

# Load ring with internal thread > VWBM <



## Safety instructions

This safety instruction/declaration has to be kept on file for the whole lifetime of the product and forwarded with the product.

TRANSLATION OF THE ORIGINAL SAFETY INSTRUCTION



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## VWBM Load ring with internal thread

**EG-Konformitätserklärung**

entsprechend der EG-Maschinenrichtlinie 2006/42/EG, Anhang II A und ihren Änderungen

Hersteller: **RUD Ketten  
Rieger & Dietz GmbH u. Co. KG**  
Friedensinsel  
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Hiermit erklären wir, dass die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart, sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Maschinenrichtlinie 2006/42/EG sowie den unten aufgeführten harmonisierten und nationalen Normen sowie technischen Spezifikationen entspricht.  
Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

**Produktbezeichnung:** Wirbelbock VWBM

Folgende harmonisierten Normen wurden angewandt:

<u>DIN EN 1677-1 : 2009-03</u>	<u>DIN EN 1677-4 : 2009-03</u>
<u>DIN EN ISO 12100 : 2011-03</u>	
_____	_____
_____	_____

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:

<u>DGUV-R 109-017 : 2020-12</u>	_____
_____	_____
_____	_____
_____	_____

Für die Zusammenstellung der Konformitätsdokumentation bevollmächtigte Person:  
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 14.04.2021      Hermann Kolb, Bereichsleitung MA *Hermann Kolb*  
Name, Funktion und Unterschrift Verantwortlicher

**EC-Declaration of conformity**

According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments

Manufacturer: **RUD Ketten  
Rieger & Dietz GmbH u. Co. KG**  
Friedensinsel  
73432 Aalen

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonized and national norms as well as technical specifications.  
In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

**Product name:** Load ring VWBM

The following harmonized norms were applied:

<u>DIN EN 1677-1 : 2009-03</u>	<u>DIN EN 1677-4 : 2009-03</u>
<u>DIN EN ISO 12100 : 2011-03</u>	
_____	_____
_____	_____

The following national norms and technical specifications were applied:

<u>DGUV-R 109-017 : 2020-12</u>	_____
_____	_____
_____	_____
_____	_____

Authorized person for the configuration of the declaration documents:  
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 14.04.2021      Hermann Kolb, Bereichsleitung MA *Hermann Kolb*  
Name, function and signature of the responsible person

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*This user manual contains information about the correct and safe use of RUD VWBM load rings.*

*Before initial usage of the RUD VWBM load rings, please read carefully and in full the safety instructions.*

*Make sure you have understood everything. If you need further information, ask your RUD retailer or RUD application engineer.*

*RUD VWBM load rings have been designed for commercial use.*

*Failure to observe the instructions can result in physical injury or material damage and means that the warranty no longer applies.*

## 1 Safety instructions



### WARNING

*Wrong assembled or damaged Lifting Points as well as improper use can lead to injuries of persons and damage of objects when load drops.*

*Please inspect all Lifting Points before each use.*

- Keep all body parts like fingers, hands, arms, etc. out of the hazardous area during the lifting operation.
- Attention: When suspension ring pivots there is a risk of pinching.
- The RUD VWBM must only be used by authorized and trained persons in adherence with DGUV Regulations 109-017 and according to the country-specific provisions and regulations outside Germany.
- Do not exceed the working load limit (WLL) indicated on the lifting point (except vertical loading - see Table 3).

- Continuous rotary movement under load is not permissible. RUD VWBM can be rotated 90° to the bolt-in direction under nominal load capacity.
- The RUD VWBM load rings have to be rotatable by 360° when securely screwed in.
- The ball bearing resp. the bush bearing disc must not be disassembled.
- The load ring must not be bend.
- No technical alterations must be implemented on the VWBM.
- No people may stay in the danger zone.
- Jerky lifting (strong impacts) should be prevented.
- Always ensure a stable position of the load when lifting. Swinging must be prevented.
- Damaged or worn VWBM must never be utilised.

## 2 Intended use

RUD VWBM load rings must only be used for the assembly at the load or at lifting means.

They are intended for suspending slings and can be rotated 90° to the screw-in direction under nominal load capacity. Continuous rotary movement under load is not permissible.



### HINT

*Observe the specifications for turning in Chapter 3.3.2.*

RUD VWBM load rings can also be used as lashing points to attach lashing means.

