

STRONG

# USER INSTRUCTION MANUAL <u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> TECHNICAL INFORMATION</u></u>



#### Disclaimer

The information provided in this User Instruction is based on the technical data that KStrong obtained under laboratory conditions and believes to be reliable. KStrong does not guarantee results and takes no liability or obligation in connection with this information. Since conditions of end-use are beyond our control, it is the user's responsibility to determine the hazard levels and the use of proper personal protective equipment. Persons having technical expertise should undertake evaluation under their specific end-use conditions, at their discretion and risk. Please ensure that this information is only to check that the product selected is suitable for the intended use. Any product that is damaged, torn, worn, or punctured should be discontinued from usage immediately.

# CONTENTS

Tools Required

Proof Loading

| Know Your System    | 01 |
|---------------------|----|
| Standards           | 02 |
| Instruction Guide   | 03 |
| Job Safety Analysis | 04 |

| AFF4000 FALL ARREST SYSTEM COMPONENTS                                   | 06 |
|---|----|
| Component Chart   | 07 |
| AFF4000 (Floor/Wall/ Ceiling Mounted)                                   | 08 |
| Universal Extremity Plate and Shock Absorber                            | 09 |
| Tensioner   | 10 |
| Wire Rope   | 11 |
| Carriage Body   | 12 |
| Intermediate and Corner Bracket   | 13 |
| Cable Termination   | 14 |
| Inspection Plate  | 15 |
| Fastening in Concrete Structures and Universal Extremity Anchor Plate   | 16 |
| Intermediate Bracket  | 17 |
| Corner Post   | 18 |
| Fastening in Concrete Structure Using Fixed Anchor Posts                | 19 |
| Cable Termination and Shock Absorber (Ref. AFF4000 Roof Mounted, Wall & |    |
| Ceiling Mounted)  | 20 |
| Tensioner and Intermediate(Ref. AFF4000 Roof Mounted, Wall & Ceiling    |    |
| Mounted)  | 20 |
| Carriage Body (Ref. AFF4000 Roof Mounted, Wall & Ceiling Mounted)       | 21 |
| PRE- USE CHECKS & PRECAUTIONS   | 22 |
| Post Installation Inspection  | 22 |
| Precautions While Using the System                                      | 23 |
| INSPECTION USE AND MAINTENANCE  | 24 |
| PPE Inspection and Revalidation   | 24 |
| Warranty  | 25 |



### **Know Your System**

### AFF4000 Horizontal Lifeline System on Concrete Structure



The AFF4000 Cable Line Fall Arrest System is designed for commercial buildings and industrial structures of all types. Our engineered systems cover all your working at heights requirements for maintenance, cleaning, access, wash bays and inspections.

The Fixed Cable Line Fall Arrest System is an integrated solution to arrest the fall of a user who constantly works on any building/ structure that has an element of a potential fall and where your only fall arrest connection point is above your head or on the side of a building or structure.

This system allows you to walk along a fall edge for a continued distance while staying connected in fall arrest.

Safety, simplicity, and durability are some key words to explain the advantages of this system.

This system is made of stainless steel components, wire cable and is maintained in the rigid position by the use of two mounting brackets-one at the start and one at the end.

The AFF4000 Cable Line Fall Arrest System has been rigorously tested and manufactured in accordance with EN795:2012 Type C & TS 16415:2013 Standards, ensuring you have quality and guarantee of any system installed onto your asset.

# Standards

| Standards  |                 | Description  |
|--|-----------------|--|
| EN 353-1   |                 | Guided type fall arresters including a rigid anchor line   |
| EN 353-2   |                 | Guided type fall arresters including a flexible anchor line  |
| EN 795 Type A  |                 | Anchor device requiring the fixing of one or more structural anchors   |
| EN 795 Type B  |                 | Anchor device not requiring the fixing of one<br>or more structural anchors  |
| EN 795 Type C  | œ <u>∎∎</u> ~≎© | Anchor devices using a horizontal flexible anchor line   |
| EN 795 Type D  | <u> </u>        | Anchor devices using a horizontal rigid anchor line  |
| EN 795 Type E  |                 | Deadweight anchoring device  |
| CEN/TS<br>16415:2013   |                 | Personal fall protection equipment - Anchor<br>devices - recommendations for anchor<br>devices for use by more than one person<br>simultaneously         |
| Ex h IIc T6 Gb<br>Ex h IIc T6 Gb<br>EN 80079-36:2016<br>EN 80079-37:2016 | (Ex)            | The ATEX directives are two EU directives<br>describing the minimum safety requirements<br>for workplaces and equipment used in<br>explosive atmospheres |

