

Clamp plate

AKZ 500

Operating instruction



Typ / Type	AKZ 500	Serial-No.	
Gewicht / Weight / Poids:		22 kg	
Max Zugkraft / Max tension load / Force de traction maximale:		150 kN	

Zurbrügg Seilbahnen + Montagen GmbH

Obere Bahnhofstrasse 30A
3714 Frutigen
Schweiz

T +41 33 671 44 80
info@zurbruegg.ch
zurbruegg.ch

Created	Revision	Edited by	Controlled by	Remarks
14.01.2025	Model has been up-dated	ss	Est	Value from serial no. 2505
16.01.2025	New CE., No. 8./9./10./11.		Est	

Index

1. General.....	4
1.1. Scope of application of the clamp plate	4
1.2. Scope of this guide	4
1.3. Caution and prohibition note	5
1.4. Risk	5
1.5. Security	5
1.6. Expertise	6
2. Preparation	7
2.1. Condition control of the clamp plate.....	7
2.2. Replacement of the ropes inserts	7
3. Application	8
3.1. Prerequisites	8
3.2. Mounting the clamp plate.....	8
3.3. Disassembling the clamp plate	9
4. Technical tables.....	10
4.1. Table for strand ropes (Safety Factor 2 against slipping).....	10
4.2. Table for fully locked ropes (Safety Factor 2 against slipping)	11
5. Example of a rope tensioning.....	12
6. Technical Data.....	13
7. Accessories	13
8. Maintenance	14
8.1. Maintenance by the user	14
8.2. Maintenance at the manufacturer	14
8.3. Periodic testing	14
9. Lifetime	15
10. Disposal.....	15
11. Spare and wear parts.....	16

EG-Konformitätserklärung / Déclaration de conformité CE / EC declaration of conformity

Wir / Nous / We

Zurbrügg Seilbahnen + Montagen GmbH
Obere Bahnhofstrasse 30A
CH-3714 Frutigen

erklären hiermit, dass die Maschine /
déclarons par la présente que la machine
hereby declare that the device

**Klemmplatte / mordache / clamp plate AKZ 500**

in seiner Konzipierung und Bauart sowie in den von uns in Verkehr gebrachten Ausführungen den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinie Maschinen entsprechen. Bei nicht bestimmungsgemässer Verwendung, sowie bei nicht von uns freigegebenen Umbauten oder Änderungen, verliert diese Erklärung ihre Gültigkeit. Zudem verliert diese Konformitätserklärung ihre Gültigkeit, wenn die Bestimmungen der Betriebs- und Instandhaltungsanleitung nicht befolgt oder missachtet werden.

satisfait aux exigences fondamentales de la directive machines CE en matière de sécurité et de santé, tant du point de vue de sa conception et de sa construction que pour toutes les versions que nous avons mises sur le marché. En cas d'utilisation non conforme ou de modification ou transformation non approuvées par nous, cette déclaration perd sa validité. Cette déclaration perd également sa validité en cas de non-respect des instructions d'utilisation et de maintenance.

conforms to the health and safety requirements of the EC Machinery Directives in its conception and design, as well as in the version placed on the market by us. In the event of improper use, as well as modifications or changes which are unauthorised by us, this statement loses its validity. This declaration of conformity also loses its validity if the relevant user guide and maintenance manual are not followed or are violated.

Zutreffende EG-Richtlinie:	Maschinen 2006/42/EG, Anhang II A
<i>Directive CE concernée:</i>	<i>Machine 2006/42/CE, Annexe II, chapitre A</i>
Applicable EC directives:	Machinery 2006/42/EC, Annex II., sub. A

Geschäftsleitung / direction / management

Reto Zurbrügg

1. General

1.1. Scope of application of the clamp plate

The clamp plate is to be used for temporary rope tensioning, not for permanent installations.

The clamp plate is designed for pulling ropes. It is designed for use on steel cables with cable diameters according table (see table Pt 4) and for associated tension forces (see table Pt 4). The clamp plate was specifically developed for use in ropeways and cable rigging work. Preferably, the clamp plate is to be used for tension (attached rollers for this purpose). However, a use with share loads is also possible under certain conditions. The company *Zurbrügg Seilbahnen und Montagen GmbH* is at your disposal if you have questions about specific applications.

