Installation and User's Manual

I-Type Ladder I-ST / I-VA

Center styled ladder hot dip galvanized / stainless steel pickled

H-Type Ladder H-ST / H-VA

Side rung ladder hot dip galvanized / stainless steel pickled

Foreword

Thank you for buying a guided type fall arrester including a rigid anchor line from MKL-Technik GmbH. The **MKL-Technik System** is made to be used with a fall arrester **Type Twinstop® accordingly EN 353-1:2014+A1:2017** approved and applies to the latest standards in worksafety.

In case of any further question on the following subjects please do not hesitate to contact our customer service phone+49 9284 8011465 or mail info@mkl-technik.de at any time.

Fall guided type fall arresters including a rigid anchor line in accordance with EN 353-1:2014+A1:2017 are a safety product category 3, which means that they are products that directly protect the user's life. Incorrect installation and usage of such systems are life threatening.

Therefore, we emphasize strict adherence to the installation instructions, user guidelines and maintenance guidelines that follow.

MKL-Technik GmbH will refuse any claim caused by incorrect installation and use. We also will not take responsibility for claims caused by non MKL components; therefore, we strongly recommend not using components that have not been approved by MKL-Technik GmbH.

Attention! Due to copyright § 106 UrhG, it is not permitted to copy and distribute this installation and user manual without the written authorization of MKL-Technik GmbH

General Safety Instructions

1. Before using a fall arrester including a rigid anchor line, every user needs to understand and comply with the user instructions.

2. In case personal protective equipment (PPE) will be used, this user instruction must be followed as well.

3. All user instructions must to be provided to the climbing staff on site.

4. The equipment may only be used within the specified operating conditions and for the intended use.

5. Incorrect combination of individual elements of the equipment may result in the impairment or even inefficiency of the safe operation of one or more elements.

6. Guided type fall arresters and the rigid anchor line must be visually inspected before each use. If any damage is determined, or if there are any doubts about proper functioning, the system must not be used. See §8 function test

7. Parts that have been damaged by an accidental falls or simply by using the system must be withdrawn from further use.

8. Manipulating or modifying the fall arrester or rigid rail without the consent of the manufacturer is prohibited.

9. The fall arrester needs to be attached on the front D-ring at belly or chest level on the harness, which has to be certified in accordance to EN 361.

10. Guided type fall arresters are for protection while climbing a vertical access. For any other activities, such as working from a ladder, the climber needs to use proper anchorage equipment, like shock absorbing lanyards / work positioning lanyards, etc.

11. Belly and chest harnesses need to be tight to the body

12. The safety of the user depends on the effectiveness and durability of the equipment. Therefore, guided type fall arresters and their rigid anchor line must be checked annually and within a period of 12 months by a qualified person. Repairs may only be carried out by the manufacturer.

13. It must be ensured that the necessary space below the user is sufficiently large so that in case of a fall no impact on the ground or against another obstacle is possible.

14. In principle, no changes may be made to the system that are not performed by the manufacturer or approved by the manufacturer.

15. All persons working on job sites using PPE against falls need to be in good physical conditions. A medical test, like the German G41 (DGUV 250-449), can help to confirm the condition of a potential climber. Exclusion criteria are e.g. Alcohol and drug use, dizziness, nausea, fear of heights or similar.

16. Fall protection systems may only be used by people that have been trained or that are experienced with the risks associated of high workplaces, and that are aware of how to use fall protection.

17. Before using a rescue plan must be set up specifying how to make rescue activities safe and efficient. When using the plan, the instruction needs to be followed correctly.

18. All information on the fall arrester, the rigid anchor line and PPE needs to be correct and visible to all. An unreadable label is equivalent to a lack of safety.

19. PPE that has gotten wet during use must be dry out naturally. It should be kept away from heaters, stove, sun, etc.

20. Responsible notified body:
TÜV AUSTRIA Deutschland GmbH, Seilfahrt 12, 44809 Bochum, Germany
notified body number: 0408

Beside the installation and user manuals from MKL-Technik GmbH, the following guidelines are important:

European standards and directives

EN 353-1:2014	Personal protective equipment against falls from height Part 1 - Guided type fall arresters including a rigid anchor line
EN 365	Personal protective equipment against falls from a height General requirements for instructions for use, maintenance, periodic examination
EN 361	Personal protective equipment against falls from a height - Full body harnesses
EN 795	Anchor points

This summary might not be complete. Specific guidelines in respect to the individual projects have to be researched by the architects, planers, or installers themselves

The final inspection as well as the annual inspection has to be done accordingly to MKL-Technik GmbH Checklist.

Storage

Ladder segments and accessories have to be transported and stored in a way that mechanical impact, chemicals, sparks, airborne rust, Cement or paint will not effect the lifetime and function of the elements.

Damages at the zinc coating have to be repaired accordingly DIN EN ISO 1461. We do recommend the thick film repair set LZ-09 of company ReiColor (www.reicolor.de) or similar.

Lifetime

The lifetime of installed elements of the fall protection systems is principally dependent upon the category of corrosion in the respective location (weather and atmospheric conditions).

The fall protection systems of MKL-Technik GmbH are available in following materials:

- Hot dipped galvanized Steel (1.0037)
- Anodized Aluminum (3.3206)
- Stainless Steel pickled (1.4401/1.4571)

For the best long-term corrosion protection, we recommend the following use:

	Hot dip galv. Steel	Anodized Aluminum	Stainless Steel
Country Side	X	X	X
Commercial env.	X	X	X
Industral		X	X
Heavy industry			X
Coastal	X	X	X
offshore			X

CAUTION ! Components made of stainless steel quality 1.4401 and 1.4571 must not be installed in high corrosive environment (for instance chloric water or atmosphere in swimming pools). That can potentially cause invisible tension crack corrosion and lead to failing components.

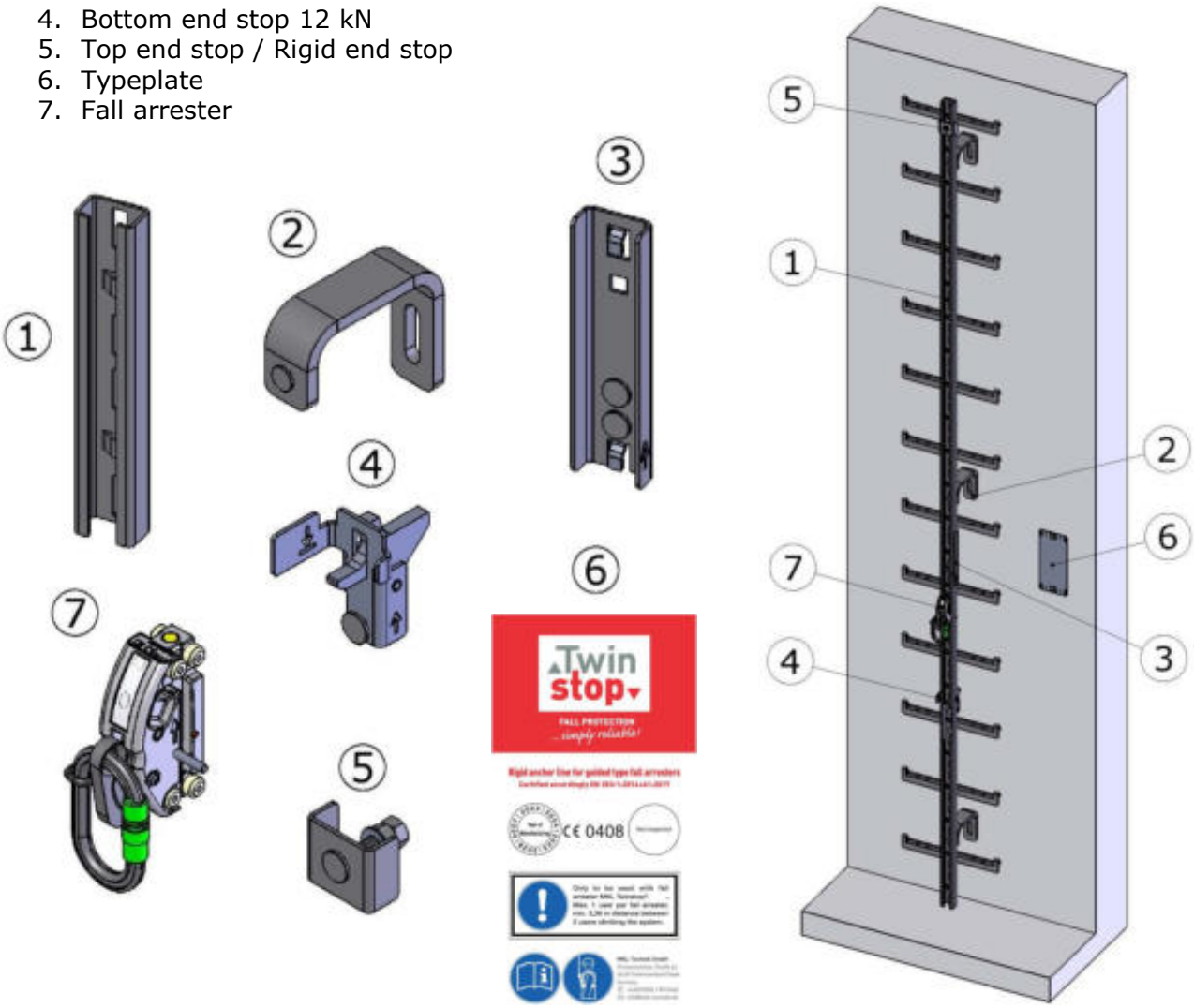
Purpose of guided type fall arresters including a rigid anchor line

