



2

Steel anchors

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Efficient fixing for cracked concrete



Balcony railings



Cable trays

VERSIONS

- zinc-plated steel
- stainless steel
- highly corrosion-resistant steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The expansion clip allows for a high load-bearing capacity, thus fewer fixing points and smaller anchor plates are required.
- The international approvals guarantee maximum safety and the best performance.
- The bolt geometry provides maximum load distribution which enables use close to edges and in thin components.
- Fewer hammer blows and minimal torque slippage provides a more simplified installation process
- The drive-in pin protects the thread from damage and ensures a trouble-free dismantling of the fixture.

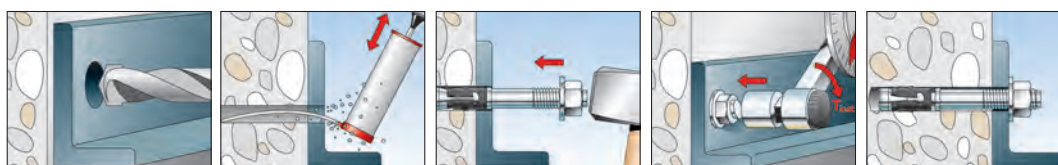
APPLICATIONS

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable conduits
- Machines
- Staircases
- Gates
- Façades
- Wood constructions

FUNCTIONING

- The FAZ 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 anchoring.
- In the case of series installation, we recommend using the FABS anchor bolt setting tool.

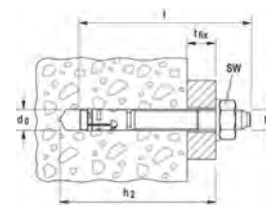
INSTALLATION



TECHNICAL DATA



Bolt anchor FAZ II



Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval		Drill hole diameter	Min. drill-hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	ICC	d ₀ [mm]	h ₂ [mm]	l [mm]	t _{fix} [mm]	Ø x length [mm]	SW [mm]	[pcs]
Item	gvz	A4	C									
FAZ II 8/10	094871	501396	—	■	▲	8	65	75	10	M 8 x 21	13	50
FAZ II 8/10	—	—	501428	■	▲	8	65	75	10	M 8 x 21	13	10
FAZ II 8/30	094877	501399	—	■	▲	8	85	95	30	M 8 x 41	13	50
FAZ II 8/30	—	—	501429	■	▲	8	85	95	30	M 8 x 41	13	10
FAZ II 8/50	094878	501401	—	■	▲	8	105	115	50	M 8 x 61	13	50
FAZ II 8/100	094879	—	—	■	▲	8	155	165	100	M 8 x 100	13	25
FAZ II 8/160	503251	—	—	■	▲	8	215	225	160	M 8 x 100	13	20
FAZ II 10/10	094981	501403	—	■	▲	10	85	95	10	M 10 x 24	17	50
FAZ II 10/10	—	—	501430	■	▲	10	85	95	10	M 10 x 24	17	10
FAZ II 10/20	094982	—	—	■	▲	10	95	105	20	M 10 x 34	17	25
FAZ II 10/20	—	501406	—	■	▲	10	95	105	20	M 10 x 34	17	50
FAZ II 10/30	094983	—	—	■	▲	10	105	115	30	M 10 x 44	17	25
FAZ II 10/30	—	501407	—	■	▲	10	105	115	30	M 10 x 44	17	50
FAZ II 10/30	—	—	503185	■	▲	10	105	115	30	M 10 x 44	17	10
FAZ II 10/50	094984	501409	—	■	▲	10	125	135	50	M 10 x 64	17	20
FAZ II 10/70	—	501410	—	■	▲	10	145	155	70	M 10 x 84	17	20
FAZ II 10/80	094985	—	—	■	▲	10	155	165	80	M 10 x 94	17	20
FAZ II 10/100	094986	501411	—	■	▲	10	175	185	100	M 10 x 100	17	20
FAZ II 10/160	503252	501412	—	■	▲	10	235	245	160	M 10 x 100	17	20
FAZ II 12/10	095419	501413	—	■	▲	12	100	110	10	M 12 x 27	19	20
FAZ II 12/10	—	—	503186	■	▲	12	100	110	10	M 12 x 27	19	10
FAZ II 12/20	095420	501415	—	■	▲	12	110	120	20	M 12 x 37	19	20
FAZ II 12/30	095421	501416	—	■	▲	12	120	130	30	M 12 x 47	19	20
FAZ II 12/30	—	—	501431	■	▲	12	120	130	30	M 12 x 47	19	10
FAZ II 12/50	095446	501419	—	■	▲	12	140	150	50	M 12 x 67	19	20
FAZ II 12/60	—	501420	—	■	▲	12	150	160	60	M 12 x 77	19	20
FAZ II 12/80	095454	—	—	■	▲	12	170	180	80	M 12 x 97	19	20
FAZ II 12/100	095470	501421	—	■	▲	12	190	200	100	M 12 x 100	19	20
FAZ II 12/160	503253	—	—	■	▲	12	250	260	160	M 12 x 100	19	10
FAZ II 12/160	—	503180	—	■	▲	12	250	260	160	M 12 x 100	19	20
FAZ II 12/200	095605	—	—	■	▲	12	290	300	200	M 12 x 100	19	10
FAZ II 16/25	—	501423	—	■	▲	16	135	148	25	M 16 x 47	24	20
FAZ II 16/25	095836	—	501432	■	▲	16	135	148	25	M 16 x 47	24	20
FAZ II 16/50	095864	—	503187	■	▲	16	160	173	50	M 16 x 72	24	10
FAZ II 16/50	—	501424	—	■	▲	16	160	173	50	M 16 x 72	24	20
FAZ II 16/100	095865	501425	—	■	▲	16	210	223	100	M 16 x 100	24	10
FAZ II 16/160	503254	—	—	■	▲	16	270	283	160	M 16 x 100	24	10
FAZ II 16/200	095967	—	—	■	▲	16	310	323	200	M 16 x 100	24	10
FAZ II 16/250	095968	—	—	■	▲	16	360	373	250	M 16 x 100	24	10
FAZ II 16/300	096188	—	—	■	▲	16	410	423	300	M 16 x 100	24	10
FAZ II 20/30	046632	—	—	■	▲	20	155	172	30	M 20 x 54	30	5
FAZ II 20/30	—	501426	—	■	▲	20	155	172	30	M 20 x 54	30	4
FAZ II 20/60	046633	—	—	■	▲	20	185	202	60	M 20 x 84	30	5
FAZ II 20/60	—	503183	—	■	▲	20	185	202	60	M 20 x 84	30	4
FAZ II 20/160	503255	—	—	■	▲	20	285	302	160	M 20 x 100	30	5
FAZ II 24/30	046635	—	—	■	▲	24	185	205	30	M 24 x 58	36	5
FAZ II 24/30	—	501427	—	■	▲	24	185	205	30	M 24 x 58	36	4
FAZ II 24/60	046636	—	—	■	▲	24	215	235	60	M 24 x 88	36	5
FAZ II 24/60	—	503184	—	■	▲	24	215	235	60	M 24 x 88	36	4

FAZ II GS 8/10/12/16 with large washers also available to order, please ask for details

ACCESSORIES



fischer Anchor bolt setting tool **FABS**

Item	Art.-No.	Fits anchor	Sales unit [pcs]
FABS	077937	FAZ II, FBN II, EXA for diameter from M6 - M12	1

LOADS

Bolt anchor FAZ II

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 05/0069 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness ⁵⁾ h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FAZ II 8	45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40
FAZ II 10	60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45
FAZ II 12	70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55
FAZ II 16	85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65
FAZ II 20	100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95
FAZ II 24	125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135

LOADS

Bolt anchor FAZ II A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 05/0069 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness ⁵⁾ h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FAZ II 8 A4	45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40
FAZ II 10 A4	60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45
FAZ II 12 A4	70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55
FAZ II 16 A4	85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65
FAZ II 20 A4	100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95
FAZ II 24 A4	125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135

LOADS

Bolt anchor FAZ II C

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 05/0069 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness ⁵⁾ h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FAZ II 8 C	45	100	20,0	2,4	6,9	35	40	4,3	6,9	40	40
FAZ II 10 C	60	120	45,0	4,3	11,4	40	45	7,6	11,4	40	45
FAZ II 12 C	70	140	60,0	7,6	16,9	45	55	11,9	16,9	50	55
FAZ II 16 C	85	170	110,0	13,4	31,4	60	65	18,8	31,4	60	65
FAZ II 20 C	100	200	200,0	17,1	40,0	95	85	24,0	40,0	95	95
FAZ II 24 C	125	250	270,0	24,0	49,1	100	100	33,6	49,1	100	135

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⁾ 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⁾ For combination of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ According approval the minimum member thickness ($h_{min} \geq 2 \times h_{ef}$) can be reduced under specific conditions.

The cost-efficient fixing for flexible use in non-cracked concrete



Column bases



Stormwater overflow tank manholes

VERSIONS

- zinc-plated steel
- stainless steel
- hot-dip galvanised steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The standard anchorage depth achieves the maximum load-bearing capacities so 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 more flexible areas of use.
- The long thread allows flexible fixture thickness for stand-off installations.
- With only a few hammer blows and minimal torque slippage installation is a simple process.
- The drive-in pin protects the thread from damage, and ensures a faster installation and dismantling of the attachment.

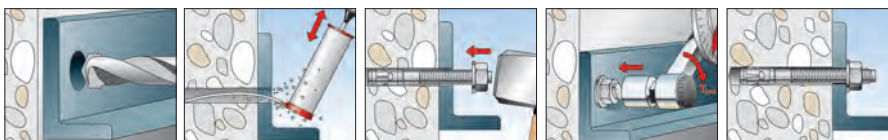
APPLICATIONS

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable conduits
- Machines
- Staircases
- Gates
- Façades

FUNCTIONING

- 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 so that the drive-in pin projects by approx. 3 mm out of the hexagon nut.
- When applying torque, the cone is pulled into the expansion clip and expands it against the drill hole wall.
- The embossed head offers a simple control of the anchoring.
- For a series of installations we recommend using the FABS bolt anchor setting tool.

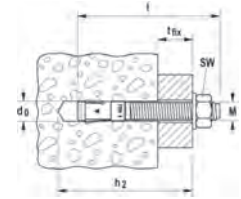
INSTALLATION



TECHNICAL DATA



Bolt anchor **FBN II**



Items to order only	zinc-plated steel	stainless steel	hot-dip galvanised steel	Approval	Drill hole diameter	Min. Drill hole depth for through fixings	Anchor length	Max. usable length $h_{ef, standard}/h_{ef, reduced}$	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	d_0 [mm]	h_2 [mm]	l [mm]	t_{fix} [mm]	$\emptyset \times$ length [mm]	$\emptyset$ SW [mm]	[pcs]
Item	gvz	A4	fvz								
FBN II 6x5 (6/5)	505526 1) 2)	—	—	■	6	45	50	5/-	M 6 x 12	10	100
FBN II 6x55 (6/10)	505527 1) 2)	505532 1) 2)	—	■	6	50	55	10/-	M 6 x 17	10	100
FBN II 6x75 (6/30)	505528 1) 2)	505535 1) 2)	—	■	6	70	75	30/-	M 6 x 35	10	100
FBN II 8x65 (8/65)	040662	—	—	■	8	61	66	5/15	M 8 x 34	13	50
FBN II 8x55 K (8/5)	040806	508007	—	■	8	51	56	-/5	M 8 x 24	13	50
FBN II 8x55 K (8/55)	—	—	508012	—	8	51	56	-/5	M 8 x 24	13	50
FBN II 8x60 K (8/10)	040807	—	—	■	8	56	61	-/10	M 8 x 29	13	50
FBN II 8x70 (8/10)	040664	507555	—	■	8	66	71	10/20	M 8 x 39	13	50
FBN II 8x70 (8/10)	—	—	507575	—	8	66	71	10/20	M 8 x 39	13	50
FBN II 8x80 (8/20)	040669	—	—	■	8	76	81	20/30	M 8 x 49	13	50
FBN II 8x90 (8/20)	040700	507556	—	■	8	86	91	30/40	M 8 x 59	13	50
FBN II 8x90 (8/20)	—	—	507576	—	8	86	91	30/40	M 8 x 59	13	50
FBN II 8x110 (8/50)	040771	507557	—	■	8	106	111	50/60	M 8 x 79	13	50
FBN II 8x110 (8/50)	—	—	507577	—	8	106	111	50/60	M 8 x 79	13	50
FBN II 8x130 (8/70)	040777	—	—	■	8	126	131	70/80	M 8 x 99	13	20
FBN II 10x70 K (10/5)	040946	508010	—	■	10	63	71	-/5	M 10 x 31	17	50
FBN II 10x70 K (10/5)	—	—	508013	—	10	63	71	-/5	M 10 x 31	17	50
FBN II 10x75 K (10/10)	040947	—	—	■	10	68	76	-/10	M 10 x 36	17	50
FBN II 8x130 (8/70)	—	—	507578	—	8	126	131	70/80	M 8 x 99	13	20
FBN II 8x160 (8/100)	040783	—	—	■	8	156	161	100/110	M 8 x 129	13	20
FBN II 10x85 (10/10)	040827	507558	—	■	10	78	86	10/20	M 10 x 46	17	50
FBN II 10x85 (10/10)	—	—	507579	—	10	78	86	10/20	M 10 x 46	17	50
FBN II 10x95 (10/20)	040851	507559	—	■	10	88	96	20/30	M 10 x 56	17	50
FBN II 10x105 (10/30)	040854	507560	—	■	10	98	106	30/40	M 10 x 66	17	50
FBN II 10x105 (10/30)	—	—	507580	—	10	98	106	30/40	M 10 x 66	17	50
FBN II 10x125 (10/50)	040855	507561	—	■	10	118	126	50/60	M 10 x 86	17	20
FBN II 10x125 (10/50)	—	—	507582	—	10	118	126	50/60	M 10 x 86	17	20
FBN II 10x145 (10/70)	040931	—	—	■	10	138	146	70/80	M 10 x 106	17	20
FBN II 10x175 (10/100)	040943	507562	—	■	10	168	176	100/110	M 10 x 136	17	20
FBN II 10x175 (10/100)	—	—	507583	—	10	168	176	100/110	M 10 x 136	17	20
FBN II 10x215 (10/140)	040944	—	—	■	10	208	216	140/150	M 10 x 176	17	20
FBN II 10x235 (10/160)	040945	—	—	■	10	228	236	160/170	M 10 x 196	17	20
FBN II 12x85 K (12/5)	045272	508011	—	■	12	75	86	-/5	M 12 x 39	19	20
FBN II 12x90 K (12/5)	—	—	508014	—	12	75	86	-/5	M 12 x 39	19	20
FBN II 12x90 K (12/5)	045273	—	—	■	12	80	91	-/10	M 12 x 44	19	20
FBN II 12x105 (12/10)	040950	507563	—	■	12	95	106	10/25	M 12 x 59	19	20
FBN II 12x105 (12/10)	—	—	507589	—	12	95	106	10/25	M 12 x 59	19	20
FBN II 12x110 K (12/30)	045274	—	—	■	12	100	111	-/30	M 12 x 64	19	20
FBN II 12x115 (12/20)	044558	507564	—	■	12	105	116	20/35	M 12 x 69	19	20
FBN II 12x125 (12/30)	045263	507565	—	■	12	115	126	30/45	M 12 x 79	19	20
FBN II 12x125 (12x30)	—	—	507591	—	12	115	126	30/45	M 12 x 79	19	20
FBN II 12x145 (12/50)	045264	507566	—	■	12	135	146	50/65	M 12 x 99	19	20
FBN II 12x145 (12/50)	—	—	507592	—	12	135	146	50/65	M 12 x 99	19	20
FBN II 12x175 (12/80)	045265	—	—	■	12	165	176	80/95	M 12 x 129	19	20
FBN II 12x195 (12/100)	045266	507567	—	■	12	185	196	100/115	M 12 x 149	19	20
FBN II 12x195 (12/100)	—	—	507596	—	12	185	196	100/115	M 12 x 149	19	20
FBN II 12x215 (12/120)	045267	—	—	■	12	205	216	120/135	M 12 x 169	19	20
FBN II 12x235 (12/140)	045268	—	—	■	12	225	236	140/155	M 12 x 189	19	20
FBN II 12x255 (12/160)	045269	—	—	■	12	245	256	160/175	M 12 x 189	19	20
FBN II 16x130 (16/10)	—	507568	—	■	16	114	130	10/25	M 16 x 74	24	10

