



Operating instructions

DLR rotating load ring



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Imprint

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1 Foreword

1.1 About these instructions

These operating instructions are part of the scope of delivery. Always keep the operating instructions to hand.

Read the operating instructions carefully before first use and observe the information when using Dolezych products.

Observe the safety instructions in the operating instructions to avoid personal injury and damage to property.

1.2 Symbols in the instructions

Warnings of personal injury



This safety warning symbol and the associated signal word indicate important information to avoid hazards that could lead to injury or even death. The meaning of this signal word is explained in more detail below.

DANGER!	Extremely dangerous situation. Failure to observe the safety instructions will result in death or serious injury.
WARNING!	Dangerous situation. Failure to observe the safety instructions can result in death or serious injury.
CAUTION!	Dangerous situation. Failure to observe the safety instructions may result in minor injuries.

Warnings about damage to property



This symbol indicates important information to prevent damage to the product or other objects.

Other information



This symbol indicates other helpful information. This information is also marked with a frame.

1.3 Limitation of liability

Dolezych GmbH & Co KG accepts no liability for damage caused by:

- Failure to observe these operating instructions,
- non-intended use,
- Use of the product by untrained personnel,
- Use of unauthorised accessories,
- unauthorised conversions.

Modifications that affect the material or the load capacity are not permitted. Such interventions are considered unauthorised modifications, resulting in the invalidation of the declaration of conformity and the manufacturer's liability.

Additional markings (e.g. by laser marking) may only be carried out by the manufacturer.

1.4 Special regulations and guidelines

For safe handling of the product, please refer in particular to the following applicable regulations and technical rules:

- DGUV Rule 109-017 - Operation of work equipment
- DGUV Information 209-013 – Rigger
- DIN EN ISO 12100 - Safety of machinery - General principles for design - Risk assessment and risk minimisation
- DIN EN 1677-1 - Components for slings - Safety - Part 1: Forged components, grade 8
- Machinery Directive 42/2006/EC

Additional special regulations may need to be observed, e.g. for the transport of hazardous goods.

2 Safety instructions

2.1 Intended use

The product is used as a load handling attachment for fastening to components in order to be able to transport them.

The product may:

- only be used by authorised and instructed persons,
- only be used in accordance with the applicable regulations.

It is expressly forbidden to:

- modify the product,
- use the product by non-specialist personnel,
- use the product for passenger transport.

This is a professional product, designed for commercial users.



The DLR rotating ring load can also be used as attachment points for load securing. In this case, all applicable rules and regulations on load securing and the instructions on page 16 must be observed.

2.2 General safety instructions

When lifting loads with slings, the people under or next to the load are particularly at risk. There are residual hazards when handling slings. These are in particular:

- insufficiently secure connection from the sling to the load,
- swinging load when lifting and
- falling loads.

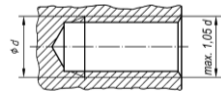
It is forbidden for people to stand under the load!

The following instructions must be observed to ensure safe handling of the product.

- Ring loads must not be used if the markings are missing or no longer legible.
- Observe the maximum load capacity! The product must never be loaded beyond the specified load capacity.
- Observe temperature ranges.

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- The product must not be used in environments with chemical influences (e.g. acids and alkalis or their vapours).
If contact cannot be avoided, the manufacturer must be contacted and informed of the concentration, exposure time and temperature.
- The ring load must be mounted in such a way that it can rotate freely through 360°.
- Only use ring loads with the same nominal size and grade as the lifting gear.
- The points to which the load blocks are attached should be marked in colour.
- The forces introduced must be able to be absorbed by the base material without it deforming to such an extent that safety is impaired.
- The ring load must be screwed in completely if the thread depth is sufficient.
- The ring load must rest flat and fully on the support surface.
- The blind holes must be drilled deep enough so that the support surface can rest completely on them.
- The thread of the screw-in hole must be designed in accordance with DIN 76. (max. $1.05 \times d$).
- Ring loads must be checked for tight fit and obvious damage (corrosion, deformation) before use.
- Ring loads with deformations must not be used any further and must not be screwed in again.
- The lifting device must be attached in such a way that the bracket of the lifting jack can move freely. The bracket must not be supported on edges.
- Avoid tearing or jerky loads.
- Threads must be clean and free from damage.
- No welding work may be carried out on the load frame. The high temperatures can reduce the working load limit.



