PHILIPPGROUP

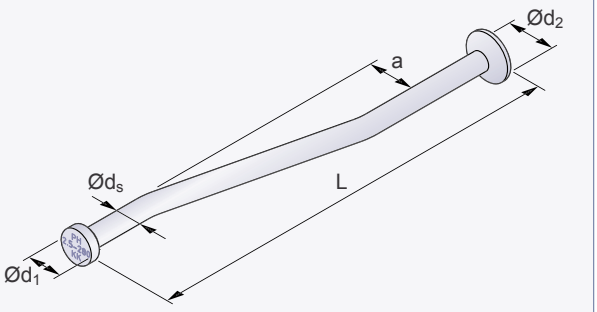
PHILIPP Spherical head anchor

VB3-T-034-en - 01/17

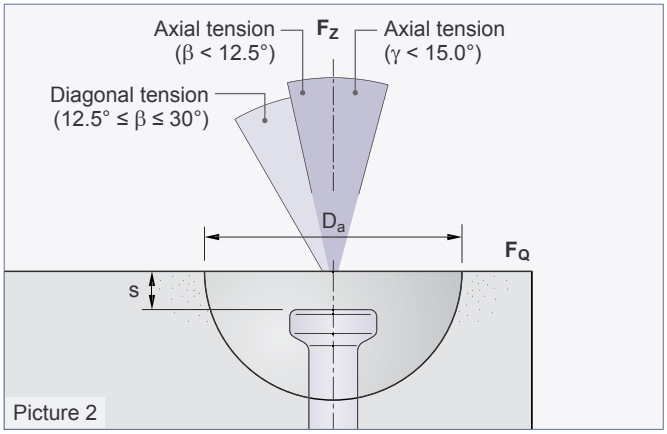
Version: with offset

Installation and Application Instruction

PHILIPP Spherical head anchor – with offset



Picture 1



Picture 2

A Spherical head anchor with offset balances an inclination of reinforced concrete sandwich panels during lifting and mounting.
It is part of the PHILIPP Transport anchor system and complies with the VDI/BV-BS Guideline "Lifting inserts and lifting insert systems for precast concrete elements" (VDI/BV-BS 6205). The use of Spherical head transport anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. The Application Instruction for the belonging PHILIPP lifting device (Spherical head Lifting clutch) as well as the data sheets of the belonging PHILIPP accessories (rubber, steel or magnetic recess formers) must be followed also. The anchor may only be used in combination with the mentioned PHILIPP lifting device.
Spherical head anchors are designed for the transport of precast concrete units only. Multiple use within the transport chain (from production to installation of the unit) means no repeated usage. This transport anchor is not specified for a repeated usage (e.g. ballasts for cranes).

Table 1: Spherical head anchor – with offset

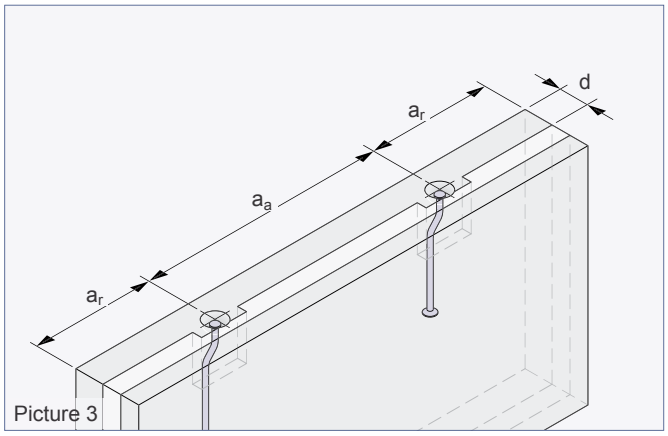
Ref.-No. **bright**	Type	Dimensions							Weight
		L [mm]	a [mm]	Ød$_s$ [mm]	Ød$_1$ [mm]	Ød$_2$ [mm]	s [mm]	D$_a$ [mm]	[kg/100 pcs.]
81-025-268GK	KK 2.5	268	50	14	25	35	11	74	41.0
81-050-466GK	KK 5.0	466	60	20	36	50	15	94	134.0
81-075-664GK	KK 7.5	664	70	24	46	60	15	118	272.0
81-100-664GK	KK 10.0	664	70	28	46	70	15	118	364.0
81-150-825GK	KK 15.0	825	80	34	69	85	15	160	686.0
81-200-986GK	KK 20.0	986	80	38	69	98	15	160	997.0

