spacer every 2 m.

1

Position the spacer at the correct distance from the previous item



3

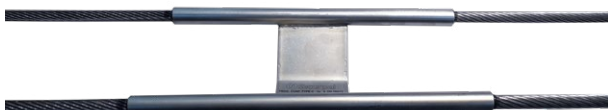
Move the spacer to the right and near the mark made in the previous step, make 2 turns of 360° with the tape and cut it with scissors.



ATTENTION: the tape should not be torn with a tensioner

5

Place the spacer so that all 4 points of tape are covered.



2

Mark the ends of the spacer on the cable with a marker.



4

Move the spacer to the left and perform the same activity as in step 3.



6

Crimp each individual rod starting at its end. Carry out a total of 4 crimps.



CAUTION: For best smoothness, do not leave uncrimped tubing between the crimping and the end of the tubing.

In case of using the article code 002994 Fixed spacer, please follow the points 1, 2 and 6 of the procedure listed above.



For crimping, the use of the APU crimping machine (cod. 001498) and the pair of pressing dies, cod. 002174.

4.5. INSTALLATION, USE AND MAINTENANCE OF THE TRAVELLER (cod. 002957)

The traveller is a key device in the **SICURAIR**line. You cannot use the line without the traveller. Its design allows the effort to be distributed evenly across both cables without overloading one.

These characteristics oblige the use of the line even if there are no intermediate cable glands.

The closed traveller should look like the picture on the side. Easily identifiable safety systems, colored red, must all be present (4 pcs) and properly tightened using the eight bolts.



- 1 Position in the middle of the distance between two spacers. This distance should be a minimum of 1m. This allows the cables to be as flexible as possible to fit inside the traveller.



- 2 Remove all 4 safety stops. Insert one cable first and then the other. Do not plug the cables in at the same time.



- 3 Once the cables are properly positioned on the individual pulleys restore the 4 safety stops. Make sure all 8 anti-vibration washers are present.



- 4** Attach the fall arrest device to the traveller eyebolt.



WARNING:

Warnings and recommendations on traveller use.

- The trolley can stop near the spacer or even at the intrados of it.
- In this second case it is possible that the trolley is blocked when restarting.
- In this case, pull it downwards with slight force or pull it to the right or left so that it can be released.



Only qualified SICURPAL personnel are allowed to dismantle the traveller. All operators who have read this manual and received appropriate training on the use of the traveller are allowed to open the safety locks.



The traveller consists of 8 bearings designed to improve sliding on the fall arrest system. It is recommended that the traveller be stored indoors so that water does not generate rust on the bearings themselves. In case of rust on the bearings, their replacement will be required.

5. INSTRUCTIONS FOR THE ASSEMBLY OF THE LIFELINE

Below are the operations to be performed in order to complete the installation of the **SICURAIR** lifeline:

1. Assemble the accessories (see Chap. 4).
2. Attach the turnbuckle to one end.
3. Insert spacers along both lifeline cables.
4. Attach intermediate accessories/cable gland in case of multi-span lifelines.
5. Fix cable.
6. Tension the cable with an unloaded cable preload (traveller not installed) of 500 lbs.
7. Install the traveller(s).
8. Properly space the spacer and perform crimping them (see Chap. 4).

Only crimping assembly is permitted for cable attachment.



SICURAIR is a complex lifeline to install, especially when coupled with the Recovery system. It is therefore recommended that:

- use the SicurAir Assembly Kit available for rental
- for the correct assembly of the lifeline, use competent and trained personnel or take a specific course for lifeline fitters
- use this manual and, if necessary, request the internal operating instructions from our internal SICURPAL technical office.

ASSEMBLY WITH CRIMPING

SICURAIR lifeline terminals can be:

- by crimping
- with fixed fork (Cod. 000292)
- With jointed fork (Cod. 000293)
- fork turnbuckle (Cod. 002494)

Each tube to be crimped has an open hole that allows you to verify proper cable placement both before and after crimping. The procedure to be followed for crimping is as follows:

- a) Insert the cable inside the tube as far as it will go and check for its presence through the hole;
- b) Imprint the first crimp with a crimping machine and make sure that the innermost part of the tube still contains the cable;
- c) Perform subsequent crimps at a distance of approximately 8 mm from the previous one by rotating the crimping machine approximately 20° each time (see **Figure 5.1**). This operation is compulsory at an aesthetic level to avoid a non-linear and off-axis shape of the tube.