Guided type fall arresters including a rigid anchor line provide safe access to higher workplaces and other areas where a risk of falling exists, such as GSM base stations, Power Transmission towers, Wind turbines, etc.
The climber is wearing a full body harness with a front D-ring at stomach or chest level. Through this D-ring the climber is connected to the Twinstop fall arrester which is guided in the fix installed ladder or guide rail system. In case of an accidental fall, the person will be stopped by the arresting mechanism in the shuttle.
The impact of the fall is fully absorbed by substructure of the building; therefore it is of paramount importance to fix the fall protection system on a solid base that can bear the impact of the fall (as described on page 7). Substructures with insufficient strength that can not absorb the static load are life threatening. These substructures must be reinforced before implementing a fall protection system.

Set up of a fall protection system

A standard conform Twinstop® fall protection system basically contents of following components. Components of MKL-Technik origin a recognized by the engrained :

1. Guiderail respectively ladder with integrated guiderail
2. Fastening / Fixation clamp
3. Joint connector
4. Bottom end stop 12 kN
5. Top end stop / Rigid end stop
6. Typeplate
7. Fall arrester



Ladder segments

Length: Our ladders are principally available in length up to 4480 mm max. Intermediate lengths are available in steps of 280 mm, respective to the rung distance. Therefore, the following lengths are available:

Ladder segment	1120	1400	1680	1960	2240	2520	2800	3080	3360	3640	3920	4200	4480
No. of rungs	4	5	6	7	8	9	10	11	12	13	14	15	16

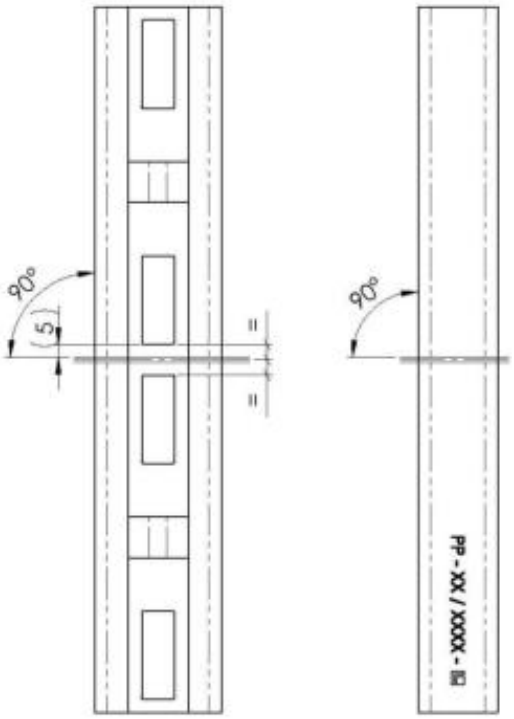
*length in mm

Mounting of the Ladder segments: The maximum joint gap between two ladder segments is 5mm, as a basic rule we are recommending a gap of 3 mm at installations which are made below 0° Celsius and 2 mm at installations made above 0° Celsius temperature of environment.

Standard segment lengths are 2800 mm. A ladder system should use as many consistent 2800 mm segments as possible, and then one or two intermediate lengths when needed.

Example: Tower of 16m = 5x2800mm + 1x1960mm = 15,96m

Rails can be shortened at site accordingly to MKL guidelines, if following steps will be followed:



The cut has to be rectangular to the rail.
If a segment in the between of a system installation, has to be shortened it has to be always in 140 mm steps and centric between the two slots which are near to each other.

Only by following this the joint connecter will continuously fit between the rails.

At ladders you have pay attention that the 280 mm distance between the rungs will be kept. The surface at the cuts have to be burred and coated against corrosion accordingly ISO 1461

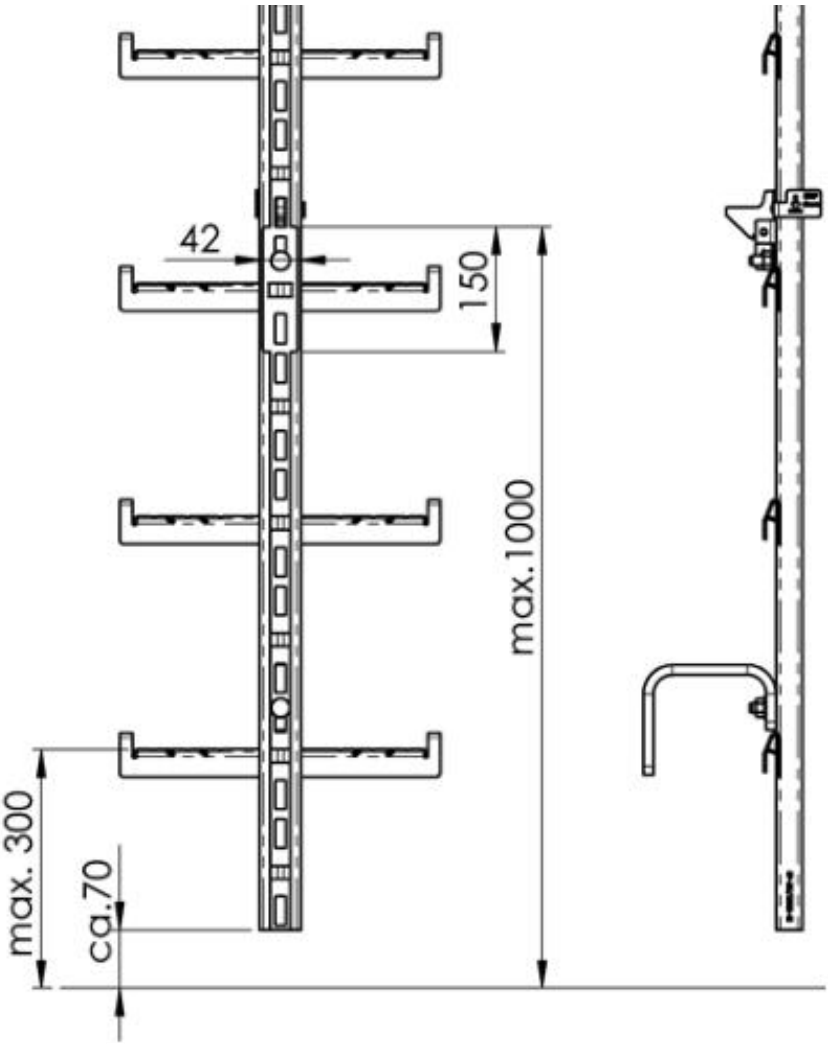
Marking: Individually manufactured and commissioned orders are numbered in ascending order from bottom to top (therefore segment number 1 is the first element installed at the bottom of the structure).

