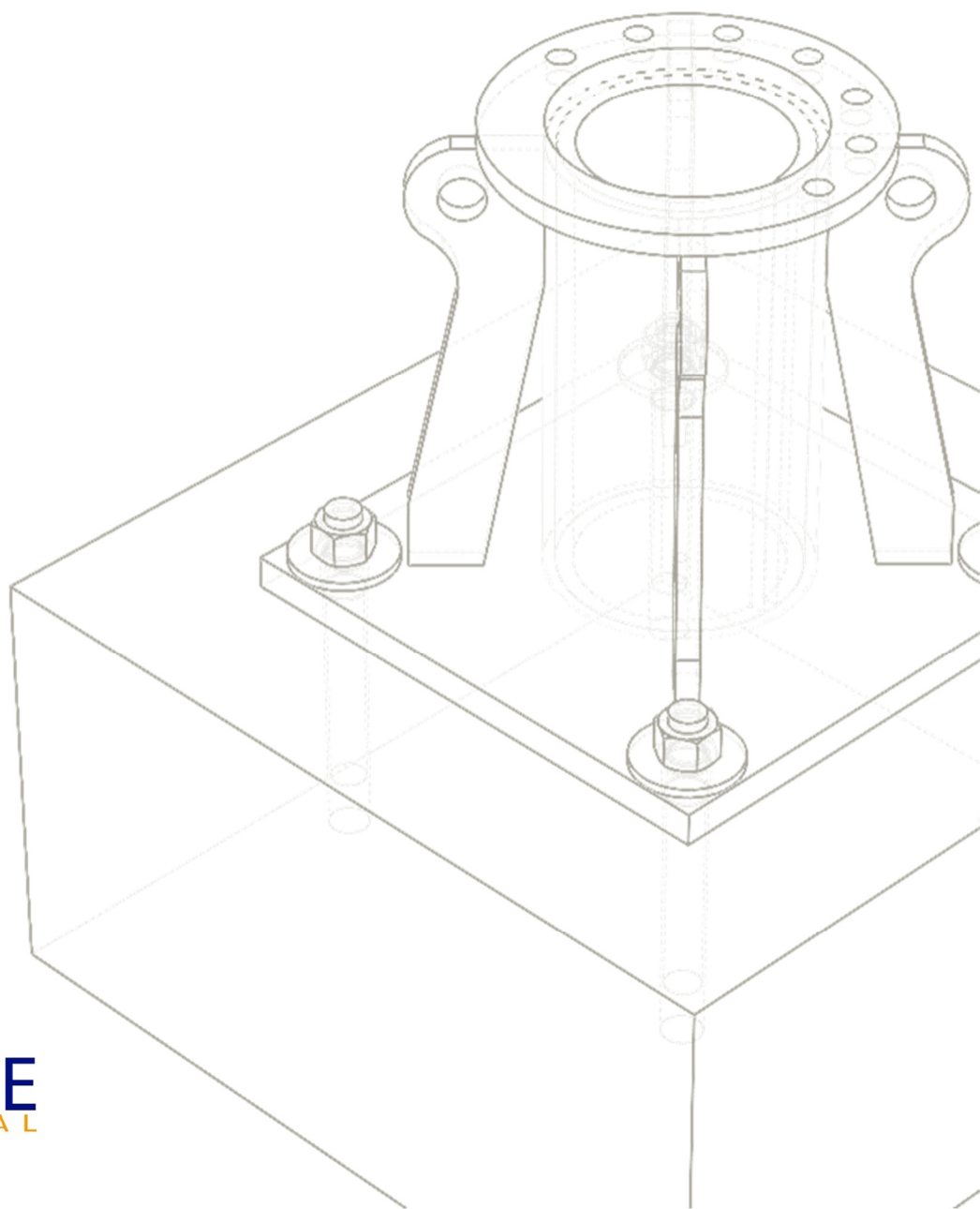


Davit Arm Installation Manual

October 2021
Revision 2.0



Installation Manual

WARNING!

- This manual is invalid if any unauthorised alteration has occurred.
- Unauthorised use of this manual may lead to prosecution
- This manual was, to the best of our knowledge, correct at its date of issue.
- It is the user's responsibility to ensure that all subsequent authorised amendments are incorporated and that the manual is to the current issue status.
- A manual that is not to the latest issue status is invalid and must not be used.

