

Alignment struts

User guide



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1 Product features

All HÜNNEBECK alignment struts are designed for bracing and adjustment of pre-fabricated walls and columns.

All alignment struts are designed in such a fashion as to permit attachment to either the quick-action fastener or the head attachment K and Alu. They serve as a support for pre-fabricated walls or props. This allows for the quick and accurate erection of even large-sized elements. In spite of their size, alignment struts are easy to transport and can be quickly and easily anchored, using the quick-action fastener.

Since the threaded part of HÜNNEBECK alignment struts is protected with a cover, they always stay clean and can be easily used and remain ready for use, even after multiple applications.

All steel parts of the alignment struts are galvanized.

1.1 General information

This user guide contains important information regarding the assembly and use of the HÜNNEBECK alignment struts, as well as safety instructions that are important for a safe application on site. This user guide is created to support effective working processes on site with the alignment struts. Therefore read this user guide before assembly and use of the alignment struts carefully, keep it always at hand and archive it for reference.

HÜNNEBECK products are exclusively designed for commercial use by technically qualified users.

1.2 Safety instructions

Important information regarding the intended use and safe application of formwork and falsework.

The contractor is responsible for drawing up a comprehensive risk assessment and a set of installation instructions. The latter is not usually identical to the user guide.

- Risk Assessment

The contractor is responsible for the compilation, documentation, implementation and revision of a risk assessment for each construction site. His employees are obliged to implement the measures resulting from this in accordance with all legal requirements.

- Installation Instructions

The contractor is responsible for compiling a written set of installation instructions. The user guide forms part of the basis for the compilation of a set of installation instructions.

- User guide

Formwork is technical work equipment which is intended for commercial use only. The intended use must take place exclusively through properly trained personnel and appropriately qualified supervisory personnel. The user guide is an integral component of the formwork construction. It comprises at least safety guidelines, details of the standard configuration and intended use, as well as the system description. This user guide is intended for commercial users with appropriate technical training. The contents and processes described are in accordance with the legal and occupational safety regulations of Germany and Austria. HÜNNEBECK assumes no liability for deviations from the contents and processes described or for use outside this area of application.

The functional instructions (standard configuration) contained in the user guide are to be complied with as stated. Enhancements, deviations or changes represent a potential risk and therefore require separate verification (with the help of a risk assessment) or a set of installation instructions that comply with the relevant laws, standards and safety regulations. The same applies in those cases where formwork and/or falsework components are provided by the contractor.

- Availability of the user guide
The contractor has to ensure that the user guide provided by the manufacturer or formwork supplier are available at the place of use. Site personnel are to be informed of this before assembly and use takes place, and that they are available at all times.
- Representations
The representations shown in the user guide are, in part, situations of assembly and not always complete in terms of safety considerations. The safety installations that have not been shown in these representations must nevertheless be available.
- Storage and transportation
The special requirements of the respective formwork constructions regarding transportation procedures as well as storage must be complied with. By way of example, name the appropriate lifting gear to be used.
- Material check
Formwork and falsework material deliveries are to be checked on arrival at the construction site/place of destination as well as before each use to ensure that they are in perfect condition and function correctly. Changes to the formwork materials are not permitted.
- Spare parts and repairs
Only original components may be used as spare parts. Repairs are to be carried out by the manufacturer or authorized repair facilities only.
- Use of other products
Combining formwork components from different manufacturers carries certain risks. They are to be individually verified and can result in the compilation of a separate set of assembly instructions required for the installation of the equipment.
- Safety symbols
Individual safety symbols are to be complied with.

DANGER

DANGER!

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING!

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION!

CAUTION used with the safety alert symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE

NOTE

NOTE refers to practices not related to personal injury.

VISUAL CHECK

VISUAL CHECK refers to a visual check and is not related to personal injury.

- Miscellaneous

Technical improvements and modifications are subject to change without notice. For the safety-related application and use of the products, all current country-specific laws, standards, as well as other safety regulations are to be complied with without exception. They form a part of the obligations of employers and employees regarding industrial safety. This results in, among other things, the responsibility of the contractor to ensure the stability of the formwork and falsework constructions as well as the structure during all stages of construction.

This also includes the basic assembly, dismantling and the transport of the formwork and falsework constructions or their components. The complete construction is to be checked during and after assembly.

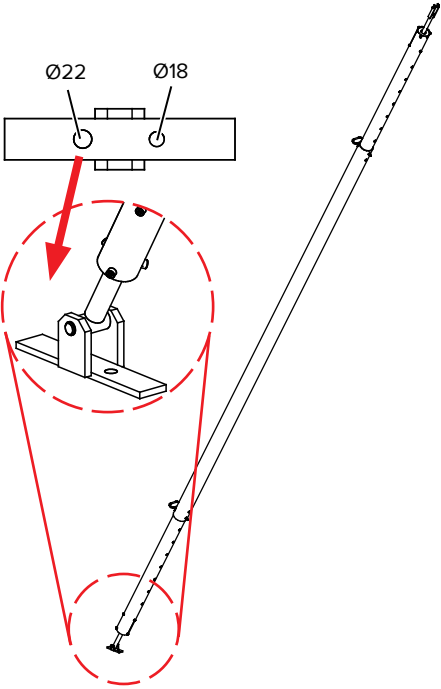
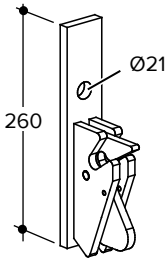
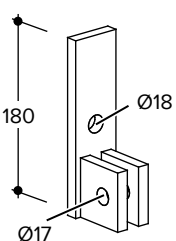


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2 Components

All alignment struts have a telescopic design and an extremely low self-weight. They are used for bracing and adjustment of pre-fabricated concrete slabs. A spindle with an encapsulated thread is used for fine-tuning.

	Component	Product code	Weight [kg]
	Alignment strut P330 perm. load 13.0 kN (length 2.05 m) perm. load 9.5 kN (length 3.30 m) Top and base plate have the same dimensions (see page 12).	600800	13.85
	Alignment strut K440 perm. load 20 kN (length 3.25 m) perm. load 11 kN (length 4.40 m)	601208	23.42
	Alignment strut K600 perm. load 20 kN (length 4.80 m) perm. load 14 kN (length 6.00 m)	601210	35.79
	Alignment strut K760 perm. load 20 kN (length 5.30 m) perm. load 15 kN (length 7.60 m)	601212	51.29
	Alignment strut Alu 10 Alignment strut Alu 10 can be telescoped twice its length. perm. load 20 kN (length 7.05 m) perm. load 17 kN (length 10.35 m)	601213	82.91