TECHNICAL DATA

Items to order only	zinc-plated steel	stainless steel	hot-dip galvanised steel	Approval	Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. usable length $h_{ef, standard}/h_{ef, reduced}$	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	d_0 [mm]	h_2 [mm]	l [mm]	t_{fix} [mm]	$\varnothing \times$ length [mm]	$\varnothing$ SW [mm]	[pcs]
Item	gvz	A4	fvz								
FBN II 16x120 K (16/15)	045571	508745	—	■	16	104	120	-/15	M 16 x 64	24	10
FBN II 16x145 K (16/15)	—	—	507597	—	16	104	120	-/15	M 16 x 64	24	10
FBN II 16x130 K (16/25)	045572	—	—	■	16	114	130	-/25	M 16 x 74	24	10
FBN II 16x260 (16/140)	045568	—	—	■	16	244	260	140/155	M 16 x 184	24	10
FBN II 16x280 (16/160)	045569	—	—	■	16	264	280	160/175	M 16 x 184	24	10
FBN II 16x320 (16/200)	045570	—	—	■	16	304	320	200/215	M 16 x 100	24	10
FBN II 20x10 K (20/10)	045577	—	—	■	20	120	142	-/10	M 20 x 50	30	10
FBN II 20x185 (20/30)	045573	507571	—	■	20	165	187	30/55	M 20 x 90	30	10
FBN II 20x185 (20/30)	—	—	508015	—	20	165	187	30/55	M 20 x 90	30	50
FBN II 20x215 (20/60)	045574	507572	—	■	20	195	217	60/85	M 20 x 90	30	10
FBN II 20x235 (20/80)	045575	—	—	■	20	215	237	80/105	M 20 x 90	30	10
FBN II 20x275 (20/120)	045576	—	—	■	20	255	277	120/145	M 20 x 90	30	10

1) Use restricted to anchoring of structural components which are statically indeterminate. 2) Nut and washer not pre-assembled/supplied loose.

ACCESSORIES



fischer Anchor bolt setting tool **FABS**

Item	Art.-No.	Fits anchor	Sales unit [pcs]
FABS	077937	FAZ II, FBN II, EXA for diameter from M6 - M12	1

ACCESSORIES



Torque wrench 1/2" **FTW8-54**



Torque wrench 1/2" drive **FTW 50-230**



Deep drive socket **FDDP 1/2"**

Items to order only		width across nut	torque	suitable for	Sales unit
Type	Art.-No.	[mm]	[Nm]		[pcs]
FTW 8-54	503324	-	8-54	hex. head fixings	1
FTW 50-230	503325	-	50-230	hex. head fixings	1
Deep drive socket					1
FDDP 10	503326	10 A/F	-	M6	1
FDDP 13	503327	13 A/F	-	M8	1
FDDP 17	503328	17 A/F	-	M10	1
FDDP 19	503329	19 A/F	-	M12	1

For further detailed information on this product range please contact our Technical Team of advisors on 01491 827 920

LOADS

Bolt anchor FBN II. Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾
For the design the complete approval ETA - 07/02 11 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FBN II 6⁵⁾		30	100	4,0	2,9	2,7	50	100
FBN II 8⁵⁾	30		100	15,0	2,9	4,0	40	40
		40	100	15,0	6,1	6,1	40	40
FBN II 10	40		100	30,0	6,1	6,1	50	80
		50	100	30,0	8,5	8,5	50	50
FBN II 12	50		100	50,0	8,5	8,5	70	100
		65	120	50,0	12,6	14,3	70	70
FBN II 16	65		120	100,0	12,6	25,2	90	120
		80	160	100,0	17,2	26,9	90	90
FBN II 20	80		160	200,0	17,2	34,4	120	120
		105	200	200,0	25,9	38,3	120	120

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge

distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The anchorage depths smaller than 40 mm are only allowed for multiple use for non-structural applications.

LOADS

Bolt anchor FBN II A4. Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾
For the design the complete approval ETA - 07/02 11 has to be considered.

Type	Min. effective anchorage depth $h_{ef,min}$ [mm]	Max. effective anchorage depth $h_{ef,max}$ [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Non-cracked concrete			
					Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FBN II 6 A4⁵⁾		30	100	4,0	2,9	3,0	50	100
FBN II 8 A4⁵⁾	30		100	10,0	2,9	4,0	50	45
		40	100	10,0	6,1	6,1	40	45
FBN II 10 A4	40		100	20,0	6,1	6,1	50	80
		50	100	20,0	8,5	8,5	70	55
FBN II 12 A4	50		100	35,0	8,5	8,5	70	100
		65	120	35,0	12,6	15,7	70	70
FBN II 16 A4	65		120	80,0	12,6	25,2	90	120
		80	160	80,0	17,2	29,1	120	80
FBN II 20 A4	80		160	150,0	17,2	34,4	140	120
		105	200	150,0	25,9	49,1	120	120

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge

distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ The anchorage depths smaller than 40 mm are only allowed for multiple use for non-structural applications.

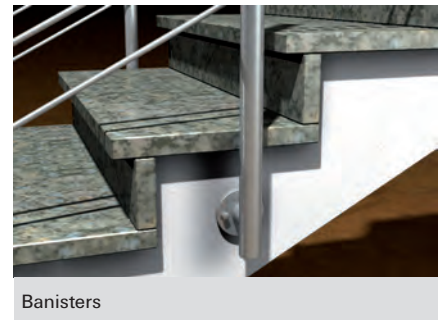
The push-through anchor for fixings with sophisticated design in cracked concrete



FH II-I Internally threaded



Steel girders



Banisters

VERSIONS

- zinc-plated steel
- stainless steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The anchor construction has a wide range of head shapes for fixing points with sophisticated design.
- The interaction between the screw shank and sleeve provides a high shear load so less fixing points are required.
- International approvals guarantee maximum safety and high performance.
- The geometry of the anchor reduces the amount of energy required for installation.
- The detachable screw allows for surface flush removal.
- FH II-I Internally threaded version also available

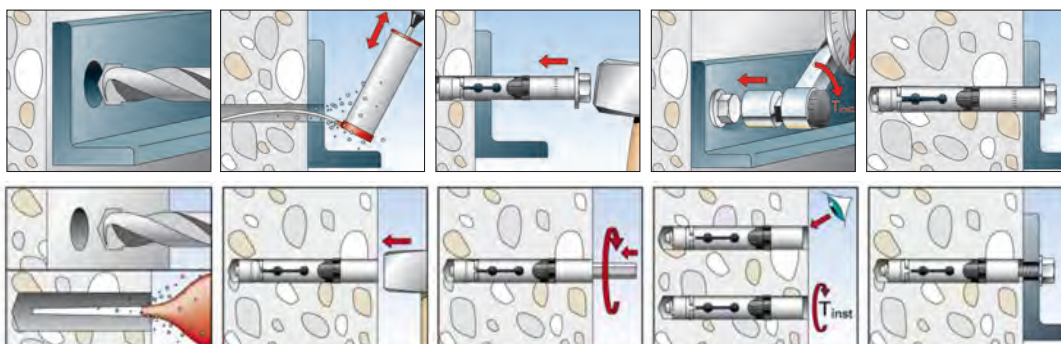
APPLICATIONS

- Guard rails
- Staircases
- Consoles
- Steel constructions
- Ladders
- Cable conduits
- Machines
- Gates
- Façades
- Gratings

FUNCTIONING

- The FH II is suitable for push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The black plastic ring prevents rotation when tightening the anchor, and acts as a crumple zone to take the torque slippage so that the fixture is pulled onto the anchor base.
- Available head shapes for flexible design solutions:
Countersunk head (type SK - for surface flush and fixing points that can be subsequently secured against theft), hexagon head (type S), bolt version with nut and washer (type B) and cap nut (type H).

INSTALLATION



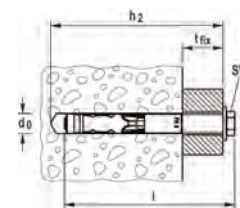
FH II high performance anchor

FH II-I internally threaded anchor

TECHNICAL DATA



High performance anchor **FH II-S** - with hexagonal head

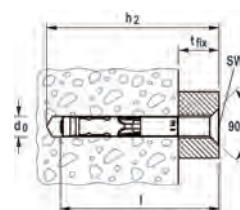


Items to order only	zinc-plated steel	stainless steel	Approval		Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.			d ₀ [mm]	h ₂ [mm]	l [mm]	t _{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz	A4	ETA	ICC							
FH II 10/10 S	503133	—	■	—	10	65	70	10	M 6	10	50
FH II 10/10 S	—	510923	■	—	10	65	69	10	M 6	10	50
FH II 10/25 S	503134	—	■	—	10	80	85	25	M 6	10	50
FH II 10/25 S	—	510924	■	—	10	80	84	25	M 6	10	50
FH II 10/50 S	503135	—	■	—	10	105	110	50	M 6	10	50
FH II 12/10 S	044884	—	■	▲	12	90	90	10	M 8	13	50
FH II 12/10 S	—	510925	■	—	12	90	90	10	M 8	13	50
FH II 12/25 S	044885	—	■	▲	12	105	105	25	M 8	13	50
FH II 12/25 S	—	510926	■	—	12	105	105	25	M 8	13	20
FH II 12/50 S	044886	—	■	▲	12	130	130	50	M 8	13	25
FH II 15/10 S	044887	—	■	▲	15	100	106	10	M 10	17	25
FH II 15/10 S	—	510927	■	—	15	100	107	10	M 10	17	50
FH II 15/25 S	044888	—	■	▲	15	115	121	25	M 10	17	25
FH II 15/25 S	—	510928	■	—	15	115	122	25	M 10	17	20
FH II 15/50 S	044889	—	■	▲	15	140	146	50	M 10	17	25
FH II 18/10 S	046847	—	■	▲	18	115	118	10	M 12	19	20
FH II 18/25 S	044894	—	■	▲	18	130	132	25	M 12	19	20
FH II 18/25 S	—	510929	■	—	18	130	133	25	M 12	19	10
FH II 18/50 S	044896	—	■	▲	18	155	157	50	M 12	19	20
FH II 24/25 S	044898	—	■	▲	24	150	160	25	M 16	24	10
FH II 24/25 S	—	502711	■	—	24	150	160	25	M 16	24	8
FH II 24/50 S	044900	—	■	▲	24	175	185	50	M 16	24	10
FH II 28/30 S	044901	—	■	▲	28	185	192	30	M 20	30	4
FH II 28/60 S	044902	—	■	▲	28	215	222	60	M 20	30	4
FH II 32/30 S	044903	—	■	▲	32	210	215	30	M 20	36	4
FH II 32/60 S	044904	—	■	▲	32	240	245	60	M 24	36	4

TECHNICAL DATA



High performance anchor **FH II-SK** with countersunk head



Items to order only	zinc-plated steel	stainless steel	Approval		Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut (hexagon socket)	Sales unit
	Art.-No.	Art.-No.			d ₀ [mm]	h ₂ [mm]	l [mm]	t _{fix} [mm]	M	[mm]	[pcs]
Item	gvz	A4	ETA	ICC							
FH II 10/15 SK	503136	—	■	—	10	70	65	10	M 6	4	50
FH II 10/25 SK	503137	—	■	—	10	80	75	25	M 6	4	50
FH II 10/50 SK	503138	—	■	—	10	105	100	50	M 6	4	50
FH II 12/15 SK	044917	—	■	—	12	95	90	15	M 8	5	25
FH II 12/15 SK	—	510931	■	—	12	95	90	15	M 8	6	25
FH II 12/25 SK	044918	—	■	—	12	105	100	25	M 8	5	25
FH II 12/30 SK	—	510932	■	—	12	110	105	30	M 8	6	25
FH II 12/50 SK	044919	—	■	—	12	130	125	50	M 8	5	25
FH II 12/50 SK	—	510933	■	—	12	130	125	50	M 8	6	25

TECHNICAL DATA



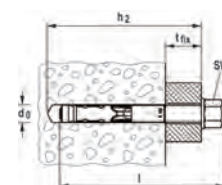
High performance anchor **FH II-SK** with countersunk head

Items to order only	zinc-plated steel	stainless steel	Approval		Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut (hexagon socket)	Sales unit
	Art.-No.	Art.-No.	ETA	ICC	d_o [mm]	h_2 [mm]	l [mm]	t_{fix} [mm]	M	[mm]	[pcs]
Item	gvz	A4									
FH II 15/15 SK	044920	—	■	▲	15	105	100	15	M 10	6	25
FH II 15/15 SK	—	510934	■	—	15	105	100	15	M 10	6	25
FH II 15/25 SK	044921	—	■	▲	15	115	110	25	M 10	6	25
FH II 15/50 SK	044922	—	■	▲	15	140	135	50	M 10	6	25
FH II 18/15 SK	044923	—	■	▲	18	120	115	15	M 12	8	20
FH II 18/25 SK	044924	—	■	▲	18	130	125	25	M 12	8	20
FH II 18/30 SK	—	510935	■	—	18	135	130	30	M 12	8	20
FH II 18/50 SK	044925	—	■	▲	18	155	150	50	M 12	8	20

TECHNICAL DATA



High performance anchor **FH II-H** with cap nut



Items to order only	zinc-plated steel	Approval		Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	ETA	ICC	d_o [mm]	h_2 [mm]	l [mm]	t_{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz									
FH II 10/10 H	503139	■	—	10	65	75	10	M 6	13	50
FH II 10/25 H	503140	■	—	10	80	90	25	M 6	13	50
FH II 10/50 H	503141	■	—	10	105	115	50	M 6	13	50
FH II 12/10 H	044905	■	—	12	90	100	10	M 8	17	50
FH II 12/25 H	044906	■	—	12	105	115	25	M 8	17	50
FH II 12/50 H	044907	■	—	12	130	140	50	M 8	17	25
FH II 15/10 H	044908	■	▲	15	100	115	10	M 10	17	25
FH II 15/25 H	044909	■	▲	15	115	130	25	M 10	17	25
FH II 15/50 H	044910	■	▲	15	140	155	50	M 10	17	25
FH II 18/25 H	044915	■	▲	18	130	145	25	M 12	19	20
FH II 18/50 H	044916	■	▲	18	155	170	50	M 12	19	20

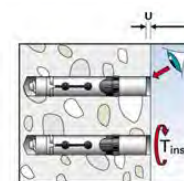
TECHNICAL DATA



high performance anchor **FH II-I**



Hex. drive setting tool (included)

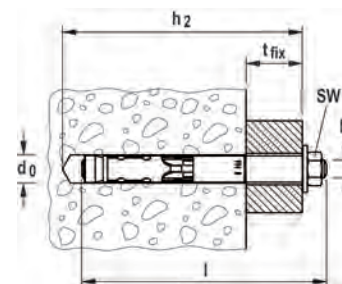


Items to order only	Zinc-plated steel	Stainless steel	Approval		Drill hole diameter	Min. drill depth pre-positioned installation	Effective anchorage depth	Total length	Thread	Gap	Installation torque	Sales unit
	Art.-No.	Art.-No.	ETA		d_o [mm]	h_2 [mm]	h_{ef} — > [mm]	l [mm]	M [mm]	U [mm]	T_{inst} [Nm]	[pcs]
Item	gvz	A4										
FH II-I 12/M6	520358	520360	■		12	85	67	78	M6	3-5	15	25
FH II-I 12/M8	520359	520361	■		12	85	67	78	M8	3-5	15	25
FH II-I 15/M10	519014	519018	■		15	85	76	90	M10	3-5	25	25
FH II-I 15/M12	519015	519019	■		15	85	76	90	M12	3-5	25	20