1.2. Scope of this guide

These operating instructions are limited exclusively to the parts supplied by *Zurbrügg Seilbahnen und Montagen GmbH*. These instructions were issued at the time of delivery of the clamp. Subsequent modifications that require changes in terms of operation and maintenance will be supplemented and adapted if implemented by *Zurbrügg Seilbahnen und Montagen GmbH*. For modifications by third parties, these operating instructions may no longer apply and the company *Zurbrügg Seilbahnen und Montagen GmbH* declines responsibility in such a case. Possible later findings by further development of the technology, experiences from other similar applications or by other application than originally intended are not taken into account and are not automatically supplemented in this manual.

These operating instructions were established according to the latest state of the art and knowledge of the technology at the time of commissioning the product. New regulations and instructions from supervisory authorities, new safety regulations and site-specific work regulations may supplement or contradict these instructions. In this case, the official requirements have priority. In case of doubt, please contact *Zurbrügg Seilbahnen und Montagen GmbH*.

1.3. Caution and prohibition note

In order to avoid dangers and damage when using the clamp plate, the following prohibitions or restrictions apply. Caution signs for special attention:



Caution : possible danger to man and machine



Prohibition: sure danger for man and machine

1.4. Risk



The operation of the clamp plate and the stay around the clamp plate and the equipment around it, especially in the vicinity of the moving mechanical components and the ropes, carry a residual risk. Although, all safety-relevant and possible precautions have been taken according to the machine guidelines to minimize the risk of handling the clamp plate, there are still possibilities to be injured or killed. It is therefore essential to observe these operating instructions and to comply with the necessary occupational safety precautions. If you have any questions, please contact *Zurbrügg Seilbahnen und Montagen GmbH*.

The owner of the clamp plate is responsible for its safe use. He is responsible for the proper maintenance and inspection, as well as compliance with the operation and maintenance described here and compliance with regulations, recommendations and laws on the use of the clamp plate.

The clamp plate should only be used for temporary rigging works, not for permanent installations.

1.5. Security



- In addition to the operating instructions and the binding regulations for accident prevention applicable in the country and the point of use, the recognized technical rules for safety and professional work must also be observed.



- The stay under the rope held with the clamp plate and under tension is expressly prohibited and can be life-threatening.



- It is absolutely forbidden to operate unattended the traction system connected to the clamp plate.



- Third parties involved are to be inform about the behaviour with the equipment or kept away if necessary.



- It is absolutely forbidden to reach into the ropes or into the clamp plate during the cable pull.



- Maintenance work may only be carried out when the clamp plate is removed from tensioning installation.



- Possible danger areas around the clamp plate must be blocked or signposted for unauthorized persons.



- The clamp plate must be mounted as far as possible in such a way that it does not lie or penetrate in the ground or other roughly soiled places.

1.6. Expertise

The furnishing and use, respectively operation of the clamp plate with associated machines and devices may only be performed by knowledgeable persons. They must be familiar with these operating instructions and the other associated machines and comply with the prescribed safety instructions. They must know how to handle ropes and their load limits and application restrictions. In case of uncertainty and questions, the specialists of *Zurbrügg Seilbahnen und Montagen GmbH* will be glad to assist you.

2. Preparation

2.1. Condition control of the clamp plate

Before using the clamp plate, the following checks must be carried out:



- Cleanliness of the clamp plate, especially the clamping surface must be clean and grease-free
- Check for damage such as dents, cracks or corrosion
- Screws and nuts must be clean and lightly greased, also the contact surface between nut and pressed-in washer

Bolts and nuts with worn or damaged threads must be replaced

Worn base plate must be replaced.



- Use the diameter information on the replaceable rope inserts and the table in this manual to check whether the rope insert matches the effective rope diameter. If not, exchange by appropriate insert (see point 2.2)

If the rope insert does not fit exactly, the tensile force information in the table is not guaranteed. There is immediate danger for man and rope!

