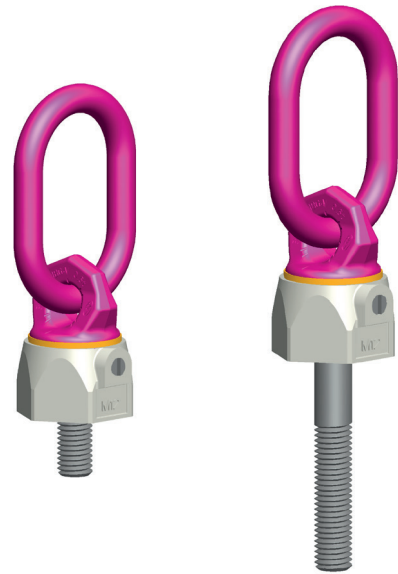


Hoist ring for bolting > VWBG-V < in pink



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



Hoist ring for bolting
Vario (variable bolt lengths)
VWBG-V



RUD Ketten
Rieger & Dietz GmbH u. Co. KG
73428 Aalen
Tel. +49 7361 504-1370
Fax +49 7361 504-1171
sling@rud.com
www.rud.com

RUD-Art.-Nr.: 8503854-EN / 10.016

| | |
|--|---|
| | |
| 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: | <u>Load ring</u> <u>VWBG-V / VWBG</u> |
| 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>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) Name, function and signature of the responsible person <i>Arne Kriegsmann</i> |

| | |
|---|---|
| | |
| 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: | <u>Wirbelbock</u> <u>VWBG-V / VWBG</u> |
| 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>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) Name, Funktion und Unterschrift Verantwortlicher <i>Arne Kriegsmann</i> |



Before initial usage of the RUD VWBG-V hoist rings please read carefully the safety instructions. Make sure that you have understood 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 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.

- Not suitable for permanent turning operations under load. Lifting point cannot be turned 90° to the bolt-on direction under full load.
- The ball bearing resp. the bush bearing disc must not be disassembled.
- The load ring must not be bend.
- RUD VWBG-V lifting points must only be used by instructed and competent persons considering BGR 500 / DGUV 100-500 and outside Germany noticing the country specific statutory regulations.

2 Intended use of VWBG-V

RUD VWBG-V lifting points must only be used for the assembly at the load or at lifting means.

They are intended to be hinged into lifting means and can be turned under load, but not under full load, especially not in the 90° direction. Not suitable for permanent turning operations under load.

RUD VWBG-V lifting points can also be used as lashing points to attach lashing means.

RUD VWBG-V lifting points 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 VWBG-V 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!

Please pay attention when using DIN EN 7042 (DIN 980) nuts the max. operation temperature of 150°C (acc. to DIN EN ISO 2320).

- RUD VWBG-V lifting points 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. The German testing authority BG, recommends the following minimum for the bolt lengths:
1 x M (thread diameter) in steel
(min. quality 235JR [1.0037])
1,25 x M (thread diameter) in cast iron
(e.g. GG 25)
2 x M (thread diameter) in aluminium
2,5 x M (thread diameter)
in light alloys of low strength
(M = thread size/diameter, e.g. M20)
- When lifting light metals, nonferrous metals and gray cast iron the thread has to be chosen in such a way that the WLL of the thread corresponds to the requirements of the base material.
- 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
 G = weight of load
 n = number of load bearing strands
 β = inclination angle of single strand

Number of load bearing strands:

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

Chart 1: Load bearing strands

- A plane bolt-on surface (with a minimum $\varnothing D$) with a perpendicular thread hole must be guaranteed. The thread must be carried out acc. to DIN 76 (countersink max. $1.05 \times d$).
- 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.
- Due to the ball bearing and the bush bearing it is sufficient for a **single lift** to tighten the VWBG-V until the bearing surface has support by using a spanner acc. to DIN 895 resp. DIN 894, without using an extension. If the VWBG-V shall **permanently** installed at the load, tensioning must be carried out with a torque (+/- 10 %) according to chart 2.
- The type VWBG-V can be supplied with different thread lengths (see Fvario in chart 2), and the metric versions with washer und crack detected nut.

The assembly resp. the installation of bolts with different thread lengths is only allowed, if came out by either RUD or an authorized RUD distributor.



ATTENTION

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

- Check finally the correct assembly (see chapter 4, Inspection criteria).

