

PHILIPPGROUP

PHILIPP Wirbelstar KH



VB3-V-016-en - 07/19 - PDF

Application Instruction

Transport and mounting systems for prefabricated building

■ Technical department

Our staff will be pleased to support your planning phase with suggestions for the installation and use of our transport and mounting systems for precast concrete construction.

■ Special designs

Customized to your particular needs.

■ Practical tests on site

We ensure that our concepts are tailored precisely to your requirements.

■ Inspection reports

For documentation purposes and your safety.

■ On-site service

Our engineers will be pleased to instruct your technicians and production personnel at your plant, to advise on the installation of precast concrete parts and to assist you in the optimisation of your production processes.

■ High safety level when using our products

Close cooperation with federal materials testing institutes (MTIs), and official approvals for the use of our products and solutions whenever necessary.

■ Software solutions

The latest design software, animated videos and CAD libraries can always be found under www.philipp-gruppe.de.

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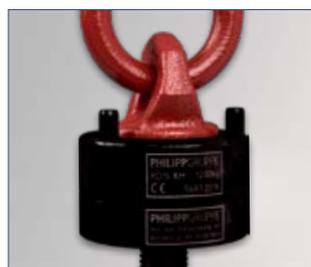
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PHILIPP Wirbelstar KH

The Wirbelstar KH is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting insert systems for pre-cast concrete elements" (VDI/BV-BS 6205).

The use of the Wirbelstar KH requires the compliance with this Application Instruction, the Installation and Application Instruction of the particular threaded anchor as well as the General Installation Instruction. The Wirbelstar KH is suitable for axial, diagonal and lateral tension.

Table 1: Permissible load bearing capacities and dimensions

Ref.-no. ①	Type	perm. F 0°- 90° [kN]	Dimensions								Weight [kg/pc.]
			RD	RD ₂	ØD ₁	b	h	e ₁	e ₂	h ₁	
62WS12KH	RD 12	5.0	12	24	47	35	125	14	18	52	0.64
62WS14KH	RD 14	8.0	14	24	52	35	126	14	20	53	0.73
62WS16KH	RD 16	12.0	16	24	56	35	151	14	23	53	0.88
62WS18KH	RD 18	16.0	18	24	59	60	152	14	26	77	1.61
62WS20KH	RD 20	20.0	20	24	70	60	158	14	29	76	1.91
62WS24KH	RD 24	25.0	24	24	74	75	186	14	34	81	2.52
62WS30KH	RD 30	40.0	30	30	90	90	219	18	46	96	4.28
62WS36KH	RD 36	63.0	36	42	101	100	255	18	55	124	7.03
62WS42KH	RD 42	80.0	42	42	110	100	256	18	64	125	8.30
62WS52KH	RD 52	125.0	52	52	130	140	344	22	78	157	16.35

① Also available with M thread (ref.-no. 62WS__MKH)
- The weight of 1.0 t corresponds to 10.0 kN.

Material

The Wirbelstar KH consists of a forged ring bolt with a chain link and a bottom plate made of a special hardened steel. The inside construction consists of a ball-bearing inlay.

Marking

Each Wirbelstar is marked as follows:

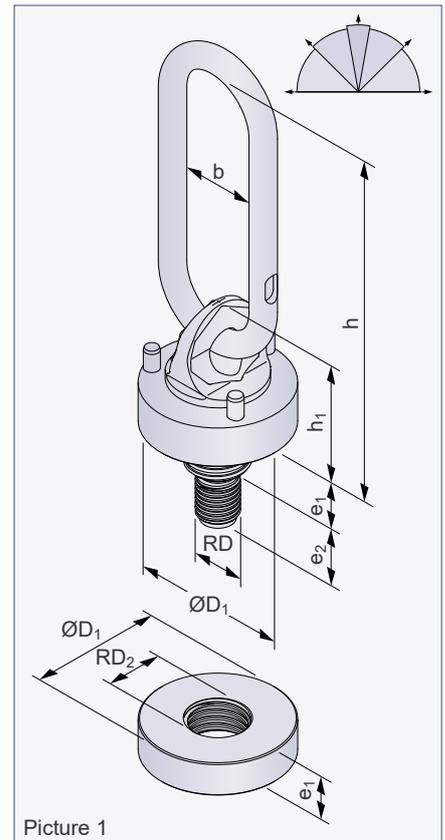
- Manufacturer
- Type (system / load class)
- CE mark ①
- Serial number
- Year of manufacturing

② The EC Declaration of Conformity (DoC) of the Wirbelstar KH is available on request or can be downloaded from our website www.philipp-gruppe.de.