2.2. Replacement of the ropes inserts

- Disassemble all nuts
- Place the two clamp plate halves with the rope insert on a clean and even ground
- Remove rope insert halves
- Clean the support surfaces in the base plates, check for damage
- Lubricate lightly with oil spray (e.g. WD40) (do not grease!)
- Clean and check also the rope inserts for damage before installing
- Install rope inserts (only tighten screws slightly)

3. Application

3.1. Prerequisites

The diameter of the cable insert in the clamp plate must be matched to the cable diameter to be clamped.



With a too large or too small rope insert, the safe transmission of the tensile force from the clamp plate to the rope is not guaranteed!

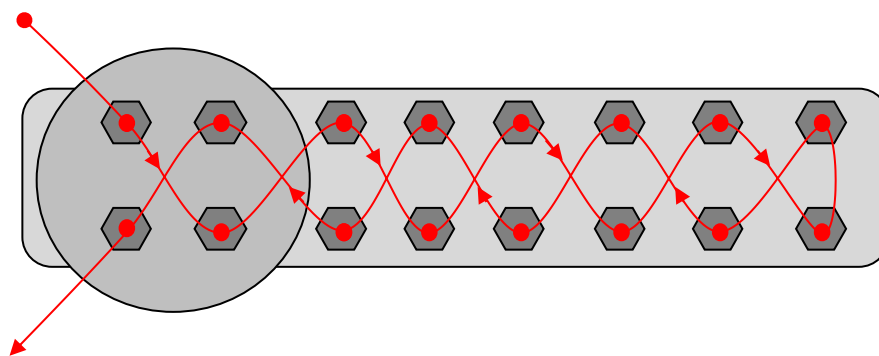
With a too small rope insert there is also the risk of damage to the rope.

The contact surface of the rope insert with the rope must be clean, grease-free and undamaged.

The rope surface must be clean and absolutely free of grease at the clamping point.

3.2. Mounting the clamp plate

- Disassemble all nuts
- Place the clamp half (screw side) on top of the rope
- Insert clamp plate half (nut side) from below and start tightening nuts lightly
- Tighten nuts according to the following sequence principle to 70 - 80% of the tightening torque according to table Pt 4



- Attach the sling at the tension fixation rollers



The slings must be dimensioned according to the maximum tensile force!

The diameter of the slings may not be greater than the thickness of the fixation rollers.

- Pre-tension the clamp plate with about 50% of the required tensile force
- Tighten nuts to the prescribed torque (according to table Pt 4), (same order as before on pre-tension)



Do not overtighten nuts, risk of damage to clamp plate and rope!

Do not tighten with impact wrench.

3.3. Disassembling the clamp plate



When disassembling, there must be no tensile load on the clamp plate!


Loosen nuts gradually evenly, same sequence principle as when tightening




Individual screws may be overstretched and the clamp plate may be damaged if the nuts are not loosened evenly!

