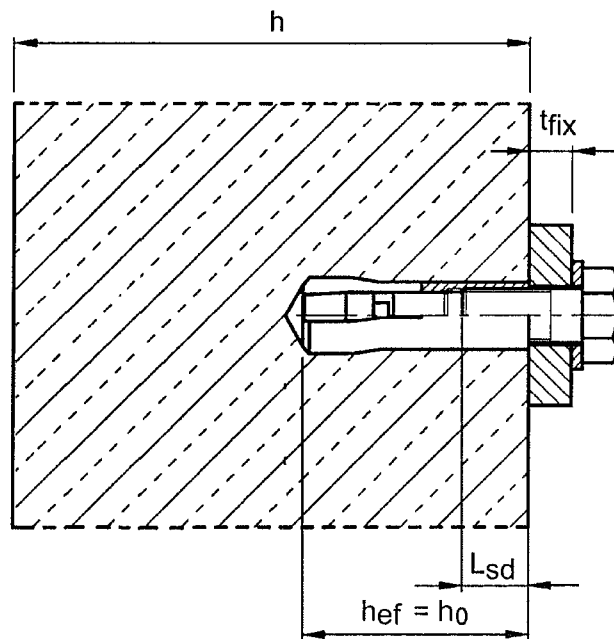
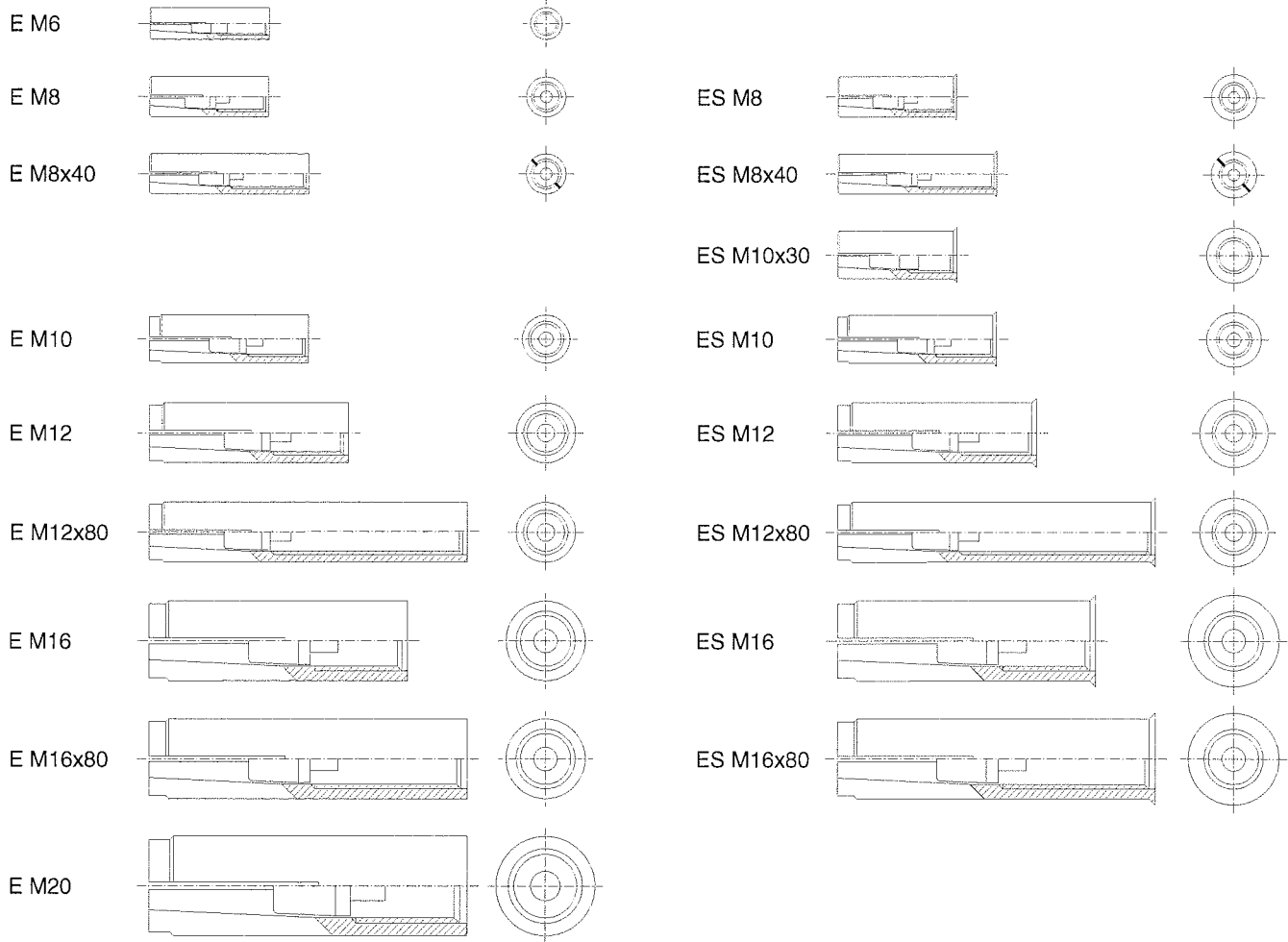