Materials

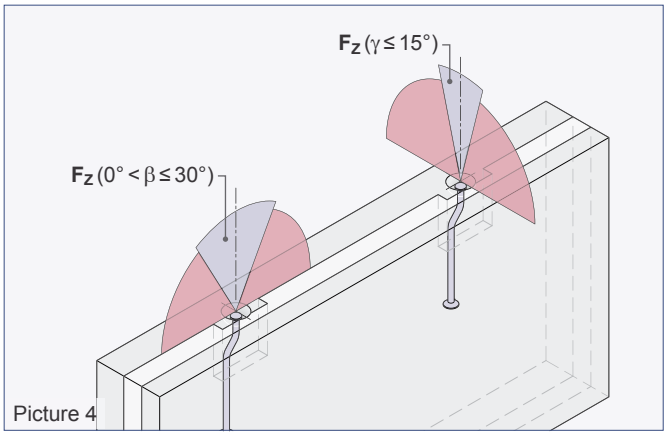
Spherical head transport anchors consist of a conforming to standards round steel bar with a forged head at both ends. The anchor can be supplied also in electro-galvanised, hot-dip galvanised and stainless steel material.

The EC Declaration of Conformity (DoC) of the Spherical head anchor with offset is available on request or can be downloaded from our website www.philipp-group.de.

Bearing capacities



Picture 3



Picture 4

Element thicknesses, centre and edge distances

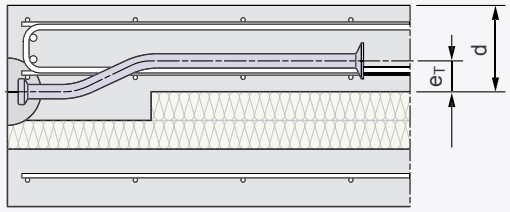
The position and installation of Spherical head transport anchors in precast concrete units require minimum element dimensions and centre distances for a safe load transfer. Table 2 shows the minimum thickness d of a unit to cover the load directions axial and diagonal tension β ≤ 30°.

Lateral tension (γ > 15°) is not permitted within the whole transport chain! This also applies to a diagonal tension with angle β more than 30°!

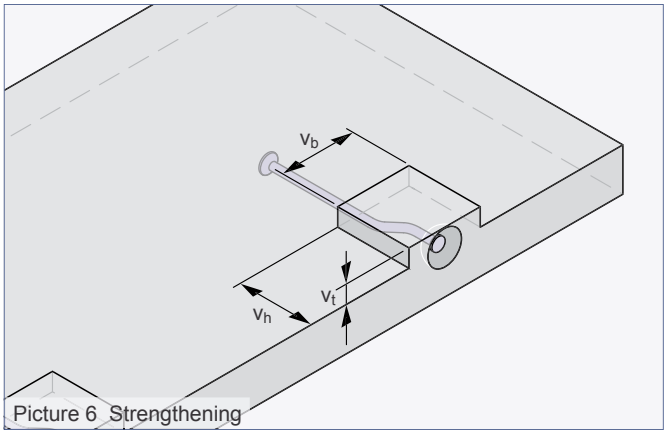
Table 2: Permissible load bearing capacities

