HDA
UNDERCUT ANCHOR

Technical Datasheet

Update: Jan-19

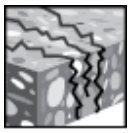
HDA Undercut anchor

Ultimate-performance undercut anchor for dynamic loads

Anchor version	Benefits
 HDA-P HDA-PR HDA-PF Anchor for pre-setting (M10-M20)	- Safe and high performance structural seismic design with ETA C1 and C2 - Mechanical interlock (undercut) - Low expansion force (thus small edge distance / spacing) - Self undercutting (without special undercutting tool) - Performance of a headed stud - Complete system (anchor, stop drill bit, setting tool, drill hammer) - Setting mark on anchor for control (easy and safe) - Completely removable
 HDA-T HDA-TR HDA-TF Anchor for through-fasting (M10-M20)	

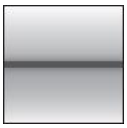
Base material

Concrete (non-cracked)



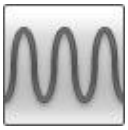
Concrete (cracked)

Load conditions



Static/ quasi-static

Seismic ETA-C1, C2



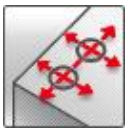
Fatigue

Shock

Fire resistance

Installation conditions

Hammer drilled holes



Small edge distance and spacing

Performance of a headed stud

Other information

European Technical Assessment

CE conformity

PROFIS design Software

Nuclear power plant approval

Corrosion resistance

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European Technical Assessment [a)]	CSTB, Paris	ETA-99/0009 / 2015-01-06
ICC-ES report incl. seismic [b)]	ICC evaluation service	ESR 1546 / 2014-02-01
Shockproof fastenings in civil defence installations	Federal Office for Civil Protection, Bern	BZS D 09-601/ 2009-10-21
Nuclear power plants	DIBt, Berlin	Z-21.1-1987 / 2014-07-22
Fatigue loading	DIBt, Berlin	Z-21.1-1693 / 2013-07-29
Fire assessment report	Warringtonfire	WF 327804/A 2016-05-3

a) All data for HDA-P(R) and HDA-T(R) given in this section according ETA-99/0009, issue 2015-01-06.
Sherardized versions HDA-PF and HDA-TF anchors are not covered by the approvals.

b) For more details on Technical Data according to ICC please consult the relevant HNA FTM.

Static and quasi-static resistance (for a single anchor)

All data in this section applies to:
- Correct setting (See setting instruction)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²

Effective anchorage depth for static

Anchor size	M10	M12	M16	M20
Eff. Anchorage depth h_{ef} [mm]	100	125	190	250

Characteristic resistance

Anchor size			M10		M12			M16					M20[a]			
Non-cracked concrete																
Tension N_{Rk}	HDA-P(F), HDA-T(F)[b]	[kN]	46		67			126					192			
	HDA-PR, HDA-TR	[kN]	46		67			126					-			
Cracked concrete																
Tension N_{Rk}	HDA-P(F), HDA-T(F)[b]	[kN]	25		35			75					95			
	HDA-PR, HDA-TR	[kN]	25		35			75					-			
Non-cracked and cracked concrete																
Shear V_{Rk}	HDA-T(F)[b]	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	≤50	<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk} [kN]	65[c]	70	80	80	100	140[c]	140	155	170	190	205	205	235	250
	HDA-TR	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤	-			
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60	-			
		V_{Rk} [kN]	71[c]	71	87	87	94	109	152	152	158	170	-			
	HDA-P(F)[b]	[kN]	22		30			62					92			
	HDA-PR	[kN]	23		34			63					-			

a) HDA M20: only galvanized 5µm version is available.
b) HDA-PF and HDA-TF: anchors are not covered by ETA-99/0009.
c) With use of centering washer (t=5mm) only.

