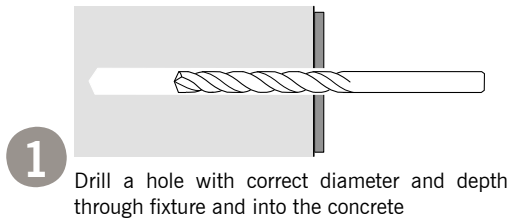


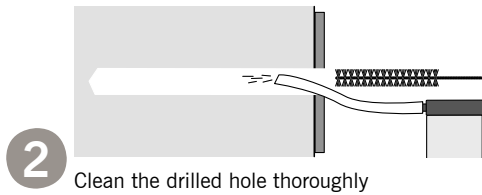
**THROUGHBOLT - EXG II**

**Installation:**

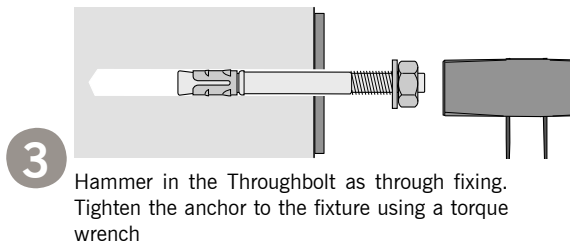
**For fixing of heavy objects like steel- and wood structures, base plates and brackets in concrete**



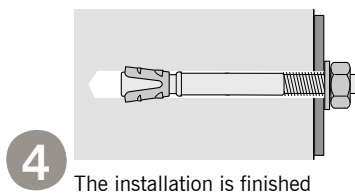
**1** Drill a hole with correct diameter and depth through fixture and into the concrete



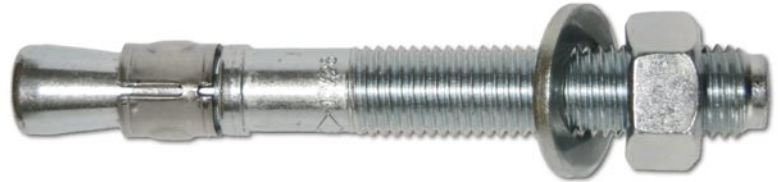
**2** Clean the drilled hole thoroughly



**3** Hammer in the Throughbolt as through fixing. Tighten the anchor to the fixture using a torque wrench



**4** The installation is finished



**Materials:**

**Throughbolt EXG II is supplied in zinc plated steel min. 5 µm in accordance with EN ISO 4042 and hot dipped galvanised steel min 40 µm in accordance with EN ISO 1461:**

- Bolt: Coldformed steel
- Expansion sleeve: Stainless steel A4 in accordance with EN 10088
- Nut: Class 8 in accordance with EN 10088
- Washer: DIN 125

**Throughbolt EXG-A4 is supplied in Stainless steel A4**

- Bolt: Stainless steel A4 in accordance with EN 10088 (coated)
- Expansion sleeve: Stainless steel A4 in accordance with EN 10088
- Nut: DIN 934 in accordance with ISO 3506, A4-70 & EN 10088 (coated)
- Washer: DIN 125; Stainless steel A4

**Advantages:**

- High load capacities.
- Is supplied assembled.
- Letter marked head - easy inspection.
- Through fixing.
- Long thread – suitable for stand-of fixing.
- Anchorage can be designed in Expandet Calculating Software.



**Approvals:**

Expandet Throughbolt EXG II & EXG-A4 II is CE-marked and have European Technical Approval (ETA) in option 7:

- EXG II Zinc Plated M6-M20: ETA-10/0180
- EXG II Hot dipped galvanised M8-M-20: ETA-10/0180
- EXG-A4 II Stainless steel A4 M6-M20: ETA-10/0179
- EXG II & EXG-A4 II has fire resistance classification F120



