Green Up the Roof!

DIADEM®

TECHNICAL MANUAL

DiaSafe® Single
Fall Protection Anchoring Systems

Anchoring devices permanently secured by layering sequence as per standards EN 795:2012 and CEN/TS 16415:2013

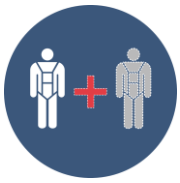
DiaSafe®

Table of contents

1 Description of symbols

Pictograms in the Technical Manual have the following meanings:

System users are obliged to carefully read this manual and the related service book and shall closely follow all relevant safety regulations and user requirements listed herein.



Number of the persons who can use the safety system simultaneously (in this case 1+1 persons).

In case of use by 1+1 persons, the system can be used even by two persons simultaneously, but the fall arresting function can be guaranteed only if the falls take place at different times.

Usage of personal protective equipment is required (in accordance with PSAgA EN 361 and EN 363). Manufacturer's prescriptions of the given equipment shall be observed.

Danger, which could lead to severe injury or death.

2 Introduction – General description

2.1 Single anchoring points

2.1.1 DiaSafe® Single

The **DiaSafe® Single** was developed as a safety technical system working as a single anchoring point based on the standards **EN 795:2012 (Type A)** and **CEN/TS 16415:2013**, for **1+1 persons**, in case of max. 5° roof angle, permanently secured by layering sequence. The anchoring point can be used solely with personal protective equipment defined according to EN 363:2008.

3 Safety instructions

3.1 General safety instructions

- The safety system may only be installed and used by appropriately trained, competent persons who are familiar with the safety system in accordance with this Technical Manual and the Installation Guide.
- The system user must be familiar and comply with the local, and labour safety regulations.
- The system may only be used by people who:
    - are trained in the use of PPE (Personal Protective Equipment).
    - are physically and psychologically fit (health restrictions such as heart and circulatory problems, medication, alcohol consumption, etc. reduce user safety).
    - understood and accepted the possibilities, restrictions and risks of using the protective equipment.
- The rescue of anyone who may have fallen down must be provided on site.
- Before works begin, measures must be taken to ensure that no objects can cause a fall down from the workspace. The area under the workspace (pavement, ...etc.) is to be kept clear and enclosed.
- If after the acceptance of the safety system, renovation work is undertaken in its immediate vicinity, it must be established that this renovation has no impact on the safety of the installed safety system! In case of doubt, the installer or the manufacturer must be consulted.
- After being subjected to the stress of fall, the entire safety system is to be taken out of operation and inspected by a qualified professional.
- It is forbidden to use the system until its inspection and complete or partial replacement, if the system has fulfilled its fall arrest function!
- The installed safety system must not be altered in any way.
- It is forbidden to use the safety system as a lightning protection system. Components of the lightning protection system statically should not load the safety system. The system is not allowed to be used as an earth cable. Relevant regulations must be complied with.
- Never hang loads on the safety system that are not approved in this manual, and never use it as an alpinist suspension point.
- The system is never to be used as alpinist anchoring points. The system shall not be loaded with any further weight different from its original purpose.
- The fall prevention anchoring systems can be installed and inspected only by specialists in possession of a required certificate authorising them for the given system, and specialists of the competent authorities or inspectorates.

- A basic tenet of the effective operation of the fall protection anchoring system in the long term is **regular maintenance - at least every 12 months** in the manner prescribed by the manufacturer.
- If the maintenance is not carried out regularly, the system may be used exclusively at the responsibility of the owner/maintainer.
- The timing of inspections recommended by the manufacturer in the instructions of the installed system (in individual cases) may also depend on the local legal requirements, on the frequency of use, and on local conditions (e.g. chemical damage, frequent lightning, etc.).
- The system may be extended only through the use of original accessories, developed by the manufacturer of the system. The installation and use of parts or products from other manufacturers, even if their appearance is very similar, is strictly prohibited.
- The installer should make sure that the receiving structure is able to bear the load what comes with the system installation. If there is any doubt, consult with a structural engineer.
- The fall protection anchoring system may be installed and used only according to the manufacturer's guidelines in the Technical Manual.
- If the system has fulfilled its fall arrest function, following a fall, the system must be immediately withdrawn from use. An immediate inspection must be performed before the system is used again. The system must be replaced entirely or partially depending on the findings of the inspection.
- If the Technical Manual is lost, or the Service Manual is completed or seriously damaged, get in touch with your distributor.