# Must be Read Prior to Use

- Prior to use, ensure all operating procedures have been read and properly understood.
- This fall arrest system is only to be used by competent persons who have experience and training in the safe use of the system and associated equipment.
- Ensure all local workplace OH&S requirements are identified and understood.
- A risk assessment with a safe work method procedure must be completed and approved by management prior to work commencing.
- The systems requires periodic inspection and maintenance by the manufacturer or their authorized representative as per EN365 of the PPE Regulation 2016.
- The system MUST NOT be used if the service date is overdue.
- A rescue plan must be formulated and ready for implementation prior to using any fall arrest system.
- Authorisation to access any risk area must be obtained from the person in control of the workplace.
- Only approved full body harness, lanyard and PPE certified either EN, ANSI or AS/NZS Standards are to be used with this system.
- Visually inspect the system for damage prior to use. The system must not be used if there is any deterioration or deformation of components or the structure to which the system is attached.
- If the safety system is damaged or has arrested a fall, discontinue use until it has been fully inspected and recertified by the manufacturer or their authorized representative.
- Ensure all fixings, fittings and components are securely attached. Any tightening, adjustment or replacement of components must be carried out by a competent person.
- Users must not be allowed to work alone in fall arrest situations in case emergency rescue assistance or first aid is required.
- All applicable EN Standards, Local OHS Acts & Regulations, and Codes of Practice & Guidelines must be read and obeyed when using this safety system.

# Instructions for Periodic Examinations

- As per EN 365 of PPE Regulation 2016, it is necessary to carry out regular periodic examinations. The safety of the users depends upon the continued efficiency and durability of the equipment.
- The personal protective equipment shall be examined at least every 12 months.
- For corrosive/harsh environments, once every 6 months (more frequent inspection may be required).
- The periodic examination can only be carried out by the manufacturer or their authorized representative.
- The comments should be included in the check card of the equipment. After the periodic examination, the next due date for periodic examination will be determined.
- During periodic inspection, it is necessary to check the legibility of the equipment marking.
- To check metals for sharp edge, burs, corrosion, bent profile distortion and opening & closing or such mechanisms for which that is intended for.

# **Remove from Service**

- In case that it has been used to arrest a fall, the equipment must be withdrawn from use.
- Labels have been removed, are missing or illegible
- Excessive abrasive wear has occurred
- · Broken fibres, tears, cuts, snags and splinters are present
- Deterioration or stretching has occurred
- Parts and mechanisms are not moving freely or are corroded
- There is excessive contamination not removed by approved cleaning methods

# Job Safety Analysis

Before commencing the job, it is recommended that the service technician / installer completes a JSA form, to identify hazards at site and to decide the correct PPE they need to mitigate the hazard. Refer to the example below.

| Section 1 Job details |  |                      |  |                          |  |
|-----------------------|--|----------------------|--|--------------------------|--|
| JSA title             |  | Project name         |  | Work order or<br>PID No. |  |
|                       |  | Principal contractor |  |                          |  |
| Location / address    |  |                      |  | Date/s of activity       |  |
| Prepared by           |  | Date prepared        |  | Signature                |  |

| Permits required |  |                       |                          | Isolations required  |             |
|------------------|--|-----------------------|--------------------------|----------------------|-------------|
| Confined Space   | □ High risk work rescue plan                 | □ High voltage access | Roof Access              | Mechanical           | □ Hydraulic |
| Work at height   | Excavation and trenching                     | Energized work        |                          | Electrical           | Pneumatic   |
| Penetrating      | □ Grid mesh, flooring and guard rail removal | □ Hot work            | □ Other (please specify) | Site access required | □ YES □ NO  |

