CE 0158

FABA™

INSTALLATION GUIDE

SYSTEM A12

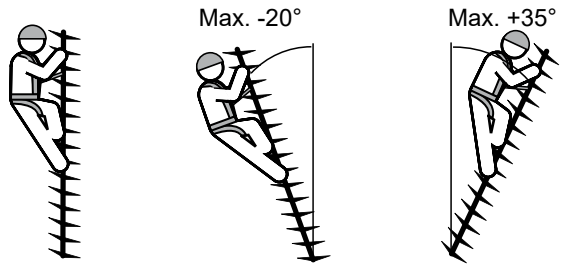
The legally valid language for these instructions is English. All other languages are translations of the original English instructions.

Tractel®

Climbing protection ladders / Climbing protection rail system FABA™ A12

The climbing protection system is designed in accordance with EN 353-1:2018. The FABA™-climbing protection ladders also comply with DIN 18799-2 and EN ISO 14122-4.

General
Masonry / support structures (e.g. steel constructions) as well as the installation base (concrete or stone) must be sufficiently supporting. A specialist must check that there is sufficient load bearing capacity before installation.
Accident prevention regulations must be observed.



Installation
The components are supplied ready for installation. In the case of accessories such as brackets, connectors, etc. the corresponding fastening is either attached in a hand-tight manner or enclosed.
Essentially all screw connections are selected so that they will not seize up even in systems where they are left in place for a long time.
The **screw locking devices** are chosen dependent on the type of use:

- **Screw connections with self-locking nut as per ISO 10511 (DIN 985)**
- **Screw connections with spring washers DIN 6796**
- **Screw connections with lock nuts**

Installation on buildings should take place from the bottom to the top. When **positioning securing holes** ensure that the vertical distance is always a **multiple of 280 mm**. The brackets are screwed into the backs of the rails using a T-head bolt, when fitting the bracket to the **climbing protection ladder**, the position of the rung must be observed. The individual ladder ends must be flush against each other without an air gap. The installation procedure is left up to the installation company.

For anchor fastenings, the guidelines of the anchor manufacturer are to be observed.

Ambient conditions must be observed for the assembly of the ladders or rails (e.g. aggressive surroundings). They must not be mounted in potentially explosive areas. Due to the risk of an invisible stress corrosion cracking, ladders and rails must not be installed in a highly corrosive atmosphere (e.g. above a swimming pool) unless particular control measures have been initiated or compatibility has been verified.

On site adjustment:
If ladder parts or rails must be adjusted on site, the cutting edges should be deburred and finished appropriately.

AFTER INSTALLATION check that all screws are correctly tightened. Check whether all necessary catches are fitted. Damaged surfaces must be made good.
The complete climbing protection system must be run with the carriage. Fitted parts such as gates, detachable catches, entry and exit sections etc. are to be checked for correct operation.

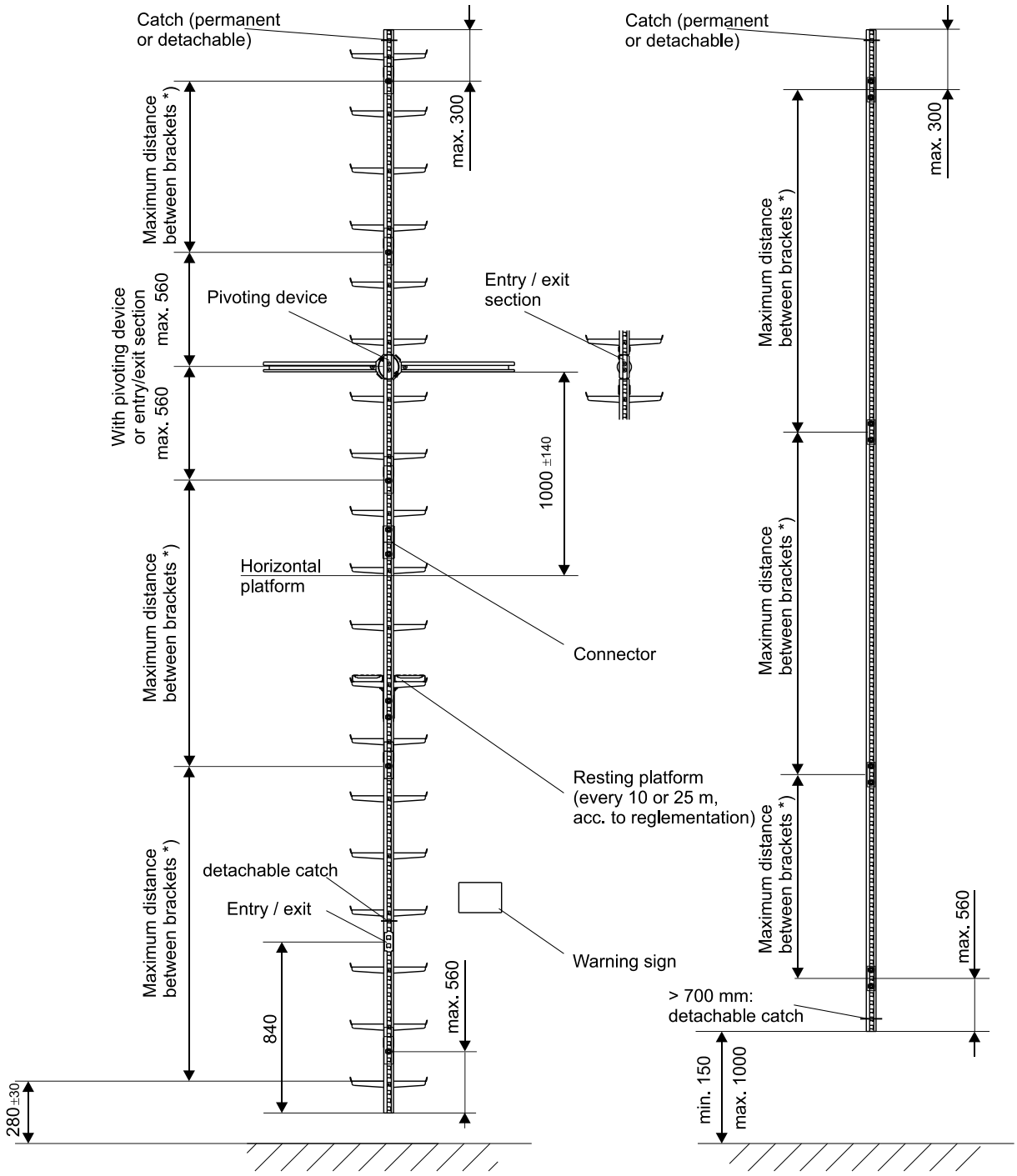
All screw connections must be tightened / checked using the torques listed below:

