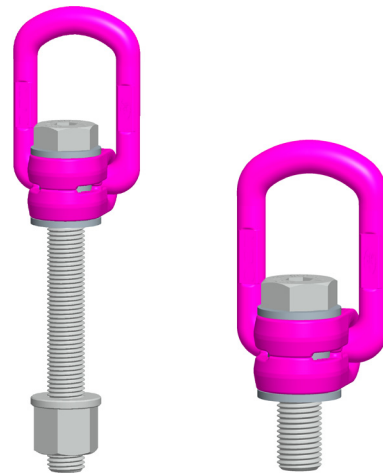


# Load Ring for bolting >VLBG<



## 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



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RUD-Art.-Nr.: 8500972-EN / 02.016

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>EN 12100 : 2011-03</u>	<u>EN 1677-1 : 2009-03</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:**  
Reinhard Smetz, RUD Ketten, 73432 Aalen

Aalen, den 27.06.2014      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>EN 12100 : 2011-03</u>	<u>EN 1677-1 : 2009-03</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:**  
Reinhard Smetz, RUD Ketten, 73432 Aalen

Aalen, den 27.06.2014      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.

- Reference should be made to German Standards accord. BGR 500 (DGUV rules 100-500) or other country specific statutory regulations and inspections are to be carried out by competent persons only.
- The VLBG must be rotatable 360° when installed.

## 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 chemi-

cal 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 lmax please see chart 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. For replacement the bolt can be easily hammered out.

The disassembly and the exchange of parts must only be carried out by a competent person.

### Versions

- VLBG lifting points are either supplied with bolts of strength class 10.9 or with „ICE“ material bolts. (Original ICE-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

### 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])  
1,25x M in cast iron (for example GG 25)  
2x M in aluminium alloys  
2,5x 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)
- The holes must be drilled with a sufficient depth in order to guarantee compatibility with the supporting surface.
- 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 criteria*).

### 3.3 User instructions

#### 3.3.1 General information for the usage

- Before every usage, control in regularly periods the whole lifting point in regard of the continuous aptitude as a lifting mean, whether it is tightened (torqued), or has strong corrosion, wear, deformations etc. (see chapter 4 *Inspection criteria*).



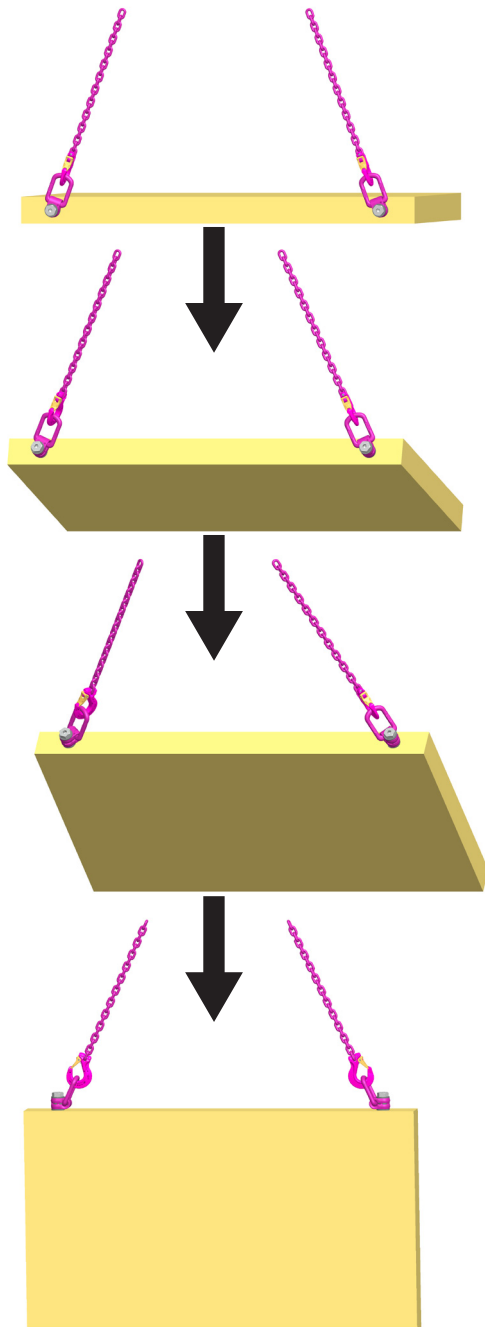
#### ATTENTION

*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.*

- Adjust to the direction of pull, before attaching to the lifting means. The load ring should be free movable and must not touch edges.
- All fittings connected to the VLBG should be free moving. When connecting and disconnecting the lifting means (sling chain) pinches and impacts should be avoided.
- Damage of the lifting means caused by sharp edges should be avoided as well.

### 3.3.2 Allowed lifting and turning operations



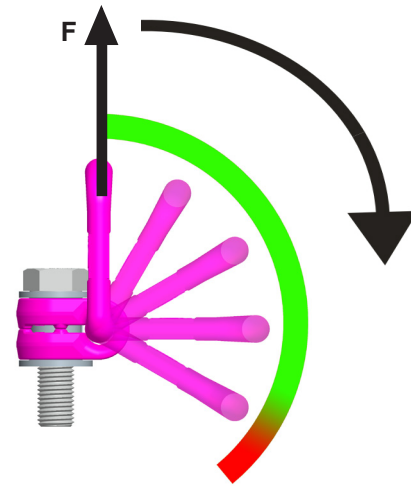
Pic. 1: Possible turning operation with the VLBG

#### 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. 2: 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.*

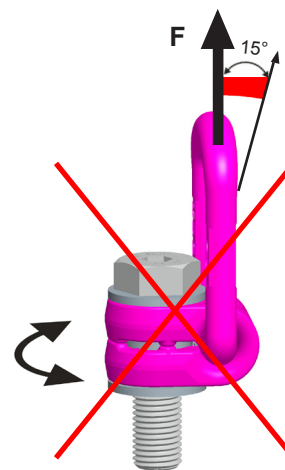
### 3.3.3 Forbidden lifting and turning operations

The following operations are forbidden:



#### WARNING

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



Pic. 3: Forbidden turning direction at loading in the direction of the axle.