Design resistance

Anchor size			M10		M12			M16					M20[a]			
Non-cracked concrete																
Tension N_{Rk}	HDA-P(F), HDA-T(F)[b]	[kN]	30,7		44,7			84,0					128,0			
	HDA-PR, HDA-TR	[kN]	28,8		41,9			78,8					-			
Cracked concrete																
Tension N_{Rd}	HDA-P(F), HDA-T(F)[b]	[kN]	16,7		23,3			50,0					63,3			
	HDA-PR, HDA-TR	[kN]	16,7		23,3			50,0					-			
Non-cracked and cracked concrete																
Shear V_{Rd}	HDA-T(F)[b]	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	≤50	<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk} [kN]	43,3[c]	46,7	53,3[c]	53,3	66,7	93,3[c]	93,3	103,3	113,3	126,7	136,7[c]	136,7	156,7	166,7
	HDA-TR	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤	-			
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60	-			
		V_{Rk} [kN]	53,4[c]	53,4	65,4[c]	65,4	70,7	82,0	114,3[c]	114,3	118,8	127,8	-			
	HDA-P(F)[b]	[kN]	17,6		24,0			49,6					73,6			
	HDA-PR	[kN]	17,3		25,6			47,4					-			

a) HDA M20: only galvanized 5µm version is available.
b) HDA-PF and HDA-TF: anchors are not covered by ETA-99/0009.
c) With use of centering washer (t=5mm) only.

Recommended loads [d]

Anchor size			M10		M12			M16					M20[a]			
Non-cracked concrete																
Tension N_{Rk}	HDA-P(F), HDA-T(F)[b]	[kN]	21,9		31,9			60,0					91,4			
	HDA-PR, HDA-TR	[kN]	20,5		29,9			56,3					-			
Cracked concrete																
Tension N_{Rec}	HDA-P(F), HDA-T(F)[b]	[kN]	11,9		16,7			35,7					45,2			
	HDA-PR, HDA-TR	[kN]	11,9		16,7			35,7					-			
Non-cracked and cracked concrete																
Shear V_{Rec}	HDA-T(F)[b]	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	≤50	<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk} [kN]	31[c]	31	38[c]	38	38	67[c]	67	74	81	90	98[c]	98	112	119
	HDA-TR	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤	-			
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60	-			
		V_{Rk} [kN]	38[c]	38	47[c]	47	50	59	82[c]	82	85	91	-			
	HDA-P(F)[b]	[kN]	12,6		17,1			35,4					52,6			
	HDA-PR	[kN]	12,3		18,2			33,8					-			

a) HDA M20: only galvanized 5µm version is available.
b) HDA-PF and HDA-TF: anchors are not covered by ETA-99/0009
c) With use of centering washer (t=5mm) only
d) With overall partial safety factor for action γ_F = 1,4. The partial safety factors for action depend on the type of loading.

Seismic resistance

All data in this section applies to:
- Correct setting (See setting instruction with a drilling hammer)
- No edge distance and spacing influence
- *Steel* failure
- Minimum base material thickness
- Concrete C 20/25, $f_{ck,cube}$ = 25 N/mm²
- α_{gap} = 1,0 (using Hilti seismic filling set)

Effective anchorage depth for seismic C2 and C1

Anchor size	M10	M12	M16	M20
Eff. Anchorage depth h_{ef} [mm]	100	125	190	250

Characteristic resistance in case of seismic performance category C2

Anchor size			M10		M12			M16					M20[a]			
Tension $N_{Rk,seis}$	HDA-P, HDA-T	[kN]	25		35			75					95			
	HDA-PR, HDA-TR	[kN]	25		35			75					-			
Shear $V_{Rk,seis}$	HDA-T	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	≤50	<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk} [kN]	39	42	56	56	70	84	84	93	102	112	144	144	165	175
	HDA-TR	$t_{fix,min}$ [mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤	-			
		$t_{fix,max}$ [mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60	-			
		V_{Rk} [kN]	21,5	21,5	30,5	30,5	33,0	38,0	45,5	45,5	47,5	51	-			
	HDA-P	[kN]	20		24			56					83			
	HDA-PR	[kN]	10,5		13,5			28,5					-			

