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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-21/0870 of 2021/11/05

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	ELEMATIC TRIDER, TRIDER/B
Product family to which the above construction product belongs:	Metal fastener for use in concrete for redundant non-structural system
Manufacturer:	ITW Construction Products italy S.r.l V.le Regione Veneto, 5 IT – 35127 Padova Internet www.itw-italy.com
Manufacturing plant:	ITW Construction Products italy S.r.l
This European Technical Assessment contains:	18 pages including 13 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 330747-00-0601 - Fasteners for use in concrete for redundant non-structural systems
This version replaces:	

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

ELEMATIC TRIDER and ELEMATIC TRIDER/B are a metallic and plastic fasteners consisting of both a polymeric and metallic sleeve, an expansion element and a lubricated metric screw (for TRIDER/B version). The metal part of the fasteners is made in steel galvanized electrolytically with a thickness ≥5µ.

The fastener is placed into pre-drilled hole perpendicular to the surface (maximum deviation 5°) in concrete and it is anchored therein by mechanical means such as friction and/or mechanical interlock.

These mechanical fasteners can be used to connect non-structural elements to structural components.

An illustration of the product is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document EAD

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

The provisions made in this European Technical Assessment are based on an assumed intended working life of the anchor of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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 Characteristics of product

Safety in case of fire (BWR 2):
Reaction to fire: The anchors are made from steel classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364.

Resistance to fire: No performance assessed.

Hygiene, health and the environment (BWR3):
No performance assessed.

Safety in use (BWR4):
The essential characteristics are detailed in the Annexes C1 and C2.

Other Basic Requirements are not relevant.

3.2 Methods of assessment

The assessment of fitness of the fastener for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 and 4 has been made in accordance with EAD 330747-00-0601 - Fasteners for use in concrete for redundant non-structural systems.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 97/161/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

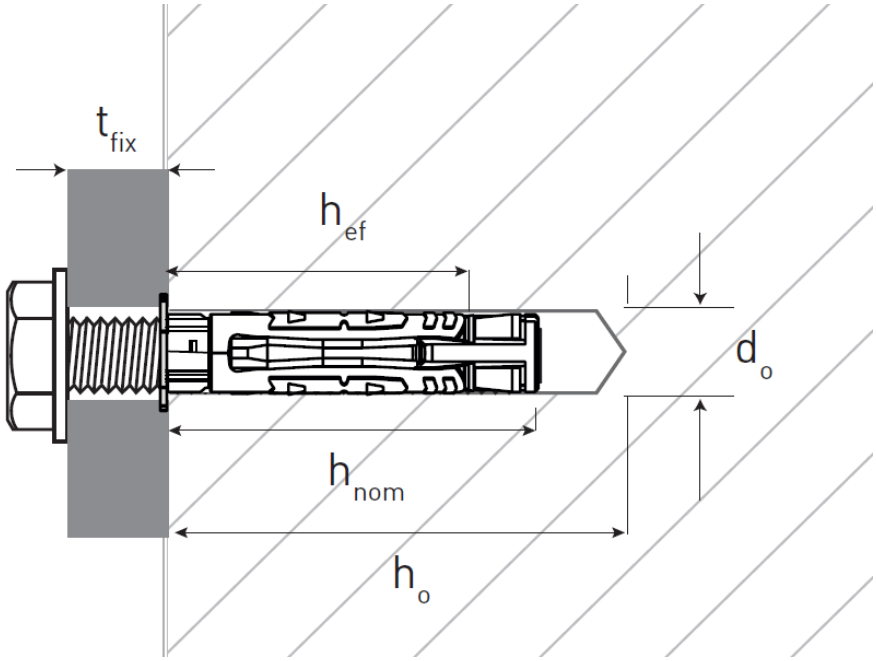
5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2021-11-05 by

Thomas Bruun
Managing Director, ETA-Danmark

Figure A1 – Elematic TRIDER and TRIDER/B installed condition on concrete



Legend:

h_{nom} = overall nominal embedment depth in the base material
h_{ef} = effective anchorage depth
h_0 = depth of the drill hole
t_{fix} = thickness of fixture
d_0 = nominal drill hole diameter

(fig. not in scale)

ELEMATIC TRIDER, TRIDER/B	**Annex A1** of European Technical Assessment ETA-21/0870
Product description – Installed condition	

Figure A2.1 – Elematic TRIDER fastener part designation

The Hexagon head screw and the washer according to Table A7.1 and Table A7.2 must be provided by the user.