3.2 Application

- In order to protect lives the Technical Manual should be read carefully, and the included manufacturer's notices and instructions must be observed, especially before first use of the system. The Service Manual does not replace the Technical Manual. You should thoroughly study the Technical Manual before starting to use the system.
- The minimum free space necessary under the edge is calculated as follows: **Deformation of the anchor device in case of stress + manufacturer's specification of the PPE (Personal Protective Equipment) used, including deflection of the cable + body height + 1m safety margin.**
- **For installations higher than 1000 m above sea level, the distance between the posts will decrease by 30%, while the wire-rope sagging will increase by 30%.**
- **In heavy snowfall, the roof surface in the area of the fall protection system must be kept clear, so that the snow cannot affect the undisturbed functioning of this system.**
- Proper use of the individual components, including the PPE must be ensured, since the effectiveness of the fall prevention system is otherwise not guaranteed.
- System checks should be carried out **at least once in every 12 months**. Check interval durations depend on relevant regional regulations, system use frequency, as well as local conditions (e.g. chemical hazards).
- To attachment the fall protection system must be used a carabiner and a PPE in accordance with standards EN 361 (safety harness) and EN 363 (fall arrest system).
- If the system will be used with a direct connection (a carabiner according to EN 362) or a traveller made by another manufacturer as long as the traveller doesn't run through the column head- special care must be taken during the coupling. The required distance for the coupling is max.15 cm.
- In case of using personal protective equipment according to EN 360 or EN 365-2 special care must be taken, and the properties of the equipment needed are to be considered in the calculations.
- ATTENTION! For horizontal use, only such connecting elements can be used which are designed for this purpose and tested for the respective edge type (sharp edges, trapeziodal sheet, steel griders, concrete, etc.).

- Do not use fall arrest systems if wind speeds exceed normal parameters or the weather conditions are not suitable according to local safety regulations!
- DiaSafe® systems should only be used in a frosted environment if they have been installed in unfrosted conditions or if at least one unfrosted period has elapsed between installation and first use. If safe use of the system in frost is not guaranteed, it must not be used.
- The fall protection system must not be used by children or pregnant women.

In the EN 795 standard an installation documentation has had to be made since 2012 for every anchoring system. This documentation must include detailed information about the following: location, company carrying out the installation, installer responsible, system installed. Also, there must be a Delivery/receipt record completed (it is found in the Service Manual), which verifies that the installation has been performed professionally in accordance with standards. Furthermore, there must be drawn up a construction plan, which shows the places of the anchoring points and the steps of installation must be photographed as well. Special care must be taken with elements of the anchoring system which are going to be covered after the installation. If, on a given location, there are separate roof areas and different anchoring systems are installed, a distinct documentation must be made for each roof area and each system.

4 Manufacturer’s responsibility, warranty

- Manufacturer's responsibility covers only faulty products, unless the fault occurred as a result of inappropriate use, enviormental effects or tear from normal use. Manufacturer shall only replace faulty or damaged components. No further claims (indirect or property damage) are acknowledged by the manufacturer.
- Because of the unknown site conditions, the manufacturer assumes no responsibility for the warranty about damage caused by diversion from the Technical Manual (improper use, incorrect installation or other reasons).
- A major prerequisite of long-term fall protection system operation is regular maintenance as prescribed by the manufacturer and the standards. Should maintenance steps fail to be executed in due time, then the system can only be used for own risk. Should any damage or accident happen on an unchecked system, the manufacturer's responsibility shall terminate.
- DiaSafe® systems can be extended using original accessories developed exclusively by the manufacturer. Should any components or products of any other manufacturer be installed or used in the system, manufacturer's responsibility and guarantee terminate immediately.
- Should the system not be installed or assembled by the manufacturer instructions or a contractor authorised for installation, the manufacturer shall accept no claims, other than for faulty products.
- Should a fall occur, the system must be discarded, and it is PROHIBITED to use it any longer! System use can only be resumed after an official interim inspection. In accordance with the inspection, relevant system components or the whole system must be overhauled or replaced. As long as the distraint or the inspection is not carried out, the manufacturer is not liable for the use of the system any longer.
- Manufacturer shall cease to take any further responsibility for the system in the following cases: damage and alterations due to environmental conditions, normal wear and tear, misuse and an aesthetic alteration.
- This manual has been prepared with the utmost care; however, it may not cover all variations that occur in reality, which is why it is not intended to be exhaustive. DIADEM® APP Kft. is not responsible for eventual usage or user errors that may result from a misinterpretation of the procedures and usage methods presented herein.