In case of a guiderail installed on an existing ladder, the load capacity of this ladder has to be proofed and confirmed in advance. See chapter *"Force Transmission on Fall Protection Systems"* Page12 in this manual.

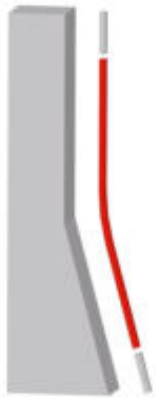
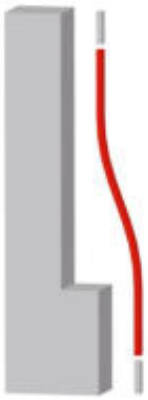
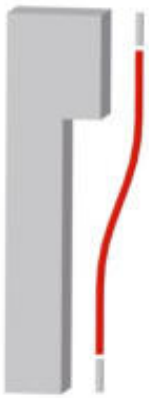
The guiderail has to be installed centric to the ladder. The remaining step left and right of the rail has to be 125 mm. That means the clear width between the side rungs has to be 300 mm(125+50+125 = 300).

Recess: Recesses are made for inserting and removing the fall arrester from the ladder system in an ergonomic position. The recommended position is +1 m from ground level. Since the ladder usually starts at +0,2 m, the recess should be positioned +0,8 m from the bottom end of the ladder.

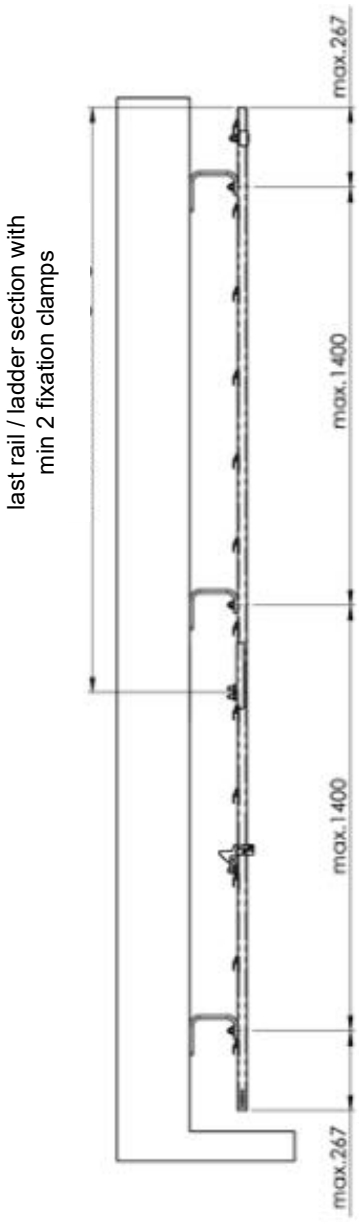
Attention! A recess may not be placed higher than a maximum of 1 m from ground level, or from a secured platform. For any other application (for instance, taking off the fall arrester from somewhere on the ladder, unsecured platforms, etc.) an exit section must be used.



Curving: In order to follow the individual surface of a structure, the ladder segments can be pre-manufactured with curves in a radius of 1.000 mm.

Curve No.1	Curve No.3	Curve No.5
		
Curve No.2	Curve No.4	
		

ATTENTION ! The Twinstop® fall arrester can be used in rails at inclination + 20° or –20° reclined, as well as a sidewise inclination (left and right) of 15°.



ATTENTION ! The last ladder section has to be fastened at at least two fixation brackets.

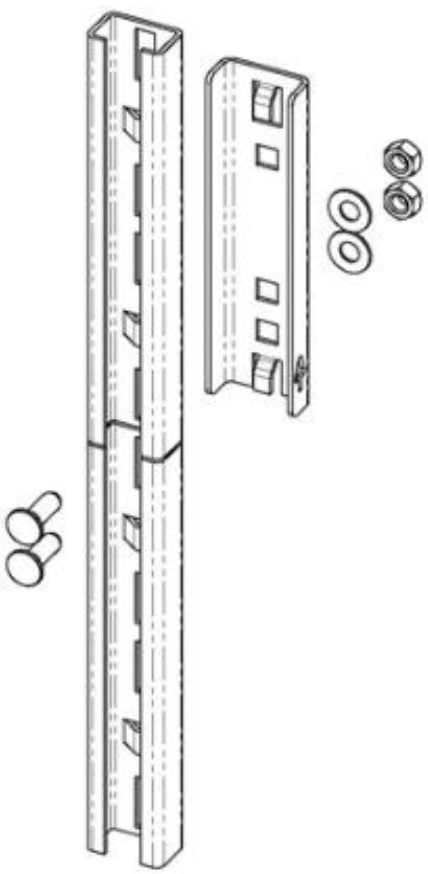
Standoff: Ladders may have a maximum stand off of 267mm above the last fastening element. If a longer stand off is required, the center rail has to be reinforced by a reinforcing profile. In these cases the maximum stand off is 1434 mm.

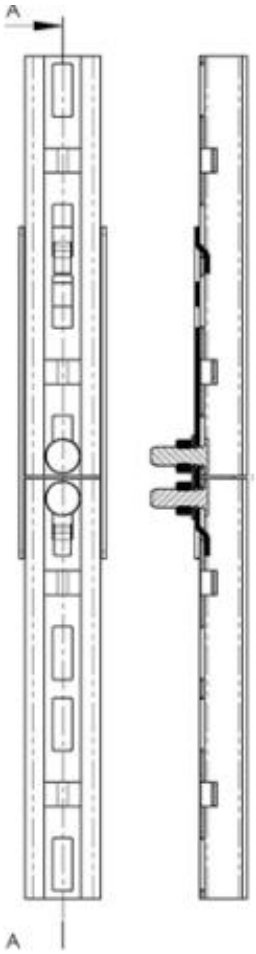
ATTENTION ! At a minimum, the reinforcement must be fastened over the last two brackets of the ladder fasteners. The ladder fasteners have to be at least 1120 mm away from each other. Furthermore, the reinforcement has to be bolted every 560 mm with the reinforcement.

The projection of the fastening elements along the reinforcement has to be reduced by 50 mm versus the projection of the rest.

Ladder position: The position of the ladder must always be upright, that means the punched edge of the rung is up.

Joint Plates: Are principally included in the ladder deliveries. The joint plates are fastened with screws at the respective upper and lower ladder segments.
Additionally, the joint plates are equipped with a metal tongue that fits in the oblong holes of the ladder.
This serves as an additional fastener in case the bolts become loose.
The engraved arrow always has to show upwards.





End stops

Attention! End stops must be placed at the beginning and the end of a ladder. At least one openable end stop per climb way is requested in order to take the fall arrester from the rail. All end stops correspond to type B (breaking load > 12 kN)

Purpose: The end stops prohibit an unintentional disconnect from the systems. Additionally, it insures that the user can not insert the fall arrester up side down into the system.

Position: Every End stop is marked with an arrow. This arrow has to point up. Furthermore, the rigid gate has to be placed to the left of the center rail.

