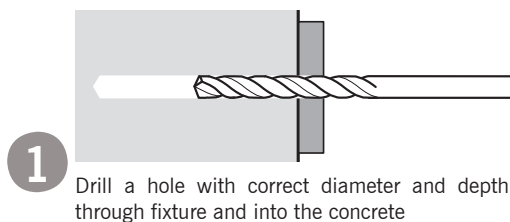


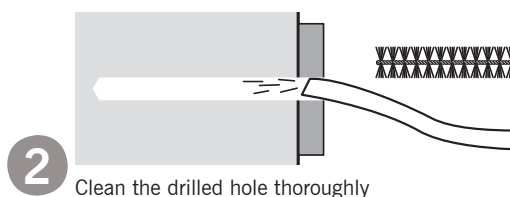


**MULTI-MONTI**

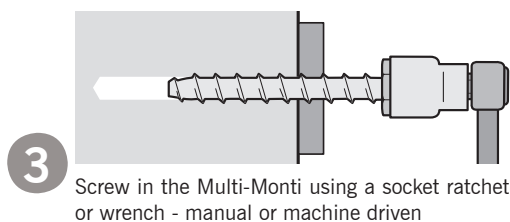
**Installation:**



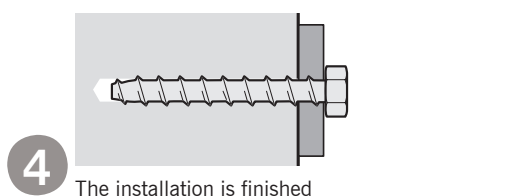
**1** Drill a hole with correct diameter and depth through fixture and into the concrete



**2** Clean the drilled hole thoroughly



**3** Screw in the Multi-Monti using a socket ratchet or wrench - manual or machine driven



**4** The installation is finished

**For fixing of brackets, balcony railings, machines, 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  $\mu\text{m}$  and stainless Steel A4.  
 Multi-Monti is also supplied with Delta Protekt surface treatment - corrosion resistance equivalent to hot dipped galvanising (Salt spray test 350 hours with used bolts / 700 hours with bolts not used). 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 to M12 are fire tested in accordance with DIN 4102-1.  
 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 tested in accordance with DIN 4102-2  
 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.



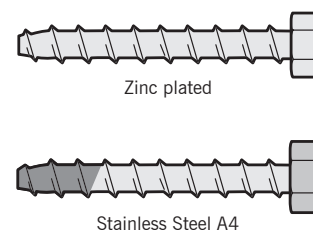
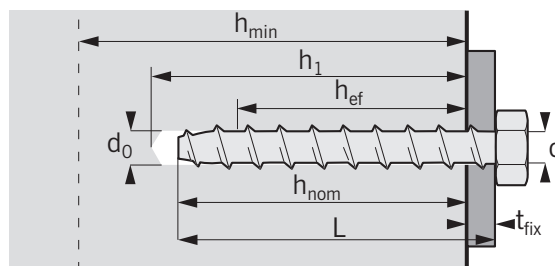
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 DK-3230 Græsted  
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Version 06.012