Thread diameter	**Screw connection / Material**	**Tightening torque** Stacked components	**Tightening torque** **Non**-stacked components (e.g.clamps)
M8	A2-70 / A4-70 / 8.8 tZn	18 Nm	12 Nm
M10	A2-70 / A4-70 / 8.8 tZn	35 Nm	23 Nm
M12	A2-70 / A4-70 / 8.8 tZn	60 Nm	40 Nm
M16	A2-70 / A4-70 / 8.8 tZn	120 Nm	80 Nm
M20	A2-70 / A4-70 / 8.8 tZn	240 Nm	158 Nm

General layout of a FABA™ climbing protection system A12

FABA™ climbing protection ladder

Climbing protection rail FABA™ A12 (retrofit to existing manhole steps)



ATTENTION! Only components approved for the system may be used.
For every FABA™ climbing protection system a warning sign should be attached at the entry point.
The climbing protection ladder with release facility may only be installed as the lowermost ladder segment in the access level area (safe standing point).
Catches must be mounted at all points where the carriage can leave the rail:
– Detachable catches if the carriage may be removed (including position above the release facility),
– Permanent catches if the carriage may not be removed.
*) = Fitting of brackets and bracket spacing see pages 4 and 5

Fitting of support brackets

Fastening method	Implementation	
	Climbing protection ladder with double rung	Climbing protection rail
max. system distance	1400	1960
Weld-on bracket or clamping device	1400	1960
Connection to steel structures with M12	1400	1960
in manhole rings with anchor bolt FZA 14x60, M10/20 1)	1400	1960
in concrete at least B25 with anchor bolt FZA 14x60, M10/20 1)	1400	1960
with brickwork 2)	1120	1120
on existing twin-rail ladder	not applicable	1960
on existing step irons	not applicable	1960

Notes:

1) Fastening can also be carried out using other similar anchor fittings authorized by the building authorities.
2) Since there are no approved anchor fittings for use with brickwork, it will be necessary for an anchor fitting manufacturer to check and determine the type and size of anchor fittings to be used by means of tensile tests carried out on-site prior to installation. Documentation and certification of the anchor fittings used must be available.

Number of support brackets

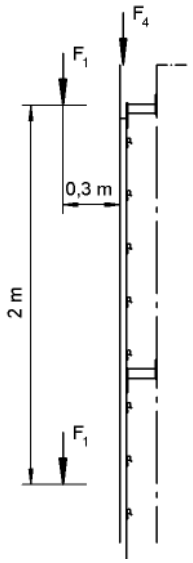
- Calculation = total ladder or rail length divided by separation distance given above between support brackets, round up, + 1 support bracket
- Example (ladder length = 15000 mm, distance between support brackets = 1400 mm) = 15000 / 1400 = 10.7 round up + 1 = 12 support brackets, or = 12 + x, if special components require the use of additional support brackets.