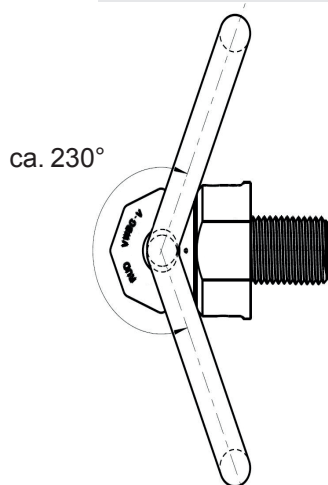
3.3 User instructions

- Check frequently and before each operation the whole lifting mean in regard of linger ability as a lifting mean, regarding corrosion, wear, deformation etc. (see chapter 4, Inspection criteria).



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.



Picture 1: Pivoting area

- VWBG-Vs are suitable for turning and flipping of loads. In doing so, all positions of the ring can occur. The stated WLL at the lifting point is given for the most inappropriate possible case of operation (see picture 6 – part X). When ring has been adjusted manually (see part Y) the higher (WLL) values from chart 3 can be used



ATTENTION

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

If the VWBG-V is will be loaded only perpendicular (in axial direction of the thread, see picture 6 - part Z) the corresponding WLL values from chart 3 (inclination angle 0°) can be used.

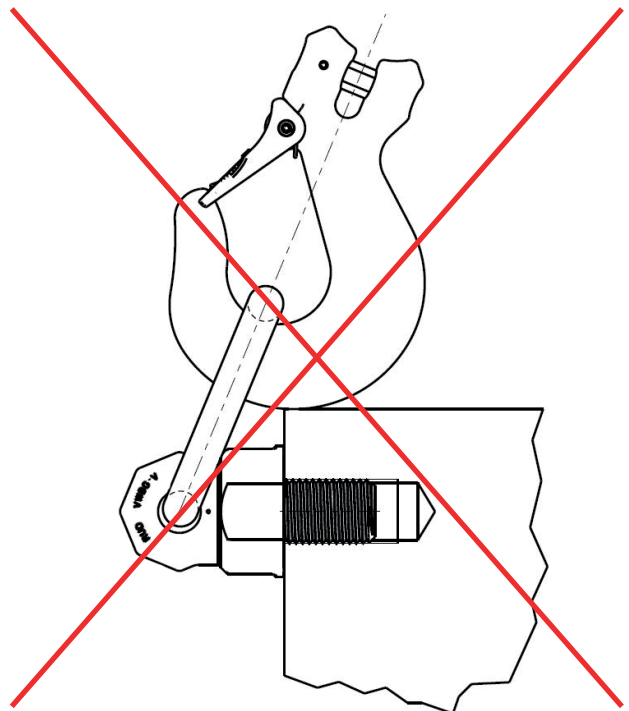
- The ring of the manually adjusted VWBG-V can be pivoted by approx. 230° (see picture 1).



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 VWBG-V (see picture 2).*

- 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.



Picture 2: Forbidden contact or support at/or with edge

- 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 such as a crown nut with split pin, lock nut etc. 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.

3.4 Hints for regular inspection

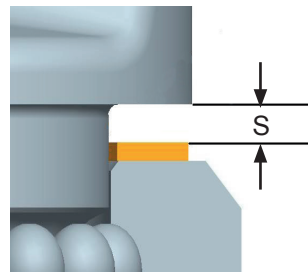
Lingering appropriateness of lifting means should be tested by a competent person, depending on the operational demands or at least once a year (see chapter 4 Inspection criteria).

Depending on the operational demands, resulting from a numerous use, f.e. increased wear or corrosion, could make an earlier inspection necessary which means in a shorter interval than one year.

4 Inspection criteria

Observe and control the following points before each initial operation, in regular time intervals, after the assembly and after special incidents:

- Correct bolt- and nut size plus thread engagement
- Solid bolt fixture - Inspection of bolting torque
- The bearing surface of the VWBG-V 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 threaded pin.
- Mechanical damage, like strong notches, especially in areas where tensile stress occurs.
- Locking screw at the side must be tightened
- Reduction of cross section caused by wear > 10 %, or when the wear lenses have been reached in the main load bearing directions
- cracks or any other damage
- Function and damage of bolt threads and nuts
- Easy turning without jerk between upper and base part of the VWBG-V must be guaranteed.
- The maximum gap S between upper and base part must not be exceeded:
 - VWBG-V 0.3 - 0.45: S max. 1.2 mm
 - VWBG-V 0.6 - 2.0: S max. 1.5 mm
 - VWBG-V 3.5 - 5.0: S max. 3.0 mm

