

PHILIPPGROUP

PHILIPP Compact anchor



VB3-V-005-en - 07/20 - PDF

Installation 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.

■ Engineering contact

Phone: +49 (0) 6021 / 40 27-318
Fax: +49 (0) 6021 / 40 27-340
E-mail: technik@philipp-gruppe.de

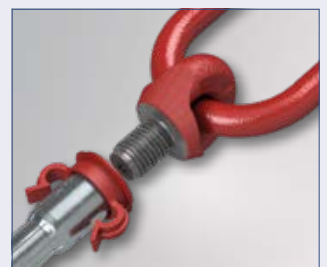
■ Sales contact

Phone: +49 (0) 6021 / 40 27-300
Fax: +49 (0) 6021 / 40 27-340
E-mail: vertrieb@philipp-gruppe.de

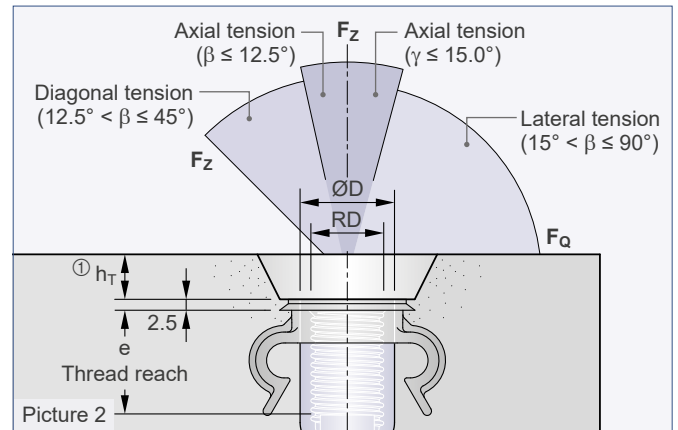
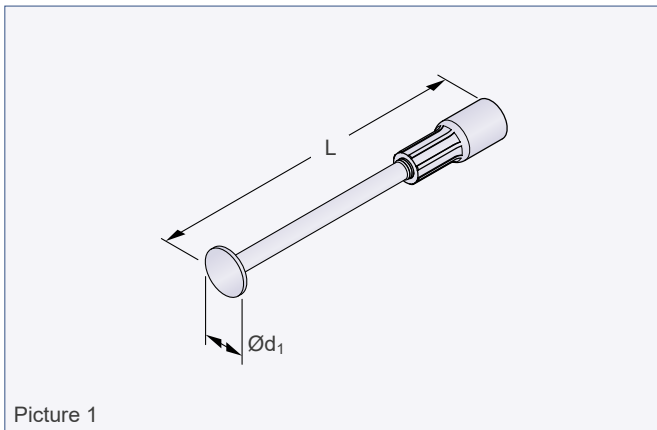


Content

- Der PHILIPP Compact Anchor Page 4
 - System description Page 4
 - EC Declaration of Conformity Page 4
- General notes / selection of anchor Page 5
 - Materials Page 5
 - Corrosion Page 5
 - Element thickness, centre and edge distances Page 5
 - Concrete strength Page 5
 - Selection guide for transport anchors Page 5
- Reinforcement Page 6
 - Minimum reinforcement Page 6
 - Single-layer reinforcement Page 6
 - Add. reinforcement for diagonal and lateral tension Page 6
- Permissible load bearing capacities and boundary conditions Page 7
 - For axial tension Page 7
 - For diagonal tension Page 8
 - For lateral tension Page 9



PHILIPP Compact anchor



The Compact anchor is used for the installations on the face side of beam-like elements and stairs. 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 Compact anchors requires the compliance with this Installation Instruction as well as the General Installation Instruction. The Installation and Application Instructions for the belonging PHILIPP lifting devices (Lifting loop with threaded end, Lifting loop Plus, "Wirbelstar", "Lifty") as well as the Application Instruction of the belonging PHILIPP accessories (KHN system, WS system etc.) must be followed also.

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. The Threaded transport anchor is not specified for a repeated usage (e.g. ballasts for cranes) or a permanent fixation.



