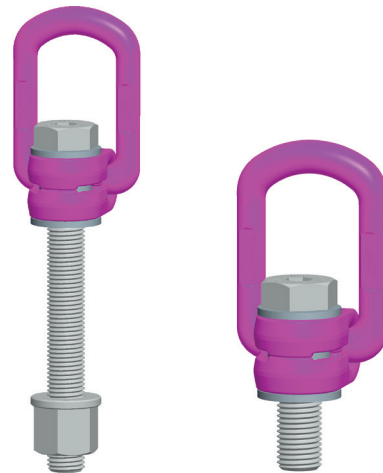


Load Ring for bolting >VLBG 10.9<

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.: 7908059-EN / V02 - 03.024

Load Ring in pink - for bolting
VLBG 10.9

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

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

Aalen, den 16.05.2021 Hermann Kolb, Bereichsleitung MA

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

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

Aalen, den 16.05.2021 Hermann Kolb, Bereichsleitung MA

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 DGUV 109-017 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_{max} please see table 4/5).
- 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-HM-36.



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 supplied with bolts of strength class 10.9. (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/was used as a lashing point, with a force higher than the WLL, it must not be used as a lifting point afterwards. If the VLBG is/was used as a lashing point, up to the WLL only, it can still be used afterwards as a lifting point.!

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
 β = 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 2/3)



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 4/5) with a perpendicular thread hole must be guaranteed. The thread must be carried out acc. to DIN 76 (counterbore diameter at the max. 1.05xd). The holes must be drilled with a sufficient depth in order to guarantee compatibility with the supporting surface. 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 4/5 (+/- 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 table 4/5.
- 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 4 Inspection / repair).

3.3 User instructions

3.3.1 General information for the usage

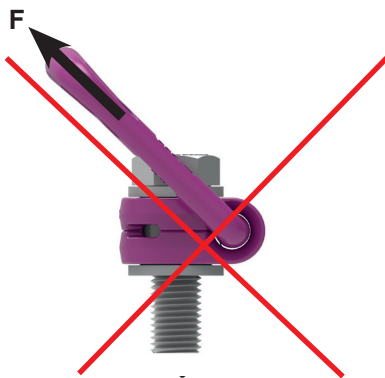
- Always regularly observe the appearance of the whole lifting point (e.g. fixed lifting point/slings) before using it (secured bolt seat, strong corrosion, cracks on load-bearing parts, deformations). Refer to chapter 4 Inspection / repair.



ATTENTION

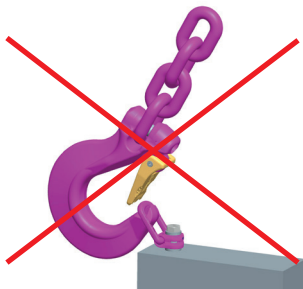
Wrong assembled or damaged VLBG as well as improper use can lead to injuries of persons and damage of objects when load drops. Please inspect all VLBG before each use.

- 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, 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.
- 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.



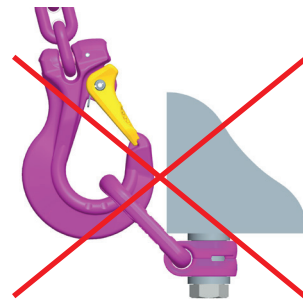
Pic. 1: Forbidden loading direction

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



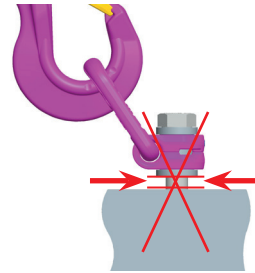
Pic. 2: Use only suitable lifting means for hanging or hooking into the VLBG

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



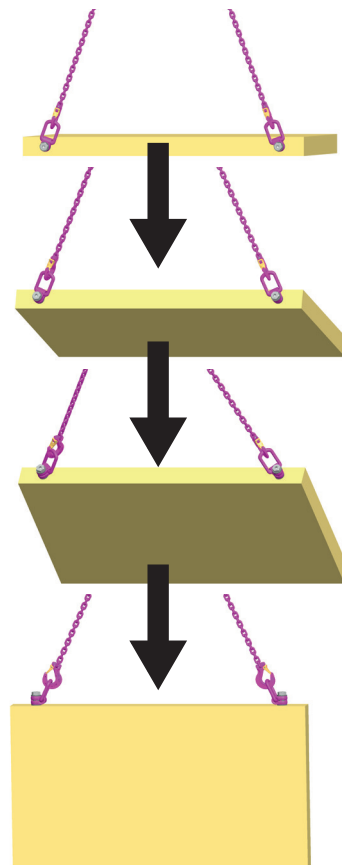
Pic. 3: The load must move freely and must not be loaded at edges

- Always completely engage the lifting point.



