Technical Sheet

FM 753 evo
Perno de ancoragem opção 7

Os pernos de ancoragem FM 753 são fixações por expansão sobre elemento de betão.

Features

Matéria

- Aço eletrogalvanizado.

Vantagens

- Distâncias ao bordo e entre-eixos mínimas,
- Instalação rápida e fácil: porca e anilha pré-montadas e profundidade de ancoragem reduzida;
- Ø da rosca = Ø de perfuração,
- Rosca protegida durante a instalação: ponto de pressão reforçado.
- Marcação na cabeça: identificação das dimensões do perno após a instalação

Applications

Applications

- Railings
- Metal and wood carpentry
- Facades

Areas de utilizaçao

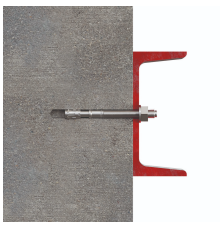
- Betão não fissurado,
- Pedra natural densa



















Fixação de estruturas em madeira



Zoom de la pointe



Fixação de estructuras metálicos

Dados técnicos

Dimensions

Referência	Metallic fixings dimensions							
					...racterísticos[mm]			
	NOI...	... de ancoragem	[mm]	fixada [df].	...nprimento ...rosca [Lv] [mm]	Chave SW[mm]	Pr... r... p...	

Dimensions
See full table online ➡️

Technical Sheet

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Perno de ancoragem opção 7

Design capacities - single anchor - no edge distances

Referência	Metallic fixings dimensions	Metallic fixings loads								
	Dimensões e valores caraterísticos[mm]	Design capacity - Non-cracked concrete (3)[kN]								Design capacity - Cracked concrete
	Dimensões[mm]	Tension - NRd (1)				Shear - VRd (1-2)[kN]				Bending moment MRd[Nm]
		C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	
75340B0604800	M6x48*/**	4	4	4	4.1	5.1	5.1	5.1	5.1	7.3
75340B0606500	M6x65	4	4	4	4.1	5.1	5.1	5.1	5.1	7.3
75340B0608500	M6x85	4	4	4	4.1	5.1	5.1	5.1	5.1	7.3
75340B0806800	M8x68	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0807300	M8x73	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0808300	M8x83	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0809300	M8x93	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0810300	M8x103	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0811300	M8x113	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0813300	M8x133	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B0816300	M8x163	8	8.3	8.5	8.7	7.9	7.9	7.9	7.9	21.5
75340B1007800	M10x78	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1008300	M10x83	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1009300	M10x93	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1010300	M10x103	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1011300	M10x113	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1012300	M10x123	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1014300	M10x143	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1017300	M10x173	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1021300	M10x213	11.6	14.2	16.4	18.3	11.6	11.6	11.6	11.6	37.3
75340B1210400	M12x104	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1210900	M12x109	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1211900	M12x119	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1212900	M12x129	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1213900	M12x139	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1214900	M12x149	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1217900	M12x179	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1219900	M12x199	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1221900	M12x219	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1223900	M12x239	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3
75340B1225900	M12x259	17.2	20.8	23.9	26.7	20.1	20.1	20.1	20.1	65.3

1. The design loads loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

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Perno de ancoragem opção 7

Referência	Metallic fixings dimensions	Metallic fixings loads								
	Dimensões e valores caraterísticos[mm]	Design capacity - Non-cracked concrete (3)[kN]								Design capacity - Cracked concrete
	Dimensões[mm]	Tension - NRd (1)				Shear - VRd (1-2)[kN]				Bending moment MRd[Nm]
		C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	
75340B1611000	M16x110*/**	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3
75340B1615100	M16x151	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3
75340B1617100	M16x171	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3
75340B1620100	M16x201	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3
75340B1622100	M16x221	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3
75340B1626100	M16x261	23.5	27	29.8	32.4	37.5	37.5	37.5	37.5	155.3

