

## LOADS

### Concrete screw ULTRACUT FBS II

zinc plated steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 10)</sup>											Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Screw-in depth	Maximum installation torque	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
								Max. tension load c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>nom</sub> [mm]	T <sub>max</sub> [Nm]	T <sub>imp,max</sub> <sup>6)</sup> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	c [mm]	c [mm]	s <sub>cr</sub> [mm]	s <sub>min</sub> <sup>8)</sup> [mm]	c <sub>min</sub> <sup>8)</sup> [mm]
FBS II 6x40 <sup>5)</sup>	gvz	80	40	10	450	1,2	4,3	35	110	100	35	35
FBS II 6x45 <sup>5)</sup>	gvz	90	45	10	450	1,7	4,3	35	105	110	35	35
FBS II 6x50 <sup>5)</sup>	gvz	90	50	10	450	1,9	4,3	35	100	120	35	35
FBS II 6x55 <sup>5)</sup>	gvz	100	55	10	450	2,4	6,3	35	145	135	35	35
FBS II 8x50	gvz	100	50	0	600	2,9	4,3	35	90	120	35	35
FBS II 8x65	gvz	120	65	0	600	5,7	9,0	70	180	160	35	35
FBS II 10x55	gvz	100	55	0	650	4,3	4,8	55	100	130	40	40
FBS II 10x65	gvz	120	65	0	650	5,7	12,5	70	250	155	40	40
FBS II 10x85	gvz	140	85	0	650	9,6	16,6	105	305	205	40	40
FBS II 12x60	gvz	110	60	0	650	5,5	11,0	70	230	145	50	50
FBS II 12x75	gvz	130	75	0	650	8,0	15,2	90	290	180	50	50
FBS II 12x100	gvz	150	100	0	650	12,5	20,3	125	355	245	50	50
FBS II 14x65	gvz	120	65	0	650	6,1	12,1	75	235	150	60	60
FBS II 14x85	gvz	140	85	0	650	9,4	18,8	100	340	205	60	60
FBS II 14x115	gvz	180	115	0	650	15,4	29,4	140	465	280	60	60

For the design the complete assessment ETA-15/0352 has to be considered.<sup>9)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-15/0352 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-15/0352.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling resp. hollow drilling. For further allowable drill methods see ETA-15/0352.

<sup>4)</sup> The anchorage depths smaller than 40 mm are only allowed for single anchors as part of a multiple fixing of non-structural systems.

<sup>5)</sup> Diamond drilling not permitted.

<sup>6)</sup> Maximum allowable torque for installation with any tangential impact screw driver.

<sup>7)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>8)</sup> Minimum possible axial spacings resp. edge distance while reducing the permissible load.

<sup>9)</sup> The given loads refer to the European Technical Assessment ETA-15/0352, issue date 30/10/2018. Design of the loads according ETAG 001, Annex C, Method A (for static resp. quasi-static loads).

<sup>10)</sup> A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at  $w_k \sim 0,3$  mm.

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Type	Material fixing element	Minimum member thickness	Screw-in depth	Maximum installation torque	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
								Max. tension load c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>nom</sub> [mm]	T <sub>max</sub> [Nm]	T <sub>imp,max</sub> <sup>6)</sup> [Nm]	N <sub>perm</sub> <sup>7)</sup> [kN]	V <sub>perm</sub> <sup>7)</sup> [kN]	c [mm]	c [mm]	s <sub>cr</sub> [mm]	s <sub>min</sub> <sup>8)</sup> [mm]	c <sub>min</sub> <sup>8)</sup> [mm]
FBS II 6x40 <sup>5)</sup>	gvz	80	40	10	450	3,8	4,3	40	75	100	35	35
FBS II 6x45 <sup>5)</sup>	gvz	90	45	10	450	4,8	4,3	50	70	110	35	35
FBS II 6x50 <sup>5)</sup>	gvz	90	50	10	450	5,7	4,3	55	70	120	35	35
FBS II 6x55 <sup>5)</sup>	gvz	100	55	10	450	6,4	6,3	60	100	135	35	35
FBS II 8x50	gvz	100	50	0	600	6,1	6,1	60	90	120	35	35
FBS II 8x65	gvz	120	65	0	600	9,0	9,0	80	125	160	35	35
FBS II 10x55	gvz	100	55	0	650	6,8	6,8	65	100	130	40	40
FBS II 10x65	gvz	120	65	0	650	8,8	14,0	80	195	155	40	40
FBS II 10x85	gvz	140	85	0	650	13,5	16,6	105	210	205	40	40
FBS II 12x60	gvz	110	60	0	650	7,7	15,2	70	220	145	50	50
FBS II 12x75	gvz	130	75	0	650	11,2	15,2	90	195	180	50	50
FBS II 12x100	gvz	150	100	0	650	17,5	20,3	125	240	245	50	50