a) HDA M20: only galvanized 5µm version is available

Design resistance in case of seismic performance category C2

Anchor size				M10		M12				M16					M20[a]			
Tension $N_{Rd,seis}$	HDA-P, HDA-T		[kN]	16,7		23,3				50					63,3			
	HDA-PR, HDA-TR		[kN]	16,7		23,3				50					-			
Shear $V_{Rd,seis}$	HDA-T	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤		15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	≤50		<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk}	[kN]	26	28	37,3	37,3	46,7		56	56	62	68	74,7	96	96	110	116,7
	HDA-TR	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤		-			
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60		-			
		V_{Rk}	[kN]	16,2	16,2	22,9	22,9	24,8	28,6	34,2	34,2	35,7	38,3		-			
	HDA-P		[kN]	16		19,2				44,8					66,4			
	HDA-PR		[kN]	7,9		10,2				21,4					-			

a) HDA M20: only galvanized 5µm version is available

Characteristic resistance in case of seismic performance category C1

Anchor size				M10		M12				M16					M20[a]			
Tension $N_{Rk,seis}$	HDA-P, HDA-T		[kN]	41,5		58				108,7					164			
	HDA-PR, HDA-TR		[kN]	41,5		58				108,7					-			
Shear $V_{Rk,seis}$	HDA-T	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤		15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	≤50		<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk}	[kN]	65	70	80	80	100		140	140	155	170	190	205	205	235	250
	HDA-TR	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤		-			
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60		-			
		V_{Rk}	[kN]	35,5	35,5	43,5	43,5	47	54,5	76	76	79	85		-			
	HDA-P		[kN]	20		22				30					62			
	HDA-PR		[kN]	10,5		11,5				17					31,5			

a) HDA M20: only galvanized 5µm version is available

Design resistance in case of seismic performance category C1

Anchor size				M10		M12				M16					M20[a]			
Tension $N_{Rd,seis}$	HDA-P, HDA-T		[kN]	27,7		38,7				72,5					109,4			
	HDA-PR, HDA-TR		[kN]	27,7		38,7				72,5					-			
Shear $V_{Rd,seis}$	HDA-T	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤		15≤	20≤	25≤	30≤	35≤	20≤	25≤	40≤	55≤
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	≤50		<20	<25	<30	<35	≤60	<25	<40	<55	≤100
		V_{Rk}	[kN]	43,3	46,7	53,3	53,3	66,7		93,3	93,3	103,3	113,3	126,7	136,7	136,7	156,7	166,7
	HDA-TR	$t_{fix,min}$	[mm]	10≤	15≤	10≤	15≤	20≤	30≤	15≤	20≤	25≤	35≤		-			
		$t_{fix,max}$	[mm]	<15	≤20	<15	<20	<30	≤50	<20	<25	<35	≤60		-			
		V_{Rk}	[kN]	26,7	26,7	32,7	32,7	35,3	41	57,1	57,1	59,4	63,9		-			
	HDA-P		[kN]	17,6		24				49,6					73,6			
	HDA-PR		[kN]	8,6		12,8				23,7					-			

a) HDA M20: only galvanized 5µm version is available

Materials

Mechanical properties of HDA

Anchor size		HDA-P(F), HDA-T(F)				HDA-PR, HDA-TR		
		M10	M12	M16	M20 a)	M10	M12	M16
Anchor bolt								
Nominal tensile strength f_{uk}	[N/mm²]	800	800	800	800	800	800	800
Yield strength f_{yk}		640	640	640	640	600	600	600
Stressed cross-section A_s	[mm²]	58,0	84,3	157	245	58,0	84,3	157
Moment of resistance W_{el}	[mm³]	62,3	109,2	277,5	540,9	62,3	109,2	277,5
Characteristic bending resistance without sleeve $M^0_{Rk,s}$ b)	[Nm]	60	105	266	519	60	105	266
Anchor sleeve								
Nominal tensile strength f_{uk}	[N/mm²]	850	850	700	550	850	850	700
Yield strength f_{yk}		600	600	600	450	600	600	600