EXPANDET SCREW ANCHORS A/S  
Svendebuen 2-6  
3230 Græsted  
Danmark

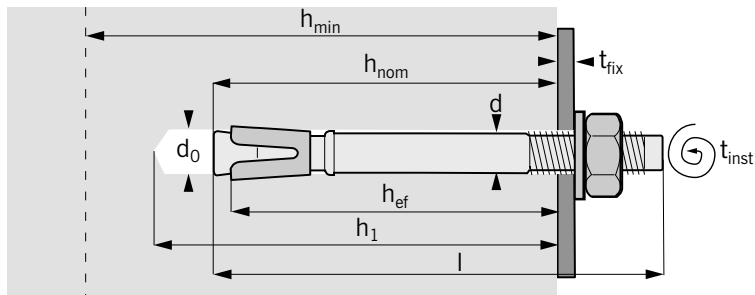
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# THROUGHBOLT - EXG II & EXG-A4 II



## Throughbolt - EXG II & EXG-A4 II with standard embedment depth:

Type	EXG-A4 II	Dimensions					Fixing										Load Capacities	
		Letter mark	d	L	t <sub>fix</sub>	L <sub>g</sub>	d <sub>0</sub>	h <sub>1</sub>	h <sub>nom</sub>	h <sub>ef</sub>	T <sub>inst</sub>			h <sub>min</sub>	S <sub>min</sub>	C <sub>min</sub>	N <sub>Rd</sub>	V <sub>Rd</sub>
EXG II (EG, VG & A4)		EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG (A4)	EG VG (A4)	EG	VG	A4	EG VG (A4)	EG VG (A4)	EG VG (A4)	EG VG (A4)	EG VG (A4)
6 x 40/ 5 *	▼	A	6	40	5	16	6	35	27	18,5	8	8	6	80	35	40	2,0	2,2
6 x 67/ 10 *	▼	C	6	67	10	30	6	55	49	40	8	8	6	100	35	40	6,0 (5,0)	4,0 (5,6)
6 x 97/ 40 *		E	6	97	40	35	6	55	49	40	8	8		100	35	40	6,0	4,0
8 x 50/ 5 *	▼	A	8	50	5	22	8	45	35	24	15	15	15	80	40 (60)	45 (60)	2,8 (3,2)	3,2
8 x 60/ 4	▼	B	8	60	4	25	8	55	47	35	15	15	15	80	40 (35)	45	6,0	6,9
8 x 75/ 10	▼	C	8	75	10	40	8	65	56	44	15	15	15	100	40 (35)	45	8,0	8,8 (9,6)
8 x 95/ 30	▼	E	8	95	30	60	8	65	56	44	15	15	15	100	40 (35)	45	8,0	8,8 (9,6)
8 x 110/ 45	▼	F	8	110	45	75	8	65	56	44	15	15	15	100	40 (35)	45	8,0	8,8 (9,6)
8 x 165/ 100		J	8	165	100	85	8	65	56	44	15	15		100	40	45	8,0	8,8
10 x 60/ 5 *	▼	B	10	60	5	25	10	55	45	30	30	30	25	100	55	65	4,6	4,6
10 x 90/ 15	▼	E	10	90	15	45	10	70	62	48	30	30	25	100	55 (45)	65 (55)	10,6	11,1
10 x 105/ 30	▼	F	10	105	30	60	10	70	62	48	30	30	25	100	55 (45)	65 (55)	10,6	11,1
10 x 120/ 45	▼	G	10	120	45	75	10	70	62	48	30	30	25	100	55 (45)	65 (55)	10,6	11,1
10 x 145/ 60	▼	I	10	145	60	80	10	70	62	48	30	30	25	100	55 (45)	65 (55)	10,6	11,1
10 x 175/ 100		K	10	175	100	80	10	70	62	48	30	30		100	55	65	10,6	11,1