Contents

Introduction	3
Typical System Layout & Positioning Criteria	4
Maximum & Minimum Reach and Height	4
Clearance over edge protection	5
Optimum System Layout	6
General Fixing Information	7
Ordering System Components & Tools	8
General Installation Information	9
Socket Installation	9
General Information	10
Installation	14
General Information	14
System Description	16
Surface Mount – to concrete using FIS VT Resin and Studding	17
Surface Mount – to concrete using FH II Mechanical Anchor and Studding	18
Cast In	19

Introduction

General Information

The Axxess Davit Arm System from Bettersafe International BV is designed specifically for the Rope Access Industry.

Designed to be used as a rope access re-direction anchor for live and back up systems the Davit Arm is an accessory to an anchorage device designed to remove the risk of ropes running over an edge, and to facilitate the easy access and egress for the worker. This socket is permanently attached to the structure and is designed to protect one or more people during work at height and the removeable arm is designed in such a way as to offer them maximum freedom of movement.

As with any anchorage device anyone connecting to the Axxess Davit Arm System must use Fall Protection PPE in conformity with the current regulations.

The equipment authorised on the system must be written in to the operator's manual which will be given to the end user and must appear on the sign plates near the lifeline. If the system is used with a different PPE from the one recommended the result may be an incompatibility of equipment with layout causing the system to be unsuitable for use and potentially dangerous.

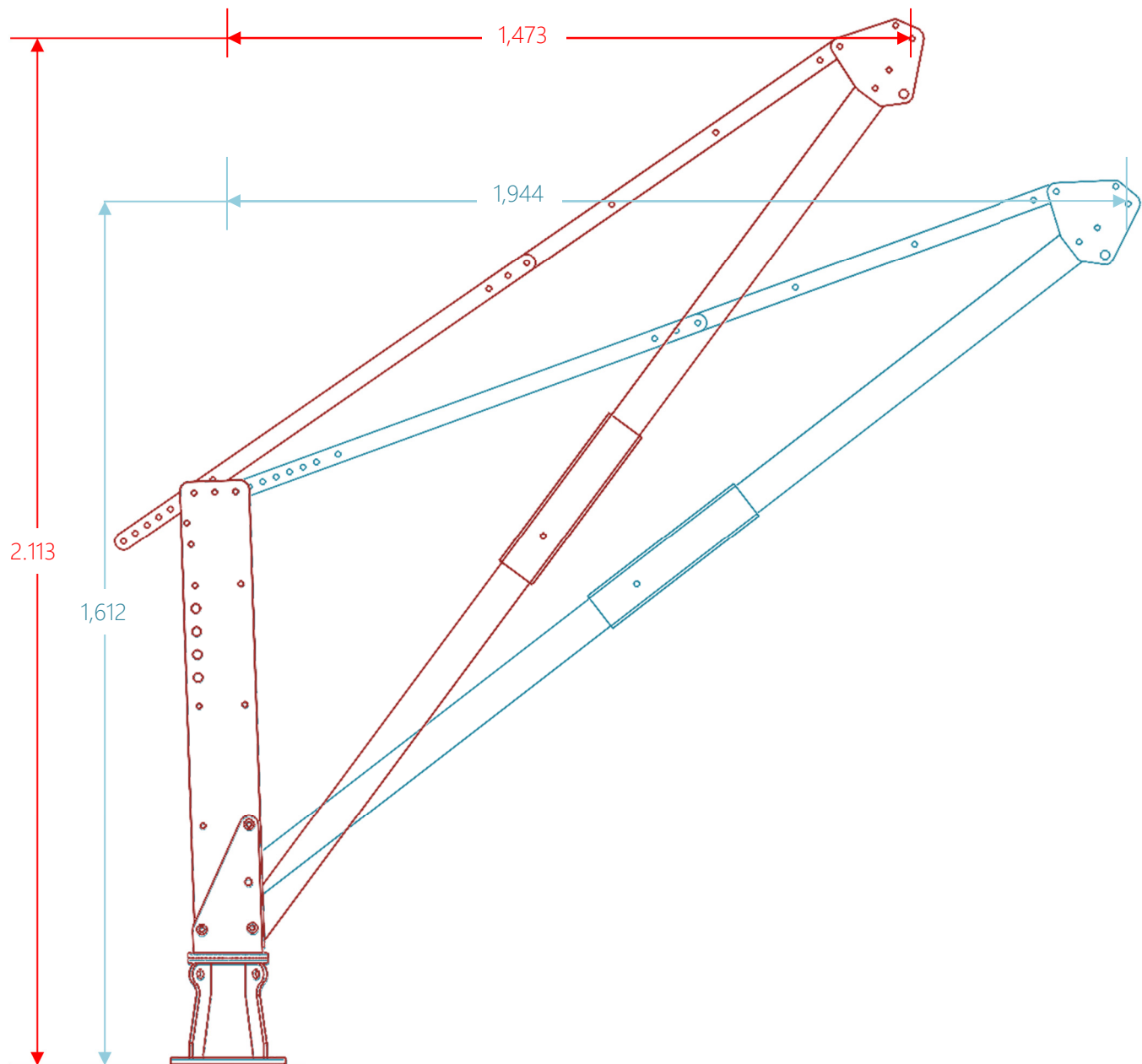
The system complies with the current standards and requirements:

Europe: EN 795:2012, CEN / TS 16413:2016, BS 8610:2017 Tested independently by SATRA.