3 Product description

3.1 Product features

Dolezych DLR rotating ring loads are:

- Made from high-alloy steel (grade 10)
- Safety factor: 4
- According to Machinery Directive 2006/42/EC
- 100 % crack-tested
- Breakage tested for each batch
- 100% tested to 2.5 times the WLL
- Fatigue tested at 1.5 times the WLL for 20,000 cycles
- Swivelling range of the bracket: 120°

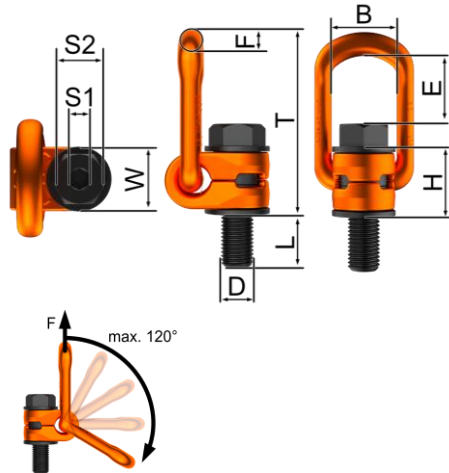


Table 1: Product properties

Item no.	Thread D x L [mm]	Thread length*[mm]		WLL 1-leg [t] 0° & 90°				Dimensions [mm]						Weight [kg]
		Min.	Max.					B	E	F	H	S1	S2	
62-59262008	M8 x 18	8	100	0,30	37,5	44,5	13	34	6	13	98	33	0,2	
62-59262010	M10 x 18	10	125	0,63	37,5	43,5	13	34	8	16	98	33	0,3	
62-59262012	M12 x 18	12	125	1,00	37,5	41	13	36	8	19	98	33	0,5	
62-59262016	M16 x 24	16	175	1,50	37,5	39	13	36	10	23	98	33	0,5	
62-59262020	M20 x 36	20	200	2,50	54	68	17,5	45	12	29	142	50	1,3	
62-59262024	M24 x 36	24	250	4,00	54	65,5	17,5	45	14	35	142	50	1,4	
62-59262030	M30 x 49	30	300	5,00	65	65	21,5	62	17	45	169	60	3,1	
62-59262037	M36 x 62	36	350	8,00	85	96	26,5	78	22	55	225	77	5,8	
62-59262042	M42 x 72	-	-	10,00	85	96	27,5	78	24	65	224	77	6,3	
62-59262043	M42 x 63	-	-	15,00	104	139	36	90	24	65	261	95	10,9	
62-59262048	M48 x 72	48	300	20,00	104	139	36	90	27,5	86	260	95	11,6	

*Mögliche Gewindelängen bei Sonderausführungen mit individueller Gewindelänge

3.2 Labelling on the product

Dolezych DLR rotating load rings are labelled with the following information:

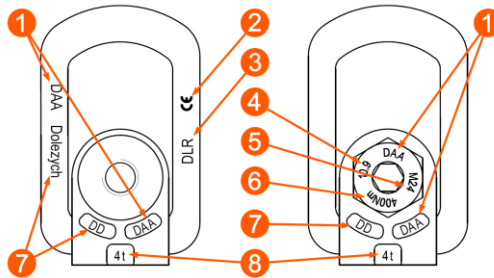


Table 2: Labelling on the product

1	Traceability code/batch number
2	CE mark
3	Article description
4	Grade of screw (10.9)
5	Thread diameter
6	Tightening torque (only for M20 to M36)
7	Manufacturer name/mark
8	Working load limit (WLL)

