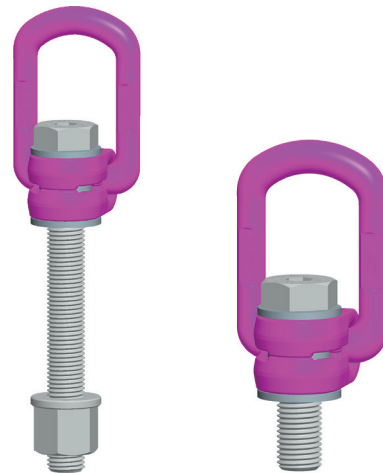


# Load Ring for bolting >VLBG<



## Safety instructions

This safety instruction/declaration of the manufacturer has to be kept on file for the whole lifetime of the product.  
Translation of the original instructions



**RUD Ketten**  
Rieger & Dietz GmbH u. Co. KG  
73428 Aalen  
Tel. +49 7361 504-1370  
Fax +49 7361 504-1460  
sling@rud.com  
www.rud.com

RUD-Art.-Nr.: 8500972-EN / 03.019

Load Ring in pink - for bolting  
VLBG

**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  
73432 Aalen

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:** Lastbock VLBG

**Folgende harmonisierten Normen wurden angewandt:**

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

**Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:**

|                                  |       |
|----------------------------------|-------|
| <u>BGR 500, KAP2.8 : 2008-04</u> | _____ |
| _____                            | _____ |
| _____                            | _____ |
| _____                            | _____ |

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

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann (Prokurist/QMB) Arne Kriegsmann  
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 VLBG

**The following harmonized norms were applied:**

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

**The following national norms and technical specifications were applied:**

|                                  |       |
|----------------------------------|-------|
| <u>BGR 500, KAP2.8 : 2008-04</u> | _____ |
| _____                            | _____ |
| _____                            | _____ |
| _____                            | _____ |

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

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann (Prokurist/QMB) Arne Kriegsmann  
Name, function and signature of the responsible person



Please read user instruction before initial operation of the bolt-on lifting point VLBG. Make sure that you have comprehended all subjected matters. Non observance can lead to serious personal injuries and material damage and eliminates warranty.

## 1 Safety instructions



### ATTENTION

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

Please inspect all VLBG before each use.

- Remove all body parts (fingers, hands, arms, etc.) out of the hazard area (danger of crushing or squeezing) during the lifting process.
- The VLBG must be used only by authorised and trained people in adherence to BGR/DGUV regulations 100-500, Chapter 2.8 and, outside Germany, when observing the relevant specific national regulations.
- The VLBG must be used only by authorised and trained people in adherence to BGR/DGUV regulations 100-500, Chapter 2.8 and, outside Germany, when observing the relevant specific national regulations.
- Do not exceed the working load limit (WLL) indicated on the lifting point.
- VLBG must be rotatable in the screwed tight status through 360 °.
- No technical alterations must be implemented on the VLBG.
- 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 VLBG must never be utilised.

## 2 Intended use

VLBGs must only be used for the assembly of the load or at load accepting means

Their usage is intended to be used as lifting means.

The VLBGs can also be used as lashing points for the fixture of lashing means.

The VLBGs must only be used in the here described usage purpose.

## 3 Assembly- and instruction manual

### 3.1 General information

- Effects of temperature:  
Due to the DIN/EN bolts that are used in the VLBG, the working load limit must be reduced accordingly:  
-40°C to 100°C --> no reduction (-40°F to 212°F)  
100°C to 200°C minus 15 % (212°F to 392°F)  
200°C to 250°C minus 20 % (392°F to 482°F)  
250°C to 350°C minus 25 % (482°F to 662°F)  
**Temperatures above 350°C (662°F) are not permitted.**

Please observe the maximum usage temperature of the supplied nuts (optionally):

- Clamping nuts according to DIN EN ISO 7042 (DIN 980) must only be used up to +150°C at the max (302°F).
- Collar nuts according to DIN 6331 can be used up to +300°C. Please note also the reduction factors (572°F).
- RUD-Lifting points must not be used under chemical influences such as acids, alkaline solutions and vapours e.g. in pickling baths or hot dip galvanising plants. If this cannot be avoided, please contact the manufacturer indicating the concentration, period of penetration and temperature of use.
- The places where the lifting points are fixed should be marked with colour.
- RUD lifting points are delivered with a 100 % crack tested bolt (length up to l<sub>max</sub> please see table 3).
- When using your own bolts, the bolts have to be 100 % crack tested.  
The average notch bar impact test value at the deepest allowed usage temperature must be at least 36 J. This is required in the test fundamentals for lifting points GS MO 15-04 (Point 6.4.1).