- When using special components, such as entry and exit sections or gates, etc., additional support brackets must be incorporated and their minimum distances observed in accordance with the applicable system installation manual. The support brackets required therefore must be included in the example calculation shown above.

PLEASE OBSERVE

- FABA™ A12 Climbing protection systems with an overall height of less than 2800 mm must be connected to the ground beneath by means of at least 3 fasteners
- For climbing protection systems with a total height of more than 2800 mm, at least 4 brackets are to be used.
- The ground to which the FABA™ A12 climbing protection system is secured, must be capable of absorbing a falling load of at least 6 kN.
- Each FABA™ A12 ladder or rail element is to be fastened to the floor with at least one bracket. With a butt joint, at least one of the two rails or ladders must be fastened with at least 2 brackets. The topmost rail or ladder must be fastened with at least 2 brackets.

The falling load (extreme effects) should be assumed to be equal to an equivalent load along the rail axis of F4 = 6 kN. Derivation of the load may be carried out on a square element (see also DIN 18799, part 2). The traffic load (variable effect) is to be set with F1 = 1.5 kN in a line of action 30 cm parallel to the longitudinal axis of the ladder every 2 m (see drawing on right).



Mounting on brickwork

The maximum bracket distance is dependent on what loading can be absorbed by the anchor fastening. If it can be demonstrated in an anchor pull-out test that the pull-out force in an unfavourable position is at least 10 kN, the maximum bracket distance is 1120 mm.

Since there are no approved anchor fittings for use with brickwork, it will be necessary for an anchor fitting manufacturer to check and determine the type and size of anchor fittings to be used by means of tensile tests carried out on-site prior to installation. Documentation and certification of the anchor fittings used must be available.

The climbing protection system must be secured with at least 4 brackets. We recommend brackets with square tubing for fastening on brickwork.

Position of the FABA™ climbing protection rail or ladder

The FABA™ climbing protection rail is asymmetric. When installing **always** note the position side piece and the sign.
See figure 1.

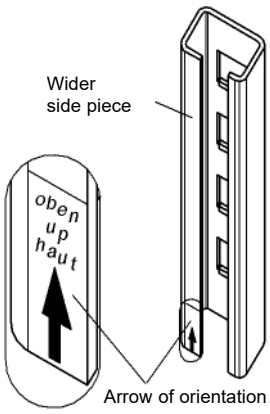


Figure 1

Ladder and rail: Fitting of attachment parts

The T-head bolt is used to secure attachment parts, e.g. brackets, from the rear to the back of the rail. Insert the T-head bolt through the rail slot and position the bolt head so that the long side lies against the rail seam (protection against turning).
See figure 2.

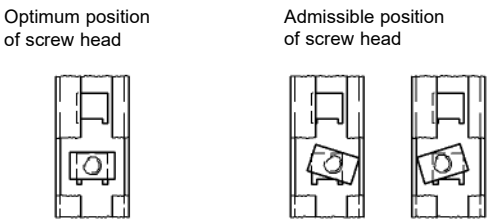


Figure 2

Detachable catch type DS

Mounted in the climbing protection system at the top or bottom. It is fitted in the third square hole from the rail end. If there is a release facility (window) in the rail profile, the DS catch must be positioned immediately after the release facility.

Unscrew the pre-mounted shaped nut and insert the threaded end from the inside through the third square hole. It must be precisely positioned flush with the back of the rail, so that the carriage can be introduced. Insert washer and ratchet knob from behind onto the threaded pin and tighten.
See figure 4.

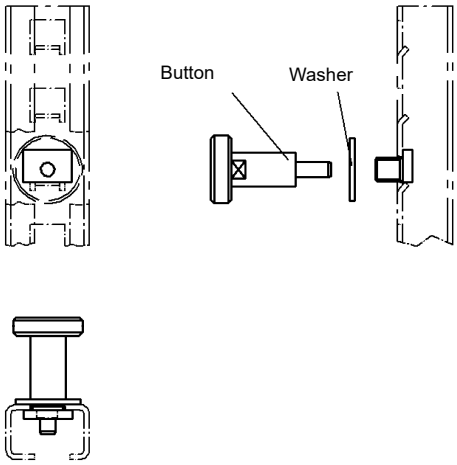


Figure 4

Permanent catch

Mounted in a climbing protection system at the top or bottom. It is fitted in the second square hole from the rail end. Feed the screw with washer into the rail slot from the front and through the square hole and the complete profile, then put the second washer onto the threaded part in the back side of the rail and tighten the locking nut with max. 40 Nm.