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								Max. tension load	Max. shear load			
		$h_{min}$	$h_{nom}$	$T_{max}$	$T_{imp,max}^{6)}$	$N_{perm}^{7)}$	$V_{perm}^{7)}$	c	c	$s_{cr}$	$s_{min}^{8)}$	$c_{min}^{8)}$
		[mm]	[mm]	[Nm]	[Nm]	[kN]	[kN]	[mm]	[mm]	[mm]	[mm]	[mm]
<b>FBS II 14x65</b>	gvz	120	65	0	650	8,5	17,0	75	235	150	60	60
<b>FBS II 14x85</b>	gvz	140	85	0	650	13,2	22,1	100	275	205	60	60
<b>FBS II 14x115</b>	gvz	180	115	0	650	21,6	29,4	140	315	280	60	60

For the design the complete assessment ETA-15/0352 has to be considered.<sup>9)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-15/0352 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As an single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-15/0352.

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# Installation instruction fischer concrete screw ULTRACUT FBS II



fischer ULTRACUT FBS II US



fischer ULTRACUT FBS II SK



fischer connecting nut and Torx

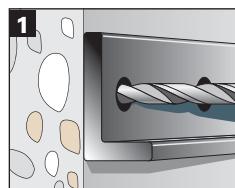


fischer socket nut hexagon

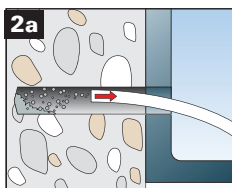


fischer ULTRACUT FBS II ring gauge

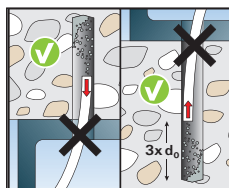
## Installation according to ETA - 15 / 0352



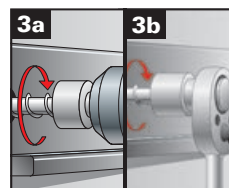
Drill the hole using hammer-drill, hollow drill or diamond core drill.



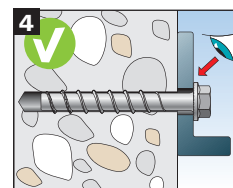
Clean the drill hole. Step 2 can be omitted in the preparation of the hole with hollow drill (complete).



Cleaning drill hole can be omitted, if drilling vertically upwards or if drilling vertically downwards and the hole depth has been increased. We recommend to increase the drill hole depth by an additional 3 x drill Ø when drilling in soils.



Installation with any torque impact screw driver at a max. mentioned torque moment ( $T_{imp,max}$ ) and with simultaneous axial pressure on the torque impact.

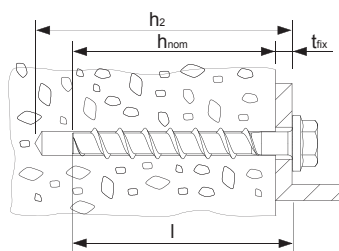


After installation a further turning of the screw must not be possible. The head of the screw must be supported on the fixture and is not damaged.