	Component	Product code	Weight [kg]
	<p>Alignment strut Super 10</p> <p>Alignment strut Super 10 can be telescoped twice its length. perm. load 25.0 kN (length 7.05 m) perm. load 22.3 kN (length 10.25 m)</p>	<p>602095</p>	<p>84.03</p>
	<p>Quick-action fastener</p> <p>The quick-action fastener is threaded onto the prefabricated wall or support and thus forms a connection with the alignment strut.</p>	<p>601385</p>	<p>2.76</p>
	<p>Head attachment K Alu alignment strut</p> <p>Can be used as an alternative to the quick-action fastener (see page 11).</p>	<p>602038</p>	<p>1.30</p>

3 Important notes

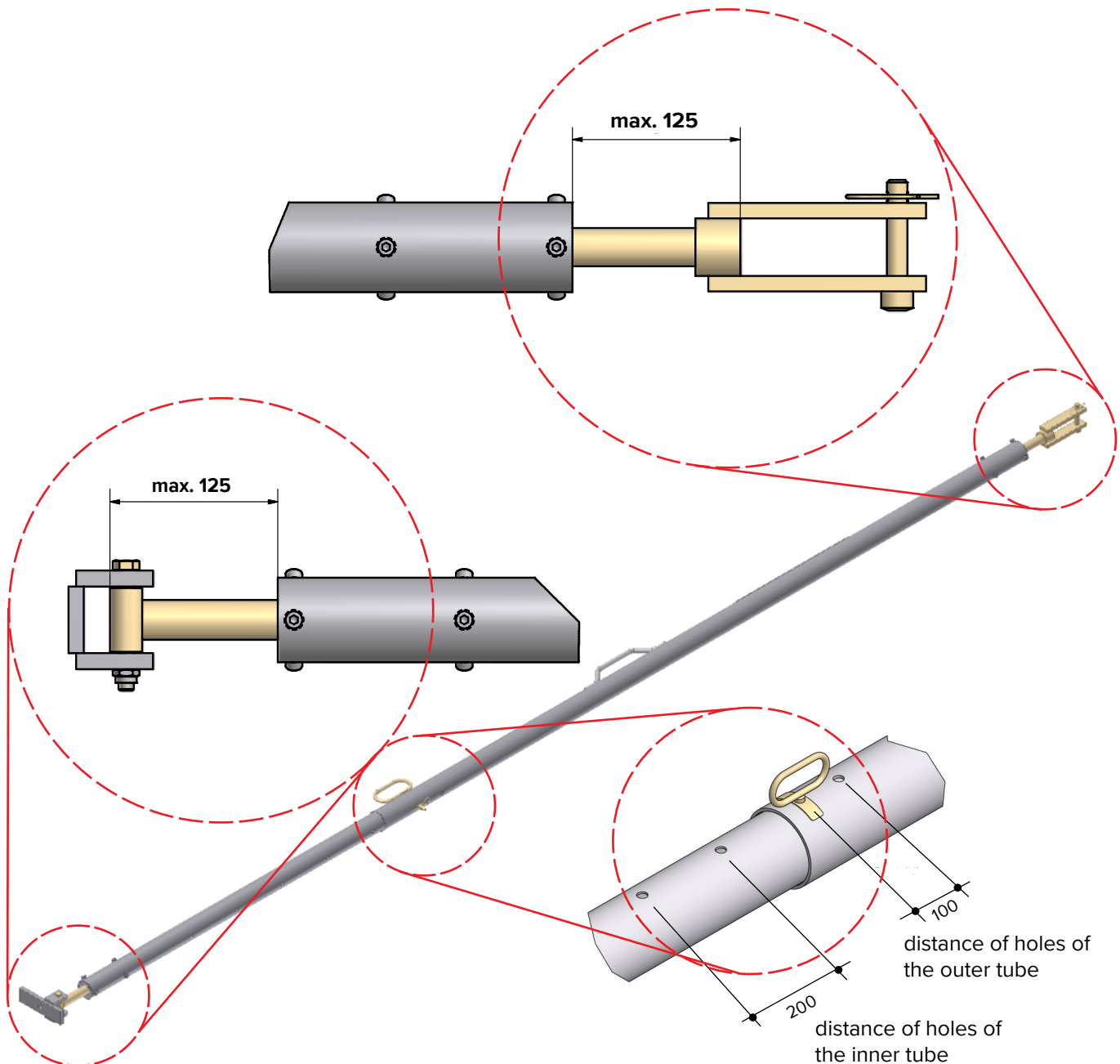
Application

Alignment strut K440, product code: 601208

Alignment strut K600, product code: 601210

Alignment strut K760, product code: 601212

When a spindle has reached the maximum extension of 125 mm, then a further length adjustment has to be made by readjusting the strut with the locking pin.



