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European Technical Assessment

ETA 11/0423 of 08/12/2016

Technical Assessment Body issuing the ETA: Technical and Test Institute for Construction Prague	
Trade name of the construction product	T101 PIOVRA, T101 PIOVRA B
Product family to which the construction product belongs	Product area code: 33 Torque controlled expansion anchor for use in non-cracked concrete
Manufacturer	ITW Construction Products Italy srl Viale Regione Veneto, 5 - 35127 Padova Italy
Manufacturing plant	Plant Italy
This European Technical Assessment contains	9 pages including 6 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	ETAG 001-Part 1 and Part 2, edition 2013, used as European Assessment Document (EAD)
This version replaces	ETA 11/0423 issued on 23/04/2012

1. Technical description of the product

The T101 PIOVRA, T101 PIOVRA B anchor in the sizes 6, 8, 10 and 12 is anchor made of galvanized steel, which is placed into a drilled hole and anchored by torque-controlled expansion.

The hexagon head screw of property class 8.8 acc. to ISO 4017 and the washer for the anchor type T101 PIOVRA shall be purchased by the user.

The installed anchor is shown in Annex 1.

2. Specification of the intended use in accordance with the applicable EAD

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 provisions made in this European Technical Assessment are based on an assumed 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, but are to be regarded only as a means for choosing the 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)

Essential characteristic	Performance
Characteristic resistance for tension loads	See Annex C 1
Characteristic resistance for shear loads	See Annex C 2
Displacement	See Annex C 1 and C 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	No performance assessed

3.3 Hygiene, health and environment (BWR 3)

Regarding dangerous substances contained in this European Technical Assessment, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.4 Safety in use (BWR 4)

For basic requirement safety in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

3.5 Sustainable use of natural resources (BWR 7)

For the sustainable use of natural resources no performance was determined for this product.

3.6 General aspects relating to fitness for use

Durability and serviceability are only ensured if the specifications of intended use according to Annex B 1 are kept.

4. Assessment and verification of constancy of performance (AVCP) system applied with reference to its legal base

According to the Decision 96/582/EC of the European Commission[1] the system of assessment verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete, structural elements (which contributes to the stability of the works) or heavy units.	-	1

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

5.1 Tasks of the manufacturer

The manufacturer may only use raw materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the control plan which is a part of the technical documentation of this European Technical Assessment. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at Technický a zkušební ústav stavební Praha, s.p.[2] The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

5.2 Tasks of the notified bodies

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The notified certification body involved by the manufacturer shall issue a certificate of constancy of performance of the product stating the conformity with the provisions of this European Technical Assessment.

In cases where the provisions of the European Technical Assessment and its control plan are no longer fulfilled the notified body shall withdraw the certificate of constancy of performance and inform Technický a zkušební ústav stavební Praha, s.p without delay.

Issued in Prague on 08.12.2016

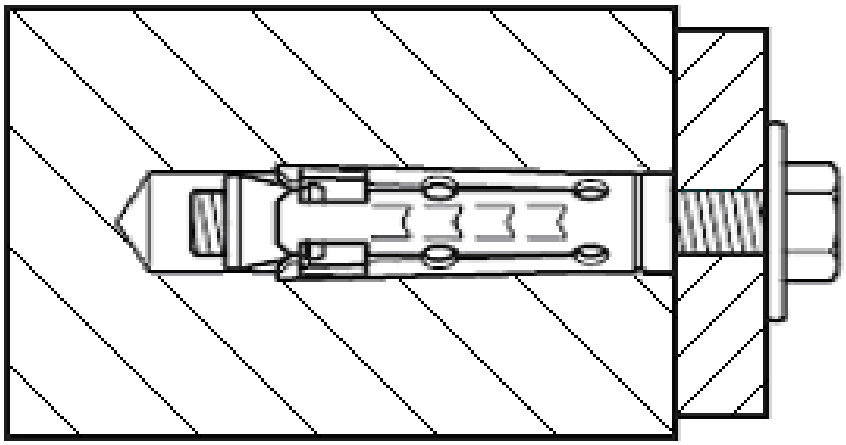
By

Ing. Mária Schaan
Head of the Technical Assessment Body

[1] Official Journal of the European Communities L 254 of 08.10.1996

[2] The control plan is a confidential part of the documentation of the European Technical Assessment, but not published together with the ETA and only handed over to the approved body involved in the procedure of AVCP.

T101 PIOVRA – Installed anchor

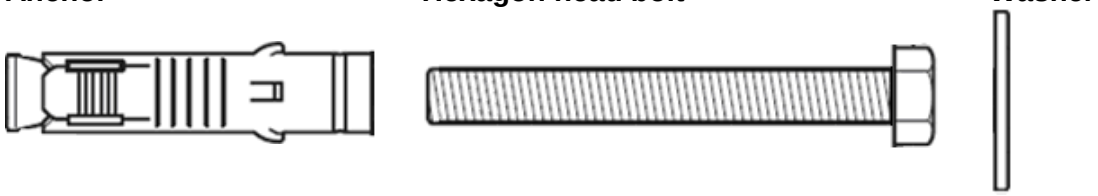


T101 PIOVRA, T101 PIOVRA B	**Annex A 1**
Product description Installed conditions	

T101 PIOVRA

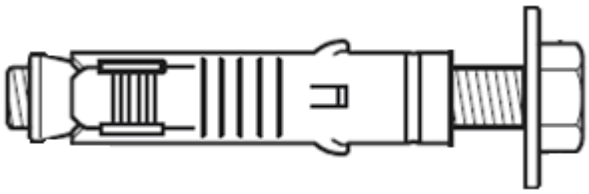
The hexagon head screw and the washer according to table 2.1 shall be purchased by the user

Anchor **Hexagon head bolt** **Washer**



T101 PIOVRA B

The hexagon head screw is provided by the manufacturer together with the anchor



Anchor: cone and sleeve

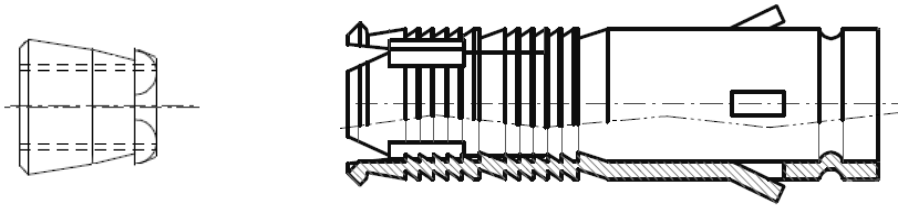


Table A1 - Materials

Component		Anchor type	Material	
Sleeve	Size 6 - 8	T101 PIOVRA T101 PIOVRA B	Galvanised steel DD12	EN 10130:2006
	Size 10 - 12			EN 10111:2008
Cone		T101 PIOVRA T101 PIOVRA B	Steel AVP SMnPb36	EN 10277:00
Screw		T101 PIOVRA B	Galvanised steel grade 8.8	EN ISO 898-1
Washer		T101 PIOVRA B	Galvanised steel DD12	EN 10111:2008

Table A2 - Criteria for hexagon head screw and washer (T101 PIOVRA)

Size		**6**	**8**	**10**	**12**
Hexagon head screw					
Length of hexagon head screw	[mm]	60	65	80	90
Thread size	-	M6	M8	M10	M12
Material	-	Steel grade 8.8 – ISO 4017			
Washer					
Hole diameter	[mm]	6,5	8,5	10,5	13
External diameter	[mm]	18	24	30	24
Thickness	[mm]	1,5	2	2,5	2,5
Material	-	Steel DD12 – EN 10111:2008			

T101 PIOVRA, T101 PIOVRA B

Product description
Product and materials

Annex A 2

Specifications of intended use

Anchorages subject to:

- Static and quasi-static load.

Base materials

- Non-cracked concrete.
- Reinforced or unreinforced normal weight concrete of strength class C20/25 at minimum and C50/60 at maximum according EN 206-1:2000-12.

Use conditions (Environmental conditions)

- Structures subject to dry internal conditions.

Design:

- The anchorages are designed in accordance with the ETAG 001 Annex C “DESIGN METHODS FOR ANCHORAGES” 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 anchored. The position of the anchor is indicated on the design drawings.

Installation:

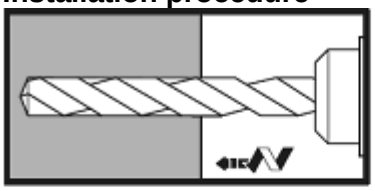
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any components of the anchor.
- Anchor installation in accordance with the manufacturer’s specifications and drawings using the appropriate tools.
- Effective anchoring depth, edge distance and spacing not less than the specified values without minus tolerance
- The hexagon head screw and the washer for anchor type T101 PIOVRA correspond to the specifications given in Annex A 2.