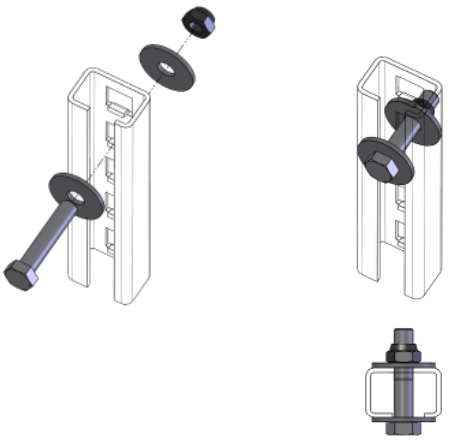


Figure 5

Connector

First T-head bolt and connector are screwed onto the already fitted FABA™ climbing protection rail in the second square hole. The next rail is positioned and tightened using the remaining screw (no air gap). The alignment of the rail is ensured by the side guidance of the connector.
See figure 6.

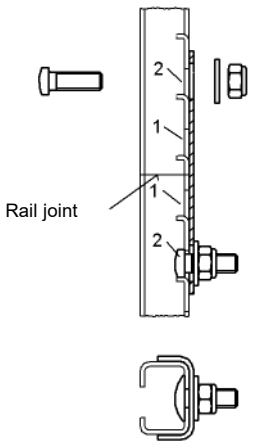


Figure 6

Fitting of support brackets to the building

The bracket is screwed onto the back of the rail with the side with the longer lug (see also figure 2).
The securing point of the building is higher than that on the rail. In exceptional cases a bracket can also be fitted in a rotated position.
See figure 7.

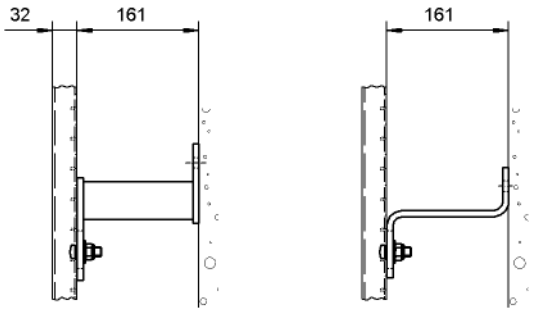


Figure 7

Resting platform

The resting platform is fitted with its bracket positioned from the rear onto the back of the rail (see also figure 2). The height is aligned so that the folded out resting platform lies horizontal with the stepping surface of the rung.
See figure 8.

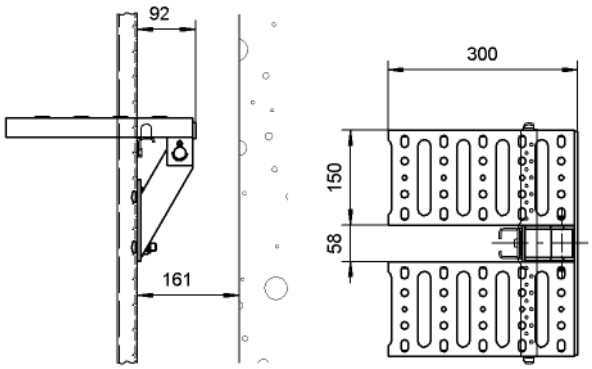
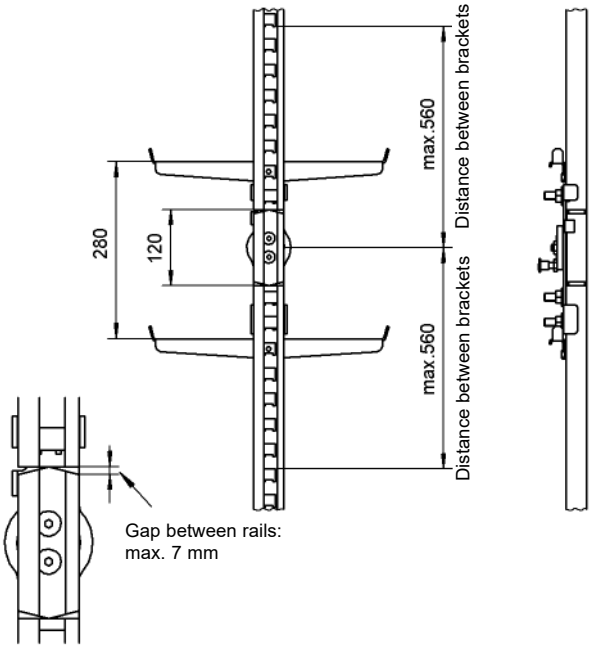


Figure 8

Entry and exit sections

The entry and exit sections are fitted between two rungs. Ladders shortened at the top and bottom can be supplied ready made upon request.
Otherwise the cutout for the entry and exist sections should be made as in figure 9. After fitting, check the gap at the rail.
Note the max. distance between brackets in the area of the entry and exist sections.
See figure 9.
For fastening of the entry and exit sections to the rail, see figure 2.



