Alvin Freestand Counterbalance
FREESTANDING
ROOF EDGE PROTECTION
Operation and Maintenance Manual

Issue No. 005. 08-2024

Contents

1.1 System Supplier:

Alvin Key Clamp
(AKC Systems Ltd)
PO Box 478
Sutton
Surrey
SM1 9PG
United Kingdom

Tel: +44 (0) 20 8254 2626
Model year: 2022

1.1.1System Installed by:

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These Operating & Maintenance Instructions are a component part of any Freestanding Roof Edge Protection system and must be used whenever the system is assembled. At no time should any pages from these instructions be removed.

1.2 Intended use

The Roof Edge Protection system is a collective freestanding guardrail that has been designed to provide an effective barrier for flat or nearly flat roofs with a maximum pitch of 10°.

The Freestanding Roof Edge Protection system is a permanent barrier.

The Alvin Freestanding Roof Edge Protection system is only regarded as being fit for its intended use if the conditions within this document are complied with.

- Alvin Roof Edge Protection is governed by statutory regulations and guidelines and installation personnel shall be familiar and adhere with the following:

  - EN ISO 13374 Part A (for temporary systems)
  - HSG 33 – Health and Safety in roof work.
  - HSE INDG 284 – Working on Flat Roofs.
  - BS13700:2021 (for permanent systems)

Alvin Freestanding Roof Edge Protection is designed to withstand a maximum horizontal load applied perpendicular to the top rail of 300N without deflecting more than 55mm. As required by EN 13374 Part A.

The Alvin Roof Edge Protection system is for use on Asphalt using Spartan or Elastomer tiles, Mineral Coated felt roofs or PVC membranes.

1.3 Service life

Metalwork:Will deteriorate with time and atmospheric conditions, but generally indefinite.
PVC Counterweights: 20 years at -10° to + 40°
Rubber pads: 20 years at -10° to + 40°

1.4 Duty of care

The Building Owner and / or Building Manager have a duty of care for the structures they have responsibility for, and in particular they shall ensure:

<u>The Alvin Roof Edge Protection system is/should:</u>

- Be identifiable from other structures by use of a serial number/label.
- Only be used as intended.
- Be Checked regularly.
- Only be used by trained and authorised personnel.
- Be provided in a reliable and fault free condition.
- Where possible be linked into the building's Lightning Protection system.
- Not be used by personnel during windstorms.
- Not be used when sheet ice or heavy snow may affect adhesion.
- Not be used as an anchor point for any fall arrest or other PPE.
- Not be used to support any other structure or be fitted with infills such as banners, visual baffles, or anything else that increases the wind loading factor.

<u>That operatives have:</u>

- Personal Protective Equipment available for use.
- Personal Protective Equipment is checked regularly.
- A current Operation and Maintenance Manual located on site for review as needed.
- All relevant operatives understand the contents of the Manual.

- Installation operatives are duly instructed in all health and safety matters before initial commencement of work, and at least once a year thereafter. In addition to this Installation operatives are to have adequate PPE to prevent falls from height during installation.
- All installation and use should cease when the average wind speed reaches 23 mph (gusting to 35mph or more).

2.1 System Parts list.

• RE00T40	Standard Post	12 kg each
• RE11P40	1850mm long Counterweight	32 kg each
• RE12P40	1925mm long Run End Double Counterweight	68 kg each