Anchor size



MKT Drop-in anchor E / ES

Product and intended use

Annex 1

of European
technical approval

ETA-02/0020

Anchor sleeve

Marking: e.g.: \diamond E M8

A4 additional marking of stainless steel A4

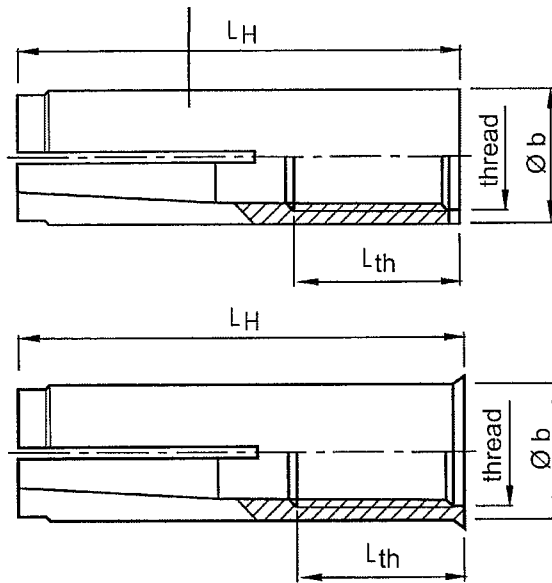
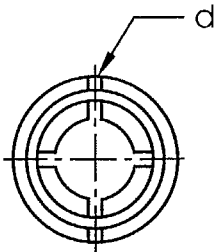
\diamond Identifying mark of manufacturing plant

HCR additional marking of high corrosion resistant steel HCR

E Anchor identity

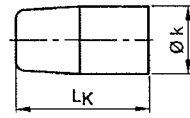
M8 Size of thread

additional marking d for size M8x40



Cone

Size M6 and M10x30



Size M8 – M20

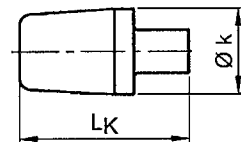


Table 1: Dimensions [mm]

Anchor size	Anchor sleeve				Cone	
	thread	Ø b	L _H	L _{th}	Ø k	L _k
M6	M6	8	30	13	5.0	13
M8	M8	10	30	13	6.5	12
M8x40	M8	10	40	20		
M10x30	M10	12	30	12	8.2	12
M10	M10	12	40	15	8.2	16
M12	M12	15	50	18	10.3	20
M12x80	M12	15	80	45		
M16	M16	19.7	65	23	13.8	29
M16x80	M16	19.7	80	38		
M20	M20	24.7	80	34	16.5	30

Table 2: Designation of anchor parts and material

Part	Designation	Steel, zinc plated	Stainless steel A4	High corrosion resistant steel HCR
1	Anchor sleeve	Cold formed or machining steel, zinc plated, EN ISO 4042	Stainless steel, 1.4401, 1.4404, 1.4571, 1.4362, EN 10088, Property class 70, acc. to EN ISO 3505	Stainless steel, 1.4529, 1.4565, EN 10088, Property class 70, acc. to EN ISO 3506
2	Cone	Steel for cold forming acc. to EN 10263-2	Stainless steel, 1.4401, 1.4404, 1.4571, 1.4362, EN 10088	