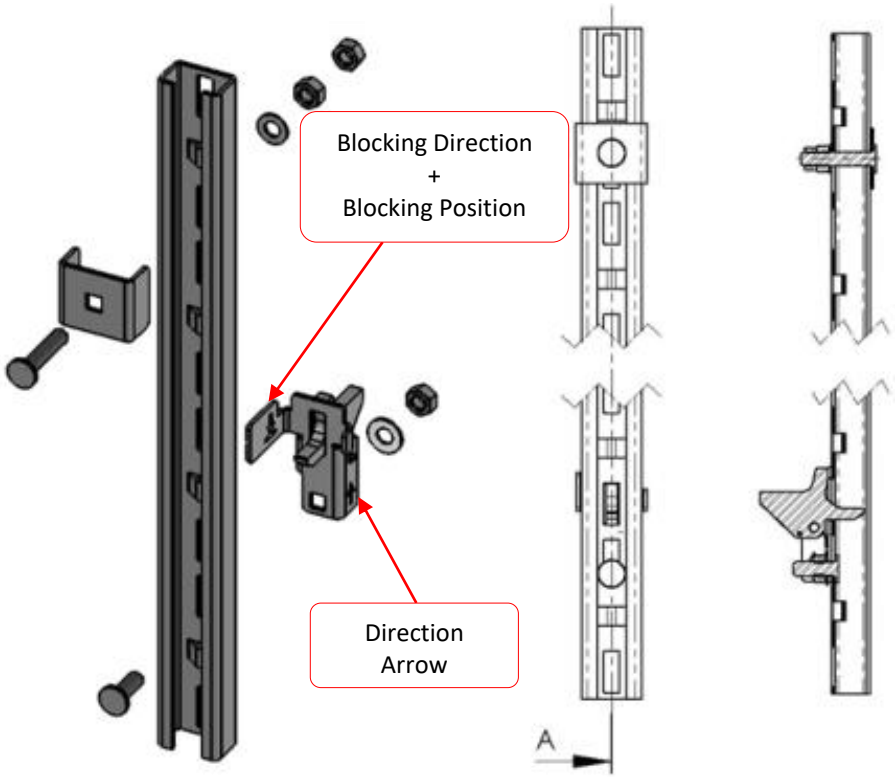
The bottom end stop must be placed immediately after the beginning of the ladder or in cases of a recess, immediately after the recess. The end stop must be placed with a maximum of 280 mm after the beginning of the ladder or respectively above the recess.

According to the latest EN regulation, the breaking load of an end stop must be greater than 12 kN.

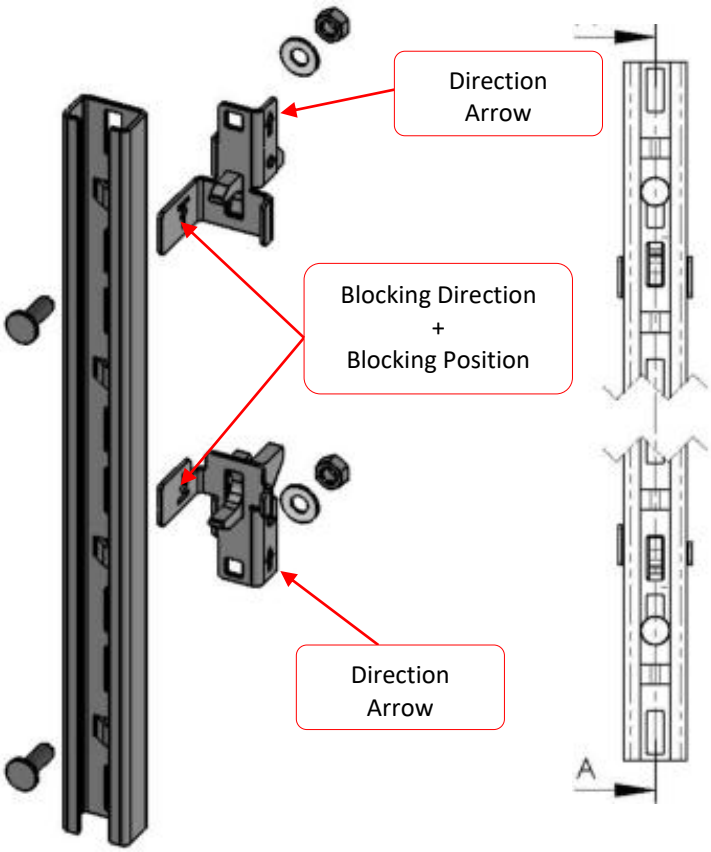
All end stops correspond to type B (breaking load > 12 kN)

The rigid end stop always has to be fixed at the second last hole or below.

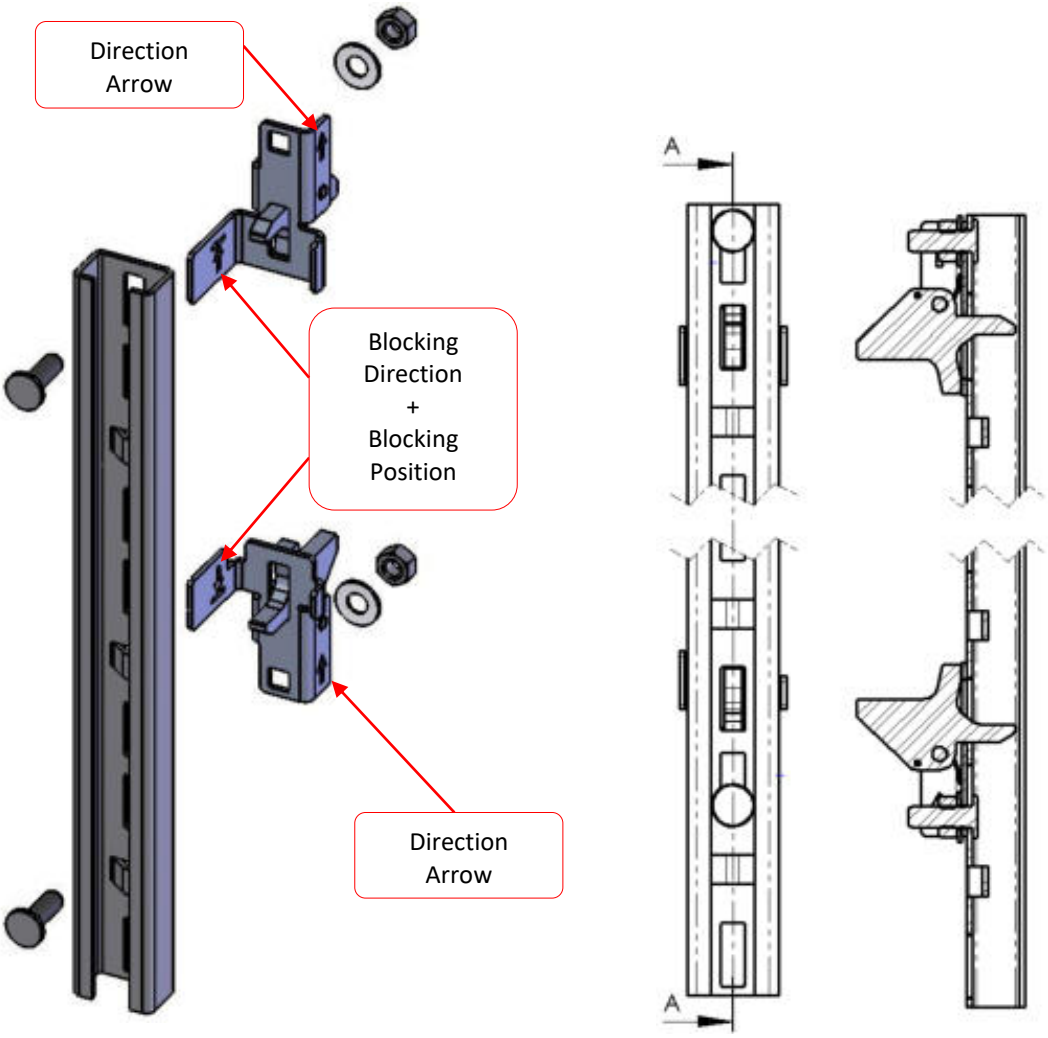
Installation examples below:



Picture shows climb way with openable bottom end stop and rigid top end stop



Picture shows climb way with openable bottom end stop and openable top end stop
Occasionally it might happen, that the guiderail needs to be shortened by 90 mm / 230 mm. In that case the end stop needs to be placed as described below:



Picture shows climb way with openable bottom end stop and openable top end stop

MKL-Technik GmbH
Kirchenlamitzer Str. 20
95126 Schwarzenbach a. d. Saale
Managing Director: Klaus Meister
Register Court Hof, HRB 5002

phone: +49 92848011465
fax : +49 92848011466
mail : info@mkl-technik.de
web : www.mkl-technik.de

