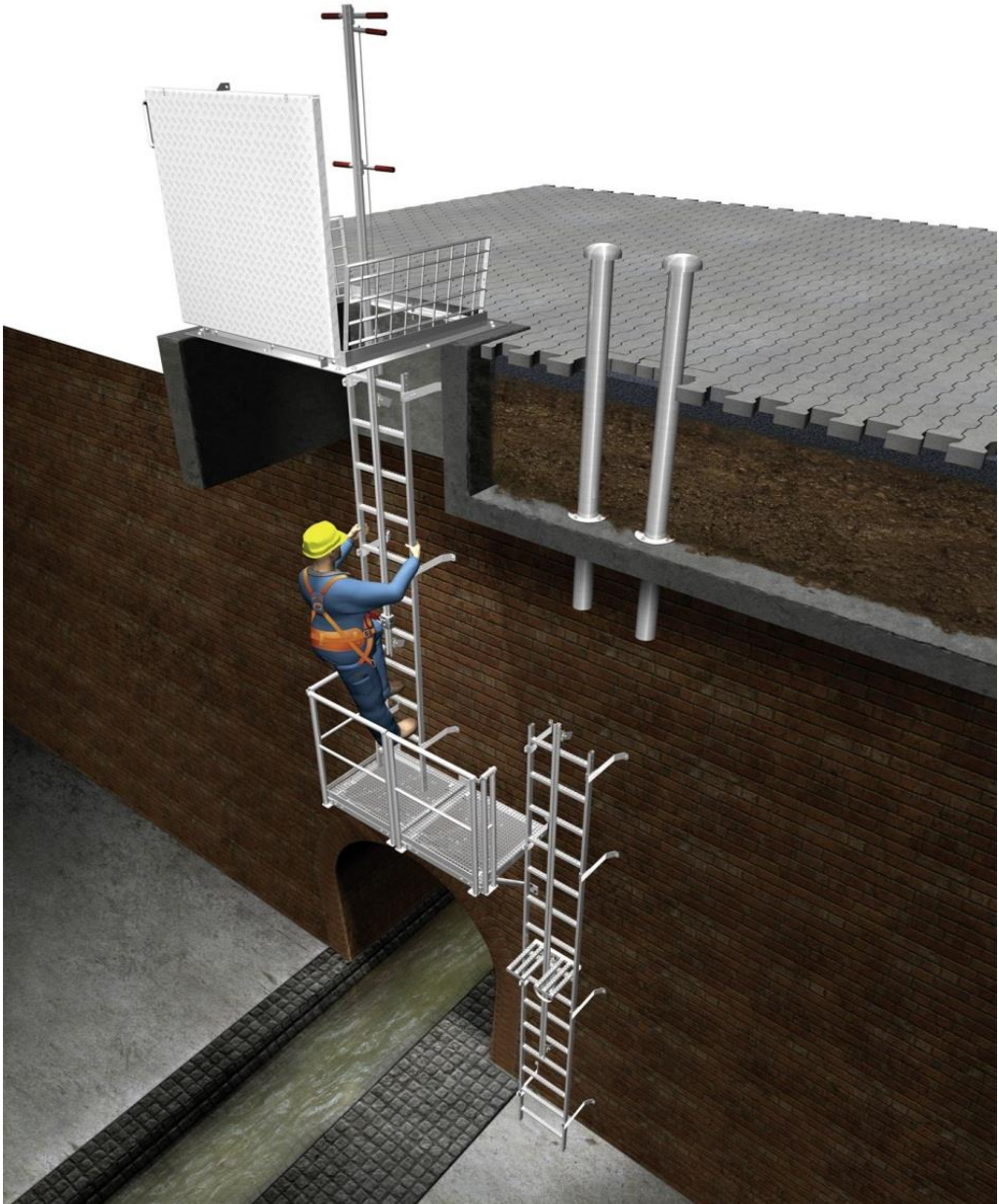
Instructions for the installation and use of fixed vertical ladders in stainless steel, galvanised steel and plastic

DIN EN 14396, DIN 18799-1, DIN EN ISO 14122-4, DIN 19752



Introduction

Dear Customer

In purchasing this Vertical Ladder System, you have opted for a quality Hailo product.

We thank you for your trust in us.

These instructions for installation and use describe how to install, use, maintain and test the Vertical Ladder System.

Please read these instructions thoroughly and take note of all the safety advice provided before commencing installation and use of the vertical ladder.

The warranty will be invalidated in the event of damage arising due to failure to comply with these instructions and the safety advice. We accept no liability for consequential losses arising from this.

If you have any questions or comments about our vertical ladder systems, please don't hesitate to call us.

We'd be delighted to assist.

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The vertical ladder systems described in these instructions for installation and use comply with DIN EN 14396, DIN 18799-1 and DIN EN ISO 14122-4.

The essential components of our vertical ladder systems have been type-approved by the testing and certification centres below:

TÜV Austria Services GmbH
Deutschstraße 10
A – 1230 Wien

IMPORTANT TELEPHONE NUMBERS:

We recommend each user to store the following Telephone numbers in tier mobile phone.

Emergency:

Fire department:

Operator of the system:

Hailo service number:

Orther important telepohone numbers:

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1. Preliminary advice

How to use the instructions for installation and use

These instructions for installation and use are to be read carefully and the contents noted before installing and using the Vertical Ladder System.

The plant operator must ensure that these instructions for installation and use are kept on site with the Vertical Ladder System (or in a suitable place) and can be made available to users at all times when required.

Texts and drawings tagged with the symbols below flag up content and hazards that are of particular significance.
Failure to comply with this advice may result in injury or death in some cases.

Symbols used in this manual:

General safety advice

Risk of falling

General instructions

Refer to documentation

Use Personal Protective Equipment (PPE) to prevent falls

Tip / Additional advice

General regulations

The German regulations on workplaces [Arbeitsstättenverordnung] require ladders (incl. accessories) to be tested on a regular basis by authorised and qualified personnel to ensure that they are in good working order. The intervals between tests are to be laid down by the contractor (i.e. operator) and based on operating conditions.

Check sheets are available on request from Hailo free of charge.

Operators are responsible for:

- ensuring compliance with local, regional and national regulations
- observing that the rules and regulations referred to in these instructions for installation and use (i.e. legislation, directives, guidelines, etc.) are properly applied
- ensuring that these instructions for installation and use are made available to personnel installing and operating the system prior to installation and that the information provided – e.g. advice, warnings and safety requirements – are followed in all respects
- complying with the different regulations that are to be adhered to in each case in the planning and installation of vertical ladders in accordance with:
  DIN EN 14396
  DIN 18799-1
  DIN EN ISO 14122-4

2. Safety instructions

Instructions for the installation and use of fixed vertical ladders

The warranty will be invalidated in the event of a failure to comply with the safety instructions on pages 6 and 7.

Fall protection

In accordance with DIN 18799-1, fall protection must be provided above a fall height of 3 m.

In accordance with DIN 14122-4, fall protection must be provided above a fall height of 3 m.

In accordance with DIN 18799-1 and DIN EN ISO 14122-4, only EN 353-1 compliant fall protection is permitted when climbing to heights in excess of 10 m using a one–piece ladder.

In accordance with DIN EN 14396, DIN 18799-1 and DIN EN ISO 14122-4, operators must ensure that when using an EN 353-1 compliant fall protection system the user is able to attach and remove the connecting piece between the fall arrester and the safety harness from a position of safety.

Compliance with the safety instructions and safety regulations is a requirement for the safe handling and sound installation and use of the vertical ladder.

These instructions for installation and use are to be observed by all personnel who install and use the vertical ladder

Furthermore, accident prevention regulations are to be observed which apply to the respective place of use.

When using a vertical ladder with a safety cage, no additional use may be made of an EN 353-1 compliant fall arrest system.
This is because it is not possible to install a rescue system for reasons of space.

- Every time the system is used, check first that the space in the working area below the user is clear so that in the event of a fall there will be no impact with any obstacle.
- A visual inspection of the system is to be carried out each time before use.
- The user must be physically and mentally capable of accessing the respective system. If the user has been required to take medication prior to using the equipment, it is advisable to find out about possible side-effects which might result in impairment or physical injury when using the system.
- Prior to starting work, the user must seek information from the respective plant operator regarding any rescue measures that might be necessary, and about how to initiate and execute them.
- In addition, the user must familiarise themselves beforehand with the local conditions in order to establish whether any specific areas at the site constitute a hazard.
- During the installation and use of accessories for this system, the accompanying instructions are to be observed in each case.
- Gloves must be worn when installing and using the ladder.
- The vertical ladder is to be used solely in accordance with the regulations and in a safe and sound condition.
- The system or system components are to be withdrawn from service if there is any doubt arising as to its safe condition.
  This must be carried out by the manufacturer or by other trained personnel.
- No change or addition to the equipment should be undertaken without the express prior agreement of the manufacturer in writing otherwise the warranty expires.
  Exception: The lower rungs are not safety or certification relevant, can therefore be shortened as required. Care must be taken to ensure that the work is carried out correctly and cleanly. For galvanized conductors, the interfaces must be sealed with zinc spray / paint.
- Any necessary repair work must be carried out in compliance with the procedures specified by the manufacturer.
- When undertaking installation, servicing or repair work, ensure that no scaffolding, platforms or any other items project into the potential fall area, thus constituting an additional danger in the event of a fall.

3. Standards and regulations

DGUV 1	General regulations
DGUV 38	Construction work
DGUV 312- 906	Principles for selection and proof of qualifications of trained personnel For personal protective equipment to prevent falls (PPE)
DGUV 208-016	Instructions for handling ladders and steps
DGUV 208-032	Waste water plants
DGUV 22	Working in tanks and in confined spaces
DGUV 113-004	Ladder access to tanks and enclosed spaces
DIN EN 14396	Fixed vertical ladders for shafts
DIN 18799-1	Fixed vertical ladders on construction works Part 1: Vertical ladders with uprights
DIN EN ISO 14122-4	Safety of machinery – permanent means of access to machinery Part 4: Fixed vertical ladders
DIN 19572	Handholds for entrance into accessible manholes

This list contains essential standards and regulations, it does not claim to be complete.
Other regulations may have to be observed depending on the installation situation.

4. Warranty and liability

Compliance with the safety instructions and safety regulations is a requirement for the safe handling and sound installation and use of the vertical ladder.

These instructions for installation and use are to be observed by all personnel who install and use the vertical ladder

Furthermore, accident prevention regulations are to be observed which apply to the respective place of use.

No liability is accepted for damage to persons or property which arises for the following reasons:

- Improper installation and use of the fixed vertical ladder and its attachments.
- Improper use of the fixed vertical ladder and its attachments.
- Use of the fixed vertical ladder when it is unsafe to do so.
- Non-compliance with or ignorance of these instructions for installation and use.
- Structural modifications undertaken to the vertical ladder system by the operator.
- Use of parts other than original parts.
- Inadequately trained installation personnel and users.

5. General installation instructions

5.1 Preliminary advice and installation guidelines

- Before commencing installation, first ensure that the requisite loads can be accommodated by the structure.
- If documentation confirming this is not available, then a statics report which takes account of the requisite load accommodation is mandatory and must be provided.
- If the necessary proof (that the customer has ensured safe load accommodation) is not provided, then in the event of damage the manufacturer may refrain from providing product liability. Liability then passes to the operator.

Installation personnel

- The personnel installing the vertical ladder system must be suitably qualified. Training from the fastener manufacturer may be required.
- The installation personnel must not be secured to the system being installed.
- An EN 795-compliant approved fastening point on the building or on some other structure is to be used.

Installing the ladder system

- Only clean and undamaged system parts are to be used. Damaged parts must be replaced using new parts.

Installation report

- The installation of the Vertical Ladder System is to be documented in full by the manager of the company installing the system.