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

3.3.2 Allowed lifting and turning operations



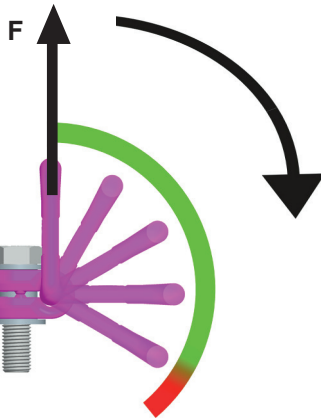
Pic. 5: Possible turning operation with the VLBG

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

- Do not rotate the VLBG under load in the direction of the bolt axle ($\pm 15^\circ$).
- **Not suitable for permanent turning actions under load.**

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

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

**HINT**

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

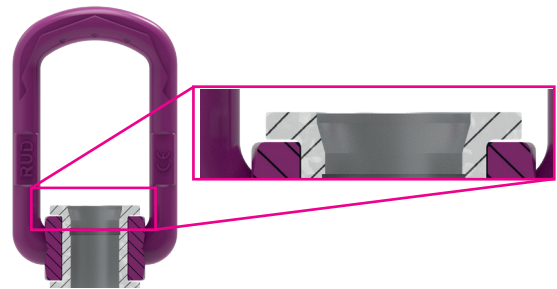
1. Insert the bolt into the drill hole in the socket until the retaining ring is positioned on the socket
2. Squeeze the retaining ring together with flat pliers so that it sits deeply in the groove of the nut.
3. Now insert the bolt with light hits with a hammer fully into the socket.
4. Finally, control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

3.4.3 Assembling the bolt for VLBG M12-M48

**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
- 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).

4.4 Disposal

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

Method of lift											
Number of legs	1	1	2	2	2	2	2	3 & 4	3 & 4	3 & 4	
Angle of inclination β	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	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	M 10	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	1	2	2	1.4	1	1	2.1	1.5	1
VLBG 1.5 t	M 16	1.5	1.5	3	3	2.1	1.5	1.5	3.15	2.25	1.5
VLBG 2.5 t	M 20	2.5	2.5	5	5	3.5	2.5	2.5	5.25	3.75	2.5
VLBG 4 t	M 24	4	4	8	8	5.6	4	4	8.4	6	4
VLBG 7 t	M 36	7	7	14	14	9.8	7	7	14.7	10.5	7
Type	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	M 10	1400	1400	2800	2800	1940	1400	1400	2910	2080	1400
VLBG 1 t	M 12	2200	2200	4400	4400	3080	2200	2200	4620	3300	2200
VLBG 1.5 t	M 16	3300	3300	6600	6600	4620	3300	3300	6930	4950	3300
VLBG 2.5 t	M 20	5500	5500	11000	11000	7700	5500	5500	11550	8250	5500
VLBG 4 t	M 24	8800	8800	17600	17600	12320	8800	8800	18480	13200	8800
VLBG 7 t	M 36	15400	15400	30800	30800	21500	15400	15400	32350	23100	15400
At a lift with one strand and two parallel strands where the inclination angles are at the max. $\pm 7^\circ$, the lifting method can be assumed as a vertical lift.					When lifting with two, three or four leg lifting means, inclination angles of less than 15° shall be avoided, if possible (Risk of instability).						

table 2: WLL VLBG 0.3 t up to VLBG 7 t in tons (above / top) and in lbs (below / bottom)

