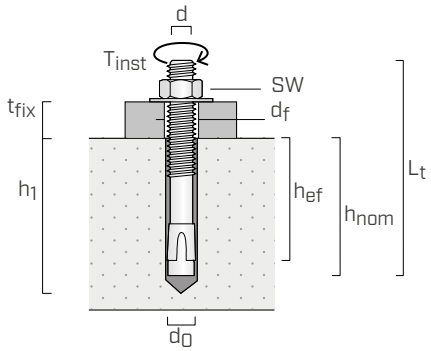
AB1 A4

CE1 STAINLESS STEEL HEAVY-DUTY EXPANSION ANCHOR

- CE option 1 for cracked and uncracked concrete
- Seismic performance category C1
- A4 stainless steel
- Fire resistance R120
- Complete with nut and washer
- Suitable for dense materials
- Through fastening
- Torque-controlled expansion

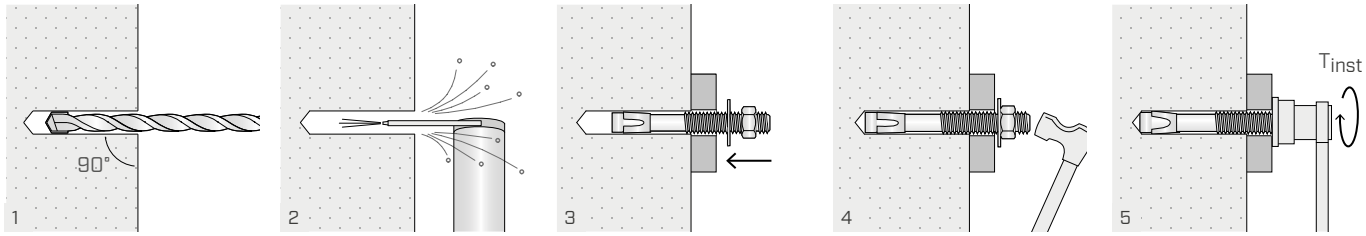
CODES AND DIMENSIONS

CODE	d = d_0	L_t	t_{fix}	$h_{1,min}$	h_{nom}	h_{ef}	d_f	SW	T_{inst}	pcs
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[Nm]	
AB1892A4	**M8**	**92**	30	60	50	45	9	13	20	50
AB18112A4		**112**	50	60	50	45	9	13	20	50
AB11092A4	**M10**	**92**	10	75	68	60	12	17	35	50
AB110132A4		**132**	50	75	68	60	12	17	35	25
AB112118A4	**M12**	**118**	20	90	81	70	14	19	70	20
AB116138A4	**M16**	**138**	20	110	96	85	18	24	120	10

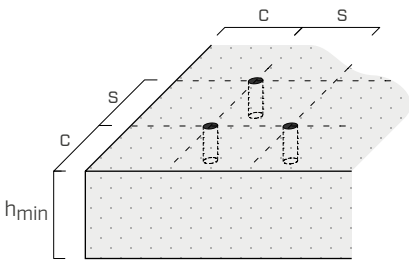


d	anchor diameter
d_0	hole diameter in the concrete support
L_t	anchor length
t_{fix}	maximum fastening thickness
h_1	minimum hole depth
h_{nom}	nominal anchoring depth
h_{ef}	effective anchor depth
d_f	maximum hole diameter in the element to be fastened
SW	wrench size
T_{inst}	tightening torque

ASSEMBLY



INSTALLATION



			AB1 A4			
Spacing and minimum distances			**M8**	**M10**	**M12**	**M16**
Minimum spacing	s_{min}	[mm]	50	55	60	70
	for c ≥	[mm]	50	80	90	120
Minimum edge distance	c_{min}	[mm]	50	50	55	85
	for s ≥	[mm]	50	100	145	150
Minimum thickness of concrete support	h_{min}	[mm]	100	120	140	170
Spacing and critical distances			**M8**	**M10**	**M12**	**M16**
Critical spacing	$s_{cr,N}$ (1)	[mm]	135	180	210	255
	$s_{cr,sp}$ (2)	[mm]	180	240	280	340
Critical edge distance	$c_{cr,N}$ (1)	[mm]	68	90	105	128
	$c_{cr,sp}$ (2)	[mm]	90	120	140	170

For spacing and distances smaller than the critical ones, strength values have to be reduced depending on the installation parameters.

STATIC VALUES

Valid for a single anchor in thickened C20/25 grade concrete with a thin reinforcing layer when spacing and edge-distance are not limiting parameters.

CHARACTERISTIC VALUES

	UNCRACKED CONCRETE				CRACKED CONCRETE			
	tension (3)		**shear** (4)		**tension** (3)		**shear**	
rod	$N_{Rk,p}$ [kN]	γ_{Mp}	$V_{Rk,s}$ [kN]	γ_{Ms}	$N_{Rk,p}$ [kN]	γ_{Mp}	$V_{Rk,s}$ [kN]	γ_M
M8	9	1,8	11	1,25	5	1,8	11	γ_{Mc} = 1,5 (5)
M10	16	1,8	17	1,25	9	1,8	17	γ_{Ms} = 1,25 (4)
M12	20	1,8	25	1,25	12	1,8	25	γ_{Ms} = 1,25 (4)
M16	35	1,5	47	1,25	20	1,5	47	γ_{Ms} = 1,25 (4)

incremental factor for $N_{Rk,p}$ (6)		
Ψ_c	C25/30	1,04
	C30/37	1,10
	C40/50	1,20
	C50/60	1,28

NOTES:

(1) Breakage characteristics for formation of concrete cone for tensile loads.
(2) Splitting failure mode for tensile loads.
(3) Pull-out failure mode.
(4) Steel failure mode.
(5) Pry-out failure mode.
(6) Tensile-strength increment factor (excluding steel failure).

GENERAL PRINCIPLES:

- Characteristic values according to ETA-10/0076.
- The design values are obtained from the characteristic values as follows: $R_d = R_k / \gamma_M$
  Coefficients γ_M are listed in the table in accordance with the failure characteristics and product certificates.
- For the calculation of anchors with reduced spacing, or too close to the edge, please refer to ETA. Similarly, in case of fastening on concrete-supports with a better-grade, limited thickness or a thick reinforcing layer please see ETA.
- When designing anchors under seismic load please refer to the ETA referral document and information in the EOTA Technical Report 045.
- For the calculation of anchors subjected to fire refer to the ETA and the Technical Report 020.