Table 3: Information on the product

Item no.	Thread (5)	Tightening torque* (6)	Working load limit (8)
62-59262008	M8	–	0,3 t
62-59262010	M10	–	0,63 t
62-59262012	M12	–	1 t
62-59262016	M16	–	1,5 t
62-59262020	M20	250	2,5 t
62-59262024	M24	400	4 t
62-59262030	M30	500	5 t
62-59262037	M36	800	8 t
62-59262048	M48	2.000	20 t

* The tightening torque is only specified on the screws in sizes M20 to M36. The required tightening torques can be found on p. 14.

3.3 Application-orientated product selection

The following points must be observed in order to select a suitable product for the application:

- Mass of the load,
- Position of the load's centre of gravity,
- Position of the attachment points,
- intended hitch,
- intended lifting gear.

The product must be selected so that it can support the load in such a way that it does not make any unwanted movements.

Criteria for the correct product selection are:

- the type of product,
- the length of the product and
- the method of attachment to the load.

The product must be selected so that it is suitable for the environmental conditions at the place of use. Special environmental conditions can have a negative impact on the performance and stability of the product, meaning that the product may fail.

Special environmental conditions are:

- Influence of chemical substances, especially acids, alkalis and solvents,
- extreme temperatures.

Chemical influence

The DLR rotating load rings must not be used in environments with chemical influences (e.g. acids and alkalis or their vapours). If contact cannot be avoided, the manufacturer must be contacted and informed of the concentration, exposure time and temperature.

Temperatures

The DLR rotating load ring may be used in a temperature range of -40 °C to +350 °C. The effects of the ambient temperature on the working load limit must be taken into account (see section 3.4).

3.4 Load factors and working load limit (WLL)

The working load limits marked on the DLR rotating load rings applies to a single-leg application (0° und 90°) and temperatures between -40 °C and +100 °C.

The actual working load limit of the load ring depends on:

- the angle of the acting forces,
- the operating temperature.

Angle-dependent loads for load rings

The working load limit depends on the angle β at which the force acts on the eyebolt and on the type of attachment (single or multi-leg).

Table 4: Working load limits as a function of angle and hitch type

Item no.	Nom. size	1-leg 0°	2-leg 0°	1-leg 90°	2-leg 90°	2-leg 0°-45°	2-leg 45°-60°	Asym.	3/4-leg 0°-45°	3/4-leg 45°-60°	Asym.
Working Load Limit (WLL) in t											
62-59262008	M 8	0,3	0,6	0,3	0,6	0,42	0,3	0,3	0,63	0,45	0,3
62-59262010	M 10	0,63	1,26	0,63	1,26	0,88	0,63	0,63	1,32	0,95	0,63
62-59262012	M 12	1,00	2,00	1,00	2,00	1,40	1,00	1,00	2,10	1,50	1,00
62-59262016	M 16	1,50	3,00	1,50	3,00	2,10	1,50	1,50	3,15	2,25	1,50
62-59262020	M 20	2,50	5,00	2,50	5,00	3,50	2,50	2,50	5,25	3,75	2,50
62-59262024	M 24	4,00	8,00	4,00	8,00	5,60	4,00	4,00	8,40	6,00	4,00
62-59262030	M 30	5,00	10,00	5,00	10,00	7,00	5,00	5,00	10,50	7,50	5,00
62-59262037	M 36	8,00	16,00	8,00	16,00	11,20	8,00	8,00	16,80	12,00	8,00
62-59262048	M 48	20,00	40,00	20,00	40,00	28,00	20,00	20,00	42,00	30,00	20,00



A larger version of this load capacity table can be found in the appendix on page 21.

Influence of temperature on working load limit

The ambient temperature during use has an influence on the working load limit of the product. Depending on the ambient temperature, the working load limit (WLL) must be reduced in accordance with Table 5.