MKT Drop-in anchor E / ES

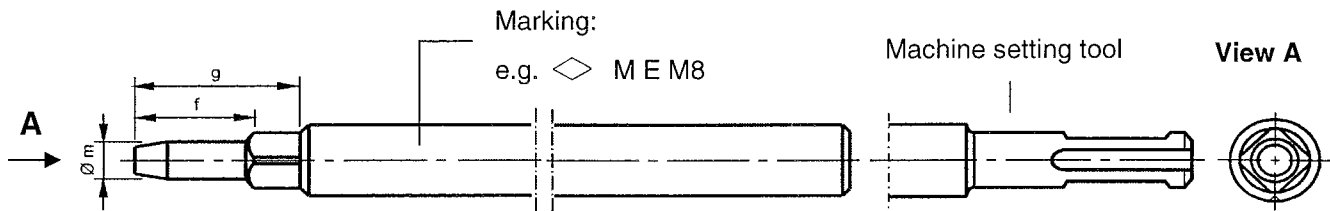
**Dimensions,
Designation of anchor parts and materials**

Annex 2

of European technical approval

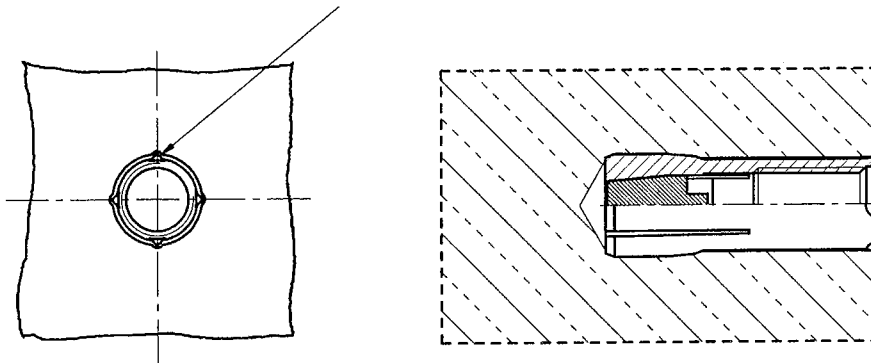
ETA-02/0020

Setting tool for marking



Verification of correct installation with setting tool marking

The setting tool leaves a visible marking after correct installation.



Setting tool

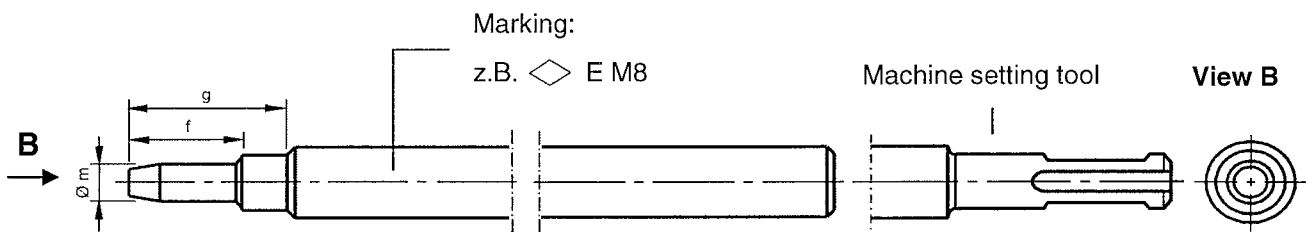


Table 3: Dimensions of setting tools [mm]

Anchor size	Ø m	f	g
M6	4.9	17	27
M8	6.4	18	28
M8x40	6.4	28	38
M10x30	8.0	18	28
M10	8.0	24	34
M12	10.0	30	40
M12x80	10.0	60	70
M16	13.5	36	46
M16x80	13.5	51	61
M20	16.5	50	60

MKT Drop-in anchor E / ES

Dimensions of setting tools and verification of correct installation

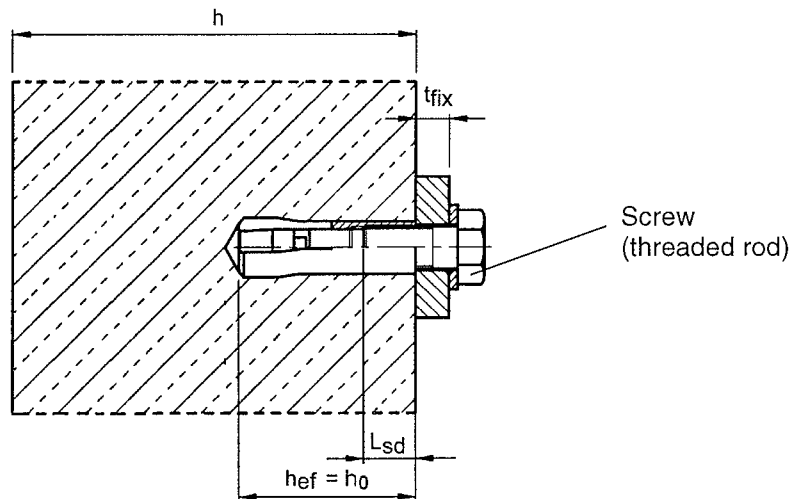
Annex 3

of European technical approval

ETA-02/0020

Table 4: Installation parameters

Anchor size		M6	M8	M8x40	M10x30	M10	M12	M12x80	M16	M16x80	M20
Depth of drill hole	$h_0 =$ [mm]	30	30	40	30	40	50	80	65	80	80
Drill hole diameter	$d_0 =$ [mm]	8	10	10	12	12	15	15	20	20	25
Cutting diameter of drill bit	$d_{cut} \leq$ [mm]	8.45	10.45	10.45	12.5	12.5	15.5	15.5	20.55	20.55	25.55
Max. recommended setting torque	$T_{inst} \leq$ [Nm]	4	8	8	15	15	35	35	60	60	120
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	7	9	9	12	12	14	14	18	18	22
Available thread length	L_{th} [mm]	13	13	20	12	15	18	45	23	38	34
Minimum screw-in depth	L_{sdmin} [mm]	7	9	9	10	11	13	13	18	18	22
Steel, zinc plated											
Minimum thickness of member	h_{min} [mm]	100	100	100	120	120	130	130	160	160	200
Minimum spacing	s_{min} [mm]	55	60	80	100	100	120	120	150	150	160
Minimum edge distance	c_{min} [mm]	95	95	95	115	135	165	165	200	200	260
Stainless steel A4, HCR											
Minimum thickness of member	h_{min} [mm]	100	100	100	—	130	140	140	160	160	250
Minimum spacing	s_{min} [mm]	50	60	80	—	100	120	120	150	150	160
Minimum edge distance	c_{min} [mm]	80	95	95	—	135	165	165	200	200	260

**Requirements of the fastening screw or the threaded rod and nut according to the engineering documents:**

- Minimum screw-in depth L_{sdmin} see Table 4
- The length of screw or the threaded rod shall be determined depending on the thickness of fixture t_{fix} , available thread length L_{th} (= maximum screw-in depth) and the minimum screw-in depth L_{sdmin} .
- $A_5 > 8\%$ Ductility

Steel, zinc plated

- Property class 4.6 / 5.6 / 5.8 or 8.8 according to EN ISO 898-1 or EN 20898-2

Stainless steel A4

- Material 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088
- Property class 70 or 80 according to EN ISO 3506

High corrosion resistant steel (HCR)

- Material 1.4529; 1.4565 EN 10088
- Property class 70 or 80 according to EN ISO 3506

MKT Drop-in anchor E / ES**Installation parameters****Annex 4**of European
technical approval**ETA-02/0020**

Table 5: Design method A – Characteristic values for tension loads

Anchor size			M6 ¹⁾	M8 ¹⁾	M8x40	M10x30 ¹⁾	M10	M12 M12x80	M16 M16x80	M20	
Steel failure, Steel zinc plated											
Characteristic resistance Steel 4.6	$N_{Rk,s}$	[kN]	8.0	14.6		23.2		33.7	62.8	98.0	
Partial safety factor	γ_{Ms} ³⁾	[-]	2.0								
Characteristic resistance Steel 5.6	$N_{Rk,s}$	[kN]	10.0	18.3		18.0	29.0	42.1	78.3	122.4	
Partial safety factor	γ_{Ms} ³⁾	[-]	2.0			1.5	2.0				
Characteristic resistance Steel 5.8	$N_{Rk,s}$	[kN]	10.0	18.3		18.0	25.2	42.1	67.1	106.4	
Partial safety factor	γ_{Ms} ³⁾	[-]	1.5					1.6			
Characteristic resistance Steel 8.8	$N_{Rk,s}$	[kN]	16.0	19.9		18.0	25.2	43.0	67.1	106.4	
Partial safety factor	γ_{Ms} ³⁾	[-]	1.5					1.6			
Steel failure, Stainless steel A4, HCR											
Characteristic resistance	$N_{Rk,s}$	[kN]	14	23		—	29	52	84	133	
Partial safety factor	γ_{Ms} ³⁾	[-]	1.87								
Pull out failure, Steel zinc plated											
Characteristic resistance in concrete C20/25	$N_{Rk,p}$	[kN]	²⁾	²⁾	9	²⁾	²⁾	²⁾	²⁾	²⁾	
Increasing factor for $N_{Rk,p}$	ψ_C	C30/37	[-]		1.12						
		C40/50	[-]		1.23						
		C50/60	[-]		1.30						
Partial safety factor	γ_{Mp} ^{3) 4)}	[-]			1.80						
Pull out failure, Stainless steel A4, HCR											
Characteristic resistance in concrete C20/25	$N_{Rk,p}$	[kN]	²⁾	²⁾	9	—	²⁾	²⁾	²⁾	²⁾	
Increasing factor for $N_{Rk,p}$	ψ_C	C30/37	[-]		1.22						
		C40/50	[-]		1.41						
		C50/60	[-]		1.55						
Partial safety factor	γ_{Mp} ^{3) 4)}	[-]			1.50						
Concrete cone failure and splitting, Steel zinc plated											
Effective anchorage depth	$h_{ef} = h_0$	[mm]	30	30	40	30	40	50	65	80	
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
	$s_{cr,Sp}$	[mm]	190	190	190	230	270	330	400	520	
Edge distance	$c_{cr,N}$	[mm]	1.5 h_{ef}								
	$c_{cr,Sp}$	[mm]	95	95	95	115	135	165	200	260	
Partial safety factor	$\gamma_{Mc} = \gamma_{M,sp}$ ^{3) 4)}	[-]	1.8	2.1	1.8						
Concrete cone failure and splitting, Stainless steel A4, HCR											
Effective anchorage depth	$h_{ef} = h_0$	[mm]	30 ⁵⁾	30	40	—	40	50	65	80	
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}								
	$s_{cr,Sp}$	[mm]	160	190	190	—	270	330	400	520	
Edge distance	$c_{cr,N}$	[mm]	1.5 h_{ef}								
	$c_{cr,Sp}$	[mm]	80	95	95	—	135	165	200	260	
Partial safety factor	$\gamma_{Mc} = \gamma_{M,sp}$ ^{3) 4)}	[-]	1.5								

¹⁾ Use restricted to anchoring of structural components statically indeterminate

²⁾ Pullout failure mode not decisive

³⁾ In absence of other national regulations

⁴⁾ The partial safety factor γ_2 is included

⁵⁾ For proof against concrete cone failure as per ETAG 001, Annex C, Eq. 5.2a, $N_{Rk,c}^0$ must be multiplied by the factor $(25/f_{ck,cube})^{0.2}$

MKT Drop-in anchor E / ES

**Design method A,
Characteristic values for tension loads**

Annex 5

of European
technical approval

ETA-02/0020

Table 6: Design method A – Characteristic values for shear loads

Anchor size			M6	M8	M8x40	M10x30	M10	M12 M12x80	M16 M16x80	M20	
Steel failure without lever arm, Steel zinc plated											
Characteristic resistance Steel 4.6	$V_{Rk,s}$	[kN]	3.8	7.3		9.6		16.8	31.3	49.0	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.67								
Characteristic resistance Steel 5.6	$V_{Rk,s}$	[kN]	5.0	9.1		10	9.6	21	39.2	61.2	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.67			1.25	1.67				
Characteristic resistance Steel 5.8	$V_{Rk,s}$	[kN]	5.0	6.9		10	7.2	21	33.5	53.2	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25					1.33			
Characteristic resistance Steel 8.8	$V_{Rk,s}$	[kN]	5.0	6.9		10	7.2	21	33.5	53.2	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25					1.33			
Steel failure without lever arm, Stainless steel A4, HCR											
Characteristic resistance (property class 70)	$V_{Rk,s}$	[kN]	7	10		–	13	26	42	67	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.56								
Steel failure with lever arm, Steel zinc plated											
Characteristic resistance Steel 4.6	$M_{Rk,s}^0$	[Nm]	6.1	15		30	30	52	133	259	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.67								
Characteristic resistance Steel 5.6	$M_{Rk,s}^0$	[Nm]	7.6	19		37	37	65	166	324	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.67								
Characteristic resistance Steel 5.8	$M_{Rk,s}^0$	[Nm]	7.6	19		37	37	65	166	324	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25								
Characteristic resistance Steel 8.8	$M_{Rk,s}^0$	[Nm]	12	30		59	60	105	266	519	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.25								
Steel failure with lever arm, Stainless steel A4, HCR											
Characteristic resistance (Threaded rod: property class 70)	$M_{Rk,s}^0$	[Nm]	11	26		–	52	92	233	454	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.56								
Characteristic resistance (Threaded rod: property class 80)	$M_{Rk,s}^0$	[Nm]	12	30		–	60	105	266	519	
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.33								
Concrete pryout failure, Steel zinc plated											
Factor in eq. (5.6) ETAG Annex C, 5.2.3.3	k	[-]	1.0				1.5		2.0		
Partial safety factor	$\gamma_{Mcp}^{1) 2)}$	[-]	1.5								
Concrete pryout failure, Stainless steel A4 / HCR											
Factor in eq. (5.6) ETAG Annex C, 5.2.3.3	k	[-]	1.0	1.7		–	1.7	2.0			
Partial safety factor	$\gamma_{Mcp}^{1) 2)}$	[-]	1.5			–	1.5				
Concrete edge failure											
Effective length of anchor under shear loading	l_f	[mm]	30	30	40	30	40	50	65	80	
Outside diameter of anchor	d_{nom}	[mm]	8	10	10	12	12	15	20	25	
Partial safety factor	$\gamma_{Mc}^{1) 2)}$	[-]	1.5			2	1.5				

¹⁾ In absence of other national regulations

²⁾ The partial safety factor γ_2 is included

MKT Drop-in anchor E / ES

**Design method A,
Characteristic values for shear loads**

Annex 6

of European
technical approval

ETA-02/0020

Table 7: Displacements under tension loads

Anchor size			M6	M8	M8x40	M10x30	M10	M12 M12x80	M16 M16x80	M20	
Steel zinc plated											
Tension load in non-cracked concrete	N	[kN]	3	3	3.6	3.3	4.8	6.4	10	14.8	
Displacement	δ_{N0}	[mm]					0.24				
	$\delta_{N\infty}$	[mm]					0.36				
Stainless steel A4 / HCR											
Tension load in non-cracked concrete	N	[kN]	4	4	4.3	—	6.1	8.5	12.6	17.2	
Displacement	δ_{N0}	[mm]					0.12				
	$\delta_{N\infty}$	[mm]					0.24				

Table 8: Displacements under shear loads

Anchor size			M6	M8	M8x40	M10x30	M10	M12 M12x80	M16 M16x80	M20
Steel zinc plated										
Shear load in non-cracked concrete	V	[kN]	2	4	4	5.7	4	11.3	18.8	32.2
Displacement	δ_{V0}	[mm]	0.9	0.9	1.0	1.5	0.6	1.2	1.2	1.6
	$\delta_{V\infty}$	[mm]	1.3	1.3	1.5	2.3	0.9	1.9	1.9	2.4
Stainless steel A4 / HCR										
Shear load in non-cracked concrete	V	[kN]	3.5	5.2	5.2	—	6.5	11.5	19.2	30.4
Displacement	δ_{V0}	[mm]	1.9	1.1	0.7	—	1.0	1.7	2.4	2.6
	$\delta_{V\infty}$	[mm]	2.8	1.6	1.0	—	1.5	2.6	3.6	3.8

MKT Drop-in anchor E / ES

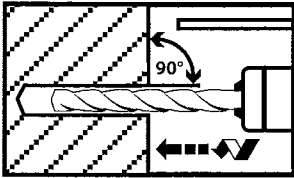
Displacements

Annex 7

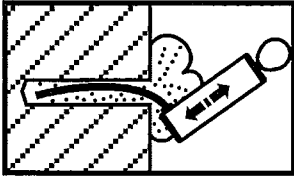
of European
technical approval

ETA-02/0020

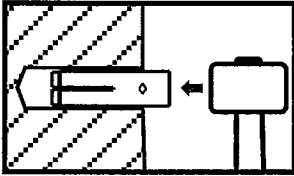
Installation instructions



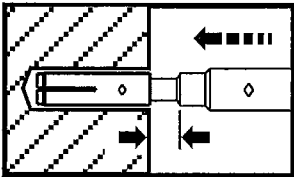
Drill hole perpendicular to concrete surface.



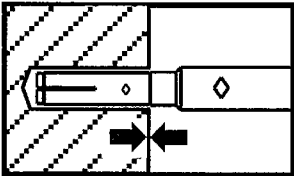
Blow out dust.



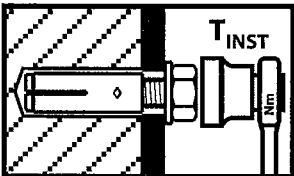
Drive in anchor.



Drive in cone by using setting tool.



Shoulder of setting tool must fit on anchor rim.



Apply installation torque T_{inst} by using torque wrench.

MKT Drop-in anchor E / ES

Installation instructions

Annex 8

of European
technical approval

ETA-02/0020