1. The design loads loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Technical Sheet

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Perno de ancoragem opção 7

Recommended capacities - single anchor - no edge distances

Referência	Metallic fixings dimensions	Metallic fixings loads								
	Dimensões e valores caraterísticos[mm]	Cargas recomendadas - Betão não fissurado (3)								Design capacity - Non-cracked concrete (3)[kN]
	Dimensões[mm]	Tensão - Nrec(1)[kN]				Cisalhamento - Vrec (1-2)[kN]				Bending moment MRd[Nm]
		C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	
75340B0604800	M6x48*/**	2.2	2.9	2.9	2.9	2.9	3.6	3.6	3.6	3.6
75340B0606500	M6x65	2.2	2.9	2.9	2.9	2.9	3.6	3.6	3.6	3.6
75340B0608500	M6x85	2.2	2.9	2.9	2.9	2.9	3.6	3.6	3.6	3.6
75340B0806800	M8x68	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0807300	M8x73	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0808300	M8x83	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0809300	M8x93	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0810300	M8x103	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0811300	M8x113	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0813300	M8x133	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B0816300	M8x163	2.4	5.7	5.9	6.1	6.2	5.6	5.6	5.6	5.6
75340B1007800	M10x78	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1008300	M10x83	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1009300	M10x93	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1010300	M10x103	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1011300	M10x113	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1012300	M10x123	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1014300	M10x143	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1017300	M10x173	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1021300	M10x213	4.7	8.3	10.1	11.7	13.1	8.3	8.3	8.3	8.3
75340B1210400	M12x104	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1210900	M12x109	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1211900	M12x119	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1212900	M12x129	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1213900	M12x139	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1214900	M12x149	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1217900	M12x179	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1219900	M12x199	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1221900	M12x219	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1223900	M12x239	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4

1. The recommended loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s) and with a partial safety factor for actions of γF=1.4. The loading figures
are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10 mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per
ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

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Referência	Metallic fixings dimensions	Metallic fixings loads								
	Dimensões e valores caraterísticos[mm]	Cargas recomendadas - Betão não fissurado (3)								Design capacity - Non-cracked concrete (3)[kN]
	Dimensões[mm]	Tensão - Nrec(1)[kN]				Cisalhamento - Vrec (1-2)[kN]				Bending moment MRd[Nm]
		C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	C20/25[kN]	C30/37[kN]	C40/50[kN]	C50/60[kN]	
75340B1225900	M12x259	7.2	12.3	14.9	17.1	19.1	14.4	14.4	14.4	14.4
75340B1611000	M16x110*/**	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8
75340B1615100	M16x151	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8
75340B1617100	M16x171	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8
75340B1620100	M16x201	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8
75340B1622100	M16x221	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8
75340B1626100	M16x261	9.2	16.8	19.3	21.3	23.1	26.8	26.8	26.8	26.8

1. The recommended loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s) and with a partial safety factor for actions of γF=1.4. The loading figures
are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10 mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per
ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Technical Sheet

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Perno de ancoragem opção 7

Design capacities - single anchor - no edge distances - reduced embedment depth

Referência	Metallic fixings dimensions	Metallic fixings loads	Dados de instalação				
	Dimensões e valores caraterísticos[mm]	Design loads - Tension & Shear - N_rd[kN]	Dados de instalação	Spacing and edge distances			
	Dimensões[mm]		Profundidade de ancoragem reduzida[mm]	Characteristic spacing for $h_{ef,r}$(5) [mm]	Profundidade mínima de ancoragem [hef]. [mm]	Min. spacing for $h_{ef,r}$[mm]	Min. edge distance for $h_{ef,r}$
75340B0604800	M6x48*/**	5.2	30	90	45	30	40
75340B0606500	M6x65	5.2	30	90	45	30	40
75340B0608500	M6x85	5.2	30	90	45	30	40
75340B0806800	M8x68	13.4	30	90	45	40	40
75340B0807300	M8x73	13.4	30	90	45	40	40
75340B0808300	M8x83	13.4	30	90	45	40	40
75340B0809300	M8x93	13.4	30	90	45	40	40
75340B0810300	M8x103	13.4	30	90	45	40	40
75340B0811300	M8x113	13.4	30	90	45	40	40
75340B0813300	M8x133	13.4	30	90	45	40	40
75340B0816300	M8x163	13.4	30	90	45	40	40
75340B1007800	M10x78	26.6	35	105	55	50	50
75340B1008300	M10x83	26.6	35	105	55	50	50
75340B1009300	M10x93	26.6	35	105	55	50	50
75340B1010300	M10x103	26.6	35	105	55	50	50
75340B1011300	M10x113	26.6	35	105	55	50	50
75340B1012300	M10x123	26.6	35	105	55	50	50
75340B1014300	M10x143	26.6	35	105	55	50	50
75340B1017300	M10x173	26.6	35	105	55	50	50
75340B1021300	M10x213	26.6	35	105	55	50	50
75340B1210400	M12x104	46.6	50	150	75	70	70
75340B1210900	M12x109	46.6	50	150	75	70	70
75340B1211900	M12x119	46.6	50	150	75	70	70
75340B1212900	M12x129	46.6	50	150	75	70	70
75340B1213900	M12x139	46.6	50	150	75	70	70
75340B1214900	M12x149	46.6	50	150	75	70	70
75340B1217900	M12x179	46.6	50	150	75	70	70
75340B1219900	M12x199	46.6	50	150	75	70	70
75340B1221900	M12x219	46.6	50	150	75	70	70
75340B1223900	M12x239	46.6	50	150	75	70	70
75340B1225900	M12x259	46.6	50	150	75	70	70
75340B1611000	M16x110*/**	110.9	59	180	90	90	90
75340B1615100	M16x151	110.9	59	180	90	90	90
75340B1617100	M16x171	110.9	59	180	90	90	90
75340B1620100	M16x201	110.9	59	180	90	90	90
75340B1622100	M16x221	110.9	59	180	90	90	90
75340B1626100	M16x261	110.9	59	180	90	90	90

