

> ICE-Balancer <

User instruction

This safety instruction has to be kept on file for the whole lifetime of the product and forwarded with the product.
Translation of the original user instruction



ICE-Balancer



RUD Ketten
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RUD-Art.-Nr.: 7903516-EN - V03b / 07.025



Simple test, management and documentation subject to mandatory testing operating resources, equipment and components.

EG-Einbauerklärung

entsprechend der EG-Maschinenrichtlinie 2006/42/EG, Anhang II B und ihren Änderungen

Hersteller: **RUD Ketten
 Rieger & Dietz GmbH u. Co. KG**
 Friedensinsel
 73432 Aalen

Hiermit erklären wir, dass die nachfolgend bezeichnete unvollständige Maschine den grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG (Anhang 1) entspricht. Die nachfolgend bezeichnete unvollständige Maschine darf, in der gelieferten Ausführung erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die diese unvollständige Maschine eingebaut werden soll, den Anforderungen der EG-Maschinenrichtlinie 2006/42/EG entspricht.

Produktbezeichnung: ICE-Wippe
IW

Folgende harmonisierten Normen wurden angewandt:
DIN EN ISO 12100 : 2011-03 _____

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:
DGUV-R 109-017 : 2020-12 _____

Die speziellen Unterlagen zur unvollständigen Maschine nach Anhang VII Teil B wurden erstellt und werden auf begründetes Verlangen in geeigneter Form übermittelt.

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

Aalen, den 01.06.2022 Hermann Kolb, Bereichsleitung MA

Name, Funktion und Unterschrift Verantwortlicher

EC-Mounting declaration

According to the EC-Machinery Directive 2006/42/EC, annex II B and amendments

Manufacturer: **RUD Ketten
 Rieger & Dietz GmbH u. Co. KG**
 Friedensinsel
 73432 Aalen

We hereby declare that the following incomplete machines correspond to the basic requirements of the Machinery Directive 2006/42/EC (annex 1). The following incomplete machine, in the delivered machine, may only be put into operation when the machine in which the incomplete machine shall be assembled, has been tested according to the requirements of the EC-Machinery Directive 2006/42/EC.

Product name: ICE-Balancer
IW

The following harmonized norms were applied:
DIN EN ISO 12100 : 2011-03 _____

The following national norms and technical specifications were applied:
DGUV-R 109-017 : 2020-12 _____

The special documents about the incomplete machine according to annex VII part B have been created and can be handed over in a suitable form on request.

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

Aalen, den 01.06.2022 Hermann Kolb, Bereichsleitung MA

Name, function and signature of the responsible person



Before use or assembly of ICE-Balancer please read user instruction carefully. Make sure that you have understood all subject matters. Non-observance can lead to personal and material damage and eliminates warranty.

1 Safety instructions



ATTENTION

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

- Keep all body parts like fingers, hands, arms, etc. out of the hazardous area during the lifting operation.
- Any technical modifications at the ICE-Balancer are prohibited.
- Keep persons out of the hazardous area.
- Detention under a floating load is forbidden.
- Jerkily lifts with shock loads must be avoided.
- When the lift starts, pay attention to a stable position of the load. Avoid swinging of the load.
- Damaged or worn ICE-Balancer must no longer be used.
- Bear in mind extreme circumstances or shock loads when choosing the used components.
- The ICE-Balancer must not be used under load with a limit inclination angle of 10° (see *Pic. 18* and *Pic. 19*).
- The inclination angle β must not exceed 45° (see *Pic. 20* and *Pic. 21*).
- ICE-Balancers must only be used by designated and trained persons by observing the DGUV 109-017, and outside Germany acc. to the country specific regulations.

2 Intended use

An ICE-Balancer is installed in a 4-leg application (2x 2-leg), to achieve an equal load distribution to all 4 legs (*Pic. 25*). The length tolerances of the single legs will be compensated by the disposition of the ICE-Balancer.

Please observe that the ICE balancer does not exceed the limit inclination angle of 10° (*Pic. 17* and *Pic. 18*). By the special bottom shape of the ICE balancer you can realize very easy the limit inclination angle of 10°.

During use make sure that the 2-leg sling with the ICE-Balancer will not be used seperately.