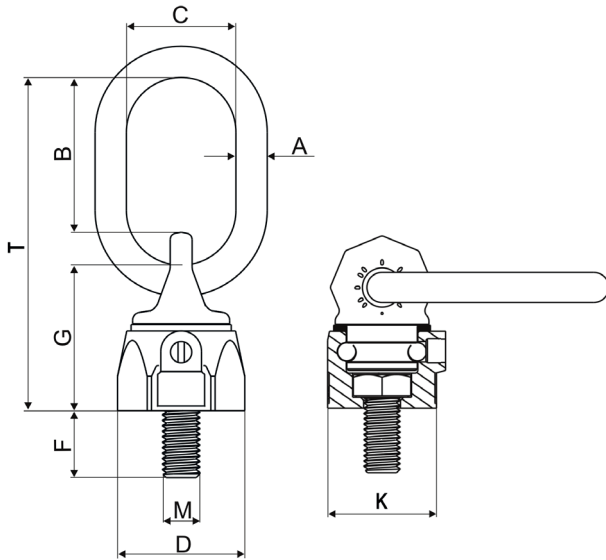


Pic. 3: Distance between upper and base part

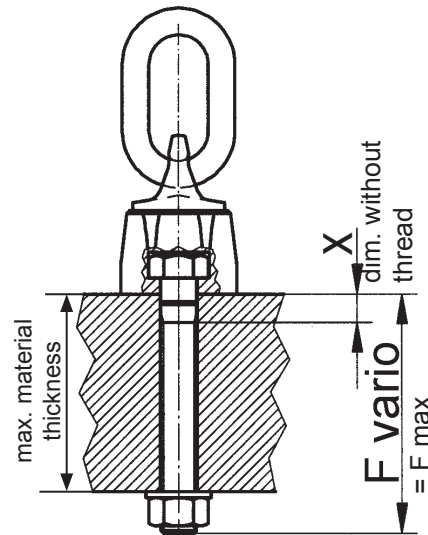
5 Hints for repairing

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.

RUD-VWBG-Vs are designed for a dynamical loading of 20.000 load cycles at nominal working load. The BG recommends: At a high dynamic loading with high numbers of load cycles (continuous work) the bearing stress acc. to FEM group 1Bm (M3 acc. to DIN 818-7) must be reduced.



Picture 4: Dimensioning VWBG-V (metric)



Picture 5: Dimensioning VWBG-V

Example to investigate the required thread length F_{vario} :

Plate thickness 50 mm, through hole for M 20 bolt, height of nut 20 mm, thickness of the washer 3 mm, plus bolt projection 5 mm (2x pitch).

Order length: VWBG-V-2.0 M 20 x 78.

| Nomination | WLL [t] | A [mm] | B [mm] | C [mm] | D [mm] | F _{stand} [mm] | F _{max} [mm] | G [mm] | K [mm] | M [mm] | T [mm] | X | weight [kg/pc.] | Bolting Torque [Nm] | Ref.-No. Stand. | Ref.-No. Vario with washer and nut |
|-----------------|------------|--------|--------|--------|--------|-------------------------|-----------------------|--------|--------|--------|--------|----|-----------------|---------------------|-----------------|------------------------------------|
| VWBG-V 0.3 M8 | 0.3 (0.4) | 8 | 31 | 29 | 30 | 13 | 102 | 36 | 28 | 8 | 76 | 18 | 0.25 | 10 | 7103720 | 8600330 |
| VWBG-V 0.45 M10 | 0.45 (0.6) | 8 | 31 | 29 | 36 | 17 | 122 | 38 | 30 | 10 | 78 | 19 | 0.3 | 10 | 7103715 | 8600331 |
| VWBG-V 0.6 M12 | 0.6 (0.7) | 10 | 49 | 35 | 42 | 21 | 140 | 47 | 36 | 12 | 107 | 19 | 0.4 | 10 | 7100180 | 8600332 |
| VWBG-V 1.0 M14 | 1.0 (1.25) | 13 | 46 | 38 | 48 | 21 | 65 | 56 | 41 | 14 | 113 | - | 0.6 | 25 | - | 8600337 |
| VWBG-V 1.3 M16 | 1.3 (1.5) | 13 | 46 | 38 | 48 | 25 | 180 | 56 | 41 | 16 | 113 | 28 | 0.6 | 30 | 7100430 | 8600333 |
| VWBG-V 1.8 M18 | 1.8 (2.0) | 13 | 54 | 35 | 62 | 27 | 83 | 67 | 55 | 18 | 137 | - | 1.1 | 50 | - | 8600338 |
| VWBG-V 2.0 M20 | 2.0 (2.5) | 13 | 54 | 35 | 62 | 33 | 223 | 67 | 55 | 20 | 137 | 30 | 1.4 | 70 | 7100800 | 8600334 |
| VWBG-V 2.0 M22 | 2.0 (2.5) | 13 | 54 | 35 | 62 | 33 | 94 | 64 | 55 | 22 | 137 | - | 1.5 | 120 | - | 8600334 |
| VWBG-V 3.5 M24 | 3.5 (4.0) | 18 | 66 | 40 | 81 | 40 | 255 | 88 | 70 | 24 | 173 | 25 | 2.6 | 150 | 7100640 | 8600335 |
| VWBG-V 3.5 M27 | 3.5 (4.0) | 18 | 66 | 40 | 81 | 40 | 92 | 88 | 70 | 27 | 173 | - | 2.9 | 200 | - | 8600335 |
| VWBG-V 5.0 M30 | 5.0 (6.0) | 22 | 90 | 50 | 99 | 50 | 330 | 106 | 85 | 30 | 221 | 32 | 5.5 | 225 | 7100650 | 8600336 |