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



Table 1: Dimensions

| Ref.-no. ② galvanised | Type | Dimensions | | | | | Weight [kg/100 pcs.] |
|--------------------------|-------|------------|------------|-----------|-----------|-------------|-------------------------|
| | | RD | ØD [mm] | L [mm] | e [mm] | Ød1 [mm] | |
| 67K120100 | RD 12 | 12 | 15.0 | 100 | 22 | 20 | 6.0 |
| 67K120150 | | | | 150 | | | 10.0 |
| 67K140105 | RD 14 | 14 | 18.0 | 105 | 25 | 25 | 10.0 |
| 67K140155 | | | | 155 | | | 12.0 |
| 67K160130 | RD 16 | 16 | 21.0 | 130 | 27 | 25 | 14.0 |
| 67K160175 | | | | 175 | | | 17.0 |
| 67K180150 | RD 18 | 18 | 24.0 | 150 | 34 | 35 | 29.0 |
| 67K180225 | | | | 225 | | | 36.0 |
| 67K200185 | RD 20 | 20 | 27.0 | 185 | 35 | 35 | 34.0 |
| 67K200250 | | | | 250 | | | 43.0 |
| 67K240200 | RD 24 | 24 | 31.0 | 200 | 43 | 35 | 42.0 |
| 67K240275 | | | | 275 | | | 52.0 |
| 67K300275 | RD 30 | 30 | 39.5 | 275 | 56 | 50 | 105.0 |
| 67K300350 | | | | 350 | | | 126.0 |
| 67K360334 | RD 36 | 36 | 47.0 | 334 | 68 | 60 | 184.0 |
| 67K360450 | | | | 450 | | | 227.0 |
| 67K420385 | RD 42 | 42 | 54.0 | 385 | 75 | 70 | 273.0 |
| 67K420500 | | | | 500 | | | 323.0 |
| 67K520550 | RD 52 | 52 | 67.0 | 550 | 100 | 85 | 567.0 |
| 67K520700 | | | | 700 | | | 634.0 |

① Mind the embedding depth h_T of the corresponding recess former (Picture 2).

② Also available in version stainless steel (Ref.-no. 75K_____VA).

General notes / selection of anchor

Materials

The Compact anchor consists of a round steel with foot and a crimped-on insert. The threaded inserts are made of special high precision steel tubes and are galvanised according to common standards.

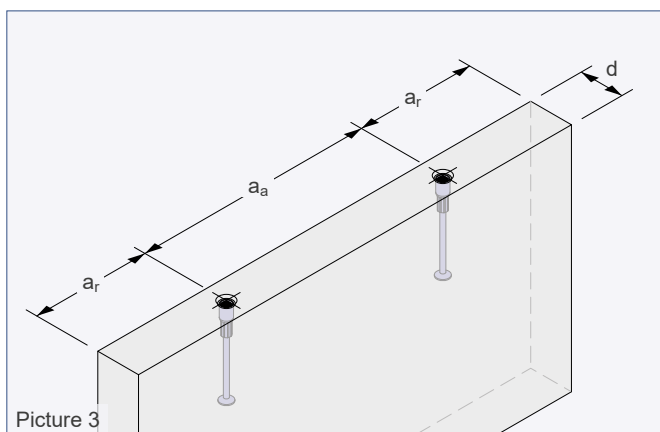
This galvanisation protects the anchor temporarily from the storage at the producer site to the final installation in the concrete element.

Corrosion

In order to avoid contamination or damage to the concrete surface of the precast concrete element due to corrosion of the transport anchor (stream of rust or similar), the insert can be delivered in stainless steel alternatively. Here the surface of the foot is protected by a special sealing against corrosion.

Element thicknesses, centre and edge distances

The installation and position of threaded transport anchors in precast concrete elements require minimum element dimensions and centre/edge distances for a safe load transfer.



Concrete strength

At the time of the first lift of the concrete unit the concrete strength must have a minimum f_{cc} according to the tables of the respective load case. Given concrete strengths f_{cc} are cube compressive strengths at the time of the first lifting.

Selection guide for transport anchors

Step 1:

Table 2 shows the maximum possible threaded anchor sizes per element thickness as a function of the load case.