Section 2-Common hazards (Each Hazard identified below must be assessed)

| Chemicals/hazardous substances  |  | High-risk activities            |   |
|---|--|---------------------------------|---|
| Name of chemicals or hazardous substance  |  | Confined space                  | □ Work at heights                       |
|   | □ SDS available  | Hot Work                        | □ Excavation, trenching or penetrations |
| Energy sources  |  | Construction work               | Scaffolding                             |
| Electricity   | Pressure   |                                 | Structural alterations                  |
| 🗆 Gas / Fuel  | Water  | Work location                   |   |
| Plant and equipment   |  | 🗆 Sun                           | □ Working over, in or near water        |
| □ Fixed Plant   | Mobile Plant   | □ Plants, Animals or Insects    | Contaminated / Flammable atmosphere     |
| Uehicles / boats  | □ Hand Tools   | □ Slips, trips and falls        | □ Work occurring in other areas         |
| Manual tasks  |  | Biological hazards              | □ Fire                                  |
| □ Repetitive tasks  | Heavy Lifting  | People                          |   |
| Awkward posture   | Sustained posture  | □ Remote or isolated work       |   |
| Facilities / built environment  |  | □ Fatigue                       | □ Visitors / land owners / public       |
| Buildings and fixtures  | On/in or adjacent to roadways  | Competency or training required | License required                        |
| Open pits, trenches or tunnels  | □ Asbestos/ lead   | Environment and water quality   |   |
| Overhead objects or services  | Underground objects or services  | Erosion & sediment control      | □ Waste/ discharge                      |
| Lighting  | Noise  | Emissions (or air pollution)    | Flora/ fauna/ weed management           |
| <ul> <li>On or near pressurized gas<br/>distribution mains or piping</li> </ul> | <ul> <li>On or near chemical. fuel or<br/>refrigerant lines</li> </ul> | □ Release to drains/waterways   | □ Water quality                         |

| Activity<br>List the task required to<br>perform the activity in the sequence<br>they are carried out. | Hazards<br>Against each task, list the hazards that<br>could cause injury when the task is<br>performed. | Risk Cor<br>List the con<br>eliminate or<br>arising from | ntrol Measures<br>trol measures required to<br>r minimize the risk of injury<br>the identified hazard.  | Who is responsible?<br>Write the name of the person responsible<br>(supervisor or above) to implement the<br>control measures identified. |
|--|--|--|---|---|
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |
| Workers Names  | Workers Signatures   | Date   | We, the undersigned employees acknowledge that we have assisted<br>the development of this JSA and have read and understood its conte<br>We agree to perform the work required in accordance with the instru-<br>provided, including but not limited to the use of all listed PPE |   |
|  |  |  |   |   |
|  |  |  |   |   |
|  |  |  |   |   |

Remember: • Each JSA must be site specific.

• Include all workers in the development of this JSA.

Customercare@kstrong.com

# AFF4000 Fall Arrest System Components

This system is made of stainless steel components, wire cable and is maintained in the rigid position by the use of two mounting brackets-one at the start and one at the end.

The AFF4000 Fall Arrest System has been rigorously tested and manufactured in accordance with EN795:2012 Type C & TS 16415:2013 Standards, ensuring you have quality and guarantee of any system installed onto your asset.



# **Component Chart**

The chart below shows all the components of the AFF4000 Horizontal Lifeline System on concrete structure with their appropriate product codes and quantity required in a system.

| Sr. No. | Component                                     | Code         | Qty. Required    |
|---------|---|--------------|------------------|
| 1       | Universal Extremity Plate                     | AFF113710    | 2 No.            |
| 2       | Carriage Body                                 | AFF119000    | 1 No.            |
| 3       | Swaged Cable Extremity                        | AFF113210    | 1 No.            |
| 4       | Wire Rope (Cable Wire)                        | AFF518XXX(S) | As per length    |
| 5       | Shock Absorber                                | AFF112100    | 1 No.            |
| 6       | Swaged Tensioner                              | AFF114100    | 1 No.            |
| 7       | Intermediate                                  | AFF111510    | 1 No.            |
| 8       | Wheel Type<br>Carriage Body                   | AFF119100    | 1 No. (optional) |
| 9       | Double Tandem Pulley<br>Small with SS Sheaves | AFX206009    | 1 No. (optional) |

# AFF4000 (FLOOR/WALL/ CEILING MOUNTED)





# **Universal Extremity Plate**

Stainless Steel Universal Extremity Plate is used to create an anchor point at the ends of the lifeline.