TECHNICAL DATA



High performance anchor **FH II-B** with hexagon nut and threaded bolt



Items to order only	zinc-plated steel	Approval		Drill hole diameter	Min. drill-hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	ETA	ICC	d_0 [mm]	h_2 [mm]	l [mm]	t_{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz									
FH II 10/10 B	503142	■	—	10	65	70	10	M 6	10	50
FH II 10/25 B	503143	■	—	10	80	85	25	M 6	10	50
FH II 10/50 B	503144	■	—	10	105	110	50	M 6	10	50
FH II 12/10 B	048773	■	▲	12	90	95	10	M 8	13	50
FH II 12/25 B	048774	■	▲	12	105	110	25	M 8	13	50
FH II 12/50 B	048775	■	▲	12	130	135	50	M 8	13	25
FH II 12/100 B	046832	■	▲	12	180	185	100	M 8	13	25
FH II 15/10 B	048776	■	▲	15	100	110	10	M 10	17	25
FH II 15/25 B	048777	■	▲	15	115	125	25	M 10	17	25
FH II 15/50 B	048778	■	▲	15	140	150	50	M 10	17	25
FH II 15/100 B	046835	■	▲	15	190	200	100	M 10	17	20
FH II 18/25 B	048779	■	▲	18	130	140	25	M 12	19	20
FH II 18/50 B	048780	■	▲	18	155	165	50	M 12	19	20
FH II 18/100 B	046841	■	▲	18	205	215	100	M 12	19	10
FH II 24/25 B	048886	■	▲	24	150	167	25	M 16	24	10
FH II 24/50 B	048887	■	▲	24	175	192	50	M 16	24	10
FH II 24/100 B	046842	■	▲	24	225	242	100	M 16	24	5
FH II 28/30 B	047547	■	▲	28	185	199	30	M 20	30	4
FH II 28/60 B	047548	■	▲	28	215	229	60	M 20	30	4
FH II 28/100 B	506630 ¹⁾	■	▲	28	255	271	100	M 20	30	4
FH II 32/30 B	047549	■	▲	32	210	253	30	M 24	36	4
FH II 32/60 B	047550	■	▲	32	240	283	60	M 24	36	4

1) Delivery time on request.

LOADS

High performance anchor **FH II - S / FH II - SK**

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered.

Type				Cracked concrete				Non-cracked concrete			
	Effective anchorage depth	Min. member thickness	Installation torque	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	h_{ef} [mm]	h_{min} [mm]	T_{inst} [Nm]	N_{perm} ³⁾ [kN]	V_{perm} ³⁾ [kN]	s_{min} ²⁾ [mm]	c_{min} ²⁾ [mm]	N_{perm} ³⁾ [kN]	V_{perm} ³⁾ [kN]	s_{min} ²⁾ [mm]	c_{min} ²⁾ [mm]
FH II 10 S	40	80	10,0	3,6	4,3	40	40	6,1	6,1	40	40
FH II 12 S / SK	60	120	22,5	5,7	15,9	50	50	11,2	18,9	60	60
FH II 15 S / SK	70	140	40,0	7,6	20,1	60	60	14,1	28,2	70	70
FH II 18 S / SK	80	160	80,0	11,9	24,5	70	70	17,2	34,4	80	80
FH II 24 S	100	200	160,0	17,1	34,3	80	80	24,0	48,1	100	100
FH II 28 S	125	250	180,0	24,0	47,9	100	100	33,6	67,2	120	120
FH II 32 S	150	300	200,0	31,5	63,0	120	120	44,2	88,4	160	180

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_f = 1,4$ 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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

High performance anchor FH II - S A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth	Min. member thickness	Installation torque	permissible tensile load	permissible shear load	min. spacing	min. edge distance	permissible tensile load	permissible shear load	min. spacing	min. edge distance
	h_{ef}	h_{min}	T_{inst}	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$	$N_{perm}^{3)}$	$V_{perm}^{3)}$	$s_{min}^{2)}$	$c_{min}^{2)}$
	[mm]	[mm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[kN]	[kN]	[mm]	[mm]
FH II 10 S A4	40	80	15,0	3,6	4,3	40	40	6,1	6,1	40	40
FH II 12 S A4 / SK A4	60	120	25,0	5,7	15,9	50	50	9,5	16,0	60	60
FH II 15 S A4 / SK A4	70	140	40,0	7,6	20,1	60	60	14,1	24,6	70	70
FH II 18 S A4 / SK A4	80	160	100,0	11,9	24,5	70	70	17,2	34,4	80	80
FH II 24 S A4	100	200	160,0	17,1	34,3	80	80	24,0	48,1	100	100

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

High performance anchor FH II - H

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FH II 10 H	40	80	10,0	3,6	4,3	40	40	6,1	6,1	40	40
FH II 12 H	60	120	22,5	5,7	15,4	50	50	11,2	15,4	60	60
FH II 15 H	70	140	40,0	7,6	20,1	60	60	14,1	23,4	70	70
FH II 18 H	80	160	80,0	11,9	24,5	70	70	17,2	34,4	80	80

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

High performance anchor FH II-I

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered..

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth h _{ef} [mm]	Min. fixture thickness h _{min} [mm]	Installation torque T _{inst} [Nm]	permissible tensile load N _{zul} ³⁾ [kN]	permissible shear load V _{zul} ³⁾ [kN]	min. spacing s _{min} ²⁾ [mm]	min. edge distance c _{min} ²⁾ [mm]	permissible tensile load N _{perm} ³⁾ [kN]	permissible shear load V _{perm} ³⁾ [kN]	min. spacing s _{min} ²⁾ [mm]	min. edge distance c _{min} ²⁾ [mm]
FH II-I 12/M6	60	125	15,0	4,3	4,3	50	50	7,1	4,3	60	60
FH II-I 12/M8	60	125	15,0	4,3 / 5,7 ⁵⁾	8,0	50	50	11,2	8,0	60	60
FH II-I 15/M10	70	150	25,0	5,7 / 7,6 ⁵⁾	12,4	60	60	14,1	12,4	70	70
FH II-I 15/M12	70	150	25,0	5,7 / 7,6 ⁵⁾	13,7	60	60	14,1	13,7	70	70

¹⁾ The required partial safety factors of resistance as well as the partial safety factor for load $\gamma_L = 1,4$ are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval or Design Software COMPUFIX.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ When the maximum torque T_{ix} is applied to the attachment, higher load levels can be achieved.

LOADS

High performance anchor FH II-I (A4)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth h_{ef} [mm]	Min. fixture thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	permissible tensile load $N_{zul}^{3)}$ [kN]	permissible shear load $V_{zul}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]	permissible tensile load $N_{perm}^{3)}$ [kN]	permissible shear load $V_{perm}^{3)}$ [kN]	min. spacing $s_{min}^{2)}$ [mm]	min. edge distance $c_{min}^{2)}$ [mm]
FH II-I 12/M6 (A4)	60	125	15,0	4,3	4,3	50	50	7,1	4,3	60	60
FH II-I 12/M8 (A4)	60	125	15,0	4,3 / 5,7 ⁶⁾	8,0	50	50	11,2	8,0	60	60
FH II-I 15/M10 (A4)	70	150	25,0	5,7 / 7,6 ⁶⁾	12,4	60	60	14,1	12,4	70	70
FH II-I 15/M12 (A4)	70	150	25,0	5,7 / 7,6 ⁶⁾	12,6	60	60	14,1	12,6	70	70

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load $\gamma_l = 1,4$ are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

High performance anchor FH II - B

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0025 has to be considered.

				Cracked concrete				Non-cracked concrete			
Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FH II 10 B	40	80	10,0	3,6	4,3	40	40	6,1	6,1	40	40
FH II 12 B	60	120	17,5	5,7	15,4	50	50	11,2	15,4	60	60
FH II 15 B	70	140	38,0	7,6	20,1	60	60	14,1	23,4	70	70
FH II 18 B	80	160	80,0	11,9	24,5	70	70	17,2	34,4	80	80
FH II 24 B	100	200	120,0	17,1	34,3	80	80	24,0	48,1	100	100
FH II 28 B	125	250	180,0	24,0	47,9	100	100	33,6	67,2	120	120
FH II 32 B	150	300	200,0	31,5	63,0	120	120	44,2	88,4	160	180

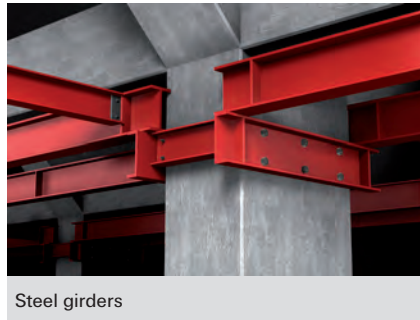
¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_l = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

The fixing system with the highest safety in cracked concrete



VERSIONS

- zinc-plated steel
- stainless steel
- highly corrosion-resistant steel - type FZA / FZA-D only

BUILDING MATERIALS

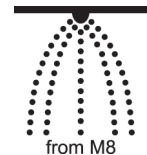
Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- This anchor uses the distinct ZYKON undercut technology to provide a positive fit and ensures maximum safety, even in large cracks.
- Because of the virtually expansion free installation small edge distances and axial spacing can be achieved.
- The FZA-D combination of threaded bolts and sleeve permits high shear load and therefore fewer fixing points.
- The FZA-I can be used for surface flush removal and reuse of the fixing point which makes installations very flexible.
- The special FZUB drill bit creates the undercut shape without having to change tools.
- The drill hole geometry is achieved with a low setting force so the overall energy required for installation is reduced.

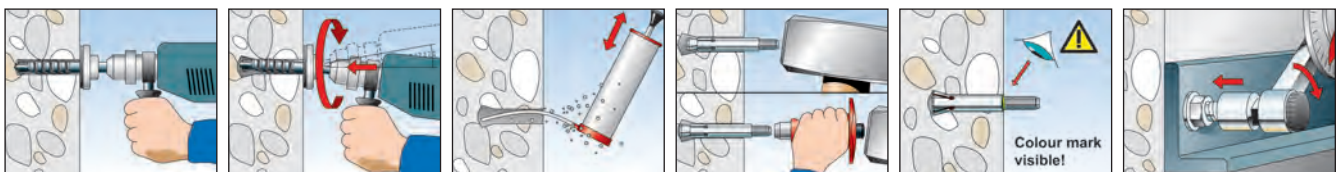
APPLICATIONS

- Steel constructions
- Guard rails
- Consoles
- Ladders
- Cable conduits
- Machines
- Staircases
- Gates
- Façades

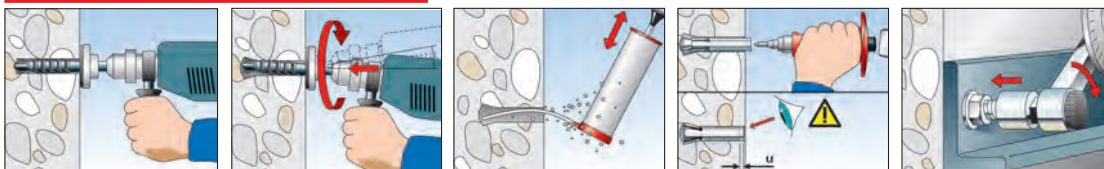
FUNCTIONING

- The FZA is suitable for pre-positioned installation, whereas the FZA-D is suitable for push-through installation.
- The FZA-I with internal thread is suitable for pre-positioned installation.
- The undercut drill hole is created using the special FZUB drill bit.
- Once the anchor has been placed in the drill hole, the expansion sleeve is driven over the cone using the FZE Plus setting tool, and the undercut drill hole is filled with a positive fit.

INSTALLATION - FZA / FZA-D



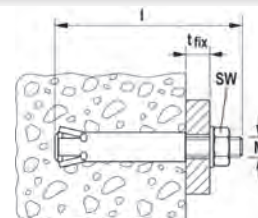
INSTALLATION - FZA-I



TECHNICAL DATA



ZYKON Bolt anchor **FZA**



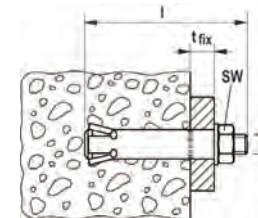
Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval	Required drill bit FZUB	Required setting tool FZE plus	Bolt length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA			l [mm]	t _{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz	A4	C								
FZA 10 x 40 M6/10	060712	060772	096214 1)	■	10 x 40	FZE 10 plus	60	10	M 6	10	25
FZA 10 x 40 M6/35	—	—	096361 1)	■	10 x 40	FZE 10 plus	85	35	M 6	10	25
FZA 12 x 40 M 8/15	060715	060775	096215 1)	■	12 x 40	FZE 12 plus	69	15	M 8	13	25
FZA 12 x 50 M 8/15	060716	060776	096227 1)	■	12 x 50	FZE 12 plus	79	15	M 8	13	20
FZA 12 x 50 M 8/50	—	060774	096362 1)	■	12 x 50	FZE 12 plus	114	50	M 8	13	20
FZA 14 x 40 M10/25	060718	—	—	■	14 x 40	FZE 14 plus	79	25	M 10	17	25
FZA 14 x 40 M10/25	—	060778	096228 1)	■	14 x 40	FZE 14 plus	79	25	M 10	17	20
FZA 14 x 60 M10/25	060719	060779	096216 1)	■	14 x 60	FZE 14 plus	102	25	M 10	17	10
FZA 14 x 60 M10/50	—	060766	096358 1)	■	14 x 60	FZE 14 plus	126	50	M 10	17	10
FZA 18 x 80 M12/25	060721	060781	096315 1)	■	18 x 80	FZE 18 plus	126	25	M 12	19	10
FZA 18 x 80 M12/55	—	060767	096359 1)	■	18 x 80	FZE 18 plus	156	55	M 12	19	10
FZA 22 x 100 M16/25	—	—	033800 1)	■	22 x 100	FZE 22 plus	151	25	M 16	24	10
FZA 22 x 100 M16/30	—	—	024523 1)	■	22 x 100	FZE 22 plus	156	30	M 16	24	10
FZA 22 x 100 M16/60	060724	060782	096364 1)	■	22 x 100	FZE 22 plus	184	60	M 16	24	10
FZA 22 x 125 M16/60	060725	060768	096360 1)	■	22 x 125	FZE 22 plus	209	60	M 16	24	6

1) Delivery time on request.

TECHNICAL DATA



ZYKON Through anchor **FZA-D**



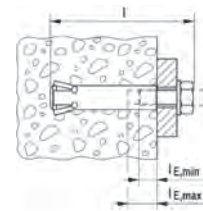
Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval	Required drill bit FZUB	Required setting tool FZE plus	Bolt length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA			l [mm]	t _{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz	A4	C								
FZA 12 x 50 M 8 D/10	060652	060664	—	■	12 x 50	FZE 12 plus	69	10	M 8	13	25
FZA 12 x 50 M 8 D/10	—	—	096319 1)	■	12 x 50	FZE 12 plus	69	10	M 8	13	20
FZA 12 x 60 M 8 D/10	060653	060665	—	■	12 x 60	FZE 12 plus	79	10	M 8	13	25
FZA 12 x 80 M 8 D/30	060654	060666	—	■	12 x 80	FZE 12 plus	99	30	M 8	13	25
FZA 12 x 80 M 8 D/30	—	—	096354 1)	■	12 x 80	FZE 12 plus	99	30	M 8	13	20
FZA 14 x 80 M10 D/20	060657	060669	096355 1)	■	14 x 80	FZE 14 plus	102	20	M 10	17	10
FZA 14 x 100 M 8 D/30	060658	060670	—	■	14 x 100	FZE 14 plus	126	40	M 10	17	10
FZA 18 x 100 M12 D/20	060684	060672	096356 1)	■	18 x 100	FZE 18 plus	126	20	M 12	19	10
FZA 18 x 130 M12 D/50	060685	060673	096357 1)	■	18 x 130	FZE 18 plus	156	50	M 12	19	10
FZA 22 x 125 M16 D/25	060663	060675	—	■	22 x 125	FZE 22 plus	156	25	M 16	24	10

1) Delivery time on request.