a) HDA M20: only a galvanized 5µm version is available

b) The recommended bending moment of the HDA anchor bolt may be calculated from $M_{rec} = M_{Rd,s} / \gamma_F = M_{Rk,s} / (\gamma_{Ms} \cdot \gamma_F) = = (1,2 \cdot W_{el} \cdot f_{uk}) / (\gamma_{Ms} \cdot \gamma_F)$, where the partial safety factor for bolts of strength 8.8 is $\gamma_{MS} = 1,25$, for A4-80 equal to 1,33 and the partial safety factor for action may be taken as $\gamma_F = 1,4$. In case of HDA-T/TR/TF the bending capacity of the sleeve is neglected, only the capacity of the bolt is taken into account.

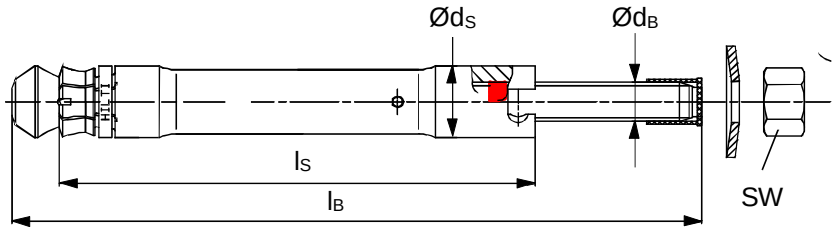
Material quality

Part	Material
HDA-P / HDA-T	
Sleeve:	Machined steel with brazed tungsten carbide tips, galvanized to min. 5 µm
Bolt M10 - M16: Bolt M20:	Cold formed steel, strength 8.8, galvanized to min. 5 µm Cone machined, rod strength 8.8, galvanized to min. 5 µm
Washer M10-M16: Washer M20:	Spring washer, galvanized or coated Washer, galvanized
Centering washer	Machined steel
HDA-PR / HDA-TR	
Sleeve:	Machined stainless steel with brazed tungsten carbide tips
Bolt M10 - M16:	Cone/rod: machined stainless steel
Washer	Spring washer stainless steel
Centering washer	Machined steel
HDA-PF / HDA-TF	
Sleeve	Machined steel with brazed tungsten carbide tips, sherardized
Bolt M10-M16:	Cold formed steel, strength 8.8, sherardized

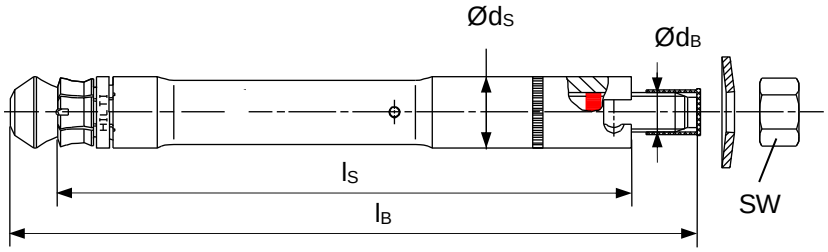
Anchor dimensions

Anchor size			HDA-P / HDA-PR / HDA-T / HDA-TR / HDA-PF / HDA-TF						
			M10	M12		M16		M20	
			x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Length code letter			I	L	N	R	S	V	X
Total length of bolt	l_B	[mm]	150	190	210	275	295	360	410
Diameter of bolt	d_B	[mm]	10	12		16		20	
Total length of sleeve									
HDA-P	l_s	[mm]	100	125	125	190	190	250	250
HDA-T	l_s	[mm]	120	155	175	230	250	300	350
Max. diameter of sleeve	d_S	[mm]	19	21		29		35	
Washer diameter	d_w	[mm]	27,5	33,5		45,5		50	
Width across flats	S_w	[mm]	17	19		24		30	