Observe the safety instructions: „Lifting means used for lifting of loads must especially avoid that loads shift unattended or drop in free fall.“

ICE-Balancers must only be used in the here explained usage.

You can calculate with 4 load bearing strands if the following criteria are fulfilled (DGUV 109-017):

- Two 2-leg slings, thereof one sling with a balancer.
- Both 2-leg slings will be attached to one hook (single or double crane hook)
- Symmetrical load spreading
- Max. inclination angle β 45°



WARNING

The 2-leg sling with the balancer must not be used seperately as 2-leg sling. Lifting means for lifting of loads must avoid that loads can shift unintentional. (compare with work safety requirement, attachment 1, chapter 3.2.3)

3 Assembly- and instruction manual

3.1 General information

- Capability of temperature usage
When used at temperatures higher than 200°C the working load limits (WLL) of the ICE-Balancer must be reduced as follows:
-20°C up to 200°C no reduction
200°C up to 250°C minus 10 %
250°C up to 300°C minus 40 %
Temperatures exceeding 300°C are prohibited!
- ICE-Balancer must not be used with aggressive chemicals such as acids, alkaline solutions and their vapours.
- The ICE-balancer head consists of the following components:

Size 6-16 mm
IAK-/ISAK-Master Link
VV-SCH/VC-SCH
IW
IVS / ICE-CCS

Table 1: Component adjustment

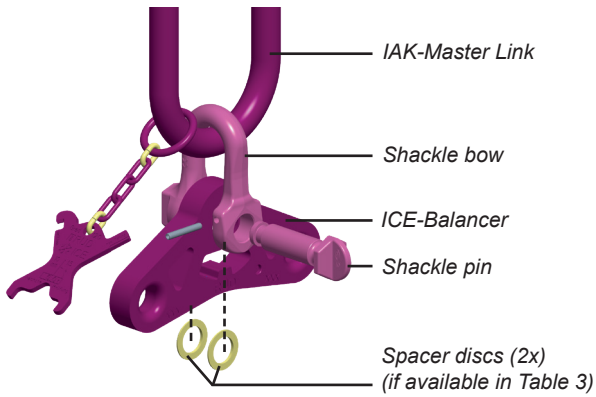
3.2 Hints for the assembly

3.2.1 Assembly of masterlinks and shackles

Please observe absolutely the correct sizing of masterlinks, shackles and balancers during assembly and repairing (see *Table 3 / Table 4*).

During the assembly of the ICE-balancer head please proceed as follows:

- 1 Please meet the following component adjustment while balancer head is assembled (Pic. 1):



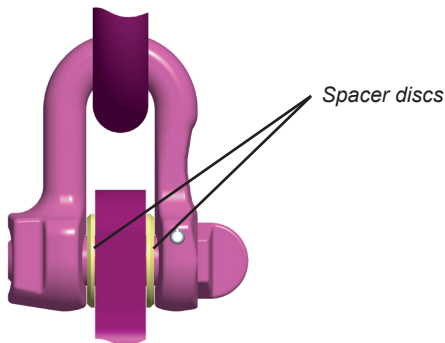
Pic. 1: Component adjustment

- 2 Attach shackle bow into IAK-Master Link.
- 3 Move shackle bow plus IAK Master link over the top hole of the balancer.
- 4 Close shackle by moving the shackle pin through the top hole of the balancer.



HINT

To avoid one-sided loading of the shackle, some ICE-Balancer heads are fitted with spacer discs on both sides of the shackle pin (see Table 3).



Pic. 2: Spacer discs (on both sides of the shackle pin)

- 5 Turn shackle pin completely in and secure it always with a cotter or a sleeve pin. The shackle must now be firm connected to the ICE-Balancer (Pic. 3).



HINT

The bow of the shackle must always be secured: Sleeve pin for VV-SCH 10, 13 and 16. Cotter pin for VC-SCH 4,0; 5.0 and 6.0.



Pic. 3: Assembled ICE-Balancer with shackle

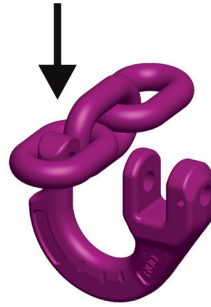
3.2.2 Assembly of chain strands (by using connectors)

The chain strands will be connected to the balancer by using Connecting Links.