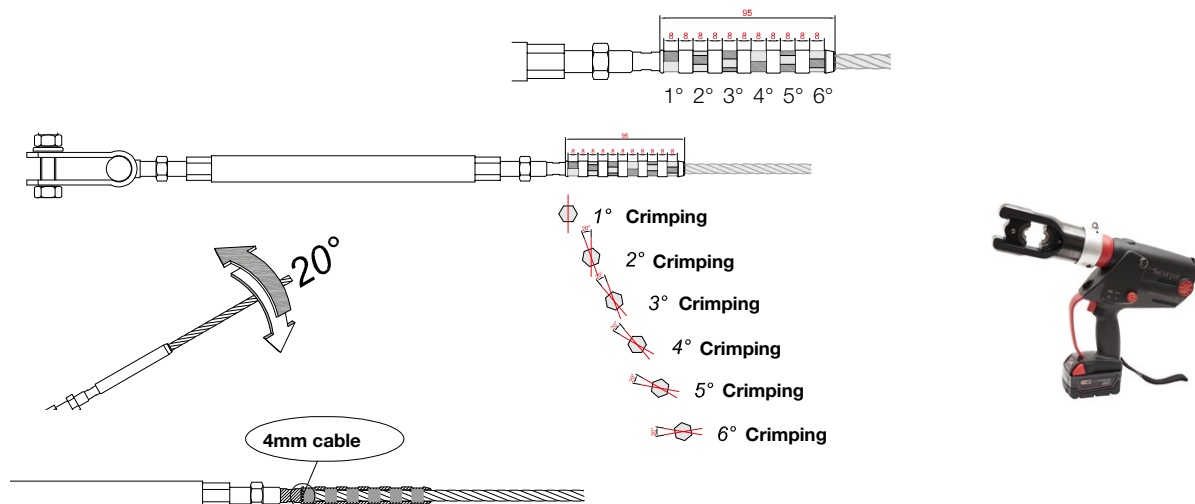


Figure 5.1 - Crimping

INSTALLATION EXAMPLES:

SICURAIR products comply with UNI 795:2012, CEN/TS 16415:2013 standards.

Crimped connections conform to all of the above standards.

Below are some examples of how lifelines can be installed, which can be applied to roofs, walls or ceilings. For ceiling applications, remember to use the traveller gland in combination with the complementary traveller support.

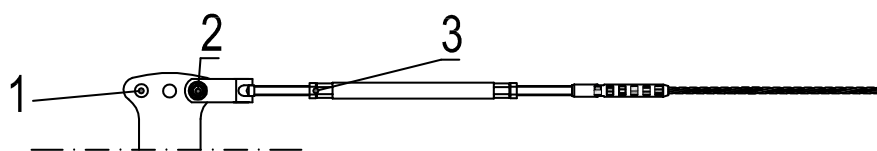


Figure 5.2

1. Fix the plate SZS (Cod.000189/000268) (1) following the instructions given in the Chap. 3.2.
2. On one of the two side holes of the plate fix the turnbuckle F/C (Cod. 000294/002494) (3) through a bolt M12x40 + washer (2)
3. Insert the cable into the other end of the turnbuckle and crimp the cable (see Chapter 5)