Table 5: Reduction of the working load limit depending on the ambient temperature

Ambient temperature	Reduction of the WLL
below -40 °C	(below -40 °F) Use not permitted
-40 °C bis +100 °C	(-40 °F bis +212 °F) No reduction
+100 °C bis +200 °C	(+212 °F bis +392 °F) -15 %
+200 °C bis +250 °C	(+392 °F bis +482 °F) -20 %
+250 °C bis +350 °C	(+482 °F bis + 662 °F) -25 %
above +350 °C	(above +662 °F) Use not permitted

4 Application notes



WARNING!

Risk of injury from falling load!

Incorrectly assembled or damaged load rings and incorrect use can lead to product failure.

- Follow the instructions in the user manual.

4.1 Treatment of the surface/preparation of the substrate

The mounting surface must be free of dirt.

The thread must be cut at right angles to the contact surface.

The blind hole must be drilled perpendicular to the bearing surface.

The blind hole must be drilled deep enough so that the bearing surface of the DLR rotating load ring can rest completely on it.

The contact surface must be flat and large enough for the load ring to rest on the entire surface.

4.2 Suitable material combinations

The required minimum thread length depends on the thread diameter d and the base material in which the DLR rotating load ring is fastened (see Table 6)

Table 6: Minimum thread length depending on the thread diameter d and the base material

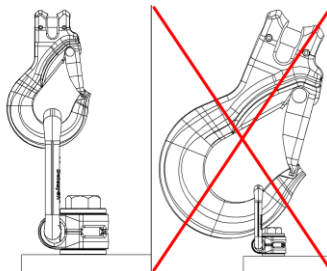
Material	Minimum thread length
Steel (Minimum quality S235JR [1.0037])	1 x d
Cast iron	1.25 x d
Aluminium alloys	2 x d
Aluminium-magnesium alloys	2.5 x d

If light metals, non-ferrous metals and grey cast iron are to be lifted, the thread must be selected so that the working load limit of the thread meets the requirements of the base material.

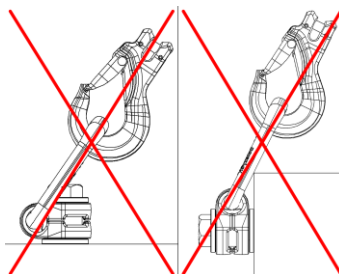
4.3 Attachment to the load

The following points must be taken into account when using the DLR rotating load ring:

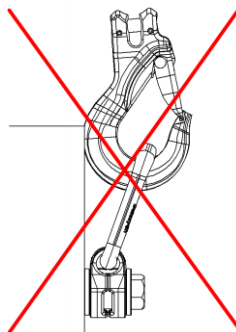
- The lifting device must be attached in such a way that the bracket of the load ring can move freely.
- The lifting gear used must not impair the free movement of the bracket.



- The bracket must not rest on the edges of the load or the body of the load ring.



- Lifting gear must not be supported on edges or the load frame.



- Before commencing the lifting operation, the bracket of the load ring must be aligned in the direction of the load.

4.4 Recommended tightening torque



WARNING!

Risk of injury from falling load!

Jerky movements and vibrations can lead to unintentional loosening of the screw connection. This can be the case with through holes in particular.

- Observe the tightening torque.
- Use thread locker (e.g. safety nut, locking pin or liquid thread locker)

For a *single* lift, it is sufficient to tighten the DLR rotating load ring hand-tight using an appropriate tool.

For a *permanent* use for lifting, the DLR rotating load ring must be tightened with a spanner to a tightening torque ($\pm 10\%$) in accordance with the specifications.