### HINT

The min. quality of the hexagon bolt has to be 10.9 accord. EN 24014 (DIN 931) with the nominal diameter.



### HINT

The dismantling / assembling for the exchange or inspecting of the bolt may only be executed by a competent person (compare with Section 3.4 Dismantling / Assembling the RUD bolt).

### Versions

- VLBG lifting points are either supplied with bolts of strength class 10.9 or with „ICE“ material bolts. Original bolts are available as a spare part from RUD.
- The type VLBG 7 t M36 is only delivered with a **special bolt**, therefore it is **not possible to use a DIN/EN-bolt**.

- RUD supplies the Vario length complete with a washer and crack-detected nut corresponding to DIN EN ISO 7042 (DIN 980) or will be supplied with a crack inspected collar nut acc. to DIN 6331.
- If the VLBG is used exclusively for lashing, the value of the working load limit can be doubled. LC = permissible lashing capacity = 2 x WLL



#### HINT

If the VLBG is or was used as a lashing point, it must not be used for lifting later on!

### 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. The German testing authority BG, recommends the following minimum for bolt lengths:
  - 1 x M in steel (minimum quality S235JR [1.0037])
  - 1,25 x M in cast iron (for example GG 25)
  - 2 x M in aluminium alloys
  - 2,5 x M in aluminium-magnesium alloys (M = diameter of RUD lifting point bolt, for ex. M 20)
- When lifting light metals, nonferrous heavy metals and gray cast iron the thread has to be chosen in such a way that the working load limit of the thread corresponds to the requirements of the respective base material.
- The lifting points must be positioned on the load in such a way that movement is avoided during lifting:
  - **For single leg lifts**, the load ring should be positioned 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 symmetrically around the centre of gravity in the same plane, if possible.
- Load symmetry:  
The working load limit of individual RUD lifting points are calculated using the following formula and are based on symmetrical loading:

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

$W_{LL}$  = working load limit  
 $G$  = load weight (kg)  
 $n$  = number of load bearing legs  
 $\beta$  = angle of inclination of the chain to the vertical

The calculation of load bearing legs is as follows:

|                  | symmetrical | asymmetrical |
|------------------|-------------|--------------|
| two leg          | 2           | 1            |
| three / four leg | 3           | 1            |

table 1: Load bearing strands (see table 2)



#### HINT

With unsymmetrical loads, the WLL of each Lifting Point must be at least as high as the weight of the load.

- A plane bolt-on surface (ØD, table 3) with a perpendicular thread hole must be guaranteed. The thread must be carried out acc. to DIN 76 (countersink max. 1.05xd)
- Tapped holes must be machined deep enough so that the bearing surface of the lifting point will be supported. Machine through holes up to DIN EN 20273-middle.
- The VLBG must be rotatable 360° when installed. Please observe the following:
  - For a **single use** hand tightening with a spanner is sufficient. Bolt supporting area must sit proper on bolt-on surface.
  - For **long term application** the VLBG must be tightened with torque according to table 3 (+/- 10 %).
  - When turning loads using the VLBG (see chapter 3.3.2 permissible lifting- and turning process) it is necessary to tighten the bolt with a torque (+/- 10 %) acc. to chart 3.
- With shock loading or vibrations, especially at through hole fixtures with a nut at the end of the bolt, accidental release can occur.  
**Securing possibilities:** Observe torque moment, use liquid securing glue f.e. Loctite (can be adapted to the usage, observe manufacturer hints) or assemble a form closure bolt locking device f.e. a castle nut with cotter pin, locknut etc.
- Finally check the proper assembly (see chapter 4 *Inspection / repair*).