Warning: Risk of falling
When installing the ladder system, use an
EN 363 - compliant fall arrest system

Instructions for fastening the system to the structure

- The anchor points and their connections (i.e. brackets and means of attachment) must be capable of accommodating the loads.
- The anchor points and wall brackets may not exceed a vertical distance of 1960 mm (i.e. 7 rungs) and must always be arranged in pairs on either side of the ladder at one level.
- For concrete structures, only wall plugs permitted under building regulations may be used. Follow the fitting instructions provided by the manufacturer of the wall plugs.

Installing ladders on concrete structures

- A concrete quality of at least B25 when using safety cage system and B35, C30 / 37 when using fall arrest system is required.

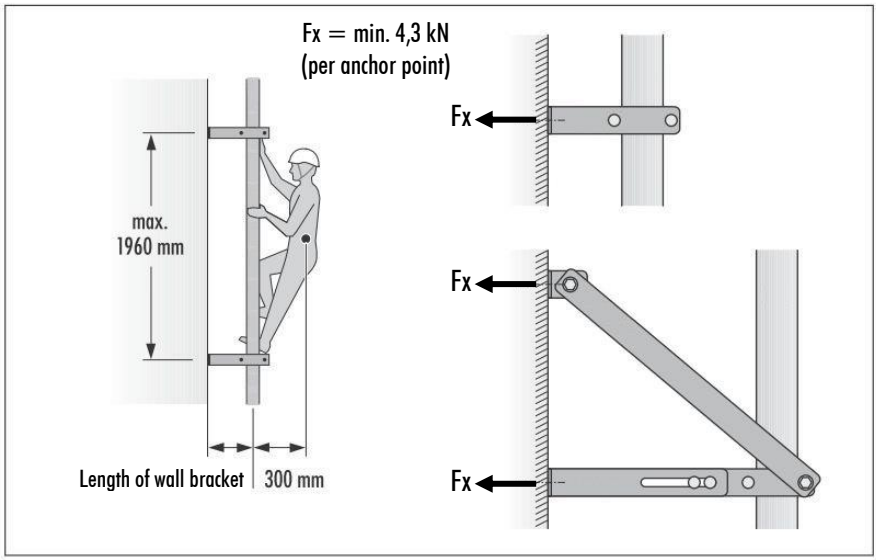
Installing ladders on masonry structures

- Where the supporting material is not defined, a system for affixing the ladder system is to be agreed with the designer of the supporting framework.
- It is also possible to anchor the system through the masonry using a counter plate. This is to be discussed and verified with the structural engineer.

Bolt torques M_A (Nm)

	Galv. steel	Stainless steel (A2 + A4)	
	8.8	10.9	A 70
M 8 =	17.9 Nm	26.2 Nm	14.5 Nm
M10 =	36.0 Nm	53.0 Nm	30.0 Nm
M12 =	61.0 Nm	90.0 Nm	50.0 Nm
M16 =	147.0 Nm	216.0 Nm	121.0 Nm
M20 =	297.0 Nm	423.0 Nm	244.0 Nm

Use mounting paste when using stainless steel bolts to prevent any cold welding (i.e. corrosion).



Pull-out strengths of wedge anchors

The pull-out trials for the various wall brackets during certification testing have confirmed that sufficient load-bearing capacity is provided when the wall bracket is connected to a concrete structure with wedge anchors with a pull-out torque of at least 4,3 kN.

We therefore recommend that these anchors M10 are used for installing our vertical ladder systems to structures of cracked and uncracked concrete with a grade of at least C20/25.

Please note:

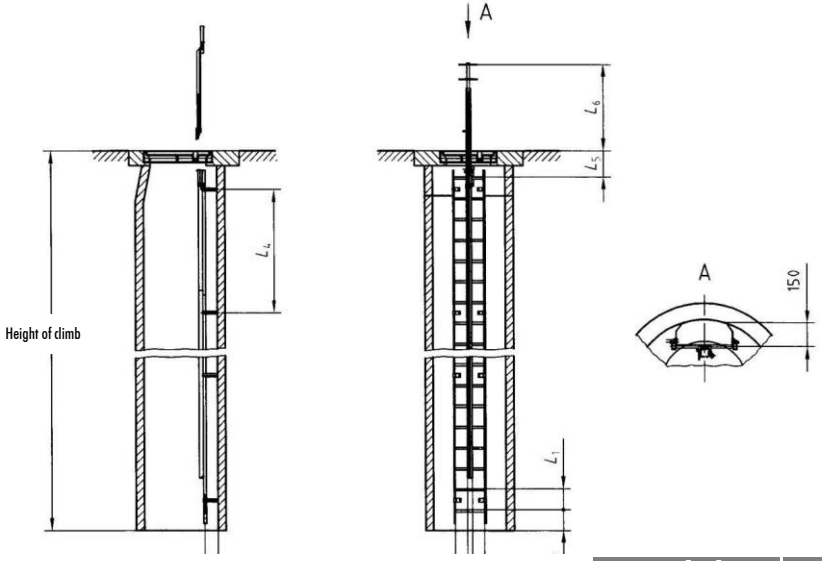
- Comply with the tightening torque specified by the manufacturer
- For masonry that is not made of concrete, a suitable fastening material must be selected, which is a has the same tensile load as that used in the tests. If necessary, the load can be increased to several Fixing points are distributed.
- Base layers with an unknown load-bearing capacity should be inspected and assessed by a professionally trained person with a view to selecting a suitable means of connection.

6. Standard-based system development
DIN EN 14396: Fixed vertical ladders for shafts

- The standard DIN EN 14396 does not stipulate a fall height at which a fall protection system is to be provided. The fall height is based either on the risk assessment drawn up by the operator or on any local authority provisions. *However, a fall protection system is to be used from a fall height of 3 m or more.*

- According to DIN EN 14396, rest platforms must be attached to or next to the ladder for the use of personnel.
  The standard does not specify at what height on the ladder these need to be installed. Therefore, we recommend installing a rest platform every 6 m for ladders in excess of 10 m in height.

- According to DIN EN 14396, entrance aids (handholds) must be installed in shafts. Minimum height required 1m above the ground surface.



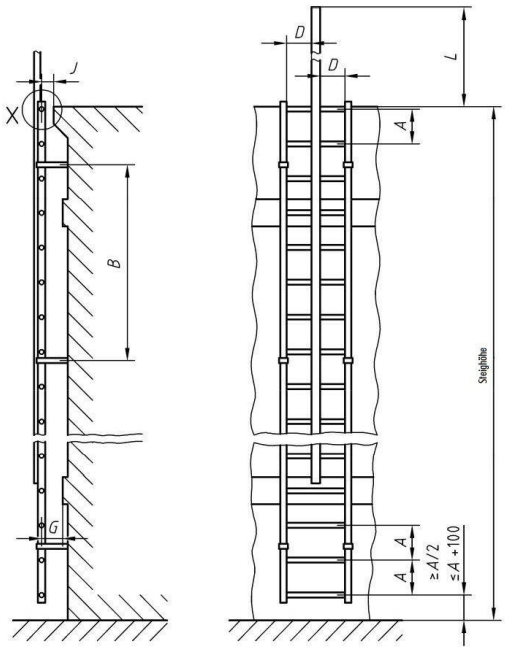
	min. [mm]	max. [mm]
L_1 = Distance between rungs / Rise-to-run ratio	250	300
L_2 = Width of rung	300	400
L_3 = Minimum tread at each point (from the middle of the upright to the shaft wall)	150	----
L_4 = Maximum distance between two fixtures (i.e. wall brackets)	----	1960*
L_5 = Distance from the ground surface to the top of the first rung	----	L 1 a
L_6 = Height of handhold	1000	----
L_7 = Distance between floor of shaft and top of bottom rung	250	300

a = In special cases (i.e. where the structure of the shaft structure dictates), this dimension can vary.
During installation, the current national and/or local regulations are to be observed on site where the ladder is to be used.

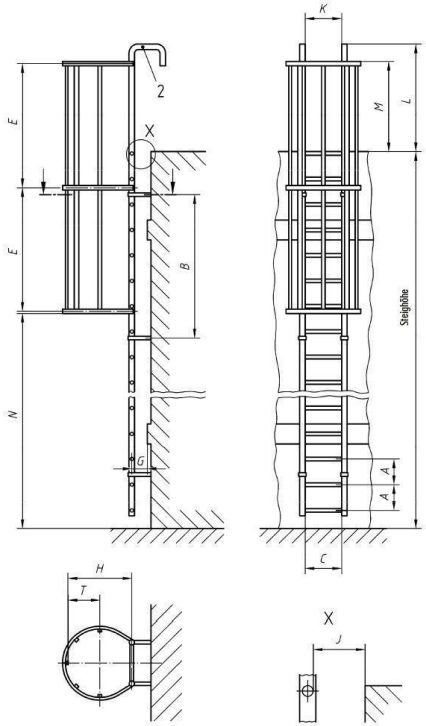
DIN 18799-1: Fixed vertical ladders on construction works
DIN EN ISO 14122-4: Permanent means of access to machinery

- In accordance with DIN 18799-1, fall protection must be provided above a fall height of 3 m.
- In accordance with DIN EN ISO 14122-4, fall protection must be provided above a fall height of 3 m.
- In accordance with DIN 18799-1 and DIN EN ISO 14122-4, rest platforms must be attached to or next to the ladder for ladder systems over 10 m high for the use of personnel.
- In accordance with DIN EN ISO 14122-4, access points in exit areas must be fitted with self-closing barriers which must have at least one handrail and one knee support. The ladder must be secured against unauthorized ascent.
- In accordance with DIN 18799-1 and DIN EN ISO 14122-4, only EN 353-1 compliant fall protection is permitted when climbing to heights in excess of 10 m using a one–piece ladder.

Vertical ladder with fall arrest rail as fall protection (in accordance with EN 353-1)



Vertical ladder with safety cage as fall protection



Size	A	B	C	D	E	G	H	J	K	L	M	N	T
min.	250	----	400	150	----	**	650	----	500	1100	1000	2200	325
max.	300	1960*	600	----	840*	----	800	75	700	----	----	3000	400

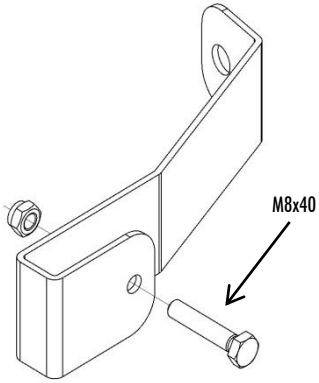
* Restricted due to manufacturer's specifications

** DIN 18799-1 & DIN EN ISO 14122-4: The distance of the ladder from the front of the rung to the structure must be at least 200 mm (narrow points at least 150mm).

7. Installing the fixed ladder

7.1 Fitting standard wall brackets 150 / 200 mm

Upright profile:
40x20 / 60x30 (VA + Steel)



Installation instructions

- The respective standard wall brackets are placed around the upright and secured with the parts listed below.
  Assembly parts: 1 x M8 bolt DIN 933, 1 x M8 polyethylene lock nut DIN 985

- The wall brackets are secured to the wall of the shaft using M10 wedge anchors available as an option.
  (Minimum concrete grade of C20/25 required). For round walls, the brackets facing inward,
  in the case of straight walls, the brackets must be mounted facing outwards.

- The ladder should rest on the ground.

- The first pair of wall brackets (seen from the top end of the ladder) must be fitted under the first
  or at most under the second rung of the shaft ladder.

  **In cases where an entrance aid or fall arrest device is secured directly to the ladder,
  the wall brackets must <u>always</u> be fitted under the first rung from the top.**

- The ladder must be secured with another pair of wall brackets at least every 1960 mm.

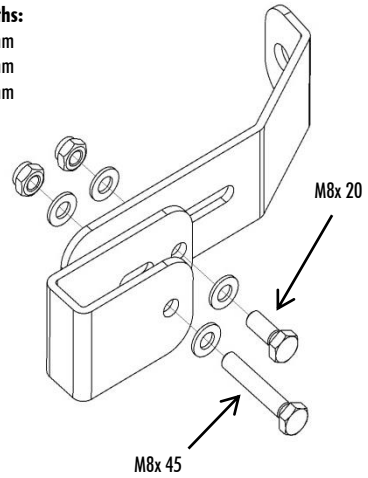
- The last pair of wall brackets (seen from the bottom end of the ladder) must be fitted under the last
  or at most under the next-to-last rung of the shaft ladder.