10 x 215/ 140		N	10	215	140	80	10	70	62	48	30	30		100	55	65	10,6	11,1
12 x 75/ 5 *	▼	C	12	75	5	30	12	65	55	38	50	40	50	100	100	100	6,5	6,5
12 x 110/ 15	▼	F	12	110	15	65	12	90	82 (81)	65	50	40	50	130	75 (60)	90 (70)	17,6 (16,7)	20,0 (21,6)
12 x 125/ 30	▼	G	12	125	30	80	12	90	82 (81)	65	50	40	50	130	75 (60)	90 (70)	17,6 (16,7)	20,0 (21,6)
12 x 145/ 50	▼	I	12	145	50	100	12	90	82 (81)	65	50	40	50	130	75 (60)	90 (70)	17,6 (16,7)	20,0 (21,6)
12 x 160/ 65	▼	J	12	160	65	100	12	90	82 (81)	65	50	40	50	130	75 (60)	90 (70)	17,6 (16,7)	20,0 (21,6)
12 x 180/ 85		L	12	180	85	100	12	90	82	65	50	40		130	75	90	17,6	20,0
12 x 200/ 105		M	12	200	105	100	12	90	82	65	50	40		130	75	90	17,6	20,0
12 x 240/ 145		P	12	240	145	80	12	90	82	65	50	40		130	75	90	17,6	20,0
16 X 90/ 5 *		E	16	90	5	35	16	75	65	47	100	90		130	100	100	9,0	18,0
16 X 115/ 13	▼	G	16	115	13	60	16	95	84 (83)	64	100	90	100	130	100 (110)	100 (110)	17,2	33,0 (34,4)
16 X 130/ 10		H	16	130	10	70	16	110	102	82	100	90		170	90	105	24,5	33,0
16 X 150/ 30	▼	I	16	150	30	90	16	110	102 (99)	82 (80)	100	90	100	170 (160)	90 (80)	105 (80)	24,5	33,0 (40,0)
16 X 180/ 60		L	16	180	60	110	16	110	102	82	100	90		170	90	105	24,5	33,0
16 X 220/ 100		O	16	220	100	80	16	110	102	82	100	90		170	90	105	24,5	33,0
16 X 250/ 130		Q	16	250	130	80	16	110	102	82	100	90		170	90	105	24,5	33,0
16 X 285/ 165		S	16	285	165	80	16	110	102	82	100	90		170	90	105	24,5	33,0
16 X 320/ 200		T	16	320	200	80	16	110	102	82	100	90		170	90	105	24,5	33,0
20 x 120/ 10 *		G	20	120	10	50	20	100	90	69	200	120	160	160	140	140	16,0	24,0
20 x 180/ 35	▼	L	20	180	35	70	20	130	121	100	200	120	160	200	105 (100)	125 (100)	33,6	51,8 (61,4)
20 x 205/ 60	▼	N	20	205	60	70	20	130	121	100	200	120	160	200	105 (100)	125 (100)	33,6	51,8 (61,4)