### 3.3 User instructions

#### 3.3.1 General information for the usage

- Always regularly observe the appearance of the whole lifting point (e.g. fixed lifting point/slings) before using it (secured bolt seat, strong corrosion, cracks on load-bearing parts, deformations). Refer to chapter 4 *Inspection / repair*.

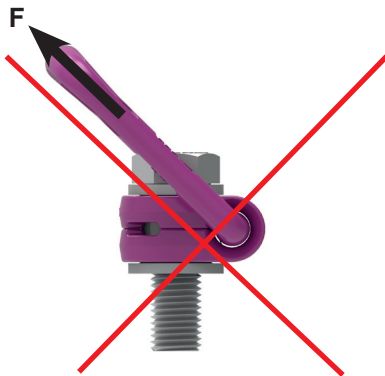


#### ATTENTION

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

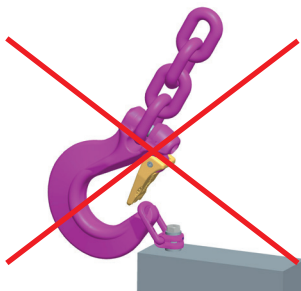
Please inspect all VLBG before each use.

- 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, 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.
- When attaching and removing the lifting means (e.g. lifting chains), crushing, shearing, trapping and impact spots must be prevented.
- Prevent damage being caused to the lifting means by loading at sharp edged.
- Set the suspension ring of the VLBG in the direction of force before attaching the lifting means.



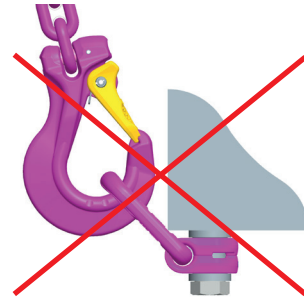
*Pic. 1: Forbidden loading direction*

- Keep in mind that the lifting means in the VLBG must be freely movable.



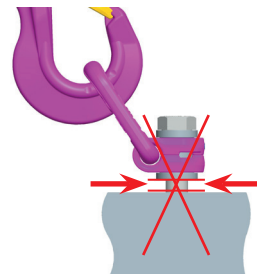
*Pic. 2: Use only suitable lifting means for hanging or hooking into the VLBG*

- A bending load of the suspension ring is not permitted!



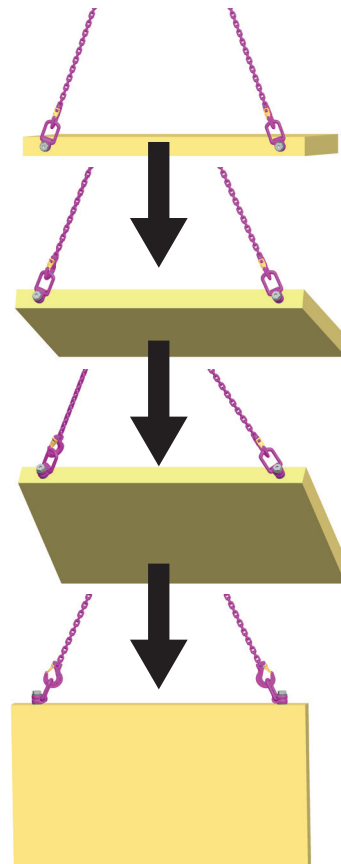
*Pic. 3: The load must move freely and must not be loaded at edges*

- Always completely engage the lifting point.



*Pic. 4: The lifting point must be completely screwed in.*

### 3.3.2 Allowed lifting and turning operations



*Pic. 5: Possible turning operation with the VLBG*

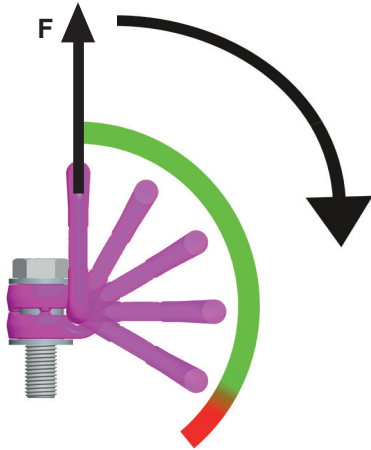
**The following turning operations are allowed**

- Turning operations where the load ring will be turned into the load direction



**WARNING**

The load ring must not support itself at edges or other attachments. Also the attached lifting mean must not touch the head of the bolt.