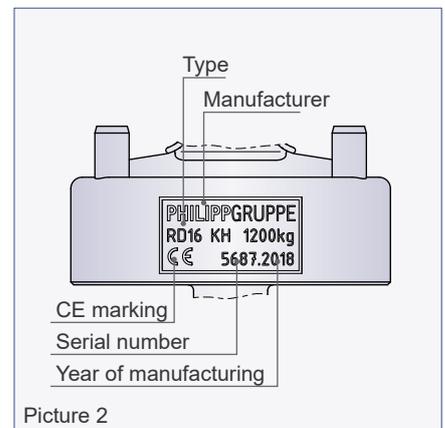


Application

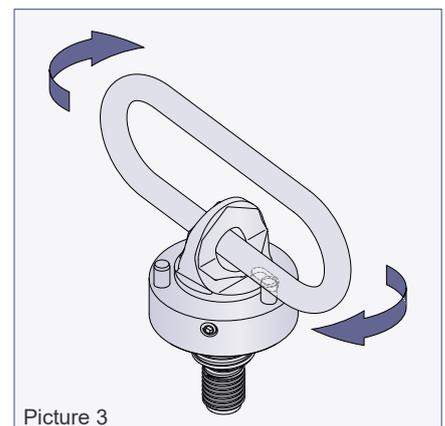
The Wirbelstar KH is a lifting device of the threaded transport anchor system and is supplied with a round thread (with metric pitch) or metric thread. The Wirbelstar KH must be screwed in until the bottom part of the Wirbelstar KH has continuous contact with the concrete surface. This is very important because during lifting the Wirbelstar KH is supported by this concrete area and a spalling is largely prevented (picture 4). Thus, a bending and damage of the thread can be avoided. The chain link is also used to tighten or loose the Wirbelstar KH. For this, the chain link must be pulled through the ring bolt so that its recess fits in 90° to one of the three pins located at the circumference of the Wirbelstar KH (picture 3). This creates an efficient lever arm which enables a convenient tightening and removing (without a tool).



Picture 1



Picture 2



Picture 3

Application / safety

Due to its double-thread construction the Wirbelstar KH (KH system, picture 4) can be used as a KH Wirbelstar as well as a standard Wirbelstar (WS system with bottom plate, picture 5). If the Wirbestar KH is used without the bottom plate (KH system) the transport anchor must be installed with one of the following recess formers:

- Plastic: 72KH12 - 72KH24
- Steel: 72KH12STAHL - 72KH52STAHL
- Magnetic: 72MAXKH12ST - 72MAXKH52ST

If the Wirbelstar KH is used with the bottom plate (WS system) the anchor can be installed flush to the surface of the concrete element or with one of the following recess formers:

- Plastic: 72KHN36WS - 72KHN52WS
- Steel: 72SAT12K - 72SAT52K
- Magnetic: 72SATM12K - 72SATM52K



The Application Instructions for the KH and WS system is to be observed!



Because of its ball-bearing the hanger moves, even after achievement of the nominal load bearing, itself into the right force direction without removing of the bottom part of the Wirbelstar KH. Therefore the Wirbelstar KH is a perfect solution for tilt-up of horizontal manufactured panels.

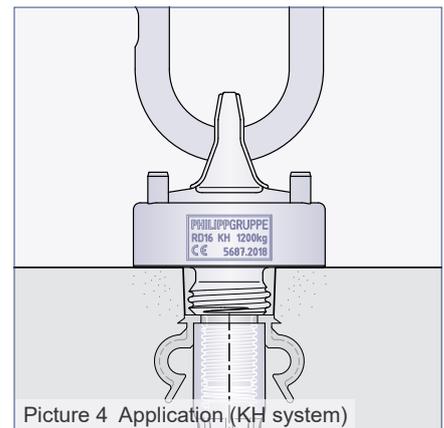
Safety notice

As each other lifting equipment and lifting device the Wirbelstar KH is subject to an annual inspection according to DGUV regulation 100-500, chapter 2.8. par. 3.15.4. This inspection has to be done by an expert and lies within the responsibility of the owner. Depending on the working conditions the inspections might be necessary in a shorter interval instead of only once a year. This might be caused by frequent use, increased wear, corrosion or heat treatment.

The Wirbelstar KH is designed in a special way that no maintenance is necessary. Because of its ball-bearing a penetration of dirt can be largely excluded. In general, attention must be paid to the current accident prevention regulations. The correct hook size and form should be considered in order to extend the durability.

If it is determined during application or an inspection, that the chain link and the bottom part twist heavily against each other, the Wirbelstar KH must be repaired by PHILIPP.

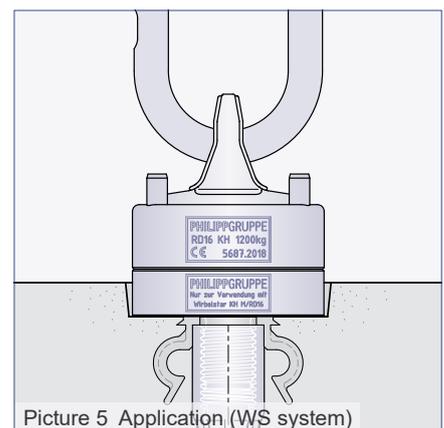
If the Wirbelstar KH is loaded with extreme loads (e.g. by an event causing damage) which may have influenced the bearing capacity it must be examined extraordinarily by an expert. The criteria listed in section „Replacement criteria and inspection service“ are the basis for the following check.



Picture 4 Application (KH system)



A use of inadmissible recess formers can lead to a reduction of the bearing capacity and to the failure of the Wirbelstar KH or the transport anchor.



