heightec
with respect to gravity...™

D23 Vector

Fall protection device

CE 0120

EN353-2
EN358

Manufactured by;
The heightec Group Ltd, Kendal, Cumbria LA9 6NH, UK

Type approval;
SGS United Kingdom Ltd, Weston-Super-Mare, BS22 0WA, UK

Doc UI-D23 - Issue date 01/05/12

USER INSTRUCTIONS

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Functions and Limitations
The Vector is designed to serve a variety of functions including but not limited to:
- Mobile fall arrester on a flexible anchor line, it will accompany the user while ascending and descending. When used on lines that are not completely vertical, the device may not automatically accompany a descending user.
- Work positioning device on horizontal or inclined anchor lines. During such use the position of the device on the anchor line must be adjusted by the user.

Pre-Use Check
Before use check the following:
1. Cam operates and returns within indicated marks
2. The front plate opens and closes correctly.
3. Rope is correctly inserted between the two cams
4. Both side plates are connected together. See fig 3.
5. Device runs freely up the anchor line and locks when pulled downwards

The standards/regulations of different countries require differing information be supplied to the end user. Please read the relevant sections carefully.

For use under EN standards:
Compatibility
For use with 10.5mm to 11.0mm kernmantel (typically polyamide) rope to EN1891 Type A standard and connection to the device should be made using components that conform to relevant EN, ANSI or equivalent standards (e.g. EN 354, EN 892, EN 362)

Use as EN353-2 Fall Arrester
- For maximum protection the Vector should be connected to a fall arrest 'A' attachment point of an EN 361 full body harness.
- heightec recommends a 0.35m* lanyard attachment is used to connect the harness to the device. EN353-2 requires the device is tested with a lanyard of 1m* – DO NOT EXCEED THIS LENGTH.
- The Vector may also be connected directly to the harness with a single connector.

For use under ANSI standards:
Compatibility
For use with 10.5mm to 11.0mm kernmantel (typically polyamide) rope and connectors to ANSI Z359.

Use as ANSI Z359 Fall Arrester
- The Vector is to be connected to the front or rear fall arrest attachment point of an ANSI Z359 full body harness.
- A 0.3m* max lanyard attachment is used to connect the harness to the device. DO NOT EXCEED THIS LENGTH.
- The Vector may also be connected directly to the harness with a single connector.

*Length includes connectors.

Use in an EN358 Work Positioning System
- When the Vector is used for work positioning an additional, separate means of fall protection should be used.
- The device can be connected to any designated fall arrest or work positioning harness attachment point (see harness instructions).
- Work positioning is a work method whereby the user relies upon their equipment for support in order to perform their tasks. To achieve this, the anchor line attachment must always be positioned above waist height.

Operation
Prior to climbing carry out a simple functional test by sliding the Vector up the anchor line and then pulling down on the connector to ensure the Vector holds firm on the line.
When safely working with the Vector, it should be kept as high as reasonably practical, ideally above the user's waist.
Never hold onto the device while ascending, descending or in the event of a fall. In the event that the device locks onto the rope while descending, only hold the connector to manipulate. In the event of a fall, the device will still operate.

Ascending
Allow the device to be towed up the rope by the lanyard attachment.
The anchor line between the device and anchor point needs to remain reasonably tight with no slack.