Method of lift											
Number of legs	1	1	2	2	2	2	2	3 & 4	3 & 4	3 & 4	
Angle of inclination β	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	WLL in metric tons. bolted and adjusted in the direction of pull										
VLBG-PLUS 6.7 t	M 30	6.7	6.7	13.4	13.4	9.4	6.7	6.7	14	10	6.7
VLBG-PLUS 8 t	M 36	8	8	16	16	11.2	8	8	16.8	12	8
VLBG-PLUS 10 t	M 42	10	10	20	20	14	10	10	21	15	10
VLBG-PLUS 15 t	M 42	15	15	30	30	21	15	15	31.5	22.5	15
VLBG-PLUS 20 t	M 48	20	20	40	40	28	20	20	42	30	20
Type	WLL in lbs. bolted and adjusted in the direction of pull										
VLBG-PLUS 6.7 t	M 30	14766	14766	29532	29532	20672	14766	14766	31008	22149	14766
VLBG-PLUS 8 t	M 36	17632	17632	35264	35264	24684	17632	17632	37027	26448	17632
VLBG-PLUS 10 t	M 42	22040	22040	44080	44080	30856	22040	22040	46284	33060	22040
VLBG-PLUS 15 t	M 42	33060	33060	66120	66120	46284	33060	33060	69426	49590	33060
VLBG-PLUS 20 t	M 48	44080	44080	88160	88160	61712	44080	44080	92568	66120	44080
At a lift with one strand and two parallel strands where the inclination angles are at the max. $\pm 7^\circ$, the lifting method can be assumed as a vertical lift.					When lifting with two, three or four leg lifting means, inclination angles of less than 15° shall be avoided, if possible (Risk of instability).						

table 3: WLL VLBG-PLUS 6.7 t up to VLBG-PLUS 20 t in tons (above / top) and in lbs (below / bottom)

Type	WLL [t]	weight [kg/pc.]	A	B	C	D	E	F	G	H Stand	H Max	J	K	L _{Stand}	L _{Max}	M	N	SW	ISK	T	torque [Nm]	Ref.-No Stand.
VLBG 0.3 t	M8	0.3	30	54	34	24	40	12	29	11	76	75	45	40	105	8	32	13	5	75	30	7908052
VLBG 0.63 t	M10	0.63	30	54	34	24	39	12	29	16	96	75	45	45	125	10	32	17	6	75	60	7908053
VLBG 1 t	M12	1	32	54	34	26	38	12	29	21	116	75	45	50	145	12	32	19	8	75	100	7908054
VLBG 1.5 t	M16	1.5	33	56	36	30	39	13.5	36	24	149	86	47	60	185	16	38	24	10	85	150	7908055
VLBG 2.5 t	M20	2.5	50	82	54	45	55	16.5	43	32	187	113	64	75	230	20	48	30	12	110	250	7908057
VLBG 4 t	M24	4	50	82	54	45	67	18	43	37	222	130	78	80	265	24	48	36	14	125	400	7908058
VLBG 7 t	M36	7	60	103	65	60	74	22.5	55	52	-	151	80	107	-	36	67	55	22	146	700	8500829

table 4: Dimensioning VLBG 0.3 t up to VLBG 7 t [mm]

Subject to technical modifications

Type	WLL [t]	weight [kg/pc.]	A	B	C	D	E	F	G	H Stand	H Max	J	K	L _{Stand}	L _{Max}	M	N	SW	ISK	T	torque [Nm]	Ref.-No Stand.	Ref.-No Vario
VLBG-PLUS 6.7 t	M30	6.7	60	103	65	60	67	22.5	61	49	279	151	80	110	340	30	67	46	17	147	1000	8504661	8600480
VLBG-PLUS 8 t	M36	8	77	122	82	70	97	26.5	77	63	223	205	110	140	300	36	87	55	22	197	800	7983553	8600481
VLBG-PLUS 10 t	M42	10	77	122	82	70	94	26.5	77	73	273	205	110	150	350	42	70	65	24	197	1000	7983554	8600482
VLBG-PLUS 15 t	M42	15	95	156	100	85	109	36	87	63	413	230	130	150	500	42	100	65	24*	222	1500	7982966	8600483
VLBG-PLUS 20 t	M48	20	95	156	100	95	105	36	87	73	303	230	130	160	390	48	100	75	27	222	2000	7982967	8600484

table 5: Dimensioning VLBG-PLUS 6.7 t up to VLBG-PLUS 20 t [mm]

Subject to technical modifications