RUD VWBM load rings must only be used in the hereby described operation purpose.

## 3 Assembly- and instruction manual

### 3.1 General information

- Capability of temperature usage:  
Usage at higher temperatures is not recommended due to the grease filling in the ball bearing. Should this though be necessary, the working load limit (WLL) of the VWBM must be reduced as follows:

-40°C up to 100°C	no reduction
100°C up to 200°C	minus 15 %
200°C up to 250°C	minus 20 %
250°C up to 350°C	minus 25 %

**Temperatures exceeding 350°C are prohibited!**

- RUD VWBM load rings must not be used with aggressive chemicals such as acids, alkaline solutions and their vapours.
- Please mark mounting position of lifting point with a coloured contrast paint for better visibility.

### 3.2 Hints for the assembly

Basically essential:

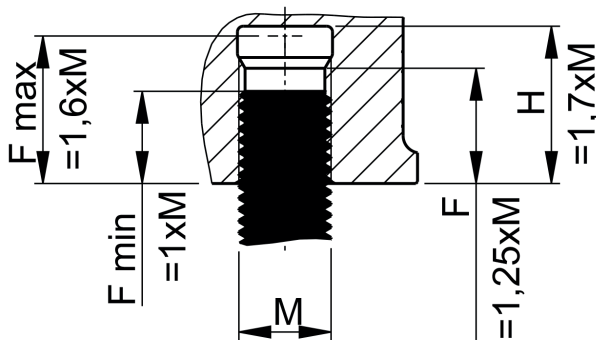
- The material construction to which the lifting point will be attached should be of adequate strength to withstand forces during lifting without deformation.
- Only insert the RUD VWBM with the correct threads, which must correspond at least to class of strength 10.9.



#### HINT

Lower classes of strength of bolts or threaded bolts reduce the WLL!

- Minimum screw-in:  
 $F_{min} = 1 \times M$
  - Maximum screw-in:  
 $F_{max} = 1,6 \times M$
  - Drilling depth in VWBM:  
 $H = 1,7 \times M$
  - Internal thread length  
 $F = 1,25 \times M$
- F, H and M see Table 2



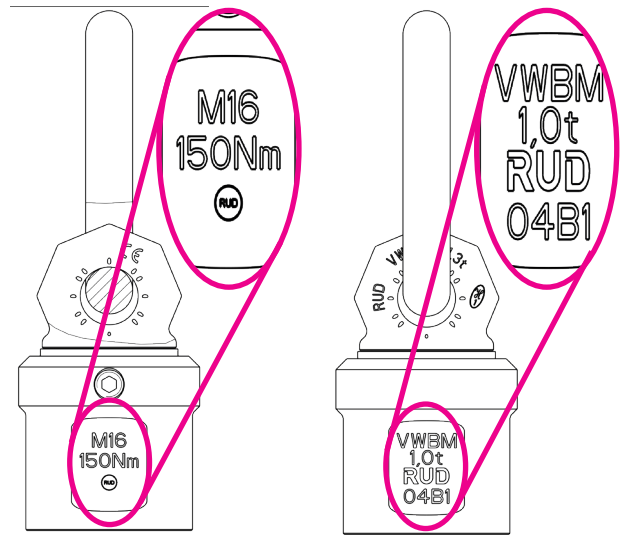
Pic. 1: Thread details



#### WARNING

The screw-in length must never be larger than size H because otherwise the thread will impact the base of the VWBM and the support of the VWBM for the load is impaired (Pic. 1). See also section 1 Safety instructions!

- When using threads (e.g. threaded bolts, bolts) provided yourself, check they are 100% free of cracks (a written confirmation from the supplier must be added to the VWBM documents).
- The average notch bar impact test at the lowest permitted usage temperature must be at minimum 36 J. This specification is required as per the test criteria for lifting points GS OA 15-04.
- Ensure that the threads used have the same thread type, thread size as the VWBM used. The VWBM is labelled with the thread type and size (Pic. 2).