Table 7: Recommended tightening torques

Item no.	Nominal size	Tightening torque [Nm]
62-59262008	M8	30
62-59262010	M10	60
62-59262012	M12	100
62-59262016	M16	150
62-59262018	M18	200
62-59262020	M20	250
62-59262024	M24	400
62-59262030	M30	500
62-59262037	M36	800
62-59262048	M48	2.000

4.5 Balancing the Load

To lift the load without it twisting or tipping over, the following conditions must be met:

- For single-leg slings, the attachment point must be positioned vertically above the load's centre of gravity.
- For 2-leg lifting assemblies, the attachment points must be positioned evenly on both sides and above the centre of gravity of the load.
- For 3- and 4-leg lifting assemblies, the attachment points must be evenly distributed in a plane around the load's centre of gravity and be above the load's centre of gravity.
- For 2-, 3- and 4-legged lifting assemblies and different angles of inclination, only the load-bearing capacity of a 1-legged lifting assemblies at 90° may be assumed, depending on the largest angle of inclination
- If different angles of inclination occur with 2-legged lifting assemblies (Figure 1), only the load-bearing capacity of a single leg at 90° may be taken as a basis.

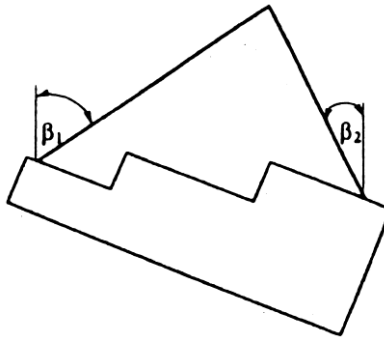


Figure 1: Example of unequal inclination angles β

Uneven load distribution is always to be expected if:

- the load is inelastic (e.g. concrete parts, castings, short beams)
- the position of the centre of gravity is not known
- the load is unevenly shaped
- different angles of inclination occur

! *NOTE!* For asymmetrical loads, the working load capacity (WLL) of each lifting point must be at least as high as the weight of the load.

4.6 Prohibited lifting/turning operations

Lifting operations during which the load ring rotates under load (e.g. turning operations) are prohibited.

4.7 Use for load securing

If the product is used as a lashing point for load securing, a distinction must be made between temporary and permanent use.

Temporary use as lashing point

If the product is used **temporarily** as a lashing point for load securing, i.e. if the product is to be used again after transport as an attachment point for lifting after transportation, the maximum value of the labelled working load limit (WLL) may be assumed as the value for the permissible lashing capacity (LC).

$$\text{LC} = \text{lashing capacity} = \text{WLL}$$

 **NOTICE!** If the DLR rotating load ring is loaded with a force greater than the WLL during use as a lashing point, it must not be used for lifting afterwards. Such load rings should be marked in color.

If the rotating load ring is only loaded up to 1 time the WLL during use as a lashing point, it may still be used as a lifting point.

Permanent use as lashing point

If the product is used **permanently** and **exclusively** as a lashing point for load securing, a maximum of twice the value of the labelled working load limit (WLL) may be assumed as the value for the permissible lashing capacity (LC).

$$\text{LC} = \text{lashing capacity} = 2 \times \text{WLL}$$

For reasons of simplification, the unit kg can be equated with the unit daN.



For permanent use in load securing, we recommend using lashing points that have been specially developed for load securing.



When installing in vehicles or vehicle bodies, the regulations and specifications for the corresponding vehicle or vehicle body type must be observed.

5 Testing and maintenance

5.1 Before each use

Before each commissioning of the product, it must be ensured that:

- The product is not ready to be discarded (see 5.2)
- The product is complete.
- Thread and nut have the correct length and grade.
- The labelling (working load limit and manufacturer's mark) is legible.
- The thread is free from
 - Wear and tear,
 - Corrosion,
 - Damage.
- The product can be screwed in easily up to the stop without the use of force.
- There is no dirt in the thread or under the collar.
- There are no deformations on the product.

Deformations can be, among others:

- Bent threaded shaft,
- Deformed eyelet
- Notches
- Cracks
- Indentations
- The body of the load ring is freely rotatable.
- The necessary tightening torque has been reached.

5.2 Regular inspection

The inspection interval must be determined by the operator (user) in the risk assessment. According to DGUV 109-017, load handling attachments must be inspected by a competent person at intervals of no more than one year.