Pic. 6: Pivoting in load direction

- Turning operations where the VLBG will be turned around the bolt axle (**exception**: see chapter 3.3.3 Forbidden lifting and turning operations). After a full turn by 180° the torque of the bolt must be checked.



**WARNING**

Observe the requested torque value before each lifting or turning operation.

**3.3.3 Forbidden lifting and turning operations**

The following operations are forbidden:



**WARNING**

The turning of the VLBG under load in the direction of the bolt axle (+15°) is forbidden.



Pic. 7: Forbidden turning direction at loading in the direction of the axle.

**3.4 Dismantling / Assembling the RUD bolt**



**HINT**

The dismantling / assembling and/or the exchange of the RUD bolt must only be executed by a competent person!

**3.4.1 Dismantling the bolt of the VLBG M8-M48 / 3/8" - 2"**

1. Position VLBG with the thread end upwards at the bushing on the top of the bench vice without clamping the hexagon head of the bolt.
2. Slightly hit the bolt from the top to drive it out from the bushing (Pic. 8).



Pic. 8: Dismantling position of the VLBG

**3.4.2 Assembling the bolt of the VLBG M8-M10 / 3/8"**



**HINT**

Only the appropriate strength class of bolt for each specific size must be used!

1. Insert the bolt into the drill hole in the socket until the retaining ring is positioned on the socket
2. Squeeze the retaining ring together with flat pliers so that it sits deeply in the groove of the nut.
3. Now insert the bolt with light hits with a hammer fully into the socket.
4. Finally, control the tightness of the bolt. The bolt must be easily rotatable by 360°.



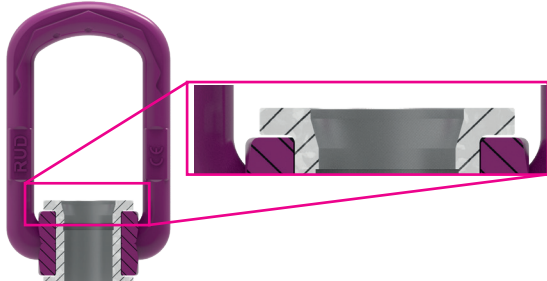
### 3.4.3 Assembling the bolt for VLBG M12-M48 / 1/2" - 2"



#### HINT

Only the stated strength of class for the respective size of the bolts must be used!

1. Insert the bolt into the bushing at the tapered end, where the chamfer is (refer to Pic. 9).



Pic. 9: VLBG in sectional view. The insertion chamfer is visible on top of the bushing

2. Insert the bolt into the socket in such a way that the retaining ring is circumferential deepened in the socket and seated (refer to Pic. 10).



#### TIP

Turn the bolt a few times under slight pressure so that it is centered in the retaining ring!



Pic. 10: Retaining ring positioned as circumferential in the recess

3. Use a light tap on the head of the bolt so that the bolt can be assembled up to the end stop of the bolt head on the socket.
4. Finally, control the tightness and seating of the bolt. The bolt must be easily rotatable by 360°.

## 4 Inspection / repair

### 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 anchor 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.

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


- Correct bolt sizes and nut sizes, bolt quality and screw-in lengths
- Always observe tightness of the bolts → inspect the torque
- Comprehensiveness of the lifting point.
- Comprehensive, legible load-bearing information as well as the manufacturer's identification mark.
- Deformations on load-bearing parts such as basic body, hanging or hooking in suspension ring and bolt
- Mechanical damage such as significant notches, particularly in areas subject to tensile stress.
- Easy rotation of the VLBG must be ensured