Pic. 2: Component labelling VWBM

- Ensure that the thread length of the thread used (e.g. threaded bolt, screws) corresponds to the requirements regarding minimum and maximum screw-in depth for the application.
- The position of the lifting points must be carried out in such a way that unintended movement like turning or flipping will be avoided.
  - For single leg lifts, the lifting point should be vertically above the centre of gravity of the load.
  - For two leg lifts, the lifting points must be equidistant to/or above the centre of gravity of the load.
  - For three and four leg lifts, the lifting points should be arranged symmetrical around the centre of gravity, in the same plane if possible.
- Load symmetry: Determine the necessary WLL of each lifting point for a symmetrical or an unsymmetrical load by using the following physical calculation formula:

$$W_{LL} = \frac{G}{n \times \cos \beta}$$

$W_{LL}$  = necessary WLL of lifting point / single strand (kg)  
 $G$  = weight of load (kg)  
 $n$  = number of load bearing strands  
 $\beta$  = inclination angle of single strand

	Symmetric	Unsymmetric
two leg	2	1
three / four leg	3	1

Table 1: Load bearing strands

- The protruding thread length must be adjusted to the screw-in situation so that contact surface of the lifting point can lie flat (Pic. 5).  
 There must be enough space between the end of the thread and the base of the internal thread in order to allow tightening.
- A plane bolt-on surface with a minimum  $\varnothing D$  (Table 2) must be guaranteed (Pic. 6).
- A threaded or through hole fixture at right-angles to the contact surface must be guaranteed.

- For through hole screw connections, make sure that the contact surface of the screw head is sufficient for the load. Complete the through hole fixture for the thread in the load according to DIN EN 20273 middle or fine.
- Due to the ball bearing and the bush bearing it is sufficient for a **single lift** to tighten the VWBM until the bearing surface has support by using a spanner acc. to DIN 895 resp. DIN 894, without using an extension.

However, the torque moment according to *Table 2* (+/- 10 %) must not be exceeded. We generally recommend assembly with a suitable torque wrench.

If the VWBM shall **permanently installed** at the load, tensioning must be carried out with a torque (+/- 10 %) according to *Table 2*.



#### ATTENTION

Disassembly of the ball bearing resp. the bush bearing disc carried out by the user is forbidden.

- The VWBM must not be loaded with the Manufacturing Proof Force MPF (2.5 x WLL). Should at the production of lifting means or similar products, a singular proof loading be necessary, please ask RUD in advance.
- Check finally the correct assembly (see chapter 4 *Inspection / Repair / Disposal*).

### 3.3 User instructions

#### 3.3.1 General information regarding use

- Before use (e.g. by the user), inspect the entire lifting point (secure thread fit strong corrosion, cracks in supporting parts, deformations). See section 4 *Inspection / Repair / Disposal*.



#### ATTENTION

*Wrong assembled or damaged lifting means as well as improper use can lead to injuries of persons and damage of objects when load falls.*

*Please inspect all lifting points before each use.*

- RUD components are designed according to DIN EN 818 and DIN EN 1677 for a dynamic load of 20,000 load cycles.
  - Keep in mind that several load cycles can occur with a lifting procedure.
  - Keep in mind that, due to the high dynamic stress with high numbers of load cycles, that there is a danger that the product will be damaged.
  - The BG/DGUV recommends: For higher dynamic loading with a high number of load cycles (continuous operation), the working load stress must be reduced according to the driving mechanism group 1Bm (M3 in accordance with DIN EN 818-7). Use a lifting point with a higher working load limit.
- The VWBM are suitable for turning and rotating loads.

- During rotation and turning, all positions of the suspension link can occur.
- The nominal load capacity is indicated on the component. The nominal load capacity corresponds to the most unfavorable possible application, resp. worst case scenario (see *Pic. 9 – Part X*).
- When turning under 90° to the bolt-in axis (*Pic. 9 Part X part Y*) the load capacity per VWBM is limited to the nominal load capacity (WLL).
- With the suspension ring manually aligned (see *Pic. 9 - Part Y*) the higher ( ) values from *Table 3* can be applied if no rotation or turning is performed.



#### ATTENTION

*Pay attention during the usage that the load type will not be change.*

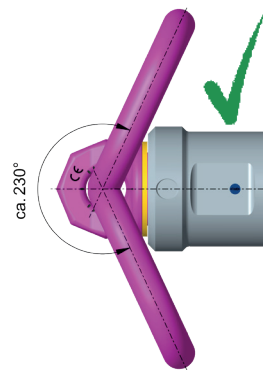
If the VWBM will be loaded only perpendicular (in axial direction of the thread, see *Pic. 9 - Part Z*), the corresponding WLL values from *Table 3* (inclination angle 0°) can be used.