2.2 System parameters – BS13700:2021

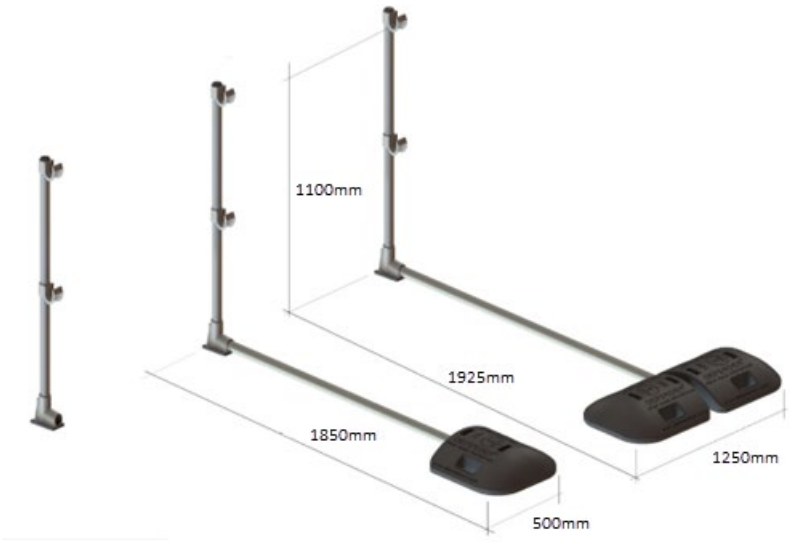
- RE00T40 posts can be spaced up to the MAXIMUM bay size specified on the attached wind calculation (see **5.3**). If no wind calculation document is included with this manual, please seek advice from the site manager or call our office on **0208 254 2626.** Without a site-specific wind calculation the system may not be BS13700:2021 compliant.
- The Roof Edge Protection system requires RE11P40 counterweights at every 2nd post along a run, apart from as defined below.
- At free ends on all systems, RE12P40 double counterweights are required to be fitted to the first & last post in a system. Immediately adjacent to the RE12P40, a RE11P40 is required to be fitted to the next upright, followed by an RE00T40, to complete the system configuration.
- On closed installations, i.e. installations which have no free ends, there are no requirements to fit RE12P40.
- The cross-rail (horizontal) tube connections should be made using A8 External Connectors. Joins should be staggered so that there is only one join per bay.

2.3 ASSEMBLY GUIDE

STANDARD UPRIGHT (RE00T40)

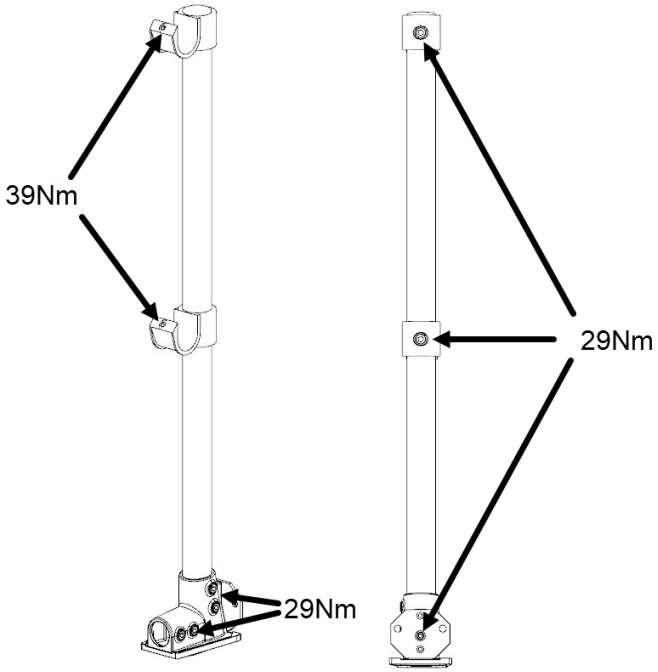
This is supplied already assembled at the correct height (1100mm) with the Base Foot & Saddle Clamps set at the correct position.

LAYING OUT SUPPORT LEG AND MAIN RAIL TUBES



CORRECT TORQUES FOR GRUB SCREWS

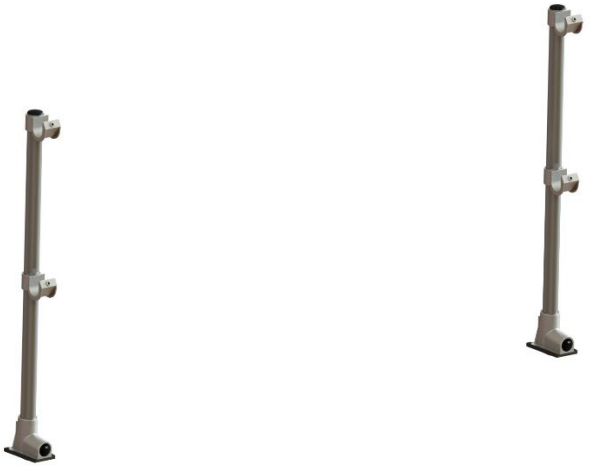
The correct torque for the fixing screws is 39 Nm for all lateral rail fixing points/joins and 29 Nm for the vertical fixing points as indicated below:



Lay out the equipment in approximately the positions shown on the following pages. Always ensure that you and the equipment are at a safe distance from the roof edge. It is recommended that this distance is no less than 2m. A risk assessment should be carried out in advance of the works to establish the need for restraint harness or other PPE for the installers, as well as to identify any other risks associated with the works.

Lay out two Main Rail Tubes side by side and in a continual line, for the whole length of the required guardrail (ensure these do not roll towards the roof edge). Then start laying out the upright units. Starting from a corner if you have one, lay out the support posts based on the bay size recommended in the wind calculation (see 5.3). Bear in mind that you need a support post within 500mm of the corner itself. Carry on laying out the Support Legs for the required length of guardrail.

STAGE 1
Starting at least 2m away from the roof edge at the corner, stand up the two uprights. Please note that the visuals below do not show the counterbalance weights because their arrangement will vary from system to system



STAGE 2
Place a Main Rail Tube into the bottom Saddle Clamp of each of the standing legs. Position the tube so there is at least 60mm extending past the Saddle Clamp and tighten the Grub Screws to the recommended torque of 39 Nm for the lateral fixing points. These are located on the front of the Saddle Clamp.

Place the second Main Rail Tube into the top Saddle Clamp, positioning the tube as before, leaving at least 60mm of the tube extending past the Saddle Clamp and tighten the Grub Screw of the Saddle Clamp to the recommended torque of 39 Nm.

STAGE 3
Form a corner via connecting 2No A6 90º Corners (of for obtuse/acute angles use 2No A27 variable angle knuckles) to one end of each of the Main Rail Tubes. There must be a Support Leg within 500mm of the corner. Slide a Main Rail Tube into the bottom Saddle Clamp and

90º Corner. Slide a Main Rail Tube into the top Saddle Clamp and 90º Corner. Tighten the grub screws of all clamps to the recommended torque of 39 Nm except for those attaching to the vertical support tubes, which should be tightened to 29Nm.

STAGE 4

Working in pairs carefully lift the assembled bay and walk towards the leading edge. Carefully place the bay in the desired position and slide the corresponding Counter Weight tube into the Base Foot.

Always ensure the bay is being held in position whist carrying out this part of the assembly, and ensure that installers are protected from the risk of falls. Please note the cantileever arms have been shortened below for illustative purposes. Never cut down cantilever arms and seek advice if you are unsure.

STAGE 5

Intermediate uprights Legs. Tubes & PVC weights are required at the upright following the double weighted free end combination and then at every other upright position. To install slide 1No. Cantilever Tube into the Base Foot. Do not tighten at this stage. Place 1No. A58 Collar in the front slot of the PVC Counter Weight. Slide 1No. PVC Counter Weight on to the

free end of the Cantilever Tube. Line and level guardrail. Tighten all grub screws to the recommended torque as shown at the top of this section.

STAGE 6

Working away from the corner slide an A8 External Connector on to the top and intermediate Main Rail Tubes. Ensure the External Connectors are staggered either side of the upright to ensure no two couplers line up within the same bay. As far as possible only use one External Connector per bay. Stand up the next Support Leg at the desired position (see **5.3** for maximum spacing). Continue with this method of fitting the Main Rail Tube and uprights together for this run of guardrail, remembering to connect the intermediate Cantilever Tubes and PVC Counter Weights to the uprights as you proceed.