Typical System Layout & Positioning Criteria

Surface Mount shown for example purposes.

Maximum & Minimum Reach and Height



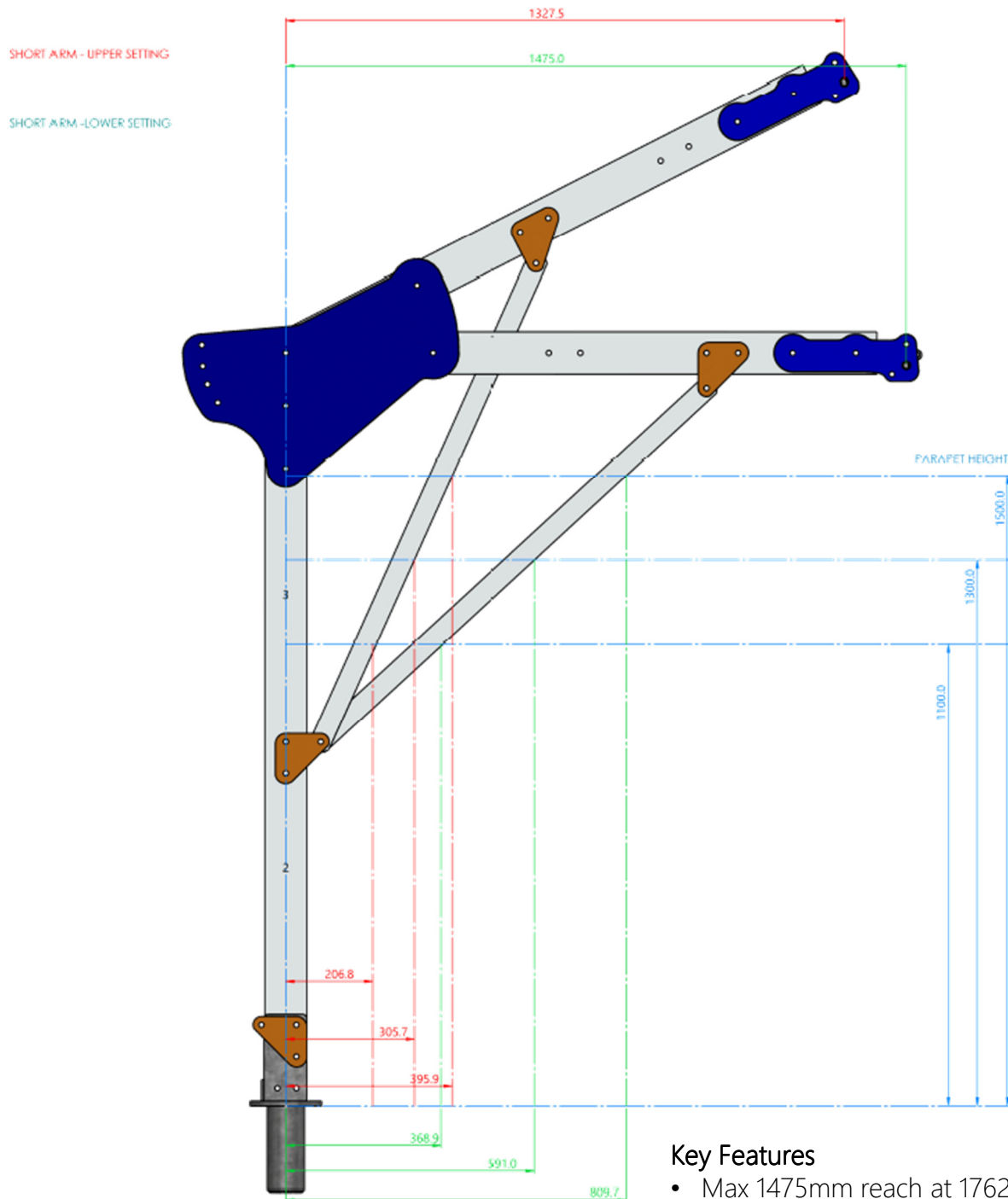
Typical System Layout & Positioning Criteria

Surface Mount shown for example purposes.