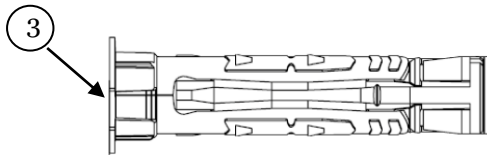
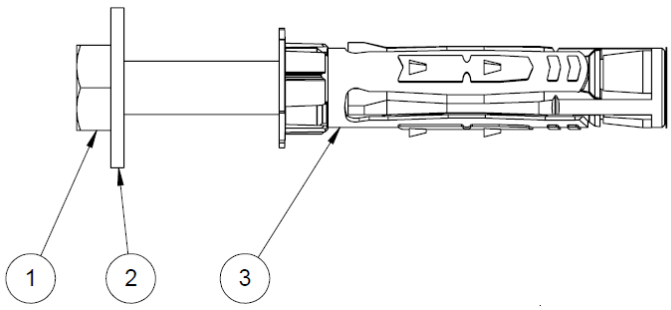


Figure A2.2 – Elematic TRIDER/B fastener part designation

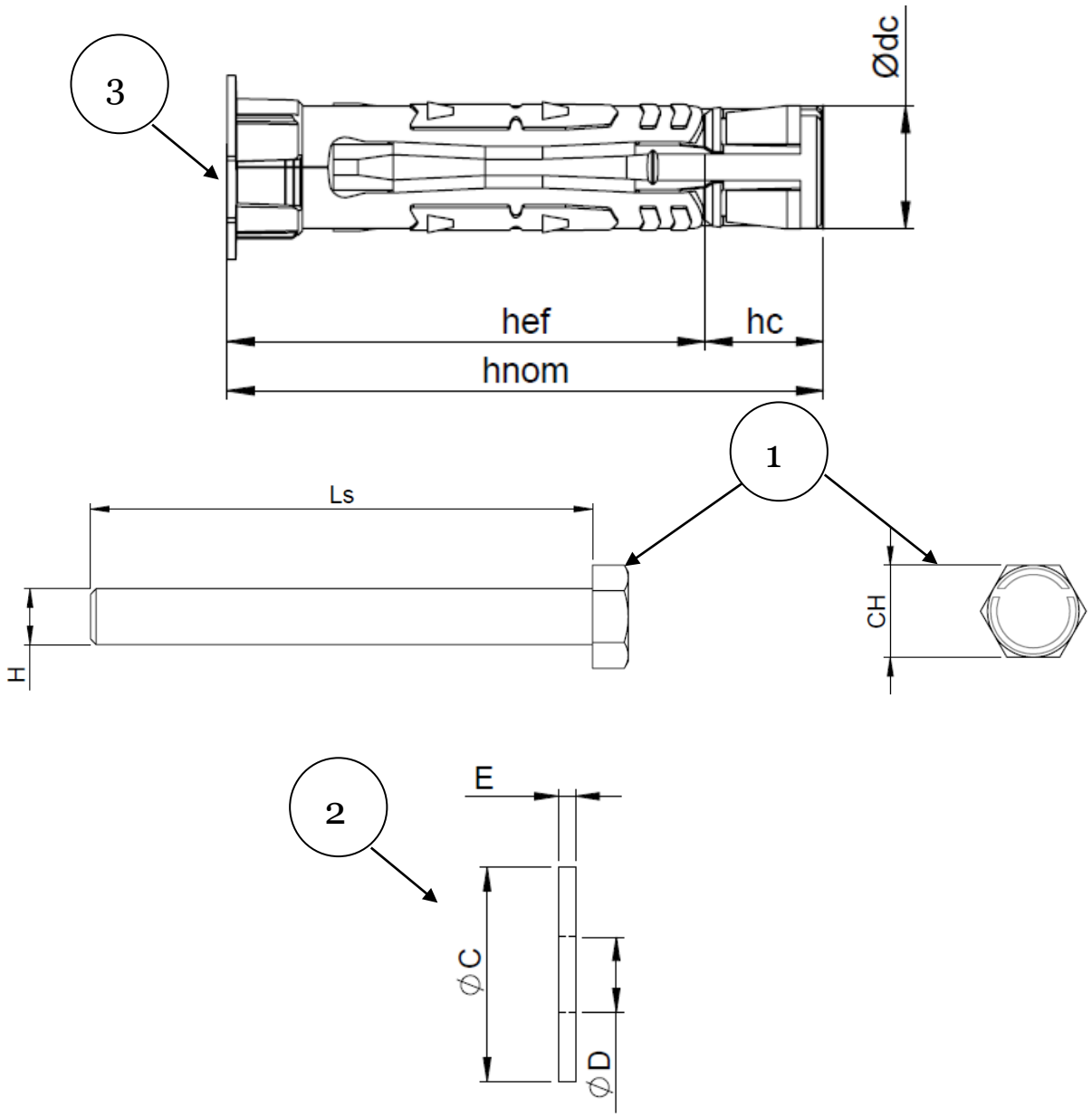
The Hexagon head screw is provided by the manufacturer together with the fastener sleeve.