#### **TECHNICAL SNAPSHOT**

| Universal<br>Extremity Plate | AFF113710  |
|------------------------------|--|
| Design                       | Universal Extremity for Horizontal Lifeline  |
| Application                  | Anchorage point for Horizontal Lifelines with over head application. For steel structures M16x50. For concrete M16X125 (Refer Hilti HSV guide) |
| Material                     | Stainless Steel Grade 316  |
| MBS                          | 23kN for 3 minutes   |
| Weight                       | 0.70 kg  |
| Conforms to                  | EN 795 Type C:2012 and TS16415,<br>AS/NZS 5532:2013  |



# **Shock Absorber**

The Shock Absorber reduces the impact of the fall on the user as well as on the structure. The shock absorber also has a tension indicator at one end to help the installer know how much tension is to be given to the line after the installation.

| Shock Absorber              | AFF112100   |
|-----------------------------|---|
| Design                      | Multiple User   |
| Application                 | Spring type shock absorber with protective casing. It reduces the impact force in the event of a fall or overloading on the system. |
| Minimum<br>Activation Force | MAF of energy absorber is 1kN   |
| Length                      | 258mm   |
| Material                    | Shock Absorber 304 Stainless Steel with PVC<br>protective covering D-Shackle 316 Stainless Steel                                    |
| MBS                         | 25kN  |
| Weight                      | 1.5 kgs   |
| Conforms to                 | EN 795:2012 Type C and TS16415,<br>AS/NZS 5532:2013   |



# Tensioner

The Tensioner is attached to the shock absorber using stainless steel nut bolts and has a swageless termination at one end for the wire rope. Once the life line is installed, the tensioner is tightened by inserting a rod in the hole and rotating it.





TENSIONER WITH SWAGING

SWAGELESS TENSIONER

| Tensioner   | AFF114100   | AFF114100(SL)   |
|-------------|---|---|
| Design      | It has one side swage and one side eye to fix in the shock absorber   | It has one side swage less extremity and one side eye to fix in the shock absorber  |
| Application | The tension device is an interconnection between the cable and shock absorber with cable length adjustment feature. | The tension device is an interconnection between<br>the cable and shock absorber with cable length<br>adjustment feature. |
| Size        | 14mm  | 14mm  |
| Material    | Stainless Steel Grade 316   | Stainless Steel Grade 316   |
| Weight      | 1kg   | 1kg   |
| MBS         | 35kN  | 35kN  |
| Conforms to | EN 795:2012 Type C and TS16415 & AS/NZS 5532:2013   | EN 795:2012 Type C and TS16415 & AS/NZS 5532:2013   |

# Wire Rope

# **Stainless Steel Cable**



8MM WIRE CABLE

| Wire Rope   | AFF518XXX(S)  | AFF5187X7XXXS   | AFF518119XXXS   |
|-------------|---|---|---|
| Design      | 7X19  | 7X7   | 1X19  |
| Application | Stainless steel cable for<br>horizontal and vertical life line<br>systems | Stainless steel cable for<br>horizontal and vertical life line<br>systems | Stainless steel cable for horizontal and vertical life line systems |
| Size        | 8mm   | 8mm   | 8mm   |
| Material    | Stainless Steel Grade 316   | Stainless Steel Grade 316   | Stainless Steel Grade 316   |
| MBS         | 39kN  | 39kN  | 44kN  |
| Weight      | 0.24 kg per meter   | 0.30 kg per meter   | 0.34 kg per meter   |
| Conforms to | EN 795:2012 Type C and TS16415 & AS/NZS 5532:2013                         | EN 795:2012 Type C and TS16415 & AS/NZS 5532:2013                         | EN 795:2012 Type C and TS16415 & AS/NZS 5532:2013                   |

# **Carriage Body**

Simply connect a karabiner to the Carriage Body when using a lanyard, rope line or a fall arrestor with a full body harness allowing the user to freely travel along the length of the line.

The carriage body may be attached or detached from the line at any given point by two consecutive deliberate actions. In applications on roofs, the carriage body may be used on either side of the roof.



# Intermediate

The Intermediate brackets are used to divide a long line into multiple span, this reduces the sag on the line. The distance between two intermediate brackets may be between 5 meters and 15 meters depending on the receiving structure.

### **TECHNICAL SNAPSHOT**

| Intermediate | AFF111510   |
|--------------|---|
| Design       | Provided with adjustment holes to adjust the angle of line to three different angles.       |
| Application  | The intermediate is provided to hold the wire in position all along the length of the wire. |
| Material     | Stainless Steel Grade 316   |
| MBS          | 15kN  |
| Weight       | 0.58 kg   |
| Conforms to  | EN 795 Type C:2012 and TS16415, AS/NZS 5532:2013  |



Intermediate

# **Corner Bracket**

Corner piece designed to be fixed on concrete floors or ceilings in conjunction with a horizontal lifeline (AFF4000).

