

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-21/0723**  
**of 10 November 2021**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Supporting bracket "TRA-WIK-PU"

Product family  
to which the construction product belongs

Supporting bracket "TRA-WIK-PU" for the low  
thermal bridging fixation of attachment parts in external  
thermal insulation composite systems (ETICS) and other  
facade systems

Manufacturer

Dosteba GmbH  
Julius-Kemmler-Straße 45  
72770 Reutlingen  
DEUTSCHLAND

Manufacturing plant

Plant 1

This European Technical Assessment  
contains

17 pages including 12 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 040868-00-0404

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## Specific Part

### 1 Technical description of the product

The supporting brackets "TRA-WIK-PU" correspond to product family b) of EAD 040868-00-0404<sup>1</sup>.

The brackets are factory-made and foamed to form a bracket using black rigid polyurethane foam with three foamed in washers. The supporting brackets have a height of 125 mm with a cantilever arm of 80 mm to 200 mm, graduated in 20 mm increments with a thickness of 60 mm. The thick arm of 50 mm with the three foamed in washers which is flush with/attached to the substrate.

The mounting area for fastening attachment parts are positioned at the end-face side (end-side mounting) of the cantilever arm and at the longitudinal side (leg-side mounting) of the cantilever arm.

Detailed information and data for all the components are provided in the annexes to this ETA and in the associated test reports and control plan.

The components and the system setup of the product are provided in Annex A 1 + A2.

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

The supporting brackets "TRA-WIK-PU" are intended for use as a low thermal bridging fixation of primarily static loads from attachment parts such as awnings, canopies, stairways, railings, window blinds and sun protection elements on external walls with external thermal insulation composite systems (ETICS) or other facade systems.

The supporting brackets are fixed with their entire surface to the level, solid, load-bearing external wall (substrate) using three anchor elements.

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

The verifications and assessment methods on which this ETA is based lead to the assumption of a working life of the supporting brackets of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, 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.

<sup>1</sup> EAD 0040868-00-0404, edition June 2019 - RIGID POLYURETHANE FOAM (PUR) ELEMENTS FOR FASTENING ATTACHMENT PARTS IN EXTERNAL THERMAL INSULATION COMPOSITE SYSTEMS

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

#### 3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	E in accordance with DIN EN 13501

#### 3.2 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance	
Swelling due to water absorption	weight [%] 0,56	
Apparent density of PU foam	0.51 g/cm <sup>3</sup> with EN 1602	
Mechanical resistance	Tensile strength	See Annex C 2 – C 6
	Compressive strength	See Annex C 2 – C 6
	Shear strength	See Annex C 2 – C 6
	Lateral tensile strength	No performance assessed
	Flexural strength	No performance assessed
	Pull-through resistance of anchor elements	See Annex C 1
	Embedment strength (local bearing strength) of the anchorage area	See Annex C 1
Influencing factors	See Annex C 1	

#### 3.3 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal conductivity	$\lambda < 0.0651 \text{ W/(mK)}^1$ with EN 12677
Thermal resistance	No performance assessed
Thermal transmittance	No performance assessed
<sup>1</sup> As a measured value which was not exceeded.	

### 4 Assessment and verification of constancy of performance system applied, with reference to its legal basis

In accordance with European Assessment Document (EAD) no. 040868-00-0404, the following legal basis shall apply: 2003/640/EC.

The following system for the assessment and verification of constancy of performance (AVCP) shall be used for the supporting brackets: 2+ for all intended uses except for uses subject to reaction-to-fire requirements.

For intended uses subject to reaction-to-fire requirements, AVCP system 1, 3 or 4 shall be used for the reaction to fire, depending on the boundary conditions listed in the above-mentioned Decision.

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

The technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with DIBt.

Issued in Berlin on 10 November 2021 by Deutsches Institut für Bautechnik

Renée Kamanzi-Fechner  
Head of Section

*beglaubigt:*  
Beckmann

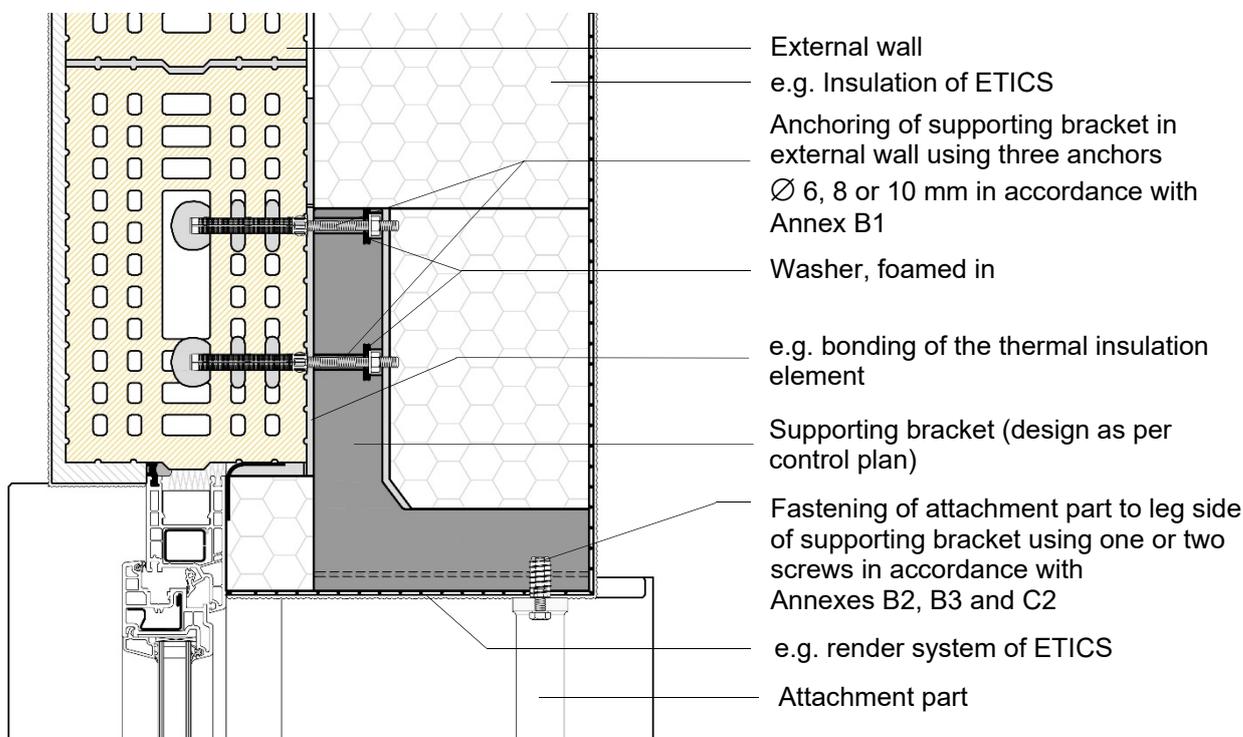
**Supporting bracket "TRA-WIK-PU" leg side mounting**  
(in accordance with the specifications deposited as part of the control plan)



Loading area in accordance with Annexes C1 + C2

Mounting attachment part on leg side

**Installation situation using the example of a railing between window openings**



Supporting bracket "TRA-WIK-PU"

**Product description**  
Product and installed condition of leg side mounting

Annex A 1

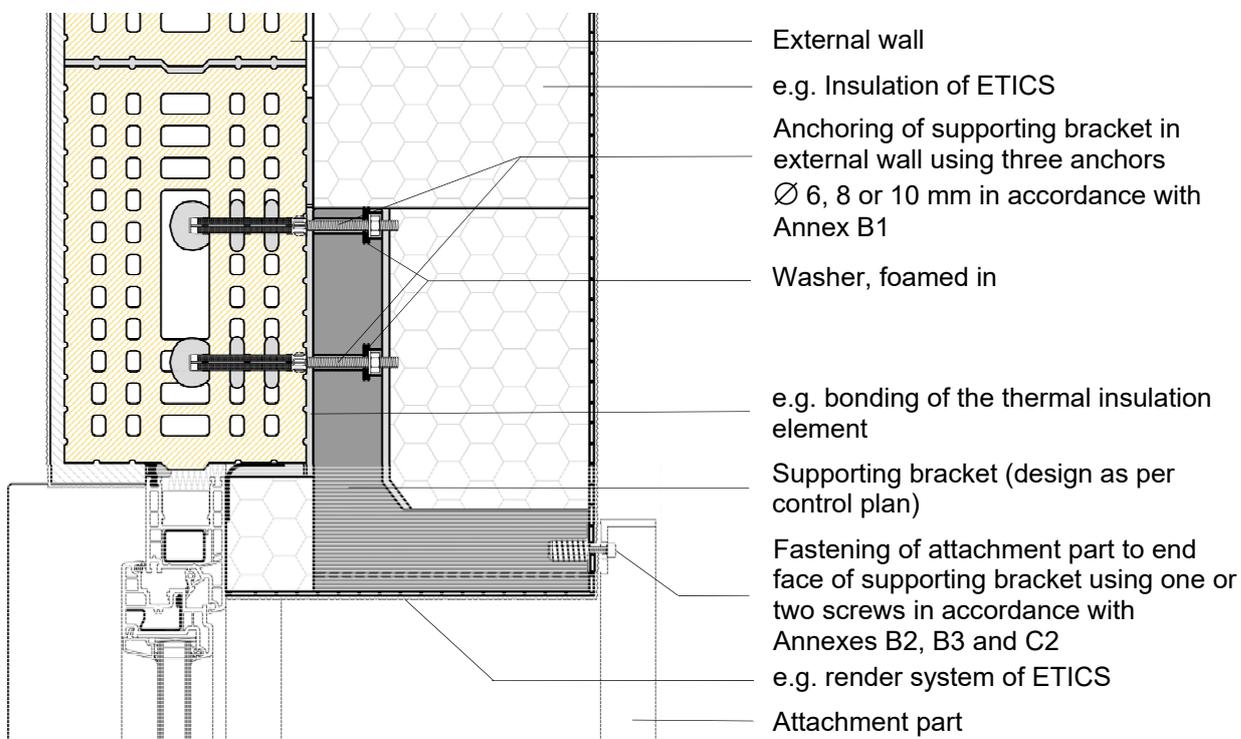
**Supporting bracket "TRA-WIK-PU" end face mounting**  
(in accordance with the information deposited in the control plan)



Loading area in accordance with Annexes C1 + C2

Mounting attachment part on end face

**Installation situation using the example of a railing on the facade**



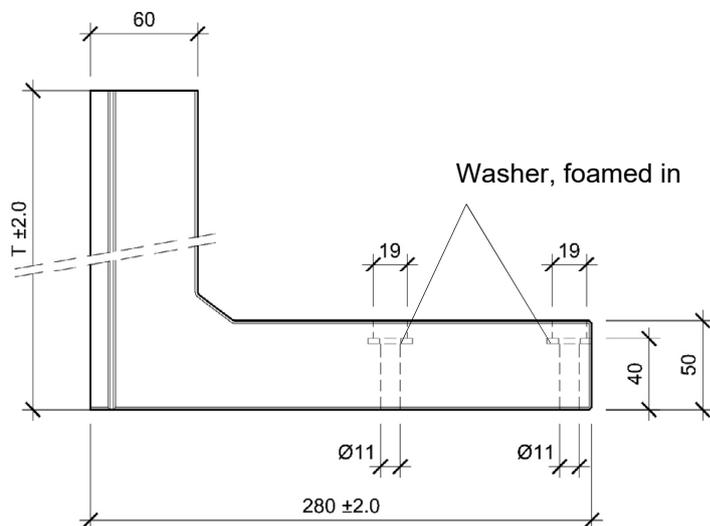
Supporting bracket "TRA-WIK-PU"

**Product description**  
Product and installed condition of end face mounting

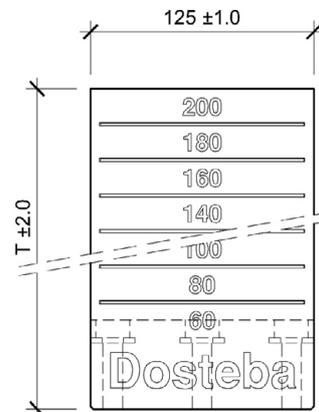
Annex A 2

**Supporting bracket "TRA-WIK-PU"**

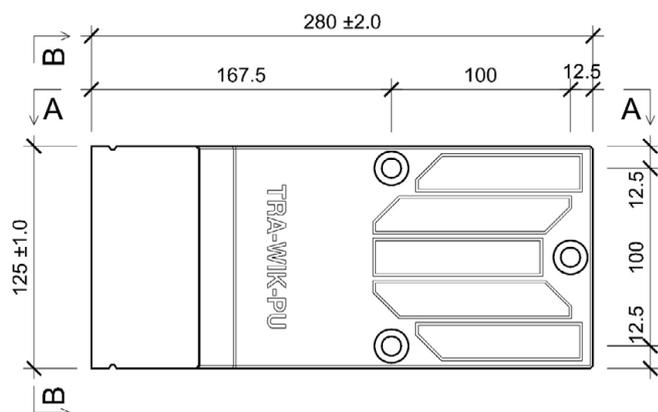
**View A-A**



**View B-B**



**Top view**



For measurements without specified tolerances, tolerance class "c (coarse)" applies in accordance with ISO 2768

All measurements in mm

Supporting bracket "TRA-WIK-PU"

**Product description**  
Outside dimensions and weight

Annex A 3

## Field of application

Product family b) Supporting bracket elements in accordance with EAD 040868-00-0404, June 2019

## Loading of the supporting brackets

Static and quasi-static loads (primarily static loads) from attachment parts

## Structural analysis

The verification of the supporting brackets as well as the anchoring and fastening shall take into account all loads which occur. For each application case, a structural analysis shall be carried out for the ultimate limit state (ULS) and for the serviceability limit state (SLS). Relevant national regulations shall be observed.

For table C1 in Annex C1:

The following loading durations shall be used:

- Self-weight (attachment parts, items such as flower boxes may also have to be considered here): permanent
- Imposed loads (traffic loads):  
The actions of Clauses 6.3.1, 6.3.4 and 6.4 of EN 1991-1-1:2010-12 shall be considered as imposed loads. The actions listed in Clauses 6.3.2 and 6.3.3 of the standard shall be excluded.  
Unless other values exist, the following loading durations shall be assumed:
  - Loads in accordance with Clause 6.3.1: 25 % permanent; 75 % short
  - Loads in accordance with Clause 6.3.4: short
  - Loads in accordance with Clauses 6.4 (1) and 6.4 (2): medium
  - Loads in accordance with Clauses 6.4 (NA.3) \* to 6.4 (NA.6): permanent
- Wind loads: very short
- Snow loads: medium
- Extraordinary snow loads: short

The actions  $E_k$  shall be increased through multiplication by the influencing factors depending on the load scenario.

\* acc. DIN EN 1991-1/NA:2010-12

## Installation

The supporting brackets are fixed with their entire surface to the level, solid, load-bearing external wall (substrate) using three anchor elements. The anchor elements shall be inserted so they are perpendicular to the surface of the building. Where applicable, the adhesive mortar of the ETICS used shall be placed between the supporting bracket and the external wall over the entire mounting area.

## Anchoring in the substrate

For anchoring the supporting brackets in the external wall, the loading point shall be 40 mm from the rear edge of the supporting bracket, only fit-for-use anchor elements with the following properties shall be used:

- three anchor elements with a diameter of 6, 8 or 10 mm
- strength class of anchor elements at least 8.8 in accordance with EN ISO 898-1

Supporting bracket "TRA-WIK-PU"

## Intended use

Technical data - application and installation

Annex B 1

- The load-bearing capacity of the anchoring elements in the substrate must be verified for each individual case.
- The nominal head diameter of the anchoring elements must be at least 18 mm.

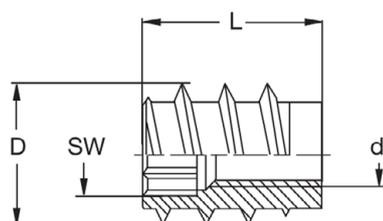
### Fastening attachment parts

The attachment parts are always fastened to the supporting bracket with one or two Screws in the fastening area of the supporting bracket in accordance with Annex C3 :

#### Type A:

Threaded insert RAMPA SK 18,5 x 30 galvanized steel, material number 1.0718 according to EN 10277-3, anchoring depth 30 mm, drill hole  $\varnothing$  16,0 – 16,5 mm and M10 screw, strength class 8.8 in accordance with EN ISO 898-1.

Half section of threaded insert Rampa SK 18,5 x 30:



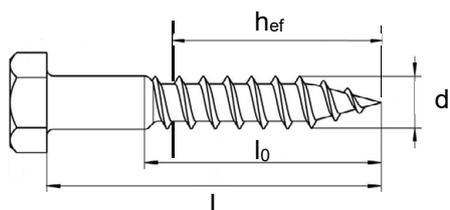
Dimensions:

- L = 30 mm
- D = 18,5 mm
- SW = 10 mm
- d = M10

#### Type B

Hexagon head wood screw  $\varnothing$  10 mm according to DIN 571, anchoring depth  $h_{ef}$  = 50 mm, drill hole  $\varnothing$  6 mm, strength class of screw min. 4.6 in accordance with EN ISO 898-1.

Section wood screw  $\varnothing$  10



Dimensions:

- L = variabel
- d = 10 mm
- $h_{ef}$  = 50 mm (Anchoring depth)
- $l_0 \geq h_{ef}$

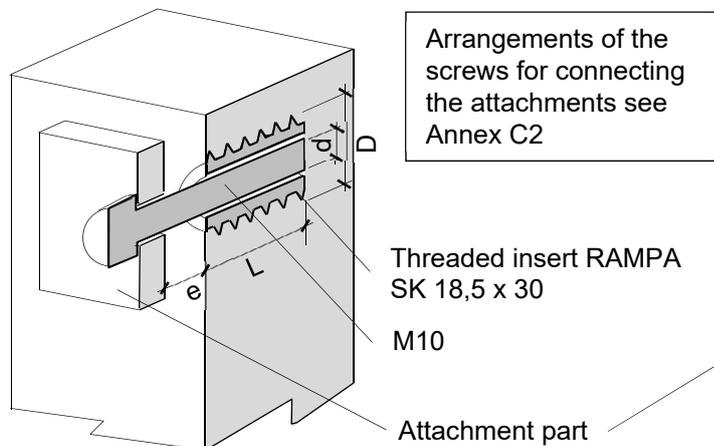
The following shall be observed when fastening the attachment parts:

- The attachment part shall be fastened at the mounting area of the supporting bracket in accordance with Annex C 2.
- The loads of the attachment part shall be applied directly at the surface of the supporting bracket or can be attached with a distance of maximum 20 mm between attachment part and the surface of the supporting bracket.
- The screw shall be positioned perpendicular to the surface of the supporting bracket.

The wood screw (Type B) shall not be loosened.

Supporting bracket "TRA-WIK-PU"	Annex B 2
<b>Intended use</b> Technical data - application and installation	

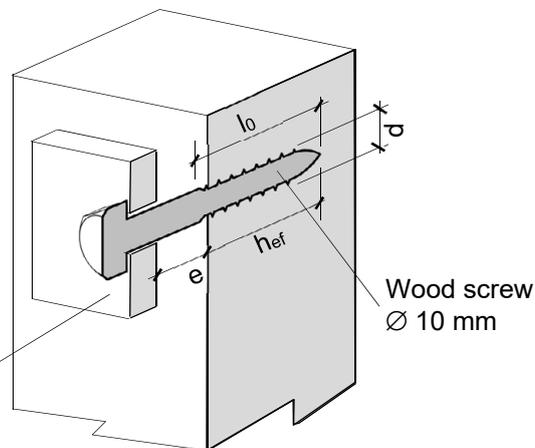
View: Mounting of attachment with threaded insert RAMPA (Type A)



Dimensions:

- L = 30 mm
- D = 18,5 mm
- d = M10
- e = Distance to the attachment part:  
( $e \leq 20$  mm)

View: Mounting of attachment with wood screw (Type B)

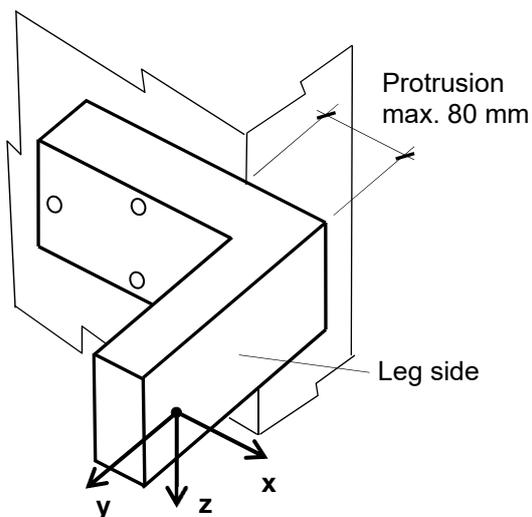


Dimensions:

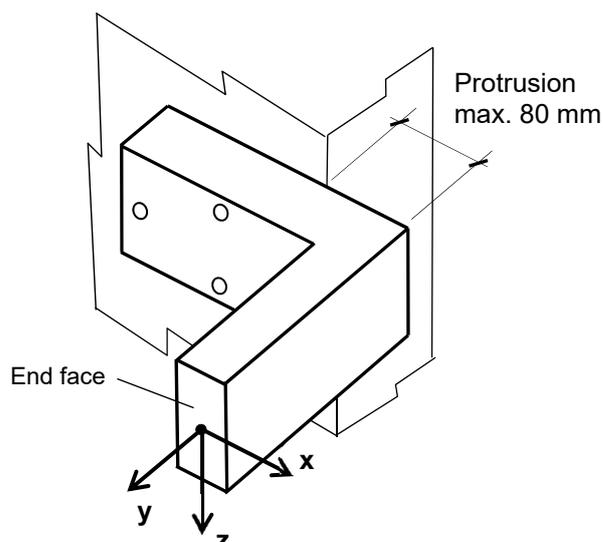
- hef = 50 mm
- lo =  $\geq$  hef
- d = 10 mm
- e = Distance to the attachment part:  
( $e \leq 20$  mm)

The verification of serviceability for non-load-bearing layer (plaster etc.) is not part of this approval

Fastening of attachment part:  
Load directions mounting on leg side



Fastening of attachment part:  
Load directions mounting on end face



Supporting bracket "TRA-WIK-PU"

**Intended use**  
Technical data - application and installation

Annex B 3

Tab. C1: Influencing factors of duration of action

Duration of load action	$A_1^f$	$A_1^E$
very short	1,00	
short up to one week	1,15	1,28
medium up to three months	1,15	1,73
long to permanent	1,16	2,84

$A_1^f$  = Ultimate limit state (ULS)  
 $A_1^E$  = Serviceability limit state (SLS)

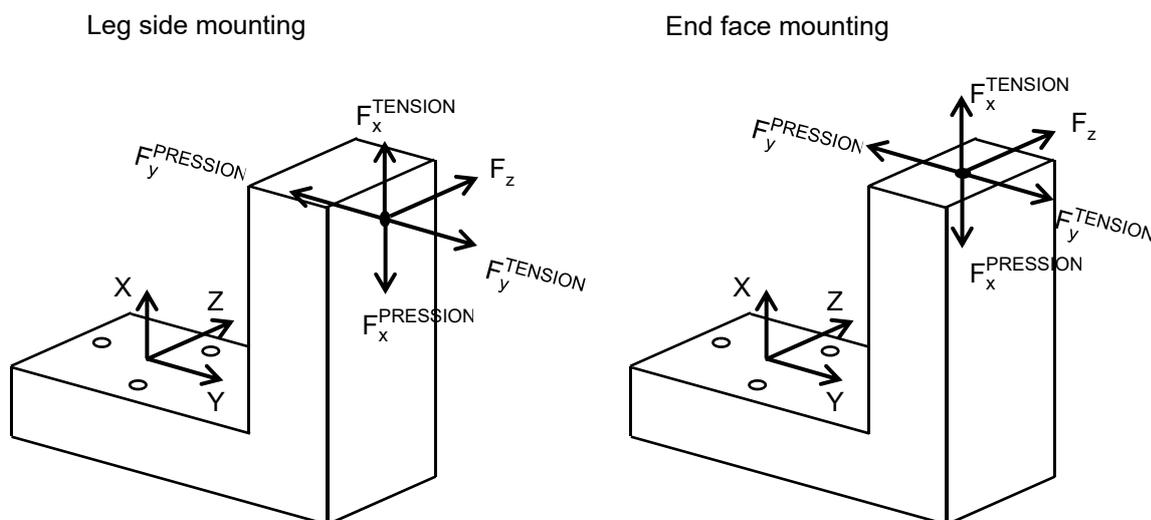
Tab. C2: Influencing factors for media, temperature and cyclic loading

	ULS Breakage	SLS Deflection
Influencing factor for media effects $A_2$	1,05	1,25
Influencing factor for temperature effects $A_3$		
- in summer, 80 °C	1,25	1,30
- in winter, -20 °C	1,05	
Influencing factor for cyclic loading $A_4$	1,10	

Tab. C3: Characteristic structural resistances  $R_k$  of local bearing stress and pull-through resistance per anchor element (see Annex B1) for the ultimate limit state (ULS)

Characteristic structural resistances $R_k$ in kN		
Supporting bracket TRA-WIK-PU 80 - 200	Local bearing strength of anchorage $F_{Y,R,k}$ $F_{Z,R,k}$	Pull-through resistance ( $\varnothing$ 18 mm) $F_{X,R,k}$
Anchor $\varnothing$ 6 mm	8,6 kN	14,2 kN
Anchor $\varnothing$ 8 mm	8,6 kN	14,2 kN
Anchor $\varnothing$ 10 mm	8,6 kN	14,2 kN

Fig. C1: Stress resultants for structural resistances  $F_x$ ,  $F_y$ ,  $F_z$ , at the supporting brackets

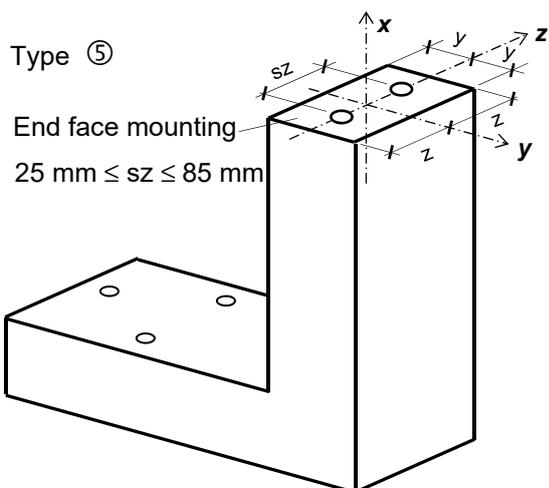
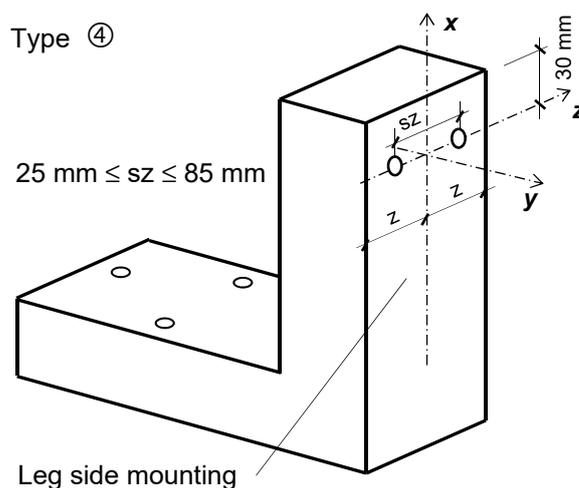
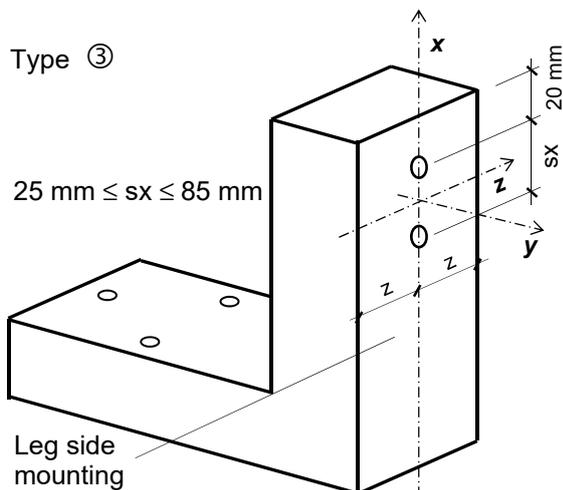
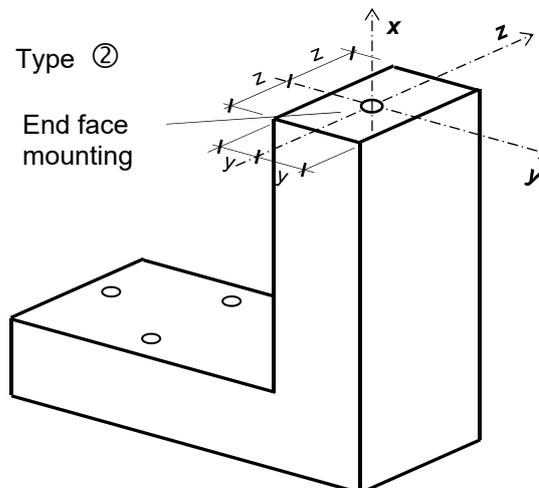
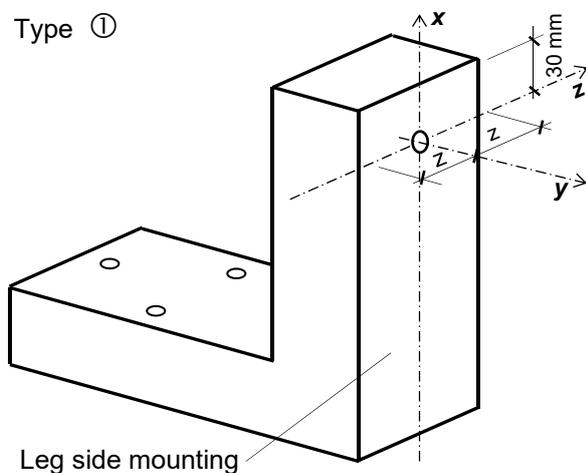


Supporting bracket "TRA-WIK-PU"

**Performance**  
Influencing factors and stress resultant directions (structural resistances)

Annex C 1

Fig. C2: Arrangement types of the fasteners for the attachment part



Supporting bracket "TRA-WIK-PU"

**Performance**  
Fastening types for attachment parts

Annex C 2

Tab. C4: Characteristic structural resistances  $R_k$  in for the ultimate limit state (ULS) of the Supporting bracket "TRA-WIK-PU", leg side mounting, without spacing.

Characteristic structural resistances $R_k$ in [kN] for the arrangement of the fasteners according to type ①, ③ and ④, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>without spacing</b> of the attachment part and ③: $25 \text{ mm} \leq s_x \leq 85 \text{ mm}$ ④: $25 \text{ mm} \leq s_z \leq 85 \text{ mm}$ Leg side mounting					
Supporting bracket	$F_{x,R,k}^{\text{TENSION}}$	$F_{x,R,k}^{\text{PRESSION}}$	$F_{y,R,k}^{\text{TENSION}}$	$F_{y,R,k}^{\text{PRESSION}}$	$F_{z,R,k}$
TRA-WIK-PU 80	4,82	10,2	8,89	13,5	5,28
TRA-WIK-PU 100	4,77	9,96	8,51	11,5	4,86
TRA-WIK-PU 120	4,72	9,73	8,14	9,44	4,45
TRA-WIK-PU 140	4,68	9,49	7,76	7,41	4,03
TRA-WIK-PU 160	4,51	8,92	6,63	6,67	4,01
TRA-WIK-PU 180	4,34	8,34	5,51	5,94	3,99
TRA-WIK-PU 200	4,17	7,77	4,38	5,20	3,97

Tab. C5: Characteristic structural resistances  $R_k$  for the ultimate limit state (ULS) of the Supporting bracket "TRA-WIK-PU", leg side mounting, with spacing.

Characteristic structural resistances $R_k$ in [kN] for the arrangement of the fasteners according to type ①, ③ and ④, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>with spacing <math>\leq 20 \text{ mm}</math></b> of the attachment part and ③: $25 \text{ mm} \leq s_x \leq 85 \text{ mm}$ ④: $25 \text{ mm} \leq s_z \leq 85 \text{ mm}$ Leg side mounting					
Supporting bracket	$F_{x,R,k}^{\text{TENSION}}$	$F_{x,R,k}^{\text{PRESSION}}$	$F_{y,R,k}^{\text{TENSION}}$	$F_{y,R,k}^{\text{PRESSION}}$	$F_{z,R,k}$
TRA-WIK-PU 80	3,90	5,36	8,89	13,5	4,96
TRA-WIK-PU 100	4,03	5,34	8,51	11,5	4,66
TRA-WIK-PU 120	4,16	5,33	8,14	9,44	4,37
TRA-WIK-PU 140	4,29	5,31	7,76	7,41	4,07
TRA-WIK-PU 160	4,01	5,44	6,63	6,67	3,86
TRA-WIK-PU 180	3,72	5,58	5,51	5,94	3,66
TRA-WIK-PU 200	3,44	5,71	4,38	5,20	3,45

Supporting bracket "TRA-WIK-PU"

**Performance**  
Characteristic structural resistances  $R_k$  ultimate limit state (ULS)

Annex C 3

Tab. C6: Characteristic structural resistances  $R_k$  in the ultimate limit state (ULS) of the Supporting bracket "TRA-WIK-PU", end face mounting, without spacing.

Characteristic structural resistances $R_k$ in [kN] for the arrangement of the fasteners according to type ② and ⑤, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>without spacing</b> of the attachment part and ⑤: $25 \text{ mm} \leq sz \leq 85 \text{ mm}$ End face mounting					
Supporting bracket	$F_{x,R,k}^{\text{TENSION}}$	$F_{x,R,k}^{\text{PRESSION}}$	$F_{y,R,k}^{\text{TENSION}}$	$F_{y,R,k}^{\text{PRESSION}}$	$F_{z,R,k}$
TRA-WIK-PU 80	4,27	15,0	6,20	7,60	5,30
TRA-WIK-PU 100	4,65	15,4	5,78	7,01	4,98
TRA-WIK-PU 120	5,04	15,7	5,35	6,43	4,67
TRA-WIK-PU 140	5,42	16,1	4,93	5,84	4,35
TRA-WIK-PU 160	5,41	15,5	4,43	5,24	4,18
TRA-WIK-PU 180	5,39	15,0	3,92	4,65	4,01
TRA-WIK-PU 200	5,38	14,4	3,42	4,05	3,84

Tab. C7: Characteristic structural resistances  $R_k$  in the ultimate limit state (ULS) of the Supporting bracket "TRA-WIK-PU", end face mounting, with spacing.

Characteristic structural resistances $R_k$ in [kN] for the arrangement of the fasteners according to type ② and ⑤, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>with spacing <math>\leq 20 \text{ mm}</math></b> of the attachment part and ⑤: $25 \text{ mm} \leq sz \leq 85 \text{ mm}$ End face mounting					
Supporting bracket	$F_{x,R,k}^{\text{TENSION}}$	$F_{x,R,k}^{\text{PRESSION}}$	$F_{y,R,k}^{\text{TENSION}}$	$F_{y,R,k}^{\text{PRESSION}}$	$F_{z,R,k}$
TRA-WIK-PU 80	4,27	15,0	2,86	4,15	5,45
TRA-WIK-PU 100	4,65	15,4	3,01	4,08	5,01
TRA-WIK-PU 120	5,04	15,7	3,15	4,02	4,57
TRA-WIK-PU 140	5,42	16,1	3,30	3,95	4,13
TRA-WIK-PU 160	5,41	15,5	3,53	3,77	3,91
TRA-WIK-PU 180	5,39	15,0	3,76	3,60	3,70
TRA-WIK-PU 200	5,38	14,4	3,99	3,42	3,48

Supporting bracket "TRA-WIK-PU"

**Performance**  
Characteristic structural resistances  $R_k$  ultimate limit state (ULS)

Annex C 4

Tab. C8: Characteristic structural resistances  $C_k$  for the serviceability limit state (SLS) of the Supporting bracket "TRA-WIK-PU", leg side mounting, without spacing.

Characteristic structural resistances $C_k$ in [kN] for the arrangement of the fasteners according to type ①, ③ and ④, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>without spacing</b> of the attachment part and ③: $25 \text{ mm} \leq s_x \leq 85 \text{ mm}$ ④: $25 \text{ mm} \leq s_z \leq 85 \text{ mm}$ Leg side mounting					
Supporting bracket	$F_{x,C,k}^{\text{TENSION}}$	$F_{x,C,k}^{\text{PRESSION}}$	$F_{y,C,k}^{\text{TENSION}}$	$F_{y,C,k}^{\text{PRESSION}}$	$F_{z,C,k}$
TRA-WIK-PU 80	4,76	9,39	8,79	13,0	4,62
TRA-WIK-PU 100	4,54	9,42	8,45	10,8	4,11
TRA-WIK-PU 120	4,33	9,46	8,10	8,57	3,59
TRA-WIK-PU 140	4,11	9,49	7,76	6,36	3,08
TRA-WIK-PU 160	4,13	8,92	6,63	5,58	3,33
TRA-WIK-PU 180	4,15	8,34	5,51	4,80	3,59
TRA-WIK-PU 200	4,17	7,77	4,38	4,02	3,84

Tab. C9: Characteristic structural resistances  $C_k$  for the serviceability limit state (SLS) of the Supporting bracket "TRA-WIK-PU", leg side mounting, with spacing.

Characteristic structural resistances $C_k$ in [kN] for the arrangement of the fasteners according to type ①, ③ and ④, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>with spacing <math>\leq 20 \text{ mm}</math></b> of the attachment part and ③: $25 \text{ mm} \leq s_x \leq 85 \text{ mm}$ ④: $25 \text{ mm} \leq s_z \leq 85 \text{ mm}$ Leg side mounting					
Supporting bracket	$F_{x,C,k}^{\text{TENSION}}$	$F_{x,C,k}^{\text{PRESSION}}$	$F_{y,C,k}^{\text{TENSION}}$	$F_{y,C,k}^{\text{PRESSION}}$	$F_{z,C,k}$
TRA-WIK-PU 80	3,90	3,01	8,79	13,05	2,57
TRA-WIK-PU 100	4,03	3,04	8,45	10,8	2,60
TRA-WIK-PU 120	4,16	3,09	8,10	8,59	2,62
TRA-WIK-PU 140	4,29	3,13	7,76	6,36	2,65
TRA-WIK-PU 160	4,01	3,08	6,63	5,58	2,75
TRA-WIK-PU 180	3,72	3,03	5,51	4,80	2,84
TRA-WIK-PU 200	3,44	2,98	4,38	4,02	2,94

Supporting bracket "TRA-WIK-PU"

**Performance**  
Characteristic structural resistances  $C_k$  serviceability limit state (SLS)

Annex C 5

Tab. C10: Characteristic structural resistances  $C_k$  for the serviceability limit state (SLS) of the Supporting bracket "TRA-WIK-PU", end face mounting, without spacing.

Characteristic structural resistances $C_k$ in [kN] for the arrangement of the fasteners according to type ② and ⑤, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>without spacing</b> of the attachment part and ⑤: $25 \text{ mm} \leq sz \leq 85 \text{ mm}$ End face mounting					
Supporting bracket	$F_{x,C,k}^{\text{TENSION}}$	$F_{x,C,k}^{\text{PRESSION}}$	$F_{y,C,k}^{\text{TENSION}}$	$F_{y,C,k}^{\text{PRESSION}}$	$F_{z,C,k}$
TRA-WIK-PU 80	4,27	9,99	3,32	7,46	4,80
TRA-WIK-PU 100	4,61	11,4	3,86	6,92	4,65
TRA-WIK-PU 120	4,95	12,7	4,39	6,38	4,50
TRA-WIK-PU 140	5,29	14,1	4,93	5,84	4,35
TRA-WIK-PU 160	5,28	14,0	4,43	5,24	4,03
TRA-WIK-PU 180	5,27	14,0	3,92	4,65	3,71
TRA-WIK-PU 200	5,26	13,9	3,42	4,05	3,39

Tab. C11: Characteristic structural resistances  $C_k$  for the serviceability limit state (SLS) of the Supporting bracket "TRA-WIK-PU", end face mounting, with spacing.

Characteristic structural resistances $C_k$ in [kN] for the arrangement of the fasteners according to type ② and ⑤, (Fig. C1, C2)					
RAMPA threaded insert or wood screws <b>with spacing <math>\leq 20 \text{ mm}</math></b> of the attachment part and ⑤: $25 \text{ mm} \leq sz \leq 85 \text{ mm}$ End face mounting					
Supporting bracket	$F_{x,C,k}^{\text{TENSION}}$	$F_{x,C,k}^{\text{PRESSION}}$	$F_{y,C,k}^{\text{TENSION}}$	$F_{y,C,k}^{\text{PRESSION}}$	$F_{z,C,k}$
TRA-WIK-PU 80	4,27	9,99	2,08	2,28	2,53
TRA-WIK-PU 100	4,61	11,4	2,49	2,56	2,60
TRA-WIK-PU 120	4,95	12,7	2,89	2,83	2,66
TRA-WIK-PU 140	5,29	14,1	3,30	3,11	2,73
TRA-WIK-PU 160	5,28	14,0	3,40	3,07	2,90
TRA-WIK-PU 180	5,27	14,0	3,50	3,04	3,06
TRA-WIK-PU 200	5,26	13,9	3,60	3,00	3,23

Supporting bracket "TRA-WIK-PU"

**Performance**  
Characteristic structural resistances  $C_k$  serviceability limit state (SLS)

Annex C 6