Sequence of assembly:

In the following description the assembly of the connecting link IVS will be described exemplarily with the example of an ICE-Balancer and an ICE chain.

- 1 Install last link of the chain strand into the nose (Pic. 4). In this case there is no additional connector necessary.

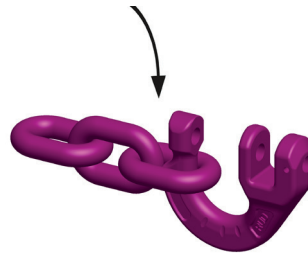


Pic. 4: Install chain into nose



HINT

At the beginning of the bow rounding, chain link can be turned by 90° within the bow (Pic. 5).



Pic. 5: Turn chain link

- 2 Position chain strand to the bottom of the bow part (Pic. 6).



Pic. 6: Suspend chain strand in bow part

- 3 Insert the second bow part into the bottom hole of the balancer / balancer connection (Pic. 7).



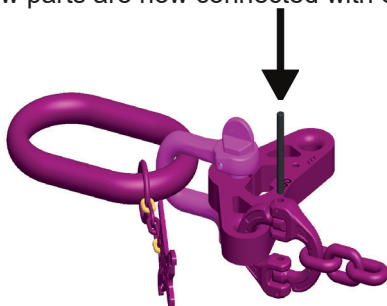
Pic. 7: Assembly of the second bow part into the bottom hole of the balancer / balancer connection

- 4 Assemble both bow parts together in such a way that components are aligned (Pic. 8).



Pic. 8: Aligning bow parts

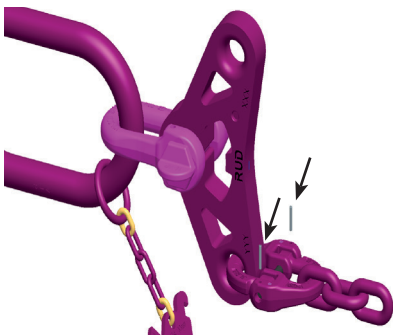
- 5 Install pin into the bore of the eye (Pic. 9). Both bow parts are now connected with each other.



Pic. 9: Assembly of connecting pin

- 6 Secure the assembled connecting link as follows (Pic. 10):

- Position the securing pin resp. the sleeve pin in such a way, that the slot faces the outside.
- Knock sleeve pin in with a hammer.



Pic. 10: Securing of connecting pin

- 7 Finally check the correct assembly (see chapter 4 Inspection / Repair / Disposal).

3.2.3 Assembly of chain strands (by using clevis shackle)

Clevis shackles can also be used at the bottom of the balancer / balancer connection instead of the ICE-connecting links.

Chain strands are connected to the balancer by using clevis shackles. The chain strands will be connected with the clevis shackles by bolt assembly.

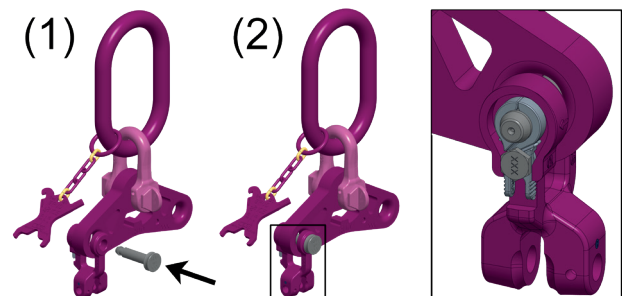
During assembly of the bolt please observe the following:

- Assemble only bolts with a D1-12 embossment
- Assemble sleeve pin for the securing of the connecting bolt in such a way that the slot shows to the outside.
- Use sleeve pin only once
- Use only original RUD spare parts
- Check finally the correct assembly (see chapter 4 Inspection / Repair / Disposal).

Sequence of assembly:

In the following description the assembly of the clevis shackle ICE-CCS will be described exemplarily with the example of an ICE-Balancer and an ICE-Chain.

- 1 Slide the shackle bow over the lower balancer connection.
- 2 Close the clevis shackle by pushing the shackle pin through the lower balancer connection (Pic. 11 (1)). When correctly mounted, both ends of the pliers open and automatically engage into the groove on the shackle pin. The clevis shackle must now be firmly connected to the balancer (Pic. 11 (2)).