TECHNICAL DATA



ZYKON Internally-threaded anchor **FZA-I**



Items to order only	zinc-plated steel	stainless steel	Approval	Required drill bit FZUB	Required setting tool FZE plus	Internal thread	Min. bolt penetration	Max. bolt penetration	Sales unit
	Art.-No.	Art.-No.	ETA			M	E_{min} [mm]	E_{max} [mm]	[pcs]
Item	gvs	A4							
FZA 12 x 40 M6 I	060758	060783	■	12 x 40	FZE 12 plus	M 6	8	13	25
FZA 12 x 50 M6 I	—	060784	■	12 x 50	FZE 12 plus	M 6	8	13	25
FZA 14 x 60 M8 I	060760	060786	■	14 x 60	FZE 14 plus	M 8	11	17	20
FZA 18 x 80 M10 I	060761	060787	■	18 x 80	FZE 18 plus	M 10	13	21	10
FZA 22 x 100 M12 I	060763	060788	■	22 x 100	FZE 22 plus	M 12	15	25	10
FZA 22 x 125 M12 I	060769	060770	■	22 x 125	FZE 22 plus	M 12	15	25	10

ACCESSORIES



Drill bit **FZUB**

Items to order only		Fits anchor			Sales unit
Item	Art.-No.	bolt anchor	push-through anchor	internal thread anchor	[pcs]
FZUB 10 x 40	060622	FZA 10 x 40 M6	-	-	1
FZUB 12 x 40	060623	FZA 12 x 40 M8	-	FZA 12 x 40 M6 I	1
FZUB 12 x 50	060627	FZA 12 x 50 M8	FZA 12 x 50 M8 D/10	FZA 12 x 50 M6 I	1
FZUB 12 x 60	060625	-	FZA 12 x 60 M8 D/10	-	1
FZUB 12 x 80	060626	-	FZA 12 x 80 M8 D/30	-	1
FZUB 14 x 40	060624	FZA 14 x 40 M10	-	-	1
FZUB 14 x 60	060628	FZA 14 x 60 M10	-	FZA 14 x 60 M8 I	1
FZUB 14 x 80	060629	-	FZA 14 x 80 M10 D/20	-	1
FZUB 14 x 100	060630	-	FZA 14 x 100 M10 D/40	-	1
FZUB 18 x 80	060634	FZA 18 x 80 M12	-	FZA 18 x 80 M10 I	1
FZUB 18 x 100	060632	-	FZA 18 x 100 M12 D/20	-	1
FZUB 18 x 130	060633	-	FZA 18 x 130 M12 D/50	-	1
FZUB 22 x 100	060636	FZA 22 x 100 M16	-	FZA 22 x 100 M12 I	1
FZUB 22 x 125	060638	FZA 22 x 125 M16	FZA 22 x 125 M16 D/25	FZA 22 x 125 M12 I	1

ACCESSORIES



Setting tool **FZE plus**

Items to order only		Fits anchor			Sales unit
Item	Art.-No.	bolt anchor	push-through anchor	internal thread anchor	[pcs]
FZE 10 plus	044637 ¹⁾	FZA 10 x ... M6	-	-	1
FZE 12 plus	044638	FZA 12 x ... M8	FZA 12 x ... M8 D	FZA 12 x ... M6 I	1
FZE 14 plus	044639	FZA 14 x ... M10	FZA 14 x ... M10 D	FZA 14 x ... M8 I	1
FZE 18 plus	044640	FZA 18 x ... M12	FZA 18 x ... M12 D	FZA 18 x ... M10 I	1
FZE 22 plus	044641	FZA 22 x ... M16	FZA 22 x ... M16 D	FZA 22 x ... M12 I	1

1) Without centring pin.

LOADS

ZYKON undercut anchor FZA

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 10 x 40 M6	40	100	8,5	2,4	4,6	40	35	3,6	4,6	40	35
FZA 12 x 40 M8	40	100	20,0	2,4	5,6	40	40	3,6	7,9	40	40
FZA 14 x 40 M10	40	100	40,0	2,4	5,6	70	70	3,6	7,9	70	70
FZA 12 x 50 M8	50	110	20,0	4,3	7,9	50	45	5,7	8,4	50	45
FZA 14 x 60 M10	60	130	40,0	5,7	13,3	60	55	9,5	13,3	60	55
FZA 18 x 80 M12	80	160	60,0	9,5	19,3	80	70	14,3	19,3	80	70
FZA 22 x 100 M16	100	200	100,0	17,1	34,3	100	100	19,0	35,9	100	100
FZA 22 x 125 M16	125	250	100,0	19,0	35,9	125	125	19,0	35,9	125	125

LOADS

ZYKON undercut anchor FZA A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 10 x 40 M6 A4	40	100	8,5	2,4	3,2	40	35	3,6	3,2	40	35
FZA 12 x 40 M8 A4	40	100	20,0	2,4	5,6	40	40	3,6	5,9	40	40
FZA 14 x 40 M10 A4	40	100	40,0	2,4	5,6	70	70	3,6	7,9	70	70
FZA 12 x 50 M8 A4	50	110	20,0	4,3	5,9	50	45	5,7	5,9	50	45
FZA 14 x 60 M10 A4	60	130	40,0	5,7	9,3	60	55	9,5	9,3	60	55
FZA 18 x 80 M12 A4	80	160	60,0	9,5	13,5	80	70	14,3	13,5	80	70
FZA 22 x 100 M16 A4	100	200	100,0	17,1	25,2	100	100	19,0	25,2	100	100
FZA 22 x 125 M16 A4	125	250	100,0	19,0	25,2	125	125	19,0	25,2	125	125

LOADS

ZYKON undercut anchor FZA-D

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 12 x 50 M8 D	40	100	20,0	2,4	5,6	40	35	3,6	7,9	40	35
FZA 12 x 60 M8 D	50	110	20,0	4,3	7,9	50	45	5,7	8,4	50	45
FZA 12 x 80 M8 D	50	110	20,0	4,3	7,9	50	45	5,7	8,4	50	45
FZA 14 x 80 M10 D	60	130	40,0	5,7	13,3	60	55	9,5	13,3	60	55
FZA 14 x 100 M10 D	60	130	40,0	5,7	13,3	60	55	9,5	13,3	60	55
FZA 18 x 100 M12 D	80	160	60,0	9,5	19,3	80	70	14,3	19,3	80	70
FZA 18 x 130 M12 D	80	160	100,0	9,5	19,3	80	70	14,3	19,3	80	70
FZA 22 x 125 M16 D	100	200	100,0	17,1	34,3	100	100	19,0	35,9	100	100

LOADS

ZYKON undercut anchor FZA-D A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 12 x 50 M8 D A4	40	100	20,0	2,4	5,6	40	35	3,6	5,9	40	35
FZA 12 x 60 M8 D A4	50	110	20,0	4,3	5,9	50	45	5,7	5,9	50	45
FZA 12 x 80 M8 D A4	50	110	20,0	4,3	5,9	50	45	5,7	5,9	50	45
FZA 14 x 80 M10 D A4	60	130	40,0	5,7	9,3	60	55	9,5	9,3	60	55
FZA 14 x 100 M10 D A4	60	130	40,0	5,7	9,3	60	55	9,5	9,3	60	55
FZA 18 x 100 M12 D A4	80	160	60,0	9,5	13,5	80	70	14,3	13,5	80	70
FZA 18 x 130 M12 D A4	80	160	60,0	9,5	13,5	80	70	14,3	13,5	80	70
FZA 22 x 125 M16 D A4	100	200	100,0	17,1	25,2	100	100	19,0	25,2	100	100

LOADS

ZYKON undercut anchor FZA-I (screw quality 8.8)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{zul}^{3)}$ [kN]	$V_{zul}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{zul}^{3)}$ [kN]	$V_{zul}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 12 x 40 M6 I	40	100	8,5	2,4	4,1	40	35	3,6	4,1	40	35
FZA 12 x 50 M6 I	50	110	8,5	4,3	4,1	50	45	5,7	4,1	50	45
FZA 14 x 60 M8 I	60	130	15,0	5,7	5,4	60	55	9,5	5,4	60	55
FZA 18 x 80 M10 I	80	160	30,0	9,5	5,6	80	70	9,6	5,6	80	70
FZA 22 x 100 M12 I	100	200	60,0	17,1	13,2	100	100	19,0	13,2	100	100
FZA 22 x 125 M12 I	125	250	60,0	19,0	13,2	125	125	19,0	13,2	125	125

LOADS

ZYKON undercut anchor FZA-I A4 (screw quality A4-70)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 98/0004 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZA 12 x 40 M6 I A4	40	100	8,5	2,4	3,2	40	35	3,6	3,2	40	35
FZA 12 x 50 M6 I A4	50	110	8,5	4,3	3,2	50	45	5,4	3,2	50	45
FZA 14 x 60 M8 I A4	60	130	15,0	5,7	4,3	60	55	7,1	4,3	60	55
FZA 18 x 80 M10 I A4	80	160	30,0	9,0	5,4	80	70	9,0	5,4	80	70
FZA 22 x 100 M12 I A4	100	200	60,0	17,1	12,7	100	100	19,0	12,7	100	100
FZA 22 x 125 M12 I A4	125	250	60,0	19,0	12,7	125	125	19,0	12,7	125	125

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

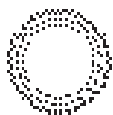
³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

The internally threaded anchor with shallow anchoring depth for individual fixings in cracked concrete



- Anchor shape before expansion



- Anchor shape after correct



The anchor is set correctly when the anchor sleeve is positioned flush with the surface of the concrete and the 4 imprints are visible



Emergency exit signs in tunnels



Air conditioning units

VERSIONS

- zinc-plated steel
- stainless steel
- highly corrosion-resistant steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The combination of hammerset and ZYKON undercut anchor allows for individual fixings in cracked concrete.
- The special ZYKON undercut technology reduces the energy required for installation.
- The special FZUB drill bit creates the undercut shape without having to change tools.
- The embossing that is applied when expanding the anchor secures the simple control of the anchoring.
- The drill hole geometry is achieved with a low setting force so the overall energy required for installation is reduced.

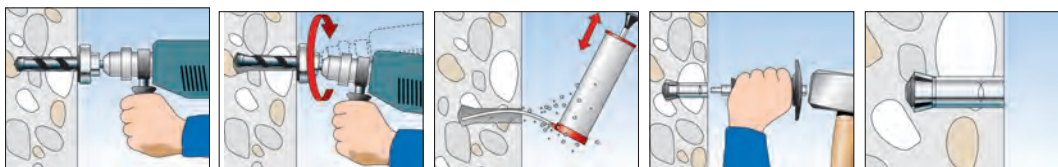
APPLICATIONS

- Pipes
- Ventilation systems
- Sprinkler systems
- Cable conduits
- Suspended ceilings

FUNCTIONING

- The FZEA II is suitable for pre-positioned installation.
- The undercut drill hole is created using the special FZUB drill bit
- Once the anchor has been placed in the drill hole, the expansion sleeve is expanded and splayed open by driving in the internal expansion pin with the FZED Plus setting tool. The undercut drill hole is now filled with a positive fit.

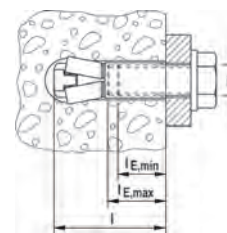
INSTALLATION



TECHNICAL DATA



Zykon-Hammerset anchor **FZEA II**



Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval	Required drill bit FZUB	Required setting tool FZED plus	Length I [mm]	Internal thread M	Max. bolt penetration I _{E,max} [mm]	Min. bolt penetration I _{E,min} [mm]	Sales unit [pcs]
Item	Art.-No.	Art.-No.	Art.-No.	ETA							
	gvz	A4	C								
FZEA II 10 x 40 M 8	047303	047306	047309	■	10 x 40	FZED 10 plus	43	M 8	17	11	100
FZEA II 12 x 40 M10	047304	047307	047310	■	12 x 40	FZED 12 plus	43	M 10	19	13	100
FZEA II 14 x 40 M12	047305	047308	047311	■	14 x 40	FZED 14 plus	43	M 12	21	15	50

ACCESSORIES



Drill bit **FZUB**



Setting tool **FZED plus**

Items to Order only	Art.-No.	Fits anchor	Sales unit [pcs]
Item			
FZUB 10 x 40	060622	FZEA II 10 x 40	1
FZUB 12 x 40	060623	FZEA II 12 x 40	1
FZUB 14 x 40	060624	FZEA II 14 x 40	1
FZED 10 plus	044642	FZEA II 10 x 40	1
FZED 12 plus	044643	FZEA II 12 x 40	1
FZED 14 plus	044644	FZEA II 14 x 40	1

LOADS

ZYKON hammerset anchor FZEA II (screw quality 5.8)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 06/0271 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZEA II 10 x 40 M8	40	80	10,0	1,6	4,7	40	40	3,6	4,7	40	40
FZEA II 12 x 40 M10	40	80	15,0	3,0	5,6	45	45	3,6	7,8	45	45
FZEA II 14 x 40 M12	40	80	20,0	3,6	5,6	50	50	3,6	7,9	50	50

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

ZYKON hammerset anchor FZEA II A4 (screw quality A4-70)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 06/0271 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZEA II 10 x 40 M8 A4	40	80	15,0	1,6	5,6	40	40	3,6	5,7	40	40
FZEA II 12 x 40 M10 A4	40	80	20,0	3,0	5,6	45	45	3,6	7,9	45	45
FZEA II 14 x 40 M12 A4	40	80	40,0	3,6	5,6	50	50	3,6	7,9	50	50

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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

ZYKON hammerset anchor FZEA II C (screw quality: material 1.4529, strength 700 N/mm²)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 06/0271 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FZEA II 10 x 40 M8 C	40	80	15,0	1,6	5,6	40	40	3,6	5,7	40	40
FZEA II 12 x 40 M10 C	40	80	20,0	3,0	5,6	45	45	3,6	7,9	45	45
FZEA II 14 x 40 M12 C	40	80	40,0	3,6	5,6	50	50	3,6	7,9	50	50

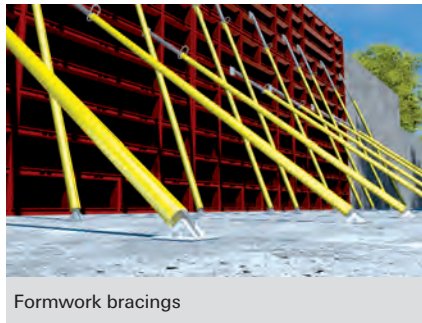
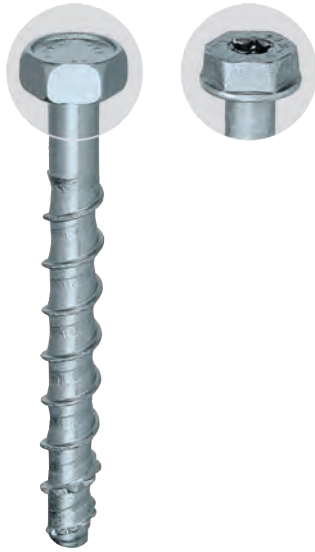
¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

The fully removable fixing in cracked concrete



Formwork bracing



Protective barriers

VERSIONS

- zinc-plated steel
- stainless steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The self-tapping concrete screw enables full removal and is ideally suited to temporary fixings.
- The FBS can be set and installed in one go, thereby saving on installation time.
- When combined with a tangential impact wrench, the screw principle allows for a quick and easy installation.
- The head embossing offers a simple control of the anchoring, thus saving time.