Picture 5 Application (WS system)



Using only one Wirbelstar KH in order to lift concrete elements attention must be paid that the Wirbelstar KH is protected against unscrewing.



The continued use of damaged lifting devices or equipment already met the discard criteria is not permitted!



Welding or other strong heat influences on the Wirbelstar KH are not allowed.

Inspection

Replacement criteria and inspection service

The replacement state of the Wirbelstar KH is determined according to the German regulation DGUV 100-500, chapter 2.8 par. 3.15.4.

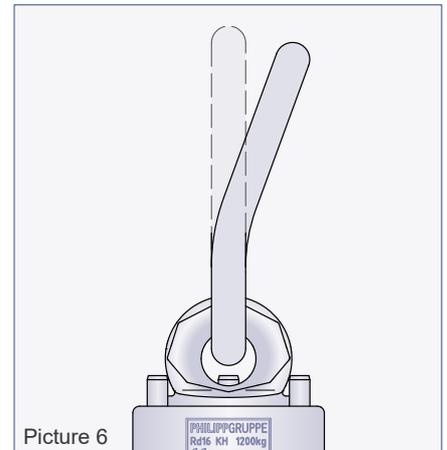
Prior inspection the Wirbelstar KH must be cleaned. During inspection the following points have to be considered. If one of the following points is fulfilled the Wirbelstar KH has reached its replacement state and must not be used any more.

- Breakage of chain link
- Deformation of chain link (picture 6)
- Pressure marks on chain link caused by rigging hardware
- Cracks or capacity reducing corrosion pits
- Twisted threaded bolt
- Damaged threaded bolt
- Welding or other strong heat influences
- Marking not readable anymore
- Exceeding of upper or lower test dimensions (table 2 and 3)

The chain link has to be checked both for any elongation and taper of the diameter (picture 7). The replacement state is reached when the chain link has a lengthening of 5 % or the diameter of the link has a taper of 10 % (see test dimensions in table 2).

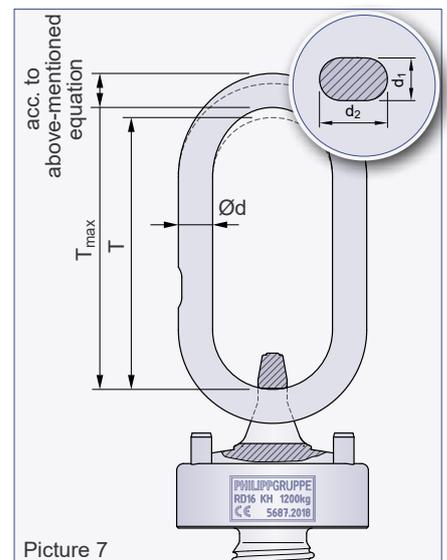
Table 2: Test dimensions of the chain link

Load class	T [mm]	T _{max} [mm]	Ød [mm]	d _{min} [mm]
12	85	89	10	9.0
14	85	89	10	9.0
16	110	116	10	9.0
18	95	100	16	14.4
20	102	107	16	14.4
24	125	131	18	16.2
30	148	155	22	19.8
36	160	168	26	23.4
42	160	168	26	23.4
52	220	231	36	32.4



Picture 6

$$\frac{d_1 + d_2}{2} > d_{\min}$$



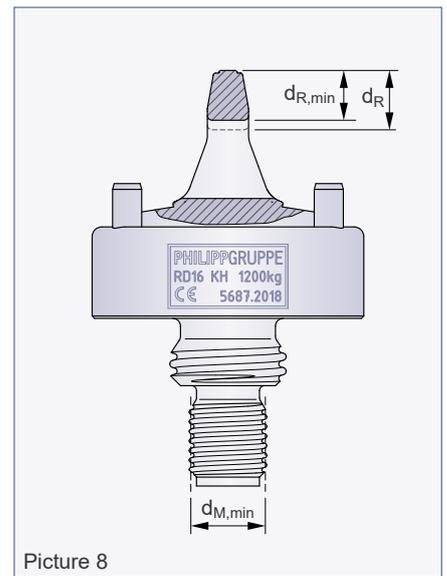
Picture 7

Inspection

During the inspection of the ring bolt, the wear of the bolt diameter shall be checked. The replacement state for this part is reached when the forged ring bolt has a diminution of 10 % (picture 8 and table 3). The outer diameter of the thread must also be checked acc. to picture 8 and table 3.

Table 3: Test dimensions of the ring bolt

Load class	$d_{M,min}$ [mm]	d_R [mm]	$d_{R,min}$ [mm]
12	11.50	10.0	9.0
14	13.50	10.0	9.0
16	15.45	10.0	9.0
18	17.40	17.0	15.3
20	19.40	17.0	15.3
24	23.40	17.0	15.3
30	29.40	22.0	19.8
36	35.40	28.0	25.2
42	41.20	28.0	25.2
52	51.20	30.0	27.0



Picture 8

Our customers trust us to deliver. We do everything in our power to reward their faith and we start each day intending to do better than the last. We provide strength and stability in an ever-changing world.

Welcome to the PHILIPP Group

Sustainable
solutions

PHILIPPGROUP



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