

# PHILIPPGROUP

## PHILIPP Transport anchors



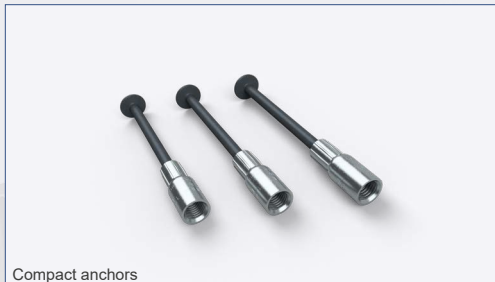
VB3-TP-004-en - 01/21 - PDF

in unreinforced concrete blocks

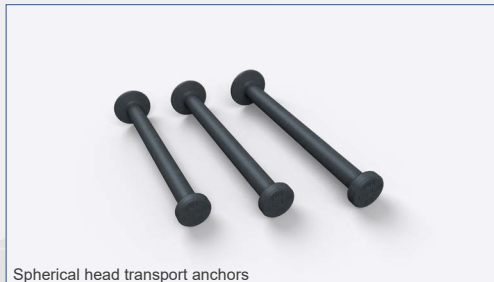
Design assistance

# PHILIPP Transport anchors in unreinforced concrete blocks

## Transport anchors



Compact anchors



Spherical head transport anchors

### Compact anchor

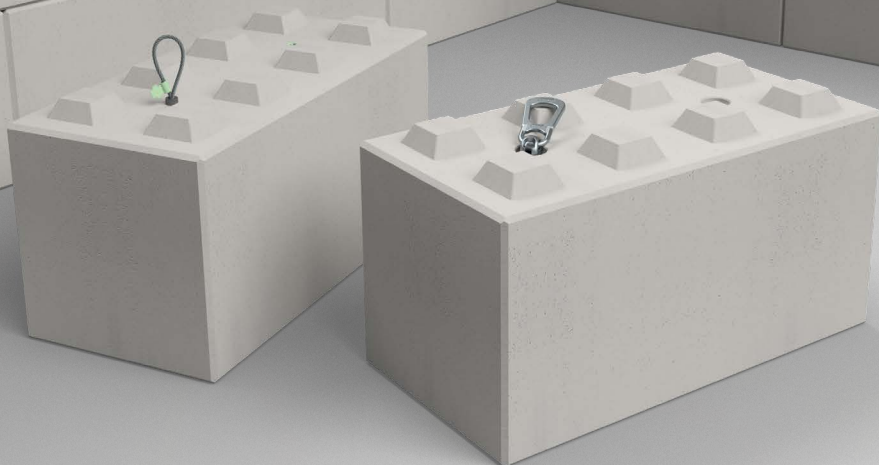
Ref.-no. <b>galvanised</b>	Type	Dimensions	
		Thread	Anchor length
		[RD]	[mm]
67K120100	RD 12	12	100
67K160130	RD 16	16	130
67K200185	RD 20	20	185
67K240200	RD 24	24	200
67K300275	RD 30	30	275

also available in stainless steel (Ref.-No. 75K-----VA).

### Spherical head transport anchor

Ref.-no. <b>bright</b>	Type	Dimensions	
		Anchor length	Anchor head diameter
		[mm]	[mm]
81-013-120	KK 1.3	120	Ø18
81-025-170	KK 2.5	170	Ø25
81-040-210	KK 4.0	210	Ø36

also available in stainless steel (Ref.-No. 81-\_\_\_\_-\_\_\_\_V4A).



**General notes**

**Design assistance**

This planning guide provides a simple and efficient way of choosing the right Transport anchors for unreinforced concrete blocks. The PHILIPP Transport anchor system complies with the VDI/BV-BS-Guideline "Safety rules of transport anchor systems for precast concrete units" (VDI/BV-BS 6205).

The use of these transport anchors requires compliance with the technical information in this document as well as the General Installation Instruction. According to the VDI-Guideline our PHILIPP Transport anchors can be used only in combination with PHILIPP Lifting devices. The installation instruction for PHILIPP lifting devices and PHILIPP fixing systems have to be taken under consideration as well.

Our Transport anchors are designed for transportation of precast concrete elements. Multiple fastening of the ropes during the transport chain (from manufacturing to encasing in concrete units) doesn't count to repeated usage. If repeated use of the transport anchors is intended, please choose these in stainless steel.