Pivoting gate (special component)

The pivoting gate is fitted between two rungs. Ladders shortened at the top and bottom can be supplied ready made upon request.
Otherwise the cutout for the pivoting gate should be made as in figure 10. After fitting, check the gap at the rail.
Note the max. distance between brackets in the area of the pivoting gate. See figure 10.
For fastening of the pivoting gate to the rail, see figure 2.

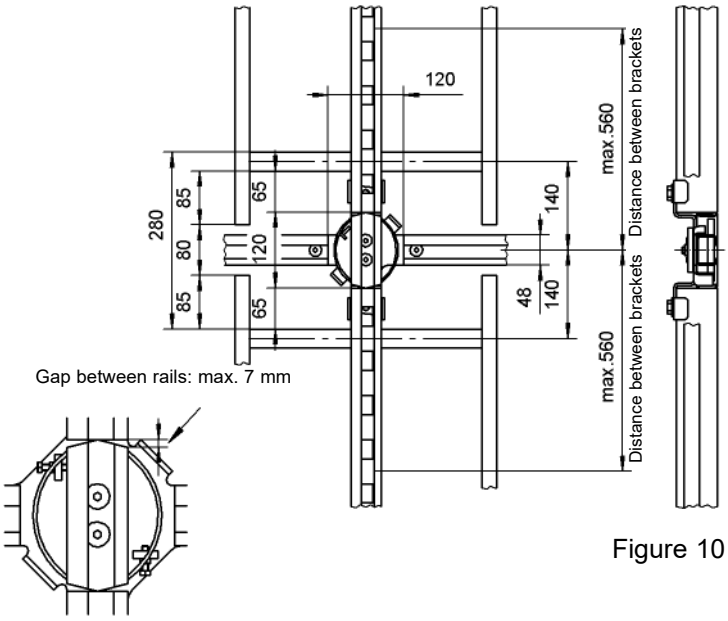


Figure 10

Note:
Peripheral rails and horizontal connections to gates are planned in a project by project manner. For fitting and corresponding connection measures, the corresponding project drawing applies.

Straight step-over with climbing protection ladder

The side rail reinforcement is supplied with preassembled brackets for securing to the building as well as to the climbing protection ladder.
The side rail reinforcement is fitted to the the building in accordance with figure 11. The guidelines of the anchor manufacturer are to be observed.
The climbing protection ladder with 7 lower rungs is fitted to the side rail reinforcement as shown in figure 13. The top rung must not be higher than the standing surface (refer to DIN 18799-2 and EN ISO 14122-4).
Optionally an entry or exit or detachable catch may be fitted to the top end of the ladder.
See figure 11 (the entry and exit is represented swivelling to the left).

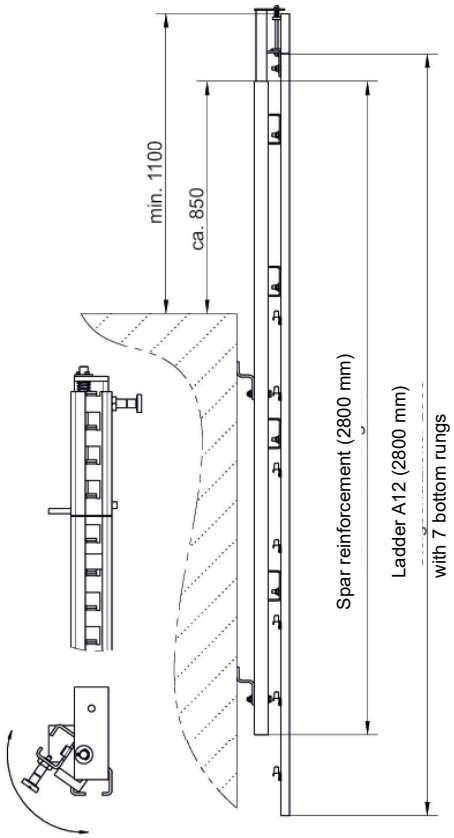


Figure 11

Straight step-over on existing climbing facility

The side rail reinforcement is supplied with pre-assembled brackets for securing to the climbing protection rail.
The climbing protection rail is fitted to the side rail reinforcement as shown in figure 12. The top rung must not be higher than the standing surface (refer to DIN 18799-2 and EN ISO 14122-4).
Optionally an entry or exit or detachable catch may be fitted to the top end of the ladder.
See figure 12 (the entry and exit is represented swivelling to the left).