Shear value valid with distance from the edge c>10 x $h_{ef,r}$

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Perno de ancoragem opção 7

Recommended capacities - single anchor - no edge distances - reduced embedment depth

Referência	Metallic fixings dimensions	Metallic fixings loads	Dados de instalação				
	Dimensões e valores caraterísticos[mm]	tensão / carga de cisalhamento Rrec[kN]	Dados de instalação	Spacing and edge distances			
	Dimensões[mm]		Profundidade de ancoragem reduzida[mm]	Characteristic spacing for $h_{ef,r}$(5) [mm]	Profundidade mínima de ancoragem [hef]. [mm]	Min. spacing for $h_{ef,r}$[mm]	Min. edge distance for $h_{ef,r}$
75340B0604800	M6x48*/**	1.6	30	90	45	30	40
75340B0606500	M6x65	1.6	30	90	45	30	40
75340B0608500	M6x85	1.6	30	90	45	30	40
75340B0806800	M8x68	1.7	30	90	45	40	40
75340B0807300	M8x73	1.7	30	90	45	40	40
75340B0808300	M8x83	1.7	30	90	45	40	40
75340B0809300	M8x93	1.7	30	90	45	40	40
75340B0810300	M8x103	1.7	30	90	45	40	40
75340B0811300	M8x113	1.7	30	90	45	40	40
75340B0813300	M8x133	1.7	30	90	45	40	40
75340B0816300	M8x163	1.7	30	90	45	40	40
75340B1007800	M10x78	3.4	35	105	55	50	50
75340B1008300	M10x83	3.4	35	105	55	50	50
75340B1009300	M10x93	3.4	35	105	55	50	50
75340B1010300	M10x103	3.4	35	105	55	50	50
75340B1011300	M10x113	3.4	35	105	55	50	50
75340B1012300	M10x123	3.4	35	105	55	50	50
75340B1014300	M10x143	3.4	35	105	55	50	50
75340B1017300	M10x173	3.4	35	105	55	50	50
75340B1021300	M10x213	3.4	35	105	55	50	50
75340B1210400	M12x104	5.2	50	150	75	70	70
75340B1210900	M12x109	5.2	50	150	75	70	70
75340B1211900	M12x119	5.2	50	150	75	70	70
75340B1212900	M12x129	5.2	50	150	75	70	70
75340B1213900	M12x139	5.2	50	150	75	70	70
75340B1214900	M12x149	5.2	50	150	75	70	70
75340B1217900	M12x179	5.2	50	150	75	70	70
75340B1219900	M12x199	5.2	50	150	75	70	70
75340B1221900	M12x219	5.2	50	150	75	70	70
75340B1223900	M12x239	5.2	50	150	75	70	70
75340B1225900	M12x259	5.2	50	150	75	70	70
75340B1611000	M16x110*/**	6.5	59	180	90	90	90
75340B1615100	M16x151	6.5	59	180	90	90	90
75340B1617100	M16x171	6.5	59	180	90	90	90
75340B1620100	M16x201	6.5	59	180	90	90	90
75340B1622100	M16x221	6.5	59	180	90	90	90
75340B1626100	M16x261	6.5	59	180	90	90	90

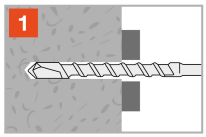
The recommended loads N,V and F derive from the mean ultimate loads and are inclusive of the total safety factor γ=4 (shear γ=3).
Shear value valid with distance from the edge c>10 x hef,r

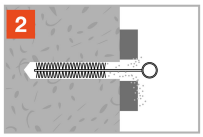
Technical Sheet

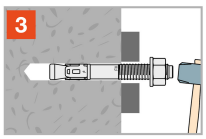
FM 753 evo

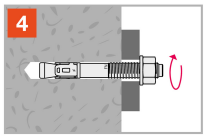
Perno de ancoragem opção 7

Execução









Spacing, Edge Distance and Member Thickness

Referência	Metallic fixings dimensions			Dados de instalação					
	Dimensões e valores característicos[mm]		Outro	Dados de instalação			Spacing and edge distances - Rebar		Spacing and ed
	Dim							Espaçamento característico(5) - Scr,N[mm]	Distâ caracte de bordo
			[mm]						
75340R0604800	M6x48*/**	10	6	7	45	8	30	90	40	120	6(

Spacing, Edge Distance and Member Thickness
See full table online ➡️

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