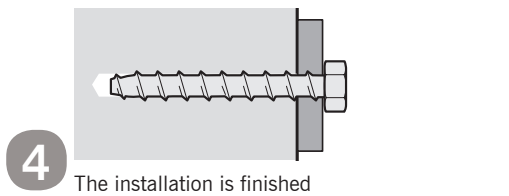
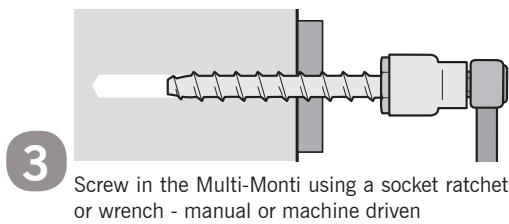
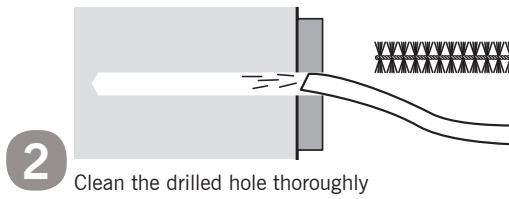
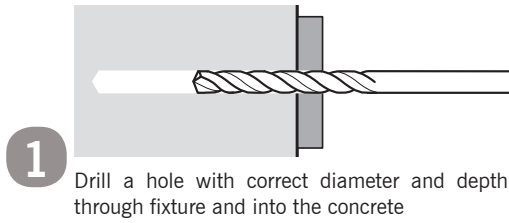
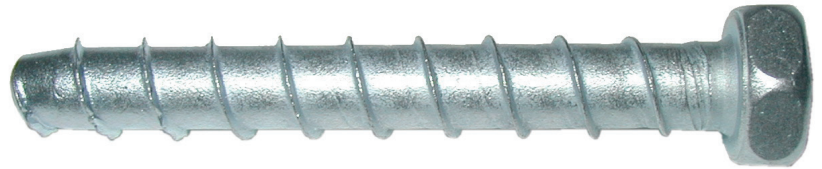


**MULTI-MONTI**

**Installation:**



**For fixing of brackets, balcony railings, wood- and steel structures etc. in cracked and non-cracked concrete and other solid base materials**



**Materials:**

Multi-Monti is supplied in zinc plated minimum 5 µm and stainless Steel A4.  
 Multi-Monti is also supplied with Delta Protekt surface treatment. Standard assortment is limited to dimensions indicated in technical specifications on the following pages.  
 Zinc plated, Delta Protekt: Steel in accordance with EN 10263-4  
 Stainless Steel A4 (1.4401): Steel in accordance with EN 10263-5  
 Multi-Monti in Stainless HCR steel is only supplied on request.

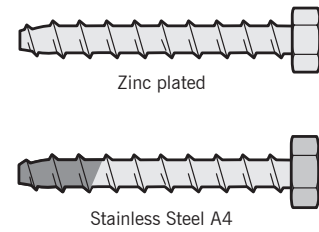
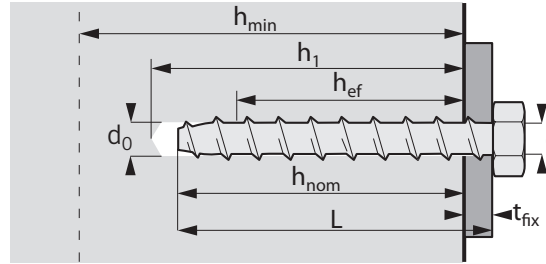
**Approvals:**

**Zinc plated:**  
 M 6 are fire tested F120.  
 M7,5 to M16 are fire approved in accordance with ETA 05/0010  
 M7,5 to M16 are VdS-approved.  
 M 10 to M16 are CE-marked.  
 M 10 to M16 have European Technical Approval (ETA 05/0010) in Option 1.  
**Stainless Steel A4:**  
 M7,5 to M12 are fire approved in accordance with ETA 05/0010  
 M7,5 to M12 are VdS-approved.  
 M 10 to M12 are CE-marked.  
 M 10 to M12 have European Technical Approval (ETA 05/0011) in Option 1.

**Advantages:**

- Expansion free.
- Through fixing.
- Installation is economic and easy - without use of special tools.
- Reduction of installation time up to 50%.
- Torque control is not required.
- Can be installed close to edges.
- ETA approved in Option 1, for use in cracked and non-cracked concrete.
- Anchorage can be designed in Expandet Calculation Software.