Available in following variants depending upon the angle:

- AFA935204(60) 60 degrees
- AFA935204(90) 90 degrees
- AFA935204(120) 120 degrees

### **TECHNICAL SNAPSHOT**

| Corner Bracket | AFA935204(60°),(90°),(120°)  |
|----------------|--|
| Design         | The corner piece is designed to install the anchorage line on curved bend area |
| Application    | Corner piece bend for a floor/ ceiling mounted lifeline                        |
| Material       | Stainless Steel Grade 316  |
| MBS            | 15kN   |
| Weight         | 1.05 kg  |
| Conforms to    | EN795:2012 Type C, TS16415:2013  |



Corner Bracket

# **Cable Termination**

The Stainless Steel Cable Extremity attaches directly to the end of the 8mm wire rope allowing a simple an easy connection to the extremity anchor. Simple and easy to install on the desired length of the cable. The extremity provides neat end connection eliminating any loose wires.



SWAGED

| Cable Termination | AFF512001   | AFF113210   |
|-------------------|---|---|
| Design            | Swageless   | Swaged  |
| Application       | Cable extremity provides strong swage less<br>end connections to the wire rope and<br>completely eliminate the danger of any loose<br>wire which may cause injury to the user<br>working on the line. | The swage provides a strong end<br>connection. The swaging is done using a<br>130kN hydraulic swaging hand tool and<br>hexlock dies at 6 positions. |
| Material          | Stainless Steel Grade 316   | Stainless Steel Grade 316   |
| Weight            | 0.40 kg   | 0.50 kg   |
| MBS               | 25kN  | 25kN  |
| Conforms to       | EN 795:2012 Type C and<br>TS16415 & AS/NZS 5532:2013  | EN 795:2012 Type C and<br>TS16415 & AS/NZS 5532:2013  |

# Inspection Plate: AFF115101H

The Inspection Plate is installed on the tensioner side of the system for identification, traceability and maintenance of inspection records. At time of installation, the relevant details are recorded on the ID Tag. The next inspection dates are also recorded on the month and year on the back of the ID plate. The label is provided with a protective aluminum frame with a poly carbonate sheet for UV protection. It is installed on the pin ring of the tensioner. The label is equipped with a dynamic QR code and an RFID tag that are linked to the Compass inspection software.



| K           | STR        | ONG"                | Ex h lic T              | "œ []] (€      |
|-------------|------------|---------------------|-------------------------|----------------|
| KStron      | g Horiz    | zontal Lifelines    |                         |                |
| AF          | F4000      | Roof Mount - EN 75  | 5:2012 TYPE C and CEN   | /TS 16415:2013 |
| AF          | F4000      | Wall, Floor and Cei | ling Mount - EN795:2012 | TYPE D         |
| Date of Ins | stallation |                     |                         | REID TAG       |
| No. of use  | rs         |                     |                         | 1 m            |
| UID         |            | K4000332            |                         | RFID           |
| Line No.    |            |                     |                         | alor And       |
| custom      | ercare@    | kstrong.com         | www.kstrong.com         | /asia          |



# Fastening in Concrete Structures:

- Threaded Rod: Hilti HAS-E or Fischer FTR
- Material of Threaded Rod: Stainless Steel 316
- · Adhesive: HILTI HY 150, FISCHER FIS V360S or at least equivalent.

### **Fasteners and Tools**

#### Tools:

- Hammer drill machine
- Hammer drill 18 mm
- Dust blower
- Setting tool
- Rebar locator

Note: Strictly follow the original instructions provided by the adhesive manufacturer!

# **Universal Extremity Anchor Plate (AFF113710)**

- · Using the rebar locator, mark the position of the holes which are not obstructed by a rebar.
- Drill 2 nos. of hole Ø18mm in structural concrete 100mm in depth, following the distance between the 2 holes of the Extremity Anchor Plate. Concrete
  quality at least C20/25 (20MPa based on cylinder test and 25MPa based on cube test).
- Clean bores by blowing it out, using a dust blower.
- Bond in M16 threaded rods (not included) using a setting tool in accordance with the instructions for installation and use provided by the adhesive
  manufacturer.
- Check for firm seat.
- Use hex nuts and/or locks nut (not included) to attach and tighten the extremity plate.



