ISO-CONNECT

The connector for additional connections on thermally insulated timber facades

Post bases
Connectors
Balcony/fence posts
Tools
Fasteners
Sound protection

ETA-10/0413 ETA-15/0187
DIN EN 1090-2

Innovative wood connection systems
for highest requirements.

Disclaimer

The load-bearing capacities were calculated with the greatest possible care. However, isolated errors cannot be ruled out. The use of the information provided is expressly at your own risk. All calculations must be checked and approved by the responsible design consultant or structural engineer before the execution.

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ISO-CONNECT product world

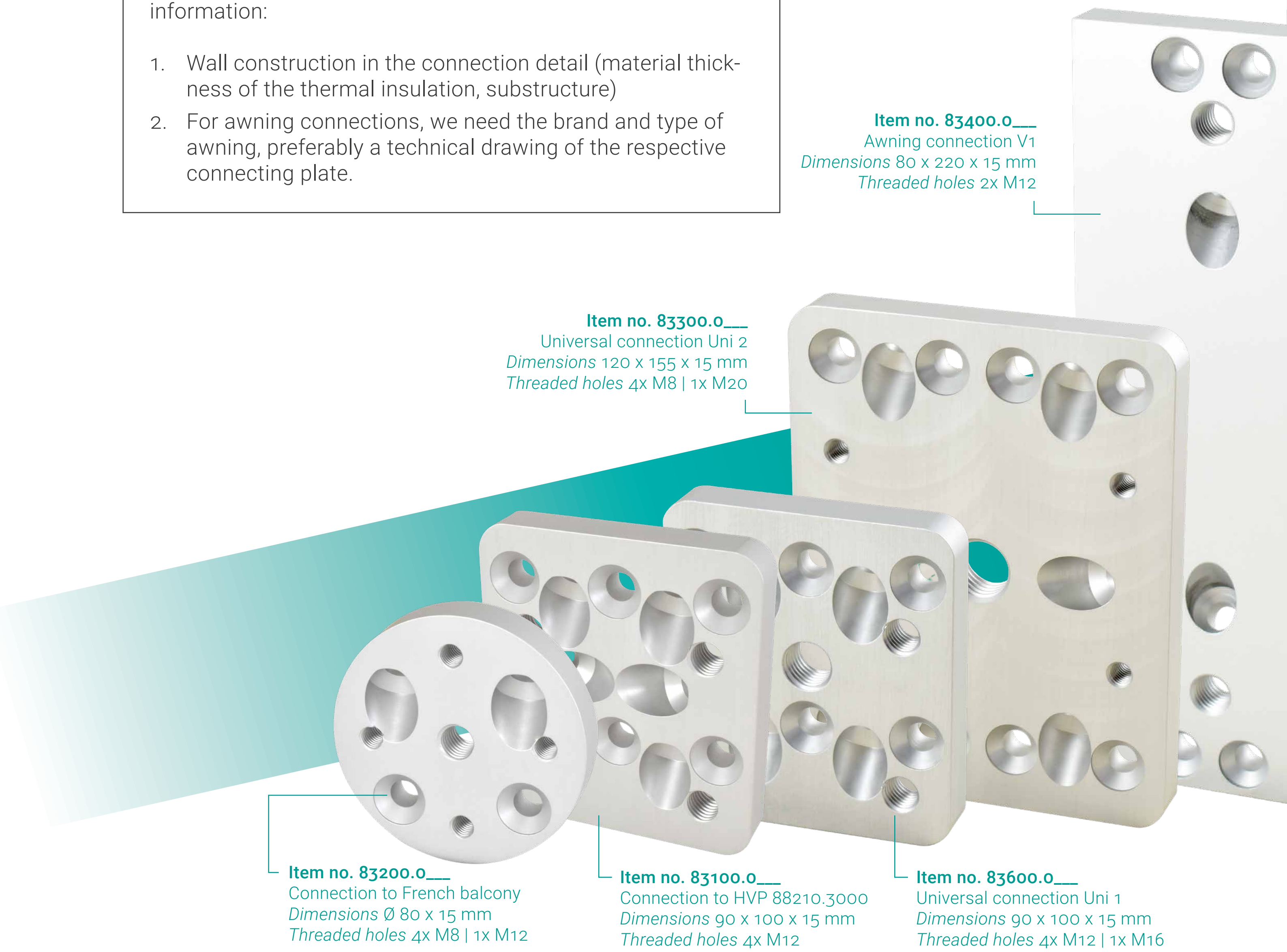
The fastening of various attachments such as awnings to existing external thermal insulation composite systems is often problematic in timber constructions. The solutions currently applied require a considerable and very costly intervention in the existing insulation layer by inserting wooden blocks or brackets.

The patented adapter plate system from Pitzl eliminates such time-consuming activities. The flexible screw connection concept, which combines ISO-CONNECT tension and pressure screws, offers connection options for almost all areas of application, such as porches, balconies or the fastening of French balconies and much more. Compatibility with the tried and tested HVP connector system, for example with an external thermal insulation composite system, further extends the possible uses of our ISO-CONNECT product range.

Rafters can be connected directly to the facade. As a further option, the connection concept offers the alternative of connecting a purlin directly to the ISO-CONNECT and the facade using threaded studs.

The ISO-CONNECT can be mounted on solid timber, glulam and cross laminated timber.

> To be able to guarantee you **competent advice** on the selection of the right fastener, please provide us with the following information:
>
> 1. Wall construction in the connection detail (material thickness of the thermal insulation, substructure)
> 2. For awning connections, we need the brand and type of awning, preferably a technical drawing of the respective connecting plate.



Product information

The ISO-CONNECT connection plates may only be used in combination with the including screws with countersunk head. The deformation of the rubber mat (3 mm thick) included in the scope of delivery indicates the contact pressure of the connection plate. In addition, this ensures a reliable effect of the seal, as three-flank adhesion of the adhesive and sealant is avoided.