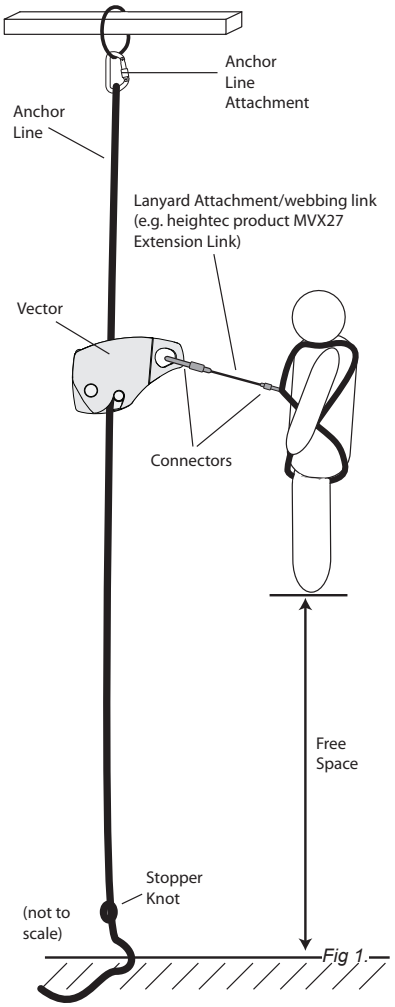

Fig 1.

Descending
- Smoothly descend allowing the device to hang from the connector so that it will slide down the anchor line under its own weight.
- Where possible avoid manual manipulation when used as a fall arrest device.
- If working in restraint on flat roofs it is advisable to put a stopper knot at roof edge.
- All anchor lines must have a stopper knot or other termination at the free/bottom end of the rope.
- A small mass (about 1.5kg) at the bottom of the anchor line helps the Vector run downwards and prevents it dragging the anchor line up in ascent.
- Avoid holding the anchor line while using the device to ensure it operates and moves along the line correctly.
- Regularly check that connectors are closed and secure during use.
- Ensure anchor line is free from contamination e.g.; mud, ice and grit as the effectiveness of the device will be reduced.

Minimum Free Space
To avoid collision with the ground or other substantial object during a fall from height, it is essential to calculate the minimum free space necessary below the feet of the user (see fig. 1). This takes into account the arrest distance, the length of the connection, the elongation of the anchor line and a safety margin of 1.0m.
The minimum free space can be calculated by:
rope stretch + double connection length + arrest distance + safety

Worked Example: For simplicity the worst case maximum arrest distance with a safety margin is to be 1.0m
Standard 10.5mm kernmantel (EN 1891 Type A) ropes/anchor lines could stretch approximately 1m for every 10m in use (10%).
e.g. for a 15m kernmantel anchor line using 100kg mass:

Rope stretch (10% of 15m)	1.5m +
Double connection length (e.g. 0.6m):	1.2m +
Arrest distance:	1.0m +
Safety:	1.0m
Min Free Space	**= 4.7m**

To increase safety margins further in low height applications, reducing the lanyard attachment length will reduce the clearance. For example (**using 100kg mass and 10.5mm Tectra Rope**):

Rope stretch (10% of 5m)	0.5m +
Double connection length of 0.35m	0.7m +
Arrest distance:	0.8m +
Safety:	1.0m
Min Free Space	**= 3m**

Placing the Vector on the anchor line

Unclip the front plate from the connector (to save dropping the device the back plate can remain clipped).

Rotate open the front plate.
Feed the anchor line between the cam and the friction bollard (fig 2)

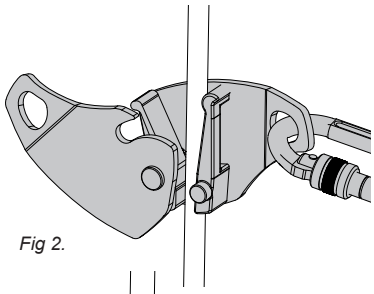
Fig 2.

Close the front plate and connect back into the connector as shown (fig 3)
To remove the device, reverse this process.

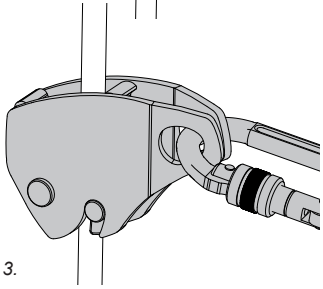
Fig 3.

Supplementary information
The Vector meets the requirements of EN353-2 with a mass of 125kg on new 10.5mm to 11mm TECTRA ropes.