Chart 2: Dimensioning (metric)

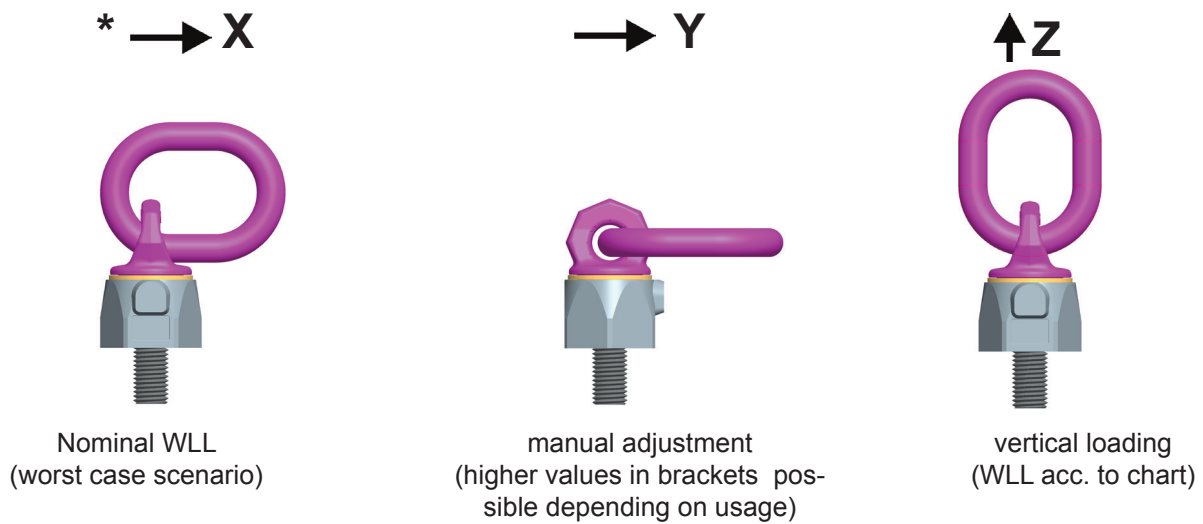
Subject to technical alterations



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 BGR 500 / DGUV 100-500 chapter 2.8 paragraph 3.5.3).