Maximum & Minimum Reach and Height

ADA-RHS-1475

Davit Arm



Key Features

- Max 1475mm reach at 1762mm height
- Min 1327mm reach at 2435mm height
- Bespoke options available
- 2 adjustment positions
- WLL 429kg

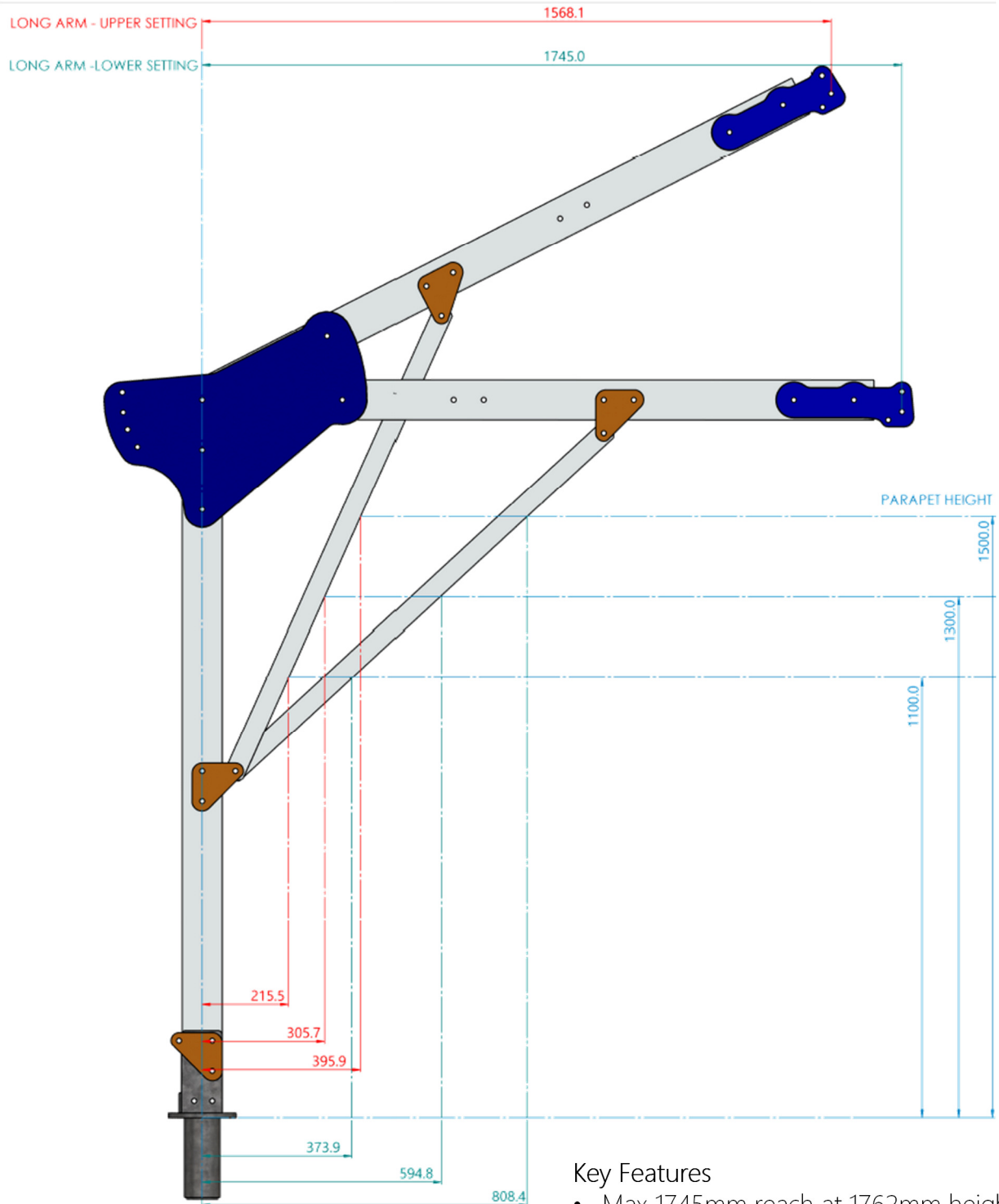
Typical System Layout & Positioning Criteria

Surface Mount shown for example purposes.