If the product is frequently used under full load, this test should be carried out at shorter intervals.

It is recommended to check the product for cracking every three years.

All parts that may affect the safety and operation of the product must be checked for:

- Cracks,
- Notches,
- Deformations,
- Visible damage (e.g. due to excessive heat),
- Wear or corrosion on more than 10 % of the cross-section.

If there is any doubt as to whether the eyebolt is undamaged, it must be replaced:

- operation is stopped immediately and
- the devices are checked by a competent person.

Depending on the result of the risk assessment, further tests may be necessary.

5.3 Discard maturity

The product must not be used once it has reached discard maturity.

The discard maturity is reached at:

- labelling no longer legible
- Deformations, such as
 - Bent threaded shank
 - Deformed eyelet
 - Notches, cracks, indentations
- Corrosion
- reduced cross-section of 10 % or more.

6 Storage and care

6.1 Storage

The product should be cleaned of dirt before storage and then stored as follows:

- In containers that have a "soft" surface (e.g. wooden crates) to prevent damage to the threads.
- The use of mesh protection tubes or thread caps is recommended to protect the thread.
- The storage temperature should be between 0 °C and +40 °C.

The product should be checked for damage before storage. Do not store damaged or discarded products but remove them directly from further use.

6.2 Cleaning

Only clean the product with clean water or multifunctional oil (e.g. WD40).

Do not use any chemical additives, especially acids or alkalis.

Allow the product to dry sufficiently before further use. Do not accelerate drying, e.g. by heating.

No cleaning methods may be used which:

- can lead to overheating,
- Hide errors on the surface,
- can lead to hydrogen embrittlement or
- can lead to stress corrosion cracking.

7 Disposal instructions

Once the product has reached maturity, it must be disposed of properly and in accordance with local legal requirements.



8 EC Declaration of Conformity

In accordance with the EC Machinery Directive

2006/42/EC we hereby declare,

Dolezych GmbH & Co KG

Hartmannstraße 8

44147 Dortmund



that the Dolezych DLR rotating load ring, which have been developed for attaching loads, comply with the following relevant regulations in the standard version:

EC Machinery Directive 2006/42/EC

DIN EN ISO 12100 Safety of machinery - General principles for design

DIN EN 1677-1 Components for slings - Safety - Part 1: Forged components, grade 8

Dortmund; 28/09/2023

A handwritten signature in black ink, appearing to read 'Th. Schade', is written over a dotted line.

Dipl. Ing. Thomas Schade
(authorised representative)

9 Appendix

9.1 Working load limits

Item no.	Norm. size	1-leg		2-leg		1-leg		2-leg		0°-45°		45°-60°		Asym.		0°-45°		45°-60°		Asym.		
		0°		0°		90°		90°		0°		45°		60°		0°		45°		60°		
																						
Working Load Limit (WLL) in t																						
62-59262008	M8	0,3		0,6		0,3		0,6		0,42		0,3		0,3		0,63		0,45		0,3		
62-59262010	M10	0,63		1,26		0,63		1,26		0,88		0,63		0,63		1,32		0,95		0,63		
62-59262012	M12	1,00		2,00		1,00		2,00		1,40		1,00		1,00		2,10		1,50		1,00		
62-59262016	M16	1,50		3,00		1,50		3,00		2,10		1,50		1,50		3,15		2,25		1,50		
62-59262020	M20	2,50		5,00		2,50		5,00		3,50		2,50		2,50		5,25		3,75		2,50		
62-59262024	M24	4,00		8,00		4,00		8,00		5,60		4,00		4,00		8,40		6,00		4,00		
62-59262030	M30	5,00		10,00		5,00		10,00		7,00		5,00		5,00		10,50		7,50		5,00		
62-59262037	M36	8,00		16,00		8,00		16,00		11,20		8,00		8,00		16,80		12,00		8,00		
62-59262048	M48	20,00		40,00		20,00		40,00		28,00		20,00		20,00		42,00		30,00		20,00		