**Mould adhesion**

The existing mould adhesion can cause an increase in load on the anchors during the de-moulding process.

**Concrete compressive strength**

The concrete must have a minimum strength  $f_{cc}$  by the first load application acc. to the required conditions.

Concrete compressive strength by their first lift  $f_{cc} \geq 25 \text{ N/mm}^2$

**Criteria to choose the suitable transport anchors**

**Dimensions of the concrete element**

Dimensions and weight of the concrete element are basics of choosing the appropriate transport anchors.

- Density of unreinforced concrete  $\rho = 2.4 \text{ t/m}^3$

**Dynamic factor**

Dynamic forces caused by lifting and transporting process of precast elements, have to be considered for calculating the effective anchor load. The dynamic factor should cover all of the situations involved during the whole transport chain. The decisive dynamic factor should be the one in the worst situation according to VDI / BV-BS 6205.

- table 1 and 2: dynamic factor  $\psi_{dyn} = 1.3$  (e.g. tower crane, portal crane, mobile crane)

- table 3 and 4: dynamic factor  $\psi_{dyn} = 2.5$  (e.g. lifting by an excavator on a plane ground)

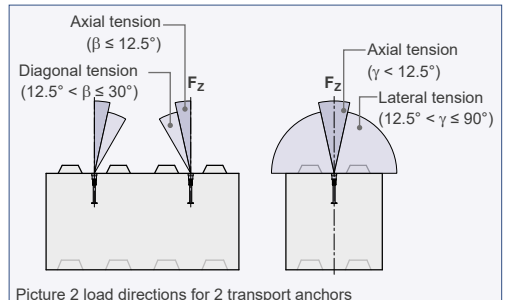
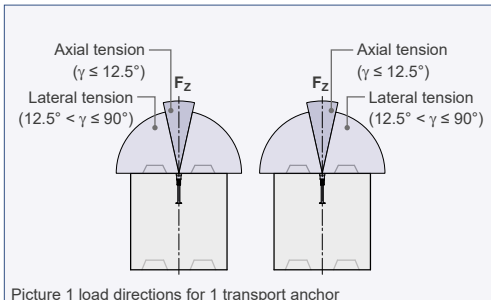
**Load directions**

The load direction has an important impact on determining the final load on transport anchors. The right choice of lifting devices is also determined by its suitability to the required lifting direction.

- Calculative proof against concrete failure is adduced for the installation situation:

- 1 Transport anchors in concrete blocks: load directions axial and lateral tension (picture 1)

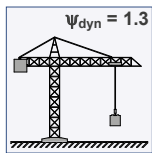
- 2 transport anchors in concrete block: load directions - diagonal tension and slanted lateral tension (picture 2)



# PHILIPP Transport anchors in unreinforced concrete blocks

## Anker selection

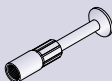


### Boundary conditions:



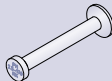


#### 1 or 2 Transport anchors (Compact anchor or Spherical head transport anchor)

- Anchor position: according to picture 3 or 4
- Dynamic factor:  $\psi_{dyn} = 1,3$  (e.g. crane with lifting speed  $v_H \leq 90$  m/min)
- Mould adhesion: **excluded**
- anchor load: **axial tension  $\beta_{max} 12.5^\circ$  / diagonal tension  $\beta_{max} 30^\circ$  + lateral tension  $\gamma_{max} 90^\circ$**
- Minimum concrete compressive strength **25 N/mm<sup>2</sup>**
- Reinforcement: **no reinforcement required**

**Table 1: Compact anchor, dynamic factor  $\psi_{dyn} = 1.3$**

	Dimensions (L×B×H) [cm]	Weight [t]	Axial tension $\beta_{max} 12.5^\circ$ Lateral tension $\gamma_{max} 90^\circ$			Diagonal tension $\beta_{max} 30^\circ$ Lateral tension $\gamma_{max} 90^\circ$		
			Number of anchors [pcs.]	Anchor type	Ref.-no.	Number of anchors [pcs.]	Anchor type	Ref.-no.
	40×40×40	0.15	1	RD 12 × 100	67K120100	No diagonal / lateral tension in case of one single anchor		
	80×40×40	0.31		RD 12 × 100	67K120100			
	60×60×60	0.52		RD 16 × 130	67K160130			
	80×40×80	0.61		RD 16 × 130	67K160130			
	80×80×80	1.23		RD 20 × 185	67K200185			
	120×40×40	0.46	2	RD 12 × 100	67K120100	2	RD 12 × 100	67K120100
	160×40×40	0.61		RD 12 × 100	67K120100	RD 12 × 100	67K120100	
	120×60×60	1.04		RD 16 × 130	67K160130	RD 16 × 130	67K160130	
	180×60×60	1.56		RD 16 × 130	67K160130	RD 16 × 130	67K160130	
	120×80×80	1.84		RD 20 × 185	67K200185	RD 20 × 185	67K200185	
	160×80×80	2.46		RD 20 × 185	67K200185	RD 20 × 185	67K200185	