4.1 General terms of warranty

For the DiaSafe® fall protection anchoring systems range, we undertake a General Manufacturer's warranty of **60 months**, valid from the day of the sale of the product by Manufacturer.

The warranty does not cover:

- Any loss of time, inconvenience, administrative costs or any other consequential damages suffered by the owner/maintainer as a consequence of a malfunction under warranty.
- Repair or replacement of spare parts, due to the following causes:
  - Wear and tear from normal use.
  - Damage or alteration due to negligence or improper use.
  - Activated fall arrest function, requiring replacement or any modification of the system, or of any part thereof, without the manufacturer's approval.
- Uses not intended or expressly prohibited by the manufacturer.
- Damage caused by the user's physical condition or health (with special regard to the weight limit: 130kg/person) and thus improper use.
- Damage caused by the owner/maintainer's failure to adequately maintain, service or repair any part of the system.
- Other causes, such as: damage due to extreme environmental impact; natural wear and tear, aesthetic alteration, etc.

Loss of warranty rights, including, among others:

- Damage occurring following incorrect installation of the product, or installation not following the guidelines.
- Loss of function and other faults due to improper use.
- Deterioration, structural damage, loss of function of the installed product due to external impact.
- Loss of function or structural damage due to natural causes (lightning strike, snow, or ice stress, earthquake etc.).
- Evidence of damage caused by unauthorised and/or non-professional repair, mounting, or impact.

4.2 Expected lifetime

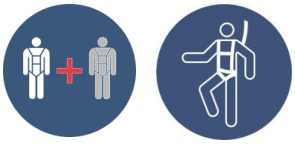
The DiaSafe® safety systems maximum lifetime is **10 years** from the date of correct installation – In case of the intended use, optimal condition, and without any visible damage.

The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works. These provisions are based upon the current state of the art and the available knowledge and experience. The indications given as to the working life of the construction product cannot be interpreted as a guarantee but are regarded only as a means for expressing the expected economically reasonable working life of the product.

5 System design, components

5.1 DiaSafe® Single anchoring points

5.1.1 DiaSafe® Single



Post structure: DS post + DS amoeba-shaped damping plate with ballasting mat (3x3 m)
Properties: no need to break through the layering sequence of the roof insulation to perform the installation
Load direction: 360° (horizontal)
Material: stainless steel 1.4404, glass-fibre reinforced plastic (amoeba-shaped damping plate)
Fixation: specified ballast material (detailed in Point 6)
Standard height: 300 mm

5.1.2 DiaSafe® Single / Anchor point components

DS Single Post
Product No.: 100369
Material: Stainless steel 1.4404
Size: Ø250mm x 300mm

DS Amoeba-shaped damping plate with ballasting mat (3x3m)
Product No.:100560
Material: Glass-fibre reinforced plastic
Size: 3x3m

5.1.3 Recommended carabiner to connect to the system

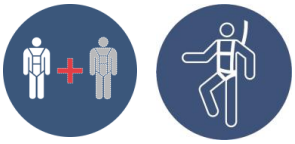
Applied standard: EN 362:2013
Max. diameter: ∅ 12 mm