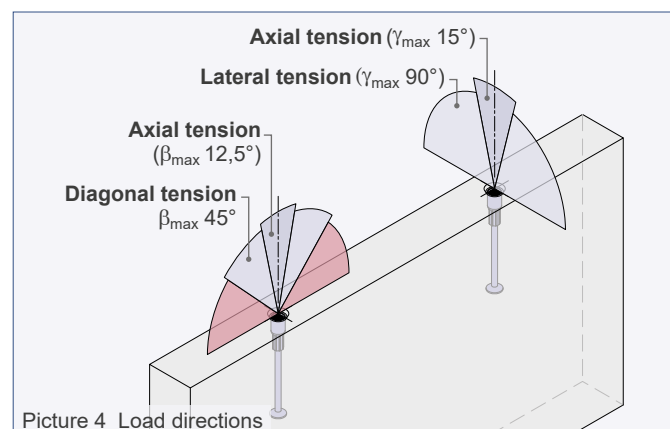
Table 2: Element thickness and max. anchor size for $f_{cc} \geq 15 \text{ N/mm}^2 / f_{cc} \geq 20 \text{ N/mm}^2$

| Element thickness d [mm] | Transport anchor [Type] | | |
|--------------------------------|--|---|--|
| | Axial tension $\beta_{max} 12.5^\circ$ $\gamma_{max} 15^\circ$ | Diagonal tension $\beta_{max} 45^\circ$ $\gamma_{max} 15^\circ$ | Lateral tension $\beta_{max} 45^\circ$ $\gamma_{max} 90^\circ$ |
| 60 | RD 12 | - | - |
| 70 | RD 14 | RD 12 | - |
| 80 | RD 16 | RD 16 | RD 16 |
| 90 | | RD 18 | |
| 95 | RD 18 | RD 18 | RD 18 |
| 100 | | | |
| 105 | RD 20 | RD 20 | RD 20 |
| 110 | | | |
| 120 | RD 24 | RD 24 | RD 24 |
| 125 | RD 30 | | |
| 130 | RD 36 | RD 30 | RD 30 |
| 140 | RD 42 | | |
| 150 | RD 52 | RD 42 | RD 36 |
| 160 | | | |
| 200 | RD 52 | RD 52 | RD 42 |
| 220 | | | |
| 280 | | | RD 52 |

Step 2:

Details of the load bearing capacities and boundary conditions as a function of the concrete compressive strength are given in the following tables:

- Axial tension: **Table 3** (15 / 20 N/mm²)
- Diagonal tension: **Table 4** (15 / 20 N/mm²)
- Lateral tension: **Table 5** (15 / 20 N/mm²)



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

Minimum reinforcement

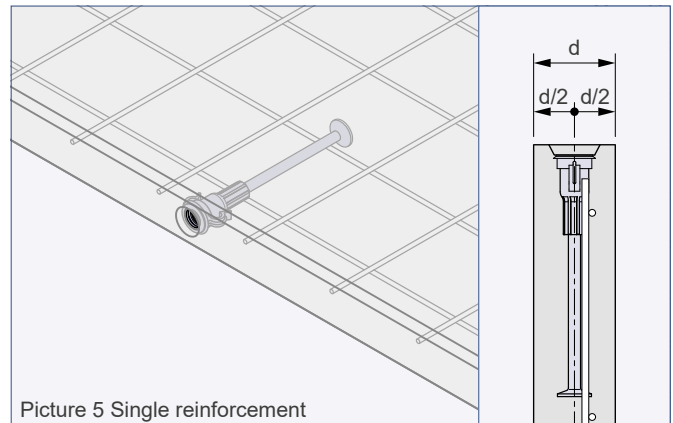
In use of Compact anchors precast units must be reinforced with a minimum reinforcement. Depending on the load case this can differ and is specified in the tables of the respective load case. This minimum reinforcement can be replaced by a comparable steel bar reinforcement. The user is personally responsible for further transmission of load into the concrete unit.



Existing static or constructive reinforcement can be taken into account for the minimum reinforcement of the respective load case.

Single-layer reinforcement

In order to ensure a central anchor position in the element, the mesh reinforcement has to be cut in this area (see Picture 5) in case of single-layer reinforcement.