Scope of delivery: Connection plate, rubber mat and suitable screws for your insulation.
Universal connection is supplied with matching steel pressure plate.

Assembling

1. Positioning of the connector and optionally the rubber mat.
2. Fix the connector plate first with the screws perpendicular (horizontal) to the facade until contact to the facade surface is reached. If using the rubber mat screw in until low deformations are reached.
3. Screw in the oblique screws at an angle of 45° until they touch the connector plate.
4. Installation of the balcony railing, the HVP connector or the counter plate of the universal connector.
5. The gap between ISO-CONNECT and the facade should be filled with silicone (acetic-free).

Item no. 83400.1___
Awning connection V2
Dimensions 80 x 220 x 15 mm
Threaded holes 2x M12

Item no. 83500.0___
Awning connection Uni 1
Dimensions 220 x 220 x 15 mm
Threaded holes as required

Item no. 83500.1___
Awning connection Uni 2
Dimensions 220 x 220 x 15 mm
Threaded holes as required

Item no. 83200.0___

ISO-CONNECT Connection to French balcony

Developed for the connection of a French balcony to facades with an external thermal insulation composite system, this adapter offers a force-locking solution. Four connection points to which the French balcony is secured are required to fasten the railing. Four M8 threaded holes and one M12 threaded hole are provided for this purpose.

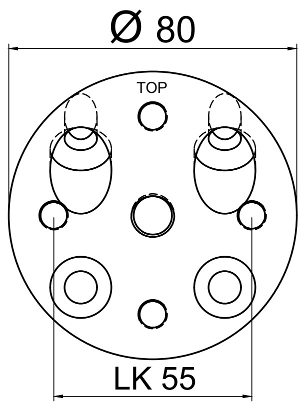
Features of connection to French balcony
- Dimensions connection plate: Ø 80 x 15 mm
- Oblique screws: 2 x Ø 8 mm
- Horizontal screws: 2 x Ø 8 mm

Note
The wall plate on the French balcony serves as a pressure plate.

Boreholes
- 2 boreholes Ø 9 mm, countersunk
- 2 boreholes Ø 9 mm, 45°, countersunk
- 1 threaded hole Ø 12 mm
- 4 threaded holes Ø 8 mm

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 360 mm
- Column width min.: 120 mm
- Reduced column width: 100 mm

Further values can be found from page 14.



Design values of the load-bearing capacity
The tables are calculated according to the dimensioning concept on page 16.

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø 8		Design load-bearing capacities		
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9		
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN
Insulation 60	60	160	75	220	100	7,3	7,8	7,8
Insulation 120	120	240	95	320	100	7,3	9,8	9,8
Insulation 180	180	300	95	400	100	7,3	9,8	8,7
Insulation 220	220	340	95	400	54	3,9	9,8	6,3

*You can find detailed design values and other structural features from **page 18.***

Item no. 83100.0__

ISO-CONNECT Connection to HVP 88210.3000

Matched to the dimensions of the HVP 88210.3000, this adapter offers the direct option of using our end-grain connectors. To create a rafter connection, for example, the HVP is simply fastened to the four M12 threaded holes. The male part of the connector is screwed to the end grain of the rafter as usual. Hook it in, all done!

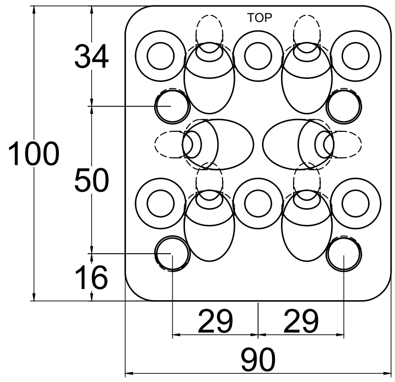
Features of connection to HVP 88210.3000
- Dimensions connection plate: 90 x 100 x 15 mm, aluminium
- Oblique screws: 6 x Ø 8 mm
- Horizontal screws: 6 x Ø 8 mm

Note
The HVP connector 88210.3000 is used as pressure plate.

Boreholes
- 6 boreholes Ø 9 mm, countersunk
- 6 boreholes Ø 9 mm, 45°, countersunk
- 4 threaded holes Ø 12 mm

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 370 mm
- Column width min.: 140 mm
- Reduced column width: 120 mm
- Construction width for $F_{5/6}$: 530 mm

Further values can be found from page 14.



Design values of the load-bearing capacity
The tables are calculated according to the dimensioning concept on page 16.
The HVP connector creates an eccentricity of 18 mm in relation to the ISO-CONNECT.
This was taken into account in the load-bearing capacity tables.

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø8		Design load-bearing capacities			
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9; e = 18 mm			
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$	$F_{5/6,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN
Insulation 60	60	160	75	220	100	13,0	22,4	22,4	3,9
Insulation 120	120	240	95	320	100	14,6	28,4	28,4	3,9
Insulation 180	180	300	95	400	100	14,6	28,4	26,1	3,9
Insulation 220	220	340	95	400	54	7,8	28,4	19,0	2,1

*You can find detailed design values and other structural features from **page 20.***

Item no. 83600.0__

ISO-CONNECT Universal connection Uni 1

The complex solution for individual requirements. If required, the Uni 1 can be used to create an invisible connection between various add-on parts and thermally insulated timber facades. 16 mm studs ensure a powerful connection to the adapter plate.

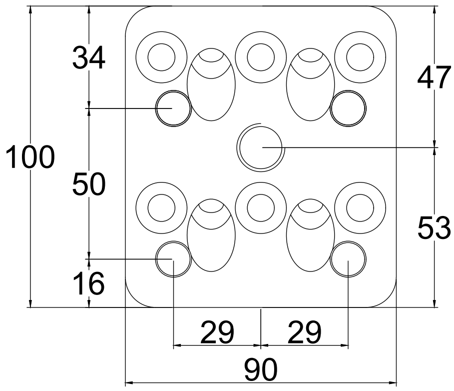
Features of universal connection Uni 1
- Dimensions connection plate: 90 x 100 x 15 mm
- Oblique screws: 4 x Ø 8 mm
- Horizontal screws: 6 x Ø 8 mm

Note
The compression plate is included in shipment.

Boreholes
- 6 boreholes Ø 9 mm, countersunk
- 4 boreholes Ø 9 mm, 45°, countersunk
- 4 threaded holes Ø 12 mm
- 1 threaded hole Ø 16 mm

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 370 mm
- Column width min.: 140 mm
- Reduced column width: 120 mm
- Construction width for $F_{5/6}$: 530 mm

Further values can be found from page 14.



Design values of the load-bearing capacity
The tables are calculated according to the dimensioning concept on page 16. Load-bearing capacities of Uni 1 universal connection with eccentricities according to ISO-CONNECT Universal M16.

Version	Thickness of the insulation	Pressure screw Ø 8		Tension screw and lateral screws Ø8		Design load-bearing capacities					
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9					
						40mm	60mm	80mm	100mm		
	t_D	l_c	$l_{ef,c}$	l_t	$l_{ef,t}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN	kN	kN
Insulation 60	60	180	75	220	100	11,46	8,76	7,09	5,96	29,79	29,79
Insulation 120	120	240	95	320	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 180	180	300	95	400	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 220	220	340	95	400	54	8,60	8,60	8,60	7,37	36,85	36,85

*You can find detailed design values and other structural features from **page 22.***

Item no. 83300.0___

ISO-CONNECT Universal connection Uni 2

The universal connection system with a greater height and additional compression screws is optimized for higher forces and eccentricity to connect for example purlins. The connection is realized with a M20 bolt.

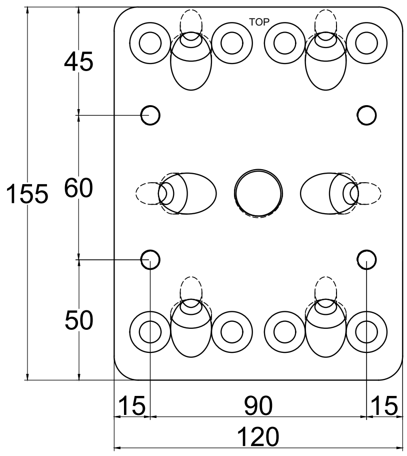
Features of universal connection Uni 2
- Dimensions connection plate: 120 x 155 x 15 mm
- Oblique screws: 6 x Ø 8 mm
- Horizontal screws: 8 x Ø 8 mm

Note
The compression plate is included in shipment.

Boreholes
- 8 boreholes Ø 9 mm, countersunk
- 6 boreholes Ø 9 mm, 45°, countersunk
- 1 threaded hole Ø 20 mm
- 4 threaded holes Ø 8 mm

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 440 mm
- Column width min.: 160 mm
- Reduced column width: 140 mm
- Construction width for $F_{5/6}$: 565 mm

Further values can be found from page 14.



Design values of the load-bearing capacity

The tables are calculated according to the dimensioning concept on page 16.

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø 8		Design load-bearing capacities k_{mod} = 0,9						
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	e = 40 mm	e = 60 mm	e = 80 mm	e = 100 mm	no influence of eccentricity		
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$	$F_{5/6,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN	kN	kN	kN
Insulation 60	60	160	75	220	100	14,59	14,59	12,82	11,22	29,91	29,91	3,91
Insulation 120	120	240	95	320	100	14,62	14,62	14,62	14,21	37,88	37,88	3,92
Insulation 180	180	300	95	400	100	14,62	14,62	14,62	13,04	37,88	34,78	3,92
Insulation 220	220	340	95	400	54	7,82	7,82	7,82	7,82	37,88	25,35	2,10

You can find detailed design values and other structural features from ***page 24.***

Item no. 83400.0___

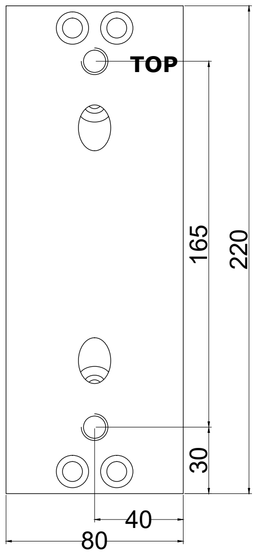
ISO-CONNECT Awning connection V1

The right system connector to connect awnings of the Warema brand to external thermal insulation composite systems. A load bearing capacity that is perfectly matched to the requirements of an awning installation guarantees simple and safe installation.

Features of awning connection V1
- Dimensions connection plate: 80 x 220 x 15 mm
- Oblique screws: 2 x Ø 8 mm
- Horizontal screws: 4 x Ø 8 mm

Note
Additional threaded holes can be machined on the adapter on request. The awning bracket serves as a pressure plate. An additional pressure plate may be necessary.

Boreholes
- 4 boreholes Ø 9 mm, countersunk
- 2 boreholes Ø 9 mm, 45°, countersunk
- 2 threaded holes Ø 12 mm



Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 480 mm
- Column width min.: 84 mm
- Reduced column width: 68 mm

Further values can be found from page 14.

Design values of the load-bearing capacity
Note: The tables are calculated according to the dimensioning concept on page 26 *(applies to V1 and V2).*

Loads apply to fischer wood construction screws *Power-Fast* made of carbon steel.

	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	1,62	11,5
Insulation 120	120	240	100	260	57	0,75	1,62	11,5
Insulation 180	180	300	100	340	72	0,75	1,22	8,5
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

You can find detailed design values and other structural features from ***page 26.***

Item no. 83400.1___

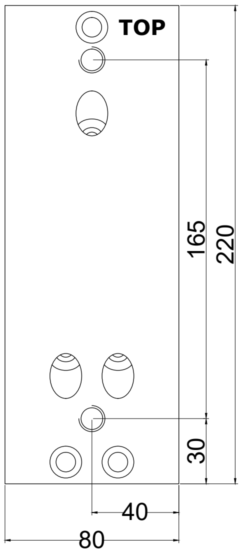
ISO-CONNECT Awning connection V2

The inwardly inclined arrangement of the 45° tension screws enables the awning to be installed even on facades with smaller timber dimensions in the connection area.

Features of awning connection V2
- Dimensions connection plate: 80 x 220 x 15 mm
- Oblique screws: 3 x Ø 8 mm
- Horizontal screws: 3 x Ø 8 mm

Note
Additional threaded holes can be machined on the adapter on request. The awning bracket serves as a pressure plate. An additional pressure plate may be necessary.

Boreholes ***(with inwards inclined boreholes)***
- 3 boreholes Ø 9 mm, countersunk
- 3 boreholes Ø 9 mm, 45°, countersunk
- 2 threaded holes Ø 12 mm



Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 320 mm
- Column width min.: 88 mm
- Reduced column width: 72 mm

Further values can be found from page 14.

	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	0,92	6,2
Insulation 120	120	240	100	260	57	0,75	0,92	6,2
Insulation 180	180	300	100	340	72	0,75	0,92	6,2
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

You can find detailed design values and other structural features from ***page 28.***

Item no. 83500.0___

ISO-CONNECT Awning connection Uni 1

A connection option for almost all brands and types of awnings available on the market. If you send us the technical drawing of your connection plate, we will manufacture the connector in 1 to 2 working days regardless of your awning's manufacturer.

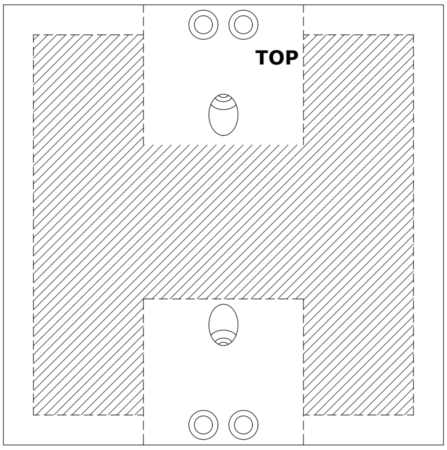
Features of awning connection Uni 1
- Dimensions connection plate: 220 x 220 x 15 mm
- Oblique screws: 2 x Ø 8 mm
- Horizontal screws: 4 x Ø 8 mm

Note
Within the hatched area (see technical illustrations), threaded holes can be machined according to customer requirements for individual applications. The load-bearing capacities remain the same.

Boreholes
- 4 boreholes Ø 9 mm, countersunk
- 2 boreholes Ø 9 mm, 45°, countersunk
- *Threaded holes as required*

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 480 mm
- Column width min.: 84 mm
- Reduced column width: 68 mm

Further values can be found from page 14.



Design values of the load-bearing capacity
Note: The tables are calculated according to the dimensioning concept on page 26 *(applies to Uni 1, Uni 2).*

	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	1,62	11,5
Insulation 120	120	240	100	260	57	0,75	1,62	11,5
Insulation 180	180	300	100	340	72	0,75	1,22	8,5
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

*You can find detailed design values and other structural features from **page 26.***

Item no. 83500.1___

ISO-CONNECT Awning connection Uni 2

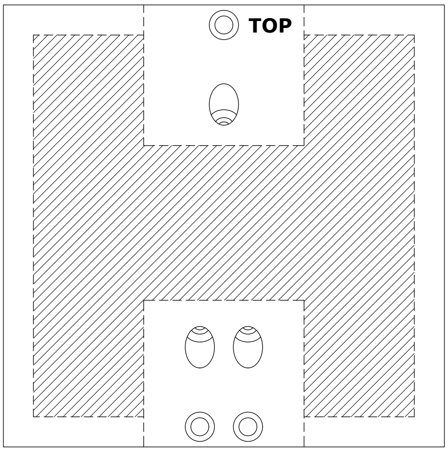
Features of awning connection Uni 2
- Dimensions connection plate: 220 x 220 x 15 mm
- Oblique screws: 3 x Ø 8 mm
- Horizontal screws: 3 x Ø 8 mm

Note
Within the hatched area (see technical illustrations), threaded holes can be machined according to customer requirements for individual applications. The load-bearing capacities remain the same.

Boreholes *(with inwards inclined boreholes)*
- 3 boreholes Ø 9 mm, countersunk
- 3 boreholes Ø 9 mm, 45°, countersunk
- *Threaded holes as required*

Minimum cross sections for insulation 120 mm *(example):*
- Beam height min.: 320 mm
- Column width min.: 88 mm
- Reduced column width: 72 mm

Further values can be found from page 14.



	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	0,92	6,2
Insulation 120	120	240	100	260	57	0,75	0,92	6,2
Insulation 180	180	300	100	340	72	0,75	0,92	6,2
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

*You can find detailed design values and other structural features from **page 28.***

Minimum cross-sections

The specified minimum cross-section height and width values relate to the information in EC 5 or ETA 11-0027 fischer *Power-Fast*. In the case of frame assembly, the width can be reduced if a distance of 200 mm to the end of the grain is maintained. All adapter plates require a minimum component depth (solid timber, glued laminated timber, engineered wood product) of 120 mm.

Item no. 83200.0___
Connection to French balcony

[mm]	Beam height min.	Column width min.	Reduced column width
Insulation 60	290	120	100
Insulation 80	315	120	100
Insulation 100	330	120	100
Insulation 120	360	120	100
Insulation 140	370	120	100
Insulation 160	400	120	100
Insulation 180	415	120	100
Insulation 200	415	120	100
Insulation 220	415	120	100

Item no. 83100.0___
Connection to HVP 88210.3000

Item no. 83600.0___
Universal connection Uni 1

[mm]	Beam height min.	Column width min.	Reduced column width	Construction width for $F_{5/6}$
Insulation 60	300	140	120	390
Insulation 80	330	140	120	445
Insulation 100	345	140	120	480
Insulation 120	370	140	120	530
Insulation 140	385	140	120	560
Insulation 160	415	140	120	615
Insulation 180	430	140	120	650
Insulation 200	430	140	120	650
Insulation 220	430	140	120	650

Item no. 83300.0___
Universal connection Uni 2

[mm]	Beam height min.	Column width min.	Reduced column width	Construction width for $F_{5/6}$
Insulation 60	365	160	140	425
Insulation 80	400	160	140	480
Insulation 100	410	160	140	505
Insulation 120	440	160	140	565
Insulation 140	450	160	140	590
Insulation 160	480	160	140	650
Insulation 180	495	160	140	675
Insulation 200	495	160	140	675
Insulation 220	495	160	140	675

Item no. 83400.0___
Awning connection V1
Item no. 83500.0___
Awning connection Uni 1

[mm]	Beam height min.	Column width min.	Reduced column width
Insulation 60	360	84	68
Insulation 80	390	84	68
Insulation 100	445	84	68
Insulation 120	480	84	68
Insulation 140	530	84	68
Insulation 160	560	84	68
Insulation 180	590	84	68
Insulation 200	645	84	68
Insulation 220	675	84	68

Item no. 83400.1___
Awning connection V2
Item no. 83500.1___
Awning connection Uni 2

[mm]	Beam height min.	Column width min.	Reduced column width
Insulation 60	320	88	72
Insulation 80	320	88	72
Insulation 100	320	88	72
Insulation 120	320	88	72
Insulation 140	320	88	72
Insulation 160	335	88	72
Insulation 180	365	88	72
Insulation 200	420	88	72
Insulation 220	450	88	72

Note:
When using the ISO-CONNECT adapter in critical environmental conditions (cat. C4: severe corrosion exposure near the coast or through direct exposure to de-icing salt), it is recommended to use stainless steel screws for assembly.

The following load-bearing capacity tables refer to the use of carbon steel screws. For stainless steel screws, the load-bearing capacities change due to the material properties.

Dimensioning concept

The acting forces are divided into tension and compression stresses, are transfered with screws through the insulation into the timber construction. The load distribution and the stress on the screws are shown below for each connector version.

The load carrying capacity depends first on the withdrawal parameter and the tensile strength of the fischer *Power-Fast* screws. And second on the compression strength (= withdrawal parameter of the effective point side penetration length of the threaded part in timber) and the buckling load capacity in the area of the free screw length in the thermal insulation.

Provide evidence: Load carrying capacity of the screws > stress of the screws.

Load-bearing capacity of the tension screws

Withdrawal capacity for screws in **solid timber or glulam** according to ETA-11/0027: $F_{ax,k} = n_{ef} \cdot k_{ax} \cdot f_{ax,k} \cdot d \cdot l_{ef,t} \cdot \left(\frac{\rho_k}{350}\right)^{0,8}$	Values for d = 8 mm: α: screw axis – grain direction $k_{ax} = 1,0$ $f_{ax,k} = 10\ N/mm^2$ l_{ef}: effective point side penetration length of the threaded part ρ_k: characteristic density of the timber $n_{ef} = n^{0,9}$
Characteristic tensile strength: $f_{tens,k}$	$f_{tens,k} = 19,1$ kN for stainless steel screws: $f_{tens,k} = 13,0$ kN
Criterium: $F_{ax,t,Rd} = min\begin{cases} F_{ax,a,Rk} \cdot k_{mod}/\gamma_m \\ f_{tens,k}/\gamma_{m2} \end{cases}$	

Stability and load-bearing capacity of the compression screws

Stability of the screw: $I_s = \pi/64 \cdot d_s^4$ $N_{pl,k} = \pi \cdot d_s^4/4 \cdot f_{yk}$ $s_k = \beta \cdot l_f$ $N_{ki,k} = \pi^2/(s_k^2) \cdot E_s \cdot I_s$ $\lambda'_k = \sqrt{N_{pl,k}/N_{ki,k}}$ $k = 0,5 \cdot (1 + \alpha \cdot (\lambda'_k - \lambda_0) + {\lambda'_k}^2$ $\kappa_c = \begin{cases} 1 & \text{for } \lambda'_k < 0,2 \\ 1/(k + \sqrt{k^2 - {\lambda'_k}^2} & \text{for } \lambda'_k \geq 0,2 \end{cases}$ $F_{ki,Rk} = \kappa_c \cdot N_{pl,k}$	$d_s = 5,9$ mm $f_{yk} = 1000\ N/mm^2$ for carbon steel $f_{yk} = 500\ N/mm^2$ for stainless steel β = 0,7 (screw with fixed support at one end) l_f = free screw length (from the wood to the screw head) $E_s = 210000\ N/mm^2$ for screws made of carbon steel $E_s = 160000\ N/mm^2$ for screws made of stainless steel $\lambda_0 = 0,2$ α = 0,49
Withdrawal parameter: See withdrawal capacity of the tension screw	
Criterium: $F_{ax,c,Rd} = min\begin{cases} F_{ax,k} \cdot k_{mod}/\gamma_m \\ n_{ef} \cdot F_{ki,Rk}/\gamma_{m1} \end{cases}$	n: number of compression screws $n_{ef} = n^{0,9}$

The tables below give an overview about the load carrying capacity for single screws according to the given equations. Values for timber elements with a characteristic density of ρ_k = 350 kg/m³ and carbon steel screws.

Characteristic withdrawal parameter $F_{ax,k}$	
l_{ef}	α = 45° / 90°
mm	kN
40	3,20
45	3,60
50	4,00
55	4,40
60	4,80
65	5,20
70	5,60
75	6,00
80	6,40
85	6,80
90	7,20
95	7,60
100	8,00
$F_{ax,d} = k_{mod} \cdot F_{ax,k} / \gamma_m$	

Characteristic buckling capacity $F_{ki,k}$			
l_f	$F_{ki,k}$	l_f	$F_{ki,k}$
mm	kN	mm	kN
60	21,1	160	7,3
65	20,2	165	6,9
70	19,3	170	6,6
75	18,4	175	6,3
80	17,5	180	6,0
85	16,6	185	5,7
90	15,8	190	5,5
95	14,9	195	5,2
100	14,1	200	5,0
105	13,3	205	4,8
110	12,6	210	4,6
115	11,9	215	4,4
120	11,2	220	4,2
125	10,6	225	4,1
130	10,0	230	3,9
135	9,5	235	3,8
140	9,0	240	3,6
145	8,5	245	3,5
150	8,1	250	3,4
155	7,6		
l_f: free screw length			
$F_{ki,d} = F_{ax,k} / \gamma_{m1}$		$\gamma_{m1} = 1{,}1$	

Minimum edge and end distances for screws

With specification for d = 8 mm, according to ETA-11/0027 fischer wood construction screws *Power-Fast*.

Solid timber and glulam:

Distance to the stressed end of the center of gravity of the threaded part of the screw in the timber: $a_{3,c} = 9 \cdot d = 72$ mm

Edge distance of the center of gravity of the threaded part of the screw in the timber: $a_{4,c} = 4 \cdot d = 32$ mm

In the case of frame assembly and purely vertical load, $a_{4,c}$ may be reduced to 3*d = 24mm, if the distance to the end-grain end is $a_{3,c}$ >/= 25*d = 200 mm.

Cross laminated timber, screws used in the plane surface:

Distance to the unstressed end grain of the center of gravity of the threaded part of the screw in the timber: $a_{3,c} = 6 \cdot d = 48$ mm

Distance to the stressed end grain of the center of gravity of the threaded part of the screw in the timber: $a_{3,t} = 6 \cdot d = 48$ mm

Distance to the unstressed edge of the center of gravity of the threaded part of the screw in the timber: $a_{4,c} = 2{,}5 \cdot d = 20$ mm

Distance to the stressed edge of the center of gravity of the threaded part of the screw in the timber: $a_{4,t} = 6 \cdot d = 48$ mm

Item no. 83200.0__

ISO-CONNECT Connection to French balcony

Dimensions connection plate: Ø 80 x 15 mm
Oblique screws: 2 x Ø 8 mm
Horizontal screws: 2 x Ø 8 mm

Design values of the load-bearing capacity

The tables are calculated according to the dimensioning concept on page 16.

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø 8		Design load-bearing capacities		
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9		
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN
Insulation 60	60	160	75	220	100	7,3	7,8	7,8
Insulation 80	80	180	75	260	100	7,3	7,8	7,8
Insulation 100	100	220	95	280	100	5,7	5,7	5,7
Insulation 120	120	240	95	320	100	7,3	9,8	9,8
Insulation 140	140	260	95	340	100	7,3	9,8	9,8
Insulation 160	160	280	95	380	100	7,3	9,8	9,8
Insulation 180	180	300	95	400	100	7,3	9,8	8,7
Insulation 200	200	320	95	400	82	6,0	9,8	7,4
Insulation 220	220	340	95	400	54	3,9	9,8	6,3

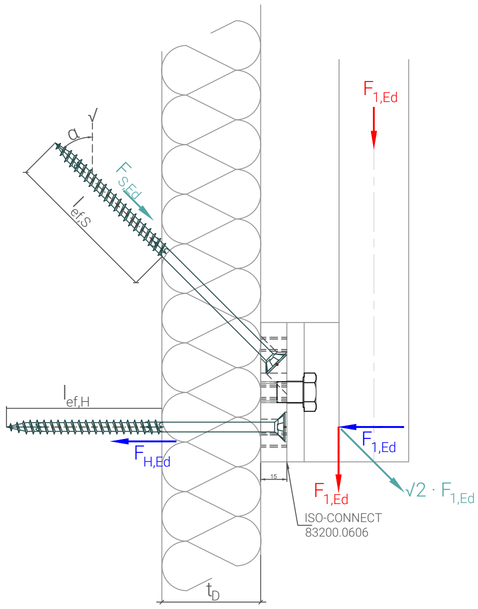
The values are valid when using carbon screws and the following composition: 15mm ISO-CONNECT plate, 3mm rubber panel, 5mm plaster, thermal insulation.
The penetration length of the threaded part of the horizontal partial threaded screw must be at least the effective threaded length but maximum 5 mm longer.
For combined stresses in F_1 and F_4 direction, the forces resulting from the acting forces must be assigned to the screws and summed up.

Stress on the screws depending on the acting loads

$F_{s,Ed}$: Stress on the inclined screws

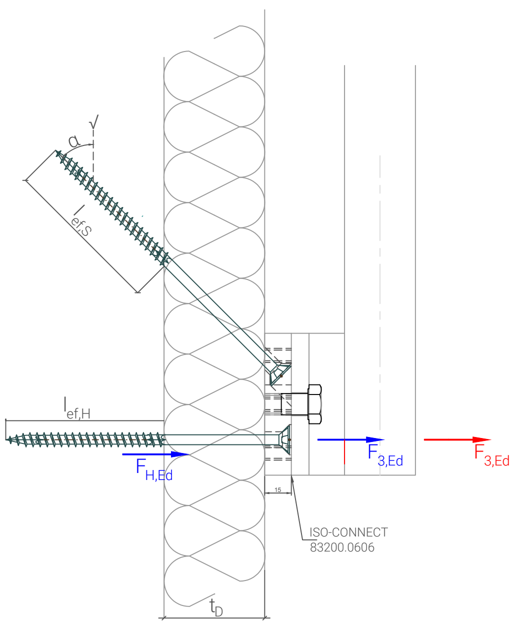
$F_{H,Ed}$: Stress on the horizontal screws

Direction F_1



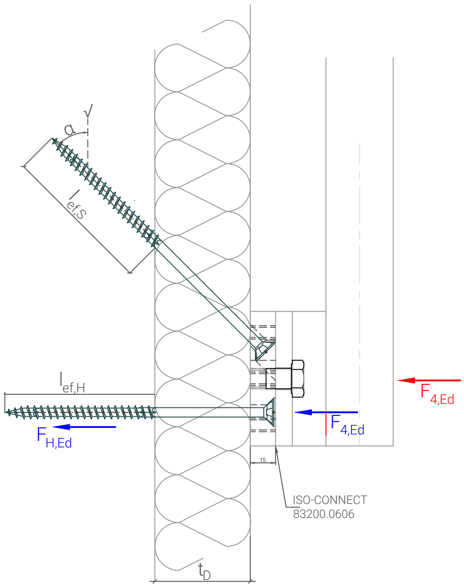
Stress on the screws:
$F_{s,Ed} = \sqrt{2} \cdot F_{1,Ed}$ (Tension)
$F_{H,Ed} = F_{1,Ed}$ (Compression)

Direction F_3



Stress on the screws:
$F_{H,Ed} = F_{3,Ed}$ (Tension)

Direction F_4



Stress on the screw
$F_{H,Ed} = F_{4,Ed}$ (Compression)

Proof of a French balcony

Situation:
The French balcony is installed with two ISO-CONNECT connectors on the left and right side of the doorway. Decisive for the evidence are the upper connectors, due to the horizontal railing forces. The thickness of the thermal insulation is 200 mm and the screws are anchored in a CLT-element with a thickness of 100 mm.

For the system solution the version *Insulation 200* is chosen.
Horizontal screws: 8 x 300 partially threaded, threaded part 100 mm.
Inclined screws: 8 x 380 partially threaded, threaded part 80 mm.

Load assumptions for balcony railings:

Dead weight balcony railing:	g_k = 0,4 kN/m
Horizontal load:	h_k = 1,0 kN/m
Vertical load:	v_k = 1,0 kN/m

Length of balcony railing: 1,00 m

Stress on the connector:
$F_{1,Ed} = (1{,}35 * 0{,}4 + 1{,}5 * 1{,}0) * 1{,}0/2 = 1{,}02$ kN
$F_{3,Ed} = F_{4,Ed} = 1{,}5 * 1{,}0 * 1{,}0/2 = 0{,}75$ kN

Proof direction F_1 with table values:

Insulation 200:	$F_{1,Rd}$ = 6,0 kN
Proof:	1,02/6,0 = 0,17 < 1,0

Proof direction F_3 and F_4 with table values:
Due to the low values the combined proof is not shown.

Insulation 200:	$F_{4,Rd}$ = 7,4 kN
Proof:	0,75/7,4 = 0,10 < 1,0

Item no. 83100.0___

ISO-CONNECT Connection to HVP 88210.3000

Dimensions connection plate: 90 x 100 x 15 mm
Oblique screws: 6 x Ø 8 mm
Horizontal screws: 6 x Ø 8 mm

Design values of the load-bearing capacity
The tables are calculated according to the dimensioning concept on p. 16. The HVP creates an eccentricity of 18 mm in relation to the ISO-CONNECT. This was taken into account in the load-bearing capacity tables.

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø8		Design load-bearing capacities			
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9; e = 18 mm			
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$	$F_{5/6,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN
Insulation 60	60	160	75	220	100	13,0	22,4	22,4	3,9
Insulation 80	80	180	75	260	100	13,0	22,4	22,4	3,9
Insulation 100	100	220	95	280	100	14,6	28,4	28,4	3,9
Insulation 120	120	240	95	320	100	14,6	28,4	28,4	3,9
Insulation 140	140	260	95	340	100	14,6	28,4	28,4	3,9
Insulation 160	160	280	95	380	100	14,6	28,4	28,4	3,9
Insulation 180	180	300	95	400	100	14,6	28,4	26,1	3,9
Insulation 200	200	320	95	400	82	12,0	28,4	22,1	3,2
Insulation 220	220	340	95	400	54	7,8	28,4	19,0	2,1

The values are only valid for carbon screws and the following composition: 15mm ISO-CONNECT plate, 3mm rubber panel, 5mm plaster, thermal insulation. If l_{ef} is greater than in the table, it is allowed to increase $F_{5/6,Rd}$ with the factor ($l_{ef,neu}/l_{ef}$).The penetration length of the threaded part of the horizontal partial threaded screw must be at least the effective threaded length but maximum 5 mm longer. For combined stresses in F_1 and F_4 direction, the forces resulting from the acting forces must be assigned to the screws and summed up.

Proof of a rafter connection with HVP

Situation:
Installation of a 5 m wide canopy (projecting roof) on an existing building with a CLT-wall structure with a thickness of 100 mm and a thermal insulation of 140 mm. The rafters have a center distance of 800 mm.
For the system solution the version *Insulation 140* is selected. Horizontal screws: 8 x 240 partially threaded, threaded part 100 mm. Oblique and lateral screws: 8 x 320 partially threaded, threaded part 120 mm.