T101 PIOVRA, T101 PIOVRA B	**Annex B 1**
Intended use Specifications	

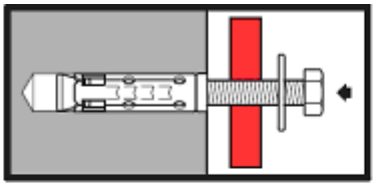
Table B1 - Installation parameters

Size			6	8	10	12
Nominal drill hole diameter	$Ød_0$	[mm]	12	14	16	20
Depth of drill hole	h_0	[mm]	60	65	75	85
Anchor lenght	l	[mm]	48	55	65	77
Effective anchoring depth	h_{ef}	[mm]	41	46	56	64
Fixable thickness	T_{fix}	[mm]	10	15	15	20
Screw size	$d_v x l_v$	[mm]	M6x60	M8x65	M10x80	M12x90
Installation torque	T_{inst}	[Nm]	10	23	40	65
Minimum edge distance	c_{min}	[mm]	70	90	100	130
Minimum spacing	s_{min}	[mm]	80	110	120	140
Minimum thickness of member	h_{min}	[mm]	110	110	110	140

Installation procedure



a



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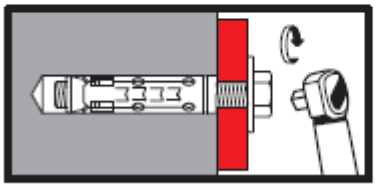

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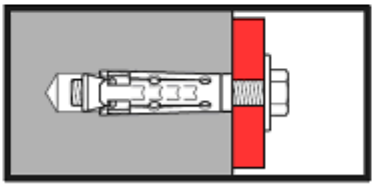

d

a) drill and clean the hole

b) Insert the anchor and place the object to fix

c) tighten the screw

d) fixing completed

T101 PIOVRA, T101 PIOVRA B	
Intended use Installation parameters	**Annex B 2**

Table C1 – Design method A
Characteristic values of resistance to tension load

Steel failure – Characteristic resistance						
Size			**6**	**8**	**10**	**12**
Steel grade **8.8**	$N_{Rk,s}$	[kN]	16	29	46	67
Partial safety factor	γ_{Ms}	[-]	1,5			

Pullout failure in concrete C20/25						
Size			**6**	**8**	**10**	**12**
Characteristic resistance	$N_{Rk,p}$	[kN]	9	12	20	30
Partial safety factor	γ_{Mc}	[-]	1,8			
Increasing factor	ψ_c	C30/37	1,22			
		C40/50	1,41			
		C50/60	1,55			

Concrete cone failure						
Size			**6**	**8**	**10**	**12**
Effective anchoring depth	h_{ef}	[mm]	41	46	56	64
Edge distance	$c_{cr,N}$	[mm]	80	95	110	140
Spacing	$s_{cr,N}$	[mm]	160	190	220	280
Partial safety factor	γ_{Mc}	[-]	1,8			

Splitting failure						
Size			**6**	**8**	**10**	**12**
Edge distance	$c_{cr,sp}$	[mm]	3 h_{ef}			
Spacing	$s_{cr,sp}$	[mm]	6 h_{ef}			
Partial safety factor	γ_{Msp}	[-]	1,8			

Table C2 – Displacement under tension loads

Size			**6**	**8**	**10**	**12**
Load in non-cracked concrete	F	[kN]	3,6	4,8	7,9	11,9
Displacement	δ_{N0}	[mm]	0,43	0,31	0,31	0,80
	$\delta_{N\infty}$	[mm]	0,41			

Table C3 – Design method A
Characteristic values of resistance to shear load

Steel failure without lever arm						
Size			**6**	**8**	**10**	**12**
Steel grade **8.8**	$V_{Rk,s}$	[kN]	8	15	23	34
Partial safety factor	γ_{Ms}	[-]	1,25			

Steel failure with lever arm						
Size			**6**	**8**	**10**	**12**
Steel grade **8.8**	$M^0_{Rk,s}$	[kN]	12	30	60	105
Partial safety factor	γ_{Ms}	[-]	1,25			
Concrete pryout failure						
Factor *k* from ETAG 001, Annex C, 5.2.3.3			1			2
Partial safety factor	γ_{Mp}	[-]	1,5			

Concrete edge failure						
Size			**6**	**8**	**10**	**12**
Effective length of anchor in shear loading	l_f	[mm]	41	46	56	64
Diameter of anchor	d_{nom}	[mm]	12	14	16	20
Partial safety factor	γ_{Mc}	[-]	1,5			

Table C4 – Displacement under shear loads

Size			**6**	**8**	**10**	**12**
Load in non-cracked concrete	F	[kN]	4,6	8,4	13,3	19,3
Displacement	δ_{V0}	[mm]	1,49	2,04	2,28	5,42
	$\delta_{V\infty}$	[mm]	2,2	3,1	3,4	8,1

T101 PIOVRA, T101 PIOVRA B

Performances
Characteristic resistance for shear loads
Displacement under shear load

Annex C 2