7. Installing the fixed ladder

7.2 Fitting adjustable wall brackets 150 - 330 mm

Upright profile:
40x20 / 60x30 (VA+Steel)

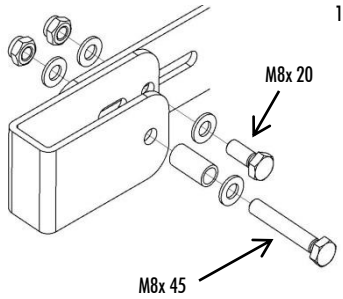
Standard lengths:
150mm - 180mm
180mm - 250mm
250mm - 330mm



Upright profile:
60x20 (GFK)

Standard lengths
180mm - 250mm
250mm - 330mm

150mm - 180mm
(see next site)



Installation instructions

- As shown in the illustrations, the respective fixing around the upright is fitted to the wall bracket and the ladder upright.
  Assembly parts: 2 x M8 bolts DIN 933, 4 x M8 washers DIN 125-A, 2 x M8 polyethylene lock nuts DIN 985
  (For fixing onto an upright with a 60 x 20 GFK profile, a distance sleeve **must** also be fitted to the centre of the fixing so that the plastic upright is not damaged.)

- The wall brackets are secured to the wall of the shaft using M10 wedge anchors available as an option.
  For round walls, the brackets facing inward, in the case of straight walls, the brackets must be mounted facing outwards.

- The ladder should rest on the ground.

- The first pair of wall brackets (seen from the top end of the ladder) must be fitted under the first or at most under the second rung of the shaft ladder.

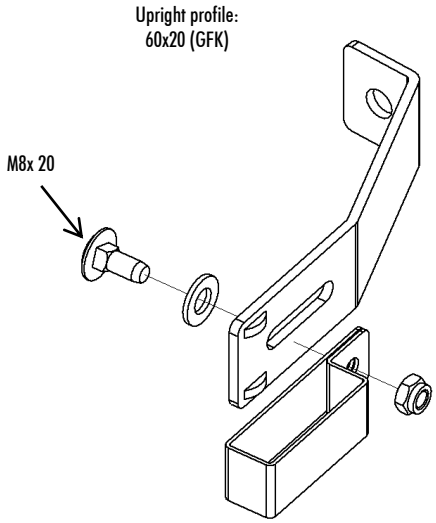
  In cases where an entrance aid or fall arrest device is secured directly to the ladder, the wall brackets must always be fitted under the first rung from the top.

- The ladder must be secured with another pair of wall brackets at least every 1960 mm.

- The last pair of wall brackets (seen from the bottom end of the ladder) must be fitted under the last or at most under the next-to-last rung of the shaft ladder.

7. Installing the fixed ladder

7.3 Fitting adjustable wall brackets 150 - 180 mm for plastic ladders 60x20 (GFK)



Installation instructions

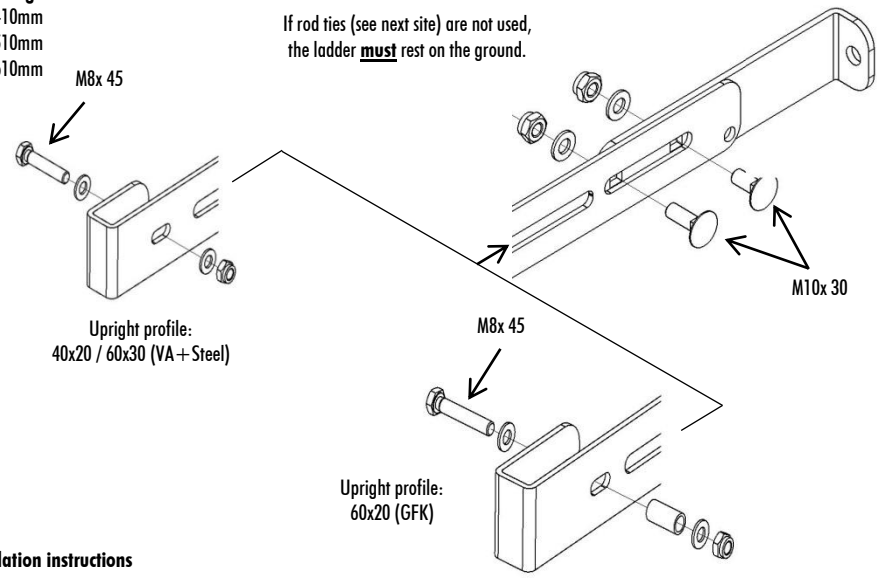
- The retaining clip is placed around the ladder upright directly under the rung and – together with the wall bracket is secured using the parts listed below.
  Assembly parts: 1 x M8 bolt DIN 933, 1 x M8 polyethylene lock nut DIN 985
- The adjustable distance (for wall clearance) of 150 – 180 mm can be set using the slot in the wall bracket.
- The wall brackets are secured to the wall of the shaft using M10 wedge anchors available as an option.
  For round walls, the brackets facing inward, in the case of straight walls, the brackets must be mounted facing outwards.
- The ladder should rest on the ground.
- The first pair of wall brackets (seen from the top end of the ladder) must be fitted under the first or at most under the second rung of the shaft ladder.

  In cases where an entrance aid or fall arrest device is secured directly to the ladder, the wall brackets must <u>always</u> be fitted under the first rung from the top.
- The ladder must be secured with another pair of wall brackets at least every 1960 mm.
- The last pair of wall brackets (seen from the bottom end of the ladder) must be fitted under the last or at most under the next-to-last rung of the shaft ladder.

7. Installing the fixed ladder

7.4 Fitting adjustable wall brackets 330 - 610 mm – Part 1

Standard lengths:
330mm - 410mm
430mm - 510mm
530mm - 610mm



Installation instructions

- As shown in the illustrations, the respective upright fixing is fitted to the wall bracket.
  Assembly parts: 2 x M10 mushroom head square neck bolts DIN 603, 2 x M10 washers DIN 125-A, 2 x M10 polyethylene lock nuts DIN 985

- The upright fixing is fitted to the upright.
  Assembly parts: 1x M8 bolt DIN 933, 2 x M8 washers for DIN 125-A, 1 x M8 polyethylene lock nut DIN 985
  (For fixing onto an upright with a 60 x 20 (GFK) profile, a distance sleeve **must** also be fitted to the centre of the fixing so that the plastic upright is not damaged.)

- The wall brackets are secured to the wall of the shaft using M10 wedge anchors available as an option.
  For round walls, the brackets facing inward, in the case of straight walls, the brackets must be mounted facing outwards.

- The ladder should rest on the ground.

- The first pair of wall brackets (seen from the top end of the ladder) must be fitted under the first or at most under the second rung of the shaft ladder.

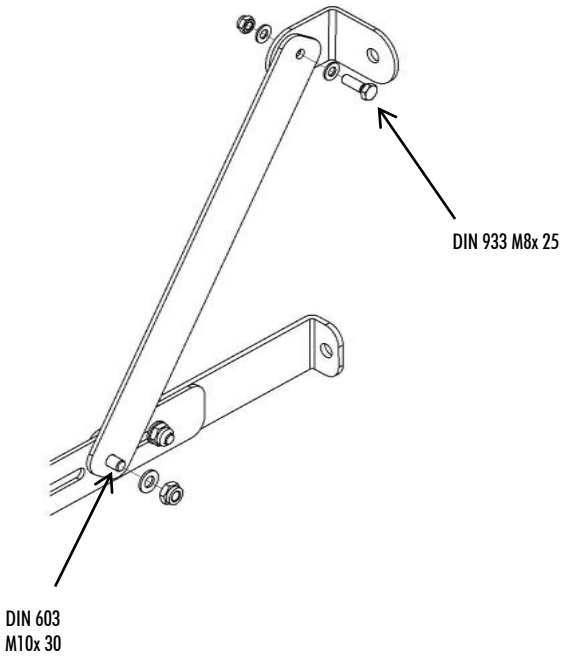
  In cases where an entrance aid or fall arrest device is secured directly to the ladder, the wall brackets must always be fitted under the first rung from the top.

- The ladder must be secured with another pair of wall brackets at least every 1960 mm.

- The last pair of wall brackets (seen from the bottom end of the ladder) must be fitted under the last or at most under the next-to-last rung of the shaft ladder.

7. Installing the fixed ladder

7.4 Fitting adjustable wall brackets 330 - 610 mm – Part 2



Rod ties – for additional load accommodation for ladders not supported at the foot

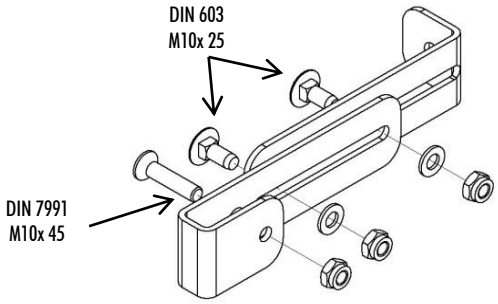
Installation instructions

- The rod tie which is available as an option is fitted to the front M10 mushroom head square neck bolt DIN 603 of the wall bracket.
- The rod tie and its angle bracket are fitted as shown in the illustration.
  Assembly parts: 1 x M8 bolt DIN 933, 2 x M8 washers DIN 125-A, 1 x M8 polyethylene lock nut DIN 985
- The angle bracket is also secured to the wall of the shaft using M10 wedge anchors which are available as an option.
  For round walls, the brackets facing inward, in the case of straight walls, the brackets must be mounted facing outwards.

7. Installing the fixed ladder

7.5 Fitting adjustable wall brackets 150 - 300 mm

Upright profile:
40x20 / 60x30 (VA+Steel)



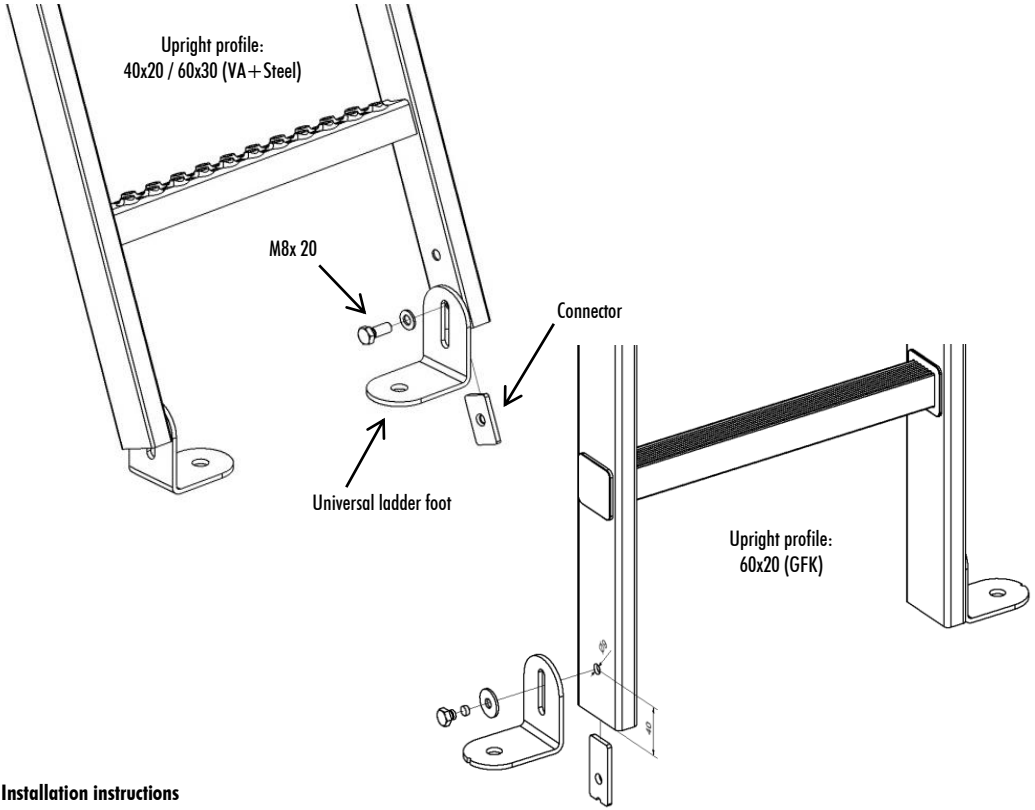
Installation instructions

- As shown in the illustration, the respective fixing around the upright is fitted to the wall bracket and the ladder upright.
  Assembly parts: 2 x M10 bolts DIN 7991, 4 x M10.5 washers DIN 125-A, 4 x M10 bolts DIN 603, 6 x M10 hexagonal nuts DIN 985.
- The wall brackets are secured to the wall of the shaft using M10 wedge anchors available as an option.
  For round walls, the brackets facing inward, in the case of straight walls, the brackets must be mounted facing outwards.
- The ladder should rest on the ground.
- The first pair of wall brackets (seen from the top end of the ladder) must be fitted under the first or at most under the second rung of the shaft ladder.