Load class	Element thicknesses and edge / centre distances				Strengthening			perm. F if f_{cc} **15 N/mm²**		perm.F if f_{cc} **25 N/mm²**		perm.F if f_{cc} **35 N/mm²**	
								Axial tension perm. F_Z 0°- 12.5°	**Diagonal tension** perm. F_Z 12.5°- 30°	**Axial tension** perm. F_Z 0°- 12.5°	**Diagonal tension** perm. F_Z 0°- 30°	**Axial tension** perm. F_Z 0°- 12.5°	**Diagonal tension** perm. F_Z 0°- 30°
	d [mm]	e_T [mm]	a_r [mm]	a_a [mm]	v_t [mm]	v_b [mm]	v_h [mm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]
2.5	100	50	275	550	40	200	150	24.0	24.6	25.0	25.0	25.0	25.0
5.0	120	60	385	770	40	200	200	39.9	36.5	50.0	47.1	50.0	50.0
7.5	160	80	475	950	40	200	200	66.6	56.9	75.0	72.7	75.0	72.7
10.0	160	80	535	1070	40	200	200	77.5	62.5	100.0	80.7	100.0	95.5
15.0	240	120	625	1250	40	300	200	146.2	95.8	150.0	123.7	150.0	146.3
20.0	240	120	775	1550	40	300	200	164.5	105.3	200.0	136.0	200.0	160.9

- To determine the correct type please refer also to our General Installation Instruction.
- The weight of 1.0 t corresponds to 10.0 kN.



Picture 5



Picture 6 Strengthening

Reinforcement

Main reinforcement (Axial tension)

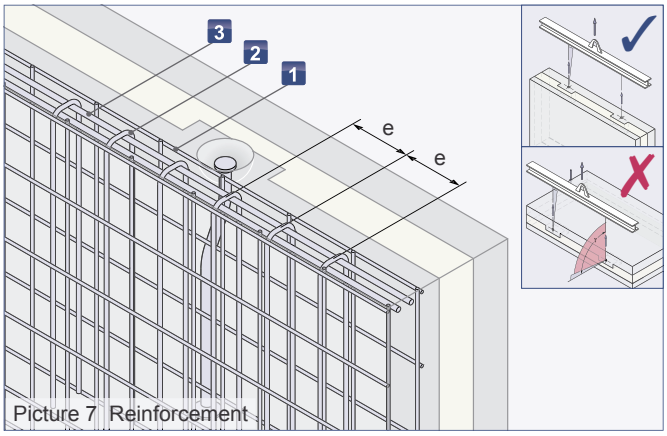
For the installation of Spherical head anchors with offset the precast elements must be reinforced with a minimum reinforcement (table 3). This minimum reinforcement can be replaced by a comparable steel bar reinforcement.

Existing static or constructive reinforcement can be taken into account for the minimum reinforcement according to Table 3.

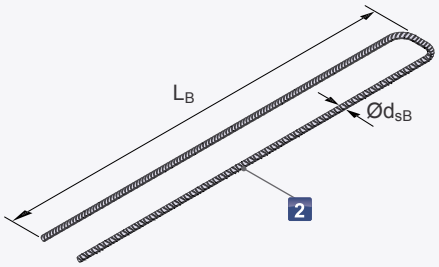
An additional reinforcement (according to table 3, picture 7) consisting of U-bars and longitudinal bars to the existing reinforcement near surface is necessary.

At the first time of lifting the concrete must have a minimum strength f_{cc} acc. to table 2.
The user is personally responsible for further transmission of load into the concrete unit.

The Spherical head anchor with offset must be installed above the centre of gravity, in order to avoid a tipping of the concrete unit during lifting.



Picture 7 Reinforcement



Picture 8 U-bar

Table 3: Minimum reinforcement

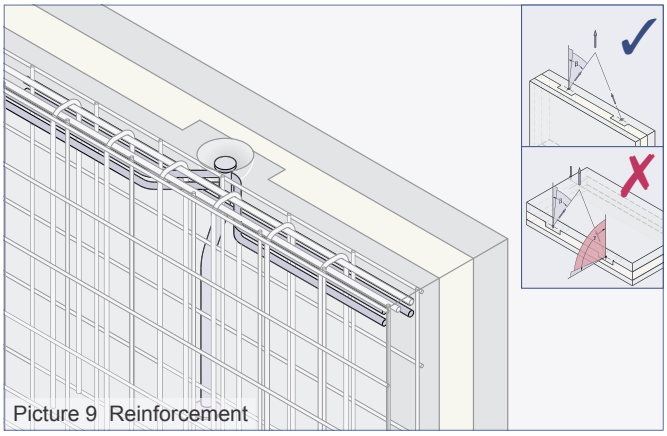
Load class	1 Mesh reinforcement (square)	2 U-bar ① (B500A)				3 Longitudinal reinforcement (B500A)
	[mm²/m]	Number [pcs.]	$Ød_{sB}$ [mm]	L_B [mm]	e [mm]	Quantity and Ø [mm]
2.5	2 × 188	6	Ø 8	600	100	2 Ø 10
5.0	2 × 188	6	Ø 8	600	125	2 Ø 10
7.5	2 × 188	6	Ø 10	1000	125	2 Ø 14
10.0	2 × 188	6	Ø 10	1000	125	2 Ø 14
15.0	2 × 257	6	Ø 10	1000	125	2 Ø 14
20.0	2 × 377	6	Ø 10	1000	125	2 Ø 14