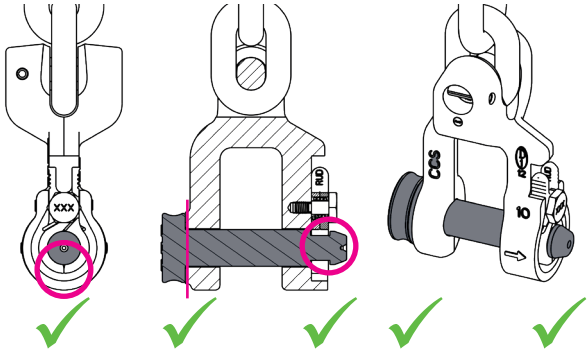


Pic. 11: Mounting the clevis shackle into the bottom of the balancer

3 Check that the clevis shackle is fitted correctly:

- Correct assembly (Pic. 12)
- Incorrect assembly (Pic. 13)

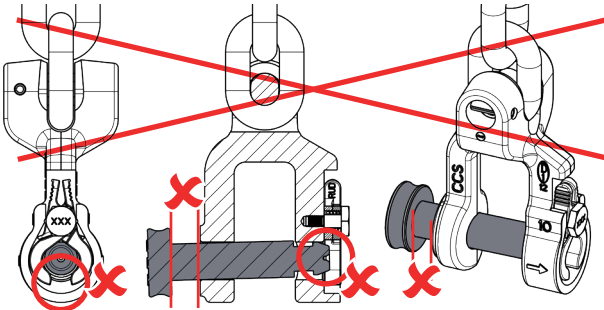
Make a correction!



Clevis pin fully enclosed

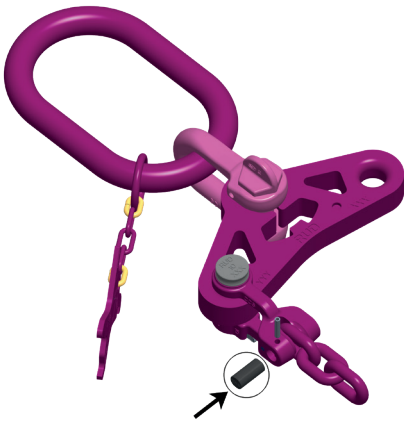
Clevis pin mounted flush and engaged in the groove

Pic. 12: Correct assembly



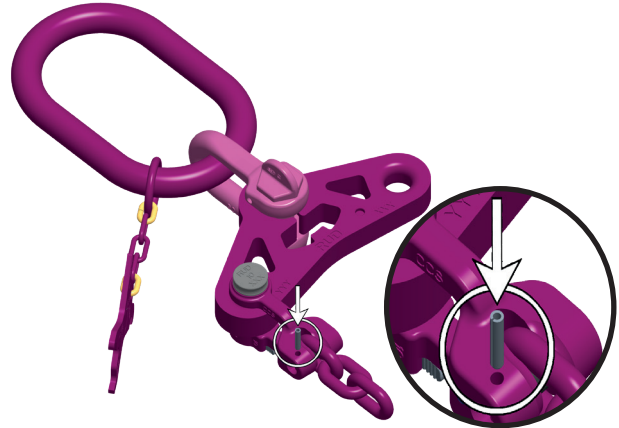
Pic. 13: Incorrect assembly (not flush or not fully mounted)