# Intermediate Bracket (AFF111510)

- Using the rebar locator, mark the position of the holes which are not obstructed by a rebar.
- Drill a hole Ø14mm in structural concrete 100mm in depth. Concrete quality at least C20/25 (20MPa based on cylinder test and 25MPa based on cube test).
- Clean bore by blowing it out, using a dust blower.
- Bond in M12 threaded rod (not included), using a setting tool in accordance with the instructions for installation and use provided by the adhesive manufacturer.
- Check for firm seat.
- Use hex nuts and/or locks nut (not included) to attach and tighten the intermediate bracket.



# Corner Post (AFA935204)

- Using the rebar locator, mark the position of the holes which are not obstructed by a rebar.
- Drill a hole Ø18mm in structural concrete 100mm in depth. Concrete quality at least C20/25 (20MPa based on cylinder test and 25MPa based on cube test).
- Clean bore by blowing it out, using a dust blower.
- Bond in M16 threaded rod (not included) using a setting tool in accordance with the instructions for installation and use provided by the adhesive manufacturer.
- Check for firm seat.
- Use hex nuts and/or locks nut (not included) to attach and tighten the corner post.



# Fastening in Concrete Structure Using Fixed Anchor Posts (AFA935841):

- Using the rebar locator, mark the position of the holes which are not obstructed by a rebar.
- Drill 4 nos. of hole Ø14mm in structural concrete 100mm in depth, following the distance between the holes of the base plate. Concrete quality at least C20/25 (20MPa based on cylinder test and 25MPa based on cube test).
- Clean bores by blowing it out, using a dust blower.
- Bond in M12 threaded rods (not included) using a setting tool in accordance with the instructions for installation and use provided by the adhesive
  manufacturer.
- Check for firm seat.
- Use hex nuts and/or locks nut (not included) to attach and tighten the base plate of the fixed anchor.
- Mount the lifeline components (extremities, corners and intermediates) on the top plate using the included fasteners.



# Cable Termination & Shock Absorber Ref. AFF4000 Roof Mounted, Wall & Ceiling Mounted

#### STEP 1: SHOCK ABSORBER: Ref. PN AFF112100

- Insert the connector to the universal extremity plate.
- Connect the other connector to the tensioner.
- Apply tension to the cable until the L tension indicator plate touches the coil of shock absorber.



# Tensioner & Intermediate Ref. AFF4000 Roof Mounted, Wall & Ceiling Mounted

#### STEP 1: MOUNTING THE TENSIONER ON THE SYSTEM

- Open the threads of the tensioner from both ends. Ensure 75% of the threads are open.
- Insert the locking pin so as to pass the eye of the tensioner and the shock absorber.
- Insert a pin ring in the locking pin to lock it.



#### STEP2: APPLYING TENSION TO THE LINE

- Hold the tensioner eye
- Insert the tensioning tool in the housing of tensioner and rotate tensioner in clock wise direction. Tension should be applied slowly. After terminating the wire, tension the cable to ensure the sag in the last span is reduced. Remove the U bolts that have been previously installed after each intermediate. Now tension the cable again until the shock absorber coil touches the tension indicator L plate.
- Tighten both the chuck nuts.
- Tighten the grub screws on chuck nuts.
- Tie the tie cords and lock them with ferrule.



#### STEP 3: INTERMEDIATE; Ref. AFF111510

- Insert the cable through intermediate
- Connect the intermediate to the receiving structure with fastener.
- The angle of the Intermediate may be changed by inserting intermediate fastener to different holes provided.



# Carriage Body Ref. AFF4000 Roof Mounted, Wall & Ceiling Mounted

#### STEP 1: CARRIAGE BODY Ref. AFF119000

- To connect the line to the user, there is a freely moving carriage body AFF119000, which moves along the length of the line with the user, who is connected to it by using a karabiner followed by a Connecting element connected to the full body harness of the user.
- The carriage body may be attached or detached from the line at any given point by two consecutive deliberate action. This is suitable for over head / over the roof application single as well as multi span systems.



### **RECOMMENDED PPE:**



# **Pre-Use Checks and Precautions**

### **Post Installation Inspection**

- Once installed, it is important to inspect the complete line by moving the entire length of life line
- It is mandatory for the Site Inspector/Supervisor and the actual users of the system to perform a thorough check before carrying out work. KStrong conducts a brief training of all concerned personnel on the subject of pre-use inspection of the system as per a defined guideline after the system has been installed by KStrong personnel.