Part	Type		
	M6	**M8**	**M10**
Designation			
①	Hexagon head screw EN ISO 4017: 2014/ISO 4017: 2014 8.8 M6x65	Hexagon head screw EN ISO 4017: 2014/ISO 4017: 2014 8.8 M8x70	Hexagon head screw EN ISO 4017: 2014/ISO 4017: 2014 8.8 M10x90
②	Washer EN ISO 7093-2: 2001/ISO 7093-2: 2000 M6	Washer EN ISO 7093-2: 2001/ISO 7093-2: 2000 M8	Washer EN ISO 7093-2: 2001/ISO 7093-2: 2000 M10
③	Fastener sleeve M6	Fastener sleeve M8	Fastener sleeve M10

(fig. not in scale)

Figure A3 – fastener components



(fig. not in scale)

ELEMATIC TRIDER, TRIDER/B	**Annex A3** of European Technical Assessment ETA-21/0870
Product description – Fastener components	

Table A4.1 – Elematic TRIDER, TRIDER/B sleeve dimensions

Sleeve dimensions				Type		
				M6	M8	M10
Part	Designation	Parameter				
③	Elematic Trider, Trider/B sleeve	h_{ef}	[mm] =	43,0	46,0	57,0
		h_{nom}	[mm] =	54,5	58,1	72,5
		h_c	[mm] =	11,5	12,1	15,5
		$Ød_c$	[mm] =	10,0	12,0	15,0