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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>	N <sub>Rd</sub> Non-cracked concrete	V <sub>Rd</sub> Non-cracked concrete	N <sub>Rd</sub> Cracked concrete	V <sub>Rd</sub> Cracked concrete	
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*	Thickness of concrete member min., mm	Minimum allowable spacing mm	Minimum allowable edge distance mm	Design resistance tension kN▽	Design resistance shear kN▽	Design resistance tension kN▽	Design resistance shear kN▽
<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	4,9	2,2	4,2
MMS-S 7,5x 50	7,5	50	13	5	6	50	45	31,5	20	90	40	40	3,3	4,9	2,2	4,2
MMS-S 7,5x 60	7,5	60	13	5	6	60	55	40,0	20	100	40	40	4,1	4,9	2,9	4,9
MMS-S 7,5x 80	7,5	80	13	25	6	60	55	40,0	20	100	40	40	4,1	4,9	2,9	4,9
MMS-S 7,5x100	7,5	100	13	45	6	60	55	40,0	20	100	40	40	4,1	4,9	2,9	4,9
MMS-S 7,5x120	7,5	120	13	65	6	60	55	40,0	20	100	40	40	4,1	4,9	2,9	4,9
MMS-S 7,5x140	7,5	140	13	85	6	60	55	40,0	20	100	40	40	4,1	4,9	2,9	4,9
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	17,3
MMS-S 12x 90	12	90	18	15	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x100	12	100	18	25	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x120	12	120	18	45	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x140	12	140	18	69	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x160	12	160	18	85	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x200	12	200	18	125	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x240	12	240	18	165	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x280	12	280	18	205	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
MMS-S 12x320	12	320	18	245	10	85	75	54,5	80	125	60	60	8,8	17,3	6,6	17,3
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	10	14	125	110	83,0	150	160	100	100	19,4	32,6	13,8	32,6
MMS-S 16x130	16	130	24	15	14	130	115	83,0	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	20	6	60	55	27,3	20	110	50	50	3,6	4,9	2,5	3,5
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

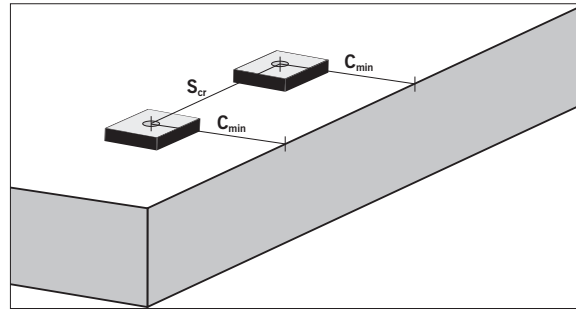
- Not included in ETA-approval.
- Is also supplied with forged-on washer.
- \* Is also supplied with Delta Protekt surface treatment - equivalent to 45 μm hot dipped galvanising.
- ▽ Design resistance for tension is valid for a single anchor in concrete C20/25 not influenced by edge distance and/or spacing:  $C \geq 1,5 h_{ef}$  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 ( $\gamma_f$ ) 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 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. See "Principles for Fastening" page 5 (Verification Method 2).

**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))


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

MMS-S EG, Delta Protokt		MMS-S M10	MMS-S M12	MMS-S M14	MMS-S M16
$h_{nom}$	Embedment depth mm	65	75	95	115
$V_{Rd,c}$	(cracked concrete) kN	2,1	3,1	6,3	8,1
$V_{Rd,c}$	(non-cracked concrete) kN	2,9	4,3	8,8	11,3
$C_{min}$	mm	50	60	90	100
$S_{cr}$	mm	150	180	276	300
MMS-S A4					
$h_{nom}$	Embedment depth mm	47,5	54,5	-	-
$V_{Rd,c}$	(cracked concrete) kN	2,1	3,1	-	-
$V_{Rd,c}$	(non-cracked concrete) kN	3,0	4,3	-	-
$C_{min}$	mm	50	60	-	-
$S_{cr}$	mm	150	180	-	-

♦ Above design shear load capacities are 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 in accordance with product ETA.

Use Expandet Calculation Software for calculation of load capacities for single anchors and anchor groups in accordance with ETAG 001, Annex C – Design Method A.

**Design shear load capacity (steel failure) and resistance against bending (lever arm) for Multi-Monti, zinc plated, Delta Protokt <sup>◇</sup>**

		MMS-S M10	MMS-S M12	MMS-S M14	MMS-S M16
$h_{nom}$	Embedment depth mm	65	75	95	115
$V_{Rd,s}$	kN	10,6	17,3	24,0	32,6
$M_{Rd}$	Nm	25,3	54,6	88,0	144,6

◇ Design shear load capacities include partial safety factor for material ( $\gamma_{ms}$ ) in accordance with product ETA.

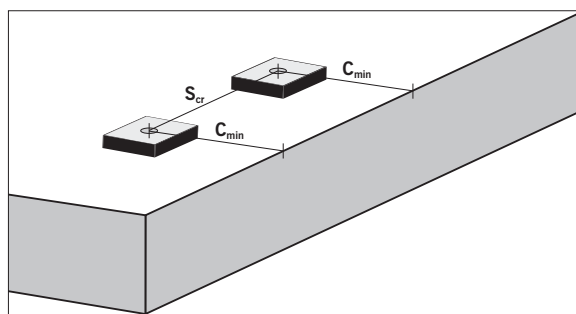
**Design shear load capacity (steel failure) and resistance against bending (lever arm) for Multi-Monti, stainless steel A4<sup>◇</sup>**

		MMS-S M10	MMS-S M12
$h_{nom}$	Embedment depth mm	47,5	54,5
$V_{Rd,s}$	kN	13,3	22,0
$M_{Rd}$	Nm	30,0	62,0

◇ 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.



## MULTI-MONTI


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

MMS-S EG, Delta Protokt	MMS-6	MMS-6	MMS-7,5	MMS-7,5	MMS-7,5	MMS-10x60	MMS-12x60	MMS-16	MMS-16	MMS-20	MMS-20
$h_{nom}$ Embedment depth mm	35	45	35	45	55	55	55	70	110	90	110
$V_{Rd,c}$ (cracked concrete) kN	0,9	1,23	1,2	1,3	1,4	2,1	2,9	5,9	8,0	7,0	7,4
$V_{Rd,c}$ (non-cracked concrete) kN	1,3	1,73	1,7	1,8	1,9	2,9	4,0	8,3	11,2	9,8	10,4
$C_{min}$ mm	35	40	40	40	40	50	60	90	100	90	90
$S_{cr}$ mm	105	120	120	120	120	150	180	270	300	270	270
<b>MMS-S A4</b>											
$h_{nom}$ Embedment depth mm	-	-	-	-	65	-	-	-	-	-	-
$V_{Rd,c}$ (cracked concrete) kN	-	-	-	-	1,4	-	-	-	-	-	-
$V_{Rd,c}$ (non-cracked concrete) kN	-	-	-	-	1,9	-	-	-	-	-	-
$C_{min}$ mm	-	-	-	-	40	-	-	-	-	-	-
$S_{cr}$ mm	-	-	-	-	120	-	-	-	-	-	-

♦ Above design shear load capacity 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 capacities for single anchors and anchor groups in accordance with ETAG 001, Annex C – Design Method A.

**Design shear load capacity for steel failure and resistance against bending (lever arm) for Multi-Monti, zinc plated, Delta Protokt<sup>◇</sup>**

MMS-S EG, Delta Protokt	MMS-6	MMS-6	MMS-7,5	MMS-7,5	MMS-7,5	MMS-10x60	MMS-12x60	MMS-16	MMS-16	MMS-20	MMS-20
$h_{nom}$ Embedment depth mm	35	45	35	45	55	55	55	70	110	90	110
$V_{Rd,s}$ kN	4,1	4,1	4,9	4,9	4,9	10,6	17,3	32,6	32,6	54,0	54,0
$M_{Rd}$ Nm	6,6	6,6	12,6	12,6	12,6	25,3	54,6	144,6	144,6	239,1	239,1

◇ 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 ( $\gamma_{ms}$ ).

**Design shear load capacity for steel failure and resistance against bending (lever arm) for Multi-Monti, stainless steel A4<sup>◇</sup>**

MMS-S A4	MMS-7,5
$h_{nom}$ Embedment depth mm	65
$V_{Rd,s}$ kN	7,6
$M_{Rd}$ Nm	14,9

◇ 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 ( $\gamma_{ms}$ ).