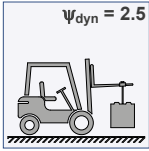
**Table 2: Spherical head transport anchor, dynamic factor  $\psi_{dyn} = 1.3$**

	Dimensions (L×B×H) [cm]	Weight [t]	Axial tension $\beta_{max} 12.5^\circ$ Lateral tension $\gamma_{max} 90^\circ$			Diagonal tension $\beta_{max} 30^\circ$ Lateral tension $\gamma_{max} 90^\circ$		
			Number of anchors [pcs.]	Anchor type	Ref.-no.	Number of anchors [pcs.]	Anchor type	Ref.-no.
	40×40×40	0.15	1	KK 1.3 × 120	81-013-120	No diagonal / lateral tension in case of one single anchor		
	80×40×40	0.31		KK 1.3 × 120	81-013-120			
	60×60×60	0.52		KK 1.3 × 120	81-013-120			
	80×40×80	0.61		KK 1.3 × 120	81-013-120			
	80×80×80	1.23		KK 2.5 × 170	81-025-170			
	120×40×40	0.46	2	KK 1.3 × 120	81-013-120	2	KK 1.3 × 120	81-013-120
	160×40×40	0.61		KK 1.3 × 120	81-013-120	KK 1.3 × 120	81-013-120	
	120×60×60	1.04		KK 1.3 × 120	81-013-120	KK 1.3 × 120	81-013-120	
	180×60×60	1.56		KK 1.3 × 120	81-013-120	KK 1.3 × 120	81-013-120	
	120×80×80	1.84		KK 1.3 × 120	81-013-120	KK 2.5 × 170	81-025-170	
	160×80×80	2.46		KK 2.5 × 170	81-025-170	KK 2.5 × 170	81-025-170	

 The provided data demonstrate only one of the few possibilities. For more individual advices please contact our technical department under [technik@philipp-gruppe.de](mailto:technik@philipp-gruppe.de)

Anchor selection

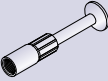


Boundary conditions:



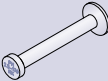


1 or 2 Transport anchors (Compact anchor or Spherical head transport anchor)

- Anchor position: according to picture 3 or 4
- Dynamic factor:  $\psi_{dyn} = 2,5$  (e.g. excavator on plain ground)
- Mould adhesion: **excluded**
- anchor load: axial tension  $\beta_{max} 12.5^\circ$  / diagonal tension  $\beta_{max} 30^\circ$  + lateral tension  $\gamma_{max} 90^\circ$
- Minimum concrete compressive strength **25 N/mm<sup>2</sup>**
- Reinforcement: **no reinforcement required**

**Table 3: Compact anchor, dynamic factor  $\psi_{dyn} = 2.5$**

	Dimensions (L×B×H) [cm]	Weight [t]	Axial tension $\beta_{max} 12.5^\circ$ Lateral tension $\gamma_{max} 90^\circ$			Diagonal tension $\beta_{max} 30^\circ$ Lateral tension $\gamma_{max} 90^\circ$		
			Number of anchors [pcs.]	Anchor type	Ref.-no.	Number of anchors [pcs.]	Anchor type	Ref.-no.
	40×40×40	0.15	1	RD 12 × 100	67K120100	No diagonal /lateral tension in case of one single anchor		
	80×40×40	0.31		RD 16 × 130	67K160130			
	60×60×60	0.52		RD 20 × 185	67K200185			
	80×40×80	0.61		RD 20 × 185	67K200185			
	80×80×80	1.23		RD 30 × 275	67K300275			
	120×40×40	0.46	2	RD 16 × 130	67K160130	2	RD 16 × 130	67K160130
	160×40×40	0.61		RD 16 × 130	67K160130		RD 16 × 130	67K160130
	120×60×60	1.04		RD 20 × 185	67K200185		RD 20 × 185	67K200185
	180×60×60	1.56		RD 20 × 185	67K200185		RD 24 × 200	67K240200
	120×80×80	1.84		RD 24 × 200	67K240200		RD 30 × 275	67K300275
	160×80×80	2.46		RD 30 × 275	67K300275		RD 30 × 275	67K300275