Figure A4 – Elematic TRIDER, TRIDER/B sleeve

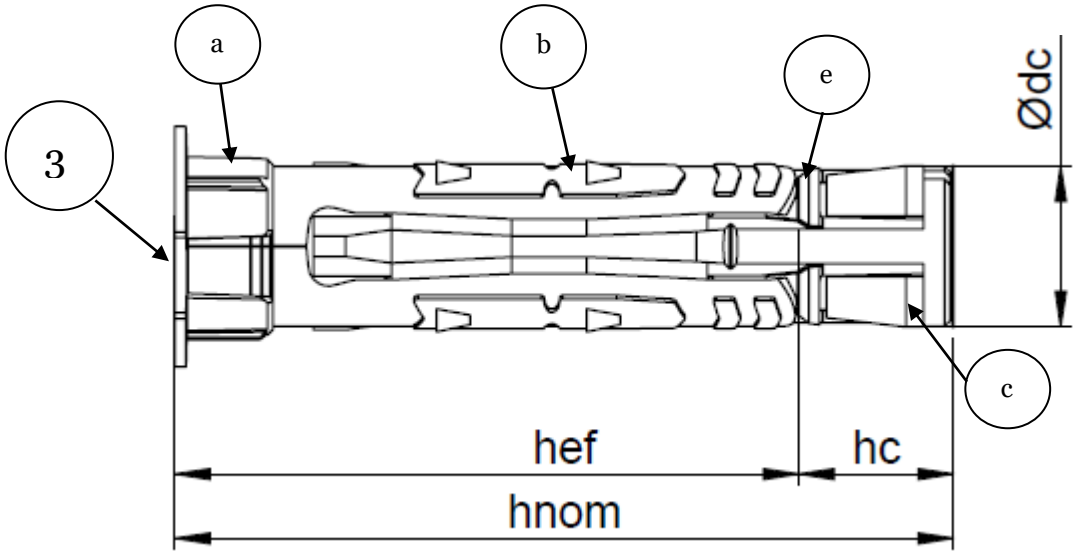


Table A4.2 – Elematic TRIDER, TRIDER/B sleeve materials

Sleeve materials				
Part		Sub-part	Designation	Description
③	TRIDER and TRIDER/B sleeve	a	Collar	Modified copolymer. Colour black
		b	Metallic sleeve part	Steel galvanized electrolytically with a thickness ≥5µ. Colour: white-blue
		c	Expansion cone	Steel galvanized electrolytically with a thickness ≥5µ. Colour: white-blue
		e	Plastic sleeve part	Modified copolymer.High resistance.Colour Black

(fig. not in scale)

Table A5.1 Elematic TRIDER/B screw dimensions

Screw dimensions				Type		
				TRIDER/B 6	TRIDER/B 8	TRIDER/B 10
Part	Designation	Parameter				
①	Hexagon head screw EN ISO 4017: 2014/ISO 4017: 2014	H	[-]	M6	M8	M10
		L_S	[mm] =	65	70	90
		C_H	[-]	CH10	CH13	CH17

Figure A5 – Elematic TRIDER/B screw

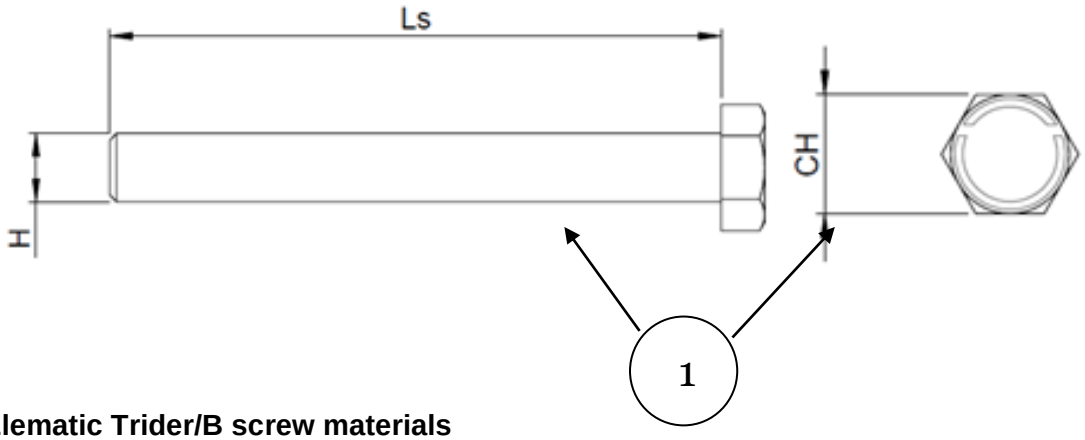


Table A5.2 – Elematic Trider/B screw materials

Screw materials		
Part	Designation	Description
①	**Hexagon head screw EN ISO 4017: 2014/ISO 4017: 2014**	Hexagon head screw, steel class 8.8 galvanized electrolytically with a thickness ≥5µ. Colour: white-blue. Dry film lubrication: after the electrolytical galvanisation the screws are immersed in lubrication solution bath and then dried (Lubrification process type Agewachs 1026 or equivalent).

(fig. not in scale)

Table A6.1 Elematic TRIDER/B washer dimensions

Washer dimensions				Type		
				TRIDER/B 6	TRIDER/B 8	TRIDER/B 10
Part	Designation	Parameter				
②	Washer EN ISO 7093-2: 2001/ISO 7093-2: 2000	ØC	[mm] =	18,0	24,0	30,0
		ØD	[mm] =	6,4	8,4	10,5
		E	[mm] =	2,0	2,0	2,5