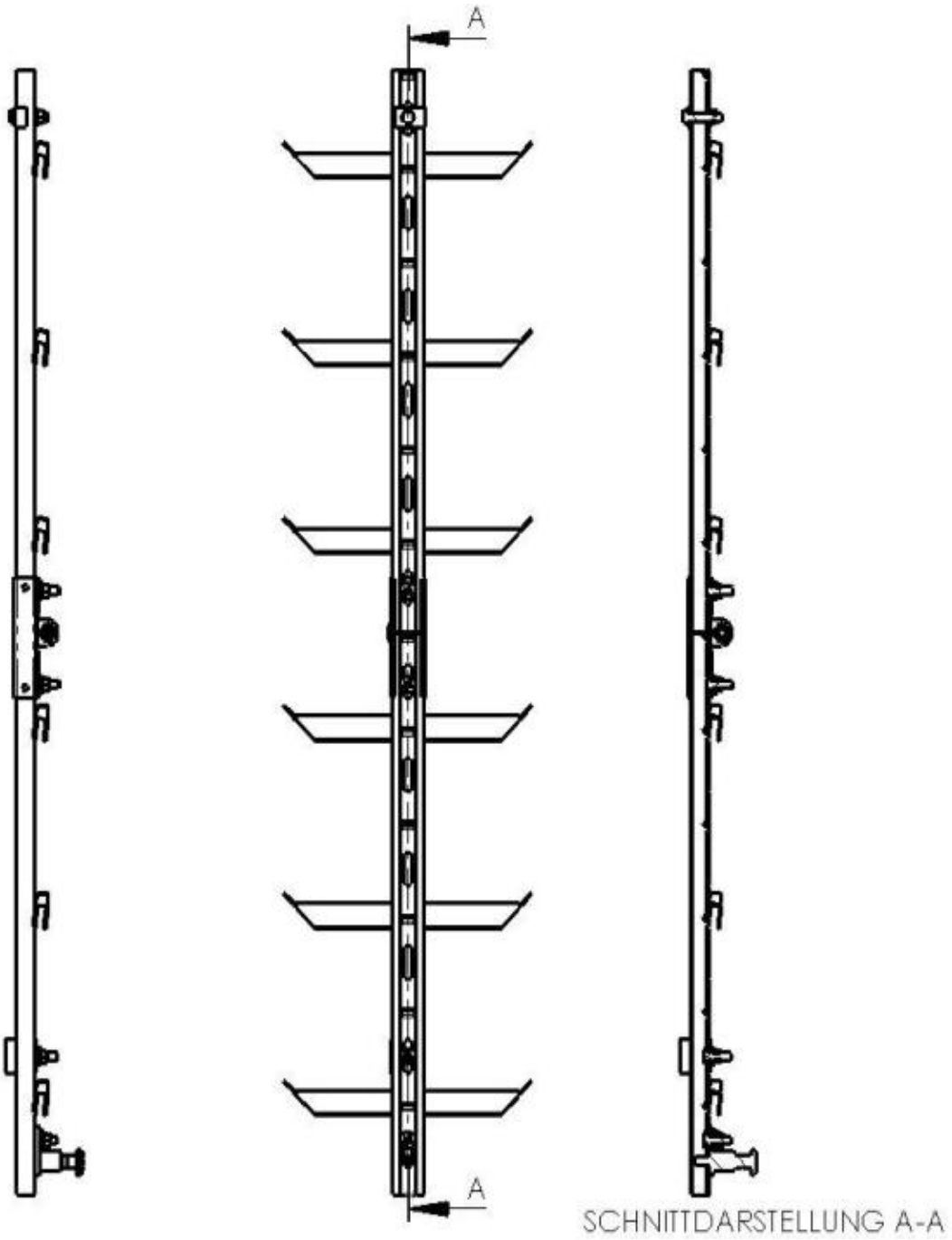
I-type ladder low temperature approved down to -40°C

Rigid Endstop

Joint connector

Slide-in module lock

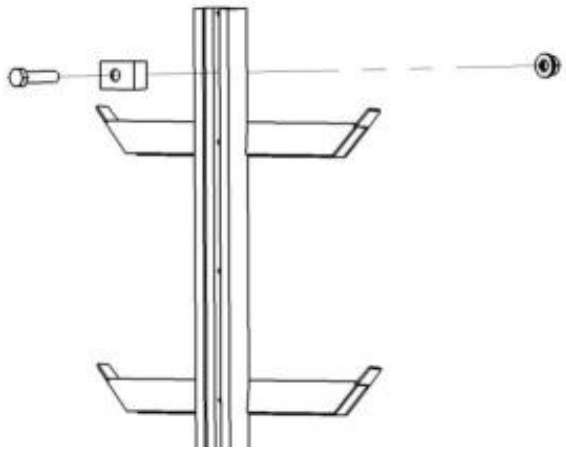
Openable
Endstop



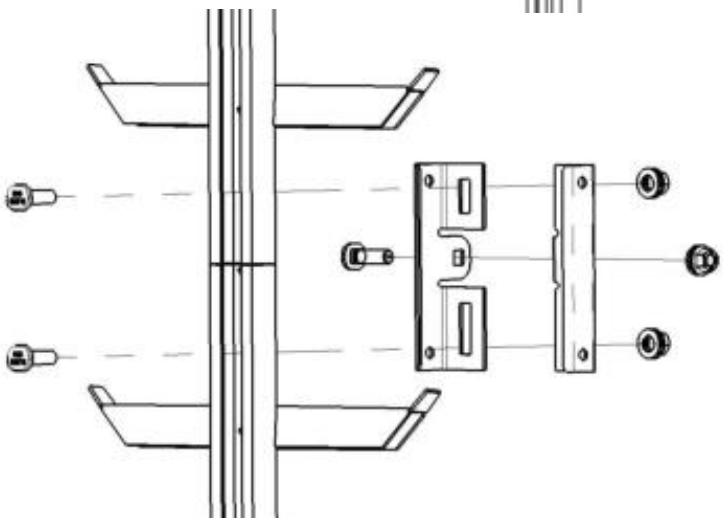
MKL-Technik GmbH
Kirchenlamitzer Str. 20
95126 Schwarzenbach a. d. Saale
Managing Director: Klaus Meister
Register Court Hof, HRB 5002

phone: +49 92848011465
fax : +49 92848011466
mail : info@mkl-technik.de
web : www.mkl-technik.de

Rigid Endstop

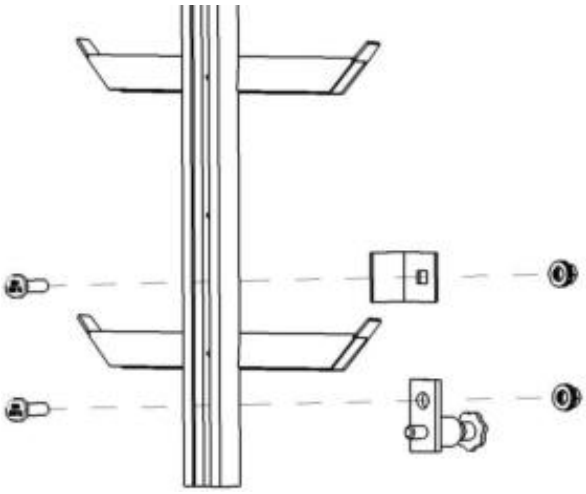


Joint connector



Slide-in module lock

Openable Endstop



The Slide-in module lock must always be mounted in the climbing direction above the openable endstop. It ensures the correct insertion of the fall arrester.

The openable end stop must be placed immediately after the beginning of the ladder or in cases of a recess, immediately after the recess. The end stop must be placed with a maximum of 280 mm after the beginning of the ladder or respectively above the recess.

All end stops correspond to type B (breaking load > 12 kN)

Fastening Elements

Specification: The specification of sufficient fastening elements depends on the substructure of the building where the ladder is to be installed.
In this regard, the geometry (walls, lattice towers, Monopoles, etc) as well as the material of the construction (Steel, reinforced concrete, bricks, etc,) are extremely import.