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

- Cross-section alterations caused by wear > 10 %.
- Strong corrosion
- Cracks on load-bearing parts
- function of and damage to the bolts, nut as well as the screw thread (disassembly / assembly of the bolt see section 3.4).
- further checks may be required, depending on the result of the risk assessment (e.g. testing for cracks in load-bearing parts).

| Method of lift                          |                    |  |       |       |       |       |         |          |       |         |          |
|---|--------------------|--|-------|-------|-------|-------|---------|----------|-------|---------|----------|
| Number of legs                          |                    | 1  | 1     | 2     | 2     | 2     | 2       | 2        | 3 / 4 | 3 / 4   | 3 / 4    |
| Angle of inclination <math>\beta</math> |                    | 0°   | 90°   | 0°    | 90°   | 0-45° | >45-60° | Un-symm. | 0-45° | >45-60° | Un-symm. |
| Factor                                  |                    | 1  | 1     | 2     | 2     | 1,4   | 1       | 1        | 2,1   | 1,5     | 1        |
| Type                                    | Thread             | WLL in metric tons, bolted and adjusted in the direction of pull |       |       |       |       |         |          |       |         |          |
| VLBG 0.3 t                              | M 8                | 0.3  | 0.3   | 0.6   | 0.6   | 0.42  | 0.3     | 0.3      | 0.63  | 0.45    | 0.3      |
| VLBG 0.63 t                             | M 10 / 3/8"        | 0.63   | 0.63  | 1.26  | 1.26  | 0.88  | 0.63    | 0.63     | 1.32  | 0.95    | 0.63     |
| VLBG 1 t                                | M 12 / 1/2"        | 1  | 1     | 2     | 2     | 1.4   | 1       | 1        | 2.1   | 1.5     | 1        |
| VLBG 1.2 t                              | M 14               | 1.2  | 1.2   | 2.4   | 2.4   | 1.68  | 1.2     | 1.2      | 2.52  | 1.8     | 1.2      |
| VLBG 1.5 t                              | M 16 / 5/8"        | 1.5  | 1.5   | 3     | 3     | 2.1   | 1.5     | 1.5      | 3.15  | 2.25    | 1.5      |
| VLBG 2 t                                | M 18               | 2  | 2     | 4     | 4     | 2.8   | 2       | 2        | 4.2   | 3       | 2        |
| VLBG 2.5 t                              | M 20 / 3/4" / 7/8" | 2.5  | 2.5   | 5     | 5     | 3.5   | 2.5     | 2.5      | 5.25  | 3.75    | 2.5      |
| VLBG 2.5 t                              | M22                | 2.5  | 2.5   | 5     | 5     | 3.5   | 2.5     | 2.5      | 5.25  | 3.75    | 2.5      |
| VLBG 4 t                                | M 24 / M27 / 1"    | 4  | 4     | 8     | 8     | 5.6   | 4       | 4        | 8.4   | 6       | 4        |
| VLBG 5 t                                | M 30 / 1 1/4"      | 5  | 5     | 10    | 10    | 7     | 5       | 5        | 10.5  | 7.5     | 5        |
| VLBG 7 t                                | M 36               | 7  | 7     | 14    | 14    | 9.8   | 7       | 7        | 14.7  | 10.5    | 7        |