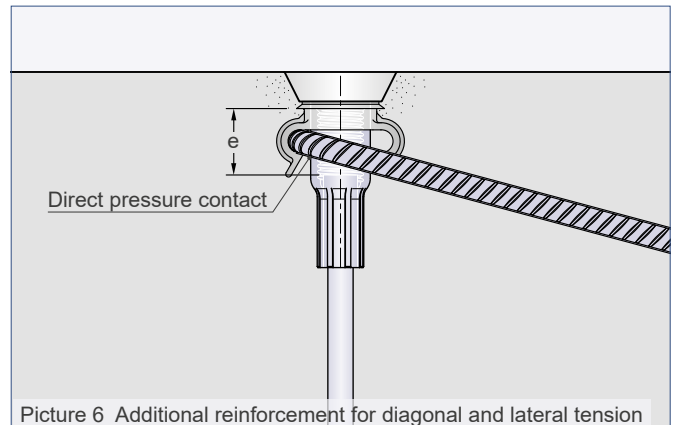
Picture 5 Single reinforcement



The installation of a single-layer reinforcement requires for all subsequent loads (e.g. within a transport chain) the attention of the load directions.

Add. reinforcement for diagonal and lateral tension

Additional reinforcement for diagonal and lateral tension has to be installed with pressure contact to the anchor insert. The position of the direct pressure contact must be within the thread reach e of the insert (see Picture 6). By using the Marking ring with clip (74KR__CLIP) this position is guaranteed.



Picture 6 Additional reinforcement for diagonal and lateral tension

Axial tension: Permissible load bearing capacities and boundary conditions

If the Compact anchor is used in axial load $\beta_{max} 12.5^\circ / \gamma_{max} > 15^\circ$ an additional reinforcement according to Table 3 is required.

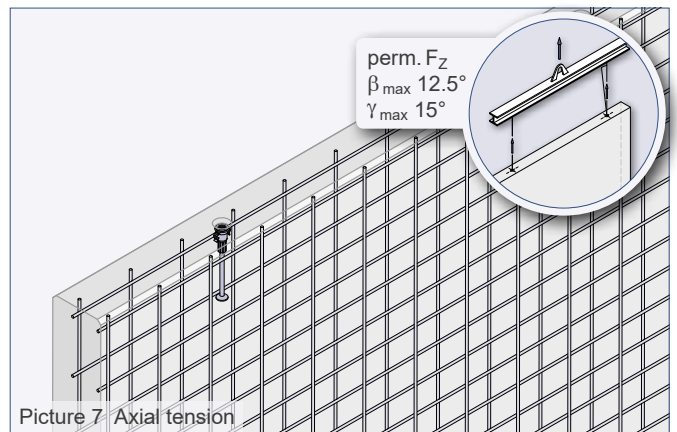
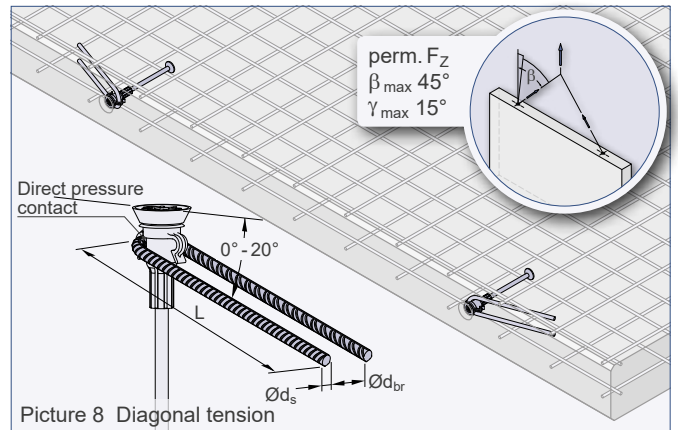