4 Insert ICE-G-pin (Pic. 14).



Pic. 14: Mounting ICE-G-pin

5 Secure the ICE-G-pin by hammering the split pin in (Pic. 15 and Pic. 16).

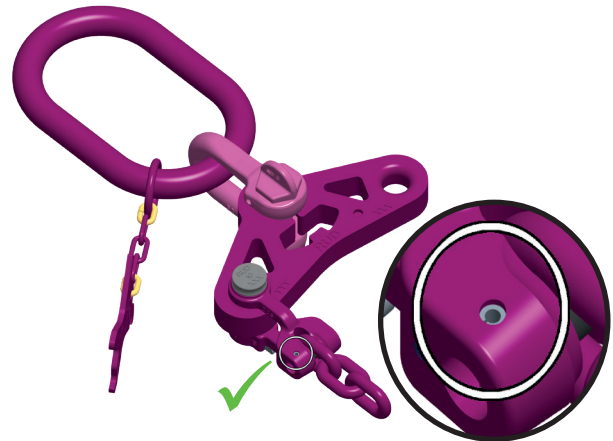


Pic. 15: Secure ICE-G-pin using a sleeve pin



IMPORTANT HINT

The slot of the sleeve pin must always look to the outside



Pic. 16: Mounted / fixed ICE-G-pin and sleeve pin

6 Finally check the correct assembly (see chapter 4 Inspection / Repair / Disposal).

3.3 General information regarding use

The whole lifting mean must be inspected regularly by a competent person in regard of proper installation, strong corrosion, cracks at load bearing parts and deformations (e.g. by the person responsible for attachment). See section 4 Inspection / Repair / Disposal.



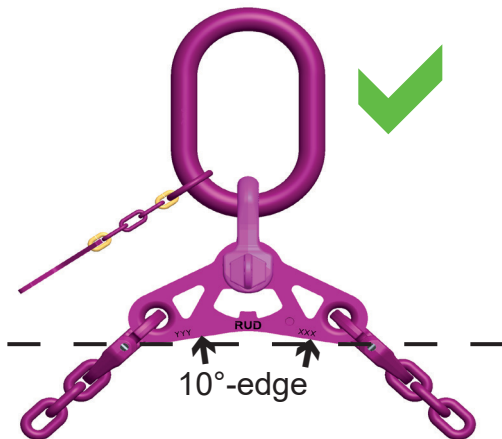
WARNING

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

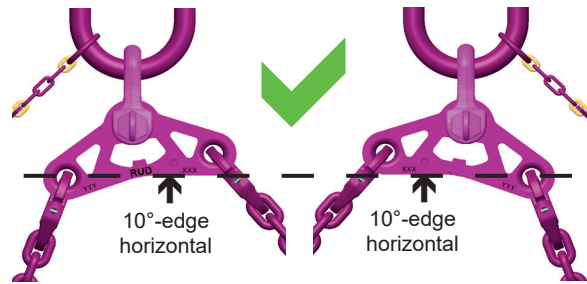
- RUD components have been designed as per DIN EN 818 and DIN EN 1677 for a dynamic load of 20,000 load cycles.
- Observe and be aware that multiple load cycles can occur during a lifting operation.
- Observe the risk of product damage caused by high dynamical influences at high load cycle numbers.
- BG/DGUV Germany's employer insurance association recommends: At high dynamical loading with a high number of load cycles (permanent use), the stress at WLL acc. to FEM class 1Bm (M3 acc. to DIN EN 818-7) must be reduced. Use a lifting chain with a higher WLL.
- Make sure that the load force happens in the straight leg without being twisted, fold-over or kinked.
- Leave hazardous area when possible.
- Monitor always attached or lashed loads.
- Read for all lifting means the RUD sling chain safety instructions for RUD lifting means.

3.4 Hints for the usage (limit of inclination angle)

- Before each usage please control the correct assembly of the ICE-Balancer.
- Observe that the inclination angle of the ICE balancer does not exceed 10° (see Pic. 17-Pic. 19)



Pic. 17: In the ideal case no skewing of the balancer should occur 10° edge



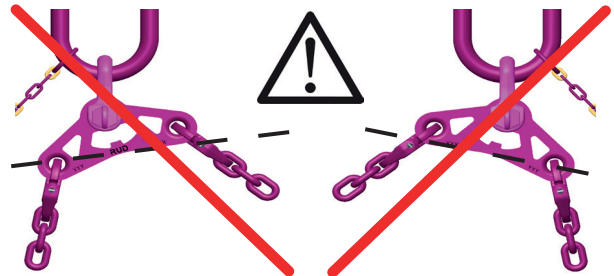
Pic. 18: Limit skewing inclination of 10° reached (can be recognised by horizontal alignment of edge)



HINT

The maximum allowed balancer skewing of 10° can be recognised by the specific shape of the ICE-Balancer. The limit skewing angle of 10° can be easily recognized.