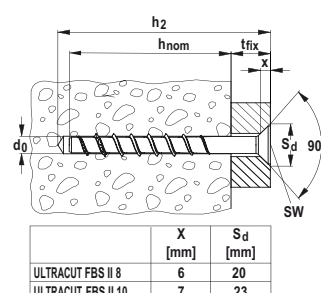
## Installation parameters concrete C 20/25 - C50/60

ULTRACUT FBS II Concrete screw		8	10	12	14
Drill hole diameter [mm]	$d_0$	8	10	12	14
Nominal screw-in depth $h_{nom}$	$h_{nom1}$	50	55	60	65
	$h_{nom2}$	-	65	75	85
	$h_{nom3}$	65	85	100	115
Drill hole depth (push-through installation) [mm]	$h_2 \geq$	$l + 10$	$l + 10$	$l + 10$	$l + 15$
Clearance hole diameter [mm]	$d_f$	10,6 - 12	12,8 - 14	14,8 - 16	16,9 - 18
Maximum torque for in-stallation with impact screw driver in concrete	$T_{imp,max}$	600	650	650	650
Maximum torque for manual installation in concrete	$T_{max}$	65	100	150	250
Width across flat	SW	13	15	17	21
Drive	Torx	T 40 (SK u. US)	T 50 (SK)	-	-

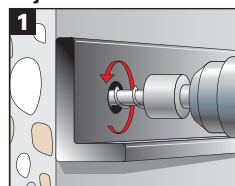
### Type US



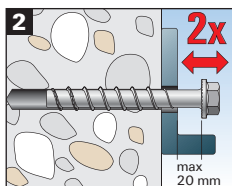
### Type SK



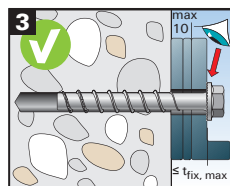
## Adjustment of fixture



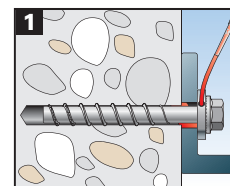
Optional: It is permissible to adjust the screw two times.



Therefore the screw may be tightened to a maximum of 20 mm of the surface of the initial fixture. The total permissible thickness of shims added during the adjustment process is 10 mm.



## Filling (e.g. for Seismic)



For Seismic Performance Category C2 applications: The gap between screw shaft and fixture must be filled with mortar, compressive strength  $\geq 50 \text{ N/mm}^2$  e.g.: FIS V, FIS EM, FIS HB oder FIS SB.

## Temporary fixing and reusability in green concrete according to Z-21.8 - 2049

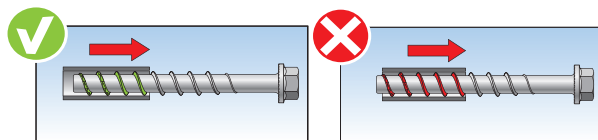
(Concrete strength  $\geq 10 - \leq 20 \text{ N/mm}^2$ )

ULTRACUT		FBS II 8		FBS II 10		FBS II 12		FBS II 14	
Screw in depth [mm]	$h_{nom}$	50	65	55	85	60	100	65	115
Max. torque on installation with impact screw driver	$T_{imp,max}$	400	600	400	650	400	650	400	650

## Check of reusability



fischer ULTRACUT FBS II Ring gauge



The concrete screw has to be checked for damages (e.g. corrosion) before each usage and if necessary it has to be changed.

## Installation parameters masonry (not regulated in ETA-15/0352)

ULTRACUT FBS II Concrete screws					
Base material	Compressive strength class [N/mm <sup>2</sup> ]	Size	[mm]		
			$h_{nom}$	[mm]	
Solid clay brick (EN771-1)	$\geq 12$	$T_{inst}$	[Nm]	8	10
Solid sand-lime brick (EN771-2)	$\geq 12$	$T_{inst}$	[Nm]	65	85
Aerated concrete (EN771-4)	$\geq 6$	$T_{inst}$	[Nm]	5	5