Table 3: Axial tension if $f_{cc} \geq 15 \text{ N/mm}^2 / 20 \text{ N/mm}^2$

| Load class | Min. element thickness min. centre and edge distances | | | $\beta_{max} 12.5^\circ / \gamma_{max} 15^\circ$ allow. F_z | | Mesh reinforcement (square) [mm ² /m] |
|------------|--|---------------|---------------|--|---------------------------------|---|
| | d [mm] | a_a [mm] | a_r [mm] | $f_{cc} \geq 15 \text{ N/mm}^2$ | $f_{cc} \geq 20 \text{ N/mm}^2$ | |
| | | | | [kN] | [kN] | |
| 12 | 60 | 300 | 150 | 5.0 | 5.0 | 1 × #131 |
| 14 | 70 | 400 | 200 | 8.0 | 8.0 | 1 × #131 |
| 16 | 80 | 400 | 200 | 11.7 | 12.0 | 1 × #131 |
| 18 | 95 | 500 | 250 | 16.0 | 16.0 | 2 × #188 |
| 20 | 105 | 600 | 300 | 20.0 | 20.0 | 2 × #188 |
| 24 | 120 | 600 | 300 | 25.0 | 25.0 | 2 × #188 |
| 30 | 125 | 700 | 350 | 40.0 | 40.0 | 2 × #188 |
| 36 | 130 | 800 | 400 | 62.8 | 63.0 | 2 × #188 |
| 42 | 140 | 1000 | 500 | 80.0 | 80.0 | 2 × #188 |
| 52 | 150 | 1200 | 600 | 125.0 | 125.0 | 2 × #188 |

Diagonal tension: Permissible load bearing capacities and boundary conditions

If the Compact anchor is used under diagonal tension $\beta > 12.5^\circ$ an additional reinforcement according to Table 4 is required. Here the reinforcement for diagonal tension is placed contrarily to the tensile direction (Picture 8) and must have direct pressure contact to the anchor insert in the peak of its bending. The installation of the rebars for diagonal tension can be done in an angle of 0° bis 20° to the concrete surface. If an installation angle of 0° is given the transport anchor has to be installed in a deeper position (e.g. By using a nailing plate) in order to reach the minimum required concrete covering.



Picture 8 Diagonal tension

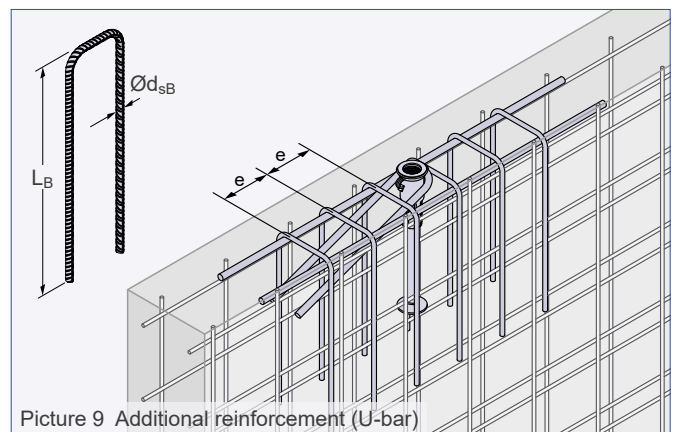
Table 4: Diagonal tension if $f_{cc} \geq 15 \text{ N/mm}^2 / 20 \text{ N/mm}^2$

| Load class | Min. element thicknesses, min. centre and edge distances | | | perm. Fz | | $\beta_{\max} 45^\circ / \gamma_{\max} 15^\circ$ | | | |
|------------|--|------------|------------|--------------------------------------|--------------------------------------|--|--------------|--------|-----------------|
| | d [mm] | a_a [mm] | a_r [mm] | $f_{cc} \geq 15 \text{ N/mm}^2$ [kN] | $f_{cc} \geq 20 \text{ N/mm}^2$ [kN] | Mesh reinforcement (square) [mm ² /m] | Ø d_s [mm] | L [mm] | Ø d_{br} [mm] |
| 12 | 70 | 300 | 150 | 5.0 | 5.0 | 1 × #131 | 6 | 150 | 18 |
| 14 | 80 | 400 | 200 | 8.0 | 8.0 | 1 × #188 | 8 | 200 | 24 |
| 16 | 80 | 400 | 200 | 11.2 | 12.0 | 1 × #188 | 8 | 200 | 24 |
| 18 | 90 | 500 | 250 | 16.0 | 16.0 | 1 × #188 | 10 | 250 | 30 |
| 20 | 100 | 600 | 300 | 20.0 | 20.0 | 2 × #188 | 10 | 300 | 40 |
| 24 | 120 | 600 | 300 | 25.0 | 25.0 | 2 × #188 | 10 | 300 | 40 |
| 30 ① | 130 | 700 | 350 | 40.0 | 40.0 | 2 × #257 | 12 | 350 | 48 |
| 36 ① | 160 | 800 | 400 | 63.0 | 63.0 | 2 × #257 | 14 | 400 | 56 |
| 42 ① | 160 | 1000 | 500 | 80.0 | 80.0 | 2 × #257 | 14 | 500 | 56 |
| 52 ① | 200 | 1200 | 600 | 125.0 | 125.0 | 2 × #257 | 20 | 600 | 86 |