5.1.4 DiaSafe® systems accessories

DS Auxiliary ballasting mat
Product No.: 320317
Material: Polypropylene

5.2 DiaSafe® Single optional anchoring points (for individual order)

5.2.1 DiaSafe® Single



Post structure: DS post + DS amoeba-shaped damping plate with ballasting mat (3x3 m)
Properties: no need to break through the layering sequence of the roof insulation to perform the installation
Load direction: 360° (horizontal)
Material: stainless steel 1.4301, glass-fibre reinforced plastic (amoeba-shaped damping plate)
Fixation: specified ballast material (detailed in Point 6)
Standard height: 300 mm

5.2.2 DiaSafe® Single / Anchor point components

DS Post
Product No.: 100520
Material: Stainless steel 1.4301
Size: Ø250mm x 285mm

DS Amoeba-shaped damping plate with ballasting mat (3x3m)
Product No.:100560
Material: Glass-fibre reinforced plastic
Size: 3x3m

DS Single head Kit
Product number: 130936
Material: Stainless steel 1.4301
Attached: M12 nut, spring washer, spacer

DS Single SEAT head Kit
Product number: 130939
Material: Stainless steel 1.4408
Attached: M12 nut, spring washer, spacers

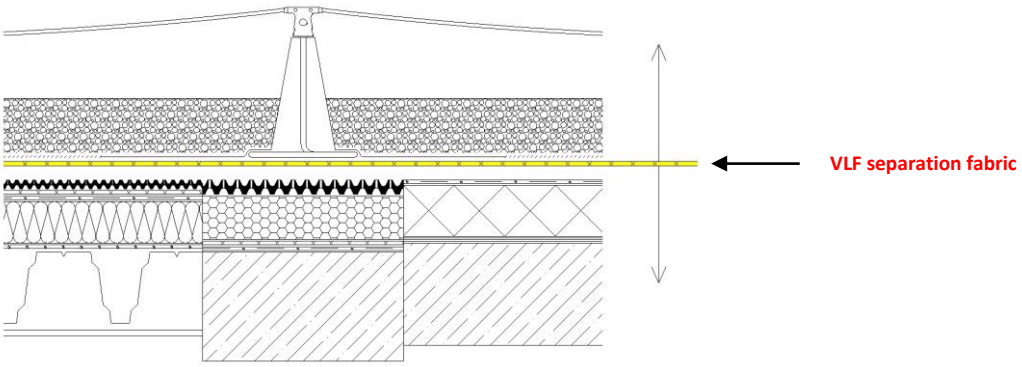
5.2.3 Recommended carabiner to connect to the system

Applied standard: EN 362:2013
Max. diameter: ∅ 12 mm

6 Load bearing structure and ballast layer

6.1 Load bearing structure

DiaSafe® systems were tested and examined on a number of surface types and structures (roofs with steel, reinforced concrete and wooden structure). Their performance is controlled on the most prevailing waterproofing materials (bituminous, PVC, TPO or EPDM) and roof panes. The system is applicable on any roof system which is able to bear the extra load originating from the installation and use of the system.



Warning!

The system cannot be installed on substructure with uncompressed grained or rolling structure (e.g.: gravel or planting medium).

6.2 Ballast material

Stability of the system is ensured by the ballast layer which can be planting medium for green roof, otherwise gravel surfacing or other bulk material. DiaSafe® anchoring points can be used on roofs with maximum 5° slope angle.
It shall be ensured that the surface weight of the ballast layer in dry state on the entire surface of the ballasting mat:

If the system is used by 1+1 persons:

- **should be 80 kg/m^2 at least when applying DS amoeba-shaped damping plate (3x3 m)**
- **or minimum 720 kg per post**
- **thickness of the ballast layer is minimum 3 cm in any case**

NUMBER OF USERS	1+1
standard mat size	3x3 m
surface weight	80 kg/m^2
total weight per post	720 kg

Standard mat sizes belonging to the anchor points is 9 m^2 (3×3 m). The specified minimum ballast layer thickness of minimum 3 cm shall always be ensured. When applying custom mat sizes, the minimum ballast surface weight shall be determined according to the Technical Manual to which assistance is provided by the table below:

1+1 users

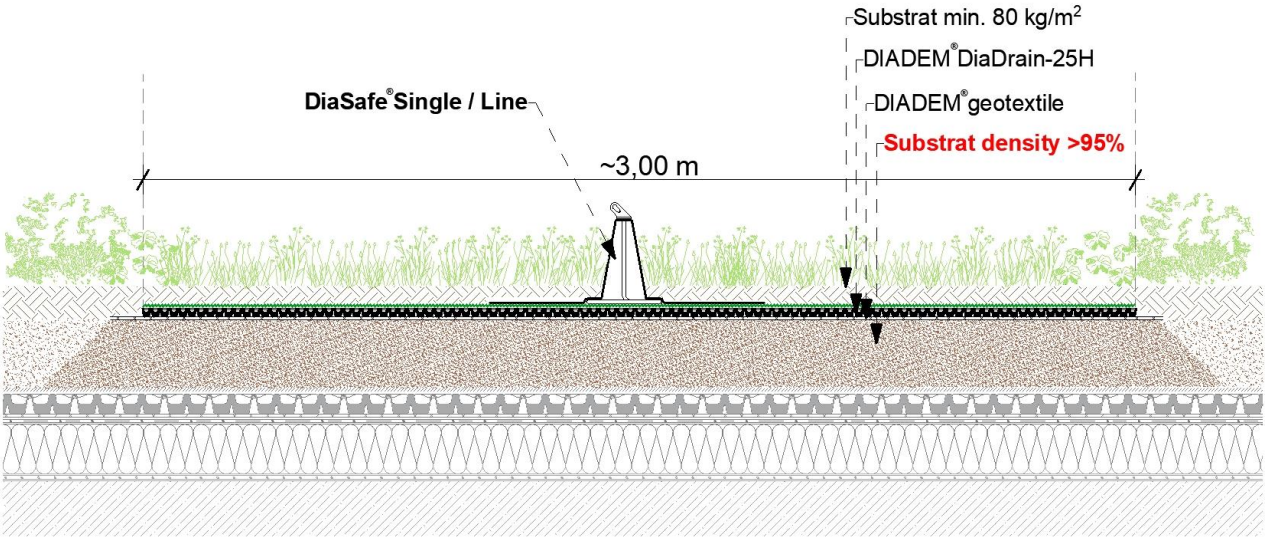
Mat size	Total weight	Surface weight	Layer thickness: gravel, sand γ = 1600 kg / m³	Layer thickness: planting medium γ = 1000 kg / m³	Layer thickness: planting medium γ = 800 kg / m³
m² (m × m)	kg	kg / m²	cm	cm	cm
4.0 (2 × 2)	720	180	10.5	18.0	22.5
6.0 (3 × 2)	720	120	7.0	12.0	15.0
9.0 (3 × 3)	720	80	5.0	8.0	10.0
12.0 (3 × 4)	720	60	min. 3.5	6.0	7.5
16.0 (4 × 4)	720	45	min. 3.0	4.5	6.0
20.0 (4 × 5)	800	40	min. 3.0	4.0	5.0
25.0 (5 × 5)	875	35	min. 3.0	3.5	4.0
30.0 (5 × 6)	900	30	min. 3.0	3.0	3.5
35.0 (5 × 7)	1050	30	min. 3.0	3.0	3.5
40.0 (5 × 8)	1200	30	min. 3.0	3.0	3.5

If the surface of the ballasting mat shall be increased, application of an auxiliary ballasting mat is required. If the surface of the ballasting mat shall be reduced for geometric reasons, the standard ballasting mat must be folded back to the appropriate size or cut, but in this case, the minimum distance of the mat measured from the centre point of the damping plate cannot be smaller than 50 cm at any point, and special attention shall be paid to the existence of the appropriate ballast weight. It is prohibited to cut or damage the glass-fibre reinforced plastic in any way.

Warning!

Because the thickness of the ballast layer may change by time (people walk on it, it is eroded by wind or rain etc.), the actual layer thickness must be controlled before each use by visual inspection at least. The ballast layer must always cover the ballasting mat on the entire surface. In case of inadequate layer thickness, additional ballast material is required.
The various types of ballast materials (substrate, gravel etc.) can be combined within one system; in such a case uniform weight distribution of the mixed ballast materials shall be ensured. For this help is provided by the marking placed on the anchor post of the damping plate, which is described in detail in the Installation Guide.