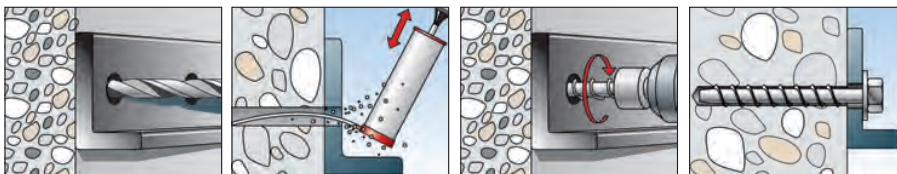
APPLICATIONS

- Guard rails
- Consoles
- Metal profiles
- Ladders
- Protection boards
- Gates
- Façades
- Window elements
- Temporary fixings

FUNCTIONING

- The FBS is suitable for push-through installation.
- When the concrete screw is screwed into the drill hole, the thread taps into the concrete with a positive fit.
- Please note the power output information to ensure that the best results are achieved with a tangential impact wrench (incl. nuts fitting tangential impact wrenches) (see table).
- Use FBS A4 for external applications (including temporary ones) and those in a damp environment.

INSTALLATION



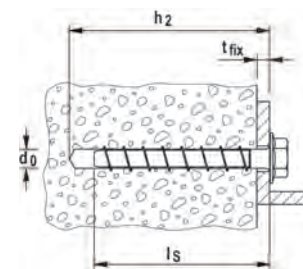
TECHNICAL DATA



Concrete screw **FBS-US** with hexagon head and forged washer



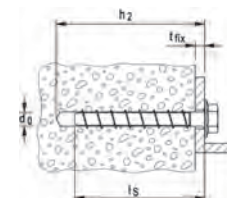
Concrete screw **FBS-S** with hexagon head



Item to order only	zinc-plated steel	stainless steel	Approval	Drill hole diameter	Min. drill-hole depth for through fixings	Screw length	Max. fixture thickness	Actuation	Sales unit
	Art.-No.	Art.-No.	ETA	d_0 [mm]	h_2 [mm]	l_s [mm]	t_{fix} [mm]		[pcs]
Item	gvz	A4							
FBS 8x70 US	066956	—	■	8	90	80	5	T40/SW13	100
FBS 8x110 US	066957	—	■	8	110	100	25	T40/SW13	100
FBS 8x90 S	066958	—	■	8	100	90	15	SW 16	100
FBS 10x90 S	067062	—	■	10	100	90	5	SW 18	50
FBS 10x100 S	067063	—	■	10	110	100	15	SW 18	50
FBS 10x100 A4 S	—	047465	—	10	110	100	15	SW 17	50
FBS 10x120 S	067168	—	■	10	120	110	25	SW 18	50



Concrete screw **FBS** with forged washer



Item to order only	zinc-plated steel	Approval	Drill diameter	Drill hole diameter in object	Screw diameter	Screw length (under head)	Drill depth	Screw-in depth	Max. useable length	Recommended nominal torque of tangential impact wrench	Maximum tightening torque with torque wrench resp. ratch	Width across nut	Sales unit
	Art.-No.	ETA	d_0 [mm]	d_i [mm]	d_s [mm]	l_u [mm]	h_1 [mm]	h_{nom}	[pcs]	[Nm]	[Nm]	SW [mm]	[pcs]
Item	gvz												
FBS 8x70	517875	■	8	12	8	70	75	65	5	250	20	13	50
FBS 8x80	517876	■	8	12	8	80	75	65	15	250	20	13	50
FBS 8x90	517877	■	8	12	8	90	75	65	25	250	20	13	50
FBS 8x110	517878	■	8	12	8	110	75	65	45	250	20	13	50
FBS 8x130	517880	■	8	12	8	130	75	65	65	250	20	13	50
FBS 10x70	517881		10	14	10	70	75	65	5	300	40	15	50
FBS 10x90	517883	■	10	14	10	90	95	85	5	300	40	15	50
FBS 10x100	517884	■	10	14	10	100	95	85	15	300	40	15	50
FBS 10x120	517885	■	10	14	10	120	95	85	35	300	40	15	50
FBS 10x140	517887	■	10	14	10	140	95	85	55	300	40	15	50
FBS 10x160	517891	■	10	14	10	160	95	85	75	300	40	15	50
FBS 10x200	517893	■	10	14	10	200	95	85	115	300	40	15	50
FBS 12x90	517895		12	16	12	90	95	85	5	450	60	17	20
FBS 12x110	517898	■	12	16	12	110	110	100	10	450	60	17	20
FBS 12x130	517900	■	12	16	12	130	110	100	30	450	60	17	20
FBS 12x150	517903	■	12	16	12	150	110	100	50	450	60	17	20
FBS 14x110	517905		14	18	14	110	110	100	10	450	80	21	20
FBS 14x135	517908	■	14	18	14	135	135	125	10	450	80	21	8
FBS 14x160	517910	■	14	18	14	160	170	125	35	450	80	21	8

INSTALLATION TORQUE OF CONCRETE SCREWS

Concrete screw	recommended nominal torque of the tangential impact wrench*) [Nm]	maximum tightening torque with torque wrench resp. ratch ≤ [Nm]
FBS 8	200	40
FBS 10	300	40

*) Use nuts (black) which fit percussion power screwdrivers!

The conversion of nominal output into effective tightening torque varies from machine to machine - always therefore use torque control.

LOADS

Concrete screw FBS

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 11/0095 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FBS 8	51	120	-	4,3	6,2	50	50	5,7	8,6	50	50
FBS 10	68	130	-	7,6	16,2	70	70	13,5	16,2	70	70

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_f = 1,4$ 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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

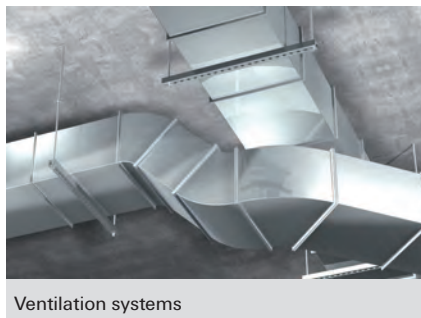
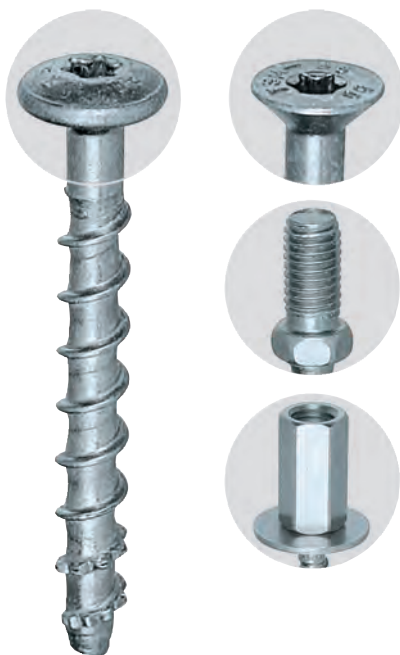
Concrete screw FBS A4

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 11/0095 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Cracked concrete				Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FBS 10 A4	68	130	-	7,6	19,0	70	70	13,5	19,0	70	70

The screw solution for multiple fixings



VERSIONS

- zinc-plated steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked, for multiple fixings of non-structural applications

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The concrete screw has been approved for the multiple fixing of non-load bearing systems and which makes it ideal for fixing pipelines, cable conduits etc.
- The FBS can be set and installed in one go, saving valuable installation time.
- When combined with a tangential impact wrench, the screw design allows for a quick and easy installation.
- A range of head shapes allows for the fixing of wide-ranging attachments, and for the ideal adaptation to suit the intended use.

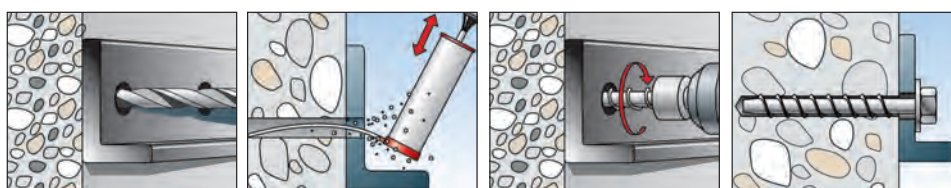
APPLICATIONS

- Pipes
- Ventilation systems
- Sprinkler systems
- Cable conduits
- Wire hangers
- Punched tapes
- Ceilings
- Temporary internal fixings

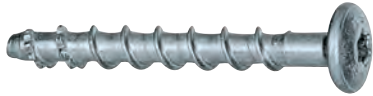
FUNCTIONING

- The FBS type SK and type P are suitable for push-through installation; whilst the FBS type M8 and type M8/M10 I are suitable for pre-positioned installation.
- When the concrete screw is screwed into the drill hole, the thread taps into the concrete making a positive fit.
- Please note the power output information to ensure that the best results are achieved with a tangential impact wrench (incl. nuts fitting tangential impact wrenches - see table).
- **Head shapes for flexible design solutions:**
 - Countersunk head - type SK for surface flush fixings.
 - Panhead - type P.
 - Bushing with internal thread - type M8/M10-I for suspended items.
 - Threaded bolts - type M8.

INSTALLATION



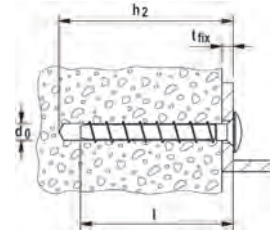
TECHNICAL DATA



Concrete screw **FBS-P**, panhead



Concrete screw **FBS-SK**, countersunk head



Items to order only	zinc-plated steel	Approval	Drill hole diameter	Drill hole diameter in object	Min. Drill-hole depth	Anchor length	Max. fixture thickness	Width across nut	Sales unit
	Art.-No.	ETA	d_0 [mm]		h_2 [mm]	l [mm]	t_{fix} [mm]		[pcs]
Item	gvz								
FBS 5/5 P	066774	■	5	7	65	55	5	T30	100
FBS 6/5 P	066939	■	6	8	65	60	5	T 30	100
FBS 6/25 P	066948	■	6	8	85	80	25	T 30	100
FBS 6x60 SK	066935	■	6	8	65	60	5	T 30	100

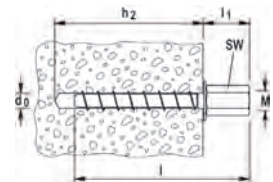
TECHNICAL DATA



Concrete screw **FBS-M8**, outside diameter M8



Concrete screw **FBS-M8/M10**,
internal thread M8/M10



	zinc-plated steel	Approval	Drill hole diameter	Min. drill hole depth	Anchor length	Projection length	Thread	Width across nut	Sales unit
	Art.-No.	ETA	d_0 [mm]	h_2 [mm]	l [mm]	l_1 [mm]	M	○ SW [mm]	[pcs]
Item	gvz								
FBS 6x55 M8	066949	■	6	60	75	19	M 8	10	100
FBS 6x55 M8/M10	066950	■	6	60	83	26	M8 + M10	13	100

INSTALLATION TORQUE OF CONCRETE SCREWS

Concrete screw	Recommended nominal torque of the tangential impact wrench ^{*)}	Maximum tightening torque with torque wrench resp. ratch ≤
	[Nm]	[Nm]
FBS 6	150	15

^{*)} Use nuts (black) which fit percussion power screwdrivers!

The conversion of nominal output into effective tightening torque varies from machine to machine - always therefore use torque control.

LOADS

Concrete screw FBS

Highest permissible loads for a single anchor¹⁾ for multiple use for non-structural applications in concrete C20/25⁴⁾.

For the design the complete approval ETA - 11/0093 has to be considered.

				Cracked concrete				Non-cracked concrete			
Typ	Effective anchorage depth	Minimum member thickness	Installation torque	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance	Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
	h_{ef} [mm]	h_{min} [mm]	T_{inst} [Nm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]	$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
FBS 6	44	100	-	3,6	3,3	40	40	3,6	3,3	40	40

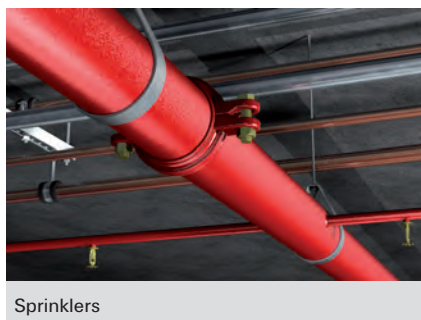
¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$. Accurate data see approval.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

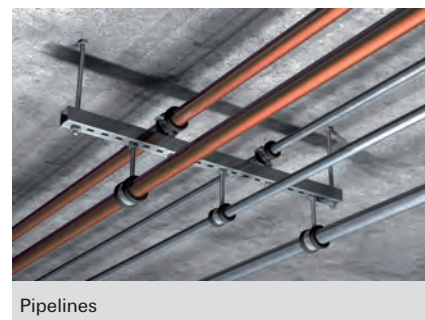
³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

The internally threaded anchor with rim for simple hammerset installation



Sprinklers



Pipelines

VERSIONS

- zinc-plated steel
- stainless steel

BUILDING MATERIALS

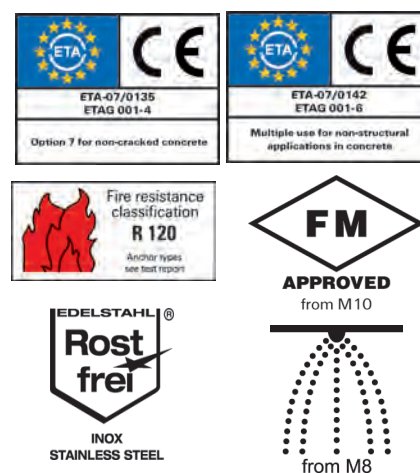
Approved for:

- Concrete C20/25 to C50/60, cracked, for the multiple fixings of non-load-bearing systems
- Concrete C20/25 to C50/60, non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPROVALS



ADVANTAGES

- The embossed rim prevents the anchor sleeve from slipping, ensuring a trouble free hammerset installation.
- The metric internal thread means that it is possible to use standard screws or threaded rods to suit the intended use.
- The EA II S-SDS machine setting tool allows for effortless installation, particularly for a series of installations.
- The embossing that is applied when the anchor is expanded with the EAW H Plus setting tool offers control of the anchoring and provides increased safety.

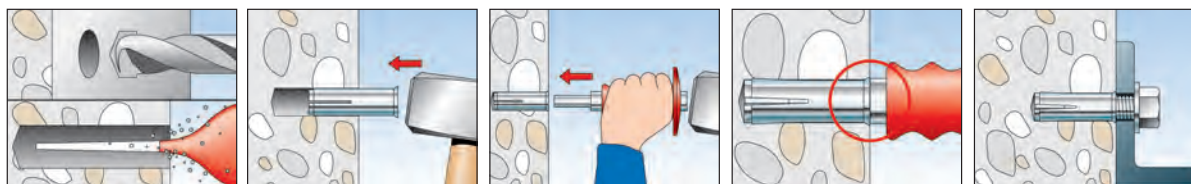
APPLICATIONS

- Pipelines and ventilation systems
- Sprinkler systems
- Cable conduits and wires
- Gratings
- Steel constructions
- Machines
- Consoles
- Shuttering props

FUNCTIONING

- The EA II is suitable for pre-positioned installation.
- Position the hammerset anchor in the drill hole and drive in flush to the surface of the anchor base using the hammer.
- The sleeve is then expanded by driving in the internal bolt with the EAW H Plus setting tool (alternative: EA II-SDS machine setting tool), and expanded against the drill hole wall.
- The setting tools must sit on the rim of the anchor to ensure correct expansion.