Type	Dimensions				Fixing								Load Capacities				
	d	L	t <sub>fix</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>	Non-cracked concrete N <sub>Rd</sub>	Cracked concrete V <sub>Rd</sub>	Cracked concrete N <sub>Rd</sub>	Cracked concrete V <sub>Rd</sub>	
Multi-Monti	Bolt diameter mm	Anchor length mm	Key size mm	Max. fitting thickness mm	Drill hole diameter mm	Depth of drilled hole (Min.) mm	Embedment depth mm	Effective anchorage depth mm	Maximum setting torque Nm <sup>®</sup>	Thickness of concrete member min., mm	Minimum allowable spacing mm	Minimum allowable edge distance mm	Design resistance tension kN <sup>▼</sup>	Design resistance shear kN <sup>▽</sup>	Design resistance tension kN <sup>▼</sup>	Design resistance shear kN <sup>▽</sup>	
<b>HMS-S EG &amp; MMS-S EG, zinc plated</b>																	
HMS-S 6x 40	•	6	40	10	5	5	45	35	23,8	12	90	40	35	2,7	3,9	1,9	2,7
MMS-S 6x 50	•	6	50	10	5	5	55	45	32,3	12	90	40	40	3,7	4,1	2,6	4,1
MMS-S 6x 60	•	6	60	10	15	5	55	45	32,3	12	90	40	40	3,7	3,9	2,0	3,6
MMS-S 6x 80	•	6	80	10	35	5	55	45	32,3	12	90	40	40	3,7	3,9	2,0	3,6
MMS-S 6x100	•	6	100	10	55	5	55	45	32,3	12	90	40	40	3,7	3,9	2,0	3,6
HMS-S 7,5x 35	•	7,5	35	13	1	6	40	35	22,2	20	90	40	40	2,8	3,5	1,6	2,5
HMS-S 7,5x 40	•	7,5	40	13	5	6	40	35	22,2	20	90	40	40	2,8	3,5	1,6	2,5
MMS-S 7,5x 45	•	7,5	45	13	1	6	50	45	31,5	20	90	40	40	3,3	4,6	2,2	4,6
MMS-S 7,5x 50	•	7,5	50	13	5	6	50	45	31,5	20	90	40	40	3,3	4,6	2,2	4,6
MMS-S 7,5x 60	•	7,5	60	13	5	6	60	55	40,0	20	100	40	40	4,1	4,6	2,8	4,6
MMS-S 7,5x 80	•	7,5	80	13	25	6	60	55	40,0	20	100	40	40	4,1	4,6	2,8	4,6
MMS-S 7,5x100	•	7,5	100	13	45	6	60	55	40,0	20	100	40	40	4,1	4,6	2,8	4,6
MMS-S 7,5x120	•	7,5	120	13	65	6	60	55	40,0	20	100	40	40	4,1	4,6	2,8	4,6
MMS-S 7,5x140	•	7,5	140	13	85	6	60	55	40,0	20	100	40	40	4,1	4,6	2,8	4,6
MMS-S 10x 60	•	10	60	16	5	8	65	55	39,0	50	100	50	50	5,6	10,7	4,1	10,7
MMS-S 10x 70	•	10	70	16	5	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 10x 80	•	10	80	16	15	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 10x100	•	10	100	16	35	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 10x120	•	10	120	16	55	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 10x140	•	10	140	16	75	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 10x160	•	10	160	16	95	8	75	65	47,5	50	115	50	50	6,6	10,7	5,0	10,7
MMS-S 12x 60	•	12	60	18	5	10	65	55	37,4	80	110	60	60	6,4	15,3	4,6	10,9
MMS-S 12x 80	•	12	80	18	5	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x 90	•	12	90	18	15	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x100	•	12	100	18	25	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x120	•	12	120	18	45	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x140	•	12	140	18	69	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x160	•	12	160	18	85	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x200	•	12	200	18	125	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x240	•	12	240	18	165	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x280	•	12	280	18	205	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 12x320	•	12	320	18	245	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	15,3
MMS-S 14x110	•	14	110	21	15	12	105	95	71,5	100	150	90	90	16,6	24,0	11,1	24,0
MMS-S 14x130	•	14	130	21	35	12	105	95	71,5	100	150	90	90	16,6	24,0	11,1	24,0
MMS-S 14x150	•	14	150	21	55	12	105	95	71,5	100	150	90	90	16,6	24,0	11,1	24,0
MMS-S 16x 80	•	16	80	24	10	14	80	70	60,0	150	120	90	90	13,0	30,2	9,4	22,3
MMS-S 16x120	•	16	120	24	5	14	120	110	87,5	150	180	100	100	22,9	32,6	16,4	32,6
MMS-S 16x150	•	16	150	24	35	14	130	115	87,5	150	180	100	100	22,9	32,6	16,4	32,6
MMS-S 20x100	•	20	100	30	10	18	100	90	63,5	180	140	90	90	14,1	33,9	10,1	24,2
MMS-S 20x130	•	20	130	30	15	18	125	115	85,0	180	155	90	90	21,8	52,5	15,6	37,5
<b>MMS-S A4, stainless steel A4</b>																	
MMS-S 7,5x 60/ 75	•	7,5	75	13	10	6	70	65	40,0	20	105	54	40	3,5	6,0	2,4	6,0
MMS-S 10x 70/ 85	•	10	85	16	10	8	90	75	47,5	50	130	50	50	6,6	13,3	5,0	13,3
MMS-S 10x 80/ 95	•	10	95	16	20	8	90	75	47,5	50	130	50	50	6,6	13,3	5,0	13,3
MMS-S 12x 80/100	•	12	100	18	10	10	100	90	54,5	80	140	60	60	8,8	22,0	6,6	19,3
MMS-S 12x100/120	•	12	120	18	30	10	100	90	54,5	80	140	60	60	8,8	22,0	6,6	19,3