  In cases where an entrance aid or fall arrest device is secured directly to the ladder, the wall brackets must <u>always</u> be fitted under the first rung from the top.
- The ladder must be secured with another pair of wall brackets at least every 1960 mm.
- The last pair of wall brackets (seen from the bottom end of the ladder) must be fitted under the last or at most under the next-to-last rung of the shaft ladder.

7. Installing the fixed ladder

7.6 Fitting the universal ladder feet



Installation instructions

- The universal ladder feet are attached to the upright of the ladder from outside. The upright plug is then pushed into the upright and secured using the parts listed below.

  Assembly parts for each ladder foot: 1 x M8 bolt DIN 933, 1 x 8.4 washer DIN9021, 1 x M8 connector

- For the GFK ladder a hole Ø9mm must be inserted into each upright before installation.

- The universal ladder foot is secured to the floor of the shaft with M10 wedge anchors, for example, which are available as an If the conductor feet are screwed to the building, they can be used as wall brackets so that the next wall brackets have to be mounted upwards only 1960mm. The conductor feet can compensate for inclination and height differences of the floor.

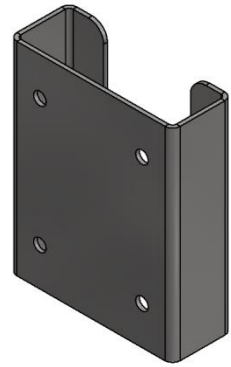
*** The universal ladder feet are not covered by certification.

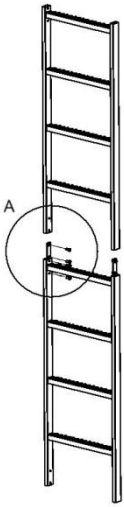
7. Installing the fixed ladder

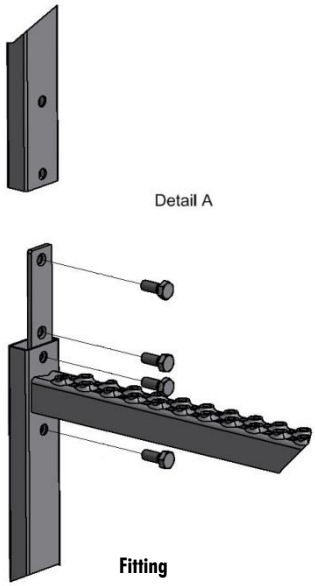
7.7 Fitting the connectors for the shaft ladders

Upright profile:
40x20 / 60x30 (VA+Steel)

Upright profile:
60x20 (GFK)

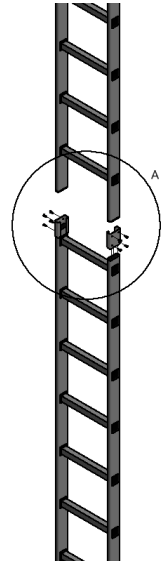


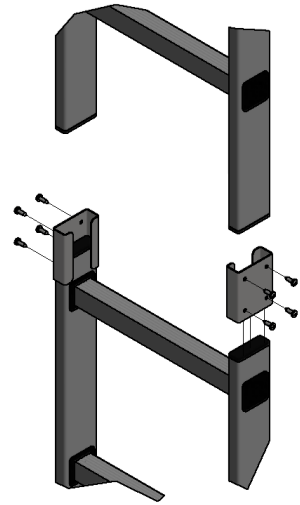




Fitting

Push in the connectors and fit with the hexagonal bolts supplied.





Fitting

Push the connector over the conductor ends and tighten.

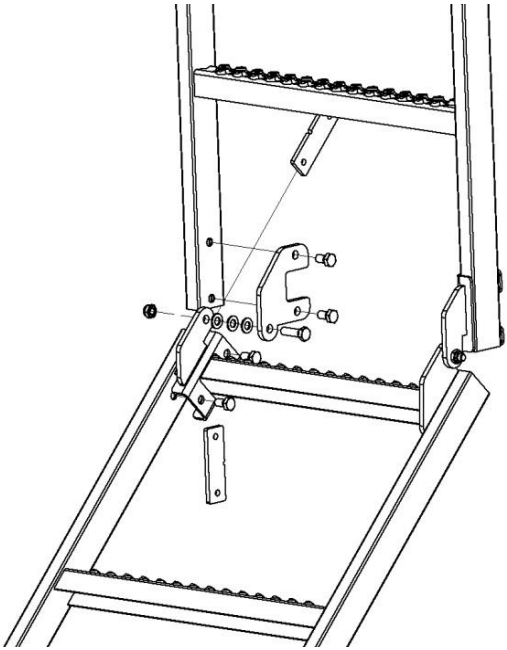
7. Installing the fixed ladder

7.8 Fitting the ladder joints for profile 40x20

Installation instructions

- These installation instructions apply exclusively to the fitting of ladder joints, Item No. 9695-11, for Hailo ladders with uprights of 40x20. Before fitting, check that all parts are supplied in full and are undamaged.

  IMPORTANT: Never fit incomplete or damaged parts.



Installation instructions

- First, screw the fittings to the ladder uprights; then fit the axle bolts with the distance plates and lock nuts, ensuring that the ladder sections pivot easily.

Instructions for use

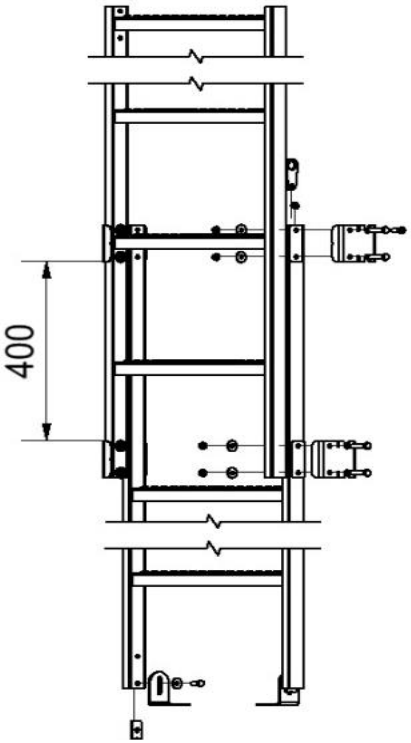
- Ladders with a joint can be fitted with other components, such as a chain or rope, which allow the ladder to be raised and lowered from above and serve to secure it in the raised position. Only use a ladder with a joint when the ladder is let down and is resting on the ground or is supported by additional wall brackets fitted to the wall of the shaft.

7. Installing the fixed ladder

7.9 Fitting the sliding fittings for profile 40x20 – Part 1

Installation instructions

- These installation instructions apply exclusively to the fitting of sliding fittings, Item No. 9635-50, for Hailo ladders with uprights of 40 x 20 mm. Before fitting, check that all parts are supplied in full and are undamaged.
- Tools required (in case the ladders do not already have holes drilled in them):
  Tape measure, felt-tip pen, hammer, centre punch, drill, 9 mm drill bit, 2 SW13 spanners, SW6 Allen key
- The fittings can be used as templates for marking out. The holes for the fittings are drilled through in the bottom ends of the uprights of the fixed ladder. A hole is drilled in the extending ladder at the end of each upright on the outside of the uprights. All holes to be drilled with a diameter of 9 mm.



*** The sliding fittings are not covered by certification.

Using the extending ladder:

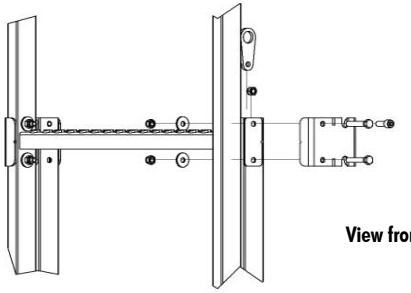
- Loosen the chain or similar for lowering the ladder and let the ladder down until it rests on the floor of the shaft or is held by the locking bolts in the sliding fittings
- After use, pull the ladder back up again and secure it in place.

7. Installing the fixed ladder

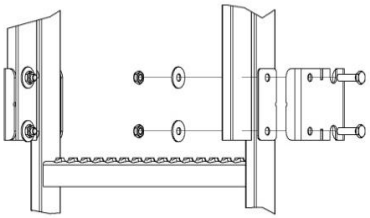
7.9 Fitting the sliding fittings for profile 40x20 – Part 2

Installation instructions

- The extending ladder is positioned in front of the fixed ladder. The guide parts are fitted to the fixed ladder pointing forwards.
- The distance plates are inserted between the guide parts and the upright during installation. Screw on the fittings as shown in the following illustrations.
  Zwischen den Führungsteilen und dem Holm werden bei der Montage die Distanzplatten eingelegt. Beschlagteile wie auf den folgenden



View from rear

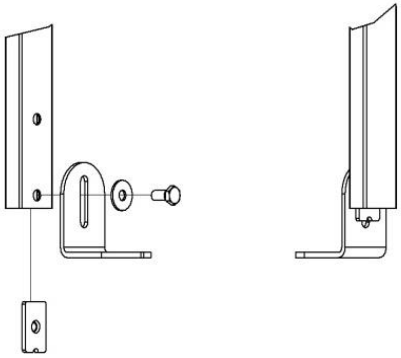


- The adjusting screws (fillister head) and eyelet for attaching a rope or chain for raising the ladder are fitted to the top ends of the uprights of the extending ladder.

- The feet are fitted at the bottom end.

  A pair of wall brackets is to be fitted for ladders that are not supported at the foot to support the ladder on the wall of the shaft.

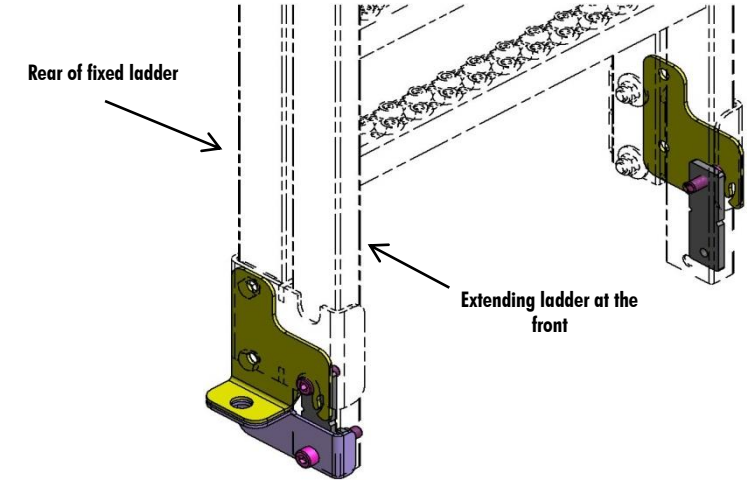
- The ladders are to be fitted to the wall of the shaft so that when the ladder is extended the overlapping rungs are at the same height - or for an extending ladder not supported at the foot so that the pair of wall brackets attached to it supports the ladder in the lowest position facing the wall.