1 - Personal issue and traceability:
This product is personal protective equipment and should be individually issued to the person who will be using it. The product should remain traceable to the original certificate of conformity and a permanent record should be kept of its use. This user instruction forms part of the permanent product record. All users must receive and read a copy of these instructions and should understand what the instructions mean and be familiar with them, including, but not limited to function, suitability, compatibility of the product and inspection for defects arising from damage. A copy of this user instruction should be kept with the equipment, and referred to before and after each use. In the event of a rescue, these instructions should be provided to the rescuer.

2a - Anchor Points:
The anchor device or anchor point used should be of sufficient strength to sustain foreseeable loads in all permitted directions.
Specific standards requirements:
EN: Anchor device should conform to EN795, with minimum static strength of 12kN. heightec reccommend a higher strength of 15kN as specified in the IRATA ICOP and BS7985.
When more than one system is attached to an anchorage, these strengths should be multiplied by the number of systems.
Anchorages should be positioned to minimise the potential for falls, and the distance and consequences of any potential fall, ideally above above the user. Verify there is sufficient free space beneath the user to avoid collision with the ground or other obstacles and minimise sideways or pendulum falls. The connecting system instructions should give advice on clearance required, but a fall arrest energy absorber may extend by up to 1.75m.

2b - Further Requirements for Anchor Points in US (ANSI):
ANSI: (a) where certified, twice the maximum arrest force, or (b) where not certified 22.2kN (5,000lbf) for fall arrest, 13.3kN (3,000lbf) for work positioning, or 4.5kN (1,000lbf) for restraint.
When designing, selecting, and certifying a fall arrest anchorage, the qualified person shall include the limitations on use of the system in fall protection procedures described in ANSI Z359.2.
Design, selection and installation of certified fall arrest anchorages shall include determining a safe location where and how to connect those anchorages by taking into consideration the forces generated by arresting a fall, total existing and anticipated loading, load path, structural member strengths, connection and support strengths, stability, clearance requirements, swing fall, rescue deflection of the system, and impact on the structural members to which the fall arrest system is attached.
Anchorages selected for rescue systems shall have a strength capable of sustaining static loads, applied in the directions permitted by the rescue system of at least 3,100lbf for connection of rescue system only, or meet a Factor of Safety of 5:1 based on the static load placed on the system when the system is designed, installed and used under the supervision of a qualified person.

1

Persons engaged in rescue operations that are exposed to a fall hazard, must be provided an anchorage suitable for fall arrest in accordance with ANSI Z359.1.
Anchorage connectors shall not be attached to anchorages where such attachment would reduce the anchorage system strength below the applicable level set forth above or reduce the anchorage strength below the allowable level set by applicable structural codes. A suitable anchorage connector shall be used for rigging the connection of lanyards and lifelines to structural members. A lanyard shall not be connected back onto itself for use as an anchorage connector unless specifically designed for this purpose.
Anchorage connections shall be stabilised to prevent unwanted movement or disengagement of the rescue system from the anchorage. Verify system connections by pre-tensioning the system before applying the intended load.
Other components used in fall protection or work positioning systems must conform to the relevant standards, be compatible with each other and be used in accordance with their user instructions.

3a - Inspection and care:
The strength of this product may be affected by cuts, nicks, deep scratches, wear, abrasion, deformation, chemical contamination, UV degradation, exposure to flame, extreme termperatures and other factors. Keep this equipment away from such sources of damage.
Use this product with caution near moving machinery, electrical hazards, sharp edges and abrasive surfaces.
This product must be inspected before and after use, and particularly after being used for rescue, to ensure the product is in a suitable condition and operates correctly. Written records should be kept of all inspections.
If there is any doubt about condition of the product, or it has been subjected to a fall or substantial shock load, withdraw it from use until confirmed to be safe, in writing, by a person deemed to be competent by The heightec Group.
No repairs of this product should be undertaken, any attempt to do so may invalidate it's compliance and/ or certification.
The safety of users depends upon the continued efficiency and durability of this equipment, which must subjected to detailed visual and tactile examination by a competent person* at intervals of no greater than 6 months for textiles or 12 months for metals, taking into account relevant legislation, equipment type, frequency of use and environmental conditions. These examinations should be carried out strictly in accordance with the manufacturer's periodic examination procedures. Detailed examinations should include confirmation of the legibility of product markings.