- Not included in ETA-approval.
- Is also supplied with forged-on washer.
- \* Is also supplied with Delta Protekt surface treatment - equivalent to 45 μm hot dipped galvanising.
- ▼ 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  $S \geq 3 h_{ef}$ .  $\Psi_{re,N} = 1$  (Normal reinforcement according to 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  $S \geq 3 h_{ef}$ .
- ◊ Torque is recommended maximum.

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

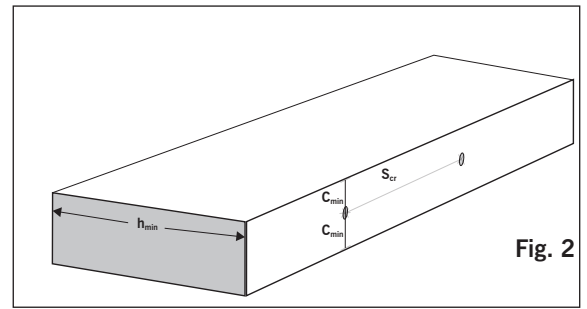
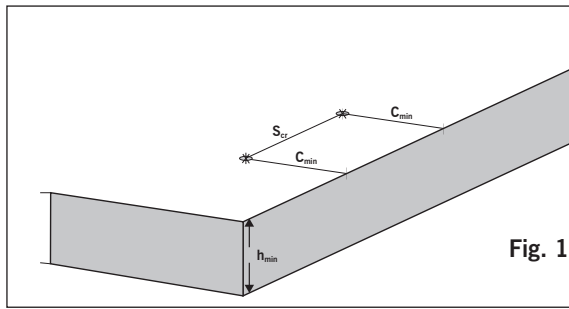
When calculating load capacities for anchors or anchorgroup use Expandet Calculation Software allowing for design with individual edge distance and spacing in accordance with ETAG 001, Annex C, Design Method A. Download Expandet Calculation Software for free at [www.expandet.com](http://www.expandet.com).

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

$$\left(\frac{N_{Rd}}{N_{Rd,c}}\right)^{1,5} + \left(\frac{V_{Rd}}{V_{Rd,c}}\right)^{1,5} \leq 1,0$$