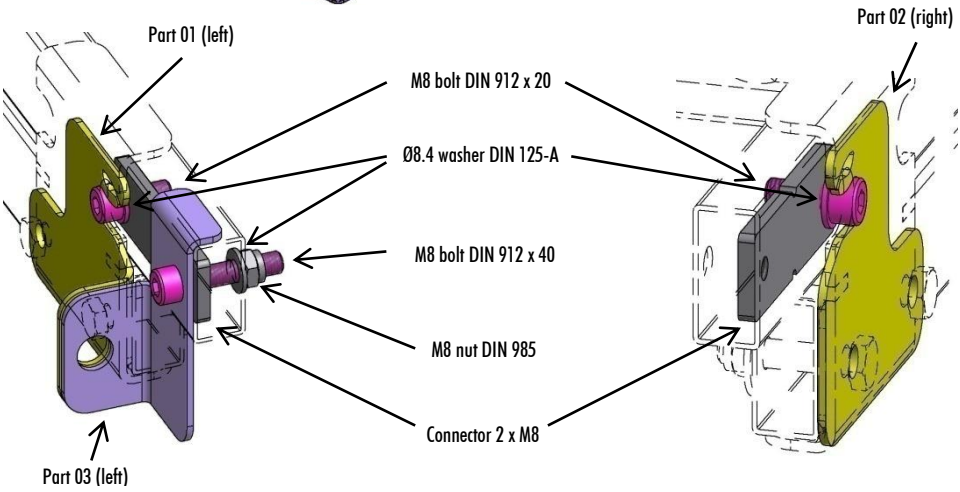


Additional component enabling sliding fittings to be locked and a padlock fitted

Installation instructions

- Before fitting, check that all parts are supplied in full and are undamaged.
- This additional component is fitted to the existing sliding fitting set, Item No. 9635-50.
  This is achieved by drilling through the bottommost upright holes Ø 9 mm of the extending ladder.





7. Installing the fixed ladder

7.10 Fitting 27/50 ltr floats for ladder clearance of 300/400 - 40x20

Installation instructions

- The float holders are to be fitted together with the fixings that fit around the uprights. Fig. 04 shows the arrangement for ladder clearance 300 mm and in Fig. 05 is the arrangement for ladder clearance 400 mm.
  Assembly parts: 2 x M8 bolts x 20 DIN 933
  2 x M8 bolts x 45 DIN 933, 8 x M8 washers DIN 125-A
  4 x M8 polyethylene lock nuts DIN 985

- The diagonal member which connects the two float holders is to be fitted as shown in Fig. 02 together with the rubber buffers.
  Assembly parts: 2 x M8 polyethylene lock nuts DIN 985

- The plastic floats are fitted between the two float holders and the lateral struts using the threaded rod M12 x 560 mm (see Figs. 01 & 02).
  Assembly parts: 2 x M12 polyethylene lock nuts DIN 985

- The lateral struts are to be fitted together with the upright fixings, as shown in Figs. 02 & 03.
  Assembly parts: 2 x M8 bolts x 45 DIN 933
  2 x M8 polyethylene lock nuts DIN 985

Fig. 01

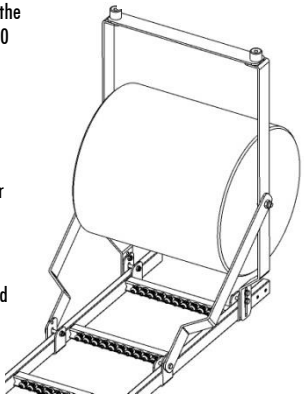
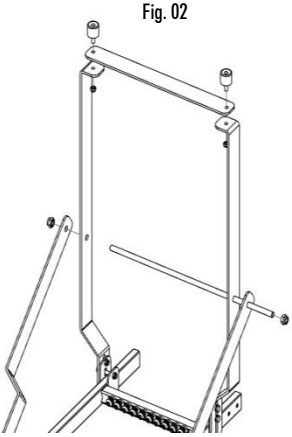


Fig. 02



*** The floats are not covered by certification.

Note

At the bottom end of the floating ladder, a counter support must be provided against which the ladder rests so that the ladder cannot swing freely.

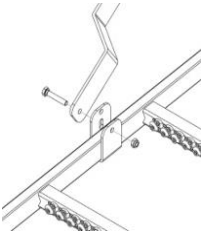


Fig. 03

Clearance 300

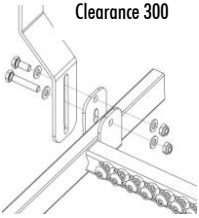


Fig. 04

Clearance 400

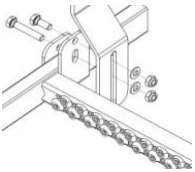


Fig. 05

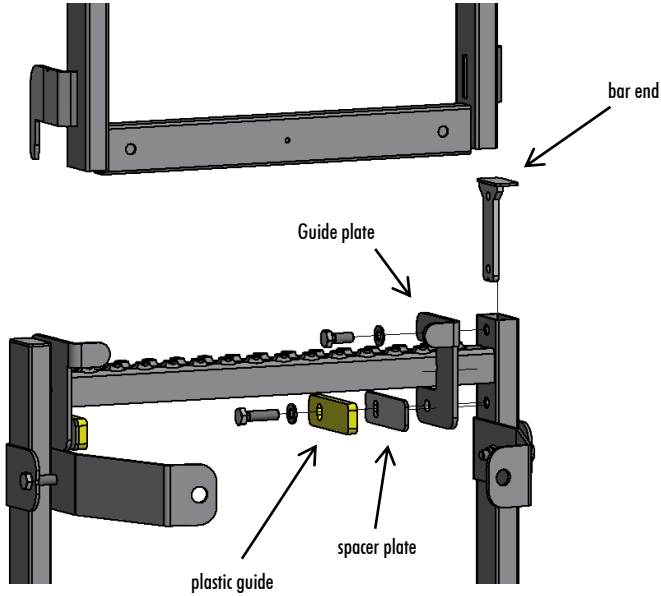
Installation instructions

- The entrance aid must be fitted **behind** the ladder. It needs to be fitted in such a way that it protrudes at least 1 m above the entrance area when it is extended.

- Before commencing installation, first check whether all the parts are present and are undamaged.
  PLEASE NOTE: Never fit incomplete or damaged parts

- The entrance aid is fitted on the rear of the ladder facing the wall.

Tip: If possible, attach the entrance aid to the ladder before installation in the shaft.
First, pre-fit the parts loosely, then adjust the amount of play in the entrance aid using the slots in the guide lugs and then tighten the bolts.



Using the entrance aid

- Hold the entrance aid by the handle and pull upwards; the stop hooks move over the 2 rungs of the ladder and come to rest on the rungs. Check the entrance aid is properly in place; the entrance aid is now ready for use.

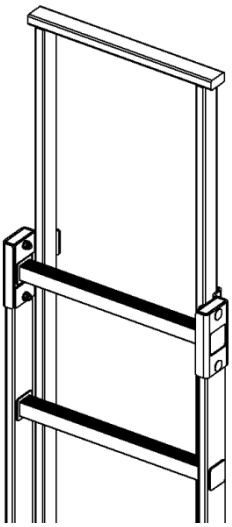
- Lower the entrance aid
  Pull the entrance aid using the handle slightly towards the wall and lift. This takes the stop hooks off the rung.
  Tip the entrance aid in such a way that the stop hooks do not come into contact with the rungs of the ladder when the entrance aid is lowered. Lower the entrance aid far enough to allow the handle to rest on it.

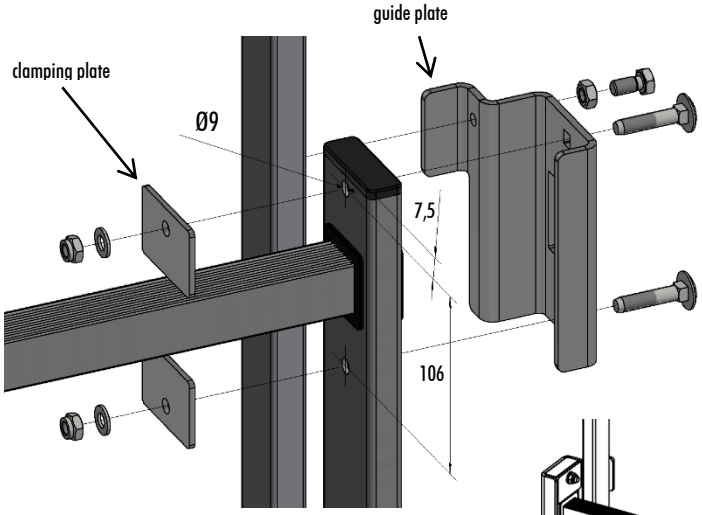
7. Installing the fixed ladder
7.11 Fitting the two-stile entrance aid 60x20 (GFK)

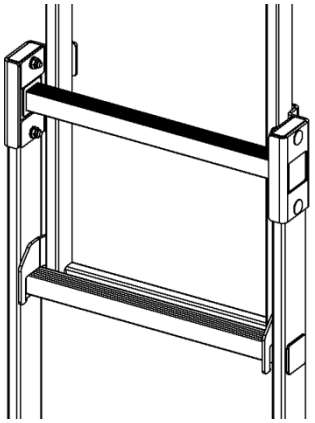
Installation instructions

- The entrance aid must be fitted **behind** the ladder. It needs to be fitted in such a way that it protrudes at least 1 m above the entrance area when it is extended.
- Before installation, 2 holes Ø9mm must be inserted into the two spars. (The guide plates can be used as drilling templates.)
- Apply the entrance aid to the ladder. The two guide plates (li /re) from the outside to the spars, and assemble them together with the clamping plates as shown. Screw tightening torque: max. 10 Nm

  Assembly parts: 4 x M8 bolts DIN603, 4 x M8 washers DIN 125-A, 4x M8 polyethylene lock nuts DIN 985 1 x M8 bolts DIN9333, 2x M8 lock nuts DIN 934







Using the entrance aid

- The two-stile entrance aid is lowered in the shaft and can be pulled out if required and positioned on the last-but-one rung with the rung hooks secured to the entrance aid.
- The rung hooks stop the two-stile entrance aid on the rung and thus prevent it from accidentally becoming detached.

7. Installing the fixed ladder

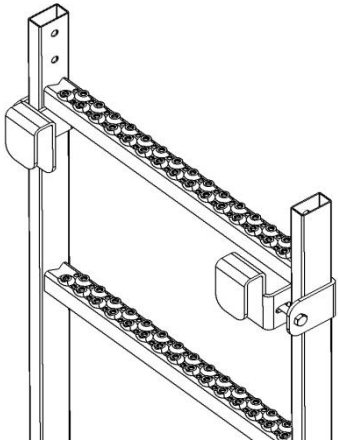
7.12 Fitting the attachment hooks/rails 40x20

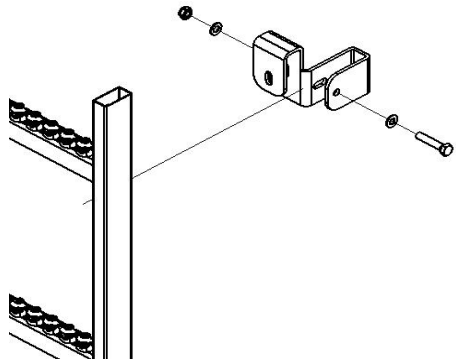
Installation instructions

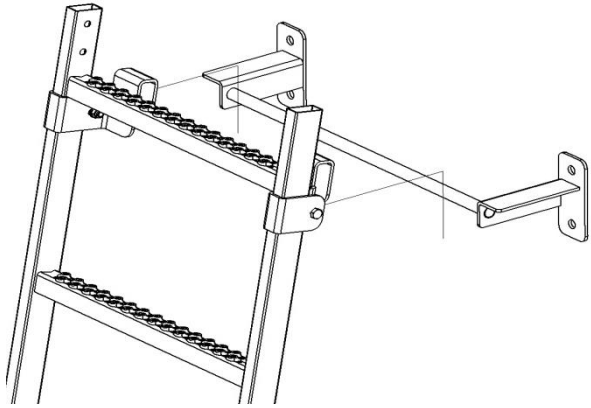
- The attachment hooks are positioned around the ladder upright directly under the rung and secured using the parts listed below.
  Assembly parts for each hook: 1 x M8 bolt DIN 933, 2 x 8.4 washers DIN125 A
  1 x M8 polyethylene lock nut DIN 985