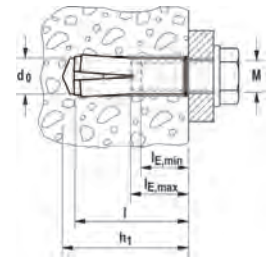
INSTALLATION



TECHNICAL DATA



Hammerset anchor **EA II**. Not suitable for diamond drilling appliances and diamond saws.



Items to order only	zinc-plated steel	stainless steel	Approval	Drill hole diameter	Min. Drill hole depth for pre-positioned installation	Anchor length	Internal thread	Min. bolt penetration	Max. bolt penetration	Sales unit
	Art.-No.	Art.-No.	ETA	d_0 [mm]	h_1 [mm]	l [mm]	M	l_{Emin} [mm]	l_{Emax} [mm]	[pcs]
Item	gvz	A4								
EA II M 6	048264	048410	■	8	32	30	M 6	6	13	100
EA II M 8	048284	048411	■	10	33	30	M 8	8	13	100
EA II M 8 x 40	048323	048412	■	10	43	40	M 8	8	13	50
EA II M 10 x 30	048332	—	■	12	33	30	M 10	10	13	50
EA II M 10	048339	048414	■	12	43	40	M 10	10	17	50
EA II M 12	048406	048415	■	15	54	50	M 12	12	22	25
EA II M 16	048408	048416	■	20	70	65	M 16	16	28	20
EA II M 20	048409	048417	■	25	85	80	M 20	20	34	10

Associated setting tool for manual installation (EAW H plus), for installation with hammer drill (EA II S-SDS)

ACCESSORIES



Setting tool **EAW H Plus** with hand impact protection for your safety and embossing tool.



Setting tool **EA-ST**

Items to order only	Art.-No.	Fits	Sales unit
Item			[pcs]
EAW H 6 Plus	044630	EA II M 6	1
EAW H 8 Plus	044631	EA II M 8	1
EAW H 8 x 40 Plus	044632	EA II M 8 x 40	1
EAW H 10 Plus	044633	EA II M 10	1
EAW H 10 x 30 plus	048487	EA II M 10 x 30	1
EAW H 12 Plus	044634	EA II M 12, EA II M 12 D	1
EAW H 16 Plus	044635	EA II M 16	1
EAW H 20 Plus	044636	EA II M 20	1
EA-ST 12	504585	EA II M 6	1

ACCESSORIES



Machine setting tool **EA II S-SDS**

Items to order only	Art.-No.	Tool holder	Fits	Sales unit
Item				[pcs]
EA II S-SDS 6	048065	SDS plus	EA II M 6	1
EA II S-SDS 8	048066	SDS plus	EA II M 8	1
EA II S-SDS 8 x 40	048067	SDS plus	EA II M 8 x 40	1
EA II S-SDS 10 x 30	048068 1)	SDS plus	EA II M 10 x 30	1
EA II S-SDS 10	048070	SDS plus	EA II M 10	1
EA II S-SDS 12	048071	SDS plus	EA II M 12 D / EA II M 12 / EA M 12 N D	1
EA II S-SDS-M 16	048072 1)	SDS max	EA II M 16	1
EA II S-SDS-M 20	048073 1)	SDS max	EA II M 20	1

1) Delivery time on request.

LOADS - MULTIPLE USE , CRACKED CONCRETE

Hammerset anchor EA II (screw quality 5.8) / EA II A4 (screw quality A4 -70)

Highest permissible loads¹⁾ for a single anchor for **multiple use** for non-structural applications in concrete C20/25 up to C50/60. For the design the complete approval ETA - 07/0142 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque moment $T_{inst,max}$ [Nm]	Cracked or Non-cracked concrete		
				Permissible load	Min. spacing	Min. edge distance
				$F_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
EA II M6 / A4	30	100	4,0	1,0	65	115
EA II M8 / A4	30	100	8,0	1,7	95	140
EA II M8 x 40 / A4	40	100	8,0	1,7	95	140
EA II M10 x 30 / A4	30	120	15,0	1,7	85	140
EA II M10 / A4	40	120	15,0	2,5	95	160
EA II M12 / A4	50	120	35,0	3,6	145	200

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.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

LOADS - SINGLE ANCHOR, NON-CRACKED CONCRETE

Hammerset anchor EA II (screw quality 8.8) / EA II A4 (screw quality A4 -70)

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾

For the design the complete approval ETA - 07/0135 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque moment $T_{inst,max}$ [Nm]	Non-cracked concrete			
				Permissible tensile load	Permissible shear load	Min. spacing	Min. edge distance
				$N_{perm}^{3)}$ [kN]	$V_{perm}^{3)}$ [kN]	$s_{min}^{2)}$ [mm]	$c_{min}^{2)}$ [mm]
EA II M6 ⁵⁾ / A4 ⁵⁾	30	100	4,0	4,0	3,9	65	115
EA II M8 ⁵⁾ / A4 ⁵⁾	30	100	8,0	4,0	4,0	95	140
EA II M8 x 40	40	100	8,0	6,1	4,9	95	140
EA II M10 x 30 ⁵⁾ / A4 ⁵⁾	30	120	15,0	4,0	4,0	85	140
EA II M10 / A4	40	120	15,0	6,1	6,1	95	160
EA II M12 / A4	50	120	35,0	8,5	8,5	145	200
EA II M12D / A4	50	120	35,0	8,5	8,5	145	200
EA II M16 / A4	65	160	60,0	12,6	18,3	180	240
EA II M20 / D A4	80	200	120,0	17,2	29,1	190	280

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.

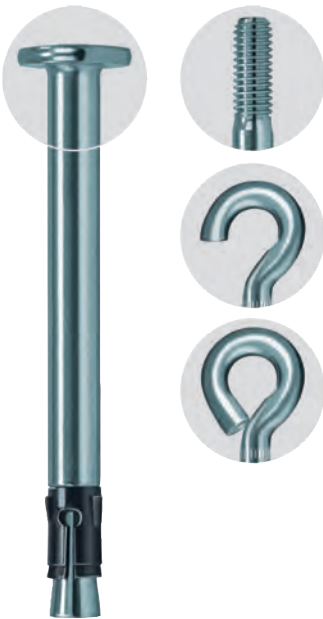
²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

⁵⁾ Only for multiple use for non-structural applications.

The hammer-set nail anchor for multiple fixings



VERSIONS

- zinc-plated steel
- stainless steel
- highly corrosion-resistant steel

BUILDING MATERIALS

Approved for:

- Concrete C12/15 to C50/60, cracked, for multiple fixings of non-structural applications

Also suitable for:

- Solid sand-lime brick
- Natural stone with dense structure
- Prestressed hollow-core concrete slabs

APPROVALS



ADVANTAGES

- The special design principle allows for a simple hammer-set installation and a short processing time.
- The extremely short anchor depth prevents reinforcement hits, and creates conditions for a trouble-free installation.
- The expansion clip ensures a firm hold when placed in the drill hole, and prevents it falling out during overhead installations.
- A range of different head shapes allows for the fixing of wide-ranging fixtures and for the ideal adaptation to suit the intended use.

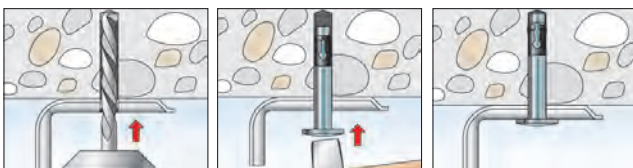
APPLICATIONS

- Fire protection plates
- Fire protection boards
- Ventilation systems
- Wire and nonious hangers
- Mounting rails
- Metal clamps
- Sub-structures made of wood or metal

FUNCTIONING

- The FNA II with nail head is suitable for push-through installation. The FNA II M6 is suitable for pre-positioned and push-through installation. The FNA II OE and H are suitable for pre-positioned installation.
- The installed FNA II nail anchor expands automatically under load. The cone is pulled into the expansion clip and expands it against the drill hole wall.
- Available setting tools:
FNA S-SBO to slip onto the drill.
FNA S-SDS for series installation with a drilling hammer.
FNA S-H for the manual installation of mounting rails.

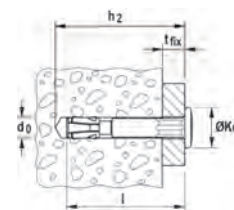
INSTALLATION



TECHNICAL DATA



Nail anchor **FNA II** with nail head



Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval	Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	KD head-Ø	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	d ₀ [mm]	h ₂ [mm]	l [mm]	t _{fix} [mm]	[mm]	[pcs]
Item	gvz	A4	C							
FNA II 6 x 25/5	044121 ¹⁾	—	—	■	6	40	35	5	13	100
FNA II 6 x 30/5	044115 ¹⁾	044122	—	■	6	45	40	5	13	100
FNA II 6 x 30/5	—	—	044124	■	6	45	40	5	13	25
FNA II 6 x 30/20	—	—	506147	■	6	60	55	20	13	50
FNA II 6 x 30/30	044116	044123	—	■	6	70	65	30	13	50
FNA II 6 x 30/30	—	—	044125	■	6	70	65	30	13	25
FNA II 6 x 30/50	044117	046024	500569	■	6	90	85	50	13	50
FNA II 6 x 30/75	044118	—	500573 ²⁾	■	6	115	110	75	13	50
FNA II 6 x 30/100	044119	—	500574 ²⁾	■	6	140	135	100	13	50
FNA II 6 x 30/120	044120	—	500575 ²⁾	■	6	160	155	120	13	50

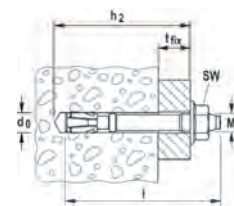
¹⁾ with hexagon below the nail head for anti-rotation lock of hole and wire hangers (for example) and centring for optional setting tool FNA-S

²⁾ On request.

TECHNICAL DATA



Nail anchor **FNA II M6** with thread and flange nut

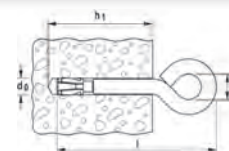


Items to order only	zinc-plated steel	stainless steel	highly corrosion resistant steel	Approval	Drill hole diameter	Min. drill hole depth for through fixings	Anchor length	Max. fixture thickness	Thread	Width across nut	Sales unit
	Art.-No.	Art.-No.	Art.-No.	ETA	d ₀ [mm]	h ₂ [mm]	l [mm]	t _{fix} [mm]	M	○ SW [mm]	[pcs]
Item	gvz	A4	C								
FNA II 6 x 25 M6/5	044111	—	—	■	6	40	45	5	M 6	10	100
FNA II 6 x 30 M6/5	044109	—	—	■	6	45	50	5	M 6	10	100
FNA II 6 x 30 M6/5	—	044112 ²⁾	—	■	6	45	50	5	M 6	10	50
FNA II 6 x 30 M6/5	—	—	044113 ²⁾	■	6	45	50	5	M 6	10	25
FNA II 6 x 30 M6 x 41	044110 ¹⁾	—	—	■	6	40	41	—	M 6	10	100
FNA II 6 x 30 M6/10	046022	—	—	■	6	45	55	10	M 6	10	100
FNA II 6 x 30 M8/5	044114	—	—	■	6	45	51	5	M 8	13	50

¹⁾ without nut; e.g. for fixing of pipe clamps

²⁾ with nut and washer (no flange nut)

TECHNICAL DATA



Nail anchor **FNA II-H** with hook Nail anchor **FNA II-OE** with eye

Items to order only	zinc-plated steel	Approval	Drill hole diameter	Anchor l length	Min. drill hole depth	Inner diameter of the hook/eye	Sales unit
	Art.-No.	ETA	d_0 [mm]	l [mm]	h_1 [mm]	$\varnothing$ [mm]	[pcs]
Item	gvz						
FNA II 6 x 25 H	044126	—	6	54	35	10	50
FNA II 6 x 25 OE	044127	■	6	54	35	10	50

TECHNICAL DATA



Machine setting tool **FNA S-SDS**



Machine setting tool **FNA S-SBO** for mounting on the drill bit (drill-Ø 6mm)



Hand tool **FNA S-H**

Items to order only		Use	Description	Sales unit
Item	Art.-No.			[pcs]
FNA S-SDS	061547	for all FNA II with nail head	The ideal setting tool for the serial installation with SDS-plus adapter for driving in FNA II with nail head using a hammer drill.	1
FNA S-SBO	061548	for all FNA II with nail head	For a power saving and fast installation to be placed on the drill.	1
FNA S-H	095990	for FNA II with metric thread M6	E.g. for the fixing of installation of mounting rails. Chuck with outer diameter of 15mm for the installation of FNA II M6 by hand.	1

LOADS

Nail anchor FNA II

Highest permissible loads¹⁾ for a single anchor for multiple use for non-structural applications in concrete C20/25 up to C50/60⁴⁾.
For the design the complete approval ETA - 06/0175 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque moment $T_{inst,max}$ [Nm]	Cracked or Non-cracked concrete		
				Permissible load $F_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FNA II 6 x 25	25	80	-	1,4	100	50
FNA II 6 x 30	30	80	-	2,4	100	50
FNA II 6 x 25 M6	25	80	4,0	1,4	100	50
FNA II 6 x 30 M6	30	80	4,0	2,4	100	50
FNA II 6 x 30 M8	30	80	4,0	2,4	100	50
FNA II 6 x 25 OE	25	80	-	0,7	100	50

LOADS

Nail anchor FNA II A4 / FNA II C

Highest permissible loads¹⁾ for a single anchor for multiple use for non-structural applications in concrete C20/25 up to C50/60⁴⁾.
For the design the complete approval ETA - 06/0175 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. member thickness h_{min} [mm]	Maximum torque moment $T_{inst,max}$ [Nm]	Cracked or Non-cracked concrete		
				Permissible load $F_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
FNA II 6 x 30 A4 / C	30	80	-	2,4	100	50
FNA II 6 x 30 M6 A4 / C	30	80	4,0	2,4	100	50

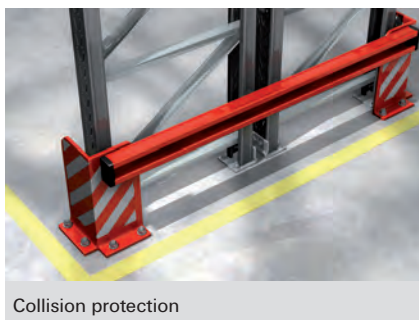
¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load. The combination of the given min. spacing and min. edge distance is not possible. One of them has to be increased according approval.

³⁾ Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ Loads for concrete strength class C12/15 see approval.

The installation-friendly push-through anchor for fixings in non-cracked concrete



FUNCTIONING

- The TA M is suitable for push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The hexagonal head of the TA M BP is tightened until it breaks off.

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, non-cracked

Also suitable for:

- Concrete C12/15
- Natural stone with dense structure

APPLICATIONS

- Steel constructions
- Hand-rails
- Consoles
- Ladders
- Cable conduits
- Machines
- Staircases
- Gates
- Façades

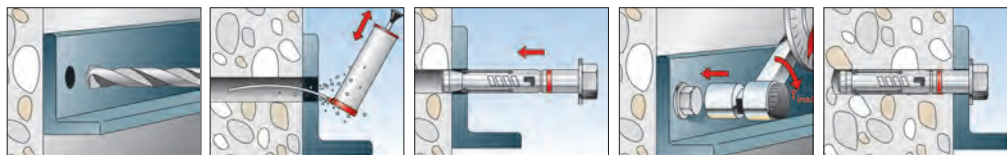
ADVANTAGES

- The optimised geometry minimises setting energy and enables the anchor to be used in extremely narrow spaces. The TA M BP version of the TA M anchor has a twist-off head which prevents the dismantling of the fixture. Ideal for use as an anti-theft deterrent and break-in protection.