# **Checking the Receiving Structure**

Do not install the system if the receiving structure does not meet the minimum structural strength of 15kN. If in doubt, refer to an Engineer.

### **Checking the System**

- Clean the system from dust/dirt. Check for any mechanical defects.
- Check for wear and tear in all components or unusual bending or deformation.
- Check for any modifications done by the user.
- Check for any missing component.
- · Check for any damages that may have been caused due to welding while maintenance of other equipment.
- Check the Identification Plate. The system needs to be put out of service if the label is not legible or missing.

# **Checking the Cable**

- See that there is sufficient tension on the cable by checking the tension indicator in the shock absorber.
- Check the condition of the cable. Wear hand gloves and check the wire from all sides. Check for broken strands or any deformity in the cable. Report if strands are found broken.

# **Checking the Carriage Body**

- Check the smooth movement of the carriage body before each usage. If friction is noticed, it can be due to dust accumulated due to continuous use. Clean the carriage body with a soft cloth using silicon spray
- Only use a karabiner at the termination end of the lanyard to slide the carriage body on the cable.

### Precautions While Using the System

The following points and precautions needs to be considered for safe use of the system

- The life line is for the purpose of fall protection while working on a horizontal plane at height. A back up fall arrest system is required when transitioning on and off the life line system while working at height.
- Never disengage the fall arresting lanyard and the carriage body from the life line while working at height.
- Avoid using grease to lubricate the system. If any fall is reported, put the system out of use. Contact the manufacturer for repairs and re-validation.
- Only certified full body harness with proper attachment anchorage points should be worn while using the AFF4000 system.
- Do not alter or misuse this equipment. Always take the advice from KStrong personnel while using this equipment in combination with components or subsystems other than those described in this manual. Usage of certain component/sub system may interfere with the proper functioning of this equipment and the system may not deliver or work as per its intended use. In such case KStrong may not be held responsible for any malfunction.
- The lifelines must be kept free from dust, grease etc., by periodic cleaning. The system can be cleaned by a soft dry cloth.

### Hazards

Hazards existing in immediate environment may require additional precautions to limit the possibility of injury to the user or damage to the equipment. Hazards may include but are not limited to, extreme temperatures, caustic chemicals, corrosive environments, high voltage power lines, explosive or toxic gases, moving machinery, sharp edges, high velocity winds etc.

Do not expose the equipment to any hazard which it is not designed to withstand. Consult the manufacturer if in doubt.

### **Rescue Plan**

It is recommended to ensure that the user shall have a rescue plan and means to execute it while using this equipment. The rescue plan needs to be project specific. The employees must be trained in self-rescue or alternative means shall be provided for prompt rescue in an event of a fall. It is recommended to work in a pair to ensure that in an event of a fall your partner may help in rescue.

### **Annual Inspection & Revalidation**

According to the requirement of EN365, every PPE needs to be inspected at least once in a year. The KStrong COMPASS software maintains the data of the system for at least 20 years and reminds the client whenever the inspection is due. The KStrong Inspection team is trained to perform the inspection and provide a certificate each year at a nominal cost. The client may at any given moment of time extract the status of any of the lifeline installed anywhere in the world from the KStrong data base.

### Environment

To protect the environment, KStrong follows a 100% paperless process. Unless specifically required, KStrong avoids printing its reports and make it available to the client digitally.

# Inspection Use and Maintenance

### **PPE Inspection and Revalidation**

Fall Protection Equipment is a life saving product. As per the EN 365 of PPE Regulations 425/2016, it is mandatory to have a 'Competent Authority' to inspect the Fall Protection Equipment at least once annually.

KStrong COMPASS Inspection software helps taking care of the equipment for at least 20 years.



- Cloud based online as well as off line software
- Captures geo coordinates where the system is installed
- RFID / Bar code compliant
- Generates report in real time
- Reminds user of items due for inspection
- Captures images of components
- User customizable
- Can be integrated to client software
- Reports can be shared with multiple recipients in real time

### Infrastructure:

- Good quality equipment complying with international standards
- 100% backward oriented manufacturing unit
- Qualified engineering crew
- Sophisticated test equipment
- Precise engineering software to understand the client requirement to provide a safe & optimum solution
- Technical marketing team capable of understanding the client requirement & present the solution using engineering drawings (Auto CAD) & calculations
- Force predictions on the system in an event of a fall and a testing facility to validate the force calculations

### Fixed Life Line System Projects can be Executed in 3 Steps :

#### Site Visit

- Site engineer visits the client's site to check & understand the requirement.
- · Site measurements using sophisticated equipments like digital distance meter & special imaging tools.
- Simulations of forces on the receiving structure using advanced engineering software like STADPRO.