4. Technical tables

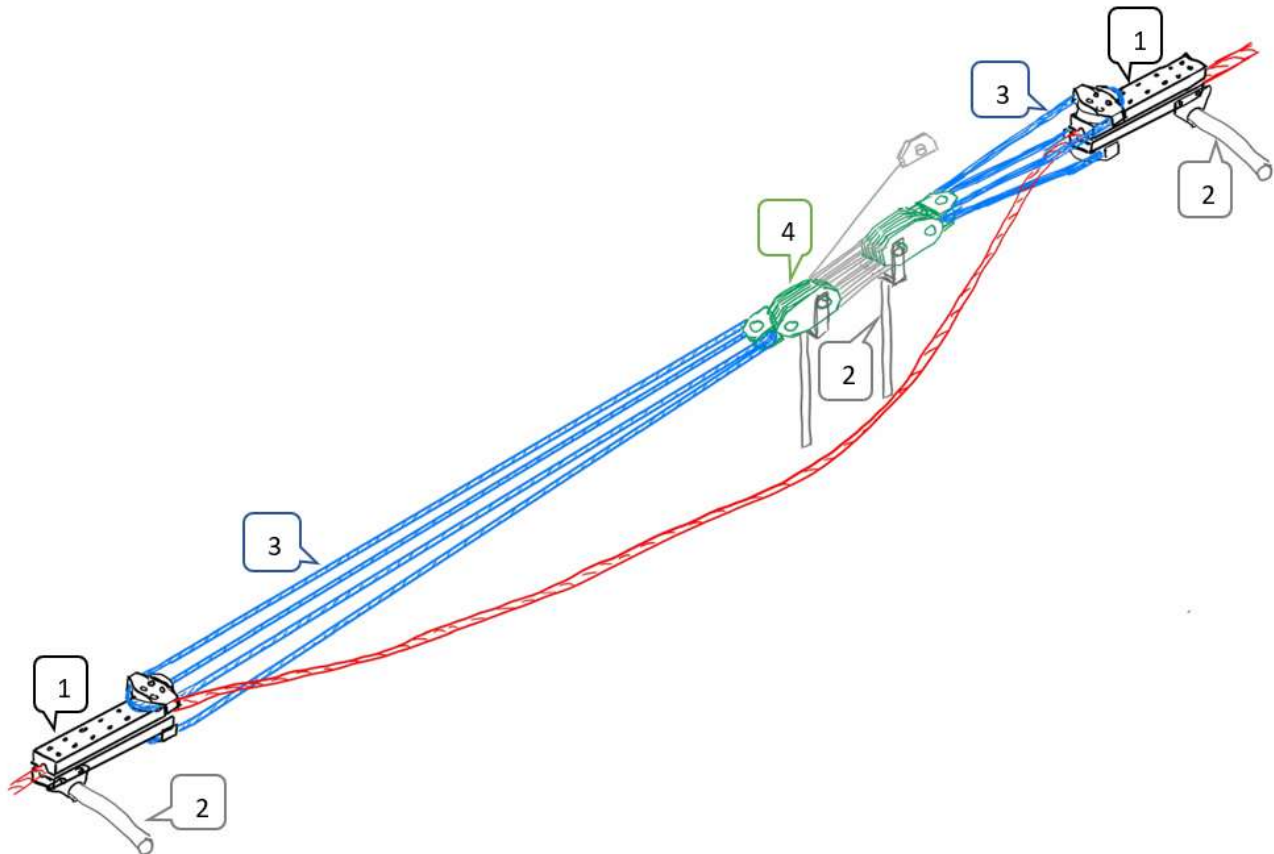
4.1. Table for strand ropes (Safety Factor 2 against slipping)

Clamp plate type	Rope insert Ø Nominal [mm]	Rope Ø min [mm]	Rope Ø max [mm]	Surface pressure on rope [N/mm ²]	 Slot width [mm]	Maximum tensile force [kN]	Tightening torque [Nm]
	16	15.5	16.2	85	6	68	101
	17	16.5	17.2	85	6	74	111
	18	17.4	18.3	85	6	81	121
	19	18.4	19.3	85	6	88	132
AKZ 500 (14xM20) <i>max 150kN</i> Standard range Ø20-32	20	19.4	20.3	85	6	95	142
	21	20.3	21.3	85	6	102	152
	22	22.3	22.3	85	6	108	162
	23	23.3	23.3	85	6	115	172
	24	24.3	24.3	85	6	122	182
	25	25.3	25.4	85	6	129	192
	26	26.3	26.4	85	6	136	202
	27	26.3	27.4	85	6	142	213
	28	27.3	28.4	85	6	150	223
	29	28.3	29.4	82	6	150	223
	30	29.2	30.4	79	6	150	223
	31	30.2	31.4	76	6	150	223
	32	31.2	32.4	73	6	150	223