6.2.1 Installation of the system in the case of ballast materials with various layer thicknesses



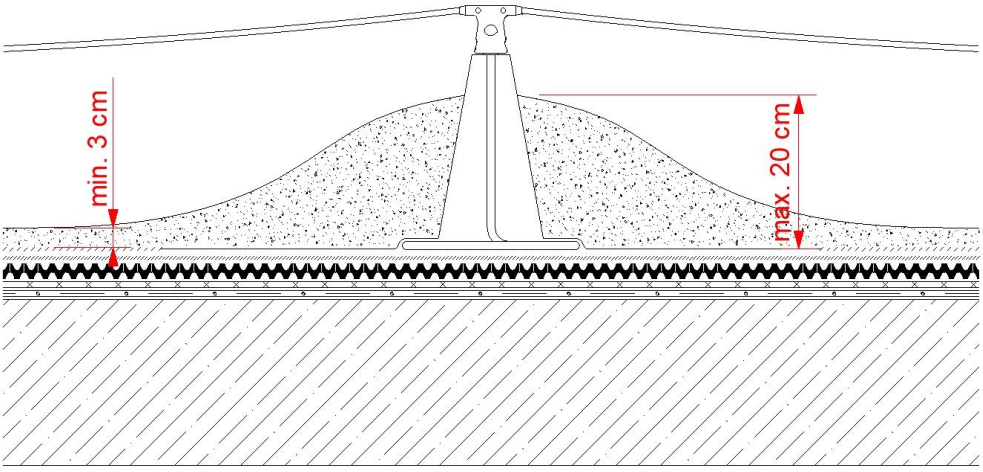
Layer thickness of the ballast materials on green roofs can be different. If thickness of the ballast layer is maximum 20 cm or less, the system can be installed in the regular way. For larger layer thickness, the system can be installed as shown in the picture above. This applies both for the wire-rope and single systems.

6.2.2 Uniform layer thickness

Basically, the uniform weight distribution of the ballast materials shall be ensured. Only the minimum layer thickness shall be ensured. The top of the post of the DiaSafe® systems shall be at least 10 cm above the surface of the ballast layer.

6.2.3 Varying layer thickness

Uneven ballast layer is permitted under observance of the load parameters.



7 Information on system installation and usage

- The system guarantees full-scale safety for the user, regardless of the sag of the wire.
- Sag of the wire may change during the lifetime of the system, e.g. due to the mounting actions, thermal expansion or other dynamic effects. It is important that the DiaSafe® systems are not preloaded systems, the wire does not need to be entirely tight, on the contrary, overtight wires originating from the incorrectly adjusted sag of the wire disadvantageously affect the efficiency and durability of the anchoring system.
- If posts of the system are distorted due to the incorrect wire tension during or after the installation, it means that the system was overstretched. The allowed distortion of the posts is 45° measured from the vertical axis in any direction, but the side of the cone (from the point measured back vertically 10 mm from the top of the cone to the bottom) as well as its bottom part shall remain intact, they must keep their integrity.
- Such bending of a post due to mounting, thermal expansion or other dynamic effects means solely an aesthetic change to the system, it cannot be subjected to manufacturer's warranty procedure.
- The system is capable to accomplish its function even in the above cases.
- When using according to the respective intended use, the fixing element of post head can be used - released and then fixed again - safely so many times on the occasion of the mandatory check before maintenance, inspection and use, until no tear of a filament on the wire can be experienced and the clamping bolt can be operated as intended.

8 System installation and annual inspection information

8.1 System installation and annual inspection

- For the commissioning of the system, the Service Manual and the handover protocol shall be completed in compliance with the test criteria. The validating sticker shall be placed on the control label.
- The annual inspection shall be documented in writing. The test criteria and detailed information are included in the Service Manual. Based on the international guidelines and the manufacturer's instructions, the inspection shall be performed without test load.

8.2 Information regarding required free fall height

To appropriately fulfil the fall arresting function of the system it is required to consider the correct free fall height both for planning and before being put into service. To consider this, assistance is provided by the respective existing provisions.

Warning!