*A competent person may be defined as someone who "...has appropriate theoretical and practical knowledge and experience..."

2

The results of examinations should be recorded. Intermittent inspections of components which may be subject to excessive wear may also be appropriate. The results of these need not be recorded. Contact your distributor for information on suitable inspection procedures.

3b - Inspection criteria:
Textile products or elements: check material and stitching for damage including cuts, nicks, abrasion, fraying, discolouration, heat or chemical damage etc. Ensure stoppers are present on ends of adjustment webbing.
Metal devices or components: check for damage, corrosion, excessive tightness, sharp edges, excessive play, deformation, cracking or anything that might affect strength. Check security and correct operation of any moving parts e.g. side plates, return action of springs, cams, operating handles, bearings. Check function of closure mechanisms, where present (e.g. screwlink thread, connector gates).

3c - Cleaning, maintenance and storage:
Wash textiles by hand with non-detergent soap at approx 25°C (cool). Rinse and dry naturally, away from direct sources of heat and sunlight. If necessary use a disinfectant compatible with polyamide and polyester. Use diluted and rinse thoroughly in clean water. Dry as previously stated. These cleaning procedures must be strictly adhered to.
Mechanical metal products with moving parts should be occasionally oiled, at bearings or pivot points, with excess oil removed. Store and transport in a dry, clean condition, away from sources of severe vibration, humidity, direct heat, sunlight and any physical or chemical contaminants.

4 - Lifespan:
Textile products or elements: maximum 10 year lifespan from date of manufacture, subject to competent use, maintenance and examination programme.
Metal products: indefinite lifespan, subject to competent use, care and examination programme. The lifespan of all products will be reduced by normal wear and tear, particularly when used in abrasive or corrosive environments. In extreme circumstances, the life of an item may be reduced to a single use.

5a - General usage:
Users should be suitably trained and competent to work in situations where a risk of falling may be present or under the direct supervision of such a person, fully trained in the use of this product and free of medical contra-indications for work at height or rescue. Do not use this product outside of its limitations or if you are unsure of any aspect of its use. No alterations or additions may be made to the product. The heightec Group do not take any responsibility for injury or accident of any kind arising from the use of this product.

3

INSPECTION RECORDS		ID Number:	
Product:		PO/ Certificate No.:	
Model/Type:		Purchase Date:	
Manufacture Date:		First Use Date:	

Date	Observations / Comments	Actions	Inspector	Next Due

It is essential a rescue plan is in place to deal with emergencies and in particular to consider treatment and recovery of a fallen or suspended person. Rescue equipment must be present and personnel should be competent in its use. Orthostatic intollerance can occur when a person is suspended motionless in a harness, and is potentially fatal. Ensure that the rescue of a suspended person is carried-out promptly.
Contamination with oils, lubricants, water or solvents may alter the performance of the product. For rope devices behaviour will vary according to the age, type, diameter and characteristics of the rope used.

5b - Care of rope during use:
Take any steps necessary to protect the rope from damage during use, including rope protectors, edge protectors, intermediate anchor points or deviations to avoid sharp or rough edges. Consider also the position of the rope below the user. Ensure rope cannot suffer from the effects of wind, or become trapped around obstacles.

6 - Guarantee:
This product is guaranteed for three years against faults arising from manufacturing errors or materials defects. This guarantee does not include normal wear and tear, faults arising from uses for which the product was not designed and accidental damage.

7 - Notes:
If this product is re-sold outside the original country of destination the reseller shall provide these instructions in the language of the country in which the product is to be used.

Markings:
The following markings may be present on the product:


CE mark - European Conformity.


Read these instructions before use.


For use with kernmantel ropes conforming to EN1891 type A


XX-YY - Diameter range of rope which this product may be used, in mm


Direction of use

Date of manufacture is marked on the product in the form: DAY MONTH YEAR, DDMMYY eg.120510.

The ID no. is unique to this item.
Do not remove or obscure the product labels or markings.

4