4.2. Table for fully locked ropes (Safety Factor 2 against slipping)

Clamp plate type	Rope insert Ø nominal [mm]	Rope Ø min [mm]	Rope Ø max [mm]	Surface pre-screening on rope [N/mm ²]	 Slot width [mm]	Maximum tensile force [kN]	Tightening torque [Nm]
	18	17.6	18.1	85	6	144	214
	19	18.6	19.1	85	6	150	223
AKZ 500 (14xM20) <i>max 150kN</i> Standard range Ø20-32	20	19.6	20.1	85	6	150	223
	21	20.6	21.1	85	6	150	223
	22	21.5	22.2	85	6	150	223
	23	22.5	23.2	85	6	150	223
	24	23.5	24.2	85	6	150	223
	25	24.5	25.2	85	6	150	223
	26	25.4	26.2	85	6	150	223
	27	26.4	27.2	85	6	150	223
	28	27.4	28.2	85	6	150	223
	29	28.4	29.2	85	6	150	223
	30	29.4	30.2	85	6	150	223
	31	30.3	31.2	85	6	150	223
32	31.4	32.3	85	6	150	223	

5. Example of a rope tensioning



Designation	
1	Clamp plate
2	Anti-Twist
3	Tension slings
4	Pulley blocks

6. Technical Data

Typ	AKZ 500 (T25)
Maximum tensile force in kN	150
Weight in kg	22
Length in mm	500
Width in mm	200
Height in mm	185
Standard diameter range of the rope in mm (smaller rope diameters are possible)	20 - 32
Screw	M20 / 8.8

7. Accessories

A twist holder console is available as an option for the clamp plate, in which a commercially available pipe with a diameter of 1 ½ " (48.3 mm) of any length can be inserted and fixed.



8. Maintenance

8.1. Maintenance by the user



- The clamp plate must be carefully cleaned after each use and treated with a suitable corrosion protection (preferably oil spray, e.g. WD40)
- The screws and nuts must be checked for damage and wear after each use. They should not lie in the ground or on other areas that are very dirty. If the clamp plate is still dirty, the impurities must be removed



- **Important: It must be ensured that the clamping plate is adequately protected against corrosion at all times (during use, after cleaning and during storage).**

8.2. Maintenance at the manufacturer

The clamp plate must be sent to *Zurbrügg Seilbahnen und Montagen GmbH* for maintenance and control:



- If corrosion is detected on the aluminum parts of the clamp plate
- If strut plates are bent, torn or worn out
- When the clamp plate has been stressed by impacts and/ or excessive forces
- If the clamp has visible damage (dents, cracks, corrosion)



8.3. Periodic testing

The clamp plate must be checked periodically for cracks. The penetration test according to DIN EN ISO 3452-1 can preferably be carried out at the manufacturer *Zurbrügg Seilbahnen und Montagen GmbH* or be carried out and documented at a local testing centre.

The due date of this test depends on the frequency of use (number of clamping cycles) and the age of the clamping plate:

Number of claming cycles per year	0-2	3-10	>10
1 st Periodic testing after:	12 years	10 years	8 years
2 nd Periodic testing after:	20 years	16 years	13 years
3 rd Periodic testing after:	--	20 years	17 years
4 th Periodic testing after:	--	--	21 years

9. Lifetime







The calculated service life of a clamp plate is 24 years. The clamp plate must be replaced by a new one at the end of this period.

10. Disposal

The clamp plate must be taken out of service at the end of the calculated service life and disposed of properly. The customary regulations on disposal must be observed. Remember that protecting the environment and recycling materials benefits us all.

11. Spare and wear parts

Below are the parts of the clamp plate that are mainly affected by wear. These and all other individual parts of the clamping plate can be ordered from the manufacturer *Zurbrügg Seilbahnen und Montagen GmbH*.

Quantity	Designation	Masse / Standard	Item
2	Sling holder plate		07
			
1	Bolt locking plate		08
			
1	Base plate		09
			
10	Base plate M20	HV200 / DIN125	19
			
2	Long base plate		11
			
2	Long bolt locking plate		12C
			

4	Hex screw M20x180	8.8 / DIN 931	15A
---	-------------------	---------------	-----

			
10	Hex screw M20x130	8.8 / DIN 931	16
			
14	Hex nuts M20 1.5d	8.8 / DIN 6330 B	17
			
4	Pan head screw M8x14	8.8 / ISO 7380-1	21
			
4	Pan head screw M8x30	8.8 / ISO 7380-1	22
			
8	Safety screw with ribs M8x12	8.8 / BN 3873	23
			