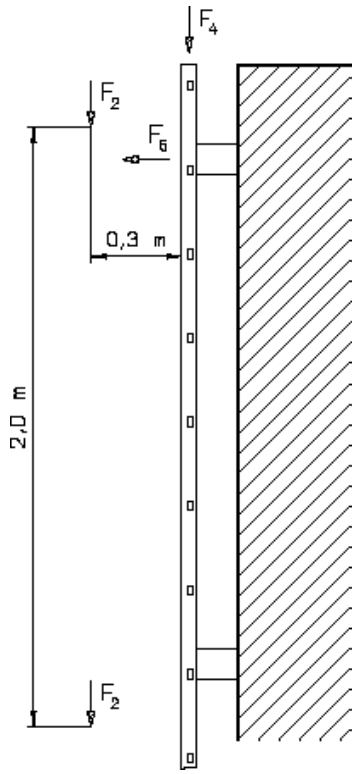
For anchors, the following forces have to be considered:

In order to determine the load capacity of the fastening elements on buildings with unknown or insufficient strength (for instance bricks walls), load tests have to be carried out on site. Preferable, this test should be carried out by the supplier of the dowels.

Torque specification: For fastening a metric galvanized steel bolt M12 - 8.8. we recommending a torque of 40 Nm.
When using self locking nuts M12 accordingly to EN 985, a torque of 60 Nm is recommended.

Force Transmission on Fall Protection Systems:

Accordingly to EN353-1 a fall protection system is impacted 3 minutes with 15 kN in the direction of a fall. In the scenario it has to be proofed that no component is collapsing. Plastically deformation is accepted.
It has to be ensured that the impact of 15 kN can be taken by the substructure as well as by any interfaces in the above mentioned manner.



Accordingly to DIN 18799 following data are requested:

The Delay action load

is an extraordinary load. The delay action load is limited by the shock absorbing element, so that it is 6 kN max. This load F4 needs to be calculated once per total length vertical to the centre rail of a fall arrest system. It can be considered to be shared by max. 4 fixation elements if available. This impact is generated by an accidental fall. See sketch.

Working load
The Working load is an ordinary load, its generated by the weight of the climbing person. It needs to be calculated with load F2 = 1,5 kN, which is generated 30 cm in front of the center rail, as well as with load F5 = 0,3 kN horizontal from the center rail. Since this load is the equivalent for a person climbing the ladder, it needs to repeat every 2 m. The working load must be assumed every 2 m over the total length of the ladder.

The two variants are to be compared and the worse load case is to be used for the dimensioning of the fastening and substructure.

Fastening distance: The recommended fastening distance is 1120 mm, the maximum distance is 1400 mm. However, you need to ensure that the load is allocated in such a way that the substructure can resist the accidental impact of 6 kN.

MKL can provide all necessary parameters to determine the static capacities.

ATTENTION! Each ladder segment has to be fastened at least once to the substructure, the last ladder segment twice. This is true even if the length of the ladder segment is less than 1400 mm and the advantage of the maximum distance of 1400 mm can't be fully taken.

The number of fastening elements a ladder way needs must be determined. It must be sufficient enough to bear the normal traffic load as well as the extraordinary stopping load in cases of accidents.

Projection: In order to provide an ergonomic stance on the ladder, the distance of the ladder from the construction should be 150 mm. This is in reference to the standard projection of our brackets and clamps.

In curved sections as well as in the area of additional parts (e.g. reinforcements), the projection has to be long enough to ensure that the ladder does not touch the construction.

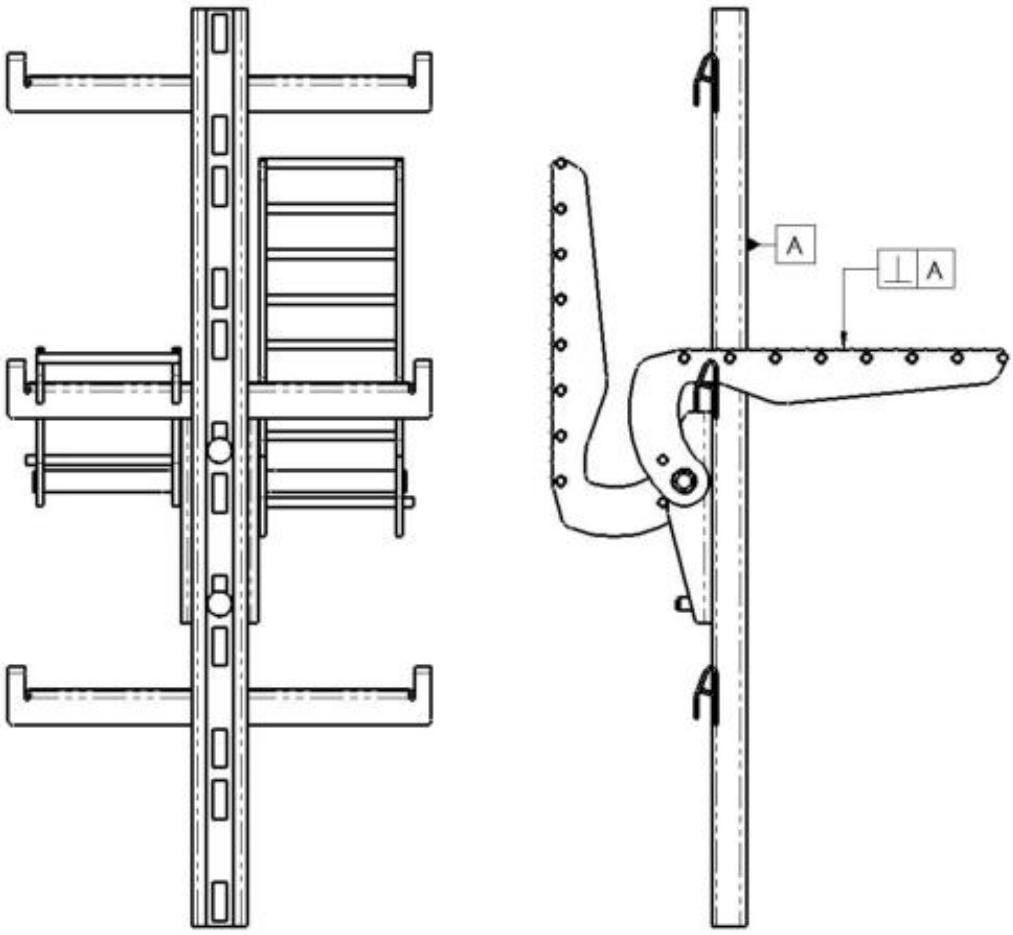
Footrests

Depending on the structure, resting platforms are to be planned and installed in the on the ladder. The distance and the resulting number of footrests are to be taken from the corresponding regulations by country and structure.

Basically, we recommend the following installation of resting platforms:

Structure	**Distance between footrests**
Machinery	6 m
Antenna structures	25 m
Other structures	10 m

Footrests are to be mounted so that the tread surface is in the unfolded state perpendicular to the rail.
In addition, these are to be mounted directly above or below a mounting bracket and not near rail joints.



Picture shows a mounted Footrest

Installation

In order to ensure a safe and economic installation, we strongly recommend performing the installation with minimum 2 people.

In this regard we point out that 2 complete sets of PPE are needed. Furthermore, we recommend having a rescue device with lifting device for each team. If there is an accident, the casualty can be evacuated immediately from the ladder.

A rescue plan should be always located on site.

DGUV Prescribtion 1
The employer has to provide sufficiant equipment and staff to execute first aid at site.
The employer has to ensure that first aid and medical service is provided immediately after an accident.

DGUV Information 203-047
The employer has to set up proper procedures to rescue casualties from power transmission lines, and to ensure that the necessary devices and equipment to rescue people is available.
The employer has to take care that the insurant can execute an alert in case of an accident and is having the necessary devices for instance walky talkies

DGUV 112-198
For the event of an accident proper measurements have to be taken for an immediate rescue service. Suspending in a harness for more than 20 minutes can cause life danger.