- The attachment rails are secured to the wall of the shaft using M10 wedge anchors available as an option.
  (Minimum concrete grade of C20/25 required)

*** The attachment hooks/rails are not covered by certification.



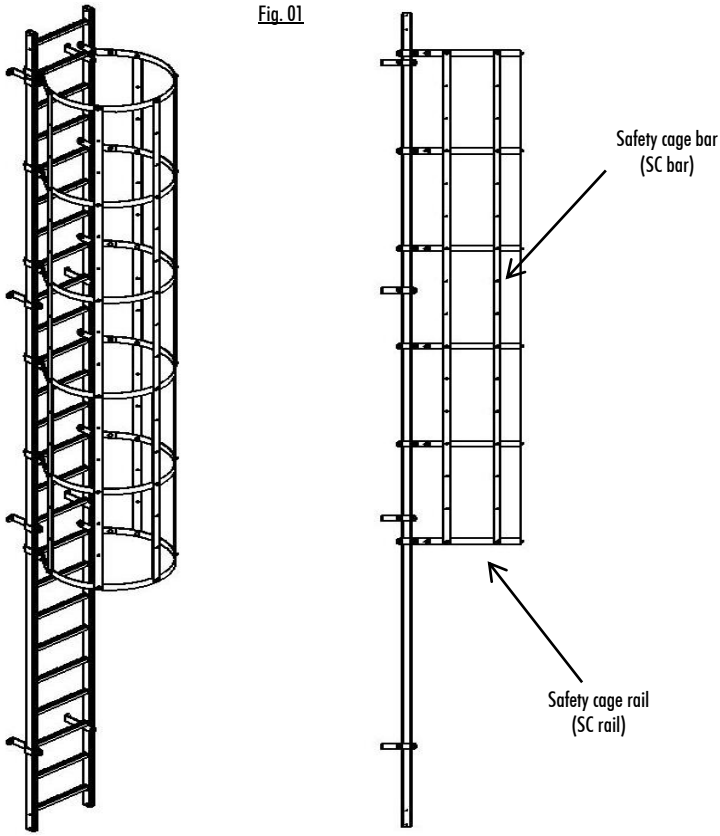




8. Installing the safety cage system

Hailo Safety Cage System based on a clearance of 400mm; 40x20 / 60x30

Fig. 01



Overview

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8.7 Fitting the side exit unit	39

8. Fitting the safety cage system
8.1 Installing the vertical ladders

Installation instructions

- The vertical ladders are secured to the wall using the respective wall brackets (7.1 – 7.5).
- Assembly parts available as an option - M10 wedge anchors (minimum concrete grade of C20/25 required)
- The ladder – or bottommost ladder where multi-stage ladder systems are installed – should rest on the floor of the shaft.
- The first pair of wall brackets (as seen from the top end of the ladder) must be fitted under the first rung of the ladder **with a distance of 50 mm to the rung** as the SC rails are fitted directly under the rung. If an exit extension is to be fitted, only the last (i.e. topmost) pair of wall brackets need to be fitted **with a distance of 100 mm to the rung**.
- The ladder must be secured with another pair of wall brackets at least every 1960 mm.
- The last pair of wall brackets must be fitted under the bottommost rung (+50 mm) of the shaft ladder.
- In multi-stage ladder systems, the two ladder sections in each case overlap with each other by 8 rungs. In other words, the 8th rung of ladder section 2 as seen from the bottom end of the ladder is level with the top rung of ladder section 1

Fig. 02

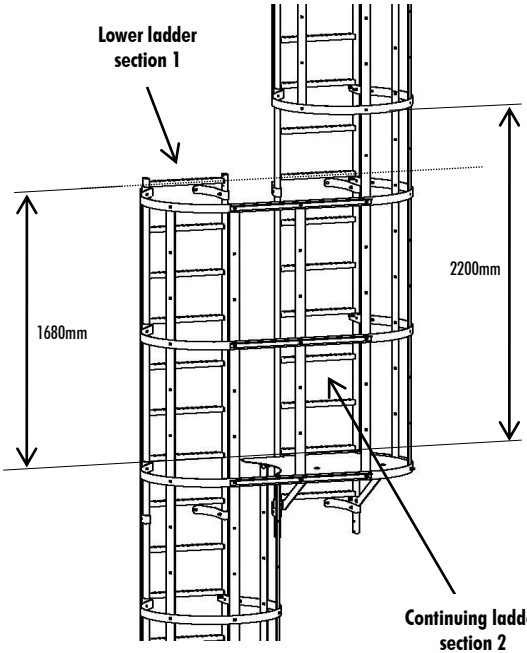
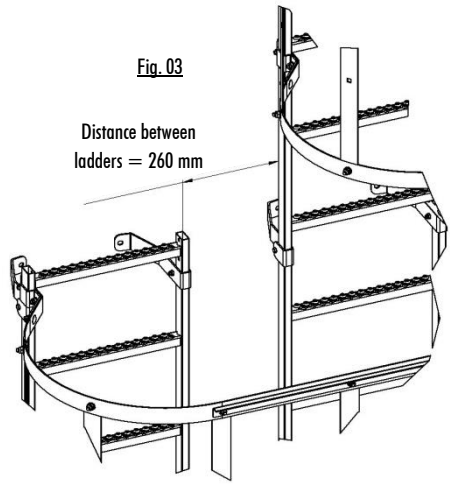


Fig. 03



8. Fitting the safety cage system
8.2 Fitting fixtures around uprights onto the safety cage rails

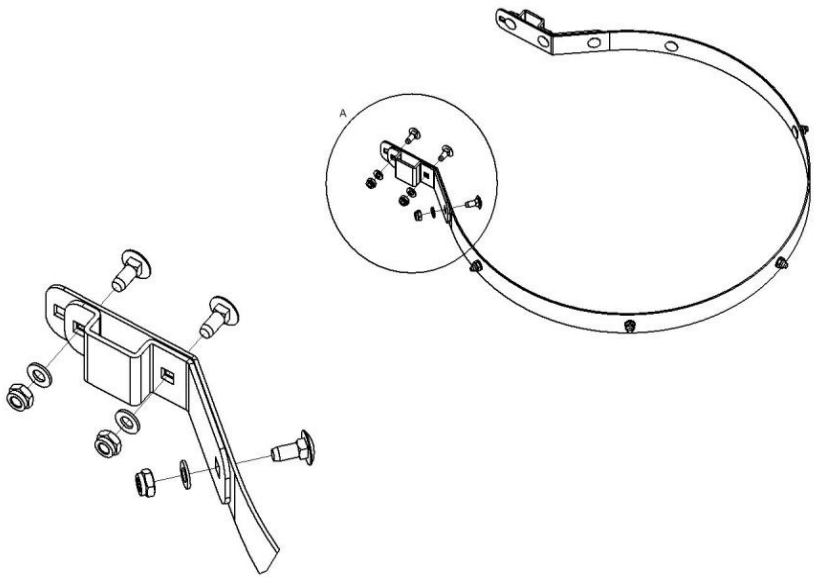
Installation instructions

- The upright fixings are placed around the ladder upright and then secured to the respective safety cage rails as shown in the Figures.

- **One safety cage rail must be fitted to the ladder at least every 840 mm (3 rungs).**
  The safety cage rails are fitted directly under the ladder rungs.

  Assembly parts for 2 x upright fixings:
  6 x M10 bolts x 25 DIN 603, 6 x Ø 10.5 U washers DIN 125-A
  6 x M10 polyethylene lock nuts DIN 985

Fig. 04

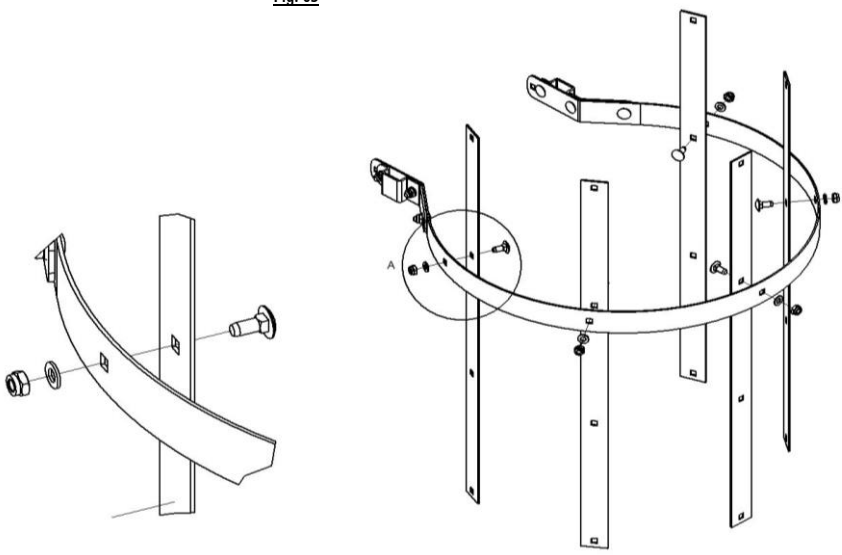


Installation instructions

- The safety cage bars are attached to the SC rails from the inside as shown in the Figures.

  Assembly parts for a set of 5 safety cage bars per SC rail:
  5 x M10 bolts x 25 DIN 603, 5 x Ø 10.5 U washers DIN 125-A
  5 x M10 polyethylene lock nuts DIN 985

Fig. 05



8. Fitting the safety cage system

8.4 Fitting the crossing unit (CU) – for multi-stage ladders (10 m or more in length) - Part 1

The crossing unit consists of:

- 1 pce base plate
- 1 pair base plate support
- 3 pces SC rail CU
- 3 pces SC rail reinforcement (L-profile)
- 4 pces SC bar 50x3 6 rungs (1680+50 = 1730 mm)
- 3 pces SC bar 50x3 8 rungs (2240+50 = 2290 mm)

Fig. 06

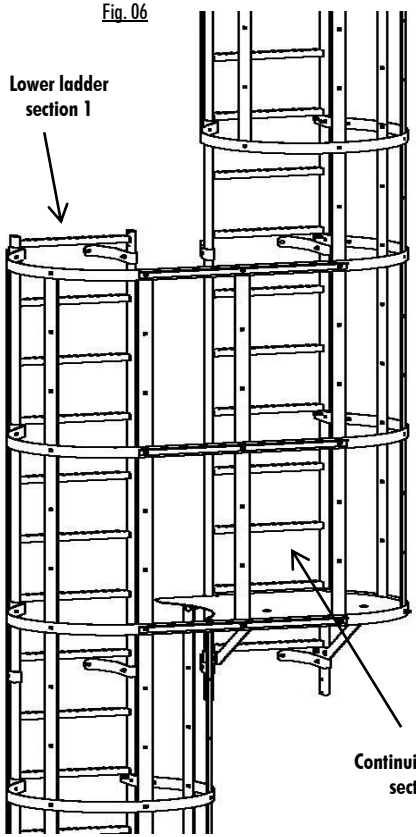
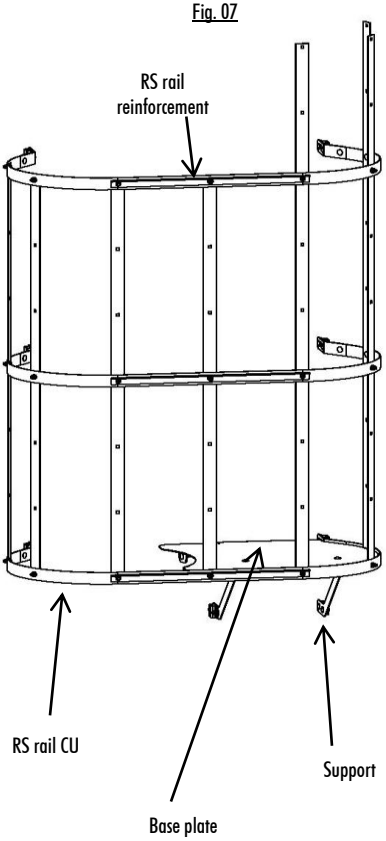