WARNING

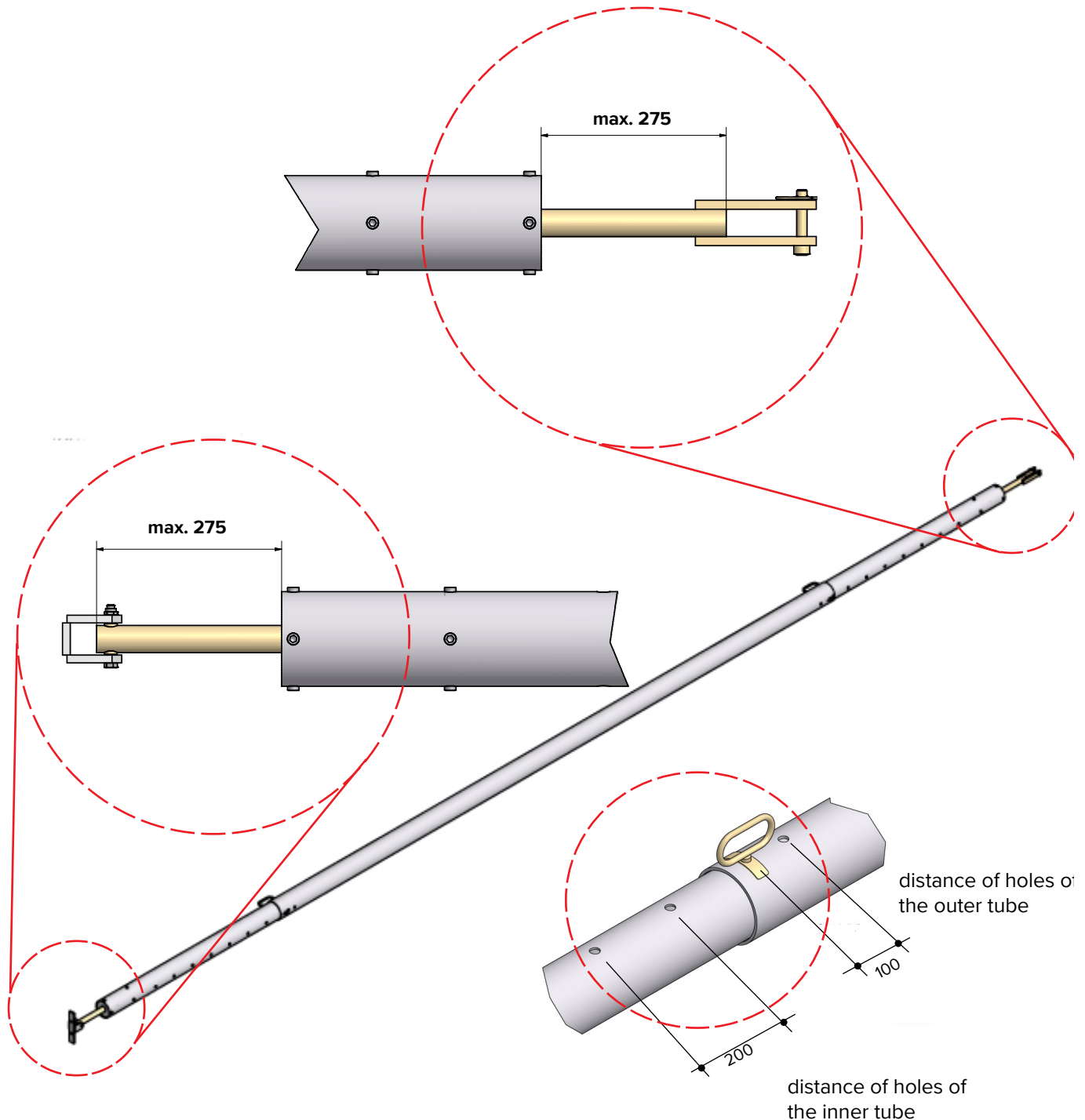
Safety information

Prior to use, the spindles must be drawn out to the same length on both sides. Only then is it sure that the defined maximum length can be achieved and no damage will occur to the alignment struts. Each spindle is only allowed to be drawn out to a maximum of 125 mm.

Application

Alignment Strut Super 10, product code: 602095

When a spindle has reached the maximum extension of 275 mm, any further length adjustment has to be made by readjusting the strut with the locking pin.



WARNING

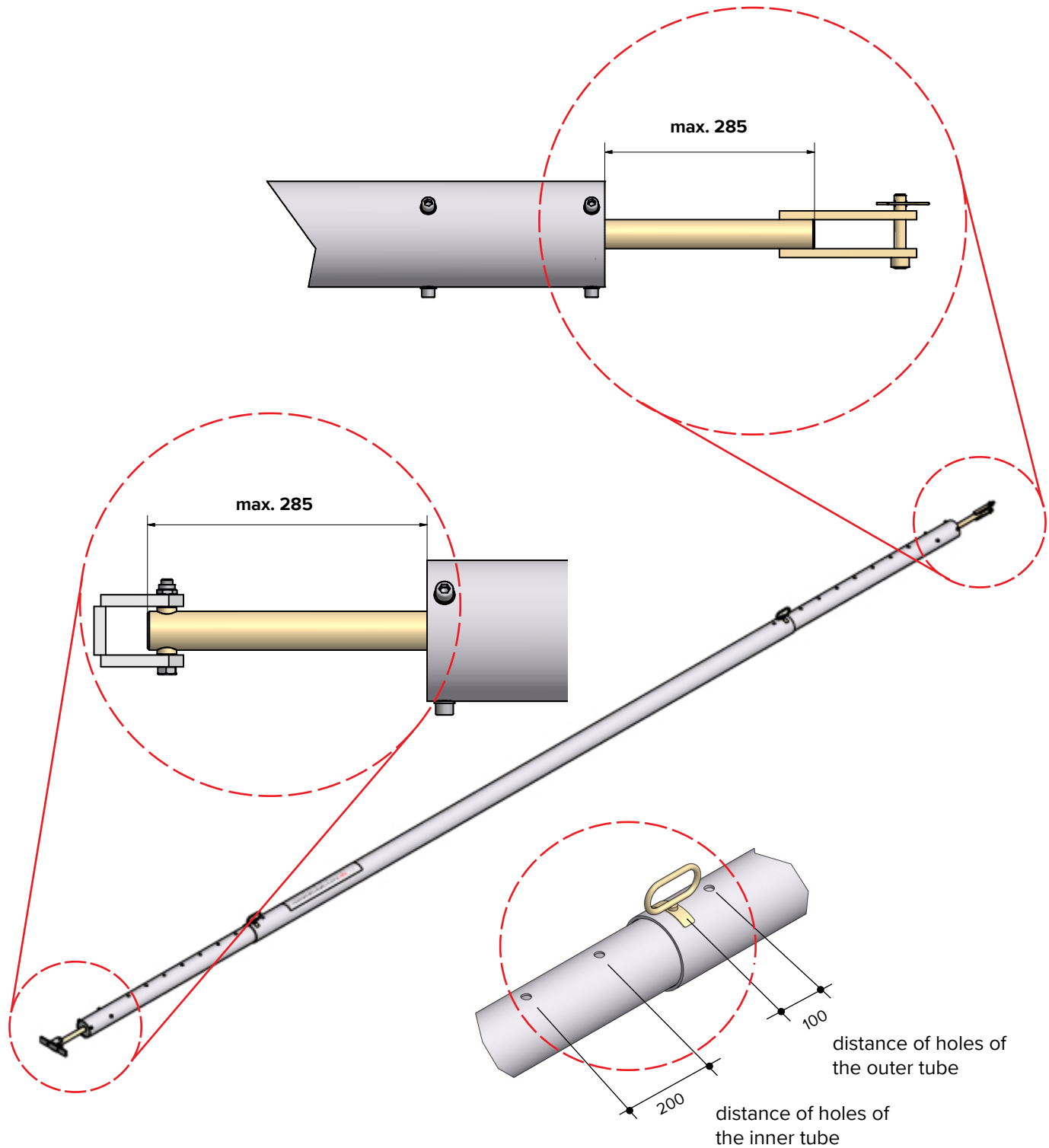
Safety information

Prior to use, the spindles must be drawn out to the same length on both sides. Only then is it sure that the defined maximum length can be achieved and no damage will occur to the alignment struts. Each spindle is only allowed to be drawn out to a maximum of 275 mm (as shown).

Application

Alignment Strut Alu 10, product number: 601213

When a spindle has reached the maximum extension of 285 mm, any further length adjustment has to be made by readjusting the strut with the locking pin.



WARNING

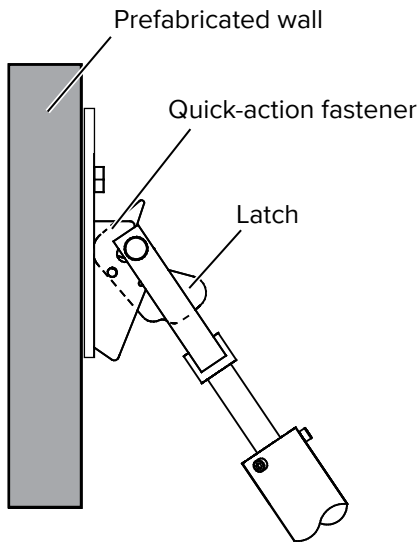
Safety information

Prior to use, the spindles must be drawn out to the same length on both sides. Only then is it sure that the defined maximum length can be achieved and no damage will occur to the alignment struts. Each spindle is only allowed to be drawn out to a maximum of 285 mm (as shown).