Figure A6 – Elematic TRIDER/B washer

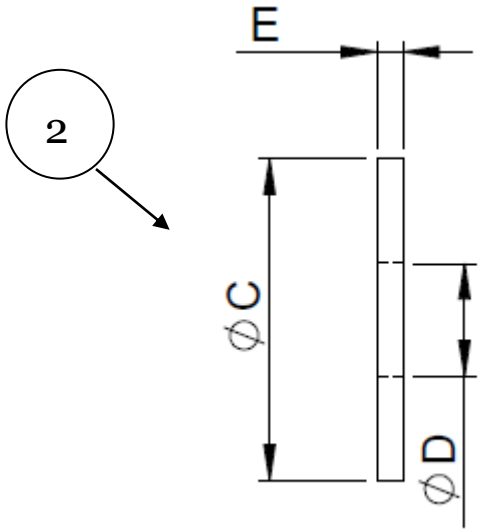


Table A6.2 Elematic Trider/B washer materials

Washer materials		
Part	Designation	Description
②	Washer EN ISO 7093-2: 2001/ISO 7093-2: 2000	Steel galvanized electrolytically with a thickness ≥7µ. Colour: white-blue

(*fig. not in scale*)

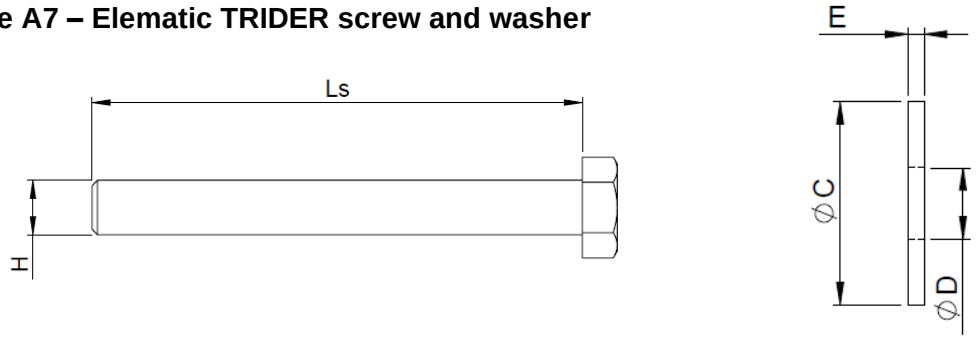
Table A7.1 Elematic TRIDER selection criteria for the hexagon head screw

Elematic TRIDER			Type		
			TRIDER 6	TRIDER 8	TRIDER 10
Description	**Parameter**				
Lenght of the hexagon head screw	L_S	[mm]	$\geq t_{fix} + E + h_{nom}$	$\geq t_{fix} + E + h_{nom}$	$\geq t_{fix} + E + h_{nom}$
Thread size	H	[-]	M6	M8	M10
Standardization	EN ISO 4017: 2014/ISO 4017: 2014				
Material	Steel, property class 8.8				
Treatment	Galvanized electrolytically with a thickness ≥5µ				
Lubrication	. Dry film lubrication: after the electrolytical galvanisation the screws are immersed in lubrication solution bath and then dried (Lubrification process type Agewachs 1026 or equivalent).				

Table A7.2 Elematic TRIDER selection criteria for the washer

Elematic TRIDER				Type		
				TRIDER 6	TRIDER M8	TRIDER M10
Description	**Parameter**					
Hole diameter	ØD	[mm]	min	6,0	8,0	10,0
			max	6,6	8,6	10,8
External diameter	ØC	[mm]		≥ 11,0	≥ 15,0	≥ 19,0
Thickness	E	[mm]	min	1,4	1,4	1,8
			max	3,0	3,0	4,0
Material	Steel, hardness class min 140 HV					
Treatment	Steel galvanized electrolytically with a thickness ≥5µ.					

Figure A7 – Elematic TRIDER screw and washer



(fig.not in scale)

ELEMATIC TRIDER, TRIDER/B	**Annex A7** of European Technical Assessment ETA-21/0870
Product description – Elematic TRIDER selection criteria for hexagon head screw and washer, dimension and materials	

Use:

The fasteners are intended to be used for anchorages for which requirements for safety and accessibility in use in the sense of the Basic Requirements 4 of Regulation 305/2011 (EU) shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

Fasteners subject to:

- Static and quasi-static loads.

Base materials:

- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum to C50/60 at maximum according to EN 206-1.
- Cracked and non-cracked concrete

Use conditions (Environmental conditions):

- Internal dry conditions

Installation:

- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Fastener installation in accordance with the manufacturer's specifications and drawings and using the appropriate tools.
- Check before placing the fastener to ensure that the strength class of the concrete, in which the fastener is to be placed, is identical with the values which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- Hole shall be clear.
- Fastener installation such that the effective anchorage depth is complied with; the compliance is ensured if the thickness of the fixture is not larger than the maximum values given in Annex B2 and in Annex B3.

Proposed design methods:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be transmitted. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Fasteners are only to be used for redundant non-structural system. Anchorages under static and quasi-static loads are designed in accordance with EN 1992-4 and CEN/TR 17079.

Figure B2.1 Elematic TRIDER installation parameter for use in concrete

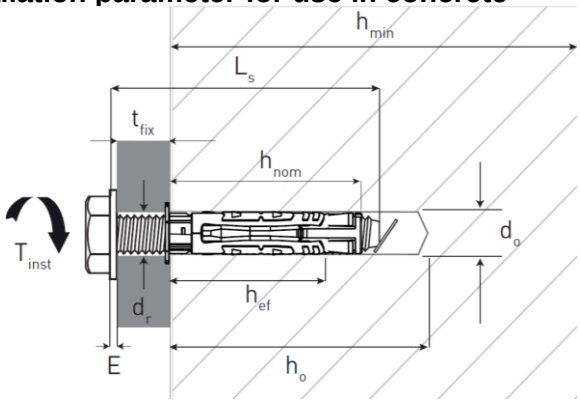
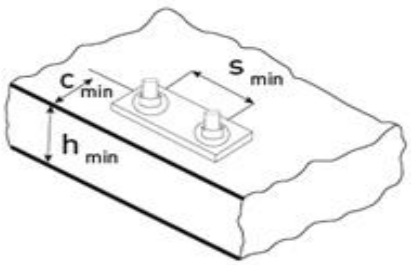


Table B2 Installation parameters

Essential characteristic Elematic TRIDER			Type			
				TRIDER 6	TRIDER 8	TRIDER 10
Installation parameters						
Ø d_0	Nominal drill hole diameter	[mm] =		10	12	15
Ø d_r	Diameter of the clearence hole in the fixture	[mm] ≤		7	9	11
h_0	Depth of drill hole	[mm] ≥		L_s-t_{fix}+15		L_s-t_{fix}+20
h_{ef}	Effective anchorage depth	[mm] ≥		43	46	57
h_{min}	Minimum thickness of the member	[mm] =		90	100	120
L_s	Lenght of the hexagon head screw	[mm] ≥		t_{fix} + E + h_{nom}	t_{fix} + E + h_{nom}	t_{fix} + E + h_{nom}
h_{nom}	Nominal embedment depth in the base material	[mm] =		54,5	58,1	72,5
E	Thickness of the washer	[mm] =	min	1,4	1,4	1,8
			max	3,0	3,0	4,0
t_{fix}	Thickness of the fixture	[mm] =	min	1		
			max	150	200	250
T_{inst}	Installation moment	[Nm] =		20	35	50
c_{min}	Minimum edge distance	[mm] =		55	60	120
s_{min}	Minimum spacing	[mm] =		90	95	115

Figure B2.2 Elematic TRIDER installation parameter edge distances and spacing for use in concrete



(fig. not in scale)

Figure B3.1 Elematic TRIDER/B installation parameter for use in concrete

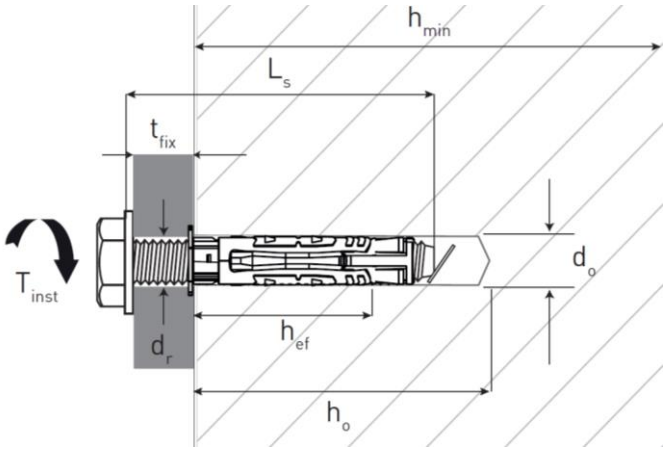
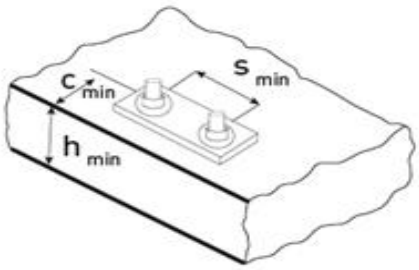


Table B3 Installation parameters

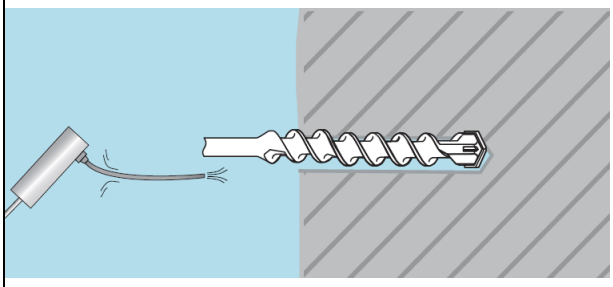
Essential characteristic Elematic TRIDER/B			Type		
			TRIDER/B 6	TRIDER/B 8	TRIDER/B 10
Installation parameters					
Ø d_0	Nominal drill hole diameter	[mm] =	10	12	15
Ø d_r	Diameter of the clearence hole in the fixture	[mm] ≤	7	9	11
h_0	Depth of drill hole	[mm] ≥	65	70	85
h_{ef}	Effective anchorage depth	[mm] ≥	43	46	57
h_{min}	Minimum thickness of the member	[mm] =	90	100	120
L_s	Lenght of the hexagon head screw	[mm]=	65	70	90
t_{fix}	Thickness of fixture	[mm] =	min 1		
			max 10	10	15
T_{inst}	Installation moment	[Nm] =	20	35	50
c_{min}	Minimum edge distance	[mm] =	55	60	120
s_{min}	Minimum spacing	[mm] =	90	95	115

Figure B3.2 Elematic TRIDER/B installation parameter edge distances and spacing for use in concrete

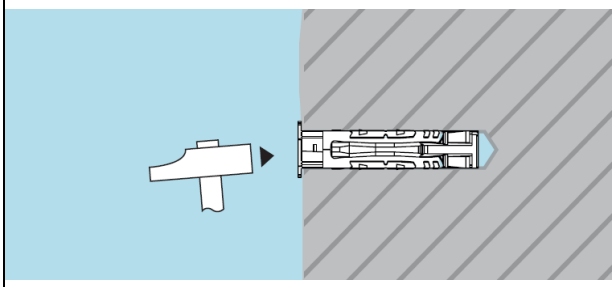


(fig. not in scale)

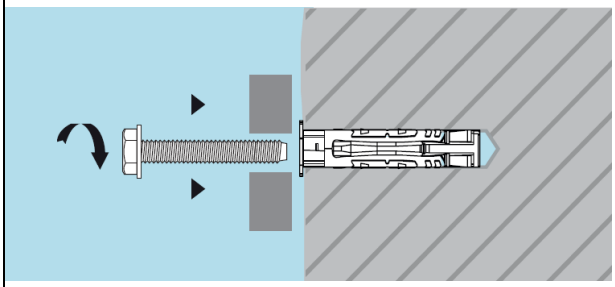
Installation instruction:



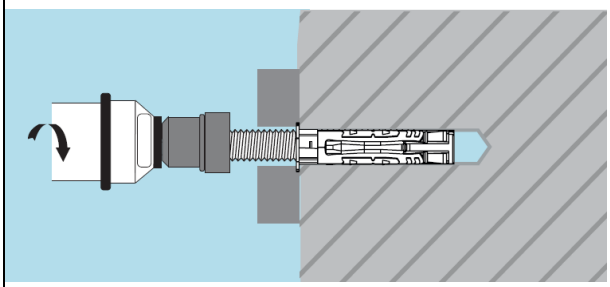
1) Drill the hole with hammer-drill; the hole must be cleaned of drilling dust.