STAGE 7

Free Standing End Details. Slide 1No. A2 Short Tee on to the free end of the Cantilever Tube. Do not tighten at this stage. Slide the solid bar through Short Tee and tighten the grub screw holding this tube into position. Place 2No. Collar in the front slot of each PVC Counter Weight. Slide 1No. PVC Counter Weight on to each free end of the solid bar.

A

B

C

WARNING

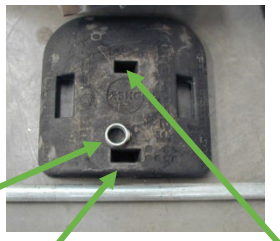
Under no circumstances should any person be anchored to the system for fall arrest purposes. Further, components such as timber infill, advertising boards, polyethylene sheets must not be fixed to the system because doing so would invalidate the wind loading calculations.

CLOSED INSTALLATION

SINGLE COUNTERWEIGHT INSTALLATION PROCEDURE

1. Lay the first post (**RE00T010**) at the start position
2. Attach a counterweight with 1575mm long tube to the first post

Single counterweight
RE11P40 or RE11P40S



The locking collar goes into the first hole in the counterweight. The tube passes through the collar and is in position when the end of the tube is visible in the second hole. The setscrew on the locking collar is then tightened and the setscrews on the post base are tightened.

3. Position the second Post this does not require a counter weight.
4. Position the third post and attach a counterweight.

Continue this procedure with a free post and then a weighted post.

CRADLE AND TUBE INSTALLATION PROCEDURE

5. Lower the tube into position in the cradle tighten the setscrew to the recommended torque of 39 Nm. Remember that the setscrew attached to the upright tube should be tightened to 29Nm.

NOTES
Make certain that the maximum spacing for posts in no greater than those specified.
Make certain that enough counterweight arms have been used and spaced correctly.
Apart from at a direction change the joining of the tubes must be in separate bays for the top and middle rail.

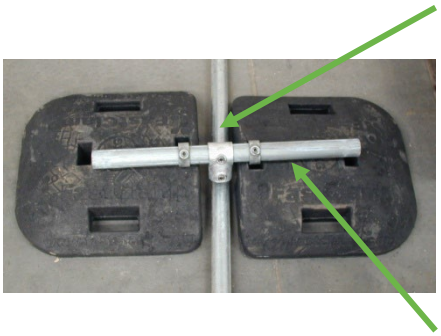
FREE END INSTALLATION

RUN END COUNTERWEIGHT INSTALLATION PROCEDURE

1. Lay the first Post at the start position.
2. Attach a Run End Counterweight assembly with 1575mm long tube to the first Post.

The Run End Counterweight comprises 2 counterweights 2 locking collars 1 short tee 1575mm tube and a 900mm solid bar.

Run End Counterweight
RE12P40



As with the single counterweight insert the locking collar into the first hole. The solid bar then passes through the locking collars until it is visible in the second hole. The short tee is positioned on the solid bar between the 2 counterweights. The setscrew on the locking collars is then tightened and the setscrew on the short tee is tightened. The 1575mm tube is then placed into the short tee and the other end into the base of the post and the setscrews tightened.

3. Position the second post and attach THE CORRECT counterweight depending on system being used (see 2.2 for system parameters).
4. Position the third Post. This does not usually require a Counterweight unless this third post also forms part of the other end of the run.
5. Position the fourth Post and attach the correct counterweight.

Continue this procedure according to the system being used with a free post and then a weighted post or a weighted post every time.

Ensure that there is a Run End Counterweight and adjacent Single Counterweight at each free end.

Free end cross bars (horizontals) should be terminated by forming a loop using two A06 clamps and a short vertical section of tube. This “D-section” should extend no more than 500mm from the last upright.

NOTES
Make certain that the maximum spacing for posts in no greater than those specified.
Make certain that enough counterweight arms have been used and spaced correctly.
Apart from at a direction change the joining of the tubes must be in separate bays for the top and middle rail.

3.1 Periodic thorough Examination

At least once every 12 months a designated competent person shall check the system against the criteria in the template Report of Thorough Examination **(5.2)** and record the results in the log table on the following page.