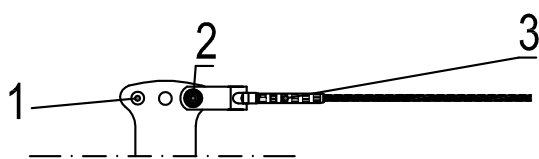


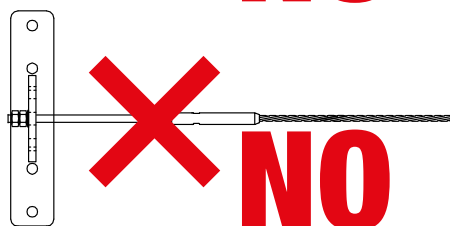
Figure 5.3

1. Fix the plate SZS (Cod.000189/000268) (1) following the instructions given in the Chap. 3.2.
2. On one of the two side holes of the plate fix the turnbuckle jointed fork (Cod. 000293) (3) through a bolt M12x40 + washer (2)
3. Insert the cable into the other end of the terminal and crimp the cable (see Chapter 5)

INCORRECT INSTALLATION

The SZS plate CANNOT be installed as per the explanatory drawings below:

SZS
000189-000268



Place the turnbuckle seal

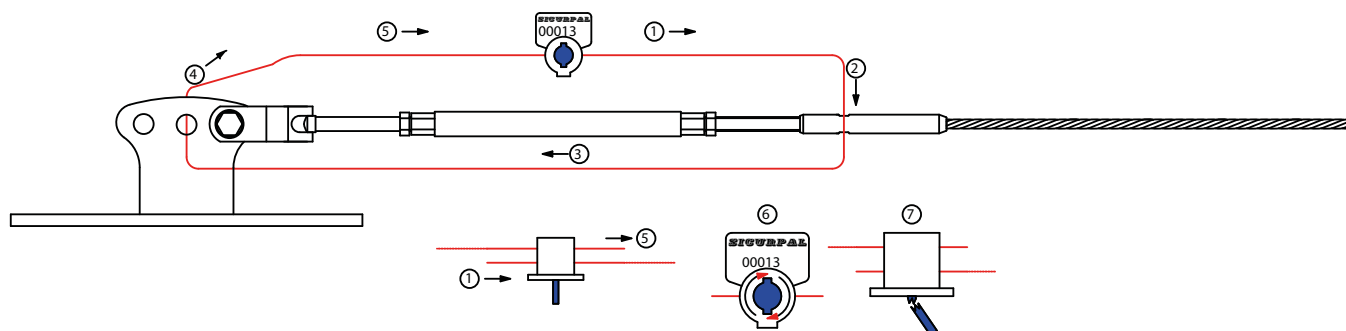


Figure 5.4

1. Run one end of the metal wire through one of the two holes in the security seal;
2. Continue by inserting the wire rope into the hole in the turnbuckle:
Cod. 000294/002494 or in either fork.
3. Continue with inserting the cable into the turnbuckle bracket or the remaining fork.
4. Continue with the approach of the cable to the seal
5. Insert the metal wire into the remaining hole in the security seal, bringing it under tension.
6. Finish tensioning the metal cable by turning the key in the seal and removing the excess cable.
7. Seal it by breaking the handle of the key.

For greater clarity, we recommend viewing the explanatory video on the SICURPAL website:

<https://www.youtube.com/watch?v=AfKvLSx-AFU>

Install the lifeline identification code (Cod. 000291) which identifies the system and is useful for finding all the information needed for subsequent inspections, both regarding the composition of the system and the location of the devices.



The crimp connections comply with:
UNI EN 795:2012
CEN/TS 16415:2013

6. USE OF ANTYFALL SYSTEMS

The devices of the **SICURAIR** line suitable for use by operators, meet the minimum requirements of **UNI EN 363:2019, UNI 11560:2014 and** the provisions of Legislative Decree. 81/08 and subsequent amendments and additions, art. 115. They are suitable for use in the following types of personal protective systems:

- Restraint systems;
- Work positioning systems;
- Fall arrest systems;
- Rescue systems.

A personal protection system against falls from height is composed of the assembly of components intended to protect the worker against falls from height, including a body catching device and a connection system, which can be connected to the anchor system.

It is recalled that the Legislative Decree. 81/08 subsequent amendments and additions art. 77, paragraph 5, letter a, envisages as indispensable the training in the use of personal protection systems against falls from a height and of the relative PPE. (Personal Protective Equipment) of category III (Legislative Decree 475/1992).