| VLBG 8 t                                | M 36 / 1 1/2"      | 8  | 8     | 16    | 16    | 11.2  | 8       | 8        | 16.8  | 12      | 8        |
| VLBG 10 t                               | M 42               | 10   | 10    | 20    | 20    | 14    | 10      | 10       | 21    | 15      | 10       |
| VLBG 15 t                               | M 42               | 15   | 15    | 30    | 30    | 21    | 15      | 15       | 31.5  | 22.5    | 15       |
| VLBG 20 t                               | M 48 / 2"          | 20   | 20    | 40    | 40    | 28    | 20      | 20       | 42    | 30      | 20       |
| Type                                    | Thread             | WLL in lbs, bolted and adjusted in the direction of pull         |       |       |       |       |         |          |       |         |          |
| VLBG 0.3 t                              | M 8                | 660  | 660   | 1320  | 1320  | 925   | 660     | 660      | 1400  | 990     | 660      |
| VLBG 0.63 t                             | M 10 / 3/8"        | 1400   | 1400  | 2800  | 2800  | 1940  | 1400    | 1400     | 2910  | 2080    | 1400     |
| VLBG 1 t                                | M 12 / 1/2"        | 2200   | 2200  | 4400  | 4400  | 3080  | 2200    | 2200     | 4620  | 3300    | 2200     |
| VLBG 1.2 t                              | M 14               | 2640   | 2640  | 5280  | 5280  | 3700  | 2640    | 2640     | 5545  | 3960    | 2640     |
| VLBG 1.5 t                              | M 16 / 5/8"        | 3300   | 3300  | 6600  | 6600  | 4620  | 3300    | 3300     | 6930  | 4950    | 3300     |
| VLBG 2 t                                | M 18               | 4400   | 4400  | 8800  | 8800  | 6160  | 4400    | 4400     | 9250  | 6600    | 4400     |
| VLBG 2.5 t                              | M 20 / 3/4" / 7/8" | 5500   | 5500  | 11000 | 11000 | 7700  | 5500    | 5500     | 11550 | 8250    | 5500     |
| VLBG 2.5 t                              | M22                | 5500   | 5500  | 11000 | 11000 | 7700  | 5500    | 5500     | 11550 | 8250    | 5500     |
| VLBG 4 t                                | M 24 / M 27 / 1"   | 8800   | 8800  | 17600 | 17600 | 12320 | 8800    | 8800     | 18480 | 13200   | 8800     |
| VLBG 5 t                                | M 30 / 1 1/4"      | 11000  | 11000 | 22000 | 22000 | 15400 | 11000   | 11000    | 23100 | 16500   | 11000    |
| VLBG 7 t                                | M 36               | 15400  | 15400 | 30800 | 30800 | 21500 | 15400   | 15400    | 32350 | 23100   | 15400    |
| VLBG 8 t                                | M 36 / 1 1/2"      | 17600  | 17600 | 35200 | 35200 | 24640 | 17600   | 17600    | 36960 | 26400   | 17600    |
| VLBG 10 t                               | M 42               | 22000  | 22000 | 44000 | 44000 | 30800 | 22000   | 22000    | 46200 | 33000   | 22000    |
| VLBG 15 t                               | M 42               | 33000  | 33000 | 66000 | 66000 | 46200 | 33000   | 33000    | 69300 | 49500   | 33000    |
| VLBG 20 t                               | M 48 / 2"          | 44000  | 44000 | 88000 | 88000 | 61600 | 44000   | 44000    | 92400 | 66000   | 44000    |