- The ring of the manually adjusted VWBM can be pivoted by approx. 230° (*Pic. 3*).

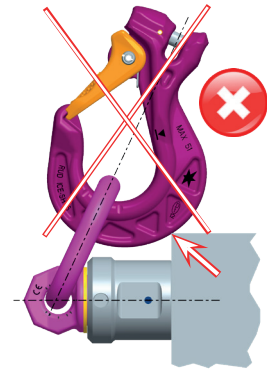


#### ATTENTION

*The suspension ring resp. the attached lifting mean must rotate and pivot without interference during lifting and must **neither** have support at the load edge **nor** at the bottom part of the VWBM (*Pic. 4*).*



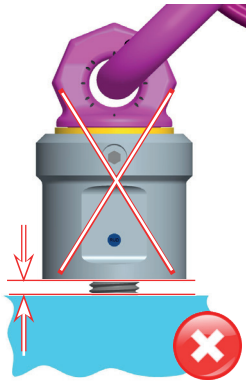
*Pic. 3: Pivoting area*



*Pic. 4: Forbidden contact or support at/or with edge*

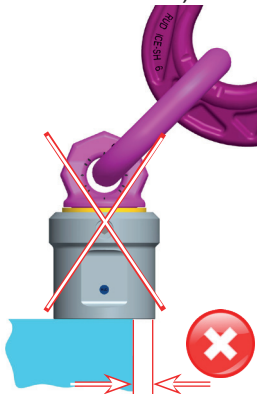
- Only use appropriate lifting means for hinging in the VWBM. The suspension ring must not be exposed to bending load
- When lifting means (sling chains) are hinged or unhinged, no pinching, shearing or joint spots must occur during the handling. Avoid damage of lifting means resulting from sharp edges
- Leave direct danger zone as far as possible.
- Watch always your hinged loads.

- VWBM must have been fully bolted in.



Pic. 5: VWBM must have been fully bolted in.

- Thread of the VWBM must be completely engaged and the lifting point must be installed full-faced. (The diameter of the bearing surface must be  $\geq D$  - see Table 2).



Pic. 6: The diameter of the bearing surface must be  $\geq D$ .

- Avoid impulsive and tiltful loading.



#### ATTENTION

Impulsive loading or vibration, especially at through hole connections with nuts, can lead to unintentional loosening.

Securing possibilities: liquid thread securing products f.e. Loctite (read manufacturer's instruction) or form closed bolt securing can be used. Secure in general all lifting points which are installed permanently, e.g. with glue.

- Please observe for the whole lifting mean the RUD sling chain safety instruction.

### 3.3.2 Rotating and turning of loads

Observe the following additional specifications for turning and rotating loads:



#### ATTENTION

The VWBM are suitable for turning and rotating of loads. However, a continuous rotating movement under load is not permitted in any load direction (Pic. 9).



#### ATTENTION

When using, take special care not to change the load type.



#### HINT

To extend the service life, we recommend the use of a VWBM with a higher load capacity.

- When turning under  $90^\circ$  to the bolt-in axis (Pic. 9 Part X and Y) the load capacity per VWBM is limited to the nominal load capacity (Table 3: Columns with angle of inclination  $90^\circ$ ).

The nominal load capacity is indicated on the component and included in the product designation (Table 2 and Table 3: e.g. VWBM 1 t M16).

- When rotating below  $90^\circ$  to the bolt-in axis, the increased load capacity „Y“ is not permissible (Pic. 9 – Part Y / value in brackets in Table 3).
- When rotating exclusively perpendicular to the bolt-in axis (Pic. 9 – Part Z), the corresponding load capacity values from Table 3 (angle of inclination  $0^\circ$ ) can be applied.
- For a single turning or reversing operation, tightening with an open-end wrench is sufficient. Observe section 3.2 Hints for the assembly.
- If the VWBM is to remain permanently attached to a load for regular turning and reversing, a suitable thread locking device must be used in addition to the specified tightening torque (see Table 2 and 3.3 User instructions).
- Regularly check for repeated turning and twisting with a VWBM:
  - Ensure that the threads are firmly tightened.
  - The bearing surface of the VWBM must lie fully on the bolt-on surface.
  - The maximum clearance between upper and lower part of the VWBM must not be exceeded (see 4.2)
  - Further tests may be necessary, depending on the result of the risk assessment.
  - In addition, observe the notes from chapters 4.2 and 4.3.