Maximum & Minimum Reach and Height

ADA-RHS-1745

Davit Arm



Key Features

- Max 1745mm reach at 1762mm height
- Min 1568mm reach at 2558mm height
- Bespoke options available
- 2 adjustment positions
- WLL 429kg

General Fixing Information

Guidance Only

The sockets can be attached to various structures:

- In all cases the structure must be investigated and subsequent calculations completed to ensure that the structure will withstand the calculated forces, including a safety factor of two (2).
- The hardware to be used (nuts, bolts, washers) of all the components of the lifeline must be 316 stainless steel with minimum strength of 70 kg/mm² (or A4 70 minimum) unless otherwise supplied by Bettersafe International.
- Fixings shall be M16 with a complete installation minimum of 21kN per pair of fixings.

Type of Structure	Concrete / Masonry	Steel Structure	Comments
Expansion Bolts	X		According to manufacturer's recommendations
Chemical Plugs	X		According to manufacturer's recommendations
Bolting		X	With the agreement of the building/structure owner and structural investigation

Ordering System Components & Tools

General Information

System components

When components are required, please contact Bettersafe International quoting relevant part number from the list. Guidance is provided in the component explanatory notes.

Orders should be sent to orders@bettersafeinternational.com

Amendments

1. Bettersafe International reserve the right to continually update their range of products and manufacturing processes, in the interests of reliability, durability and performance
2. In this respect, this installation and servicing manual will need occasional updating. Bettersafe International shall issue all registered holders the relevant amendments.
3. If in any doubt regarding the current Issue Status of a manual, please contact Bettersafe International.

General Installation Information

Socket Installation

Socket Installation

Depending upon the socket type there are multiple ways that installation can be achieved.

When installing the socket, it is important to ensure that the top face is as level as possible, with installation being not more than 3 degrees misaligned from the horizontal.

Socket installation should only be carried out by a competent person. If specifying the anchors, resin, fasteners, or any combination of the afore mentioned, it is essential that the competent person is of ability to specify an installation that is safe for use. If in any doubt about the calculation of loads contact your Bettersafe International representative.

Verifying the Installation

Bettersafe International strongly recommends testing the installation of the socket before initial use; especially when using resin bonded anchors.

When verifying the installation, we recommend that it is tested to a maximum force of 6kN at the devices maximum radius if used for the lifting of personnel.

If only used for the lifting of goods we recommend testing to no greater than 125% of the goods' WLL at its maximum radius. All tests should be carried out in all anticipated worst-case loading directions, sustained for a duration of 3 minutes.

If unable to test the installation, then each anchor can be isolated and tested individually applying the applicable loading, i.e. tension and/or shear loads.

For clarification on the loads contact your equipment supplier.

If an installation differs from the sockets referred to above or to that specified by your supplier, then the competent person must verify by calculation that the installation can withstand:

- For Rope Access, 15kN at the device's maximum radius in all anticipated worst-case loading directions but not test to more than 6kN at the device's maximum radius (If Applicable)
- For lifting of goods, 150% of the goods WLL at the device's maximum radius in all anticipated worst-case loading directions, but not test to more than 125% of the goods WLL at the device's maximum radius
- If required a sacrificial anchor may need to be installed to verify the installation has the ultimate capacities required.

Following initial socket installation verification tests, we do not recommend overload tests for the socket or davit and suggest thorough visual examination only. If the client feels that because of a visual examination that a load test is appropriate, we recommend a 100% load test and certainly no greater than 125%.

General Installation Information

General Information

1. Procedures

To prevent injury to personnel, and damage to the system, read, understand and comply with the procedures as detailed in this manual.

2. Installation Approval

Only Bettersafe International authorised installers are allowed to install and service the Axxess Davit System.

3. Traceability

All components of the system can be traced back to source.

4. Componentry

Only use approved components when erecting systems and when replacing worn or damaged items. If other parts are used, they may be of inferior or different dynamic specification and may cause incorrect operation of the system.

Bettersafe International cannot accept liability in this respect.

Modifications and alterations of components are not permitted without prior written agreement from Bettersafe International.

5. System Modifications

If the system must be modified because of a site requirement, during or after installation, which causes a deviation from the original configuration, then the anchorage forces and fall distances will have to be recalculated for the modified system.

6. Fall Protection

When working at height whilst installing the System, use an independent means of fall protection.

When servicing a System, do not attach to it if it has sustained a fall or if it has been damaged. Use an independent means of fall protection.

7. Calibration

When using equipment involving measurement (e.g. torque wrench, tension tester, micrometer), only use calibrated articles traceable to National Standards.

General Installation Information

General Information

8. Entry/Exit from System

It is important to remember that until a user has fully connected to the system, that person is not fully protected from falling.

Accordingly, where possible, the entry/exit point should always be sited in a position of safety. This will minimise the risk of falls during system connection.