HDA-P / HDA-PR



HDA-T / HDA-TR



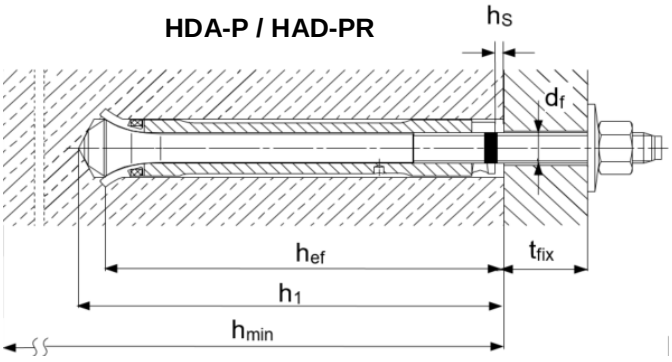
Setting information

Setting details

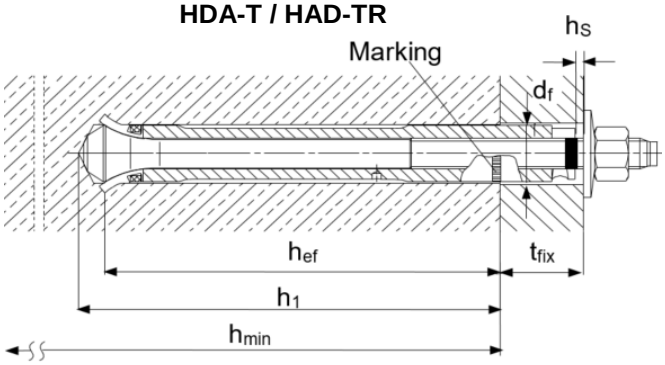
Anchor size			HDA-P / HDA-PR / HDA-T / HDA-TR						
			M10	M12		M16		M20	
			x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Length code letter			I	L	N	R	S	V	X
Nominal drill bit diameter	d_0	[mm]	20	22		30		37	
Cutting diameter of drill bit	$d_{cut,min}$	[mm]	20,10	22,10		30,10		37,15	
	$d_{cut,max}$	[mm]	20,55	22,55		30,55		37,70	
Depth of drill hole	$h_1 \geq$	[mm]	107	133		203		266	
Anchorage depth	h_{ef}	[mm]	100	125		190		250	
Sleeve recess	$h_{s,min}$	[mm]	2	2		2		2	
	$h_{s,max}$	[mm]	6	7		8		8	
Torque moment	T_{inst}	[Nm]	50	80		120		300	
For HDA-P/-PR/-PF									
Clearance hole	d_f	[mm]	12	14		18		22	
Minimum base material thickness	h_{min}	[mm]	180	200		270		350	
Fixture thickness	$t_{fix,min}$	[mm]	0	0		0		0	
	$t_{fix,max}$	[mm]	20	30	50	40	60	50	100

For HDA-T/-TR/-TF									
Clearance hole	d_f	[mm]	21	23		32		40	
Minimum base material thickness	h_{min}	[mm]	200-t_{fix}	230-t_{fix}	250-t_{fix}	310-t_{fix}	330-t_{fix}	400-t_{fix}	450-t_{fix}
Min. fixture thickness									
Tension load only!	$t_{fix,min}$	[mm]	10	10		15		20	50
Shear load **without** use of centering washer	$t_{fix,min}$	[mm]	15	15		20		25	50
Shear load - **with** use of centering washer	$t_{fix,min}$ b)	[mm]	10	10		15		20	-
Max. fixture thickness	$t_{fix,max}$	[mm]	20	30	50	40	60	50	100