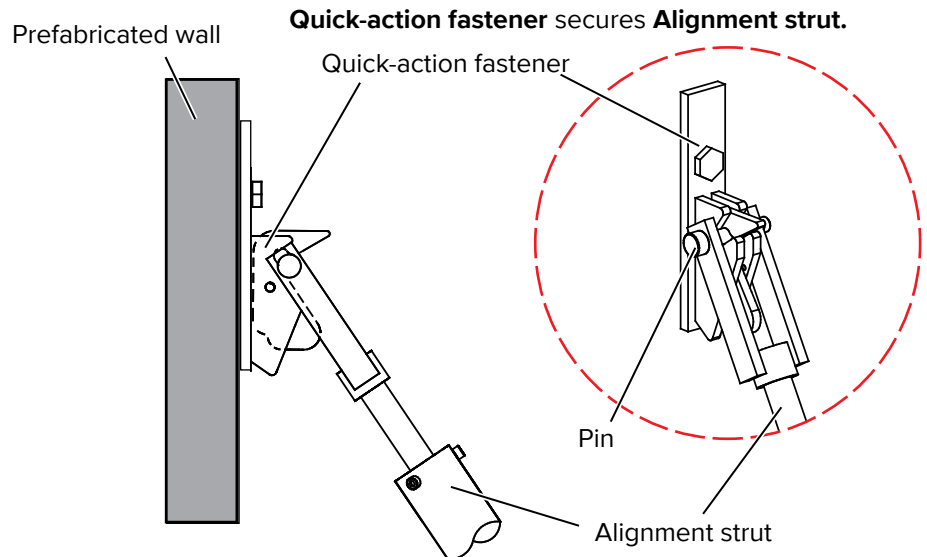
4 Application

Connection to an upright prefabricated wall

Step 1



Step 2



WARNING

Safety information

The quick-action fastener is securely locked, if the red mark on the latch is not visible any more! The quick-action fastener and head attachment K are only allowed to use at vertical walls!

Do **not** remove the pin! To remove the alignment strut, push down the latch of the quick-action fastener.

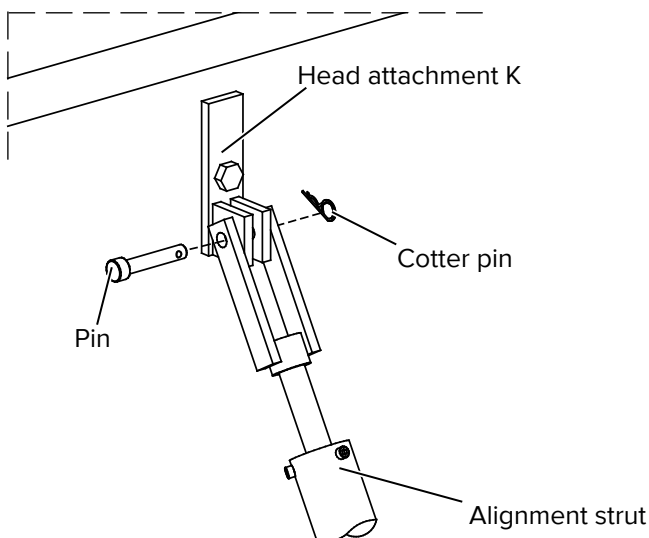


VISUAL CHECK

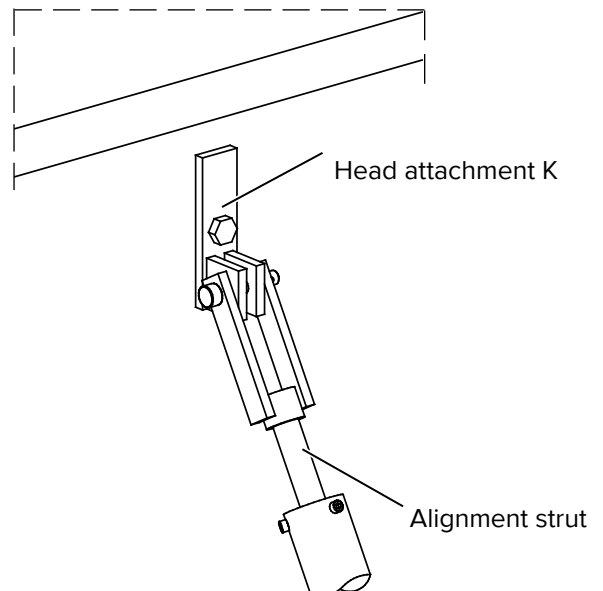
Check locking mechanism!

Optional connection by using the head attachment K.

Step 1



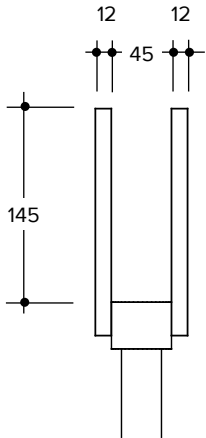
Step 2



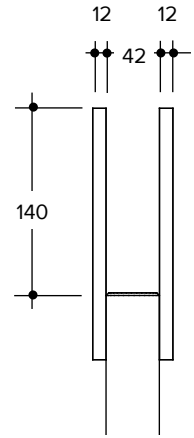
5 Statics

Top connectors

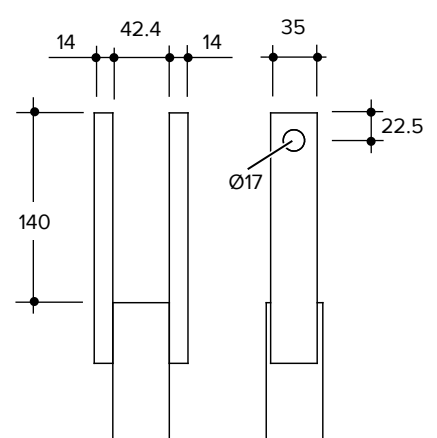
Alignment strut K440
Alignment strut K600
Alignment strut K760



Alignment strut Alu 10

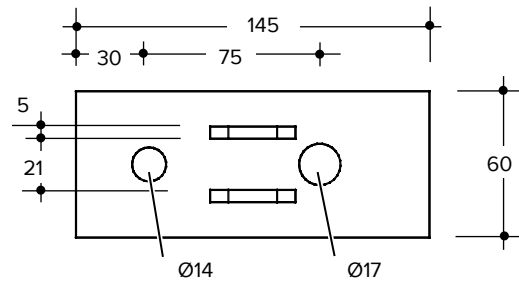
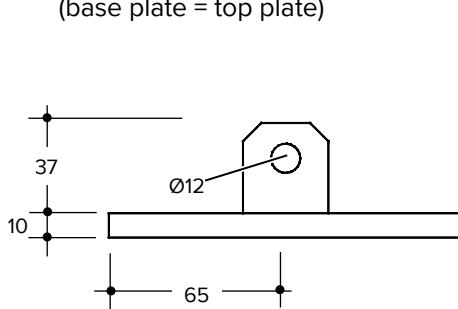