If this objective cannot be achieved, then additional precautions must be considered.

For example, a safety barrier or fence could be erected from access point to entry-exit point. Alternatively, anchorage points could be installed to provide a means for additional fall arrest protection.

9. Anchorage alignment

When designing the layout of the system it is imperative that the reach of the davits and the clearance of any obstacles is taken into account to prevent fouling.

Rescue locations also need to be considered to allow neighbouring davits to be used for rescue where possible.

Location of the sockets should be such that the worker can access the system and then move to the façade in a safe manner.

10. Anchorage Loadings

The loadings should be communicated to the client for confirmation that the support structure is capable of withstanding the forces that would be applied in the event of a fall on the system.

General Installation Information

General Information

17. Units of Measurement

Where measurement abbreviations are used in this manual, the following definitions apply:

kN (kilonewton)	-	SI unit of load or force
mm (millimetre)	-	SI unit of length
m (metre)	-	SI unit of length
kg (kilogram)	-	SI unit of mass
Nm (Newton-metre)	-	SI unit of torque

18. Limitations

Maximum number of persons for fall arrest purposes. This is noted on system label	1 (Arm) 2 (Base)
Maximum mass of each person attached to system including equipment and clothing.	140kg

General Installation Information

General Information

Note: Anchorages

In accordance with EN795 the system requires a minimum safety factor of 2 on all anchors. This is based on the ratio of the anchor fittings ultimate load to computed dynamic load (in the direction of force).

Example: - If a dynamic load of 6kN has been predicted, then the corresponding anchor must be able to withstand 12kN in the direction of force.

All anchor bolts must be able to withstand a minimum of 12kN for this installation with a combined installed load minimum of 21kN in the weakest direction depending on the substrate.

Note:

Bettersafe International strongly recommend that all anchors are fitted in accordance with the manufacturer's instructions for use, and with the installation requirements of EN 795:2012, TS 16415:2013 & BS 7883:2019.

Installation

General Information

Foreword

The nature of the following text is instructional on the installation attachment of the AxxessAbseil Davit Arm System. It does not detail anchors, anchor bolts, or plates, or any type of anchorage system to be employed. Selection of structural anchorages is a function of the mounting structure material, potential system forces, and the environment. As such the selection must be made by the competent Engineer in charge of the system installation. A competent engineer is defined as: -

'A person who has a recognised Structural or Civil Engineering qualifications, and who has had adequate previous installation experience.'

Such an Engineer must have attended Bettersafe International training and be familiar with the AxxessAbseil Davit Arm System

This manual does not automatically infer design approval to or for particular system configurations. This must be obtained from architectural or site authority as appropriate, before commencement of work.

Pre-requisite Installation requirements

Installation cannot take place until the following have been fully considered and completed.

Site Plan

A site plan must be drawn up to indicate the Davit System configuration, to include: -

- Extremities
- Entry / exit access points
- Obstacles
- Rescue Planning
- Direct Anchorage Location

Installation

General Information

Calculations

A calculation must be performed on the finalised system configuration, using the appropriate Bettersafe International approved procedures. This will provide the installation Engineer with the maximum anchorage forces, which could be generated in the event of a fall.

Component List

An appropriate list of components must be drawn up, including cable lengths, in order to fulfil the contract.

Personnel

The installation team must be competent by way of qualifications, training and experience. They must also have knowledge, and be familiar with the Davit system.

Installation

System Description

The design of the AxxessAbseil Davit Arm System is such that when any user is attached, full 360 degree movement can be enjoyed in the work zone whilst being securely connected to a safety system. In the event of a fall, the faller will be arrested.

With a large reach and clear height above the user, and 15 adjustments on the height and reach, the system is extremely versatile

General Layout: -

The system consists of a base and a removeable arm. With a choice of surface mounted base of cast in base.

The surface mounted base comes complete with anchorages, and is tested for 2 user fall arrest to EN795:2012, CEN/TS 16415:2016 and BS 8610:2017

The surface mounted base is also complete with 7 locking locations, and this feature is also an option on the cast in base. This feature allows for the location of the arm at a particular angle from the centre line, allowing fixed work along a wide section of the façade from a single socket.