table 2: WLL in tons (above / top) and in lbs (below / bottom)

| Type               | WLL [t] | weight [kg] | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H stand [mm] | H max [mm] | J [mm] | K [mm] | L Stand [mm] | L max [mm] | M [mm] | N [mm] | SW | ISK | T [mm] | Torque  | Ref.-No. |   |
|--------------------|---------|-------------|--------|--------|--------|--------|--------|--------|--------|--------------|------------|--------|--------|--------------|------------|--------|--------|----|-----|--------|---------|----------|---|
|                    |         |             |        |        |        |        |        |        |        |              |            |        |        |              |            |        |        |    |     |        |         | Standard | Vario   |
| VLBG 0.3 t M8      | 0.3     | 0.3         | 30     | 54     | 34     | 24     | 40     | 12     | 29     | 11           | 76         | 75     | 45     | 40           | 105        | 8      | 32     | 13 | 5   | 75     | 30 Nm   | 8500821  | 8600280   |
| VLBG 0.63 t M10    | 0.63    | 0.32        | 30     | 54     | 34     | 24     | 39     | 12     | 29     | 15           | 96         | 75     | 45     | 44           | 125        | 10     | 32     | 17 | 6   | 75     | 60 Nm   | 8500822  | 8600281   |
| VLBG 1 t M12       | 1       | 0.33        | 32     | 54     | 34     | 26     | 38     | 12     | 29     | 18           | 116        | 75     | 45     | 47           | 145        | 12     | 32     | 19 | 8   | 75     | 100 Nm  | 8500823  | 8600382   |
| VLBG 1.2 t M14     | 1.2     | 0.52        | 33     | 56     | 36     | 30     | 39     | 13.5   | 36     | 21           | 34         | 86     | 47     | 57           | 70         | 16     | 38     | 24 | 10  | 85     | 120 Nm  | 8600399  | 8600399   |
| VLBG 1.5 t M16     | 1.5     | 0.55        | 33     | 56     | 36     | 30     | 39     | 13.5   | 36     | 22           | 149        | 86     | 47     | 58           | 185        | 16     | 38     | 24 | 10  | 85     | 150 Nm  | 8500824  | 8600383   |
| VLBG 2.0 t M18     | 2       | 1.3         | 50     | 82     | 54     | 45     | 55     | 16.5   | 43     | 27           | 47         | 113    | 64     | 70           | 90         | 18     | 48     | 30 | 12  | 110    | 200 Nm  | 8600384  | 8600384   |
| VLBG 2.5 t M20     | 2.5     | 1.3         | 50     | 82     | 54     | 45     | 55     | 16.5   | 43     | 32           | 187        | 113    | 64     | 75           | 230        | 20     | 48     | 30 | 12  | 110    | 250 Nm  | 8500826  | 8600385   |
| VLBG 2.5 t M22     | 2.5     | 1.31        | 50     | 82     | 54     | 45     | 54     | 16.5   | 43     | -            | 57         | 113    | 64     | -            | 100        | 22     | 48     | 30 | -   | 110    | 250 Nm  | -        | 8600385   |
| VLBG 4 t M24       | 4       | 1.5         | 50     | 82     | 54     | 45     | 67     | 18     | 43     | 37           | 222        | 130    | 78     | 80           | 265        | 24     | 48     | 36 | 14  | 125    | 400 Nm  | 8500827  | 8600386   |
| VLBG 4 t M27       | 4       | 3.1         | 60     | 103    | 65     | 60     | 69     | 22.5   | 61     | 39           | 239        | 151    | 80     | 100          | 300        | 27     | 67     | 41 | 17  | 147    | 400 Nm  | 7983658  | 8600387   |
| VLBG 5 t M30       | 5       | 3.3         | 60     | 103    | 65     | 60     | 67     | 22.5   | 61     | 49           | 279        | 151    | 80     | 110          | 340        | 30     | 67     | 46 | 17  | 147    | 500 Nm  | 8500828  | 8600388   |
| VLBG 7 t M36       | 7       | 3.4         | 60     | 103    | 65     | 60     | 74     | 22.5   | 55     | 52           | -          | 151    | 80     | 107          | -          | 36     | 67     | 55 | -   | 146    | 700 Nm  | 8500829  | -   |
| VLBG 8 t M36       | 8       | 6.2         | 77     | 122    | 82     | 70     | 97     | 26.5   | 77     | 63           | 223        | 205    | 110    | 140          | 300        | 36     | 87     | 55 | 22  | 197    | 800 Nm  | 7983553  | 8600289   |
| VLBG 10 t M42      | 10      | 6.7         | 77     | 122    | 82     | 70     | 94     | 26.5   | 77     | 73           | 273        | 205    | 110    | 150          | 350        | 42     | 70     | 65 | 24  | 197    | 1000 Nm | 7983554  | 8600290   |
| VLBG 15 t M42      | 15      | 11.2        | 95     | 156    | 100    | 85     | 109    | 36     | 87     | 63           | 413        | 230    | 130    | 150          | 500        | 42     | 100    | 65 | 24* | 222    | 1500 Nm | 7982966  | 8600291   |
| VLBG 20 t M48      | 20      | 11.6        | 95     | 156    | 100    | 95     | 105    | 36     | 87     | 73           | 303        | 230    | 130    | 160          | 350        | 48     | 100    | 75 | 27  | 222    | 2000 Nm | 7982967  | 8600292   |
| LBG (3) M16 RS 1 t | 1       | 1.1         | 50     | 85     | 50     | -      | 43     | 16.5   | 38     | 25           | -          | 95     | 45     | 63           | -          | 16     | 45     | 24 | -   | 88     | 100 Nm  | 62086    |  |
| LBG (3) M20 RS 2 t | 2       | 1.2         | 50     | 85     | 50     | -      | 42     | 16.5   | 38     | 27           | -          | 95     | 45     | 65           | -          | 20     | 45     | 30 | -   | 88     | 200 Nm  | 62813    |   |