Alignment strut Super 10

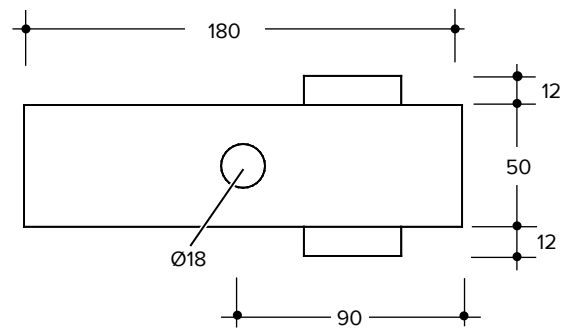
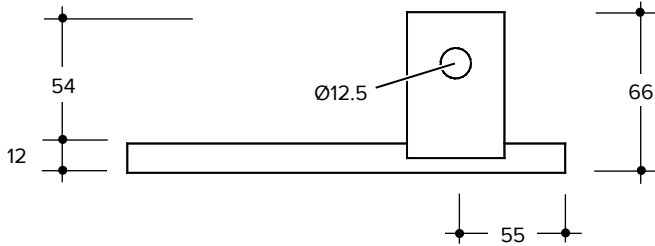


Base plates

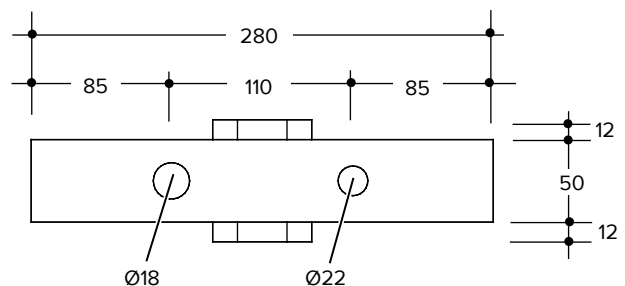
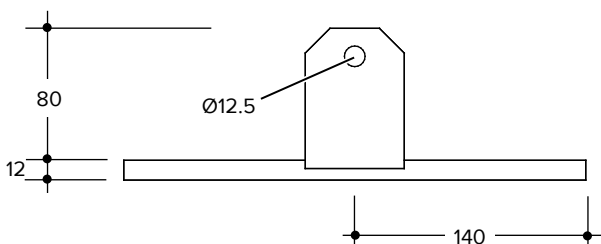
Alignment strut P330
(base plate = top plate)



Alignment strut K440
Alignment strut K600
Alignment strut K760



Alignment strut Alu 10. Alignment strut Super 10



Connection to pre-fabricated part

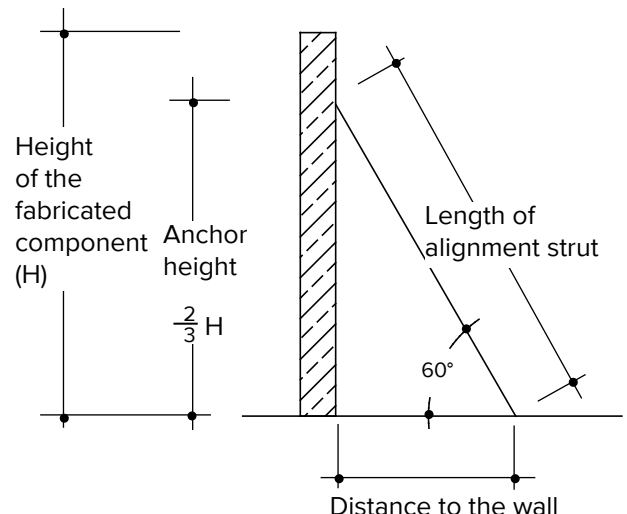
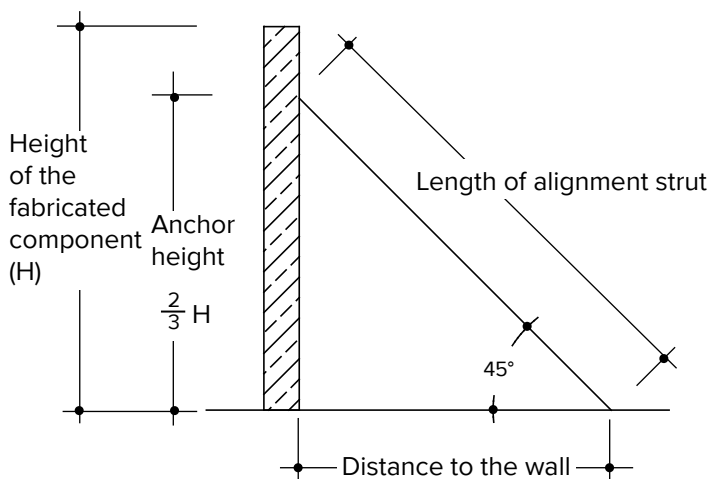
Alignment strut lengths [m] (from pin to pin)					
Height of component II [m]	Anchor height* ($H \cdot 2/3$) [m]	Angel $\alpha = 45^\circ$		Angel $\alpha = 60^\circ$	
		Lenth of alignment [m]	Distance of anchor to the wall [m]	Lenth of alignment [m]	Distance of anchor to the wall [m]
3.00	2.00	2.83	2.00	2.31	1.15
3.55	2.37	3.35	2.37	2.73	1.37
4.00	2.67	3.77	2.67	3.08	1.54
4.50	3.00	4.24	3.00	3.46	1.73
4.75	3.17	4.48	3.17	3.66	1.83
5.25	3.50	4.95	3.50	4.04	2.02
5.75	3.83	5.42	3.83	4.43	2.21
6.25	4.17	5.89	4.17	4.81	2.41
6.75	4.50	6.36	4.50	5.20	2.60
7.25	4.83	6.84	4.83	5.58	2.79
7.75	5.17	7.31	5.17	5.97	2.98
8.00	5.33	7.54	5.33	6.16	3.08
8.50	5.67	8.01	5.67	6.54	3.27
9.00	6.00	8.49	6.00	6.93	3.46
9.50	6.33	8.96	6.33	7.31	3.66
10.00	6.67	9.43	6.67	7.70	3.85
10.50	7.00	9.90	7.00	8.08	4.04
11.00	7.33	10.37	7.33	8.47	4.23
11.50	7.67			8.85	4.43
12.00	8.00			9.24	4.62
12.50	8.33			9.62	4.81
13.00	8.67			10.01	5.00



WARNING

Safety information

The height of anchoring must be coordinated with the deliverer of the pre-fabricated parts or must be noticed in the adequate construction drawings or part drawings. The length calculation does not give consideration to the arising loads. These must be calculated separately!