① The first U-Bar in the anchor area should be placed as close as possible to the anchor.

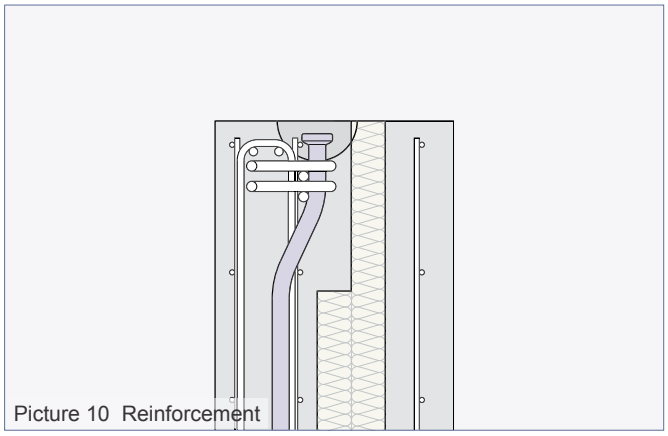
Reinforcement

Additional reinforcement for diagonal tension

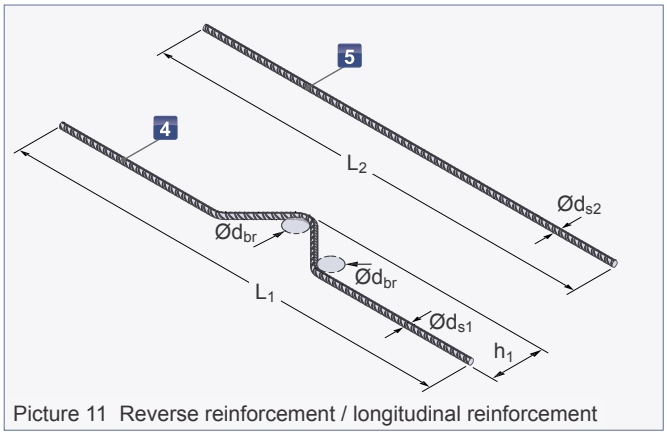
If the Spherical head transport anchor is used under diagonal tension (β ≥ 12.5°) an additional reinforcement is required. This consists of a reverse reinforcement and a longitudinal bar (see table 4).
Here, a direct contact between the additional reinforcement and the Spherical head anchor has to be ensured.



Picture 9 Reinforcement



Picture 10 Reinforcement



Picture 11 Reverse reinforcement / longitudinal reinforcement

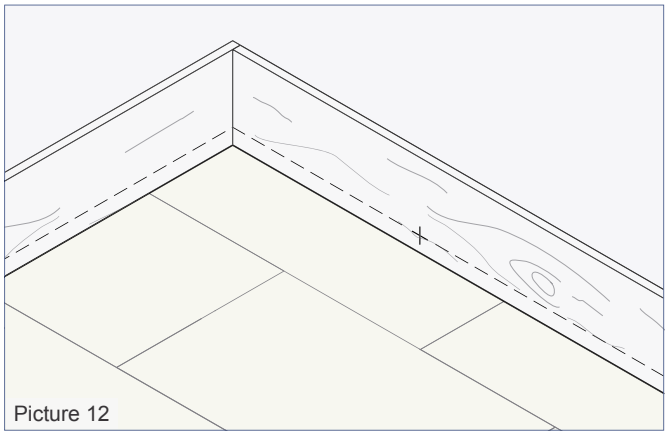
Table 4: Additional reinforcement for diagonal tension (required if β ≥ 12.5°)

Load class	4 Reverse reinforcement (B500A)					5 Longitudinal reinforcement (B500A)		
	Number [pcs.]	Ød$_{s1}$ [mm]	L$_1$ [mm]	Ød$_{br}$ [mm]	h [mm]	Number [pcs.]	Ød$_{s2}$ [mm]	L$_2$ [mm]
2.5	1	Ø 12	900	Ø 48	105	1	Ø 12	900
5.0	2					2		
7.5	3					3		
10.0	3					3		
15.0	4					4		
20.0	5					5		

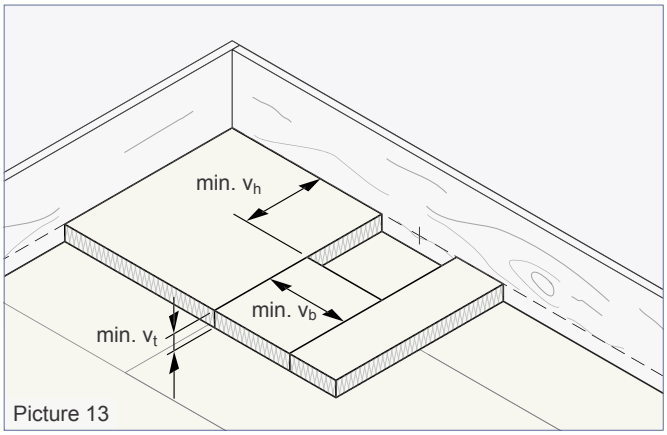
Installation

Installation of the transport anchor

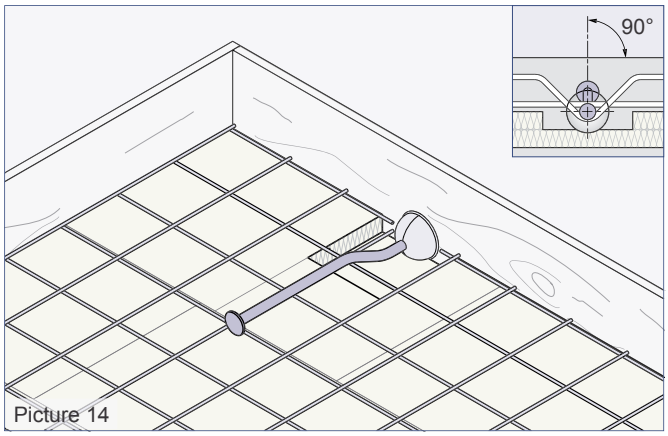
The Spherical head transport anchors with offset have to be fixed to the formwork by using suitable recess formers (rubber, steel or magnetic) in order to create recesses needed for the Spherical head lifting clutch. The direction of the offset of the transport anchor must be installed always right-angled to the surface of the bearing layer.



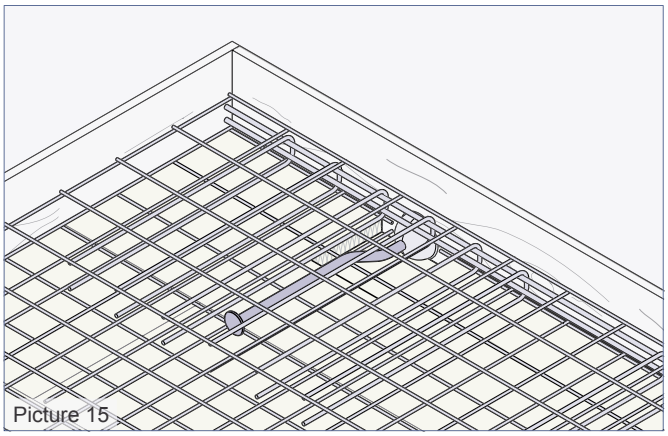
Picture 12



Picture 13



Picture 14



Picture 15