Picture 6: Loading directions

| methode of lifting | | | | | | | | | | | |
|--------------------|--------------|---|------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|
| number of strands | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 3 / 4 * | 3 / 4 * | 3 / 4 * | |
| inclination angle | 0° | 0° | 90 ° | 90° | 0-45° | 45-60° | Un-symm. | 0-45° | 45-60° | Un-symm | |
| Factor | | | 1 | 2 | 1.4 | 1 | 1 | 2.1 | 1.5 | 1 | |
| Type | thread | For the max. total load weight >G< in metric tons, tightened and adjusted to force direction. | | | | | | | | | |
| WBG-V 0,3 | M8 / 5/16" | 0.6 | 1.2 | 0.3 (0.4) | 0.6 (0.8) | 0.42 (0.56) | 0.3 (0.4) | 0.3 (0.4) | 0.63 (0.84) | 0.45 (0.6) | 0.3 (0.4) |
| VWBG-V 0,45 | M10 / 3/8" | 0.9 | 1.8 | 0.45 (0.6) | 0.9 (1.2) | 0.63 (0.84) | 0.45 (0.6) | 0.45 (0.6) | 0.94 (1.26) | 0.67 (0.9) | 0.45 (0.6) |
| VWBG-V 0,6 | M12 / 1/2" | 1.2 | 2.4 | 0.6 (0.75) | 1.2 (1.5) | 0.84 (1.05) | 0.6 (0.75) | 0.6 (0.75) | 1.26 (1.57) | 0.9 (1.12) | 0.6 (0.75) |
| VWBG-V 1.0 | M14 | 2.0 | 4.0 | 1.0 (1.25) | 2.0 (2.5) | 1.4 (1.75) | 1.0 (1.25) | 1.0 (1.25) | 2.1 (2.62) | 1.5 (1.87) | 1.0 (1.25) |
| VWBG-V 1.3 | M16 / 5/8" | 2.6 | 5.2 | 1.3 (1.5) | 2.6 (3.0) | 1.81 (2.1) | 1.3 (1.5) | 1.3 (1.5) | 2.73 (3.15) | 1.95 (2.25) | 1.3 (1.5) |
| VWBG-V 1.8 | M18 | 3.6 | 7.2 | 1.8 (2.0) | 3.6 (4.0) | 2.52 (2.8) | 1.8 (2.0) | 1.8 (2.0) | 3.78 (4.2) | 2.7 (3.0) | 1.8 (2.0) |
| VWBG-V 2.0 | M20 / 3/4" | 4.0 | 8.0 | 2.0 (2.5) | 4.0 (5.0) | 2.8 (3.5) | 2.0 (2.5) | 2.0 (2.5) | 4.2 (5.25) | 3.0 (3.75) | 2.0 (2.5) |
| VWBG-V 2.0 | M22 | 4.0 | 8.0 | 2.0 (2.5) | 4.0 (5.0) | 2.8 (3.5) | 2.0 (2.5) | 2.0 (2.5) | 4.2 (5.25) | 3.0 (3.75) | 2.0 (2.5) |
| VWBG-V 3.5 | M24 / 1" | 7.0 | 14.0 | 3.5 (4.0) | 7.0 (8.0) | 4.9 (5.6) | 3.5 (4.0) | 3.5 (4.0) | 7.35 (8.4) | 5.25 (6.0) | 3.5 (4.0) |
| VWBG-V 3.5 | M27 | 7.0 | 14.0 | 3.5 (4.0) | 7.0 (8.0) | 4.9 (5.6) | 3.5 (4.0) | 3.5 (4.0) | 7.35 (8.4) | 5.25 (6.0) | 3.5 (4.0) |
| VWBG-V 5.0 | M30 / 1 1/4" | 10.0 | 20.0 | 5.0 (6.0) | 10.0 (12.0) | 7.0 (8.4) | 5.0 (6.0) | 5.0 (6.0) | 10.5 (12.6) | 7.5 (9.0) | 5.0 (6.0) |

Chart 3: WLL-overview VWBG-V

| Nomination | WLL [t] | A [mm] | B [mm] | C [mm] | D [mm] | F [mm] | G [mm] | K [mm] | M [mm] | T [mm] | weight [kg/pc] | Bolting-torque [Nm] | Ref.-No. Stand. |
|-----------------------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------|---------------------|-----------------|
| VWBG-V 0.3 - 5/16" - 18 UNC | 0.3 (0.4) | 8 | 31 | 29 | 30 | 13 | 36 | 28 | 5/16" | 76 | 0.25 | 10 | 7991090 |
| VWBG-V 0.45 - 3/8" - 16 UNC | 0.45 (0.6) | 8 | 31 | 29 | 36 | 17 | 38 | 30 | 3/8" | 78 | 0.3 | 10 | 7991091 |
| VWBG-V 0.6 - 1/2" - 13 UNC | 0.6 (0.7) | 10 | 49 | 35 | 42 | 21 | 47 | 36 | 1/2" | 107 | 0.4 | 10 | 7991092 |
| VWBG-V 1.3 - 5/8" - 11 UNC | 1.3 (1.5) | 13 | 46 | 38 | 48 | 29 | 56 | 41 | 5/8" | 114 | 0.6 | 30 | 7991093 |
| VWBG-V 2.0 - 3/4" - 10 UNC | 2.0 (2.5) | 13 | 54 | 35 | 62 | 29 | 67 | 55 | 3/4" | 137 | 1.4 | 70 | 7991094 |
| VWBG-V 3.5 - 1" - 8 UNC | 3.5 (4.0) | 18 | 66 | 40 | 81 | 40 | 88 | 70 | 1" | 173 | 2.6 | 150 | 7991095 |
| VWBG-V 5.0 - 1 1/4" - 7 UNC | 5.0 (6.0) | 22 | 90 | 50 | 99 | 48 | 106 | 85 | 1 1/4" | 221 | 5.5 | 225 | 7991096 |

Chart 4: Dimensioning VWBG-V

Subject to technical alterations