- A skewing of the balancer under load by more than 10° is prohibited (Pic. 19)! The 10° edge is no longer aligned horizontal! The skewing of the balancer is too big.



Pic. 19: Skewing of the balancer by more than 10° is prohibited.

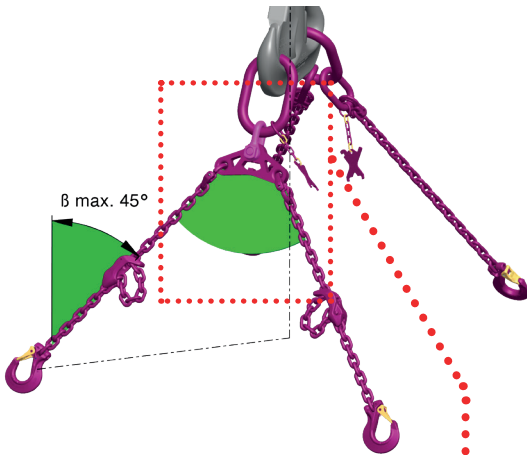


WARNING

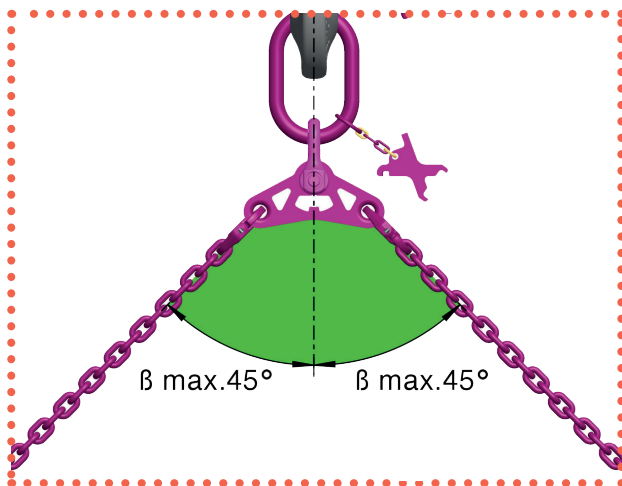
Skewing of the balancer by more than 10° is prohibited. Should the limit skewing angle exceed 10°, an ICE-CURT-GAKO length adjustment has to be installed into the 2-leg balancer sling or a shortening element must be used. Make chain strand either longer or shorter until the balancer is within the 10° range.

3.5 Hints for the usage (Inclination angle β)

- Pay attention that the inclination angle β will not exceed 45° (see *Pic. 20* and *Pic. 21*).



Pic. 20: Max. inclination angle $\beta = 45^\circ$



*Pic. 21: Detailed view *Pic. 20**

4 Inspection / Repair / Disposal

4.1 Hints for the regularly inspection

The operator has to determine and dictate the necessary inspection periods and the deadlines by a risk assessment (see sections 4.2 and 4.3).

The persisting appropriateness of the lifting mean must be checked by a competent person (auditor) at least once per year.

Depending on the conditions of use e.g. frequent use, increased wear or corrosion, it may be necessary to carry out inspections at shorter intervals than once per year. A verification is also required following damage and after special events.

4.2 Inspection criteria for the regularly examination carried out by the operator:

- Completeness of the ICE-Balancer.
- Deformations at the component.
- Check readability of nominal size and manufacturer sign
- Mechanical damage like notches especially at areas with tensile stress.

4.3 Additional inspection criteria for the competent person resp. auditor

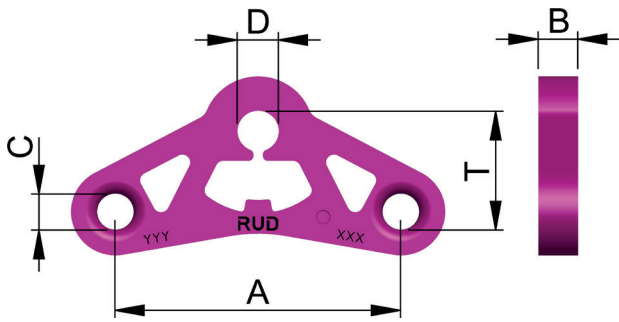
- Reduction of cross section cause by wear of more than 10 %
- Strong corrosion
- Additional inspections may be necessary depending on the result of the risk assessment (e.g. incipient cracks at load bearing parts).

4.4 Hints for the Repairing

- Repair works can only be carried out by the manufacturer or by experts disposing necessary knowledge and required skills.
- Only RUD original spare parts must be used and all repairing and overhauling operations must be documented in the chain card file (of the complete lifting mean) or use the RUD BLUE-ID-System.

4.5 Disposal

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

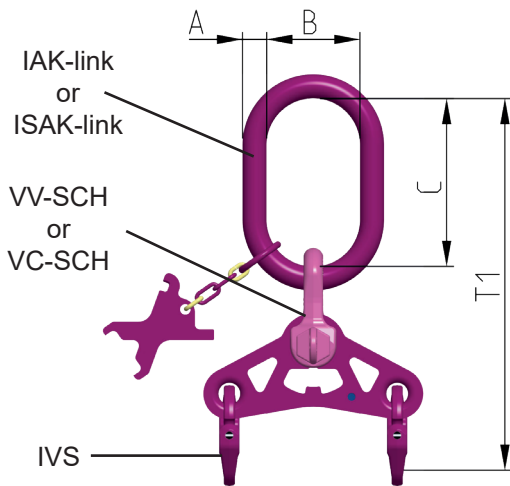


Pic. 22: Dimensioning of the ICE-Balancer

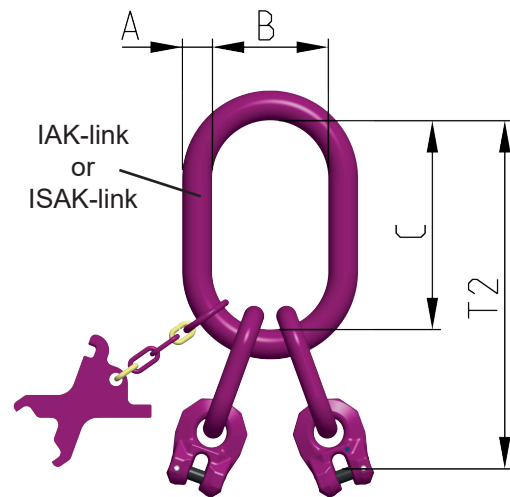
Chain [mm]	Nomination ICE-Balancer	WLL [t] Legs 0-45° ICE-Balancer	WLL [t] Legs 0° (±7°) parallel ICE-Balancer	A [mm]	B [mm]	C [mm]	D [mm]	T [mm]	weight ICE-Balancer [kg/pc.]	Ref. no. ICE-Balancer
6	IW-6	2.5	3.6	110	15	14	21	46	0.49	7904367
8	IW-8	4.25	6.0	150	20	18	26	59	1.15	7904370
10	IW-10	7.1	10.0	180	25	23	32	76	2.4	7904372
13	IW-13	11.2	16.0	240	30	28	38	91	4.37	7904375
16	IW-16	17	25.0	300	35	32	41	120	8.8	7904255

Table 2: Dimension chart of balancer

Subject to technical modifications



Pic. 23: ICE-Balancer head



Pic. 24: ICE-2-leg Masterlink

ICE-Balancer head									
Chain [mm]	Nomination ICE-Balancer head	Dimensions ICE-Suspension link (A x B x C) [mm]	Balancer Top connection	ICE-Balancer	Spacer discs (quantity) [pc.]	Balancer Bottom connection	Pitch ICE-Balancer head T1 [mm]	Weight ICE-Balancer head [kg/pc.]	Ref. no. ICE-Balancer head
6	IWK-2S-6	18 x 90 x 160	VV-SCH 10 (4t)	IW 6	-	IVS 6	300	2.33	7904654
8	IWK-2S-8	26 x 100 x 180	VV-SCH 13 (6.7t)	IW 8	2	IVS 8	363	5.39	7904655
10	IWK-2S-10	32 x 110 x 200	VV-SCH 16 (10t)	IW 10	-	IVS 10	423	9.99	7904656
13	IWK-2S-13	36 x 140 x 260	VC-SCH 5.0 (25t)	IW 13	2	IVS 13	554	17.50	7904657
16	IWK-2S-16	46 x 190 x 350	VC-SCH 6.0 (31.5t)	IW 16	2	IVS 16	698	37.54	7904658
6	IWSAK-2S-6	26 x 190 x 350	VV-SCH 13 (6.7t)	IW 6	2	IVS 6	504	5.85	7907155
8	IWSAK-2S-8	32 x 190 x 350	VV-SCH 16 (10t)	IW 8	2	IVS 8	543	9.00	7907156
10	IWSAK-2S-10	36 x 250 x 460	VC-SCH 4.0 (16t)	IW 10	2	IVS 10	701	17.17	7907157
13	IWSAK-2S-13	40 x 250 x 460	VC-SCH 5.0 (25t)	IW 13	2	IVS 13	754	24.40	7907158
16	IWSAK-2S-16	47 x 250 x 460	VC-SCH 6.0 (31.5t)	IW 16	2	IVS 16	808	37.20	7907159