As per the **UNI EN 795:2012** standard, in point 5.5.3.1.6 and the **UNI EN 11578:2015** standard, in point 5.4.3.1.6, the following reels were tested on the line at maximum and minimum span (20 m and 6 m):

- Tractel Blocfor 1.8 A reel 1.8 m
- Tractel Blocfor reel 10 m
- Tractel Blocfor reel 20 m
- KSP Stopfor traveller carabiner + rope RLX D 20 m
- Camp Cobra 10 reel 10 m
- Kratos Safety FA 20 402 15 reel 15 m
- Kratos Safety FA 20 102 10 rope + traveller 10 m
- Kratos Safety FA 20 402 10 reel 10 m
- Protecta JRG reel 10 m

Rigid-anchored and deformable-anchored lines were tested.

The tests were performed by dropping a 100 kg weight for a height capable of developing a force greater than 9 kN on a fixed point.

All devices stopped the fall regularly by intervening within 60 cm without releasing the mass.

In devices equipped with an external heatsink, a slight opening of the heatsink was observed.

For all tests performed, the peak load remained below 600 daN.

6.1. RESTRAINT SYSTEMS

A restraint system is an individual fall protection system that prevents a worker from reaching areas where there is a danger of falling from heights.

Table of arrows in the case of a 70 kg operator in restraint and/or positioning with an applied force of 70 daN

Spanned by:	5		10		15		20		25		30	
Total length line (m)	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]
5	1128	13										
10	952	15	1128	21								
15	877	16	1016	23	1128	29						
20	831	16	952	24	1047	31	1128	37				
25	800	17	909	25	991	32	1064	39	1128	44		
30	777	17	877	26	952	33	1016	40	1075	46	1128	52
60	707	18	777	28	831	37	877	46	917	53	952	61
90	677	19	732	30	777	40	814	49	847	57	877	66
120	661	19	707	30	744	41	777	51	805	60	831	69

These loads are to be multiplied by the safety coefficients ($\gamma=1,5$) of NTC

The data shown on the table "Table of arrows in case of operator in restraint and/or positioning" must necessarily be taken into consideration by the operator who will have to use the system with PPE for restraint and/or positioning.

6.2. WORK POSITIONING SYSTEMS

A work positioning system is an individual fall protection system that allows the worker to work in a tensioned/restrained manner, so that falls from height are prevented.

6.3. FALL ARREST SYSTEMS SICURAIR

A fall arrest system is an individual fall protection system that prevents a worker from being struck by an obstacle, whether it be the ground, a structure, or any other object, by limiting the force that acts on the worker's body during a fall.

Table of dynamic arrows in case of falling arrest of 4 (four) operators for the calculation of the air draught

Spanned by:	5		10		15		20		25		30	
Total length line (m)	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]	LOAD [daN]	ARROW [cm]
5	7153	51										
10	5621	54	5966	68								
15	4949	57	5203	71	5323	83						
20	4551	58	4758	74	4853	86	4916	96				
25	4285	60	4461	76	4541	88	4595	99	4633	109		
30	4094	61	4248	78	4317	91	4365	102	4398	112	4421	121
60	3271	66	3413	85	3481	100	3525	113	3555	125	3577	135
90	2863	70	2995	91	3048	107	3080	121	3102	133	3117	144
120	2576	73	2682	95	2738	112	2770	126	2792	140	2808	151

These loads are to be multiplied by the safety coefficients ($\gamma=1,5$) of NTC

6.4. RESCUE SYSTEMS

A rescue system is an individual fall protection system by which a worker can save himself or others and prevent a free fall.

Rescue system:

- Prevents free fall of both the rescued person and the rescuer during the rescue operation;
- Allows the rescued person to be lifted or lowered to a safe place.