HDA-P / HAD-PR



HDA-T / HAD-TR

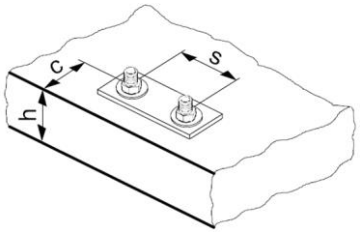


Setting parameters

Anchor size			HDA-P / HDA-PR / HDA-T / HDA-TR						
			M10	M12		M16		M20	
			x100/20	x125/30	x125/50	x190/40	x190/60	x250/50	x250/100
Minimum spacing	s_{min}	[mm]	100	125		190		250	
Minimum edge distance	c_{min}	[mm]	80	100		150		200	
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	300	375		570		750	
Critical edge distance for splitting failure	$c_{cr,sp}$	[mm]	150	190		285		375	
Critical spacing for concrete cone failure	$s_{cr,N}$	[mm]	300	375		570		750	
Critical edge distance for concrete cone failure	$c_{cr,N}$	[mm]	150	190		285		375	

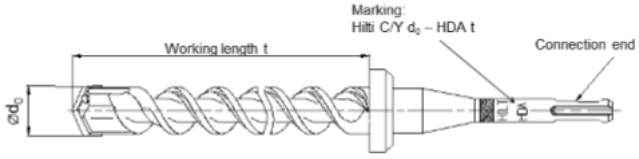
For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

Critical spacing and critical edge distance for splitting failure apply only for non-cracked concrete. For cracked concrete only the critical spacing and critical edge distance for concrete cone failure are decisive.



Stop drill bit HDA

The stop drill is required for drilling in order to achieve the correct hole depth.
The setting system (tool and setting tool) is required for transferring the specific energy for the undercutting process.



Required stop drill bits for HDA and HDA-R

Anchor	Stop drill bit with TE-C (SDS plus) connection end	Stop drill bit with TE-Y (SDS max) connection end	Nominal working length t [mm]	Drill bit diameter d_0 [mm]
HDA-P/ PF/ PR M10x100/20	TE-C-HDA-B 20x100	TE-Y-HDA-B 20x100	107	20
HDA-T/ TF/ TR M10x100/20	TE-C-HDA-B 20x120	TE-Y-HDA-B 20x120	127	20
HDA-P/ PF/ PR M12x125/30 HDA-P/ PF/ PR M12x125/50	TE-C HDA-B 22x125	TE-Y HDA-B 22x125	133	22
HDA-T/ TF/ TR M12x125/30	TE-C HDA-B 22x155	TE-Y HDA-B 22x155	163	22
HDA-T/ TF/ TR M12x125/50	TE-C HDA-B 22x175	TE-Y HDA-B 22x175	183	22
HDA-P/ PF/ PR M16 x190/40 HDA-P/ PF/ PR M16 x190/60		TE-Y HDA-B 30x190	203	30
HDA-T/ TF/ TR M16x190/40		TE-Y HDA-B 30x230	243	30
HDA-T/ TF/ TR M16x190/60		TE-Y HDA-B 30x250	263	30
HDA-P M20 x250/50 HDA-P M20 x250/100		TE-Y HDA-B 37x250	266	37
HDA-T M20x250/50		TE-Y HDA-B 37x300	316	37
HDA-T M20x250/100		TE-Y HDA-B 37x350	366	37

Anchor 	TE 24 a) TE 25 a)	TE 30-A36	TE 35	TE 40 TE 40 AVR	TE 56 TE 56-ATC	TE 60 TE 60-ATC	TE 70 TE 70-ATC	TE 75	TE 76 TE 76-ATC	TE 80-ATC TE 80-ATC AVR	Setting tool 
HDA-P/T M10x100/20	■	■		■							TE-C-HDA-ST 20 M10
					■	■					TE-Y-HDA-ST 20 M10
HDA-P/T M12x125/30	■	■		■							TE-C-HDA-ST 22 M12
HDA-P/T M12x125/50					■	■					TE-Y-HDA-ST 22 M12
HDA-P/T M16x190/40 HDA-P/T M16x190/60							■	■	■	■	TE-Y-HDA-ST 30 M16
HDA-P/T M20x250/50 HDA-P/T M20x250/100							■		■	■	TE-Y-HDA-ST 37 M20

