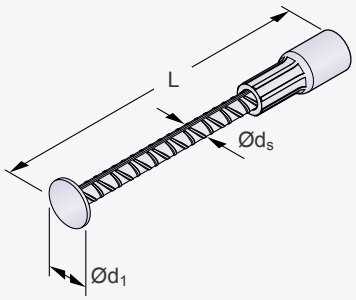
PHILIPPGROUP

PHILIPP Compact anchor

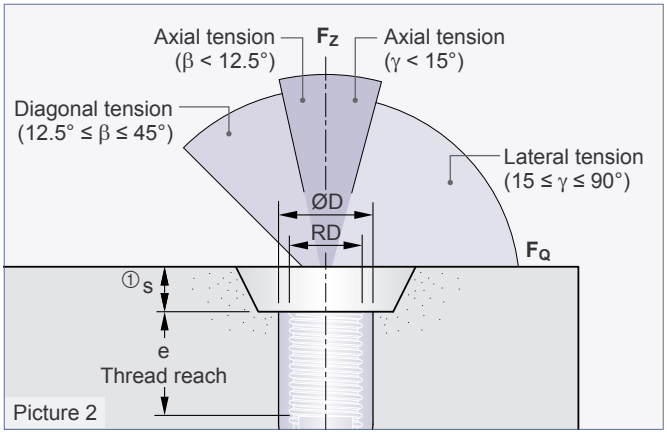
VB3-T-005-en - 01/16

Installation and Application Instruction

PHILIPP Compact anchor



Picture 1



Picture 2

The Compact anchor is part of the PHILIPP Transport anchor system and complies with the “Safety rules for transport anchors and -systems for precast concrete units” (German Regulation BGR 106).

The use of Compact transport anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. The Installation and Application Instructions for the appropriate PHIILIPP lifting devices (Lifting loop with threaded end, Adapter for lateral tension, “Wirbelstar”, “Lifty”) the data sheets of the appropriate PHILIPP accessories (Plastic nailing plates, Retaining caps etc.) must be followed as well.
The anchor may only be used in combination with the mentioned PHILIPP lifting devices. Compact 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. A repeated usage is only allowed (e.g. ballasts for cranes) if it complies with the German approval (DIBt No.: Z-30.3-6).

Table 1: Dimensions

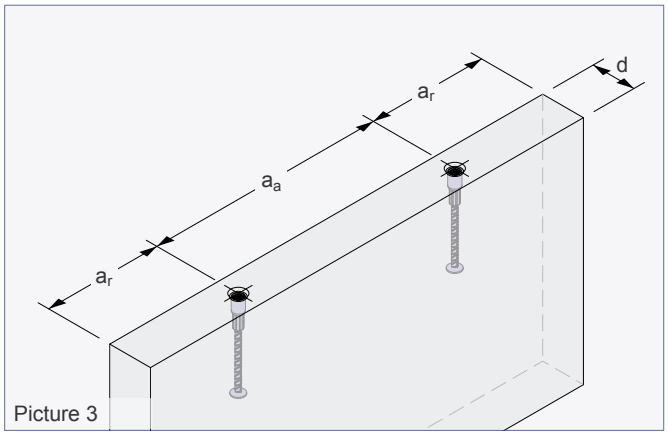
Ref.-No. **bright zinc plated**	Ref.-No. **stainless steel**	Type	Dimensions						Weight
			RD	ØD [mm]	L [mm]	e [mm]	Ød$_s$ [mm]	Ød$_1$ [mm]	[kg/100 pcs.]
67K120100	75K120100VA	RD 12	12	15.0	100	22	8	20	6.0
67K120150	75K120150VA				150				7.5
67K140105	75K140105VA	RD 14	14	18.0	105	25	10	25	10.0
67K140155	75K140155VA				155				13.0
67K160130	75K160130VA	RD 16	16	21.0	130	27	10	25	14.0
67K160175	75K160175VA				175				17.0
67K180150	75K180150VA	RD 18	18	24.0	150	34	14	35	29.0
67K180225	75K180225VA				225				36.0
67K200185	75K200185VA	RD 20	20	27.0	185	35	14	35	34.0
67K200250	75K200250VA				250				43.0
67K240200	75K240200VA	RD 24	24	31.0	200	43	14	35	42.0
67K240275	75K240275VA				275				52.0
67K300275	75K300275VA	RD 30	30	39.5	275	56	20	50	105.2
67K300350	75K300350VA				350				126.0
67K360334	75K360334VA	RD 36	36	47.0	334	68	25	60	184.0
67K360450	75K360450VA				450				227.0
67K420385	75K420385VA	RD 42	42	54.0	385	75	28	70	273.0
67K420500	75K420500VA				500				320.0
67K520550	75K520550VA	RD 52	52	67.0	550	100	32	85	567.0
67K520700	75K520700VA				700				634.0

① Mind the embedding depth of the corresponding nailing plate and retaining cap (Picture 2).