3.2 Cleaning

- System can be cleaned simply by using clean water and a light detergent applied with a hose or by wiping down.

3.3 Maintenance

- The Alvin Freestanding Roof Edge Protection system is constructed from Hot Dip Galvanised iron and steel, and PVC counterweights, this makes the product virtually maintenance free.

- Corrosion may occur with time, particularly in costal or marine environments and any signs of oxidisation should be lightly wire brushed and 2 coats of zinc rich paint should be applied to the affected area.

- Fixings should be immediately replaced on evidence of any deterioration.

4.0 Inspection Records

It is important that a record of regular inspections, comments and remedial action is kept. Each report of thorough examination (template is in attachment 5.2) should be filed with this manual and form 5.1 in the attachment section can additionally be completed to give an overview of the inspection history.

5.1 Inspection log

Date	Name of Examiner	Comments	Action	Signature

5.2 Template Report of Thorough Examination for Permanent Freestanding Guardrail to BS13700:2021

Guardrail serial number / unique identifier	

Sold by:	Installed by:	Thorough Examination carried out by:
AKC Systems Ltd. PO Box 478 Sutton SM1 9PG	…… …… ……	…… …… ……

System install date	Date of last examination	Date of this examination	Next examination due by

The following statements should be marked pass or fail. If an item is not required within the system design, enter n/a. Any defect and corrective action should be recorded in the space provided below. **For advice and spare parts contact sales@alvinkeyclamp.co.uk visit www.alvinkeyclamp.co.uk or call 020 8254 2626**

	Pass/Fail
The system label is present and legible	
System is free of any signs of damage or unauthorised additions to the system (eg. banners, attached plant or netting)	
The height of the guardrail is set correctly at 1100mm	
All Grub Screws are tightened to the required torque (39Nm for horizontals and 29Nm for verticals)	
The system is still in it's original configuration as per O&M manual	
The bay widths are still as per the original design calculations.	
The intermediate cantilever tubes and plates are in the positions and of the size specified in the O&M manual	
Intermediate counterweights are present and in good condition as per the O&M manual	
Any freestanding end cantilever tubes and plates are in the positions and of the size specified in the O&M manual (enter n/a if none required)	
Any freestanding end counterweights present and in good condition as per the O&M manual	
All required friction/protection pads are present and in contact with the roof surface	
Any end terminations fixed to the building are in good condition and the fixings are present and tight.	
Any fixings to gates/ladders are present and tight	
Tubes and clamps are free from damage/cracks/stress fractures	
All components free from signs of corrosion	

Any defects identified must be recorded below along with corrective action required and a deadline for completion. A competent person should sign off each line as it is completed.

Details of defect	Corrective action	Due date	Verified as complete

Attach additional sheet(s) of paper if you need more space and mark here how many you have added: ……..

EXAMINER TO DELETE AS APPROPRIATE:	**SIGNED BY EXAMINER**	**DATE**
THE SYSTEM IS FREE OF DEFECTS AND SAFE FOR USE. -OR- **THE SYSTEM IS SAFE FOR USE WITH MINOR DEFECTS AS NOTED ABOVE, WHICH MUST BE CORRECTED BY THE DUE DATE.** -OR- **THE SYSTEM IS NOT SAFE FOR USE. CORRECTIVE ACTION FOR SERIOUS DEFECT(S) MUST BE COMPLETED BEFORE THE SYSTEM IS USED.**		

Signature of Building Manager……

Date…….

For the avoidance of doubt, this document template is provided by AKC Systems Ltd for use by its customers or their representatives. AKC Systems Ltd. do not provide a thorough examination service and cannot accept liability for the thorough examination detailed above.

5.3

A BS13700:2021 wind calculation report should be attached to or stored in the same place as this manual. Without this report you will not be able to ascertain the maximum spacing of uprights and counterweights for your system to ensure it is safe to use.
If you are in any doubt, please contact your installer or if that is not possible our office on 020 8254 2626, we may be able to issue a copy of the report provided we can link your system details to our records.