VERSIONS

- zinc-plated steel

INSTALLATION



TECHNICAL DATA



Heavy-duty anchor **TA M BP**
with twist-off head

	zinc-plated steel	Drill hole diameter d_o [mm]	Min. drill-hole depth for through fixings h_2 [mm]	Anchor length l [mm]	Max. fixture thickness t_{fix} [mm]	Thread M	Width across nut $\bigcirc$ SW [mm]	Sales unit [pcs]
Item	Art.-No.	gvz						
TA M8 BP	090265	12	95	84	25	M 8	13	50

LOADS

Heavy-duty anchor TA M BP

Highest permissible loads for a single anchor¹⁾ in concrete C20/25⁴⁾ For the design the complete approval ETA - 04/0003 has to be considered.

Type	Effective anchorage depth h_{ef} [mm]	Min. substrate thickness h_{min} [mm]	Installation torque T_{inst} [Nm]	Non-cracked concrete			
				Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
TA M6 BP	40	100	10,0	3,6	3,3	80	50

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_f = 1,4$ 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⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

The cost-effective demountable through bolt.



VERSIONS

- zinc-plated steel

ADVANTAGES

- The FA bolt can be demounted after installation, leaving a flush surface.
- The red collar prevents the anchor rotating in the hole during installation.

BUILDING MATERIALS

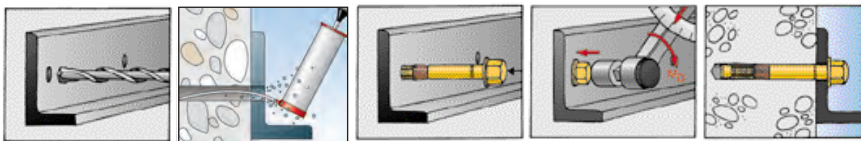
Also suitable for:

- Concrete $\geq$ B15
- Natural stone with dense structure

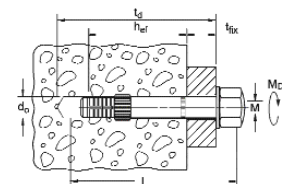
FUNCTIONING

- The FA is for push-through installation.
- When the hexagonal bolt is tightened, the tapered cone is pulled into the expansion sleeve and expands it against the hole wall.

INSTALLATION



TECHNICAL DATA



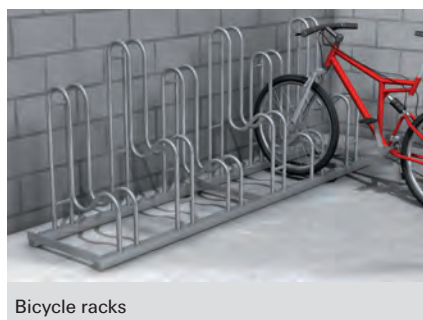
Type	Art.-No.	drill $\varnothing$ d_s [mm]	min. drill-hole depth for through fixings t_f [mm]	min. anchorage depth h_v [mm]	anchor length l [mm]	max. fixing thickness d_a [mm]	torque M_d	width across nut SW [mm]	Scale units [pcs]
FA 8/15 (8 x 70)	500511	8	75	50	65	15	10	13	25
FA 8/25 (8 x 85)	500512	8	90	50	80	25	10	13	25
FA 10/15 (10 x 85)	500515	10	90	60	75	15	20	17	25
FA 10/50 (10 x 120)	500516	10	120	60	110	50	20	17	25
FA 12/15 (12 x 100)	500522	12	100	70	85	15	35	19	20
FA 12/50 (12 x 135)	500523	12	135	70	120	50	35	19	20
FA 14/20 (14 x 115)	500526	14	115	80	100	20	50	22	10
FA 14/50 (14 x 145)	500527	14	145	80	130	50	50	22	20

LOADS

Ultimate loads $F_{u,m}$ [kN] (mean values) and recommended loads F_{rec} [kN] for single anchors of through bolt FA in non-cracked concrete.

Anchor type/thread		FA8	FA10	FA12	FA14
$F_{u,m}$ C20/25	C20/25	12.8	15.4	20.3	25.4
F_{rec} C20/25	C20/25	2.5	3.5	4.5	6.0
Axial spacing	[mm]	160	240	260	400
Edge distance	[mm]	80	100	130	150
Min. component thickness	[mm]	150	150	200	200

The push-through anchor for fixings in non-cracked concrete



Bicycle racks



Waste bins

VERSIONS

- zinc-plated steel

BUILDING MATERIALS

Suitable for:

- Concrete C12/15 to C20/25 non-cracked
- Natural stone with dense structure

FUNCTIONING

- The FSA is suitable for push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The half-moon shaped recesses act as a crumple zone to take the torque slippage, so that the attachment is pulled onto the anchor base.

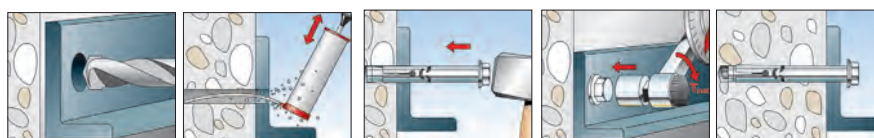
ADVANTAGES

- The optimised geometry minimises setting energy and enables the use in extremely narrow spaces. This allows for user-friendly installation.
- The anchor design makes it possible to use different head shapes for flexible anchor solutions: Hexagon head (type S), bolt version with nut and washer (type B).
- The detachable screw allows for surface flush removal.

APPLICATIONS

- Hand-rails
- Consoles
- Ladders
- Cable conduits
- Gates
- Façades
- Temporary or structural fixings

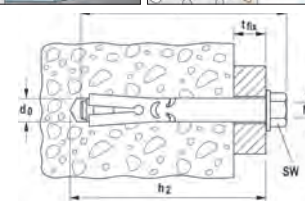
INSTALLATION



TECHNICAL DATA



Sleeve anchor **FSA-S**



	zinc-plated steel	Drill hole diameter	Min. drill-hole depth for through fixings	Max. fixture thickness	Anchor length	Thread	Width across nut	Sales unit
	Art.-No.	d ₀ [mm]	h ₂ [mm]	t _{fix} [mm]	l [mm]	M	○ SW [mm]	[pcs]
Item	gvz							
FSA 8/15 S (8x65)	068520	8	65	15	64	M 6	10	50
FSA 8/40 S (8x70)	068521	8	90	40	89	M 6	10	50
FSA 8/65 S (8x115)	068522	8	115	65	114	M 6	10	50
FSA 10/10 S (10x65)	068523	10	65	10	65	M 8	13	20
FSA 10/35 S (10x90)	068524	10	90	35	90	M 8	13	20
FSA 10/60 S (10x115)	068525	10	115	60	115	M 8	13	20
FSA 12/10 S (12x75)	068526	12	75	10	76	M 10	17	20
FSA 12/25 S (12x90)	068527	12	90	25	91	M 10	17	20
FSA 12/50 S (12x115)	068528	12	115	50	116	M 10	17	20

TECHNICAL DATA


 Sleeve anchor **FSA-B**

	zinc-plated steel	Drill hole diameter	Min. drill-hole depth for through fixings	Max. fixture thickness	Anchor length	Thread	Width across nut	Sales unit
	Art.-No.	d ₀ [mm]	h ₂ [mm]	t _{fix} [mm]	l [mm]	M	○ SW [mm]	[pcs]
Item	gvz							
FSA 8/15 B	068500	8	65	15	65	M 6	10	50
FSA 8/40 B	068501	8	90	40	90	M 6	10	50
FSA 8/65 B	068502	8	115	65	115	M 6	10	50
FSA 10/10 B	068503	10	65	10	69	M 8	13	20
FSA 10/35 B	068504	10	90	35	94	M 8	13	20
FSA 10/60 B	068505	10	115	60	119	M 8	13	20
FSA 12/10 B	068506	12	75	10	81	M 10	17	20
FSA 12/25 B	068507	12	90	25	96	M 10	17	20
FSA 12/50 B	068508	12	115	50	121	M 10	17	20
FSA 12/75 B	068509	12	140	75	146	M 10	17	20

LOADS

Sleeve anchor FSA-B

 Highest recommended loads²⁾ for a single anchor in concrete C20/25.

Type	Effective anchorage depth h _{ef} [mm]	Min. member thickness h _{min} [mm]	Installation torque T _{inst} [Nm]	Non-cracked concrete			
				Recommended tensile load N _{rec} ³⁾ [kN]	Recommended shear load V _{rec} ³⁾ [kN]	Min. spacing s _{min} ²⁾ [mm]	Min. edge distance c _{min} ²⁾ [mm]
FSA 8	35	70	8,0	2,0	3,4	70	50
FSA 10	40	80	25,0	3,5	6,3	80	60
FSA 12	50	100	40,0	5,0	9,9	100	75

¹⁾ Required safety factors are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the recommended load.

³⁾ For combinations of tensile loads and shear loads the given loads have to be reduced.

TECHNICAL DATA


 Sleeve anchor **FSA-GB**

Items to order only	zinc-plated steel	Drill hole diameter	Min. drill-hole depth for through fixings	Max. fixture thickness	Anchor length	Thread	Width across nut	Sales unit
	Art.-No.	d ₀ [mm]	h ₂ [mm]	t _{fix} [mm]	l [mm]	M	○ SW [mm]	[pcs]
	gvz							
FSA GB 6/5 (6x25)	42672	6	20	5	25	M 4.5		100
FSA GB 6/8 (6x35)	42661	6	20	8	35	M 4.5		100
FSA GB 6/25 (6x56)	42662	6	20	25	56	M 4.5		100
FSA GB 8/8 (8x40)	42663	8	25	8	40	M 6		100
FSA GB 8/30 (8x65)	42655	8	25	30	65	M 6		100
FSA GB 8/55 (8x85)	42664	8	25	55	85	M 6		25
FSA GB 10/10 (10x50)	42665	10	30	10	50	M 8		25
FSA GB 10/35 (10x70)	42656	10	30	35	70	M 8		25
FSA GB 10/60 (10x97)	42657	10	30	60	100	M 8		25
FSA GB 12/12 (12x60)	42666	12	40	12	60	M 10		25
FSA GB 12/20 (12x75)	42658	12	40	20	75	M 10		25
FSA GB 12/50 (12x99)	42659	12	40	50	100	M 10		20
FSA GB 12/75 (12x129)	42667	12	40	75	130	M 10		20
FSA GB 16/12 (16x65)	42668	16	40	12	65	M 12		20
FSA GB 16/50 (16x111)	42660	16	40	50	110	M 12		10
FSA GB 16/80 (16x147)	42669	16	40	80	150	M 12		10
FSA GB 20/20 (20x82)	42670	20	50	20	80	M 16		10
FSA GB 20/95 (20x151)	42671	20	50	95	150	M 16		5

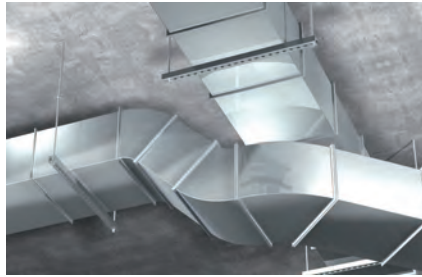
TECHNICAL DATA



Sleeve anchor **FSA-GB A2**

	zinc-plated steel	Drill hole diameter d_0 [mm]	Min. drill-hole depth for through fixings h_2 [mm]	Max. fixture thickness t_{fix} [mm]	Anchor length l [mm]	Thread M	Width across nut $\circ SW$ [mm]	Sales unit [pcs]
	Art.-No							
	gvz							
FSA GB 8/10 A2 (8x45)	42574	8	25	10	45	M 6		100
FSA GB 8/25 A2 (8x65)	42575	8	30	25	65	M 6		50
FSA GB 10/5 A2 (10x50)	42576	10	30	5	50	M 8		50
FSA GB 10/25 A2 (10x70)	42577	10	35	25	70	M 8		50
FSA GB 10/55 A2 (10x100)	42578	10	35	55	100	M 8		25
FSA GB 10/75 A2 (10x120)	42579	10	35	75	120	M 8		25
FSA GB 12/10 A2 (12x60)	42580	12	35	10	60	M 12		25
FSA GB 12/25 A2 (12/80)	42581	12	40	25	80	M 12		25
FSA GB 12/45 A2 (12x100)	42582	12	40	45	100	M 12		20
FSA GB 12/65 A2 (12x120)	42583	12	40	65	120	M 12		20

The traditional shield anchor widely used in non-cracked concrete



Ventilation ducts



Metal construction

VERSIONS

- zinc-plated steel for indoor use

BUILDING MATERIALS

Suitable for:

- Non-cracked Concrete > C12/15
- Dense natural stone
- Dense solid stone
- Good quality masonry

FUNCTIONING

- The FSA is for pre-positioned, flush fixing.
- For push-through installation.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it against the drill hole wall.
- The half-moon shaped recesses act as a crumple zone to take the torque slippage, so that the attachment is pulled onto the anchor base.

ADVANTAGES

- The segmented steel expansion shield is pre-assembled ready for use.
- Versatile: The internal metric thread makes this wallbolt suitable for a number of different head types.
- The three piece shield distributes and even load when installed.
- Surface flush which allows the fixture to be removed.
- Traditional design widely accepted by end users.

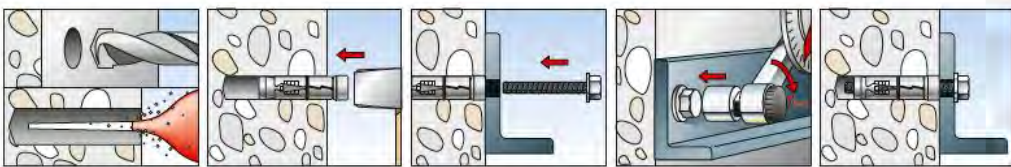
APPLICATIONS

- Hand-rails
 - Ventilation ducts
 - Pipework
 - Suspended ceilings
 - Metal construction
 - Metal profiles
- Also suitable for temporary fixings such as wall shuttering

FUNCTIONING

- For pre-positioned and flush fixings.
- The wallbolt works by torque controlled, friction locking expansion.
- When the screw or hex. nut is tightened the cone is pulled up into the expansion shield and pushes the segments against the drill hole wall.
- For best results ensure the drill hole is dust free.