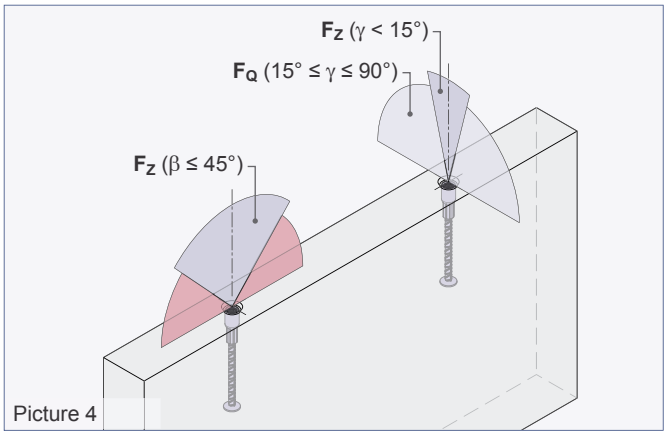
Materials

The Compact anchor consists of a straight reinforcement bar B500B with crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanised according to common standards. If the surface of a concrete element has to fulfil special conditions (e.g. no stream of rust) the insert can be delivered in stainless steel alternatively.

Bearing capacities



Picture 3



Picture 4

Element thicknesses, centre and edge distances

The installation and position of Compact 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 all load directions (axial, diagonal and lateral).

Table 2: Permissible load bearing capacities

Load class	Element thicknesses and edge distances			perm.F if f_{cc} **15 N/mm²**	
				Axial tension / Diagonal tension perm. F_Z 0°- 45°	**Lateral tension** perm. F_Q
	d [mm]	a_a [mm]	a_r [mm]	[kN]	[kN]
12	60	300	150	5.0	2.5
14	60	400	200	8.0	4.0
16	80	400	200	12.0	6.0
18	100	500	250	16.0	8.0
20	100	550	275	20.0	10.0
24	120	600	300	25.0	12.5
30	140	650	350	40.0	20.0
36	200	800	400	63.0	31.5
42	240	1000	500	80.0	40.0
52	275	1200	600	125.0	62.5

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

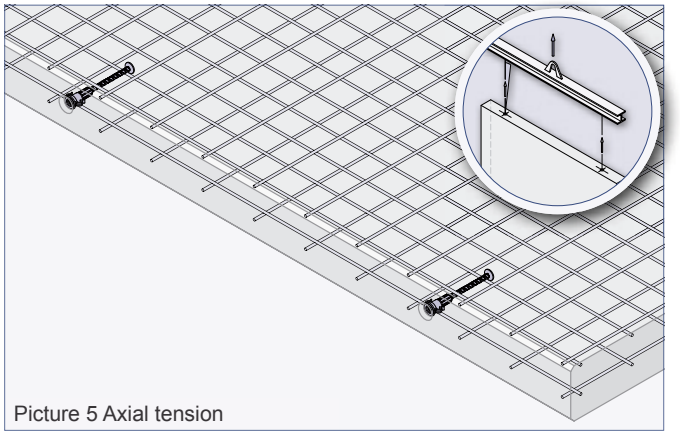
On lateral tension the Compact anchors have only half of the capacity compared to axial loading. However, this is not a limitation as during tilt-up only half of the weight has to be lifted (please refer to the General Installation Instruction).

Reinforcement

Main reinforcement / Axial tension

On use of Compact anchors precast units must be equipped with a minimum reinforcement (Table 3). This mesh reinforcement can be replaced by a comparable steel bar reinforcement. At the first time of lifting the concrete must have a minimum strength f_{cc} of **15 N/mm²**. The user is personally responsible for further transmission of load into the concrete unit.