① For this unit thickness, additional reinforcement according to Table 4a is required

Table 4a: Additional reinforcement for diagonal tension

| Load class | Lengthwise reinforcement (B500A) | | Stirrup in anchor area (B500A) | | | |
|------------|----------------------------------|-------------|--------------------------------|-----------------|------------|--------|
| | Ø [mm] | Length [mm] | Quantity [pcs.] | Ø d_{sB} [mm] | L_B [mm] | e [mm] |
| 30 | 12 | 800 | 6 | 8 | 350 | 130 |
| 36 | 12 | 800 | 6 | 8 | 400 | 150 |
| 42 | 12 | 1000 | 6 | 8 | 500 | 150 |
| 52 | 12 | 1200 | 6 | 10 | 600 | 150 |

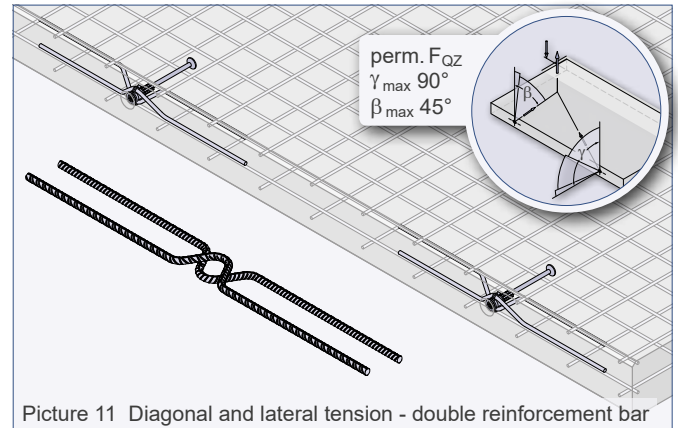


Picture 9 Additional reinforcement (U-bar)

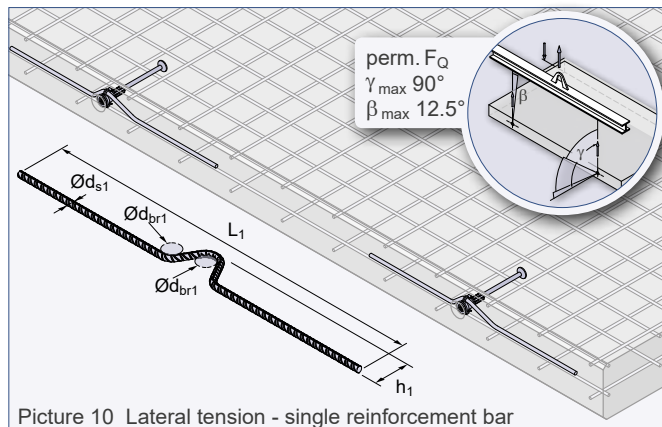
Lateral tension: Permissible load bearing capacities and boundary conditions

If an Compact anchor is loaded by lateral tension with an inclination of $\gamma > 15^\circ$ an additional reinforcement is required according Table 5 and 5a. The reinforcement for lateral tension can be done as a single reinforcement bar (Picture 10), double reinforcement bar (Picture 11) or reverse reinforcement bar for lateral tension (Picture 12). There must be direct pressure contact between the insert of the transport anchor and the reinforcement in the peak of the bending. 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 11 and 12). In this case only the reinforcement for lateral tension is required (reverse reinforcement bar 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 10 or reverse reinforcement bar for lateral tension according to Picture 12).