Table 3: Data of ICE-Balancer head

Subject to technical modifications

Data of ICE-2-leg Masterlink (for balancer assembly)						
Chain [mm]	Nomination ICE-2-Leg Masterlink	Dimensions ICE-Suspension link (A x B x C) [mm]	additional number of chain links for length adjustment between T1 and T2 [pc.]	Pitch ICE-2-Leg-Masterlink T2 [mm]	weight ICE-2-Leg-Masterlink [kg/pc.]	Ref. no. ICE-2-Leg-Masterlink
6	IAK-2S-6	18 x 90 x 160	2	266	1.80	7904659
8	IAK-2S-8	26 x 100 x 180	2	308	4.09	7904660
10	IAK-2S-10	32 x 110 x 200	2	368	7.37	7904661
13	IAK-2S-13	36 x 140 x 260	2	467	12.44	7904662
16	IAK-2S-16	46 x 190 x 350	2	603	24.87	7904663
6	ISAK-2S-6	26 x 190 x 350	3	456	5.10	7907150
8	ISAK-2S-8	32 x 190 x 350	3	478	8.64	7907151
10	ISAK-2S-10	36 x 250 x 460	2	628	14.60	7907152
13	ISAK-2S-13	40 x 250 x 460	2	667	20.12	7907153
16	ISAK-2S-16	47 x 250 x 460	2	713	28.98	7907154

Table 4: Data of ICE-2-leg Masterlink (for balancer assembly)

Subject to technical modifications

Chain [mm]	Total weight to be lifted [t] at 4-leg slings (2-leg + 2-leg with balancer)		
	maximum allowed inclination angle $\beta = 15^\circ$	maximum allowed inclination angle $\beta = 30^\circ$	maximum allowed inclination angle $\beta = 45^\circ$
6	6.9	6.2	5.1
8	11.6	10.4	8.4
10	19.3	17.3	14.1
13	31.0	27.7	22.6
16	48.3	43.3	35.3

Table 5: Area of inclination angles

Subject to technical modifications

Example ICE-10 mm:

When using a standard 4-leg sling in the worst case scenario, the user can calculate with only 2 load bearing legs (WLL at 0-45°: 7.1 t)

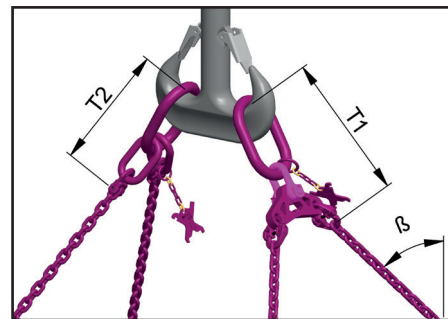
DGUV 109-017, clause 4.1.2:

When lifting with multiple strands only two strands can be assumed to be load bearing.

This is not valid if it is guaranteed that the load will be distributed equally to 2 additional legs [...].

By using the ICE-balancer, the load distribution of a 2 x 2-leg sling will be forwarded to all 4 chain legs.

→ The here of resulting WLL will then be at an inclination angle β 0-45° 14.1 t.



Pic. 25: Pitch



ATTENTION

When using two 2-leg slings at a symmetrical load distribution, one with a balancer, and both slings are attached into the same hook, 4 load bearing legs can be assumed. The inclination angle β must not exceed 45°.