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



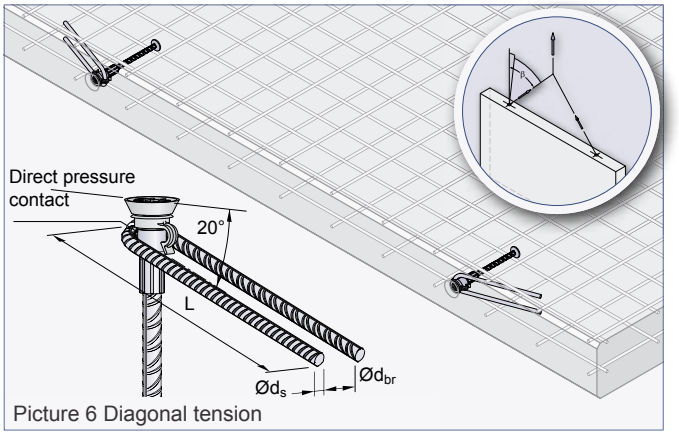
Picture 5 Axial tension

Table 3: Minimum reinforcement

Load class	Mesh reinforcement (square) [mm²/m]
12	131
14	131
16	131
18	188
20	188
24	188
30	188
36	188
42	188
52	188

Additional reinforcement for diagonal tension

If the Threaded transport anchor is used under diagonal tension $\beta > 12.5°$ an additional reinforcement according to Table 4 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (Picture 6) and must have direct pressure contact to the anchor insert in the peak of its bending.



Picture 6 Diagonal tension

Position of the direct pressure contact between insert and additional reinforcement must be within the thread reach of the insert.

Table 4 shows possibilities to use appropriate steel diameters if the inclination is less than 30°. Decisive for the choice of the stirrups are the existing diagonal inclinations during the transport chain until the final mounting of the precast element.

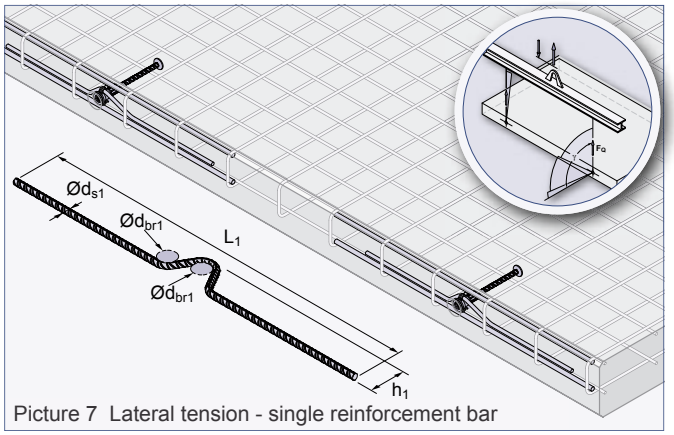
Table 4: Additional reinforcement for diagonal tension (material B500B) (required if $\beta > 12.5°$)

Load class	if $12.5° \le \beta \le 45°$			if $12.5° \le \beta \le 30°$		
	Ød$_s$ [mm]	L [mm]	Ød$_{br}$ [mm]	Ød$_s$ [mm]	L [mm]	Ød$_{br}$ [mm]
12	6	150	24	6	150	24
14	6	200	24	6	200	24
16	8	200	32	6	250	24
18	8	250	32	8	200	32
20	8	300	32	8	250	32
24	10	300	40	8	300	32
30	12	400	48	10	350	40
36	14	550	56	12	450	48
42	16	600	64	14	600	56
52	20	750	140	16	700	67

Reinforcement

Additional reinforcement for lateral tension

If an anchor is loaded by lateral tension and the inclination is $\gamma \geq 15°$ an additional reinforcement is required (Table 5 or Table 6). The reinforcement for lateral tension can be done as a single reinforcement bar (Picture 7), double reinforcement bar (Picture 8) or reverse reinforcement bar (Picture 9). There must be direct pressure contact between the insert of the Transport anchor and the reinforcement in the peak of the bending. Lateral forces on threaded transport anchors are only possible with wall thicknesses d according to Table 2. The reinforcement for lateral tension is installed in the front side of the wall contrary to the load direction. Tilting of walls can cause diagonal and lateral tension at the same time (Picture 8 and 9). In this case only the reinforcement for lateral tension is required (reverse reinforcement or double reinforcement bar). The diagonal tension is already covered by using this reinforcement. During mounting the tilt-up or turn-over of a unit requires lateral reinforcement (single reinforcement bar according to Picture 7 or reverse reinforcement for lateral tension according to Picture 9). The double reinforcement bar for lateral tension (Picture 8) covers standard lifting directions. With lateral tension the mesh reinforcement (Table 3) must be applied as a mesh cap. In addition to the mesh cap longitudinal reinforcement must be installed as shown in Table 5 or 6.