7. TECHNICAL DATA

		DEVICES					
		SZS		SAR		SAGOMA LVB	
		Stainless steel	Galvanized	Stainless steel	Galvanized	Stainless steel	Galvanized
Net Weight	[kg]	7.21	7.48	2.86	3.00	variable	
Product height [mm]	[mm]	110					
Anchor plate dimensions	[mm]	300x300		180x180		Variable with thickness 15mm minimum	
Number of structural anchor holes	n°	8 holes				variable	
Material used	n°	S235 HOT-DIP GALVANISED					
		AISI 304 STAINLESS STEEL					
Maximum usage load *	[kN]	The device has been designed, verified and conforms to the safety coefficients and design loads provided for in the UNI EN 795:2012 standard					
Number of users per lifeline as UNI EN 795 Type C	max	1					
Number of users per lifeline as CEN/TS 16415:2013 Type C	max	4					
Maximum weight of each user	[kg]	100					
Cable spacing	[mm]	100					
Minimum and maximum distance between anchor devices of a lifeline	[m]	5-30					
Maximum lifeline length	[m]	120					
Pretension load	kN	5					
Deformation of the device in case of a fall		The shape of the device allows for load dissipation. See Chapter 6 for strain values.					
Number of anchorage holes for PPE	n°	1					

* "The subject load may result in plastic deformation."

8. EXAMPLE OF MARKING

Each demountable component of the system is clearly marked as shown below:

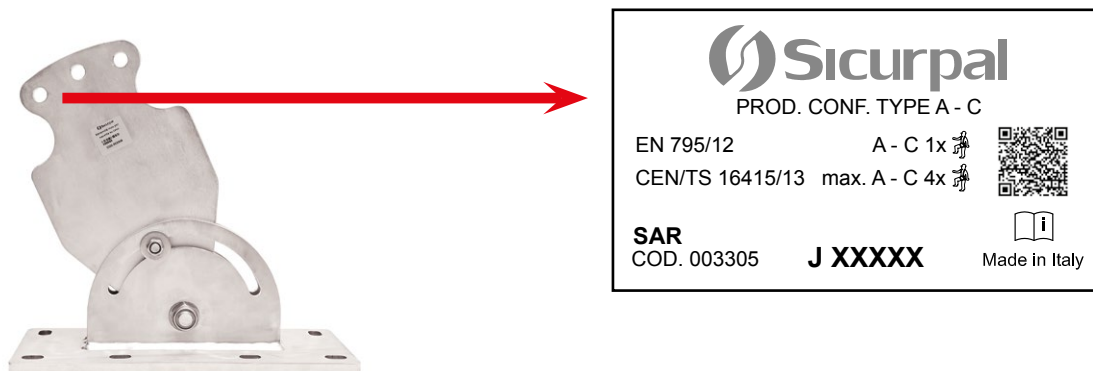





Figure 8.1

	Name and brand identification of the producing company
EN 795:2012 CEN/TS 16415:2013	Certification standards
SAR	Name of the anchor device
J XXXXX	Production lot number
PROD. CONF. TYPE C	Device type
	Max. number of operators allowed
Cod. 003305	Product identification code
Made in Italy	Country of production
	Read the instructions in the manual



If there is no marking, the device does not comply and must be replaced.

9. INSPECTION AND MAINTENANCE PROGRAM

UNI 11560:2014 provides four types of inspections that the manufacturer has implemented and applies as follows:

9.1. ASSEMBLY INSPECTION

The inspection of the components before assembly and of the system after assembly, must be carried out by the installer and performed in accordance with the instructions of **SICURPAL** as manufacturer of the devices, the designer of the anchor system and the structural designer (UNI 11560:2014).

SICURPAL, as manufacturer, prescribes to verify, before installation, the expiry date of chemical anchors, if their use is foreseen.

