

The efficient fixing for flexible use in non-cracked concrete



Column bases

APPROVALS



ADVANTAGES

- The standard anchorage depth achieves the maximum load-bearing capacities. Thus fewer fixing points and smaller anchor plates are required.
- The reduced anchorage depth reduces the drill hole depth. This minimises the amount of time needed for installation whilst increasing flexibility.
- The long thread balances component tolerances and allows for stand-off installations, thus increasing flexibility.
- Few hammer blows and minimal torque slippage allow for a noticeably simpler installation.
- The drive-in pin protects the thread from damage, and thus ensures a faster installation and dismantling of the attachment.

BUILDING MATERIALS

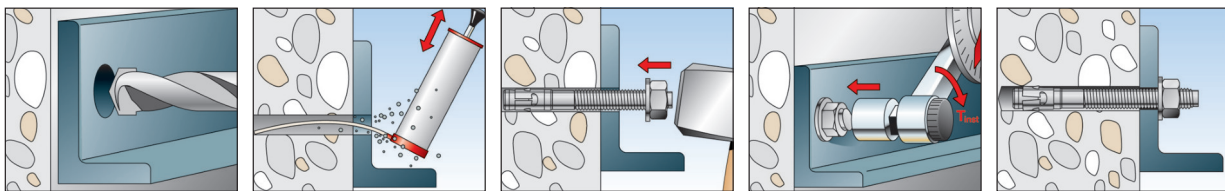
- Approved for:**
- Concrete C20/25 to C50/60
 - Non-cracked
- Also suitable for:**
- Concrete C12/15
 - Natural stone with dense structure

VERSION

- Zinc-plated steel
- Stainless steel
- Hot-dip galvanised

INSTALLATION

- The FBN II is suitable for pre-positioned and push-through installation; also suitable for stand-off installation under certain conditions.
- Prior to installation, place the hexagon nut in the optimal position (the drive-in pin projects by approx. 3 mm out of the hexagon nut).
- When applying the torque, the cone bolt is pulled into the expansion clip and expands it against the drill hole wall.
- The head embossing offers a simple control of the anchorin.



Anchor Type	FBN II M 6		FBN II M 8		FBN II M 10		FBN II M 12		FBN II M 16		FBN II M 20		
	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	gvz	A4	
drill hole diameter d_o (mm)	6		8		10		12		16		20		
hef,min (mm)	-		30		40		50		65		80		
Minimum member thickness ¹⁾ (mm)	-		100		100		100		120		160		
hef,max (mm)	30		40		50		65		80		105		
Minimum member thickness ¹⁾ (mm)	100		100		100		120		160		200		
Torque moment T_{inst} (Nm)	4,0		15,0	10,0	30,0	20,0	50,0	35,0	100,0	80,0	200,0	150,0	
Non-cracked Concrete	Min. spacing $S_{min}^{2)}$ (mm)	40	40	40	50 ³⁾ /40 ⁶⁾	50	50 ³⁾ /70 ⁶⁾	70	70	90	90 ³⁾ /120 ⁶⁾	120	140 ³⁾ /120 ⁶⁾
	Min. edge distance $C_{min}^{2)}$ (mm)	40	40	40	45	80 ³⁾ /50 ⁴⁾	80 ³⁾ /55 ⁴⁾	100 ³⁾ /70 ⁴⁾	100 ³⁾ /70 ⁴⁾	120 ³⁾ /90 ⁴⁾	120 ³⁾ /80 ⁴⁾	120	120

(1) According approval the minimum member thickness ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

(2) Minimum possible axial spacings resp. edge distance while reducing the permissible load for the minimum member thickness ($h_{min} \geq 2 \times h_{ef}$). The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

(3) Min. edge distance for $h_{ef,min}$.

(4) Min. edge distance for $h_{ef,max}$.

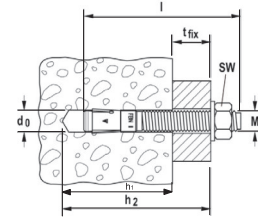
(5) Min. spacing for $h_{ef,min}$.

(6) Min. spacing for $h_{ef,max}$.

TECHNICAL DATA



Bolt anchor FBN II



Item	Zinc-plated steel	Stainless steel	Hot-dip galvanised steel	Letter code marking	Drill hole diameter do (mm)	Anchor length l (mm)	Drill hole depth for pre-position fixing Stand/Red. h1 (mm)	Drill hole depth for through fixing h2 (mm)	Max. usable length hef stand/hef,red tfix (mm)	Thread Ø length (mm)	Width across nut SW (mm)	Sales unit (pcs)
	Art-No. gvz	Art-No. A4	Art-No. C									
FBN II 6/5	505526	—	—	A	6	50	40	45	5/-	M 6 x 12	10	100
FBN II 6/10	505527	505532	—	B	6	55	40	50	10/-	M 6 x 17	10	100
FBN II 6/30	505528	505535	—	F	6	75	40	70	30/-	M 6 x 35	10	100
FBN II 8/5	040662	—	—	A	8	66	56/46	61	5/15	M 8 x 34	13	50
FBN II 8/10	040664	507555	—	B	8	71	56/46	66	10/20	M 8 x 39	13	50
FBN II 8/10	—	—	507575	B	8	71	56/46	66	10/20	M 8 x 39	13	50
FBN II 8/20	040669	—	—	D	8	81	56/46	76	20/30	M 8 x 49	13	50
FBN II 8/30	040700	507556	—	F	8	91	56/46	86	30/40	M 8 x 59	13	50
FBN II 8/30	—	—	507576	F	8	91	56/46	86	30/40	M 8 x 59	13	50
FBN II 8/50	040771	507557	—	K	8	111	56/46	106	50/60	M 8 x 79	13	50
FBN II 8/50	—	—	507577	K	8	111	56/46	106	50/60	M 8 x 79	13	50
FBN II 8/70	040777	—	—	M	8	131	56/46	126	70/80	M 8 x 99	13	20
FBN II 8/70	—	—	507578	M	8	131	56/46	126	70/80	M 8 x 99	13	20
FBN II 8/100	040783	—	—	P	8	161	56/46	156	100/110	M 8 x 129	13	20
FBN II 10/10	040827	507558	—	B	10	86	68/58	78	10/20	M 10 x 46	17	50
FBN II 10/10	—	—	507579	B	10	86	68/58	78	10/20	M 10 x 46	17	50
FBN II 10/20	040851	507559	—	D	10	96	68/58	88	20/30	M 10 x 56	17	50
FBN II 10/30	040854	507560	—	F	10	106	68/58	98	30/40	M 10 x 66	17	50
FBN II 10/30	—	—	507580	F	10	106	68/58	98	30/40	M 10 x 66	17	50
FBN II 10/50	040855	507561	—	K	10	126	68/58	118	50/60	M 10 x 86	17	20
FBN II 10/50	—	—	507582	K	10	126	68/58	118	50/60	M 10 x 86	17	20
FBN II 10/70	040931	—	—	M	10	146	68/58	138	70/80	M 10 x 106	17	20
FBN II 10/100	040943	507562	—	P	10	176	68/58	168	100/110	M 10 x 136	17	20
FBN II 10/100	—	—	507583	P	10	176	68/58	168	100/110	M 10 x 136	17	20
FBN II 10/140	040944	—	—	S	10	216	68/58	208	140/150	M 10 x 176	17	20
FBN II 10/160	040945	—	—	T	10	236	68/58	228	160/170	M 10 x 196	17	20
FBN II 12/10	040950	507563	—	B	12	106	85/70	95	10/25	M 12 x 59	19	20
FBN II 12/10	—	—	507589	B	12	106	85/70	95	10/25	M 12 x 59	19	20
FBN II 12/20	044558	507564	—	D	12	116	85/70	105	20/35	M 12 x 69	19	20
FBN II 12/30	045263	507565	—	F	12	126	85/70	115	30/45	M 12 x 79	19	20
FBN II 12/30	—	—	507591	F	12	126	85/70	115	30/45	M 12 x 79	19	20
FBN II 12/50	045264	507566	—	K	12	146	85/70	135	50/65	M 12 x 99	19	20
FBN II 12/50	—	—	507592	K	12	146	85/70	135	50/65	M 12 x 99	19	20
FBN II 12/80	045265	—	—	N	12	176	85/70	165	80/95	M 12 x 129	19	20
FBN II 12/100	045266	507567	—	P	12	196	85/70	185	100/115	M 12 x 149	19	20
FBN II 12/100	—	—	507596	P	12	196	85/70	185	100/115	M 12 x 149	19	20
FBN II 12/120	045267	—	—	R	12	216	85/70	205	120/135	M 12 x 169	19	20
FBN II 12/140	045268	—	—	S	12	236	85/70	225	140/155	M 12 x 189	19	20
FBN II 12/160	045269	—	—	T	12	256	85/70	245	160/175	M 12 x 189	19	20
FBN II 16/10	—	507568	—	B	16	130	104/89	114	10/25	M 16 x 74	24	10
FBN II 16/25	045564	507569	—	E	16	145	104/89	129	25/40	M 16 x 89	24	10
FBN II 16/25	—	—	507598	E	16	145	104/89	129	25/40	M 16 x 89	24	10
FBN II 16/50	045565	507570	—	K	16	170	104/89	154	50/65	M 16 x 105	24	10
FBN II 16/50	045565	507570	—	K	16	170	104/89	154	50/65	M 16 x 105	24	10
FBN II 16/50	—	—	507553	K	16	170	104/89	154	50/65	M 16 x 105	24	10
FBN II 16/80	045566	—	—	N	16	200	104/89	184	80/95	M 16 x 144	24	10
FBN II 16/100	045567	—	—	P	16	220	104/89	204	100/115	M 16 x 164	24	10
FBN II 16/100	—	—	507554	P	16	220	104/89	204	100/115	M 16 x 164	24	10
FBN II 16/140	045568	—	—	S	16	260	104/89	244	140/155	M 16 x 184	24	10
FBN II 16/160	045569	—	—	T	16	280	104/89	264	160/175	M 16 x 184	24	10
FBN II 16/200	045570	—	—	V	16	320	104/89	304	200/215	M 16 x 100	24	10
FBN II 20/30	045573	507571	—	F	20	187	135/110	165	30/55	M 20 x 90	30	10
FBN II 20/30	—	—	508015	F	20	187	135/110	165	30/55	M 20 x 90	30	50
FBN II 20/60	045574	507572	—	L	20	217	135/110	195	60/85	M 20 x 90	30	10
FBN II 20/80	045575	—	—	N	20	237	135/110	215	80/105	M 20 x 90	30	10
FBN II 20/120	045576	—	—	R	20	277	135/110	255	120/145	M 20 x 90	30	10
FBN II 8/5 K	040806	508007	508012	A	8	56	46	51	-/5	M 8 x 24	13	50
FBN II 8/10 K	040807	—	—	B	8	61	46	56	-/10	M 8 x 29	13	50
FBN II 10/5 K	040946	508010	508013	A	10	71	58	63	-/5	M 10 x 31	17	50
FBN II 10/10 K	040947	—	—	B	10	76	58	68	-/10	M 10 x 36	17	50
FBN II 12/5 K	045272	508011	508014	A	12	86	70	75	-/5	M 12 x 39	19	20
FBN II 12/10 K	045273	—	—	B	12	91	70	80	-/10	M 12 x 44	19	20
FBN II 12/30 K	045274	—	—	F	12	111	70	100	-/30	M 12 x 64	19	20
FBN II 16/15 K	045571	508745	507597	C	16	120	89	104	-/15	M 16 x 64	24	10
FBN II 16/25 K	045572	—	507597	E	16	130	89	114	-/25	M 16 x 74	24	10
FBN II 20/10 K	045577	—	—	B	20	142	110	120	-/10	M 20 x 50	30	10

High performance steel anchors

LOADS

Design ²⁾ and recommended ¹⁾ resistance of a single anchor¹⁾ in concrete C20/25 ³⁾
For the design the complete approval ETA - 07/02 11 has to be considered.

Item	Effective anchorage depth h_{ef} (mm)	Non-cracked concrete			
		Design tensile load N_d (kN)	Recommended tensile load N_{rec} (kN)	Design shear load V_d (kN)	Recommended shear load V_{rec} (kN)
FBN II 6 ⁴⁾	30	4.0	2.9	4.7	3.4
FBN II 8 ⁴⁾	30	4.0	2.9	9.9	7.1
FBN II 8 ⁴⁾	40	8.5	6.1	10.2	7.6
FBN II 10	40	8.5	6.1	16.2	12.0
FBN II 10	50	11.9	8.5	16.2	12.0
FBN II 12	50	11.9	8.5	21.9	17.9
FBN II 12	65	17.6	12.6	21.9	17.9
FBN II 16	65	17.6	12.6	40.7	29.0
FBN II 16	80	24.1	17.2	40.7	31.5
FBN II 20	80	24.1	17.2	55.4	38.3
FBN II 20	105	36.2	25.9	68.7	38.3
FBN II 6 A4 ⁴⁾	30	4.0	2.9	4.7	3.0
FBN II 8 A4 ⁴⁾	30	4.0	2.9	9.9	7.1
FBN II 8 A4 ⁴⁾	40	8.5	6.1	10.6	7.3
FBN II 10 A4	40	8.5	6.1	16.8	11.6
FBN II 10 A4	50	11.9	8.5	16.8	11.6
FBN II 12 A4	50	11.9	8.5	25.6	15.7
FBN II 12 A4	65	17.6	12.6	25.6	15.7
FBN II 16 A4	65	17.6	12.6	40.6	29.0
FBN II 16 A4	80	24.1	17.2	44.1	29.1
FBN II 20 A4	80	24.1	17.2	53.6	39.6
FBN II 20 A4	105	36.2	25.9	53.6	49.1

(1) The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1.4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1.5 \times h_{ef}$. Accurate data see approval.

(2) The required safety factor for material is considered.

(3) For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

(4) The anchor depth smaller than 40 mm are only allowed for multiple use for non-structural application.