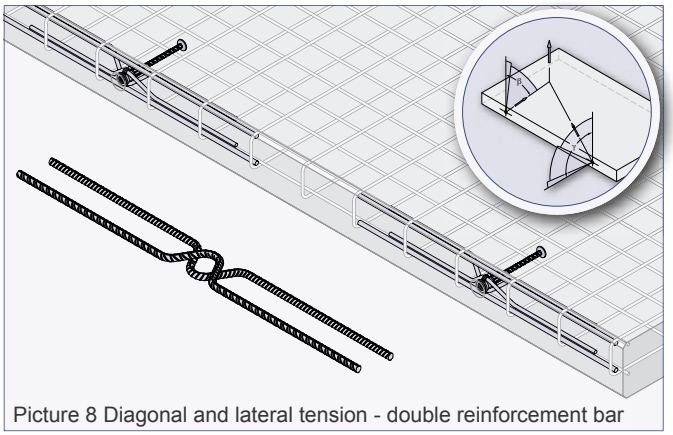


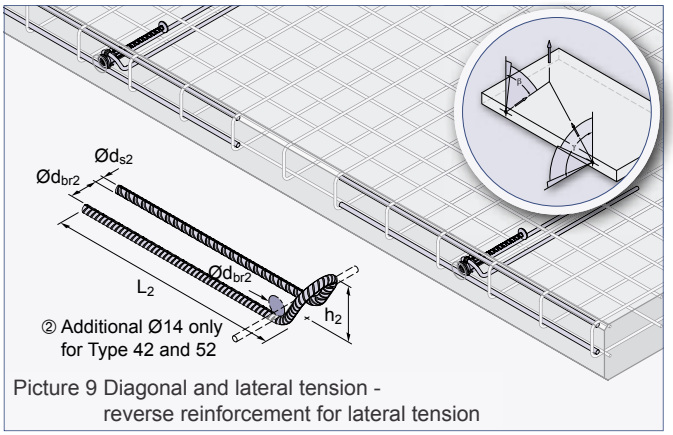
Picture 7 Lateral tension - single reinforcement bar

Table 5: Reverse reinforcement for lateral tension (material B500B) (required if $\gamma \geq 15°$)

Load class	Ød$_{s1}$ [mm]	h$_1$ [mm]	L$_1$ [mm]	Ød$_{br1}$ [mm]	longitudinal reinforcement Ø × length [mm]
12 ①	6	49	500	24	Ø10 × 850
14 ①	6	49	700	24	Ø10 × 850
16	8	49	600	32	Ø10 × 850
18	8	55	750	32	Ø12 × 850
20	10	64	800	40	Ø12 × 850
24	12	75	800	48	Ø12 × 850
30	12	92	1000	48	Ø16 × 1000
36	14	118	1000	56	Ø16 × 1000
42	16	143	1200	64	Ø16 × 1000
52	20	174	1500	140	Ø20 × 1200

① Minimum element thickness of 80 mm is required.


Picture 8 Diagonal and lateral tension - double reinforcement bar



Picture 9 Diagonal and lateral tension - reverse reinforcement for lateral tension

Table 6: Reverse reinforcement for lateral tension (material B500B) (required if $\gamma \geq 15°$)

Load class	Ød$_{S2}$ [mm]	L$_2$ [mm]	h$_2$ [mm]	Ød$_{br2}$ [mm]	longitudinal reinforcement Ø × length [mm]
12	6	270	35	24	Ø10 × 850
14	6	350	42	24	Ø10 × 850
16	8	420	49	32	Ø10 × 850
18	8	460	55	32	Ø12 × 850
20	10	490	64	40	Ø12 × 850
24	12	520	75	48	Ø12 × 850
30	12	570	92	48	Ø16 × 1000
36	14	690	118	56	Ø16 × 1000
42 ②	16	830	143	64	Ø16 × 1000
52 ②	20	930	174	140	Ø20 × 1200

② Additional Ø14, length = 60 cm (acc. to Picture 9)

Notes: