Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-23/6751of 15/06/2023
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	fischer concrete screw UltraCut FBS II
Product family to which the construction product belongs:	Product Area Code: 33 Fasteners for use in concrete for redundant non-structural systems
Manufacturer:	fischer Fixings UK Limited, Whitely Road, Hithercroft Industrial Estate, Wallingford, Oxfordshire, OX10 9AT
Manufacturing plant(s):	fischerwerke
This UK Technical Assessment contains:	17 pages including 3 Annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330747-00-0601 “Fasteners for use in concrete for redundant non-structural systems”

1. Technical description of the product

The fischer concrete screw UltraCut FBS II is an anchor of size 6 mm made of hardened carbon steel. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

The product description is given in Annex A.

2. Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this UK Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

3.1. Mechanical resistance and stability (BWR 1)

Not relevant.

3.2. Safety in case of fire (BWR 2)

Essential characteristics	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C3

3.3. Health, hygiene and the environment (BWR 3)

Not relevant.

3.4. Safety and accessibility in use (BWR 4)

Essential characteristics	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex B4, C1 and C2
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C1 and C2
Durability	See Annex B1

3.5. Protection against noise (BWR 5)

Not relevant.

3.6. Energy economy and heat retention (BWR 6)

Not relevant.

3.7. Sustainable use of natural resources (BWR 7)

No performance assessed.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied

4.1. System of assessment and verification of constancy of performance

According to UKAD No. 30747-00-0601 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011) as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 2+ applies.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

5.1. UKCA marking for the product/ system must contain the following information:

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Date of marking
- Number of certificate of constancy of performance (where applicable)
- UKTA number.

On behalf of the British Board of Agrément 	
Date of Issue: 15 June 2023	**Hardy Giesler** Chief Executive Officer

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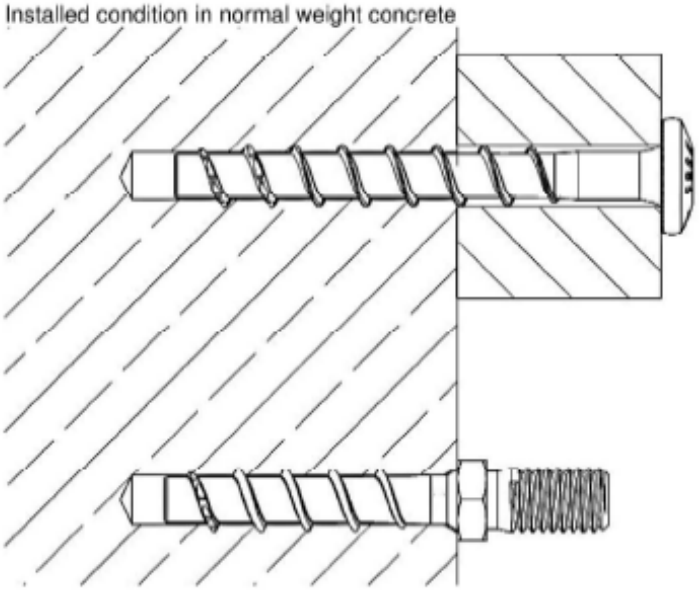
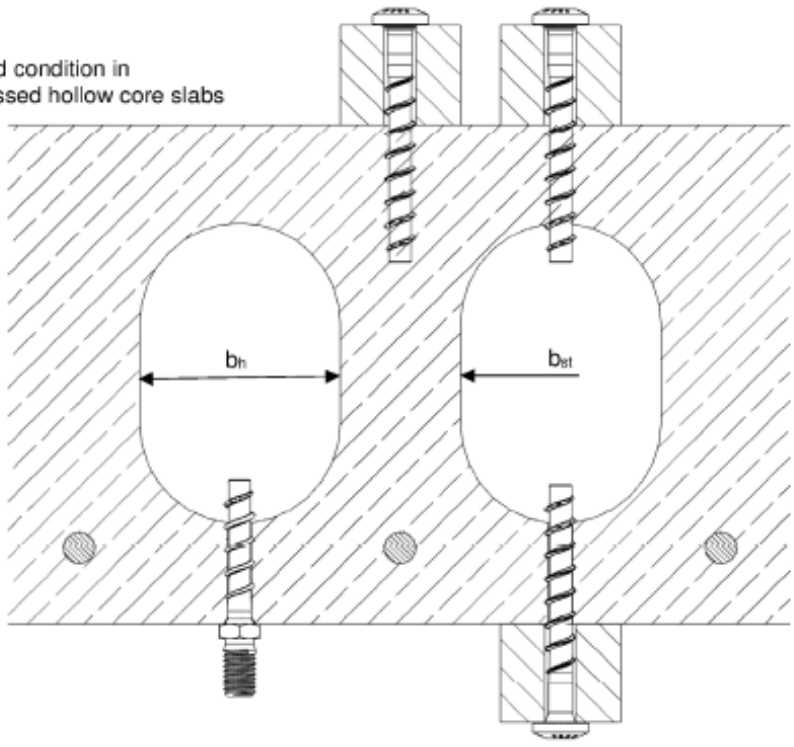
ANNEX A1
UltraCut FBS II / Product description / Product in the installed conditions

Installed condition in normal weight concrete



Installed condition in prestressed hollow core slabs



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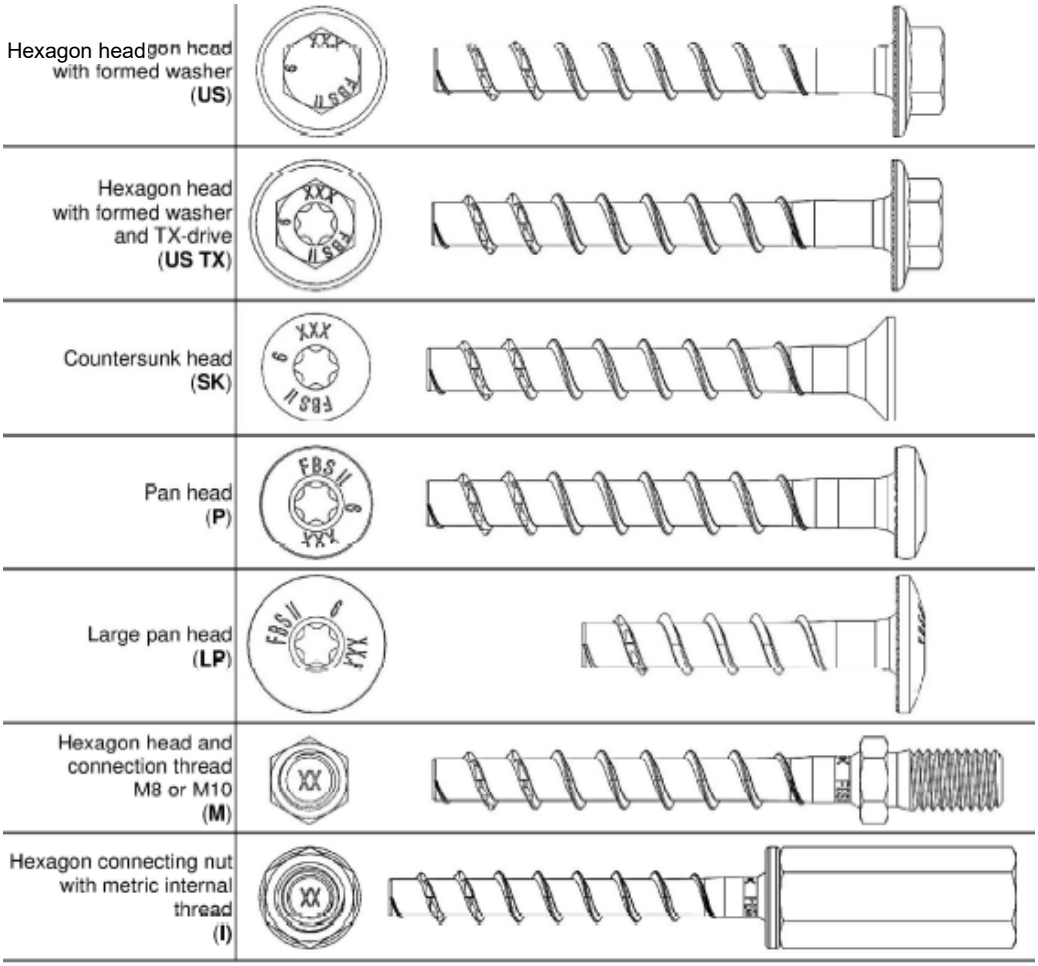
ANNEX A2
UltraCut FBS II / Product description / Screw types FBS II 6



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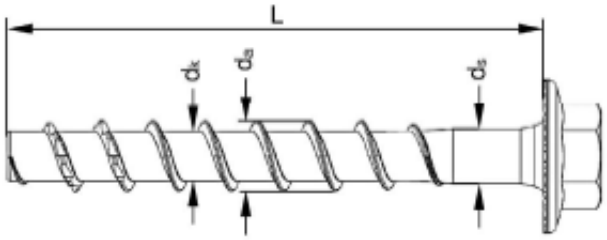
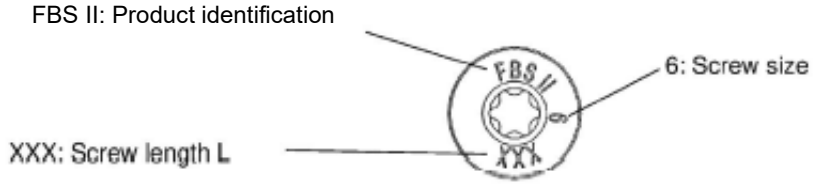
ANNEX A3
UltraCut FBS II / Product description / Geometry, material and marking

Table A3.1: geometry and material

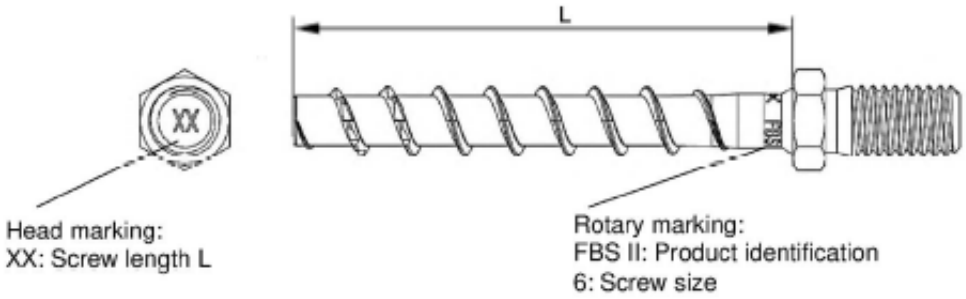
FBS II 6			All head shapes
Thread outer diameter	d_a	[mm]	7.75
Core diameter	d_k		5.65
Shaft diameter	d_s		6.0
Material		[-]	Hardened carbon steel; $A_s \geq 8\%$
Coating			Galvanised



Head marking at US, US TX, SK, P, LP



Marking at M8, M10, I



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ANNEX B1
UltraCut FBS II / Intended use / Specifications of intended use

Anchorages subject to:

- Static and quasi static loads: all types and embedment depths
- Used in concrete for redundant non-structural systems
- Used for fire: only for concrete C20/25 to C50/60 (does not apply for prestressed hollow core slabs)

Base materials:

- Compacted reinforced and unreinforced normal weight concrete without fibres (cracked and uncracked) according to EN 206:2013+A1:2016
- Strength classes C20/25 to C50/60 according to EN 206:2013+A1:2016
- Prestressed hollow core slabs, where the cavity width does not exceed 4.2 times the web width ($b_H \leq 4{,}2 \times b_{St}$) with strength classes C30/37 to C50/60

Use conditions (Environmental conditions):

- Structures subjected to dry internal conditions

Design:

- Anchorages are to be designed under the responsibility of an engineer experienced in anchorages and concrete work
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the screw is indicated on the design drawings (e.g. position of the screw relative to reinforcement or to supports, etc.)
- Design of fastenings according to EN 1992-4: 2018 and EOTA Technical Report TR 055

Installation:

- Hammer drilling or hollow drilling
- Screw installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on site
- In case of aborted hole: New hole must be drilled at a minimum distance of twice the depth of the aborted hole or closer, if the hole is filled with a high strength mortar and only if the hole is not in the direction of the oblique tensile or shear load
- Adjustability according to Annex B3 and B6
- Cleaning of drill hole is not necessary when using a hollow drill or:
    - If drilling vertically upwards
    - If drilling vertically downwards and the drill hole depth has been increased. It is recommended to increase the drill depth with additional 3 d_0
- After correct installation further turning of the screw head shall not be possible
- The head of the screw must be fully engaged on the fixture and show no signs of damage
- In Precast pre-stressed hollow core slabs the screw may be installed from all directions, if the web thickness and the spacing to the tensioning strands according to table B3.1 are observed (also in the area of solid material)

ANNEX B2
UltraCut FBS II / Intended use / Installation parameters

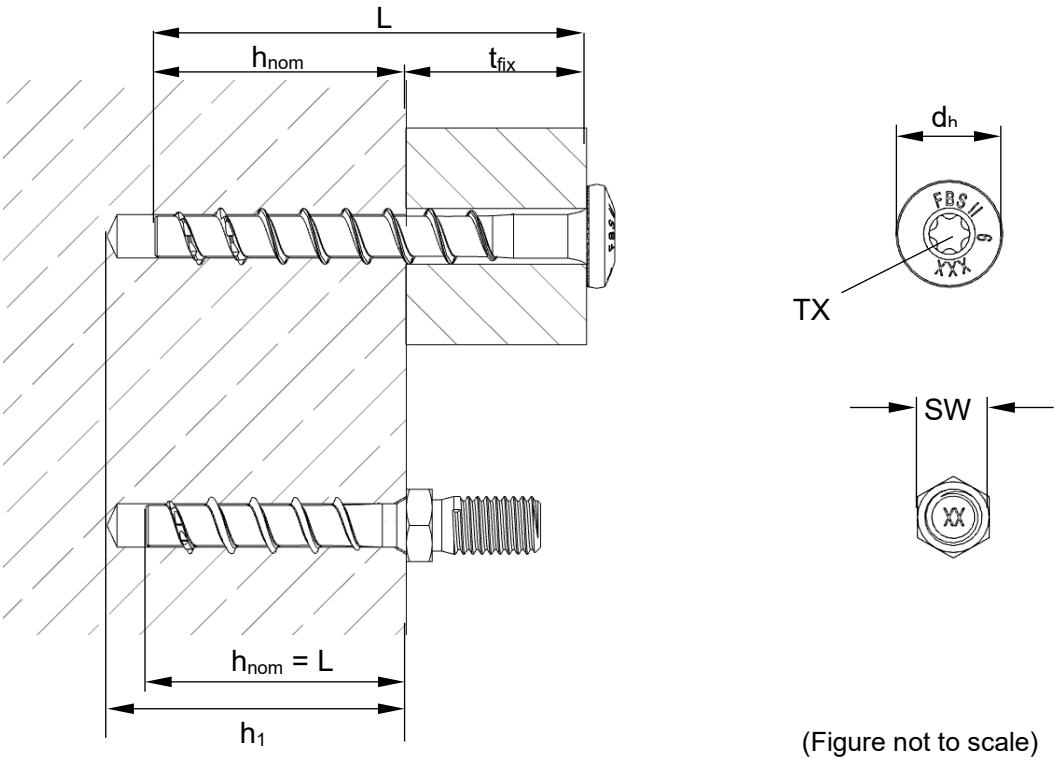
Table B2.1: Installation parameters – drilling bore hole and setting tools

FBS II 6			**All head shapes**	
Nominal embedment depth	h_{nom}	[mm]	$25 \le h_{nom} < 35$	$35 \le h_{nom} \le 55$
Nominal drill hole diameter	d_0		6	
Cutting diameter of drill bits	$d_{cut} \le$		6,4	
Clearance hole diameter	$d_f \le$		8	
Drill hole depth	$h_1 \ge$		h_{nom} + 5	h_{nom} + 10[1)]
Drill hole depth (with adjustable setting)			h_{nom} + 15	h_{nom} + 20
Torque impact screwdriver	$T_{imp,max}$	[Nm]	80	450
Maximum installation torque with metrical screws or hexagon nuts on head shapes M and I	T_{max}		5	10

[1)] Value can be reduced to h_{nom} + 5 for installation vertically upwards

Table B2.2: Installation parameters – drive and fixture

FBS II 6			**US**	**US TX**	**SK**	**P**	**LP**	**M8**	**M10**	**I**
Wrench size	SW	[mm]	10 / 13		-			10	13	-
TX size	TX	[-]	-	30				-		
Head diameter	d_h	[mm]	17		13,5	14,4	17,5			
Thickness of fixture	$t_{fix} \le$		L - h_{nom}							
Length of screw	L_{min} =		25							
	L_{max} =		325					55		



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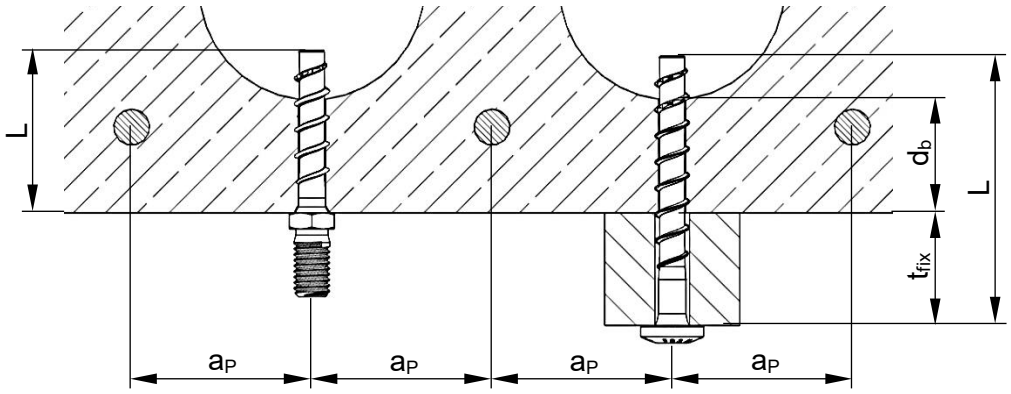
ANNEX B3
UltraCut FBS II / Intended use / Installation parameters prestressed hollow core slabs and adjustment

Table B3.1: Installation parameters – Additional information for prestressed hollow core slabs

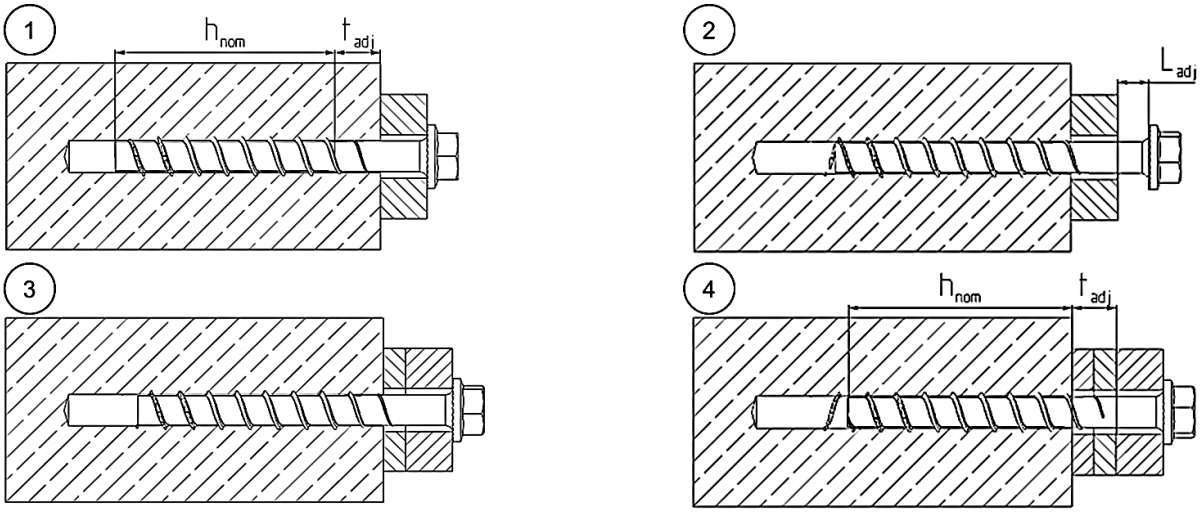
FBS II 6			
Distance to the tensioning strands	$a_P \geq$	[mm]	50
Thickness of the slab web	$d_b \geq$		25
Minimum thickness of fixture	$t_{fix} \geq$		L - d_b[1)] - 30 mm
Torque impact screwdriver	$T_{imp,max}$	[Nm]	80 (450[2)])

1) If d_b is not known, then set d_b = 25 mm

2) Parent value applies if all the following conditions are met:
- $d_b \geq$ 35 mm
- $h_{nom} \geq$ 35 mm



Adjustment



(Figure not to scale)

It is permissible to untighten the screw up to two times for adjustment purposes.

Therefore the screw may be untightened to a maximum of L_{adj} = 20 mm to the surface of the initial fixture.

The total permissible thickness of shims added during the adjustment process is t_{adj} = 10 mm.

ANNEX B4
UltraCut FBS II / Intended use / Minimum thickness of members, minimum spacing and edge distance

Table B4.1: Minimum thickness of concrete members, minimum spacing and edge distance

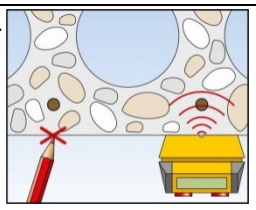
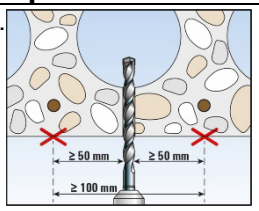
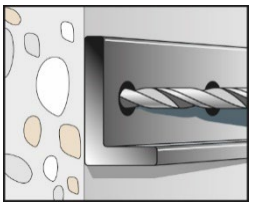
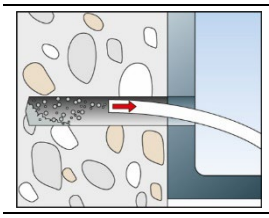
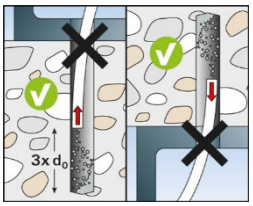
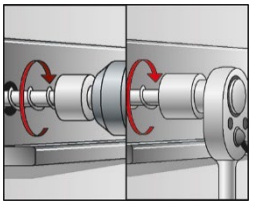
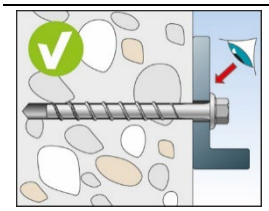
FBS II 6			
Minimum thickness of concrete member	h_{min}	[mm]	max.(80; h_1[1)] + 30)
Minimum spacing	s_{min}		35
Minimum edge distance	c_{min}		

[1)] Drill hole depth according to table B2.1

Table B4.2: Minimum spacing and edge distance for prestressed hollow core slabs

FBS II 6			
Minimum spacing	s_{min}	[mm]	100
Minimum edge distance	c_{min}		
Minimum distance between anchor groups	a_{min}		

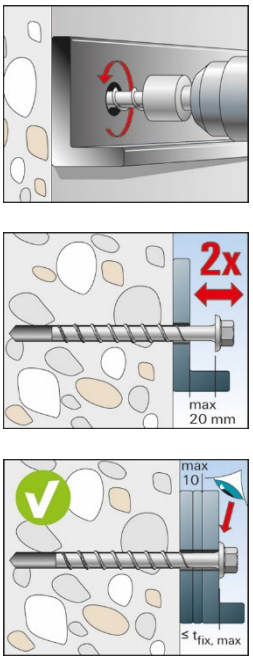
Installation instruction part 1

1.  2. 	**For installation in prestressed hollow core slabs:** Determine and mark the position of the tensioning strands, e.g. with a suitable scanner. Keep distances to the tensioning strands according to Table B3.1.
	**Step 1: Creation of the drill hole:** Drill the hole using hammer drill or hollow drill Drill hole diameter d_0 and drill hole depth h_1 according to table B2.1
	**Step 2: Cleaning of the drill hole - horizontal:** Clean the drill hole. This step can be omitted in the preparation of the hole by using a hollow drill bit.
	**Step 2: Cleaning of the drill hole - vertical:** Cleaning of the drill hole can be omitted if drilling vertically upwards or if drilling vertically downwards and the hole depth has been increased. It is recommended to increase the drill hole depth by an additional 3 x drilling ø when drilling vertically downwards.
	**Step 3: Installation:** Installation with any torque impact screwdriver up to the maximum mentioned torque moment ($T_{imp,max}$ according to table B2.1). (recommendation: use the fischer FSS 18V 400BL) Alternatively, all other tools without an indicated torque moment are allowed (e.g. ratchet spanner). The indicated torque moments $T_{imp,max}$ for impact screwdriver are not decisive for manual installation.
	**Step 4: Checking of the correct installation:** After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture and is not damaged.

ANNEX B6

UltraCut FBS II / Intended use / Installation instruction

Installation instruction part 2



Adjustment

Optional:
It is permissible to adjust the screw twice. Therefore, the screw may be untightened to a maximum of L_{adj} = 20 mm off the surface of the initial fixture. The total permissible thickness of shims added during the adjustment process is t_{adj} = 10 mm.

ANNEX C1
UltraCut FBS II / Performance / Characteristic values for static and quasi-static action

Table C1.1: Characteristic values for static and quasi-static action

FBS II 6										
Nominal embedment depth		h_{nom}	[mm]	25	30	35	40	45	50	55
Steel failure for tension load and shear load										
Characteristic resistance		$N_{Rk,s}$	[kN]	21						
Partial factor		$\gamma_{Ms,N}$	[-]	1,4						
Characteristic resistance		$V^0_{Rk,s}$	[kN]	4,8			9,0			13,3
Partial factor		$\gamma_{Ms,V}$	[-]	1,5						
Factor for ductility		k_7		1,0						
Characteristic bending resistance		$M^0_{Rk,s}$	[Nm]	17,1						
Pullout failure										
Characteristic resistance in concrete C20/25	uncracked	$N_{Rk,p}$	[kN]	3,0	5,0	6,5	8,0	10,0	12,0	13,5
	cracked			1,5	2,5	3,5	5,0	6,0	7,5	8,5
Increasing factors concrete	C25/30	ψ_c	[-]	1,12						
	C30/37			1,22						
	C35/45			1,32						
	C40/50			1,41						
	C45/55			1,50						
	C50/60			1,58						
Installation factor		γ_{inst}		1,0						
Concrete cone failure and splitting failure; concrete pryout failure										
Effective embedment depth		h_{ef}	[mm]	19	23	27	32	36	40	44
Factor for uncracked concrete		$k_{ucr,N}$	[-]	11,0						
Factor for cracked concrete		$k_{cr,N}$		7,7						
Characteristic edge distance		$c_{cr,N}$	[mm]	1,5 h_{ef}						
Characteristic spacing		$s_{cr,N}$		3 h_{ef}						
Characteristic resistance for splitting		$N^0_{Rk,sp}$	[kN]	min ($N^0_{Rk,c}$[1)]; $N_{Rk,p}$)						
Characteristic edge distance for splitting		$c_{cr,sp}$	[mm]	2 x h_{ef}			1,5 x h_{ef}			
Characteristic spacing for splitting		$s_{cr,sp}$		4 x h_{ef}			3 x h_{ef}			
Factor for pryout failure		k_8	[-]	1,3		2,0				
Installation factor		γ_{inst}		1,0						
Concrete edge failure										
Effective length in concrete		l_f	[mm]	25	30	35	40	45	50	55
Nominal diameter of screw		d_{nom}		6						
Adjustment										
Maximum thickness of shims		t_{adj}	[mm]	10						
Maximum number of adjustments		n_a	[-]	2						

[1)] $N^0_{Rk,c}$ according EN 1992-4:2018

ANNEX C2
UltraCut FBS II / Performance / Characteristic values in prestressed hollow core slabs

Table C2.1: Characteristic values for static and quasi-static action in prestressed hollow core slabs

FBS II 6											
Nominal embedment depth			h_{nom}	[mm]	25	30	35	40	45	50	55
All load directions and failure modes											
Characteristic resistance	C30/37	$d_b \geq 25$	F^0_{Rk}	[kN]	0,5	1,0					
		$d_b \geq 30$			3,5	3,5					
		$d_b \geq 35$				4,0	4,5	5,0	5,5	6,0	6,5
		$d_b \geq 40$				4,8	5,5	6,0	7,0	7,5	8,0
		$d_b \geq 50$					7,0	8,0	9,0		12,0
	C35/45	$d_b \geq 25$			0,5	1,1					
		$d_b \geq 30$			3,8	3,8					
		$d_b \geq 35$				4,3	4,9	5,4	5,9	6,5	7,0
		$d_b \geq 40$				4,8	5,9	6,5	7,6	8,1	8,6
		$d_b \geq 50$					7,6	8,6	9,0		13,0
	C40/50	$d_b \geq 25$			0,6	1,1					
		$d_b \geq 30$			4,0	4,0					
		$d_b \geq 35$				4,6	5,2	5,7	6,3	6,9	7,5
		$d_b \geq 40$				4,8	6,3	6,9	8,0	8,6	9,2
		$d_b \geq 50$					8,0	9,0			13,3
	C45/55	$d_b \geq 25$			0,6	1,2					
		$d_b \geq 30$			4,3	4,3					
		$d_b \geq 35$				4,8	5,5	6,1	6,7	7,3	7,9
		$d_b \geq 40$					6,7	7,3	8,5	9,0	9,8
		$d_b \geq 50$					8,5	9,0			13,3
	C50/60	$d_b \geq 25$			0,6	1,3					
		$d_b \geq 30$			4,5	4,5					
		$d_b \geq 35$				4,8	5,8	6,4	7,1	7,7	8,4
		$d_b \geq 40$					7,1	7,7	9,0		10,3
		$d_b \geq 50$					9,0				13,3
Partial factor			γ_M	[-]	1,5						
Installation factor			γ_{inst}		1,0						
Characteristic bending resistance			$M^0_{Rk,s}$	[Nm]	17,1						
Partial factor			γ_{Ms}	[-]	1,5						
Edge distance		$c_{cr} = c_{min}$		[mm]	100						
Spacing		$s_{cr} = s_{min}$			100						

ANNEX C3
UltraCut FBS II / Performance / Characteristic values for resistance to fire

Table C3.1: Characteristic values for resistance to fire [1) 2)]

FBS II 6										
Nominal embedment depth		h_{nom}	[mm]	25	30	35	40	45	50	55
Steel failure for tension load and shear load										
Characteristic resistance for all head shapes	$N_{Rk,s,fi}$	R30	[kN]	1,00						
		R60		0,60						
		R90		0,50						
		R120		0,40						
	$V_{Rk,s,fi}$	R30	[kN]	1,00						
		R60		0,60						
		R90		0,50						
		R120		0,40						
Characteristic bending resistance for all head shapes	$M^0_{Rk,s,fi}$	R30	[Nm]	0,80						
		R60		0,50						
		R90		0,40						
		R120		0,35						
Pullout failure										
Characteristic resistance	$N_{Rk,p,fi}$	R30	[kN]	0,4	0,6	0,9	1,2	1,5	1,9	2,1
		R60								
		R90								
		R120		0,3	0,5	0,7	1	1,2	1,5	1,7
Edge distance										
R30 to R120	$c_{cr,fi}$		[mm]	2 h_{ef}						
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm										
Spacing										
R30 to R120	$s_{cr,fi}$		[mm]	2 $c_{cr,fi}$						

1) The embedment depth must be increased for wet concrete by at least 30 mm compared to the given value.
2) Not valid for prestressed hollow core slabs

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