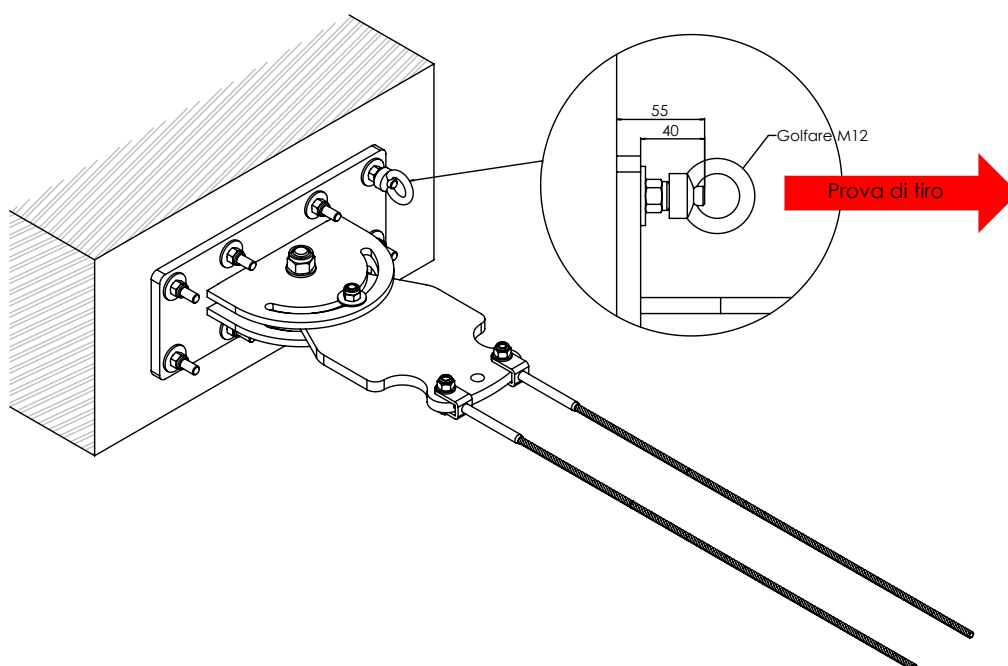


Figure 9.1 Detail of inspection at assembly plate Sicurair, with exposed bars for 20 cm and eyebolt for the test shot.



Verify the tightness of the bars with a pull test at 500 kN respecting the distances and direction shown in the figure above.

9.2. INSPECTION BEFORE USE

Before using **SICURPAL** anchor devices, visually perform the following preliminary inspections:

- Waterproofing
- Wear
- Oxidation/corrosion
- Component deformation
- Abnormal rope deformation
- Rope tensioning
- Tightening the nuts and bolts of exposed devices



If any anomalies are found in the system as a result of the above checks, it must not be used. It is also necessary to prevent access to other users and to inform the customer, who must withdraw the system from service and restore it so that it can be used again, by requesting the intervention of competent personnel.

It is necessary for the user, before entering the roof, to carry out a check on the air draught in all parts of the roof where there is a danger of falling, in order to eliminate, in the event of a fall, the risk of collision with the floor or other obstacle in the path of the fall. Before climbing onto the roof, make sure that there are environmental and climatic conditions that do not compromise the health of the fall arrest system user. The user must consult the Technical Data Sheet to check for pendulum effect hazards and for any special requirements.

9.3. PERIODIC INSPECTION

Periodic inspection of each anchor system must be performed by a competent person*.

SICURPAL, as the manufacturer, recommends periodic inspections on an annual basis for the devices and at intervals recommended by the structural designer for the part concerning the fastening system to the structure.

In any case, as per the standard, the visual inspection shall not be greater than 2 years, and the instrumental inspection on the fixing of the device shall not be greater than 4 years from the date of installation (UNI 11560:2014, see Plant Booklet). As regards the specific checks to be carried out on the product/fixing Sicurpal prescribes the same control activities reported in paragraph 10.1 (assembly inspection).



For further information, contact your local authorized dealer or SICURPAL.

9.4. EXTRAORDINARY INSPECTION

Upon report of a defect or fall, the anchor system must be taken out of service immediately. Subsequently, an extraordinary inspection must be carried out by **SICURPAL** or a company authorized by **SICURPAL**, in order to identify any interventions necessary to restore the performance characteristics of the anchor system, anchors and support structure.

9.5. MAINTENANCE

Maintenance shall be performed, as necessary, following a special inspection. If the maintenance involves the replacement of components and/or interventions on the support structure, with the possible involvement of a qualified technician (UNI 11560:2014), the maintainer must issue a declaration of correct execution of the required maintenance work, confirming the suitability for use of the system.