The system cannot fulfil any fall arresting function if the free fall height does not reach the minimum of 6.25 m height which is to be corrected with the displacement of the anchor point in any case.

9 Documentation

The manufacturer provides documentation for each **DiaSafe®** system attached and in digital, downloadable form. The installed falling arrest system can be registered on the **DIADEM® Online** registration interface. The Installation protocol is prepared during registration.

Parts of the documentation:

- Technical Manual (printed or downloadable)
- Installation Guide (printed or downloadable)
- Service Manual (furnished with individual serial number): (printed)
  - Handover protocol
  - Checking protocol
  - Validating decal
- Control label (printed)

At the annual inspection, the expert performing the inspection is obliged to place the sticker validating the appropriate state of the installed fall arresting system on the control label of the system.

Warning!

In lack of a validly filled and logged Service Manual and/or Online System Registration the state of the system becomes uncontrolled and its functionality becomes uncontrollable. This completely excludes the Manufacturer's responsibility for eventual damages, faults or injuries.

10 Technical data

Maximum forces and displacements (Temperature: 20 °C):

System	Type	Test	Deflection [mm]	Max. Force Post [kN]	System build-up
DiaSafe®	Single	Dynamic	498	7,56	Single
DiaSafe®	Single	Static	-	22,65	Single

Sufficient clearance under the usage area shall be ensured in any case! Depending on the length of wire the displacement may highly deviate from the data specified by the manufacturer.

11 Installation

See the product-specific Installation Guide.

12 Disposal

Do not dispose of the used safety system in the house waste. Local regulations should be followed in all cases.

13 Manufacturer, certification

The **DiaSafe®** fall protection systems have been tested and certified by TÜV Austria Services GmbH.

Baumusterprüfbescheinigung

Certificate

TÜV AUSTRIA

Nr.: 2042-2008-PSA20-049-Z

Hersteller: DIADEM APP Kft.
Fehérvári út 75
9028 Győr
Hungary

Produkt: Persönliche Absturzschutzausrüstung - Anschlageinrichtungen Typ A

Typ: DiaSafe® Single

Beschreibungen: Zulässige Varianten – Siehe Anhang

Prüfgrundlagen: CEN/TS 16415:2013
ÖNORM EN 795:2012 (ident EN 795:2012)
ÖNORM EN 365:2004 (ident EN 365:2004)

Bemerkungen: Siehe Anhang

Hiermit bestätigt die TÜV AUSTRIA SERVICES GMBH, dass das oben angeführte Produkt den grundlegenden Sicherheits-Anforderungen entspricht. Grundlage dieses Zertifikates ist das zur Prüfung und Zertifizierung vorgelegte Prüfmuster und die technische Dokumentation.

01.08.2020 Datum — Ing. Georg Gottschlich Geprüft / Prüfstelle — Dipl.-Ing. Georg Sonntag Freigegeben / Prüfstelle — 31.07.2025 Gültig bis

TÜV AUSTRIA SERVICES GMBH Deutschstraße 10 A-1230 Wien

TÜV AUSTRIA SERVICES GMBH, Prüf-, Inspektions- und Zertifizierungsstelle akkreditiert durch Akkreditierung Austria

Zertifikat - Certificate

Nr.: 1596-1803-PSA18-022-Z

Baumusterprüfbescheinigung

Hersteller: APP Kft.
Fehérvári út 75
H - 9028 Győr

Produkt: Persönliche Absturzschutzausrüstung - Anschlageinrichtung Typ A

Typ: DiaSafe® – Ballasted Single Duo

Beschreibungen: Zulässige Varianten – Siehe Anhang

Prüfgrundlagen: CEN/TS 16415:2013
ÖNORM EN 795:2012 (ident EN 795:2012)
ÖNORM EN 365:2004 (ident EN 365:2004)

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1208-1606-PSA16-069-Z — 15.06.2016

21.03.2018 Datum — Ing. Georg Gottschlich Prüfstelle — Ing. Paul Preissler Zertifizierungsstelle — 28.02.2023 Gültig bis

TÜV AUSTRIA SERVICES GMBH GB Industry & Energy A-1230 Wien, Deutschstraße 10

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