Values In () have to be used for EXG-A4 II.

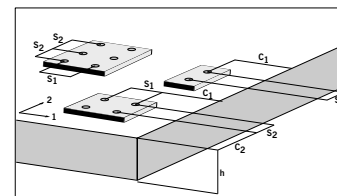
- Not part of the approval
- \* Hot dipped galvanised M6 is not part of the approval.
- ♦ Design resistance for tension is valid for a single anchor in concrete C20/25 not influenced by edge distance and/or spacing:  $C \geq 1,5 h_{ef}$  and  $S \geq 3 h_{ef}$ . If  $1,5 h_{ef} \leq C_{min}$ :  $C \geq C_{min}$  and  $S \geq 3 h_{ef}$ .  $\Psi_{re,N} = 1$  (Normal reinforcement in accordance with ETAG 001, Annex C - 5.2.2.4).
- ◇ Design resistance for shear is valid for a single anchor in concrete  $\geq C20/25$  not influenced by edge distance and/or spacing:  $C \geq 10 h_{ef}$  and  $S \geq 3 h_{ef}$ .

Combined resistance shall be verified if both tension and shear actions are applied.

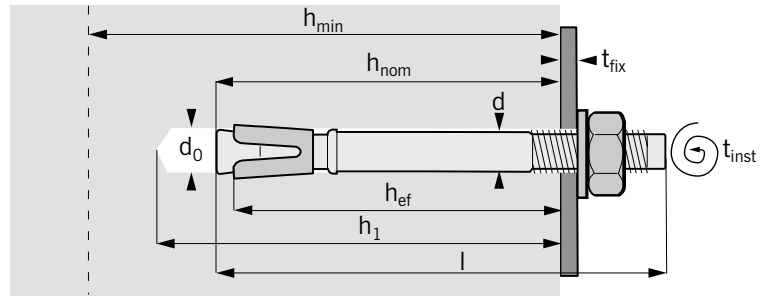
Partial safety factor for material ( $\gamma_m$ ) is included in accordance with product ETA. Partial safety factor for action ( $\gamma_f$ ) has to be applied in accordance with national building code. If no guidance for  $\gamma_f$  exists ETAG 001, Annex C recommends factor 1,35 for permanent action and factor 1,5 for variable action.

When calculating load capacity for anchor or anchorgroup use Expandet Calculation Software allowing for design with individual edge distance and spacing in accordance with ETAG 001, Annex C, Design Method A. Download Expandet Calculation Software for free at [www.expandet.com](http://www.expandet.com).

**Important:** See Expandet's "Principles for fastening" for general information on fastening as well as information on limited liability. (Can be downloaded at [www.expandet.com](http://www.expandet.com))



## THROUGHBOLT - EXG II & EXG-A4 II - with reduced setting depth



Throughbolt EXG II & EXG-A4 II with reduced embedment depth:

Type	EXG-A4 II	Dimensions					Fixing										Load Capacities	
		Letter mark	d	L	t <sub>fix</sub>	L <sub>g</sub>	d <sub>0</sub>	h <sub>1</sub>	h <sub>nom</sub>	h <sub>ef</sub>	T <sub>inst</sub>			h <sub>min</sub>	S <sub>min</sub>	C <sub>min</sub>	N <sub>Rd</sub>	V <sub>Rd</sub>
EXG II (EG, VG)		EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG A4	EG VG (A4)	EG VG (A4)	EG	VG	A4	EG VG (A4)	EG VG (A4)	EG VG (A4)	EG VG (A4)	EG VG (A4)
6 x 40 •	▼	A	6	40	5	16	6	35		18	8	8	6	80	35	40	2,0	2,2
6 x 67*	▼	C	6	67	20	30	6	45	39	30	8	8	6	80	35	40	4,0	4,0 (5,6)