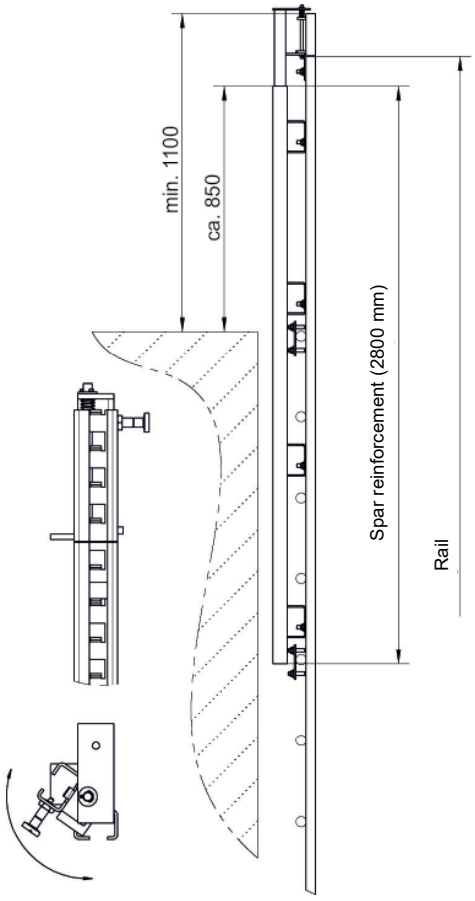


Figure 12

Curved step-over with climbing protection ladder

The curved step-over for securing to the building is supplied pre-assembled. It comprises the climbing protection ladder with curved section and the the reinforcement pipe with accessories.
The step-over is secured with brackets to the building. The guidelines of the anchor manufacturer are to be observed.
The top rung must not be higher than the standing surface (refer to DIN 18799-2 and EN ISO 14122-4).
At the top end of the climbing protection ladder a detachable catch must be fitted (figure 4).
See figure 13.

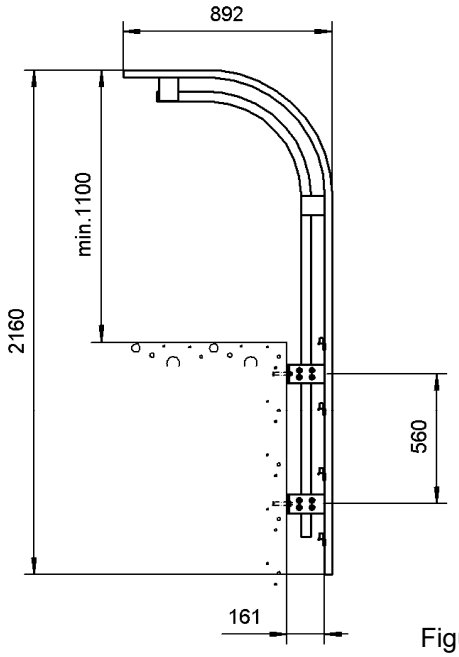


Figure 13

Curved step-over on existing climbing facility

The curved step-over for securing to an existing climbing facility (step irons) is supplied pre-assembled. It comprises a curved climbing protection rail and the reinforcement pipe with accessories.
The step-over is fitted to the existing step irons.
The attachment separations shown in figure 14 must be adhered to.
The top rung must not be higher than the standing surface (refer to DIN 18799-2 and EN ISO 14122-4).
At the top end of the climbing protection rail a detachable catch must be fitted (figure 4).
See figure 14.

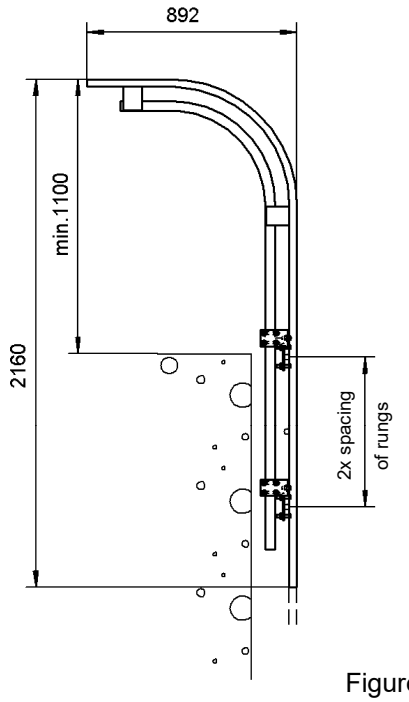


Figure 14

Shaft accessories

The climbing protection rail is fitted to the existing step irons.
The climbing protection ladder is fitted using the corresponding brackets in the shaft.
In so doing the position of the top rung as well as the top rail end must be observed.

The max. bracket spacing must be adhered to.
The coupling is fitted on the top end of the top climbing protection rail or ladder in the shaft. The top T-head bolt comes into the second window from the top.
See figure 15.