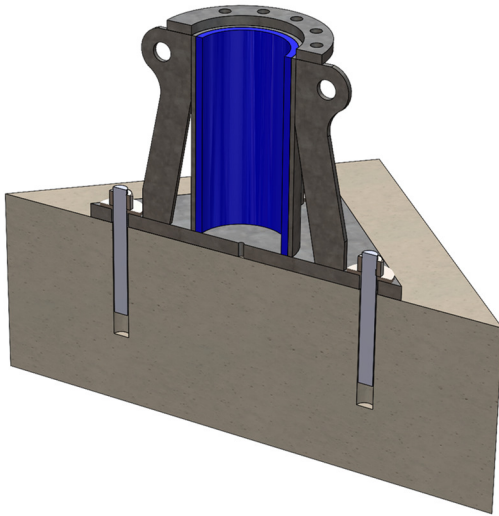
System height: -

The davit arm system may be installed at any practicable height in order to facilitate safe use and access. Care should also be taken that sufficient clearance is allowed for under the arm and behind the davit arm.

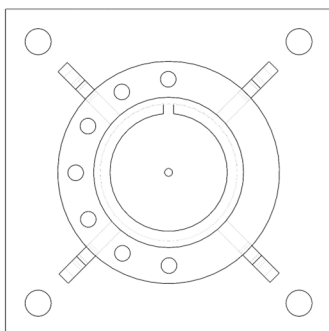
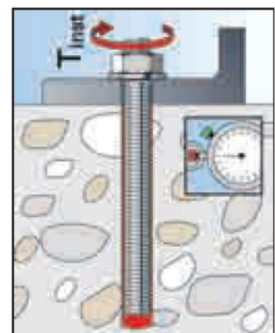
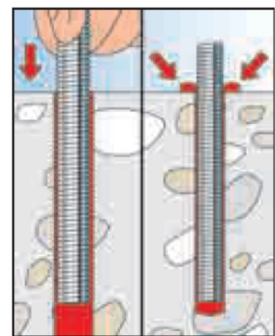
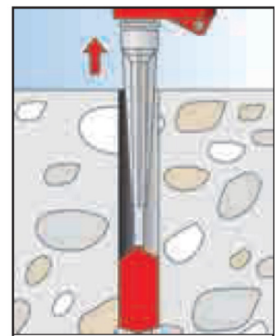
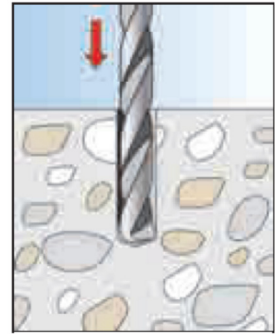
Installation

Installation Procedure

Surface Mount – to concrete using FIS VT Resin and Studding



1. For Cracked and Non-Cracked concrete.
2. Please refer to the technical manual for details on drill depths and diameters.
3. Drill a suitable hole to suit the size of studding selected.
4. Thoroughly clean the hole using a hole brush and blower, or similar.
5. Inject the FIS V T Injection resin into the hole in line with the Fischer recommendations for the substrate being fixed to.
6. Allow to set according to the Fischer recommendations.
7. Place the plate over the stud heads.
8. Tighten the bolts onto the threaded rod to the required torque
9. Have the plate sealed by a trained roofing installer.