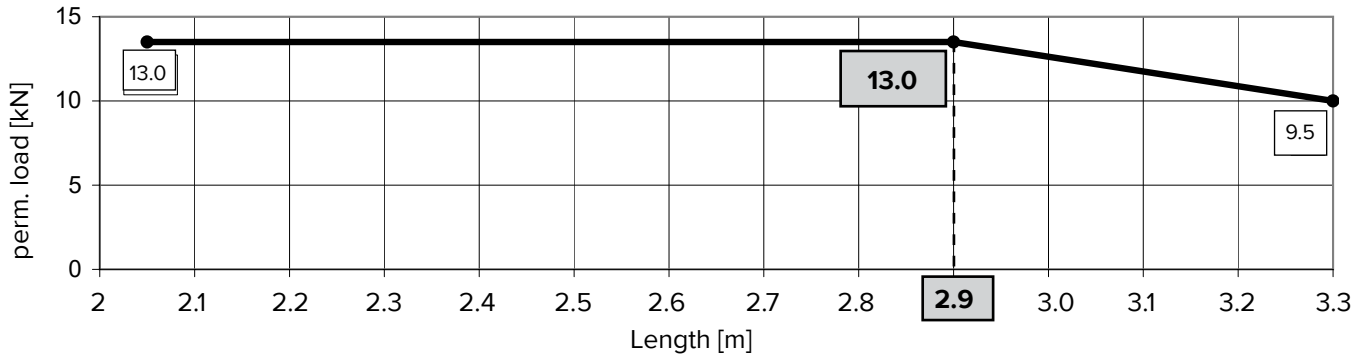


5.1 Loads at anchoring point

Alignment strut P330, product number: 600800, weight: 13.7 kg

Load diagram

P330 2.05 – 3.30 m



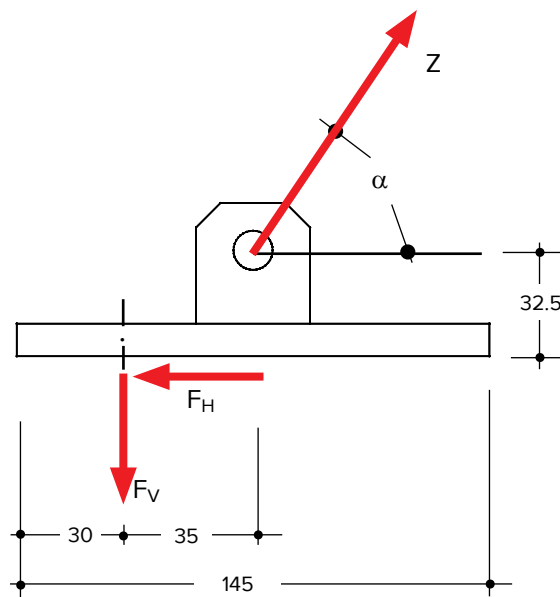
Conversion factor (C_H , C_V) to determine the resulting load at the anchoring point [kN] with tension load Z [kN] with the alignment strut P330.

C_H = horizontal conversion factor

C_V = vertical conversion factor

Z = alignment strut load

Angle α	C_H	C_V
45°	0.71	0.78
50°	0.64	1.00
55°	0.57	1.22
60°	0.50	1.43



Sample calculation:

For an extension length of 2.9 m the permissible alignment strut load is 13.0 kN. At an angle of 50° the resulting anchor loads apply:

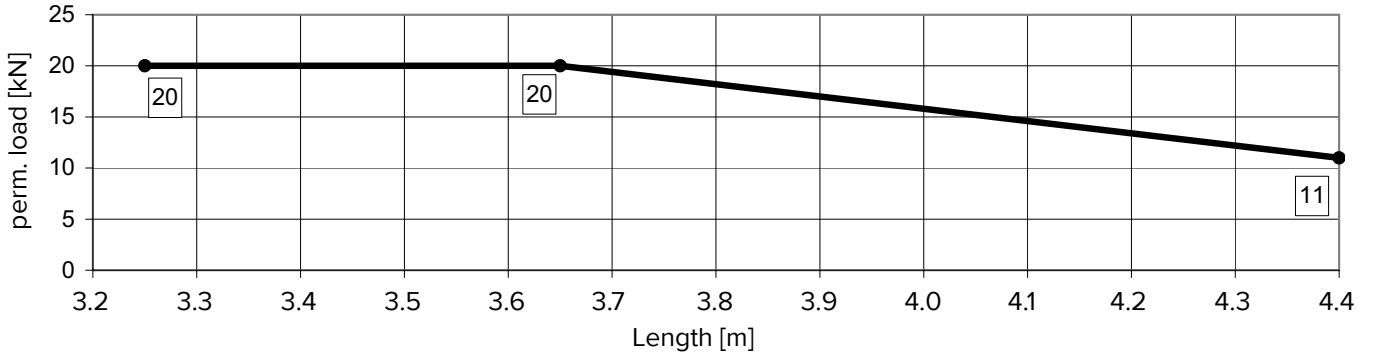
$$F_H: Z \times C_H (50^\circ) = 13.0 \text{ kN} \times 0.64 = 8.32 \text{ kN}$$

$$F_V: Z \times C_V (50^\circ) = 13.0 \text{ kN} \times 1.00 = 13.00 \text{ kN}$$