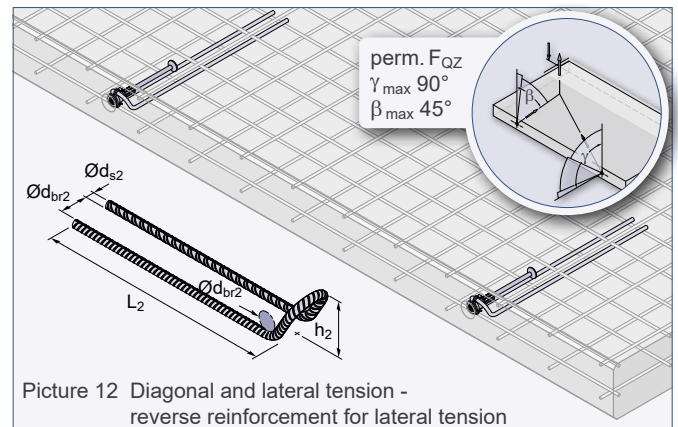
The double reinforcement tail for lateral tension (Picture 11) covers standard lifting directions.



Picture 11 Diagonal and lateral tension - double reinforcement bar



Picture 10 Lateral tension - single reinforcement bar



Picture 12 Diagonal and lateral tension - reverse reinforcement for lateral tension

Table 5: Lateral tension if $f_{cc} \geq 15 \text{ N/mm}^2 / 20 \text{ N/mm}^2$

| Load class | Min. element thicknesses, min. centre and edge distances | | | $\gamma_{\max} 90^\circ / \beta_{\max} 45^\circ$ ④ | | | | | | | | | | |
|------------|--|------------|------|--|---------------------------------|-------------------------------|--|------------|-------------------------|------------------------|-------------------------------|------------|-------------------------|-----|
| | | | | perm. F_{QZ} | | Mesh reinforcement (square) ④ | Add. reinforcement for lateral tension | | | | | | | |
| | | | | $f_{cc} \geq 15 \text{ N/mm}^2$ | $f_{cc} \geq 20 \text{ N/mm}^2$ | | Single reinforcement bar (B500A) | | | | Reverse reinforcement (B500A) | | | |
| d [mm] | a_a [mm] | a_r [mm] | [kN] | [kN] | [mm ² /m] | $\delta_{d_{s1}}$ [mm] | L_1 [mm] | h_1 [mm] | $\delta_{d_{br1}}$ [mm] | $\delta_{d_{s2}}$ [mm] | L_2 [mm] | h_2 [mm] | $\delta_{d_{br2}}$ [mm] | |
| 12 | 80 | 300 | 150 | 2.5 | 2.5 | 1 × #131 | 6 | 300 | 34 | 24 | 6 | 150 | 34 | 24 |
| 14 | 80 | 400 | 200 | 3.6 | 4.0 | 1 × #188 | 8 | 400 | 39 | 32 | 8 | 200 | 39 | 32 |
| 16 | 80 | 400 | 200 | 4.4 | 5.1 | 1 × #188 | 8 | 400 | 39 | 32 | 8 | 200 | 39 | 32 |
| 18 ⑤ | 100 | 500 | 250 | 8.0 | 8.0 | 2 × #188 | 10 | 500 | 48 | 40 | 10 | 250 | 48 | 40 |
| 20 ⑤ | 110 | 600 | 300 | 10.0 | 10.0 | 2 × #188 | 12 | 600 | 55 | 48 | 12 | 300 | 55 | 48 |
| 24 ⑤ | 120 | 600 | 300 | 12.5 | 12.5 | 2 × #188 | 12 | 600 | 73 | 48 | 12 | 300 | 73 | 48 |
| 30 ⑤ | 150 | 700 | 350 | 20.0 | 20.0 | 2 × #257 | 14 | 700 | 88 | 56 | 14 | 350 | 88 | 56 |
| 36 ⑤ | 200 | 800 | 400 | 31.5 | 31.5 | 2 × #257 | 14 | 800 | 115 | 56 | 14 | 400 | 115 | 56 |
| 42 ⑤ | 220 | 1000 | 500 | 40.0 | 40.0 | 2 × #257 | 16 | 1000 | 123 | 64 | 16 | 500 | 123 | 64 |
| 52 ⑤ | 280 | 1200 | 600 | 60.3 | 62.5 | 2 × #257 | 20 | 1200 | 170 | 140 | 20 | 600 | 170 | 140 |