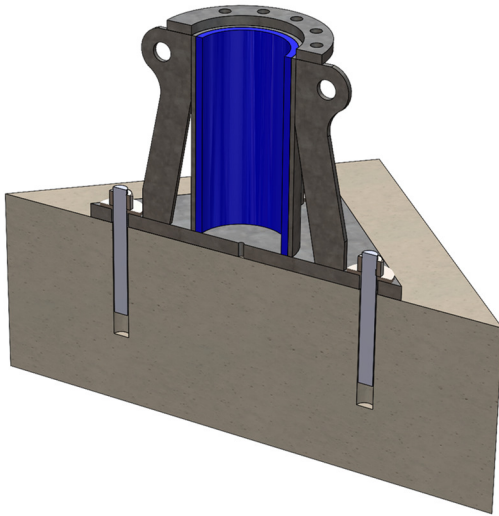


Roof Edge →

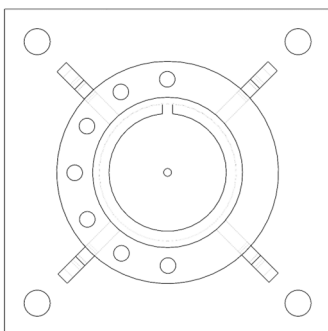
Installation

Installation Procedure

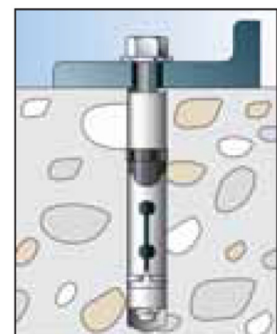
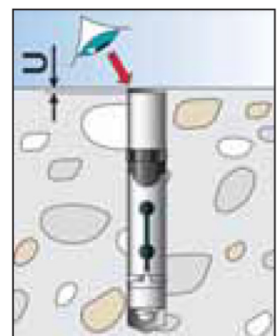
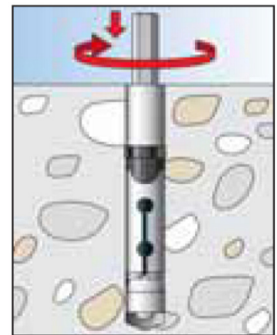
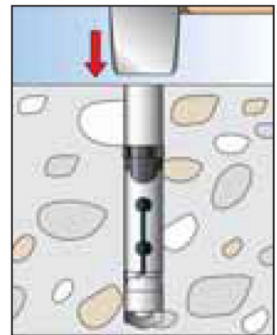
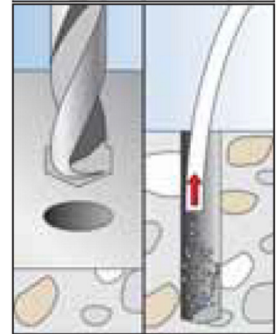
Surface Mount – to concrete using FH II Mechanical Anchor and Studding



1. For Cracked and Non-Cracked concrete.
2. Please refer to the technical manual for details on drill depths and diameters.
3. Drill a suitable hole to suit the size of studding selected.
4. Thoroughly clean the hole using a hole brush and blower, or similar.
5. Insert the FH II Socket into the Hole.
6. Tap the anchor into place and using the Setting tool set the anchor in place.
7. Insert the threaded rod into the anchor and tighten to max depth 25mm into the anchor
8. Put the plate over the stud heads.
9. Tighten the nuts onto the threaded rod to the required torque
10. Have the plate sealed by a trained roofing installer.



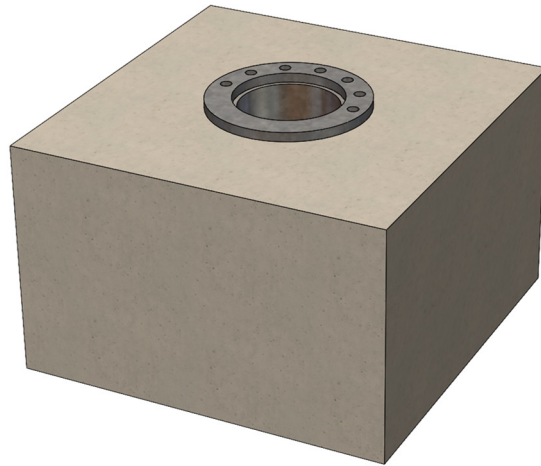
Roof Edge →



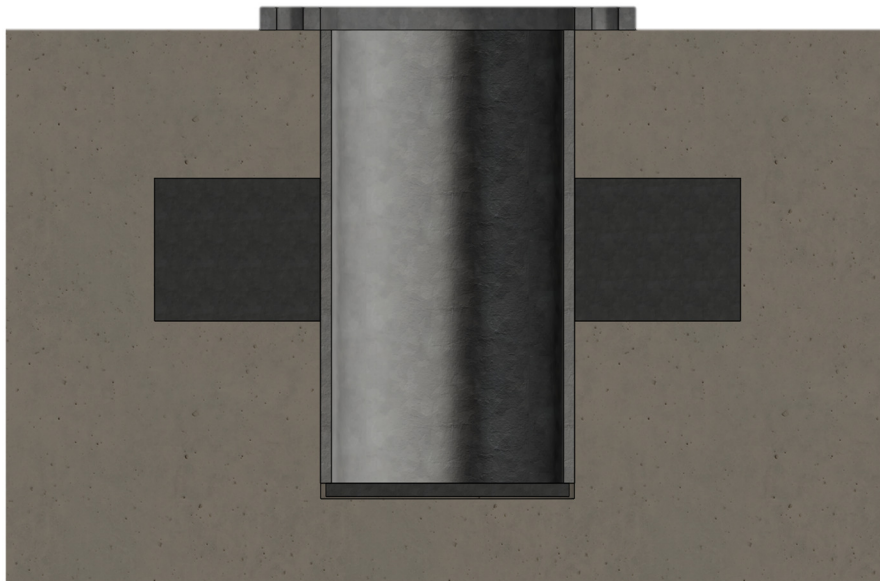
Installation

Installation Procedure

Cast In



1. For Cracked and Non-Cracked concrete.
2. Tape over any holes such as the locking points (top and bottom) and the main socket section
3. Place the socket into the form and secure if necessary.
4. Form the concrete
5. Remove the upper tape and insert the weather cap.





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