Using of ladders
Our ladders are made to be used with one person every two meters, considered that the substructure is proofed for this impact (6 kN for the first person and 1,5 kN for each further person).

Please familiarize yourself with all safety norms and procedures that pertain to your individual country.

List of recommended Tools

1 Plummet – colored string (alternative Laser)
1 Deflection Pulley / Pulley Block with rope (9 mm stranded respect. braided) Length appropriated the height of the construction
2 Carabiners
2 webbing slings á 1 m
Ring ratchet spanner SW17; SW19, SW24
Fork wrench SW17; SW19, SW24
Socket wrench SW17; SW19, SW24
Measuring tape (min. 3 m)
1000 g Hammer
Rechargeable drill (alternative drill + extension cable)
Portable Aluminum ladder 2 m
Level
Tool Bag
Walkie-Talkie
PPE

This list represents most of tools needed for installing an MKL fall protection system, However, it might not cover all eventualities at the installation site.

Placing of the Fasteners

Preferably, the fastening of the ladder segments should be done from a safe level. Ideally you should try to pre install the ladder before erecting the tower (on monopoles for instance).

In cases where the tower has to be erected in segments, make sure the ladder piece at the joint section of the tower segments are taken off while the tower segments are joined together. Otherwise a ladder segment that stands away from the tower segment might be damage during the process of placing the elements.

Furthermore, the end of the preinstalled ladder should be max. 0,84 m from the end of the tower section, so that the person erecting the tower can reach the joint section safely from the preinstalled ladder.

Installing a ladder on an existing construction

Installing from a lifting platform or scaffold

The most efficient and safe way to install a ladder on an existing construction is to use a lifting platform or scaffold.

One person will go up to the top by using the lift or scaffold and mark the top fastening point and lower a plummet from this point. The second person will mark the bottom fastening point in line with the plummet. Alternatively, the ladder line can be marked with a laser.

Afterwards the fastening distance has to market along the line, and the holes for the plug in will be set from bottom to top. In case of brackets with two fastening holes, we recommend using a level to mark the holes left and right of the vertical marked line

The drilling of the holes and the setting of the dowels needs to be done in accordance to the dowel manufacturer’s instruction.

On lattice or monopole constructions, the clamps will follow the structure automatically.

After all holes are placed, the ladder has to be mounted from bottom to top. Before using the ladder with a fall arrester, the bottom end stop has to be in place.

Before using the fall arrester the locking function has to be tested

ATTENTION! The red plastic string at the top end of a ladder section must not be removed until the next ladder section is fastened with the joint plate at the top end of the previous ladder.

At the last section a Top End stop has to be placed before taking the red string away.

ATTENTION! When installing the ladder on a non metallic construction (e.g. brick walls, concrete) make sure that a gap of 2-5 mm is kept between the joint plates. This is needed to avoid distortions cause by changing temperatures

Installation Top Rope

During an installation Top Rope, the person at the top has to act like described in the paragraph "Installation from lifting Platforms / scaffolds". However, this person has to be trained and experienced in alpine climbing techniques and rope fastenings.
Furthermore, it is essential to have an anchor point certified in accordance to EN 795 at the top.

Installation from the ladder

In order to mark the vertical position of the ladder it is of an advantage to have a laser, otherwise a plummet has to be tied outside the rung of the respective next ladder segment above the climber.

The upper ladder segment has to be placed in such a way that the plummet comes in line with the ladder segments below.

If the installation is done from the ladder, it is necessary for the installer to have a 2m portable ladder, so that the first fall protection ladder segment can be fastened twice before climbing onto it.

The fastening distance should be a maximum of 1400 mm. This will provide an ergonomic standpoint to drill the fasteners.

ATTENTION! While installing segments, the climber has to be secured by a secondary means to a solid base, preferable at the ladder bracket. The maximum distance a fall arrester can be used above the last bracket is 350 mm.

Marking

A type plate has to be placed at the very beginning of each rail way, as well as on every entry section that can be accessed from any place other than the ground level.

Twinstop

certifies the conformity of a rail system that must be used with Twinstop® fall arrester

EN 353-1:2014+ A1:2017
European standard designation number

Date of manufacturing
must correspond with the year of construction

CE 0408
EC-type examination conformity stamp and NB-number of the notified body

Use only with fall arrester type Twinstop®

User and maintenance instructions available, these must be read before using.

Use a full body harness must comply to EN 361

MKL-Technik GmbH
Manufacturer of the guided type fall arresters including a rigid anchor line

Rigid anchor line for guided type fall arresters
Certified accordingly EN 353-1:2014+A1:2017

CE 0408

Checklist for final Inspection

The attached checklist has to be fully and correctly filled in. If one or more of the criteria are not or can not be fulfilled, it must be reported immediately and the failure must be corrected before use. The safety engineer or a competent person has the responsibility of correctly and completely filling out the checklist. After this person is certain that all features have been checked and deemed safe, he or she must sign the checklist.

Annual Inspection

EN 365

The owner has to inspect Personal Protective Equipment and Safe Climbing Systems on demand according to the application, situation and environment. At the very least, these systems must be inspected annually by a competent Person.

Principally, Personal Protective Equipment and Safe Climbing Systems have to be inspected visually for defects and proper functioning before each use.

Failures and defects have to be announced and reported to the owner. The systems and personal protection equipment must not be used until the system or personal protection equipment is repaired.

Visual inspection before climbing

Before each use, the climber must check the proper condition of the fall arrest device. The following points are to be considered:

- The type label corresponds to the name of the fall arrest device
- The last inspection is no longer than 12 months
- Lower climbing barrier available
- Upper step lock / end stop available
- Fastening distance of the brackets not more than 5 rungs
- No corrosion or cross-sectional corrosion
- no deformed parts
- no mechanical effects
- no loose parts

Maintenance and Care

As a rule, MKL-Technik GmbH does not have to be separately serviced. All components are designed to work without lubrication.
If contamination by cement, paint, glue, etc., remove with a wire brush or sharp-edged tool. For moving parts, continue until the complete function is restored. For spring loaded parts, until the moving part moves independently into the rest position. Connect spot with zinc paint generously.

This manual is just a translation. Only the German version is valid.

Checklist for vertical anchor line (guide rail / ladder) for guided type fall arrester Twinstop®

Principals

The EN 365 and German BGV D36 and "DGUV 112-198" are requiring a competent person to inspect the fall protection system after the final installation. Furthermore, regular inspections have to be carried out on demand. On demand means after any type of incidents, in case the system has been modified, and the frequency, stress at using the system occurrence and seriousness of the lacks of previous inspections. At least inspections have to be done annually.

The results of this examination have to be recorded on the form below and achieved by the owner and/or by the inspector (competent person).

Control Sheet

1. Object-Number .....

2. Site

- Street .....
- City .....
- User .....

.....

3. Manufacturer / Supplier

- Name .....
- Street .....
- City .....
-

4. Installed by

- Name .....
- Street .....
- City .....

5. Date of Installation .....

Checklist for vertical anchor line (guide rail / ladder)
for guided type fall arrester Twinstop®

6. Signature of the competent person

- Name .....
- Address .....
- Phone / Fax .....
- Date / City .....
- Signature .....

7. Guide Rail Structure

- Length .....
- Building .....
- Top End-stop ☐
- Bottom End-stop ☐
- Rigid End-stop ☐
- Exit Section ☐
- Turntable ☐
- other .....