6 x 97*		E	6	97	50	35	6	45	39	30	8	8		80	35	40	4,0	4,0
8x 50 •	▼	A	8	50	5	22	8	45	35	24	15	15	15	80	40 (60)	45 (60)	2,8 (3,2)	3,2
8 x 60	▼	B	8	60	4	25	8	55	47	35	15	15	15	80	40 (60)	45 (60)	6,0	6,9
8 x 75	▼	C	8	75	19	40	8	55	47	35	15	15	15	80	40 (60)	45 (60)	6,0	6,9
8 x 95	▼	E	8	95	39	60	8	55	47	35	15	15	15	80	40 (60)	45 (60)	6,0	6,9
8 x 110	▼	F	8	110	54	75	8	55	47	35	15	15	15	80	40 (60)	45 (60)	6,0	6,9
8 x 165		J	8	165	109	85	8	55	47	35	15	15		80	40	45	6,0	6,9
10 x 60*	▼	B	10	60	5	25	10	55	45	30	30	30	25	100	55	65	4,6	4,6
10 x 90	▼	E	10	90	21	45	10	65	56	42	30	30	25	100	55	65	9,1 (8,0)	9,1
10 x 105	▼	F	10	105	36	60	10	65	56	42	30	30	25	100	55	65	9,1 (8,0)	9,1
10 x 120	▼	G	10	120	51	75	10	65	56	42	30	30	25	100	55	65	9,1 (8,0)	9,1
10 x 145	▼	I	10	145	66	80	10	65	56	42	30	30	25	100	55	65	9,1 (8,0)	9,1
10 x 175		K	10	175	106	80	10	65	56	42	30	30		100	55	65	9,1	9,1
10 x 215		N	10	215	146	80	10	65	56	42	30	30		100	55	65	9,1	9,1
12 x 75*	▼	C	12	75	5	30	12	65	55	38	50	40	50	100	100	100	6,5	6,5
12 x 110	▼	F	12	110	30	65	12	75	67 (66)	50	50	40	50	100	100	100	11,8	20,0 (21,6)
12 x 125	▼	G	12	125	45	80	12	75	67 (66)	50	50	40	50	100	100	100	11,8	20,0 (21,6)
12 x 145	▼	I	12	145	65	100	12	75	67 (66)	50	50	40	50	100	100	100	11,8	20,0 (21,6)
12 x 160	▼	J	12	160	80	100	12	75	67 (66)	50	50	40	50	100	100	100	11,8	20,0 (21,6)
12 x 180		L	12	180	100	100	12	75	67	50	50	40		100	100	100	11,8	20,0
12 x 200		M	12	200	120	100	12	75	67	50	50	40		100	100	100	11,8	20,0
12 x 240		P	12	240	160	80	12	75	67	50	50	40		100	100	100	11,8	20,0
16 X 90*		E	16	90	5	35	16	75	65	47	100	90		130	100	100	9,0	18,0
16 X 115	▼	G	16	115	13	60	16	95	84 (83)	64	100	90	100	130	100 (110)	100 (110)	17,2	33,0 (34,4)
16 X 130		H	16	130	28	70	16	95	84	64	100	90		130	100	100	17,2	33,0
16 X 150	▼	I	16	150	48 (46)	90	16	95	84 (83)	64	100	90	100	130	100 (110)	100 (110)	17,2	33,0 (34,4)
16 X 180		L	16	180	78	110	16	95	84	64	100	90		130	100	100	17,2	33,0
16 X 220		O	16	220	118	80	16	95	84	64	100	90		130	100	100	17,2	33,0
16 X 250		Q	16	250	148	80	16	95	84	64	100	90		130	100	100	17,2	33,0
16 X 285		S	16	285	183	80	16	95	84	64	100	90		130	100	100	17,2	33,0
16 X 320		T	16	320	218	80	16	95	84	64	100	90		130	100	100	17,2	33,0
20 x 120*		G	20	120	10	50	20	100	90	69	200	120		160	140	140	16,0	24,0
20 x 180	▼	L	20	180	57	70	20	120	99	78	200	120	160	160	140	140	23,1	46,3
20 x 205	▼	N	20	205	82	70	20	120	99	78	200	120	160	160	140	140	23,1	46,3