Alignment strut K440, product number: 601208, weight: 23.4 kg

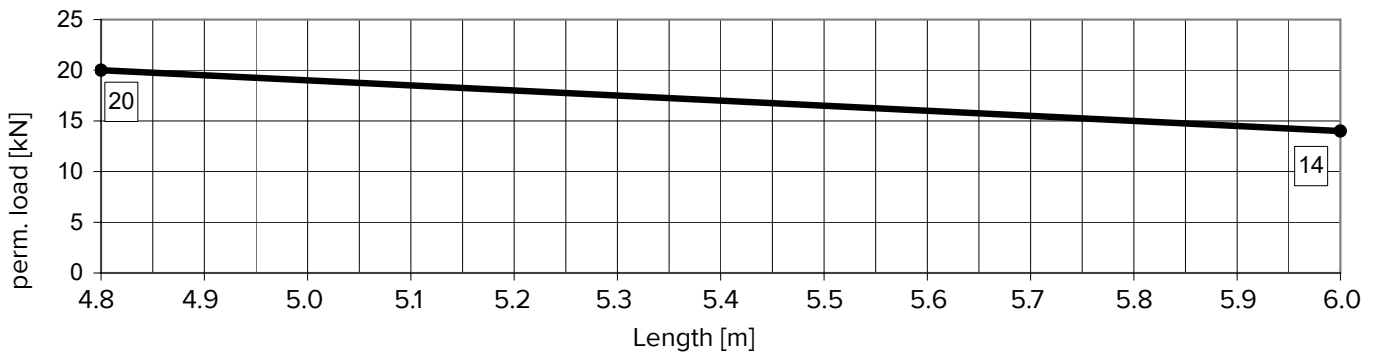
Load diagrams

K440 3.25 – 4.40 m



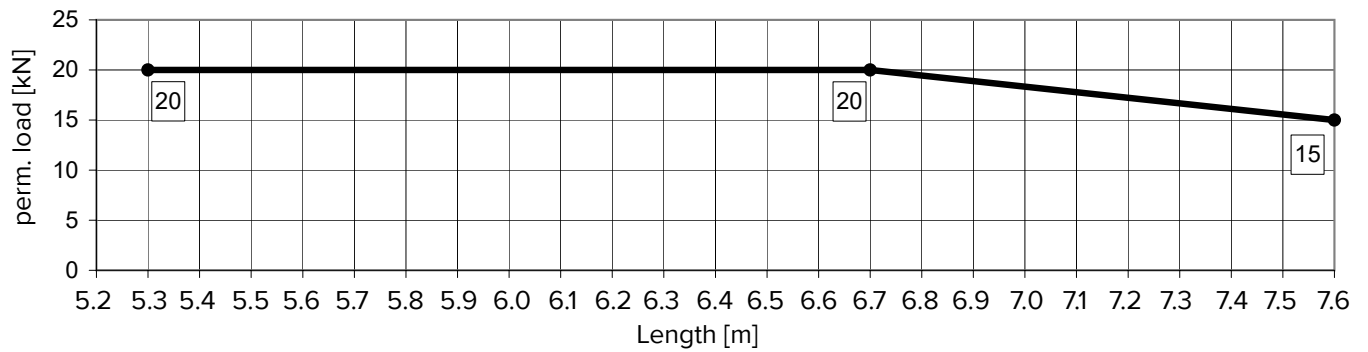
Alignment strut K600, product number: 601210, Weight: 35.8 kg

K600 4.80 – 6.00 m



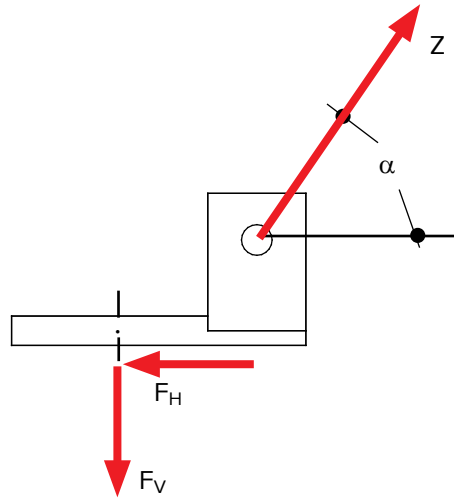
Alignment strut K760, product number: 601212, Weight: 51.3 kg

K760 5.30 – 7.60 m



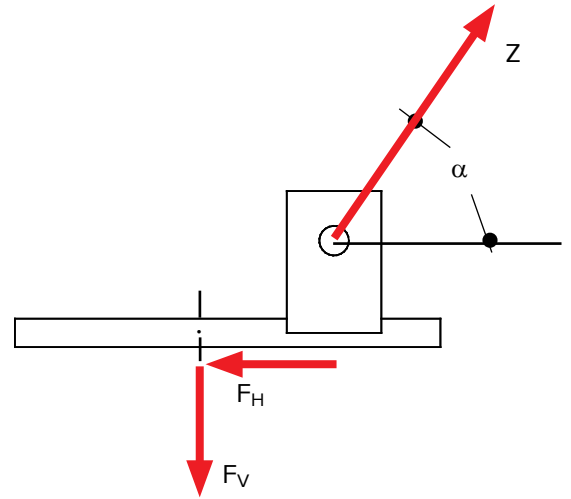
Conversion factor (C_H , C_V) to determine the resulting load at the anchoring point [kN] with tension load Z [kN] with the alignment strut K440, K600, K 760.

Old version



Old version		
Angle α	F_H	F_V
45°	0.71	0.92
50°	0.64	1.14
55°	0.57	1.33
60°	0.50	1.52

Version since August 2006



Version since August 2006		
Angle α	F_H	F_V
45°	0.71	0.79
50°	0.64	0.80
55°	0.57	0.85
60°	0.50	0.96



WARNING

Safety information

Only use the quick action fastener and head attachment K on perpendicular walls!

Sample calculation for an alignment strut old version

For an extension length of 2.9 m the permissible alignment strut load is 13.0 kN. At an angle of 50° the resulting anchor loads apply:

$$F_H: Z \times C_H (50^\circ) = 13.0 \text{ kN} \times 0.64 = 8.32 \text{ kN}$$

$$F_V: Z \times C_V (50^\circ) = 13.0 \text{ kN} \times 1.14 = 14.82 \text{ kN}$$

Sample calculation for an alignment strut actual version

For an extension length of 2.9 m the permissible alignment strut load is 13.0 kN. At an angle of 50° the resulting anchor loads apply:

$$F_H: Z \times C_H (50^\circ) = 13.0 \text{ kN} \times 0.64 = 8.32 \text{ kN}$$

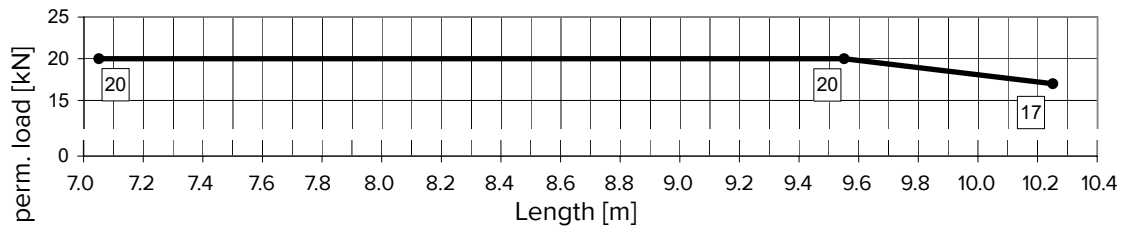
$$F_V: Z \times C_V (50^\circ) = 13.0 \text{ kN} \times 0.80 = 10.40 \text{ kN}$$