Attention: the stainless load ring is not suitable for use in chloride media (e.g. indoor swimming-pools)

|                           |      |      |    |     |     |    |     |      |    |    |     |     |     |     |     |        |     |         |        |     |         |         |         |
|---------------------------|------|------|----|-----|-----|----|-----|------|----|----|-----|-----|-----|-----|-----|--------|-----|---------|--------|-----|---------|---------|---------|
| VLBG-Z 0.63 t 3/8"-16 UNC | 0.63 | 0.32 | 30 | 54  | 34  | 24 | 39  | 12   | 29 | 16 | 98  | 75  | 45  | 45  | 127 | 3/8"   | 32  | 9/16"   | 1/4"   | 75  | 60 Nm   | 8504256 | 8600440 |
| VLBG-Z 1 t 1/2"-13 UNC    | 1    | 0.36 | 32 | 54  | 34  | 26 | 38  | 12   | 29 | 22 | 123 | 75  | 45  | 50  | 152 | 1/2"   | 32  | 3/4"    | 5/16"  | 75  | 100 Nm  | 8502349 | 8600441 |
| VLBG-Z 1.5 t 5/8"-11 UNC  | 1.5  | 0.50 | 33 | 56  | 36  | 30 | 39  | 13.5 | 36 | 24 | 148 | 86  | 47  | 60  | 184 | 5/8"   | 38  | 15/16"  | 3/8"   | 85  | 150 Nm  | 8502350 | 8600442 |
| VLBG-Z 2.5 t 3/4"-10 UNC  | 2.5  | 1.3  | 50 | 82  | 54  | 45 | 55  | 16.5 | 43 | 28 | 185 | 113 | 64  | 71  | 228 | 3/4"   | 48  | 1 1/8"  | 1/2"   | 110 | 250 Nm  | 8502351 | 8600443 |
| VLBG-Z 2.5 t 7/8"-9 UNC   | 2.5  | 1.25 | 50 | 82  | 54  | 45 | 55  | 16.5 | 43 | 27 | 211 | 113 | 64  | 70  | 254 | 7/8"   | 48  | 1 5/16" | 1/2"   | 110 | 300 Nm  | 8502352 | 8600444 |
| VLBG-Z 4 t 1"-8 UNC       | 4    | 1.5  | 50 | 82  | 54  | 45 | 67  | 18   | 43 | 41 | 211 | 130 | 78  | 84  | 254 | 1"     | 48  | 1 1/2"  | 9/16"  | 125 | 400 Nm  | 8502353 | 8600445 |
| VLBG-Z 5 t 1 1/4"-7 UNC   | 5    | 3.33 | 60 | 103 | 65  | 60 | 64  | 22.5 | 61 | 41 | 278 | 151 | 80  | 102 | 339 | 1 1/4" | 67  | 1 7/8"  | 5/8"   | 147 | 500 Nm  | 8503187 | 8600446 |
| VLBG-Z 8 t 1 1/2"-6 UNC   | 8    | 6.2  | 77 | 122 | 82  | 70 | 97  | 26.5 | 77 | 62 | 270 | 205 | 110 | 140 | 347 | 1 1/2" | 87  | 2 1/4"  | 7/8"   | 197 | 800 Nm  | 8504257 | 8600447 |
| VLBG-Z 20 t 2"-4 1/2 UNC  | 20   | 11.6 | 95 | 156 | 100 | 95 | 105 | 36   | 87 | 69 | 302 | 230 | 130 | 156 | 389 | 2"     | 100 | 3"      | 1 1/8" | 222 | 2000 Nm | 8504258 | 8600448 |

table 3: Dimensioning

\*from length L = 351mm there is no internal hexagon  
 SW = wrench size | ISK = internal hexagon

Subject to technical modifications