#### Providing Good Quality Material

- MOC of KStrong fixed line components is Stainless Steel Grade 316 and Aluminum which are tested using a spectrophotometer to ensure the quality parameters.
- State of the art test lab using high precision dynamometers, oscilloscopes & slow motion cameras to validate predictions & simulations claimed.
- The only manufacturer having 100% backward oriented plant & undertaking to supply spares for a minimum period of 20 years.

#### Installation

- Proof loading of the system using Hydra Jaws (UK) equipment for onsite horizontal lifeline testing: Post Execution Care
- Software based support for inspection of the system annually.

### Warranty

The system is produced with extreme precision. Should there arise a manufacturing defect within a period of 1 year of supply, KStrong stands to repair the components or replace if necessary.

Warranty does not cover:

- Deficiency arising out of misuse of equipment
- Malfunction due to faulty installation/wrong usage of product
- This equipment is not user maintainable. The warranty stands void if an attempt is made to repair or open the equipment.

KStrong does not provide a product functioning warranty; the warranty stands for the workmanship of the products only.

- KStrong Systems are made of stainless steel grade 316, ED Coated Steel or Aluminum and are highly resistant to corrosion.
- KStrong systems are thus further warrantied for 20 years (15 years in Marine Environment) are inspected once annually according to the requirements of EN365.

# **Tools Required**



# Machines



### Anchors



# **Measuring Tools**

| 111 |      |          | and the second s |                |            | 0005    |
|-----|------|----------|--|----------------|------------|---------|
| 5   | TAPE | DETECTOR | DIGITAL TORQUE WRENCH  | DISTANCE METER | LASER TOOL | VERNIER |

# Consumables, Miscellaneous Tools

BLOWER

| DUST PUMP | HOLE | SAW CUTTER | HOT AIR GUN | SETTING TOOL | PAINT BRUSH | DRILL BIT | IMPACT<br>DRILL |
|-----------|------|------------|-------------|--------------|-------------|-----------|-----------------|
|           |      | 0          | T           |              |             |           |                 |

|             |    | WRENCH | WRENCH SIZE |    |    |  |
|-------------|----|--------|-------------|----|----|--|
| Hex Bolt    | 6  | 8      | 10          | 12 | 16 |  |
| Wrench Size | 10 | 13     | 16          | 19 | 24 |  |
| Socket Size | 10 | 13     | 16          | 19 | 24 |  |

CHEMICAL APPLICATOR

| ALLEN KEY SIZE            |   |   |    |    |  |  |  |
|---------------------------|---|---|----|----|--|--|--|
| Allen Bolt Size           | 6 | 8 | 10 | 12 |  |  |  |
| Allen Key Size            | 4 | 6 | 8  | 10 |  |  |  |
| Allen Grub Screw Key Size | 3 | 4 | 5  | 6  |  |  |  |

# Torque Chart (Maximum torque for standard bolts)

| CHART               |      |       |       |       |       |       |  |
|---------------------|------|-------|-------|-------|-------|-------|--|
| Bolt size           | 6 mm | 8 mm  | 10 mm | 12 mm | 14 mm | 16 mm |  |
| Recommended Torque: | 9 Nm | 22 Nm | 29 Nm | 50 Nm | 80 Nm | 125Nm |  |

# **Proof Loading**

# Process of Proof Loading of Horizontal LifeLines

#### Proof loading of roof post (Non Destructive)

• Post installation at least 10% of the posts should be proof loaded by a load testing device. The posts should be subjected to a static load of 6kN f or a period of 1 minute in accordance with EN 795 (4.4.1.1). The permanent deflection as a result of proof loading should not be greater than 10mm after the load is released

#### Proof loading of termination(Non Destructive)

• Each cable end termination should be proof loaded by a load testing device, to a static force of 6kN. The force is held for 1 minute. The proof loading ensures that the end cable terminations are robust and will not release the cable in an event of a fall.



### HYDRA JAWS LIFELINE TESTING



KStrong Asia Pte Ltd 33A Chander Road, Singapore 219539 Email: customercare@kstrong.com

www.kstrong.com

USA South America

Asia