**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))

# MULTI-MONTI



## Regningsmæssige bæreevner for ENKELT anker ved minimum kant afstand ( $C_{min}$ ) til én side (Fig 1) <sup>1)</sup>

Multi-Monti MMS-S (EG & A4)		MMS-S 7,5	MMS-S 10	MMS-S 12	MMS-S 14	MMS-S 16	
$h_{nom}$	Sættedybde *	mm	55 (65)	65 (75)	75 (90)	95	115
$C_{min}$	Minimum kantafstand	mm	40	50	60	90	100
$N_{Rd,c}$	Direkte træk (ikke revnet beton)	kN	4,7	6,6	8,8	14,8	18,7
$N_{Rd,c}$	Direkte træk (revnet beton)	kN	2,8	4,8	6,4	10,5	13,3
$V_{Rd,c}$	Forskydning (ikke revnet beton)	kN	3,1	4,5	6,1	11,3	13,8
$V_{Rd,c}$	Forskydning (revnet beton)	kN	2,2	3,2	4,3	8,0	9,8
$S_{cr}$	Karakteristisk indbyrdes afstand	mm	120	150	180	276	300
$h_{min}$	Minimum betontykkelse*	mm	100 (105)	115 (130)	125 (140)	150	180

## Regningsmæssige bæreevner for ENKELT anker ved minimum kant afstand ( $C_{min}$ ) til begge sider (Fig 2) <sup>1)</sup>

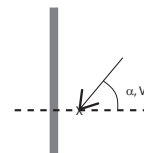
Multi-Monti MMS-S (EG & A4)		MMS-S 7,5	MMS-S 10	MMS-S 12	MMS-S 14	MMS-S 16	
$h_{nom}$	Sættedybde *	mm	55 (65)	65 (75)	75 (90)	95	115
$C_{min}$	Minimum kantafstand	mm	40	50	60	90	100
$N_{Rd,c}$	Direkte træk (ikke revnet beton)	kN	4,1	5,5	7,6	13,5	16,2
$N_{Rd,c}$	Direkte træk (revnet beton)	kN	2,7	3,9	5,4	9,6	11,5
$V_{Rd,c}$	Forskydning (ikke revnet beton)	kN	3,1	4,5	6,1	11,3	13,8
$V_{Rd,c}$	Forskydning (revnet beton)	kN	2,2	3,2	4,3	8,0	9,8
$S_{cr}$	Karakteristisk indbyrdes afstand	mm	120	150	180	276	300
$h_{min}$	Minimum betontykkelse*	mm	100 (105)	115 (130)	125 (140)	150	180

\* Tal i () gælder kun for MMS-S i rustfri A4

1) Regningsmæssige bæreevner gælder for et enkelt anker ved minimum kantafstand i beton C 20/25 forudsat at karakteristisk indbyrdes afstand  $S_{cr,N}$  overholdes. Bæreevne beregning for forskydning i henhold til ETAG 001, Annex C - August 2012.

Brug Expandets Beregningsprogram for beregning af bæreevner for et enkelt anker eller ankergrupper i henhold til ETAG 001. Programmet kan downloades på [www.expandet.dk](http://www.expandet.dk).

Hvis forskydningskraften ikke er mod kanten $C_{min}$ (hvilket antages i ovenstående regningsmæssige bæreevner $V_{Rd,c}$ ) kan denne øges med faktoren $\Psi_{\alpha,V}$										
$\alpha, V$	0°	10°	20°	30°	45°	50°	60°	70°	80°	≥ 90°
$\Psi_{\alpha,V}$	1,00	1,01	1,05	1,13	1,31	1,40	1,64	1,97	2,32	2,50



Faktor for øget betonstyrke							
Betonstyrke (EN 206-1)	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
Betonfaktor ( $f_{b,V}$ )	1	1,1	1,22	1,34	1,41	1,48	1,55

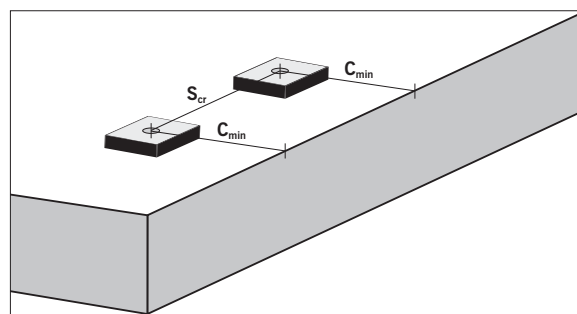
Kombineret bæreevne skal verificeres i tilfælde af samtidig direkte træk og forskydning:  $\left(\frac{N_{Sd}}{N_{Rd,c}}\right)^{1,5} + \left(\frac{V_{Sd}}{V_{Rd,c}}\right)^{1,5} \leq 1,0$