** Competent person means a person who is aware of the current requirements for pre-use, periodic and non-routine inspection, recommendations and instructions issued by the manufacturer applicable to the relevant component, subsystem or system (UNI EN 365:2005 § 3 "terms and definitions").*

10. WARNINGS AND RECOMMENDATIONS



10.1. INSTALLATION



10.2. USE

It is possible to install the devices of the **SICURAIR** line only after evaluation, by a qualified technician, of the risks of falling from a height and verification of the suitability of the structures on which the devices are to be installed.

The qualified structural engineer must indicate the most suitable fastening method depending on the type of base material, dimensions and mechanical characteristics of the load-bearing structures, on which the product is to be installed, in accordance with the performance values provided by the manufacturer.

It is absolutely forbidden, due to the forfeiture of the warranty and the conformity of the product, to create new holes, enlarge the existing ones or modify the shape of the device without the written authorization of the manufacturer **SICURPAL**.

The installer must ensure that the materials and substrate to which the anchor devices are to be attached comply with and meet the requirements of the Calculation Report.

SICURPAL anchor devices must be used only and exclusively by persons authorized by the employer (or client) who have fully read and understood the instructions contained in this manual. They must also be trained, informed and instructed in the use of Category III PPE.

SICURPAL anchor devices must be used only and exclusively by people who have regularly maintained PPE in compliance with the technical standards in force and that have not exceeded the expiry date indicated by the manufacturer.



The manufacturer assumes no responsibility for any injury resulting from improper use of this system or from failure to follow the warnings and recommendations in this owner's guide. In this case, the responsibility lies with the principal and/or employer.

The choice of PPE to be used during the use of anchor devices must be made and indicated by the employer (or client) in the operational safety plan.

10.3. INSPECTIONS AND MAINTENANCE






<p>In the event of a fall of the user hooked to the devices SICURAIR the anchor system must be taken out of service and checked in all its parts by SICURPAL.</p>	<p>If the anchor device is deformed or damaged, it is necessary to replace it immediately. Any replacement of products must be carried out by SICURPAL or by qualified personnel.</p>
<p>The system must be put back into service following final certification by SICURPAL or a company authorized by SICURPAL.</p>	<p>For proper use make sure the cables are always tight and never deflected (belly). Otherwise, it is possible that the traveller will have sliding problems.</p>

	<p>SICURPAL SRL will not be held responsible for any accidents resulting from failure to comply with the standards and instructions given in this manual.</p>
	<p>In addition to the checks on the anchor system, the user must make sure that he/she carries out all the control procedures required for all the elements anchored to the system (energy absorbers, lanyards, harnesses, etc.).</p>

10.4. EARTHING

The anchor devices produced by Sicurpal Srl once installed may be subject to capture electrical discharges. It will be the responsibility of the owner or person in charge of the system to verify, according to the regulations in force, whether the building is subject to lightning and to protect the building with systems designed according to CEI 81-10/1,2,3,4. As required by that standard, connect the lower part of the fixing plate of the device to an equipotential circuit/earth with a cable equipped with eyelet terminals of adequate section for protection from lightning. This operation must be carried out by a qualified person authorized under the Ministerial Decree. N° 37 of 22-1-2008. The performance of such workmanship is the option and responsibility of the developer/owner of the building.

	<p>Verify that the anchor device is secured and properly installed according to these instructions.</p>
	<p>SICURPAL assumes no responsibility for the earthing of the system.</p>
	<p>In case of connection of the lifeline to the Faraday cage for the grounding of the system, it will be necessary to include the lifeline in the report of the lightning protection system to be submitted to INAIL, according to DPR 462/01</p>

11. MANUFACTURER'S INFORMATION NOTICE

The following is the information required by point 7 of the UNI EN 795:2012 standard:

- A) The **SICURAIR Type C** anchor system can be used by a maximum of **1 (one) operator** following certification tests in accordance with UNI EN 795:2012.
The **SICURAIR Type C** anchor system can be used by up to **4 (four) operators** following certification testing in accordance with Technical Specification CEN/TS 16415:2013.
- B) The anchor device can be used with fall arrest systems as long as the Personal Protective Equipment contains an energy absorber.
- C) The maximum load transmissible by the **Type C** anchor device is $f_t = 71.53$ kN in the horizontal direction parallel to the cover and in the direction of the cable.
- D) The maximum displacement value of the **SICURAIR** line anchor point is 29.1° . For loads and arrows always refer to the table in chapter 6
- E) The maximum deflection value of the **SICURAIR** Type C line is 152 cm. For loads and arrows, always refer to the table in chapter 6
- F) See Chap.6.
- G) Anchor devices are composed exclusively of metal elements, so no additional information is required about the materials from which they are made.
- H) Following each inspection, the verifier's stamp and signature must be affixed to the plant booklet or to the sign located near the roof access.
- I) Not applicable - anchor devices Type B.
- J) (i) At this time, NO intermediate anchors are provided at $90^\circ/135^\circ/180^\circ$ angles.
ii) **SICURAIR** Type C anchor devices may be used with retractable type fall arresters if they have been tested by the manufacturer. The retractable type fall arresters used during the tests are the COBRA devices produced by Camp spa.
(iii) Potential hazards that could arise from using the fall arrest system with **SICURPAL SICURAIR** products are:
- fall from height with operator suspension,
- pendulum effect,
- collision with an obstacle beyond the edge of the roof due to insufficient air draught,
- vertical fall due to breakthrough of the roof,
- falling inside open or breakable skylights and dormers.
Residual hazards may be present depending on the type of support structure you are walking on. These residual hazards must be evaluated in each specific case.
- K) i) The anchor devices type C can make a lifeline that deviates from the horizon of no more than 15° (if measured between the end and intermediate anchors of any point from its length) in the sense of the standard UNI EN 795:2012.
ii) The manufacturer shall not permit direct connection using an EN 362 connector. Coupling must always take place using the SICURAIR traveller from SICURPAL.
- L) Not applicable - anchor devices Type E.
- M) At the end of the installation, the installer must deliver to the customer the Declaration of Correct Assembly (Appendix A1 UNI EN 795:2012) signed by him, as evidence and guarantee of the correct and appropriate execution of the installation. It will provide basic documentation for subsequent periodic examinations. It is the duty of the customer to keep this documentation, for possible reading by the maintainers/installers/users.

According to Appendix A2 - Guidance for Documentation to be Provided After Installation, documentation required by the developer who decides to perform the installation on their own should include:

- address and location of installation;
- name and address of the installation company;
- name of the person responsible for the installation;
- product identification (anchor device manufacturer's name, type, model/article);
- fastener (manufacturer, product, allowable tensile and transverse forces);
- schematic installation plan and relevant information for the user/buyer, such as the arrangement of anchor points.

The schematic installation plan should be posted at the point of access to the building so that it is visible or available to all.

The Declaration of Correct Installation provided by the responsible installer must contain the following information regarding the anchor device:

- It has been installed in accordance with the manufacturer's installation instructions;
- It was performed according to the installation plan, above;
- It was attached to the specified substrate;
- It has been secured as specified (number of bolts, correct materials, correct location);
- It has been commissioned in accordance with the manufacturer's information;
- It has been equipped with photographic/documentation information.

It is recommended that if more than one anchor point is to be photographed for identification, that anchor devices be numbered and that this numbering be incorporated into the anchor device inspection records and schematic plan of the installation area.

- N) The anchor device should only be used for PPE against falls and not for lifting equipment. See Chapter 2.1 for more detailed information on this topic. "Warranty".
- O) **SICURAIR** devices do not include a fall indicator. Therefore, information on how to inspect the fall indicator is not included in this manual.



Via dei Mestieri, 12
41030 Bastiglia (MO)
Tel. +39.059.818179
Fax. +39.059.909294
www.sicurpal.it
info@sicurpal.it