a) 1st gear

Anchor 	TE 24 a) TE 25 a)	TE 30-A36	TE 35	TE 40 TE 40 AVR	TE 56 TE 56-ATC	TE 60 TE 60-ATC	TE 70 TE 70-ATC	TE 75	TE 76 TE 76-ATC	TE 80-ATC TE 80-ATC AVR	Setting tool 
HDA-PR/TR M10x100/20	■	■	■	■							TE-C-HDA-ST 20 M10
					■	■					TE-Y-HDA-ST 20 M10
HDA-PR/TR M12x125/30	■	■	■	■							TE-C-HDA-ST 22 M12
HDA-PR/TR M12x125/50					■	■					TE-Y-HDA-ST 22 M12
HDA-PR/TR M16x190/40 HDA-PR/TR M16x190/60							■	■	■	■	TE-Y-HDA-ST 30 M16

a) 1st gear

Anchor 	TE 24 a) TE 25 a)	TE 30-A36	TE 35	TE 40 TE 40 AVR	TE 56 TE 56-ATC	TE 60 TE 60-ATC	TE 70 TE 70-ATC	TE 75	TE 76 TE 76-ATC	TE 80-ATC TE 80-ATC AVR	Setting tool 
HDA-PF/TF M10x100/20		■	■	■		■					TE-C-HDA-ST 20 M10
HDA-PF/TF M12x125/30 HDA-PF/TF M12x125/50		■	■	■		■					TE-C-HDA-ST 22 M12
HDA-PF/TF M16x190/40 HDA-PF/TF M16x190/60							■	■	■	■	TE-Y-HDA-ST 30 M16

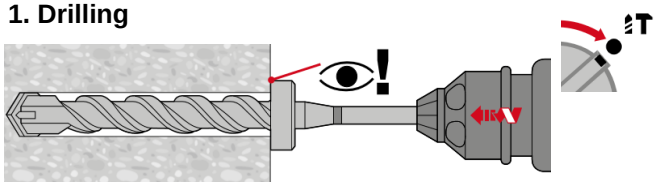
a) 1st gear

Setting instructions

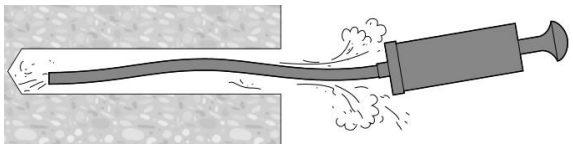
***For detailed information on installation see instruction for use given with the package of the product.**

HDA-P / HDA-PR (prepositioning)