Alignment strut Alu 10

Product code: 601213, weight: 81.9 kg

Load diagram

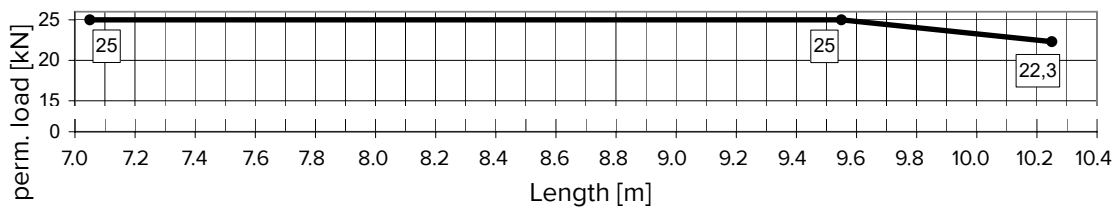
Alu 10 7.05 – 10.35 m



Alignment strut Super 10

Product code: 602095, weight: 82.6 kg

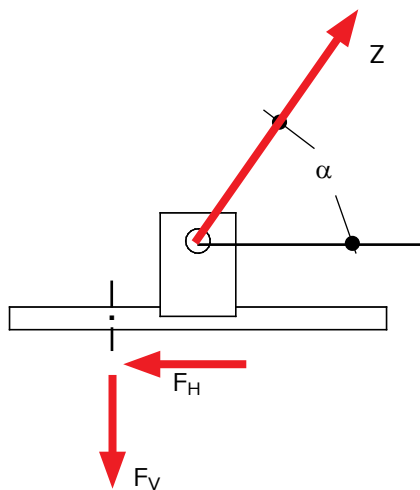
Super 10 7.05 – 10.25 m



Conversion factor (C_H , C_V) to determine the resulting load at the anchoring point [kN] with tension load Z [kN] with the **Alignment strut Alu 10** and **Alignment strut Super 10**.

Old version

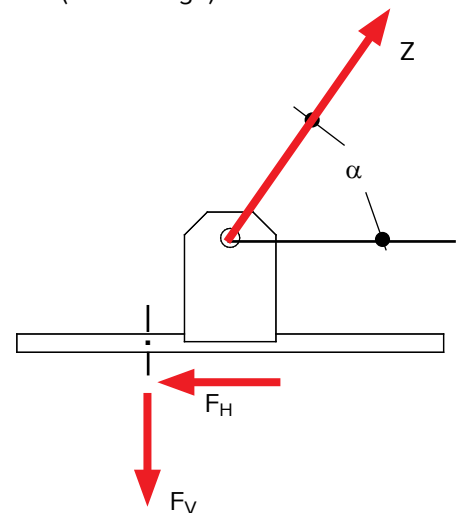
(1 anchorage)



Old version		
Angle α	F_H	F_V
45°	0.71	0.92
50°	0.64	1.14
55°	0.57	1.33
60°	0.50	1.52

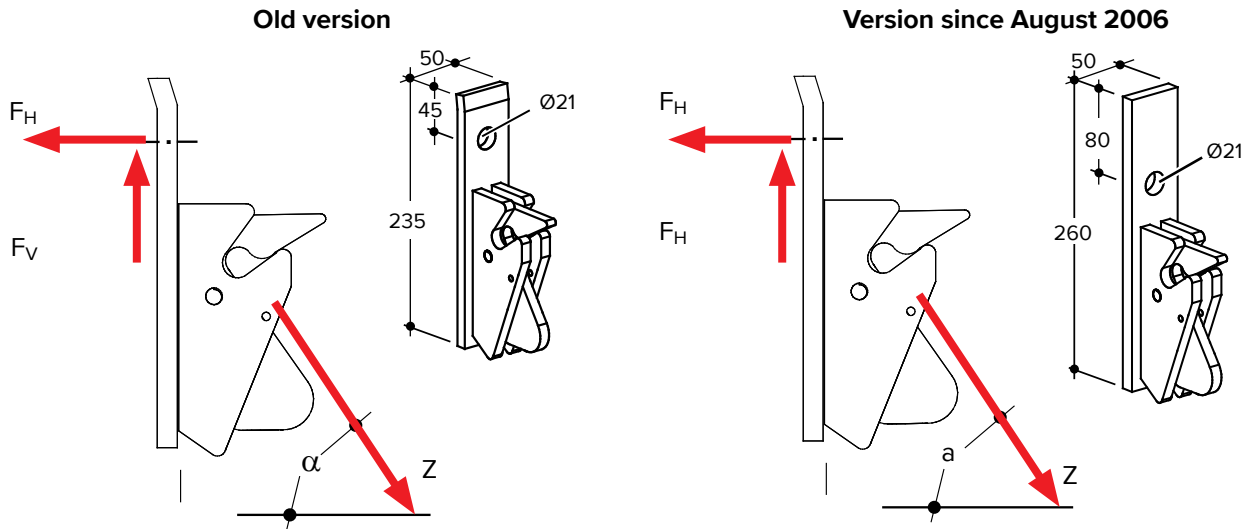
Version since August 2006

(1 anchorage)



Version since August 2006		
Angle α	F_H	F_V
45°	0.71	0.78
50°	0.64	0.80
55°	0.57	0.84
60°	0.50	1.00

5.2 Quick action fastener



Old version		
Angle α	F_H	F_V
45°	1.33	0.71
50°	1.06	0.77
55°	0.80	0.82
60°	0.53	0.87

Version since August 2006		
Angle α	F_H	F_V
45°	0.92	0.71
50°	0.76	0.77
55°	0.59	0.82
60°	0.53	0.87



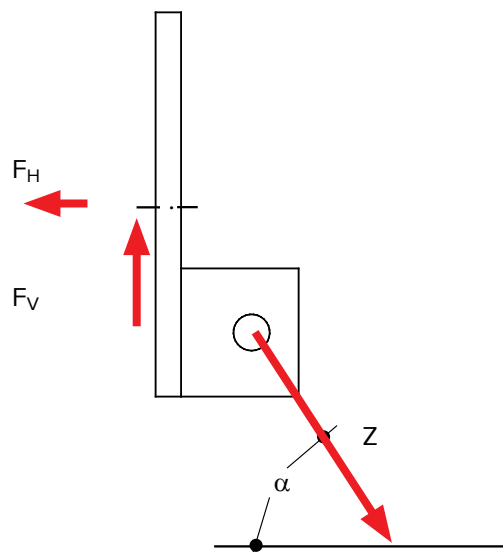
WARNING

Safety information

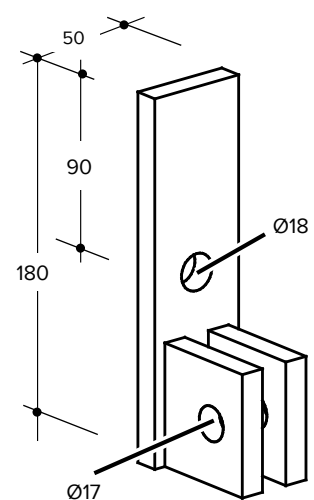
Only use the Quick action fastener and head attachment K at perpendicular walls!

5.3 Head attachment K

Conversion factor (C_H , C_V) to determine the resulting load at the anchoring point [kN] with tension load Z [kN] with the head attachment K



For sample calculation, see page 13.



Angle α	F_H	F_V
45°	0.83	0.71
50°	0.69	0.77
55°	0.60	0.82
60°	0.61	0.87

6 Chronology

Changes compared to issue 2010-07		
Changes	Page	Date
Layout updated	div	2018-12

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The illustrations in this brochure depict actual site conditions which may not always conform with applicable safety rules and regulations.

Last updated: December 2018
Keep for later use!