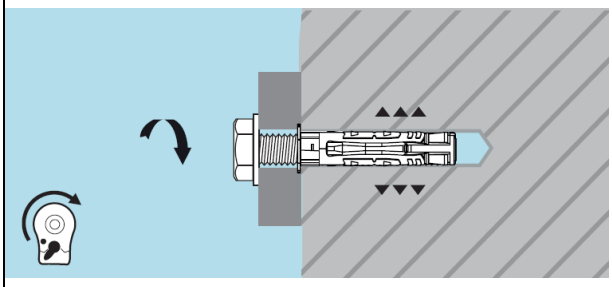
2) Set the fastener sleeve by slight hammer blows.



3) Attach the fixture and turn the screw in.



4) Apply required torque moment T_{inst} using a screwdriver.



5) Check the required torque moment T_{inst} using a torque wrench.

(fig. not in scale)

ELEMATIC TRIDER, TRIDER/B	**Annex B4** of European Technical Assessment ETA-21/0870
Intended use – Installation instruction in concrete	

Table C1: Characteristic values of resistances for design method A acc. EN 1992-4

Essential characteristic			Performance		
			M6	M8	M10
Steel failure for tension - and shear loads					
$N_{Rk,s}$	Characteristic loads	[kN]	16,1	29,3	46,4
γ_{Ms} 1)	Partial safety factor	[-]	1,5		
$V_{Rk,s}$	Characteristic loads	[kN]	8,0	13,7	23,2
$M^0_{Rk,s}$	Characteristic loads	[Nm]	12	30	60
γ_{Ms} 1)	Partial safety factor	[-]	1,25		
Pull-out failure					
$N_{Rk,p}$	Characteristic tension load for a single anchor without edge effect in uncracked and cracked concrete C20/25	[kN]	5,0	5,5	10,0
ψ_c	Increasing factor concrete for $N_{Rk,p}$	C30/37	1,08		
		C40/50	1,14		
		C50/60	1,19		
γ_{inst}	Installation safety factor	[-]	1,0		
Concrete cone and splitting failure					
h_{ef}	Effective anchorage depth	[mm]	43	46	57
k_{cr}	Factor for cracked concrete	[-]	7,7		
$s_{cr,N}$	Concrete cone failure spacing	[mm]	1,5 x h_{ef}		
$c_{cr,N}$	Concrete cone failure edge distance	[mm]	3,0 x h_{ef}		
$s_{cr,sp}$	Splitting failure spacing	[mm]	110	120	240
$c_{cr,sp}$	Splitting failure edge distance	[mm]	55	60	120
γ_{inst}	Installation safety factor	[-]	1,0		
Concrete pry-out failure (pry-out)					
k_8	k-Factor	[-]	1,0		
Concrete Edge failure					
$l_f = h_{ef}$	Effective lenght of the anchor	[mm]	43	46	57
d_{nom}	Outside diameter of anchor	[mm]	10	12	15

1) In absence of other national regulation

Table C2: Characteristic values of resistances for design method B acc. EN 1992-4.

Essential characteristic			Performance		
			M6	M8	M10
Installation parameters					
d_0	Nominal diameter of drill bit	[mm]	10	12	15
h_{ef}	Effective anchorage depth	[mm]	43	46	57
h_{min}	Minimum thickness of concrete member	[mm]	90	100	120
T_{inst}	Torque moment	[Nm]	20	35	50
s_{min}	Minimum spacing	[mm]	90	95	115
c_{min}	Minimum edge distance	[mm]	55	60	120
All loads directions					
F^0_{Rk}	Characteristic resistance in concrete C20/25	[kN]	5,0	5,5	10,0
γ_M [1)]	Partial safety factor	[-]	1,5	1,5	1,5
s_{cr}	Characteristic spacing	[mm]	110	120	240
c_{cr}	Characteristic edge distance	[mm]	55	60	120
Shear load with lever arm					
$M^0_{Rk,s}$	Bending moment characteristic failure	[Nm]	12	30	60
γ_{Ms} [1)]	Partial safety factor	[-]	1,25	1,25	1,25

1) In absence of other national regulation