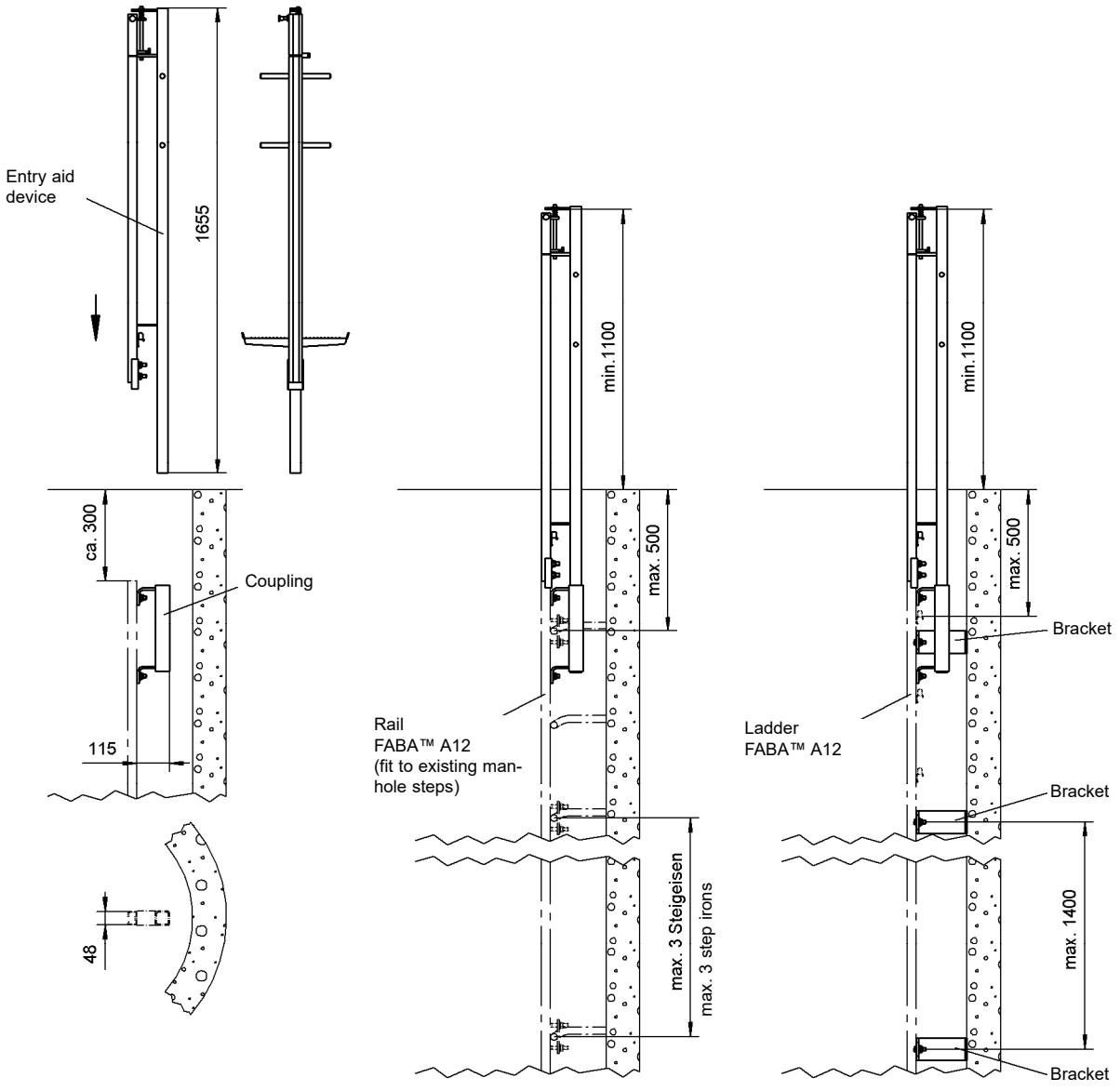


Figure 15

Cover plate

No additional fastenings to the ground or climbing protection ladder are required for the cover plate.
It is hung using the top angles on the rung. A safety bolt is pushed through the back of the rail and secured with a padlock on the bottom angles.
See figure 16.

Note:
A special installation guide is enclosed for fitting the door cover, **order no. 503518**.