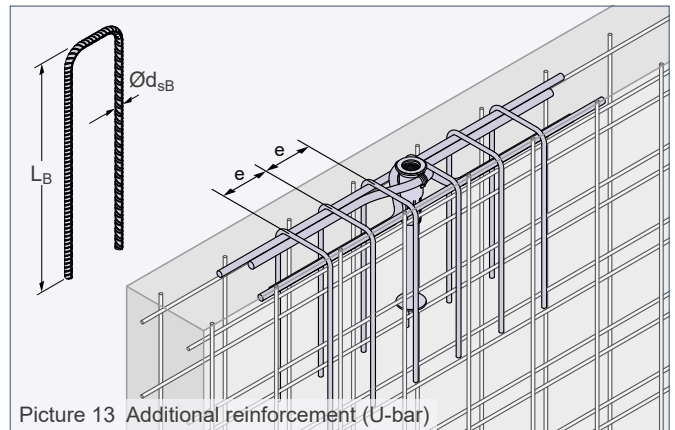
④ For the reinforcement "single reinforcement bar" (picture 10) only F_Q ($\beta_{\max} 12.5^\circ$) is permissible!

⑤ For this unit thickness, additional reinforcement according to Table 5 is required

Lateral tension: Permissible load bearing capacities and boundary conditions

Table 5a: Additional reinforcement for lateral tension

| Load class | Longitudinal reinforcement (B500A) | | Stirrup in anchor area (B500A) | | | |
|------------|------------------------------------|-------------|--------------------------------|----------------------------------|---------------------|--------|
| | Ø [mm] | Length [mm] | Quantity [pcs.] | Ø _{d_{sB}} [mm] | L _B [mm] | e [mm] |
| 18 | 10 | 500 | 4 | 6 | 250 | 150 |
| 20 | 12 | 600 | 4 | 8 | 300 | 150 |
| 24 | 12 | 600 | 4 | 8 | 300 | 150 |
| 30 | 16 | 700 | 6 | 8 | 350 | 130 |
| 36 | 16 | 800 | 6 | 8 | 400 | 150 |
| 42 | 16 | 1000 | 8 | 8 | 500 | 130 |
| 52 | 20 | 1200 | 8 | 10 | 600 | 150 |



Notes:

A large grid of graph paper for taking notes, consisting of 20 columns and 40 rows of small squares.

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. We provide it support.

Welcome to the PHILIPP Group

Sustainable
solutions

PHILIPPGROUP



PHILIPP GmbH
Lilienthalstrasse 7-9
D-63741 Aschaffenburg
Phone: + 49 (0) 6021 / 40 27-0
Fax: + 49 (0) 6021 / 40 27-440
info@philipp-group.de

24 hours hydraulic service
+ 49 (0) 6021 / 40 27-500

PHILIPP GmbH
Roßlauer Strasse 70
D-06869 Coswig/Anhalt
Phone: + 49 (0) 34903 / 6 94-0
Fax: + 49 (0) 34903 / 6 94-20
info@philipp-group.de

24 hours hydraulic service
+ 49 (0) 6021 / 40 27-500

PHILIPP GmbH
Sperberweg 37
D-41468 Neuss
Phone: + 49 (0) 2131 / 3 59 18-0
Fax: + 49 (0) 2131 / 3 59 18-10
info@philipp-group.de

24 hours hydraulic service
+ 49 (0) 2131/59 18-333

PHILIPP ACON Hydraulik GmbH
Hinter dem grünen Jäger 3
D-38836 Dardesheim
Phone: + 49 (0) 39422 / 95 68-0
Fax: + 49 (0) 39422 / 95 68-29
info@philipp-group.de



PHILIPP Vertriebs GmbH
Leogangerstraße 21
A-5760 Saalfelden / Salzburg
Phone + 43 (0) 6582 / 7 04 01
Fax + 43 (0) 6582 / 7 04 01 20
info@philipp-gruppe.at

For more information visit our website: www.philipp-group.de