**Table 4: Spherical head transport anchor, dynamic factor  $\psi_{dyn} = 2.5$**

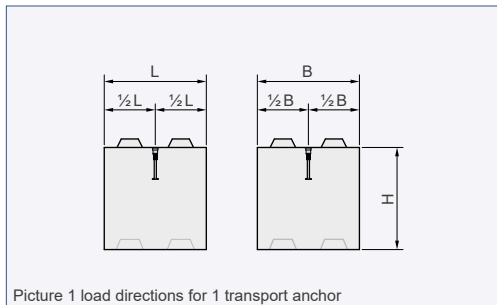
	Dimensions (L×B×H) [cm]	Weight [t]	Axial tension $\beta_{max} 12.5^\circ$ Lateral tension $\gamma_{max} 90^\circ$			Diagonal tension $\beta_{max} 30^\circ$ Lateral tension $\gamma_{max} 90^\circ$		
			Number of anchors [pcs.]	Anchor type	Ref.-no.	Number of anchors [pcs.]	Anchor type	Ref.-no.
	40×40×40	0.15	1	KK 1.3 × 120	81-013-120	No diagonal /lateral tension in case of one single anchor		
	80×40×40	0.31		KK 1.3 × 120	81-013-120			
	60×60×60	0.52		KK 1.3 × 120	81-013-120			
	80×40×80	0.61		KK 2.5 × 170	81-025-170			
	80×80×80	1.23		KK 4.0 × 210	81-040-210			
	120×40×40	0.46	2	KK 1.3 × 120	81-013-120	2	KK 1.3 × 120	81-013-120
	160×40×40	0.61		KK 1.3 × 120	81-013-120		KK 1.3 × 120	81-013-120
	120×60×60	1.04		KK 2.5 × 170	81-025-170		KK 2.5 × 170	81-025-170
	180×60×60	1.56		KK 2.5 × 170	81-025-170		KK 2.5 × 170	81-025-170
	120×80×80	1.84		KK 2.5 × 170	81-025-170		KK 4.0 × 210	81-040-210
	160×80×80	2.46		KK 4.0 × 210	81-040-210		KK 4.0 × 210	81-040-210

 The provided data demonstrate only one of the few possibilities For more individual advices please contact our technical department under [technik@philipp-gruppe.de](mailto:technik@philipp-gruppe.de)

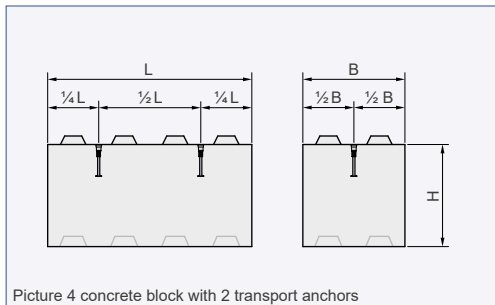
## Installation

### Anchor position

Transport anchors have to be placed according to picture 3 and 4. The required edge distances in the calculatory verification are automatically ensured, as long as the anchors are placed in the given positions. A safe load transmission during the transport procedure is therefore guaranteed.



Picture 1 load directions for 1 transport anchor



Picture 4 concrete block with 2 transport anchors

## Accessories

### Marking accessories

The PHILIPP Marking rings provide an easy and safe way of classifying the installed compact anchors to the right lifting device.

For Spherical head anchors a marking ring is not necessary, since the anchor type is visible on the anchor head even after installation.