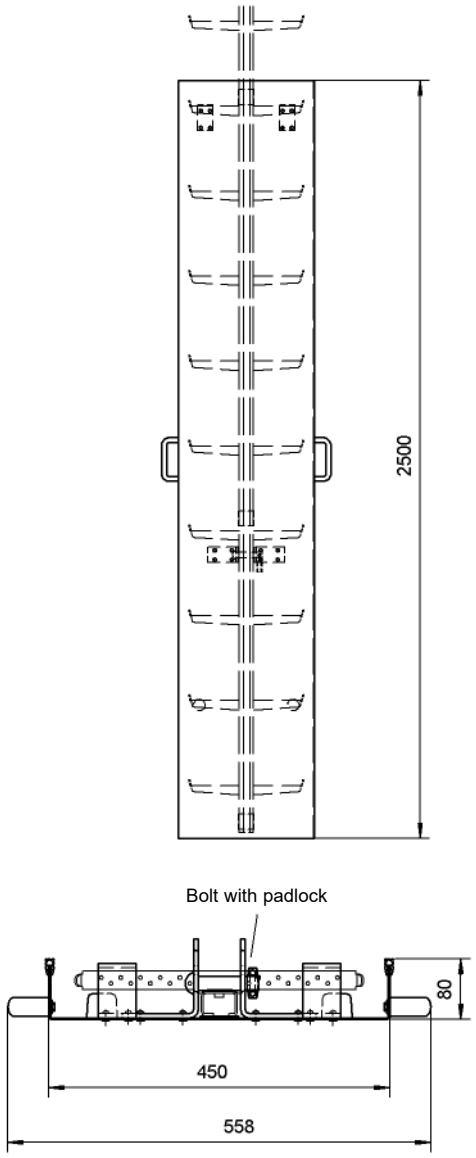


Figure 16

Climbing protection rail with mounting hooks for securing the system against unauthorized climbing

The climbing protection rail with mounting hooks may only be installed as the lowermost segment.
The lowest bracket shall be fitted as low as possible.
See figure 17.

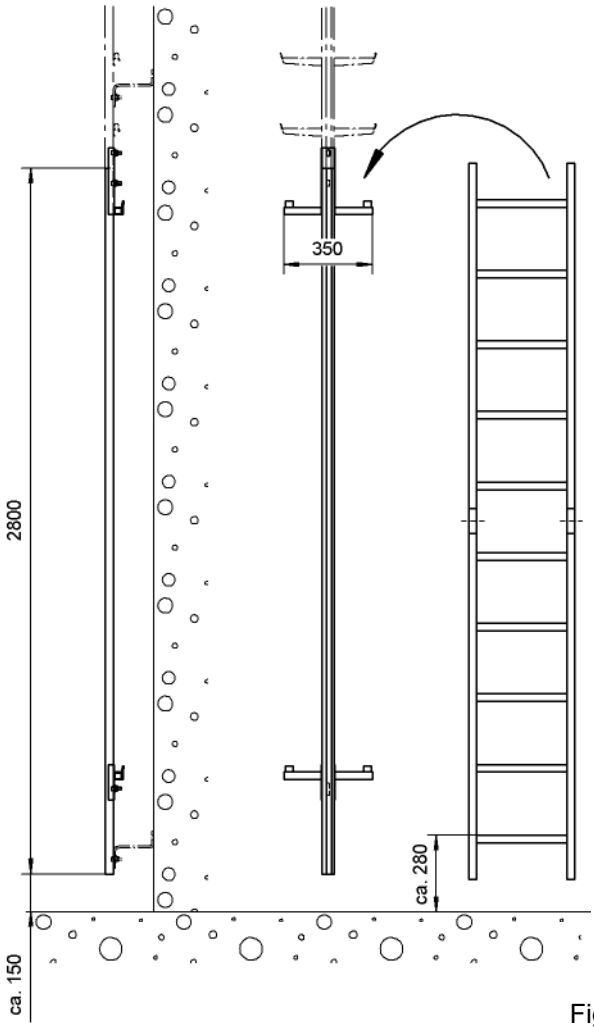


Figure 17

Checks and tests after installation

1. Check that all rail ends and entry and exit points are protected with a suitable catch.
2. Ensure that the number of brackets and their distances from each other conform to the regulations on page 4 and 5.
3. Check torques of all screw connections (table 1, column “During installation”).
4. Run through the whole installation with a carriage FABA™ Grip or AL-D (observe the operating manual of the carriage).
5. Check the functionality of all mechanical components (e.g.: entry and exit sections, resting platforms, etc.), also in conjunction with use of the FABA™ carriage.

Table 1: Tightening torques for screw connections

Thread diameter	**Screw connection / Material**	**Tightening torque during assembly** Stacked components	**Tightening torque during assembly** **Non**-stacked components (e.g. clamps)	**Tightening torque Repeated inspection** Stacked components	**Tightening torque Repeated inspection** **Non**-stacked components (e.g. clamps)
M8	A2-70 / A4-70 / 8.8 tZn	18 Nm	12 Nm	16 Nm	11 Nm
M10	A2-70 / A4-70 / 8.8 tZn	35 Nm	23 Nm	31 Nm	21 Nm
M12	A2-70 / A4-70 / 8.8 tZn	60 Nm	40 Nm	50 Nm	36 Nm
M16	A2-70 / A4-70 / 8.8 tZn	120 Nm	80 Nm	108 Nm	72 Nm
M20	A2-70 / A4-70 / 8.8 tZn	240 Nm	158 Nm	216 Nm	142 Nm

Table 2: Minimum number of components to be checked in the repeated checks

Component	Length of the FABA™ climbing protection system			
	up to 10 m	up to 25 m	up to 50 m	over 50 m
Brackets	2	4	8	10
Connectors	1	1	2	3
End-stops	all	all	all	all
Gates	all	all	all	all
Other accessories	1	1	1	1

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