### 3.4 Hints for periodical inspections

Have VLBG checked by a competent person in periods which are determined by the usage, but at least 1x per year, in regard of the ongoing appropriateness of the lifting point (see chapter 4 *Inspection criteria*).

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.

RUD components are designed for a dynamical loading of 20 000 load cycles at nominal working load.

The BG/DGUV recommends: At a high dynamic loading with high numbers of load cycles (continious work) the bearing stress acc. to FEM group 1B<sub>m</sub> (M3 acc. to DIN 818-7) must be reduced.

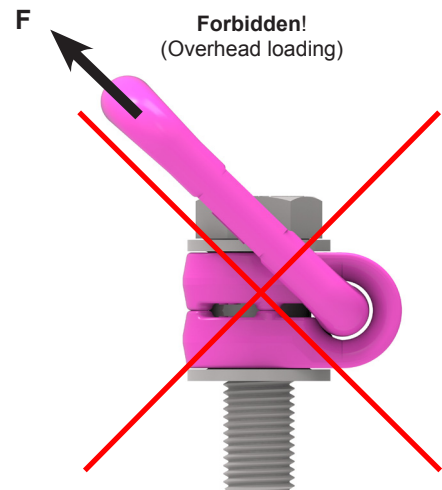
## 4 Inspection criteria

Observe and control the following points before each operation, in regularly periods, after the assembly and special incidents.


- Ensure correct bolt and nut size, quality and length.
- Ensure compatibility of bolt thread and tapped hole --> control of the torque
- The lifting point should be complete.
- The working load limit and manufacturers stamp should be clearly visible.
- Deformation of the component parts such as body, load ring and bolt.
- Mechanical damage, such as notches, particularly in high stress areas.
- Wear should be not more than 10 % of cross sectional diameter.
- Evidence of corrosion.
- Evidence of cracks.
- Damage at the bolt, nut and/or thread.
- The body of the VLBG must be free to rotate.

Method of lift											
Number of legs		1	1	2	2	2	2	2	3 & 4	3 & 4	3 & 4
Angle of inclination <math>\alpha</math>		0°	90°	0°	90°	0-45°	45-60°	unsymm.	0-45°	45-60°	unsymm.
Factor		1	1	2	2	1.4	1	1	2.1	1.5	1
Type	Thread	<b>WLL in metric tons, bolted and adjusted in the direction of pull</b>									
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	<b>WLL in lbs, bolted and adjusted in the direction of pull</b>									
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)

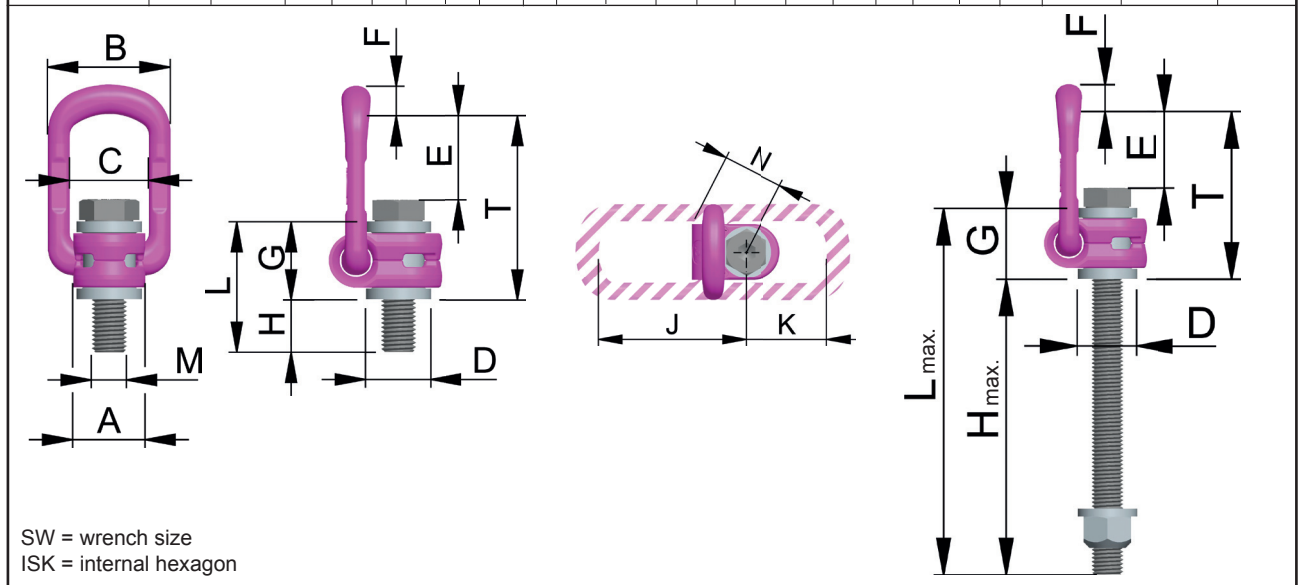


Pic. 4: Overhead loading

Type	WLL [t]	weight [kg]	A	B	C	D	E	F	G	H Stand.	H max.	J	K	L Stand.	L max.	M	N	SW	ISK	T	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	stainless

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



\*from length L= 351mm there is no internal hexagon

table 3: Dimensioning

Subject to technical modifications