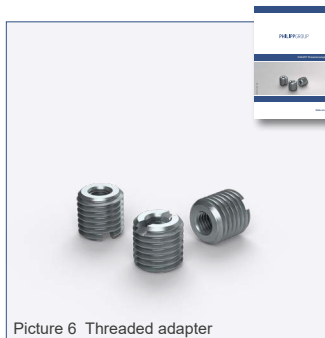


Picture 5 Marking ring with clip

## Installation accessories

### Threaded transport anchor system

The compact anchor can be installed flush to the surface of the concrete element (e.g. by using threaded adapter with internal thread) or built in deepened by using recess discs (e.g. with KHN system)



Picture 6 Threaded adapter



Picture 7 Recess former (e.g. KHN system)

### Spherical head anchor system

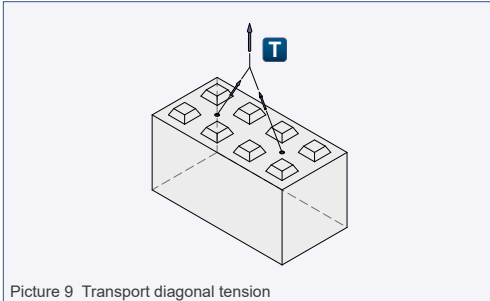
Spherical head anchors are installed by using recess formers (e.g. 83-AKK-\_\_\_)



Picture 8 Recess formers / accessories

## Application

### Transport (T)



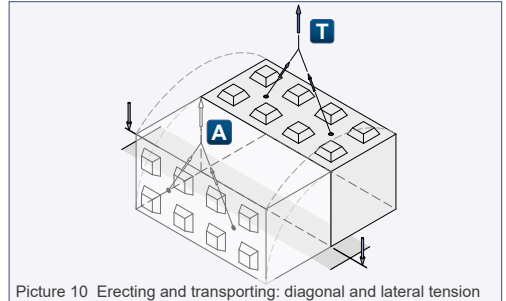
Picture 9 Transport diagonal tension

The installation and application instructions of PHILIPP lifting devices (Lifting loop with threaded end, Lifting loop plus or Spherical head lifting clutch) must be considered.

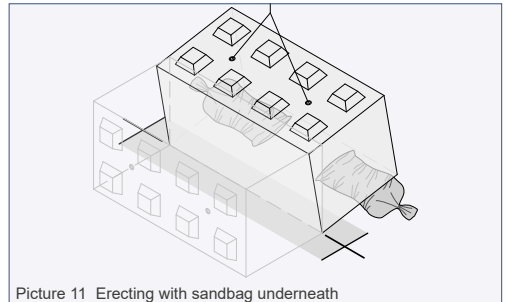
Measurements are highly recommended (e.g. underlay with sandbags) during the erecting process to avoid an abrupt knock over (picture 11).

In order to avoid concrete or sand penetration into the socket of the compact anchor during stocking of the concrete elements, the insert can be sealed with our Outside cap (72ASS\_\_\_) easily.

### Erecting and transporting (A+T)



Picture 10 Erecting and transporting: diagonal and lateral tension

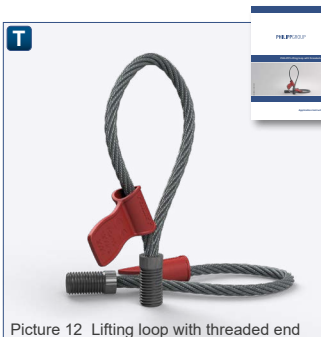


Picture 11 Erecting with sandbag underneath

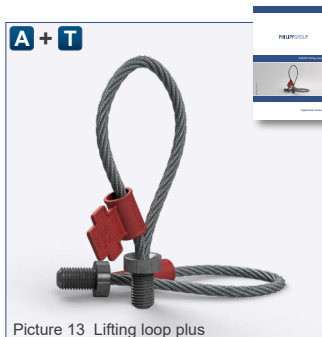
## Appropriate lifting devices

### Threaded transport anchor system

For the transport **T** of concrete blocks the Lifting loop with threaded end can be used. The Lifting loop plus can be used to erect and transport **A+T** concrete blocks.



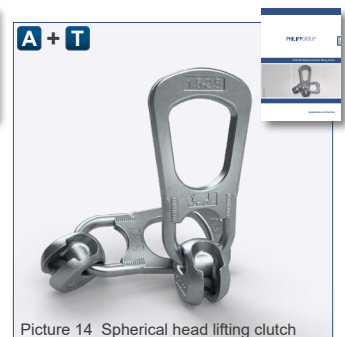
Picture 12 Lifting loop with threaded end



Picture 13 Lifting loop plus

### Spherical head anchor system

For erecting and transporting **A+T** of concrete blocks the Spherical head lifting clutch is required.



Picture 14 Spherical head lifting clutch

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

**PHILIPP**GROUP



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