## 4 Inspection / Repair / Disposal

### 4.1 Hints for periodical inspections

The operator must determine and specify the nature and scope of the required tests as well as the periods of repeating tests by means of a risk assessment (see sections 4.2 and 4.3).

The continuing suitability of the lifting point must be checked at least 1x year by an expert.

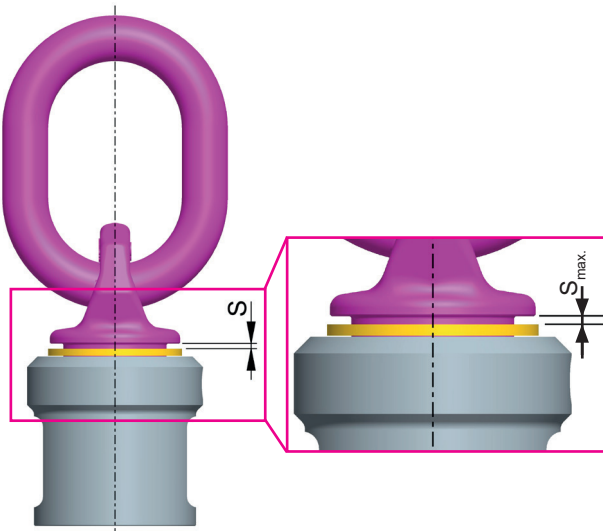
Depending on the usage conditions, f.e. frequent usage, increased wear or corrosion, it might be necessary to check in shorter periods than one year. The inspection has also to be carried out after accidents and special incidents.

The operator must specify the test cycles.

#### 4.2 Test criteria for the regular visual inspection by the user

- Correct thread size, thread quantity and screw-in length.
- Solid thread fixture - Inspection of bolting torque
- The bearing surface of the VWBM must lay plane and holohedral on the bolting area.
- Completeness of the lifting point
- Complete, readable WLL statements as well as manufacturer sign.
- Deformation at load bearing components like base body, suspension ring and threads (e.g. threaded bolts, screws).
- Mechanical damage, like strong notches, especially in areas where tensile stress occurs.
- Locking screw at the side must be tightened.
- Easy turning without jerk between upper and base part of the VWBM must be guaranteed.
- The maximum gap  $S$  between upper and base part must not be exceeded (*Pic. 7*):

VWBM 0.6 t M12:  $S_{\max.}$  1.5 mm  
VWBM 1 t M16:  $S_{\max.}$  1.5 mm  
VWBM 1.8 t M20:  $S_{\max.}$  1.5 mm



*Pic. 7: Maximum gap  $S_{\max.}$  between upper- and base part*

#### 4.3 Additional test criteria for the competent person / repair worker

- Reduction of cross section caused by wear > 10 %, or when the wear lenses have been reached in the main load bearing directions
- Strong corrosion
- Function and damage of VWBM and the thread (e.g. threaded bolts, screws).
- further checks may be required, depending on the result of the risk assessment (e.g. testing for cracks in load-bearing parts).

#### 4.4 RUD BLUE-ID SYSTEM

The RUD BLUE-ID SYSTEM offers a convenient overall solution for checking operating equipment.

RUD ID-POINT® RFID transponders with a uniquely allocated identification number are press-fitted as standard in defined RUD products. In addition, RUD offers you numerous possibilities to retrofit components safely and permanently with an RUD our transponders. This allows the simple and legally certain identification of components without any mix-up.

In addition, the cloud-based software solution AYE-D.NET offers the simplest documentation and management of the test data. As a combination of testing, administration and documentation software, AYE-D.NET facilitates numerous possibilities in testing administration and subsequent processes.

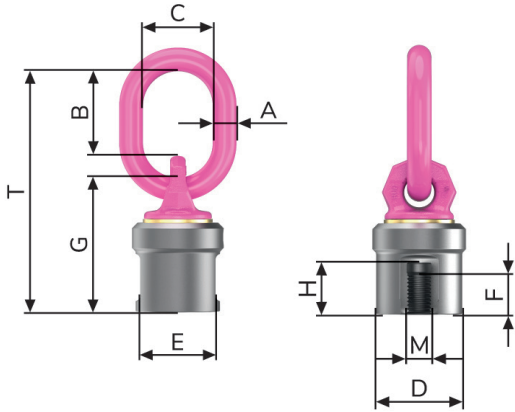
#### 4.5 Disposal

Dispose worn out components / attachments or packaging according to the local waste removal requirements.