8. Material

- Steel galvanized ☐
- Stainless Steel ☐
- Aluminum ☐

9. Style

- Guide Rail ☐
- I-Type Ladder ☐
- H-Type Ladder ☐

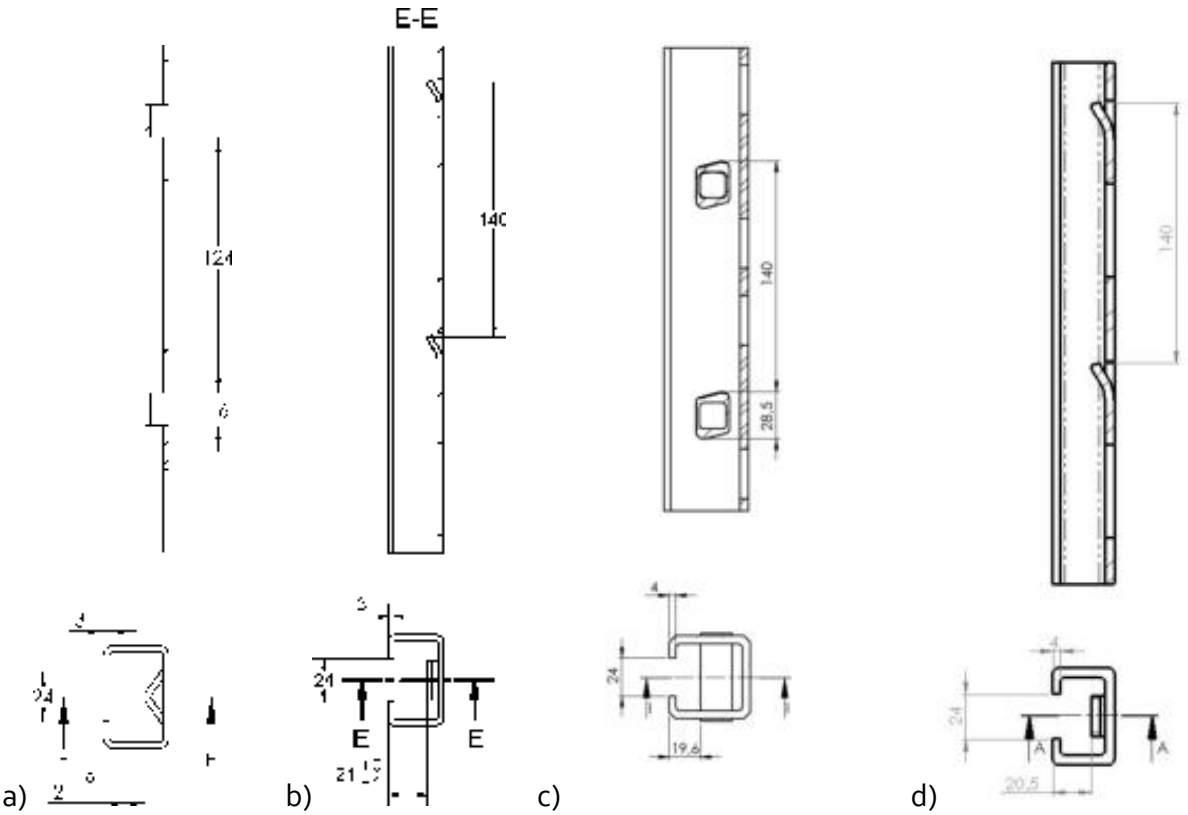
Checklist for vertical anchor line (guide rail / ladder)
for guided type fall arrester Twinstop®

10. Profile Parameters

The following profile cross sections are available:

☐ Steel rails (hot-dip galvanized) with C shape profile With tunnel catches 140mm, as a ladder or guide rail	50x31,5 mm Illustration "a"
☐ Steel rails (hot-dip galvanized) with C shape profile With catches 140mm, as a ladder	50x30 mm Illustration "b"
☐ Stainless Steel rails (pickled) with C shape profile With tunnel catches 140mm, as a ladder or guide rail	50x31,5 mm Illustration "a"
☐ Aluminum rails with C shape profile With catches 140mm, as a ladder	52x51 mm Illustration „c"
☐ Aluminum rails with C shape profile With catches 140mm, as a guide rail	52x33 mm Illustration „d"

Following profile cross sections:



Checklist for vertical anchor line (guide rail / ladder)
for guided type fall arrester Twinstop®

11. Checklist for final Inspection

Test Criteria	Test OK/Not OK		Remarks	Date
Element				
Each segment is fastened with min. one, the uppest with min. two Fixation Element	☐	☐	.....	.....
recommended Fastening Distance	☐	☐	.....	.....
Gap at the Joint Plates	☐	☐	.....	.....
Bottom End-stop	☐	☐	.....	.....
Top End-stop	☐	☐	.....	.....
Access from top, rigid platform at lower end of the ladder	☐	☐	.....	.....
Access from top, Bottom End-stop min. 2 m above platform	☐	☐	.....	.....
Lowest rung max. 300 mm above ground	☐	☐	.....	.....
Uppest rung max. 100 mm under exit edge	☐	☐	.....	.....
Bottom End of Guide Rail max. 800 mm above ground	☐	☐	.....	.....
Rail inclination	☐	☐	.....	.....
Rail Stand Off	☐	☐	.....	.....
Reinforced	☐	☐	.....	.....
Footrests (number & distance)	☐	☐	.....	.....
Only MKL Components	☐	☐	.....	.....
Static certification of non Original parts	☐	☐	.....	.....
Corrosion Protection	☐	☐	.....	.....

Checklist for vertical anchor line (guide rail / ladder) for guided type fall arrester Twinstop®

	Test	Remarks	Date
Test Criteria	OK/Not OK		
Bolt Connection			
Rail - Rail	☐ ☐	.....	.....
Rail-Fixation Elements	☐ ☐	.....	.....
Fastening element-Structure	☐ ☐	.....	.....
Cover plate			
Operative	☐ ☐	.....	.....
Key handed over	☐ ☐	.....	.....
Using			
Steps- and Running Tread free of dirt	☐ ☐	.....	.....
Rail is not deformed	☐ ☐	.....	.....
Rescue Plan available	☐ ☐	.....	.....
Type-plate installed	☐ ☐	.....	.....
Fall Arrester can be inserted	☐ ☐	.....	.....
Fall Arrester is operating	☐ ☐	.....	.....
Test Climb has been examined	☐ ☐	.....	.....
Documentation			
User Manuals was handed over	☐ ☐	.....	.....
Conclusion	yes / no		
Release granted	☐ ☐	.....	.....

Date .....

Signature .....

Please Cross the respective condition ☒ or express with words.

Checklist for vertical anchor line (guide rail / ladder)
for guided type fall arrester Twinstop®

12. Repeating inspection

Test Criteria	1.Insp. OK/n.OK		2.Insp. OK/n.OK		3.Insp. OK/n.OK		4.Insp. OK/n.OK		5.Insp. OK/n.OK	
Guide Rail										
Deformation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Damages (e.g. Cracks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Corrosion, Abrasion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sharp Edge, Burr	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Rungs on Ladder										
Deformation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Damages (e.g. Cracks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Corrosion, Abrasion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sharp Edge, Burr	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lateral guidance										
Deformation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Damages (e.g. Cracks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Corrosion, Abrasion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sharp Edge, Burr	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Welds										
Cracks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Corrosion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fixation at Substructure										
Brackets fastened tight	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Solid substructure	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Footrests										
Fixation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Damages (e.g. Cracks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Corrosion, Abrasion	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sharp Edge, Burr	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Checklist for vertical anchor line (guide rail / ladder) for guided type fall arrester Twinstop®

Test Criteria	1.Insp. OK/n.OK		2.Insp. OK/n.OK		3.Insp. OK/n.OK		4.Insp. OK/n.OK		5.Insp. OK/n.OK	
End-stops										
Deformation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Damages (e.g. Cracks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
General										
Visual Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Function Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Type Plate	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
User manual	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Conclusion	yes / no		yes / no		yes / no		yes / no		yes / no	
Release granted	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Date _____ _____ _____ _____ _____

Signature _____ _____ _____ _____ _____

Please cross the respective condition ☒ or express with words.

MKL-Technik GmbH
Kirchenlamitzer Str. 20
95126 Schwarzenbach a. d. Saale
Managing Director: Klaus Meister
Register Court Hof, HRB 5002

phone: +49 92848011465
fax : +49 92848011466
mail : info@mkl-technik.de
web : www.mkl-technik.de