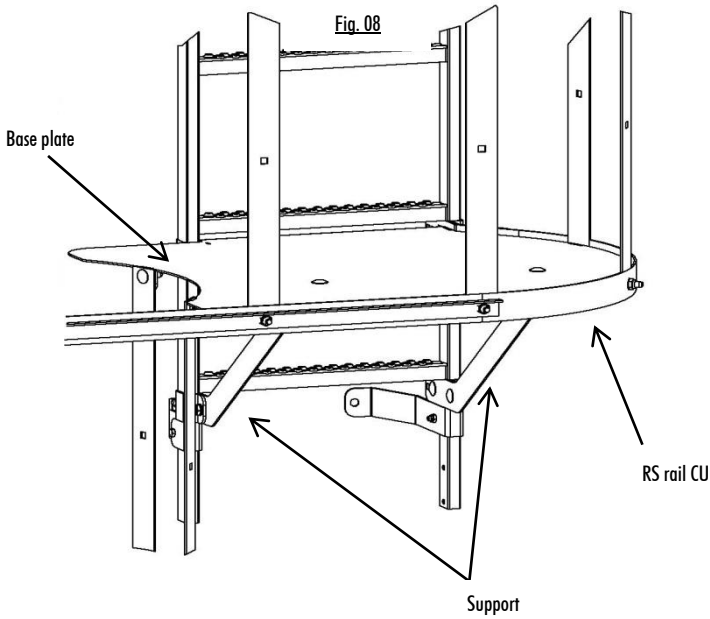
Fig. 07



Installation instructions

- As described in 8.2, for the crossing unit 3 pces **SC rail CU** are to be fitted to the ladder at a distance of 560 mm (2 rungs).
- The first (bottommost) SC rail CU is fitted together with the base plate directly under the 2nd rung of the 2nd ladder section, as seen from the bottom end of the ladder. The top ends of the SC bars of the lower ladder section 1 (as shown in Fig. 06 on the left) are connected onto this first bottommost SC rail CU at the same time.
- The base plate supports are fitted to the base plate itself as well as directly under the 1st rung of ladder section 2 (see Fig. 08).
- The SC bars 6 & 8 rungs of the CU are secured to the SC rails CU together with the reinforcements (L profile) – see Fig. 10.
- For ladder section 2 of the continuing safety cage, a standard SC rail is fitted to the 10th rung (as seen from the bottom end of the ladder). *(The distance from this rail to the base plate is therefore 2200 mm.)*
- The top ends of the SC bars 8 rungs of the CU (as shown in Fig. 06 on the right) are connected onto this first SC rail of the continuing ladder section 2 as well.

Fig. 08



8. Fitting the safety cage system

8.4 Fitting the crossing unit (CU) – Part 3

Fig. 09

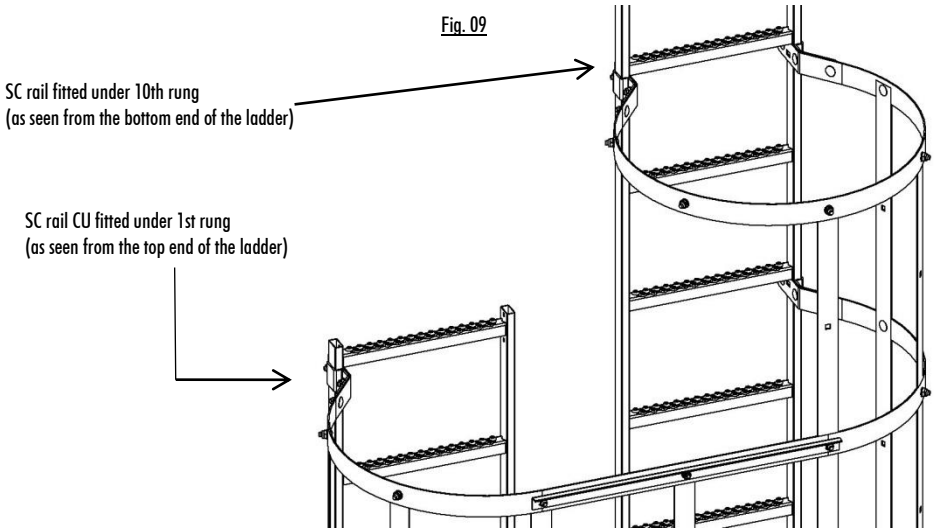
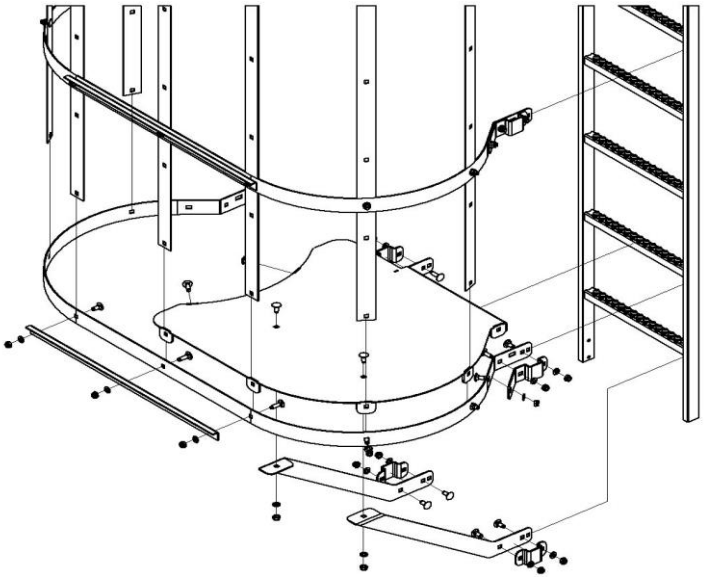


Fig. 10



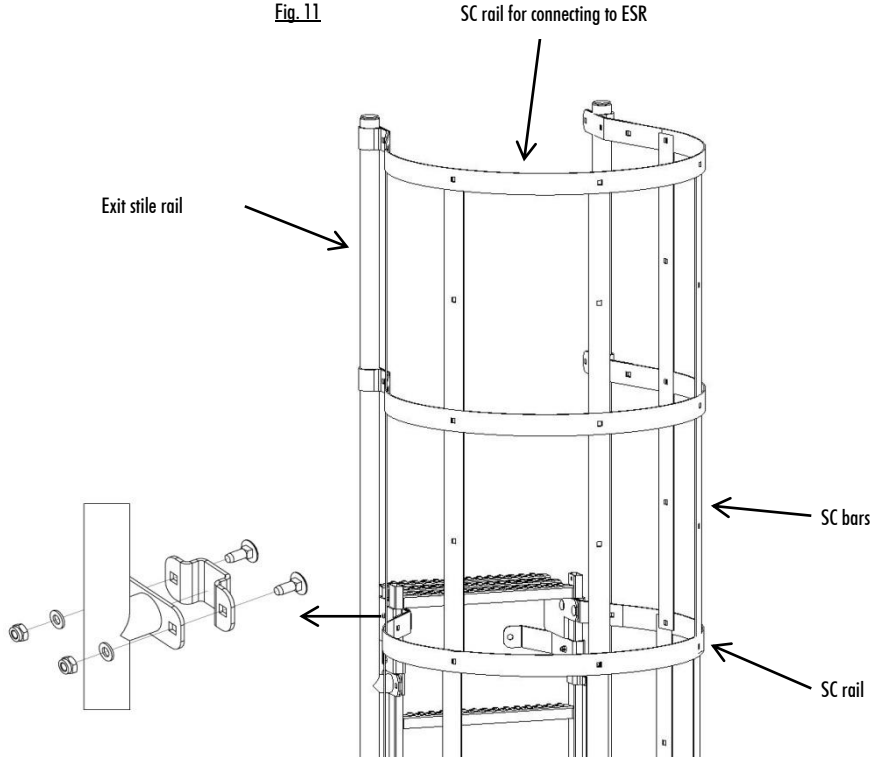
Please note:

The SC bars are fitted between the base plate and the SC rail CU

The exit unit consists of:

- 1 pair exit stile rails (ESR) – ladder clearance of 500 between the rails
- 2 pces SC rail for connecting to ESR
- 5 pces SC bar 50 x 3 4 rungs (1120+50 = 1170 mm)
- The exit stile rails are fitted onto the ladder upright from the outside using the clamps for the uprights so that the stile rail extends at least 1,1 m above the surface.
- Fit the SC rails for the ESR connection together with the SC bars to the exit stile rails.
  The bottom end of the SC bars is connected to the last SC rail of the topmost ladder section as well.

Fig. 11



8. Fitting the safety cage system
8.6 Fitting the exit extension

Installation instructions

- The exit extension is fitted to the ladder at the height of the topmost ladder rung together with the last SC rail of the topmost ladder section.

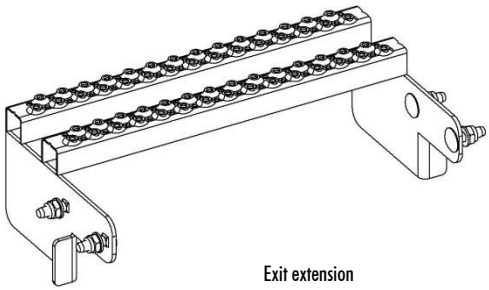
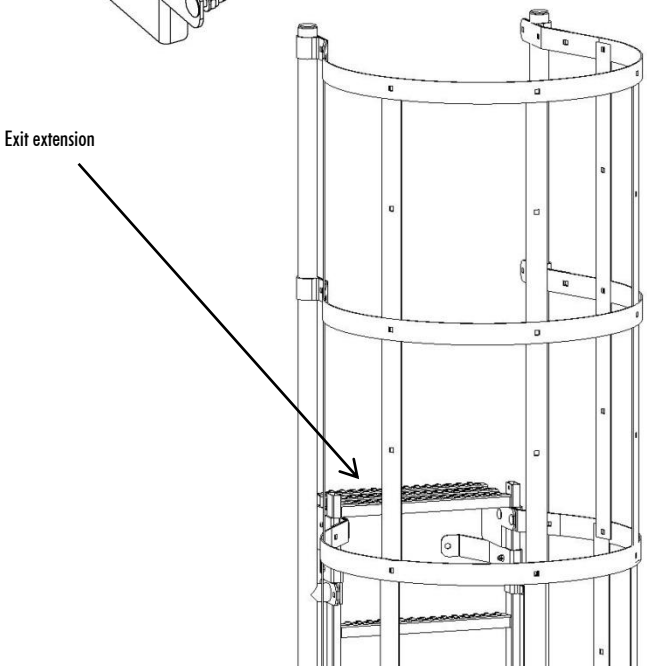


Fig. 12



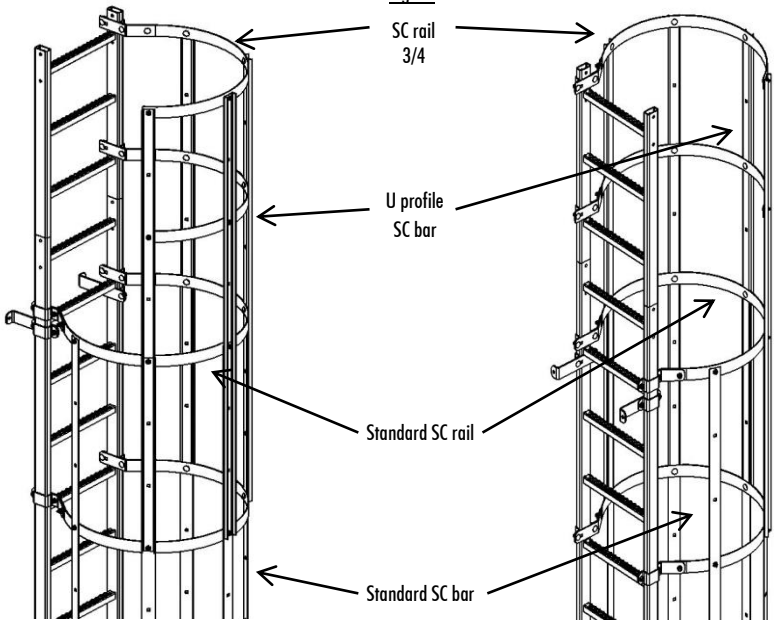
Installation instructions

- As described in 8.2, for the top side exit unit 2 pces **safety cage rail 3/4** are secured to the ladder at a distance of 560 mm (2 rungs) - see Fig. 13.