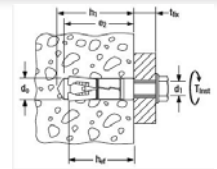
INSTALLATION



TECHNICAL DATA



FWB shield

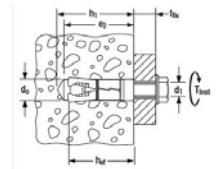


	zinc-plated steel	Drill hole dia.	Thread	Total length	Min. drill-hole depth	Min. anchorage depth	Min. bolt penetration	Installation torque	Sales unit
	Art.-No.	d ₀ [mm]	d _{1M} [mm]	h ₂ [mm]	h ₁ ≥ [mm]	h _{ef} ≥ [mm]	e ₂ ≥ [mm]	T _{inst} [Nm]	[pcs]
Item	Shield only								
FWB M6 S	044963	12	6	45	50	35	40	10	25
FWB M8 S	044964	14	8	50	60	40	45	25	25
FWB M10 S	044965	16	10	60	70	50	55	40	25
FWB M12 S	044966	20	12	75	85	60	70	75	25
FWB M16 S	044967	25	16	115	130	95	105	180	10
FWB M20 S	044970	32	20	130	150	110	120	220	10

TECHNICAL DATA



FWB L Loosebolt with hex head screw



	zinc-plated steel	Drill hole dia.	Thread	Total length	Min. drill-hole depth	Min. anchorage depth	Max. fixing thickness	Min. bolt penetration	screw dia. X length	Installation torque	Sales unit
	Art.-No.	d ₀ [mm]	d _{1M} [mm]	h ₂ [mm]	h ₁ ≥ [mm]	h _{ef} ≥ [mm]	t _{fix} ≥ [mm]	e ₂ ≥ [mm]	[mm]	T _{inst} [Nm]	[pcs]
Item	Shield only										
FWB M6 x 55L	044976	12	6	45	50	35	10	40	M6 x 55	10	25
FWB M6 x 70L	044977	12	6	45	50	35	25	40	M6 x 70	10	25
FWB M6 x 85L	044978	12	6	45	50	35	40	40	M6 x 85	10	25
FWB M8 x 65L	044979	14	8	50	60	40	10	45	M8 x 65	25	25
FWB M8 x 80L	044990	14	8	50	60	40	25	45	M8 x 80	25	25
FWB M8 x 95L	044991	14	8	50	60	40	40	45	M8 x 95	25	25
FWB M10 x 75L	044992	16	10	60	70	50	10	55	M10 x 75	40	25
FWB M10 x 90L	044993	16	10	60	70	50	25	55	M10 x 90	40	25
FWB M10 x 115L	044994	16	10	60	70	50	50	55	M10 x 115	40	25
FWB M10 x 140L	044995	16	10	60	70	50	75	55	M10 x 140	40	25
FWB M12 x 90L	044996	20	12	75	85	60	10	70	M12 x 90	75	25
FWB M12 x 105L	044997	20	12	75	85	60	25	70	M12 x 105	75	25
FWB M12 x 120L	044998	20	12	75	85	60	40	70	M12 x 120	75	25
FWB M12 x 140L	044999	20	12	75	85	60	60	70	M12 x 140	75	25
FWB M16 x 135L	045079	25	16	115	125	95	15	95	M16 x 135	180	25
FWB M16 x 150L	045099	25	16	115	125	95	30	95	M16 x 150	180	25
FWB M16 x 180L	045108	25	16	115	125	95	60	95	M16 x 180	180	25
FWB M20 x 195L	045109	32	20	130	130	110	60	110	M20 x 195	220	

Technical drawing of a shaft-hub assembly. The drawing shows a shaft with diameter d_1 and length l_{sh} inserted into a hub with inner diameter d_2 and outer diameter d_0 . The hub has a total length l_{hu} . The shaft is secured with a nut and washer. The drawing includes dimension lines for l_{sh} , l_{hu} , d_1 , d_2 , and d_0 . A curved arrow indicates a torque T_{sh} applied to the shaft.

TECHNICAL DATA



FWB E Eye bolt

TECHNICAL DATA



FWB H Hook bolt

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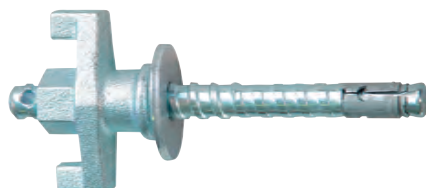
LOADS

Anchor type			FWB 6S	FWB 8S	FWB 10S	FWB 12S	FWB 16S	FWB 20S
Steel			gvz	gvz	gvz	gvz	gvz	gvz
Effective anchorage depth	h_{ef}	[mm]	35	40	50	60	95	110
Recommended tension loads N_{rec} of single anchors without edge spacing influence								
In non-cracked concrete C20/25	N_{rec}	[mm]	1.5	2.0	4.0	6.0	8.0	8.0
Recommended Shear loads V_{rec} of single anchors without edge spacing influence								
In non-cracked concrete C20/25	V_{rec}	[kN]	1.5	2.0	4.0	6.0	8.0	8.0
Components dimensions and insulation parameters								
Minimum edge distance	c_{min}	[kN]	55	60	75	90	145	165
Minimum spacing	s_{min}	[mm]	110	120	150	180	290	330
Minimum structural component thickness	h_{min}	[mm]	100	100	100	120	190	220
Nominal drill hole diameter	d_a	[mm]	12	14	16	20	25	32
Drill hole depth	$h_i \geq$	[mm]	50	60	70	85	130	150
Clearance-hole in the fixture to be attached	$d_i \geq$	[mm]	7	9	12	14	18	22
Installation torque	$T_i \geq$	[Nm]	10	25	40	75	180	220

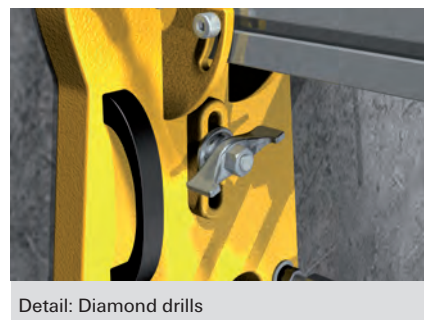
All values apply for non-cracked concrete C20/25 with normal reinforcement or not reinforced without edge or spacing influences.

Recommended loads: material safety factor γ_M and safety factor for load $\gamma_L = 1.4$ are included.

The reusable fixing system for diamond drills and saws



Diamond drills



Detail: Diamond drills

APPLICATIONS

- Diamond and core drilling devices
- Diamond saws

VERSIONS

- zinc-plated steel

BUILDING MATERIALS

Suitable for:

- Concrete C12/15 to C50/60, non-cracked
- Natural stone with dense structure

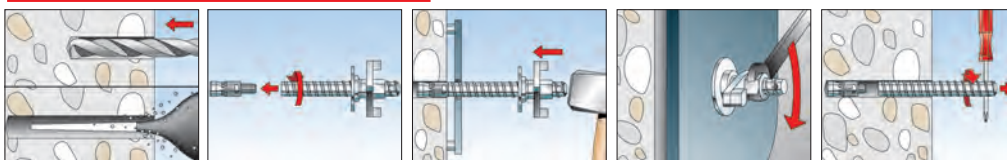
ADVANTAGES

- The detachable screw connection between the expansion element and spindle enables simple dismantling and ensures that the spindle bolt can be reused.
- The robust, reusable spindle bolt guarantees a long life span.
- The active principle of the anchor bolt enables an active controlled expansion, thus offering a high level of safety.
- The large steel cross-section provides high shear load-bearing capability and, as such, high security for the jerky stoppage of the drill bit.

FUNCTIONING

- The FDBB is suitable for pre-positioned and push-through installation.
- An expansion element must be added to the spindle bolt before installation.
- Use a hammer to drive the FDBB through the base plate of the drilling device into the drill hole.
- When the nut is tightened, the cone bolt is pulled into the expansion clip and expands it against the drill hole wall.
- The expansion element remains in the drill hole when dismantling the spindle bolt. The spindle bolt is once again completed with an expansion element and can be reused.

INSTALLATION

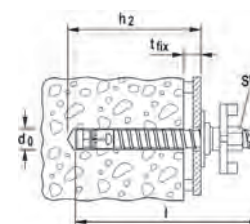


TECHNICAL DATA



Expansion element FDBB SE

Fixing set for diamond drills FDBB



	zinc-plated steel	Drill hole diameter	Usable length	Min. drill-hole depth for through fixings	Width across nut	Length	Contents	Sales unit
	Art.-No.	d_0 [mm]	t_{fix} [mm]	h_2 [mm]	$\varnothing SW$ [mm]	l [mm]		[pcs]
Item	gvz							
FDBB 16/50 Set	090680	16	50	135	27	200	1 expansion element 16 SE, 1 spindle bolt 16/50/160, 1 washer, 1 nut	1
FDBB 16 SE	090681	16	—	—	—	—	Expansion element	25

LOADS

Fixing set for diamond drills FDBB

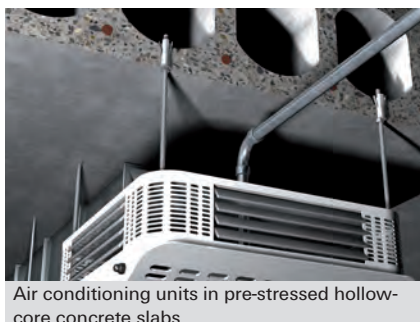
Highest recommended loads¹⁾ for a single anchor in non-cracked concrete.

Type	Recommended bending moment M_{rec} [Nm]	C20/25		C12/15	
		Recommended tensile load N_{rec} [kN]	Recommended shear load $V_{rec}^{2)}$ [kN]	Recommended tensile load N_{rec} [kN]	Recommended shear load $V_{rec}^{2)}$ [kN]
FDBB	98,0	12,0	13,3	9,0	13,3

¹⁾ Required safety factors are considered.

²⁾ Steel failure value.

The installation-friendly internally threaded anchor for fixings in pre-stressed hollow-core concrete slabs



VERSIONS

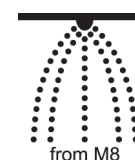
- zinc-plated steel
- stainless steel

BUILDING MATERIALS

Approved for:

- Pre-stressed hollow-core concrete slabs $\geq$ C45/55

APPROVALS



ADVANTAGES

- The active principle of the anchor means that the FHY can be used in cavities or in solid materials up to 5 cm from the tensioning wire. This ensures the highest flexibility and user-friendly installation.
- The embossed edge prevents the anchor sleeve from slipping in the cavity, thus allowing for trouble-free installation.
- The optimised geometry minimises setting energy and allows for use in extremely narrow spaces. This allows for user-friendly installation.
- The metric internal thread means that it is possible to use standard screws or threaded rods for the ideal adaptation to suit the intended use.

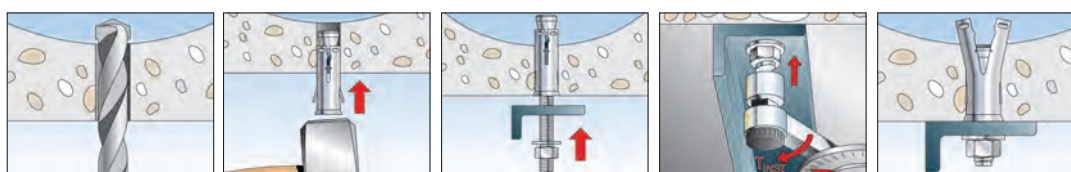
APPLICATIONS

- Pipes
- Cable conduits
- Ventilation systems
- Sprinkler systems
- Suspended ceilings
- Consoles
- Steel constructions
- Wood constructions

FUNCTIONING

- The FHY is suitable for pre-positioned installation.
- Put the FHY hollow-ceiling anchor in the drill hole and drive in flush to the surface of the anchor base using the hammer.
- The FHY pre-positioned anchor must be able to be supported on the attachment for expansion.
- When applying the torque, the cone is pulled into the expansion sleeve and expands it into the cavity or expands it in the solid material against the drill hole wall.
- Screw length $l_s =$
Minimum screw-in depth e_2
+ Thickness of fixture t_{fix}
+ Thickness of washer
(with threaded rod: + height of nut)

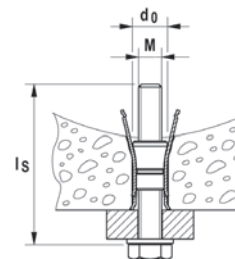
INSTALLATION



TECHNICAL DATA



Hollow-ceiling anchor **FHY**, zinc-plated steel



Items to order only	zinc-plated steel	stainless steel	Approval	Drill hole diameter	Anchor length	Thread	Min. drill hole depth	Min. bolt penetration	Sales unit
	Art.-No.	Art.-No.	DIBt	d ₀ [mm]	l [mm]	M	h ₁ [mm]	l _{E,min} [mm]	[pcs]
Item	gvz	A4							
FHY M 6	030138	—	●	10	37	M 6	50	37	50
FHY M 6	—	030139	—	10	37	M 6	50	37	50
FHY M 8	030146	—	●	12	43	M 8	60	43	25
FHY M 8	—	030147	—	12	43	M 8	60	43	25
FHY M10	030148	—	●	16	52	M 10	65	52	20
FHY M10	—	030151	—	16	52	M 10	65	52	20

LOADS

Hollow-ceiling anchor FHY (screw with grade 5.8)

Highest permissible loads¹⁾ for a single anchor in pre-stressed hollow-core concrete slabs of strength class $\geq$ B55 resp. C45/55. For the design the complete approval Z-2.1.1-1711 has to be considered.

Type	Web thickness	Min. anchorage depth	Torque moment	Pre-stressed hollow-core concrete slabs		
	d _u [mm]	h _{ef} [mm]	T _{inst} [Nm]	Permissible load F _{perm} ³⁾ [kN]	Min. spacing s _{min} ²⁾ [mm]	Min. edge distance c _{min} ²⁾ [mm]
FHY M6	25 - 29	30	10,0	0,7	70	100
	30 - 39	30	10,0	0,9	80	100
	≥ 40	30	10,0	2,0	100	100
FHY M8	25 - 29	35	10,0	0,7	70	100
	30 - 39	35	10,0	0,9	80	100
	≥ 40	35	10,0	2,0	100	100
FHY M10	30 - 39	40	20,0	1,2	80	100
	≥ 40	40	20,0	3,0	100	100

¹⁾ The required safety factors as regulated in the approval are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ Valid for tensile load, shear load and oblique load under any angle. For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

LOADS

Hollow-ceiling anchor FHY A4 (screw with grade A4-70)

Highest recommended loads¹⁾ for a single anchor in pre-stressed hollow-core concrete slabs of strength class $\geq$ B55 resp. C45/55.

Type	Web thickness	Min. anchorage depth	Torque moment	Pre-stressed hollow-core concrete slabs		
	d _u [mm]	h _{ef} [mm]	T _{inst} [Nm]	Recommended load F _{rec} ³⁾ [kN]	Min. spacing s _{min} ²⁾ [mm]	Min. edge distance c _{min} ²⁾ [mm]
FHY M6 A4	25 - 29	30	10,0	0,7	70	100
	30 - 39	30	10,0	0,9	80	100
	≥ 40	30	10,0	2,0	100	100
FHY M8 A4	25 - 29	35	10,0	0,7	70	100
	30 - 39	35	10,0	0,9	80	100
	≥ 40	35	10,0	2,0	100	100
FHY M10 A4	30 - 39	40	20,0	1,2	80	100
	≥ 40	40	20,0	3,0	100	100

¹⁾ Required safety factors are considered.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the recommended load.

³⁾ Valid for tensile load, shear load and oblique load under any angle.

Technical disclaimer / Decisive factors

Due to the complexity of building materials, tools, fixing elements and installation techniques a comprehensive recommendation depends on full and detailed understanding of specific site conditions.

This document is a factual record of anchor performance obtained under specific conditions and does not constitute an endorsement of the suitability of the product for any specific application. This responsibility remains with the customer.

The data given shall be used as a guide for assessment or anchor suitability. Even when our advice is given in good faith it cannot be binding for this reason and we cannot accept any liability for any anchor failure due to the wrong design, misuse or wrong installation.

For safety critical applications only anchors with an ETA or Zulassung German Approval shall be used.

For further product information please contact the fischer Technical Department:

Phone: 01491 827 920

E-mail: technical@fischer.co.uk

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General Notice

The information in this brochure is intended for general guidance only and is given without engagement. Additional information and advice on specific applications is available from our Technical Support Team. For this however, we require a precise description of your particular application.

All the data in this brochure concerning work with our fixings must be adapted to suit local conditions and the type of materials in use.

If no detailed performance specifications are given for certain articles and types, please contact our Technical Service Department for advice.

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Technical Service

If you need any assistance, simply contact your local fischer representative. For more specialised application problems please contact our Technical Services Team.

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Technical Training

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