Values In ( ) have to be used for EXG-A4 II.

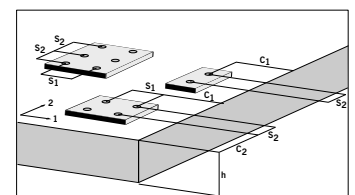
- Not part of the approval
- \* Hot dipped galvanised M6 is not part of the approval.
- ♦ Design resistance for tension is valid for a single anchor with reduced embedment depth in concrete C20/25 not influenced by edge distance and/or spacing:  $C \geq 1,5 h_{ef}$  and  $S \geq 3 h_{ef}$ . If  $1,5 h_{ef} \leq C_{min}$ :  $C \geq C_{min}$  and  $S \geq 3 h_{ef}$ .  $\Psi_{t,EN} = 1$  (Normal reinforcement in accordance with ETAG 001, Annex C - 5.2.2.4).
- ◊ Design resistance for shear is valid for a single anchor with reduced embedment depth in concrete  $\geq C20/25$  not influenced by edge distance and/or spacing:  $C \geq 10 h_{ef}$  and  $S \geq 3 h_{ef}$ .

Combined resistance shall be verified if both tension and shear actions are applied.

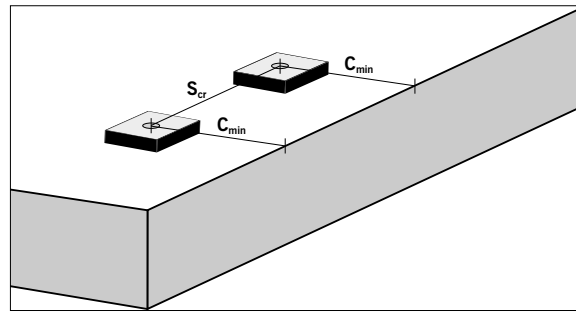
Partial safety factor for material ( $\gamma_m$ ) is included in accordance with product ETA. Partial safety factor for action ( $\gamma_f$ ) has to be applied in accordance with national building code. If no guidance for  $\gamma_f$  exists ETAG 001, Annex C recommends factor 1,35 for permanent action and factor 1,5 for variable action.

When calculating load capacity for anchor or anchorgroup use Expandet Calculation Software allowing for design with individual edge distance and spacing in accordance with ETAG 001, Annex C, Design Method A. Download Expandet Calculation Software for free at [www.expandet.com](http://www.expandet.com).

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# THROUGHBOLT - EXG II & EXG-A4 II



## Design shear load capacity for a single anchor at minimum edge distance ( $C_{min}$ ) <sup>♦</sup>

EXG II i EG & VG / EXG-A4 II i A4	M6 *		M8		M10		M12		M16		M20	
with standard embedment depth	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4
$h_{nom}$ Embedment depth mm	49	49	56	56	62	62	82	83	102	99	121	121
$h_{ef}$ Effective anchorage depth mm	40	40	44	44	48	48	65	65	82	82	100	100
$V_{rd,c}$ (non-cracked concrete) kN	1.90	1.56	2.52	2.52	4.76	3.71	8.49	5.97	12.53	8.29	18.11	12.96
$C_{min}$	40	35	45	45	65	55	90	70	105	80	125	100
$S_{cr}$	120	105	135	135	195	165	270	210	315	240	375	300
EXG II i EG & VG / EXG-A4 II i A4	M6		M8		M10		M12		M16		M20	
with standard embedment depth	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4	EG & VG	A4
$h_{nom}$ Embedment depth mm	39	39	47	47	56	56	67	66	84	83	99	99
$h_{ef}$ Effective anchorage depth mm	30	30	35	35	42	42	50	50	64	64	99	99
$V_{rd,c}$ (non-cracked concrete) kN	1.80	1.80	2.41	3.43	4.64	4.64	7.39	7.39	10.08	10.91	17.04	17.04
$C_{min}$	40	40	45	60	65	65	100	100	100	110	140	140
$S_{cr}$	120	120	135	180	195	195	300	300	300	330	420	420

- ♦ Design resistance is valid at minimum edge distance in concrete C20/25 providing that characteristic spacing is  $\geq S_{cr}$ . Partial safety factor for edge failure ( $\gamma_{mc}$ ) is included. Use Expandet Calculation Software for calculation of load capacity for anchor or anchorgroup in accordance with ETAG 001, Annex C – Design Method A. Download Expandet Calculation Software for free at [www.expandet.com](http://www.expandet.com).

\* Hot dipped galvanised M6 is not part of the approval.

## Design shear load capacity for steel failure and resistance against bending (lever arm) <sup>♦</sup>

EXG II i EG & VG	M6 *	M8	M10	M12	M16	M20
$V_{Rd,s}$ (kN)	4	8.8	13.6	20	33.1	51.8
$M_{Rd}$ (Nm)	7.2	18.4	36	62.4	139.8	272.9
EXG -A4 II i A4	M6	M8	M10	M12	M16	M20
$V_{Rd,s}$ (kN)	5.6	9.6	15.2	21.6	40	61.4
$M_{Rd}$ (Nm)	8	19.2	39.2	68	159.2	324.2

- ♦ Design shear load capacities (steel failure) and resistance against bending (lever arm) include partial safety factor for material ( $\gamma_{ms}$ ) in accordance with product ETA. Use Expandet Calculation Software for calculation of load capacity for anchor or anchorgroup in accordance with ETAG 001, Annex C – Design Method A. Download Expandet Calculation Software for free at [www.expandet.com](http://www.expandet.com).

\* Hot dipped galvanised M6 is not part of the approval.