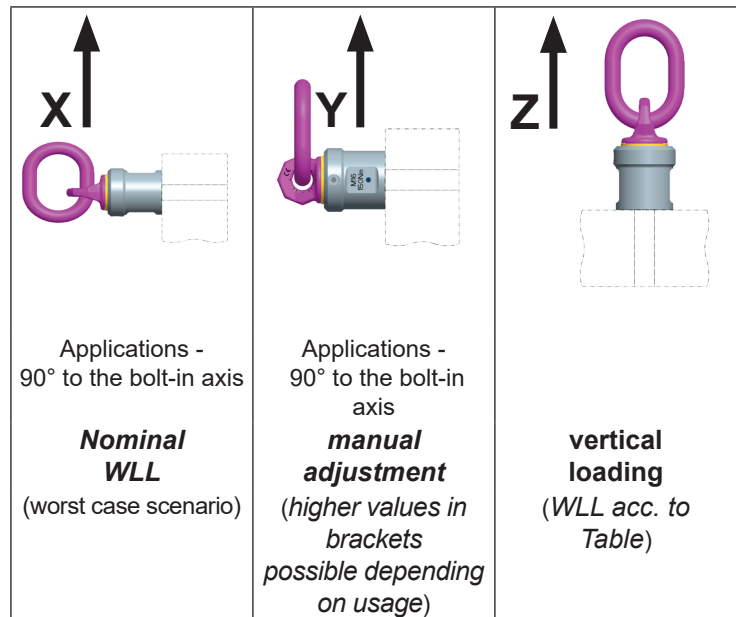
### 5 Hints for repairing

Repair work must only be carried out by a competent person at RUD or by a RUD trained and authorized service station, which has obtained the necessary knowledge and skills.

## 6 Tables



Pic. 8: Dimensioning



Pic. 9: Loading directions

Type	WLL [t]	A [mm]	B [mm]	C [mm]	D [mm]	E (SW) [mm]	F [mm]	G [mm]	H [mm]	M [mm]	T [mm]	torque [Nm]	weight [kg/pc.]	Ref.-No.	Packing unit
VWBM 0.6 t M12	0,6	10	49	35	41	36	15	62	21	12	122	80	0.6	7909682	10
VWBM 1 t M16	1	13	46	38	46	41	20	73	27	16	131	150	0.9	7909683	10
VWBM 1.8 t M20	1.8	13	54	35	62	55	25	88	34	20	158	240	1.8	7911439	4

Table 2: Dimensioning

Subject to technical alterations



### HINT

Size F is the internal thread length of the VWBM and is  $1.25 \times M$ .

Lifting method										
Number of legs	1	2	1	2	2	2	Un-symm.	3 / 4*	3 / 4*	3 / 4*
Inclination angle $\beta$	0°	0°	90°	90°	0-45°	>45-60°	Un-symm.	0-45°	>45-60°	Un-symm.
Factor				2	1.4	1	1	2.1	1.5	1
<b>Type</b>	<b>For max. total load in metric tons, bolted and adjusted to the direction of pull</b>									
VWBM 0.6 t M12	1.2	2.4	0.6 (0.75)	1.2 (1.5)	0.84 (1)	0.6 (0.75)	0.6 (0.75)	1.26 (1.57)	0.9 (1.12)	0.6 (0.75)
VWBM 1 t M16	2.6	5.2	1 (1.2)	2 (2.4)	1.4 (1.68)	1 (1.2)	1 (1.2)	2.1 (2.52)	1.5 (1.8)	1 (1.2)
VWBM 1.8 t M20	4	8	1.8 (2.1)	3.6 (4.2)	2.52 (2.94)	1.8 (2.1)	1.8 (2.1)	3.75 (4.46)	2.7 (3.15)	1.8 (2.1)

Table 3: Working load limit

Subject to technical alterations



### ATTENTION

Please mind at the use especially that the method of lifting does not get changed.

\* Hint: Stated WLL for 3-4 strands is only valid when it is guaranteed that the load is distributed equal to more than 2 strands. Otherwise the 2 strand values must be taken (see DGUV Regulations 109-017).