Vær opmærksom på gevindtangens regningsmæssige bæreevner for stål ikke overskrides: Minimum af følgende er dimensionsgivende:

Direkte træk: Minimum af:  $N_{Rd,c}$  eller  $N_{Rd,s}$

Forskydning: Minimum af:  $(V_{Rd,c} \times f_{b,V} \times \Psi_{\alpha,V})$  eller  $V_{Rd,s}$

(Regningsmæssig værdier for stål se næste side)

**MULTI-MONTI**

**Design shear load capacity (steel failure) and resistance against bending (lever arm) for Multi-Monti, zinc plated, Delta Protekt  $\diamond$** 

MMS-S EG	MMS-S 7,5	MMS-S 10	MMS-S 12	MMS-S 14	MMS-S 16
$h_{nom}$ Embedment depth mm	65	65	75	95	115
$V_{Rd,s}$ kN	4,6	10,6	15,3	24,0	32,6
$M_{Rd}$ Nm	12,6	25,3	47,3	88,0	144,6

**Design shear load capacity (steel failure) and resistance against bending (lever arm) for Multi-Monti, stainless steel A4  $\diamond$** 

MMS-S A4	MMS-S 7,5	MMS-S 10	MMS-S 12
$h_{nom}$ Embedment depth mm	65	47,5	54,5
$V_{Rd,s}$ kN	8,2	13,3	22,0
$M_{Rd}$ Nm	14,6	30,0	62,0

$\diamond$  Design shear load capacities (steel failure) and resistance against bending (lever arm) is valid for a single anchor and include partial safety factor for material ( $\gamma_{ms}$ ) in accordance with product ETA.

**Regningsmæssig forskydningsbæreevne for et enkelt anker ved mindste kantafstand ( $C_{min}$ )  $\diamond$** 

MMS-S EG	MMS-6	MMS-6	MMS-7,5	MMS-7,5	MMS-10x60	MMS-12x60	MMS-16	MMS-16	MMS-20	MMS-20
$h_{nom}$ Sættedybde mm	35	45	35	45	55	55	70	110	90	110
$V_{Rd,c}$ (revnet beton) kN	1,7	2,1	2,0	2,1	3,1	4,1	8,0	9,7	8,3	8,8
$V_{Rd,c}$ (ikke revnet beton) kN	2,34	2,94	2,86	3	4,38	5,74	11,24	13,71	11,76	12,48
$C_{min}$ mm	35	40	40	40	50	60	90	100	90	90
$S_{cr}$ mm	105	120	120	120	150	180	270	300	270	270

\* Ovenstående regningsmæssig forskydningsbæreevne gælder ved minimum kantafstand i beton C20/25 forudsat at karakteristisk afstand  $S_{cr}$  overholdes. Partialkoefficient for betonkantbrud  $\gamma_{mc}$  er indeholdt.

Brug Expandets Beregningsprogram for beregning af bæreevner for et enkelt anker og ankergrupper i følge ETAG 001, Annex C - Design metode A. Expandets Beregningsprogram kan downloades gratis på [www.expandet.dk](http://www.expandet.dk).

**Regningsmæssig forskydningsbæreevne (stål) og bøjningsmoment for Multi-Monti Betonbolt EG  $\diamond$** 

MMS-S EG	MMS-6	MMS-6	MMS-7,5	MMS-7,5	MMS-10x60	MMS-12x60	MMS-16	MMS-16	MMS-20	MMS-20
$h_{nom}$ Sættedybde mm	35	45	35	45	55	55	70	110	90	110
$V_{Rd,s}$ kN	4,1	4,1	4,6	4,6	10,6	15,3	32,6	32,6	54,0	54,0
$M_{Rd}$ Nm	6,6	6,6	12,6	12,6	25,3	47,3	144,6	144,6	239,1	239,1

$\diamond$  Regningsmæssig forskydningsbæreevne (stål) og regningsmæssig bøjningsmoment indeholder partialkoefficient for materiale ( $\gamma_{ms}$ ).

Brug Expandets Beregningsprogram for beregning af bæreevner for et enkelt anker og ankergrupper i tilfælde af monterer påvirket af bøjning grundet ikke bærende underlag i følge ETAG 001, Annex C - Design Metode A. Expandets Beregningsprogram kan downloades gratis på [www.expandet.dk](http://www.expandet.dk).