- The standard safety cage bars 50 x 3 reach from below to the top full (standard) SC rail.
  In addition to this, another 4 pces **safety cage bar U profile** are fitted for the side exit unit.
  These U profile bars serve as reinforcement and are long enough to be fitted to the top two 3/4 rails and in addition to the bottom two full (standard) rails.

  In addition to this, the top two 3/4 rails still need to be connected to an existing guard rail provided by the customer. This connection is not included in the scope of the delivery and must be undertaken by the customer.

Fig. 13



9. Markings and information

Examples of markings on fixed vertical ladders:

Please pay special attention to all markings, stickers with safety information and safety regulations.

A) Vertical ladder type plate

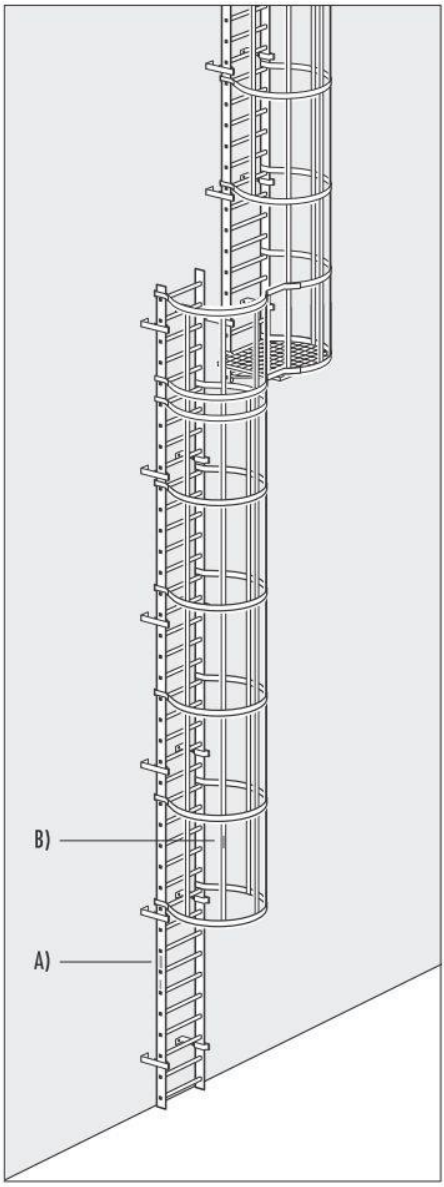
Year of manufacture, information on material and dimensions
Advice on load capacity of ladder

B) Safety cage system type plate

Year of manufacture and information on material

C) Plate with ladder markings – see next page

Example: Information on fall arrest system.
An inspection of the vertical ladder must take place at least once a year by trained personnel and be recorded with a test badge.
Advice on load capacity of ladder.



Representative illustration

If necessary, customer-specific safety and information signs can also be used; however, these are not described or illustrated here.

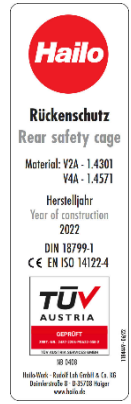
A)

Hailo
Leiter
Ladder
Holm / Rail
40 x 20 x 1,5 mm
Lichte Weite / Inner width
300 / 400
Material
1.4301 / ASTM 304
1.4571 / ASTM 316 ti
1.0037 / ASTM A 36
verzinkt / hot dip galv.
ACHTUNG! Montageanleitung beachten!
ATTENTION! Please follow our mounting instruction!
Herstelljahr
Year of construction
2022
CE EN 14396
CE EN ISO 14122-4
DIN 18799-1
TÜV AUSTRIA
GEPRÜFT
NB 0408
Holz-Werk - Rudolf Loh GmbH & Co. KG
Dainerstraße 8 - D-35708 Haiger
www.hailo.de

Hailo
Schachtleiter
Shaftladder
aus Glasfaser-verstärktem Kunststoff
fiberglass reinforced plastic
ACHTUNG! Montageanleitung beachten!
ATTENTION! Please follow our mounting instruction!
Herstelljahr
Year of construction
2022
CE EN 14396
TÜV AUSTRIA
GEPRÜFT
NB 0408
Holz-Werk - Rudolf Loh GmbH & Co. KG
Dainerstraße 8 - D-35708 Haiger
www.hailo.de

Hailo
Einstieghilfe
Access Aid
Zweiholm-Einstiegshilfe für Hailo Schachtleiter.
ACHTUNG! Montage nur mit passendem Beschlagsatz!
Two-rail access aid for Hailo-shaftladders
ATTENTION! Mounting with suitable fittings only!
ACHTUNG! Montageanleitung beachten!
ATTENTION! Please follow our mounting instruction!
Herstelljahr
Year of construction
2022
CE EN 14396
DIN 19572
TÜV AUSTRIA
GEPRÜFT
NB 0408
Holz-Werk - Rudolf Loh GmbH & Co. KG
Dainerstraße 8 - D-35708 Haiger
www.hailo.de

B)


Hailo
Rückenschutz
Rear safety cage
Material: V2A - 1.4301
V4A - 1.4571
Herstelljahr
Year of construction
2022
DIN 18799-1
CE EN ISO 14122-4
TÜV AUSTRIA
GEPRÜFT
NB 0408
Holz-Werk - Rudolf Loh GmbH & Co. KG
Dainerstraße 8 - D-35708 Haiger
www.hailo.de

C)

PROFESSIONAL
Hailo
Nächste Prüfung im:
Next inspection:
www.hailo.de

10. Care and maintenance

Cleaning:

- All non-moving components are maintenance-free
- Moving components are to be lightly lubricated when required and occasionally tested for smooth running.
- Damaged surfaces are to be sealed using a suitable anti-corrosion agent.
- Any contamination is to be cleaned off with water or a mild cleaning agent.
  Do not use acids or alkaline solutions.

11. Testing the fixed ladder system

Standards information:

DIN 18799-1, DIN EN ISO 14396, DIN EN ISO 14122

Inspection intervals:

- Inspection intervals are to be carried out in accordance with the respective current national regulations.
- Inspections intervals in Germany:
  Inspection intervals are based on frequency of use, stress during use and the frequency and severity of any defects that are identified.
- Recommendation:
  Hailo recommends that fixed vertical ladders are inspected at least once a year.

Inspection:

The ladder system must be checked at least once a year for good condition and functioning by an expert / authorized person.

- An expert / authorized person is:
  A person who has the necessary expertise to test the equipment owing to their apprenticeship, professional experience, their recent professional activity and who has undergone special training with the manufacturer.
- Inspections are to be carried out using the inspection schedule for fixed vertical ladders

The individual national operating and auditing regulations are to be followed.

Information on vertical ladder system:

Inventar-Nr. :

.....

Stock no. :

.....

.....

.....

Design of vertical ladder:

- ☐ Vertical ladder with back protection
- ☐ Vertical ladder without back protection including fall arrest system* with fixed guide in accordance with EN 361
- ☐ Vertical ladder without back protection and without an EN 361-compliant fall arrest system

Material:

- ☐ Edelstahl
- ☐ Stahl, verzinkt
- ☐ GFK

Manufacturer:

Hailo Werk Rudolf Loh GmbH & Co. KG

.....

.....

.....

Date of commissioning:

.....

* *A separate inspection is to be carried out for the fall arrest system in accordance with the manufacturer's instructions.*

11. Testing the fixed ladder system

Test plan for periodic inspection of fixed ladders

Periodic inspections are to be documented in the table

In the event of a claim, this documentation must be submitted in full as evidence.The manufacturer must be granted access to this at all times.

Result: ✗

1.	**Fixed vertical ladder**	
1.1	Ladder uprights	*Technical condition, damage, distortion, corrosion, cracks, burrs*
1.2	Ladder rungs	*Technical condition, damage, distortion, corrosion, cracks, burrs* *Rung/upright connection (welds), anti-skid protection*
2.	**Ladder fixings:**	
2.1	Anchorage points	*Steel-threaded rings: technical condition, preload force, torque* *On concrete base: condition of concrete base* *On other materials: structural condition*
2.2	Bolt connections	*Technical condition, property class, preload force, torque*
2.3	Ladder brackets	*Technical condition, suitability of fastening fixtures, damage, deformation, corrosion*
2.4	Ladder connectors	*Technical condition*
2.5	Suspension supports/tension braces (where fitted)	*Technical condition*
3.	**System components:**	
3.1	Back protection components	*Technical condition, quality of fixings, damage, distortion, corrosion*
3.2	Entry/exit elements	*Technical condition, damage, corrosion*
3.3	Folding rest platform (no.: __ pces.)	*Quality of fixings, function, damage corrosion*
3.4	Base/extension platforms (where fitted)	*Technical condition, damage, corrosion*
4.	**Markings:**	
4.1	Vertical ladder original markings	*Vertical ladder, system components, fall arrest device (where fitted)* *Markings present and legible*
4.2	Inspection documentation	

	Inspection 1		Inspection 2		Inspection 3		Inspection 4		Inspection 5	
	/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)	
	OK	not OK	OK	not OK	OK	not OK	OK	not OK	OK	not OK
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	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

11. Testing the fixed ladder system

Test plan for periodic inspection of fixed ladders

Periodic inspections are to be documented in the table

In the event of a claim, this documentation must be submitted in full as evidence. The manufacturer must be granted access to this at all times.

Result: ☒

1.	**Fixed vertical ladder**	
1.1	Ladder uprights	*Technical condition, damage, distortion, corrosion, cracks, burrs*
1.2	Ladder rungs	*Technical condition, damage, distortion, corrosion, cracks, burrs* *Rung/upright connection (welds), anti-skid protection*
2.	**Ladder fixings:**	
2.1	Anchorage points	*Steel-threaded rings: technical condition, preload force, torque* *On concrete base: condition of concrete base* *On other materials: structural condition*
2.2	Bolt connections	*Technical condition, property class, preload force, torque*
2.3	Ladder brackets	*Technical condition, suitability of fastening fixtures, damage, deformation, corrosion*
2.4	Ladder connectors	*Technical condition*
2.5	Suspension supports/tension braces (where fitted)	*Technical condition*
3.	**System components:**	
3.1	Back protection components	*Technical condition, quality of fixings, damage, distortion, corrosion*
3.2	Entry/exit elements	*Technical condition, damage, corrosion*
3.3	Folding rest platform (no.: ___ pces.)	*Quality of fixings, function, damage corrosion*
3.4	Base/extension platforms (where fitted)	*Technical condition, damage, corrosion*
4.	**Markings:**	
4.1	Vertical ladder original markings	*Vertical ladder, system components, fall arrest device (where fitted)* *Markings present and legible*
4.2	Inspection documentation	

	Inspection 6		Inspection 7		Inspection 8		Inspection 9		Inspection 10	
	/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)		/ Date (Month/Year)	
	OK	not OK	OK	not OK	OK	not OK	OK	not OK	OK	not OK
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	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

11. Testing the fixed ladder system

Documentation for conducting regular inspections and/or repairs

Date	OK	not OK	Fitness for purpose	Repair work/replacement	No access until approved (further inspection required)	

	Remarks	Date, name and signature of trained/authorised personnel	Date of next regular inspection

Notes

Item No..: 1184519 (GB) As of: 05 / 2024 – Rev.09

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