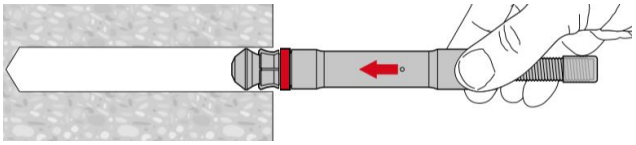
1. Drilling



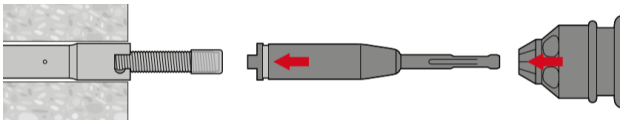
2.Cleaning



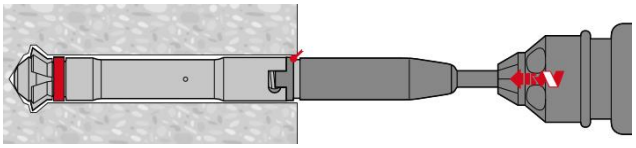
3.Inserting the anchor by hand



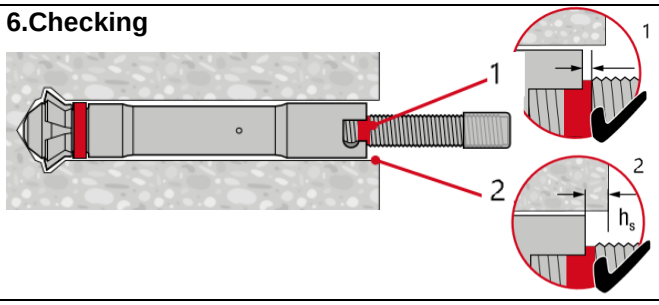
4. Applying hammerdrill



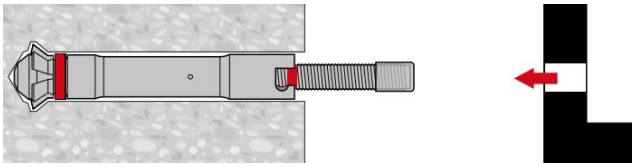
5.Applying hammer drill



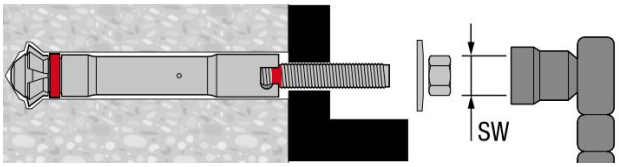
6.Checking



7.Attaching the fixture

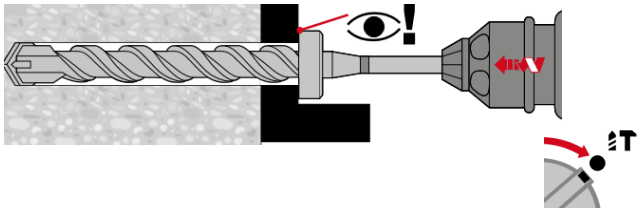


8.Attaching the belonging washer

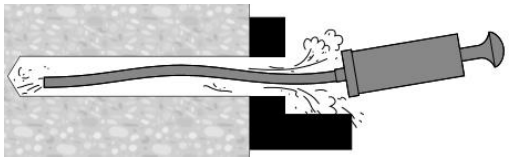


HDA-T / HDA-TR / HAD-TF (post-positioning)

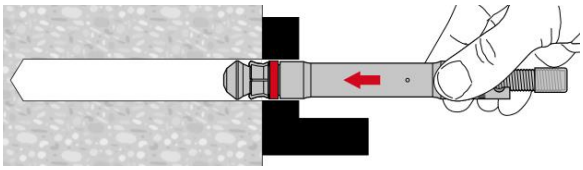
1. Drilling



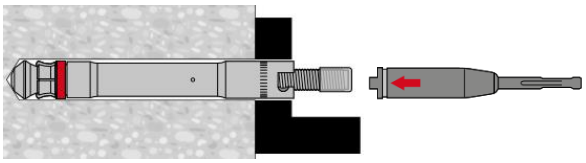
2. Cleaning



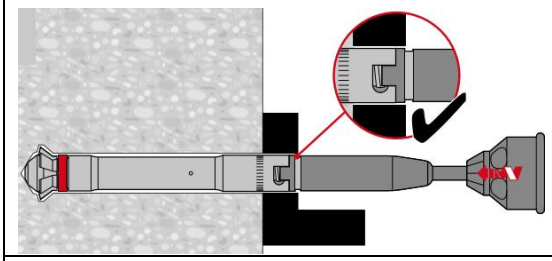
3. Inserting the anchor by hand



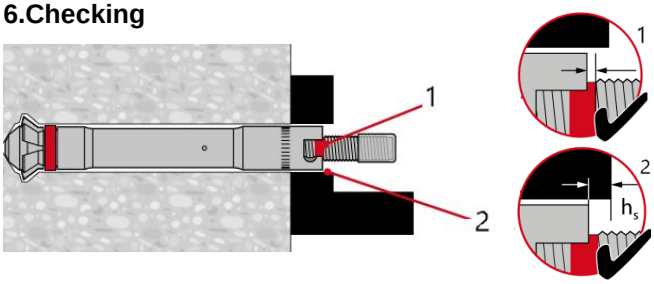
4. Applying hammerdrill



5.Checking



6.Checking



7. Attaching the belonging washer