Load assumptions:
Dead weight roof: g_k = 0,5 kN/m²
Snow load: s_k = 1,3 kN/m²
Lateral wind load: w_k = (0,8 + 0,5) * 0,65 = 0,85 kN/m²

Stress on the connector:
$F_{1,Ed}$ = (1,35 * 0,5 + 1,5 * 1,3) * 5/2 * 0,8 = 5,25 kN
$F_{5/6,Ed}$ = 0,85 * 0,4 * 5/2 = 0,85 kN

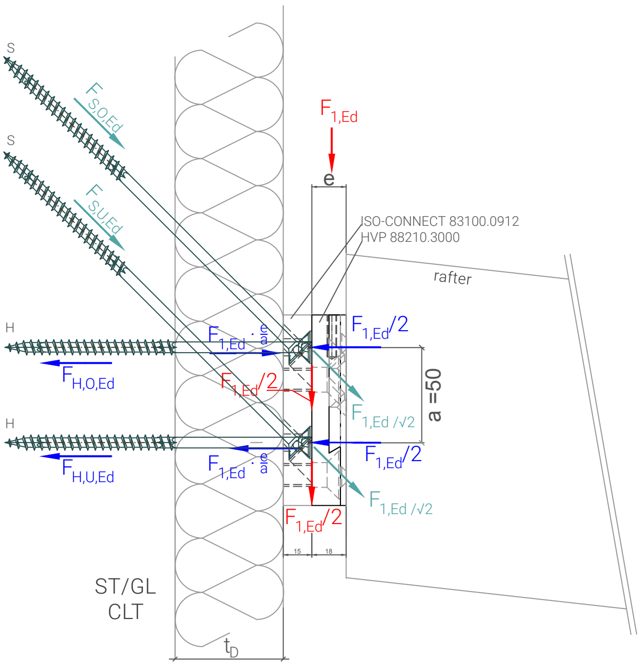
Proof direction F_1 with table values:
Insulation 140: $F_{1,Rd}$ = 14,6 kN
Proof: 5,25/14,6 = 0,36 < 1,0

Proof direction $F_{5/6}$ with table values:
Insulation 140: $F_{5/6,Rd}$ = 3,9 kN
Proof: 0,85/3,9 = 0,22 < 1,0

Stress on the screws depending on the acting loads

$F_{s,o,Ed}$: Stress on the upper inclined screws
$F_{H,o,Ed}$: Stress on the upper horizontal screws
$F_{s,u,Ed}$: Stress on the bottom inclined screws
$F_{H,u,Ed}$: Stress on the bottom horizontal screws

Direction F_1



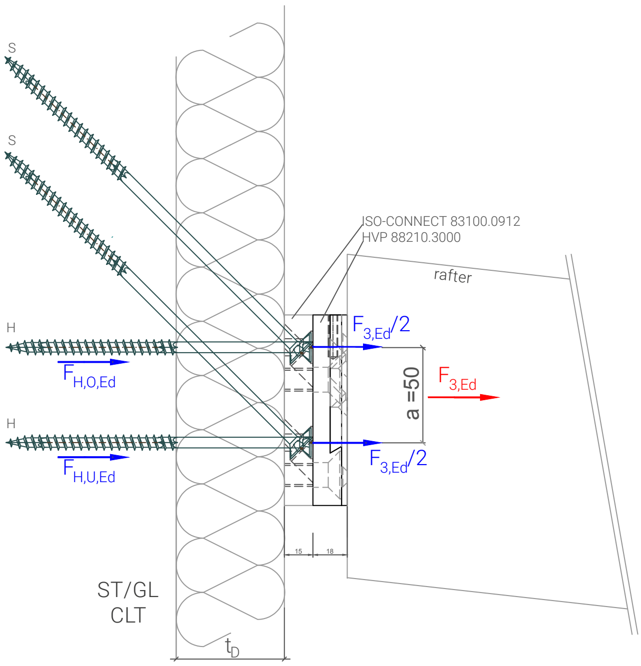
Stress on the screws:

$F_{S,O,Ed} = F_{S,U,Ed} = F_{1,Ed}/\sqrt{2}$ (Tension)

$F_{H,O,Ed} = F_{1,Ed}/2 - F_{1,Ed} \cdot \frac{e}{a}$ (Compression)

$F_{H,U,Ed} = F_{1,Ed}/2 + F_{1,Ed} \cdot \frac{e}{a}$ (Compression)

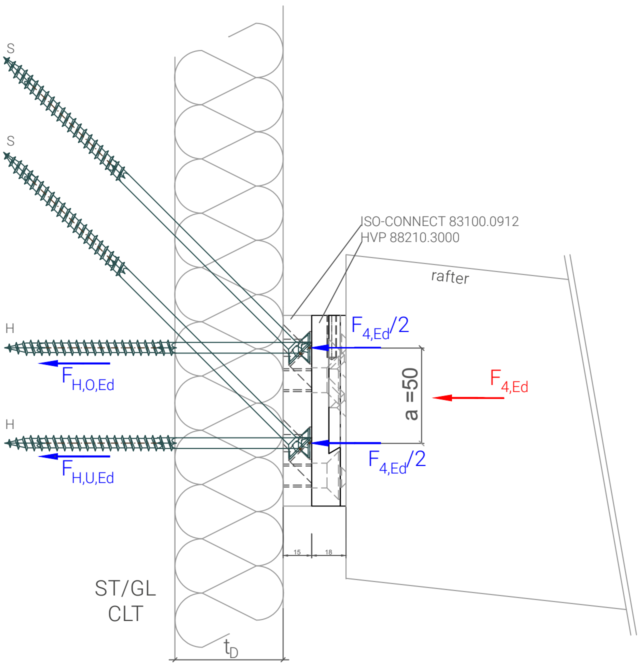
Direction F_3



Stress on the screws:

$F_{H,O,Ed} = F_{H,U,Ed} = F_{3,Ed}/2$ (Tension)

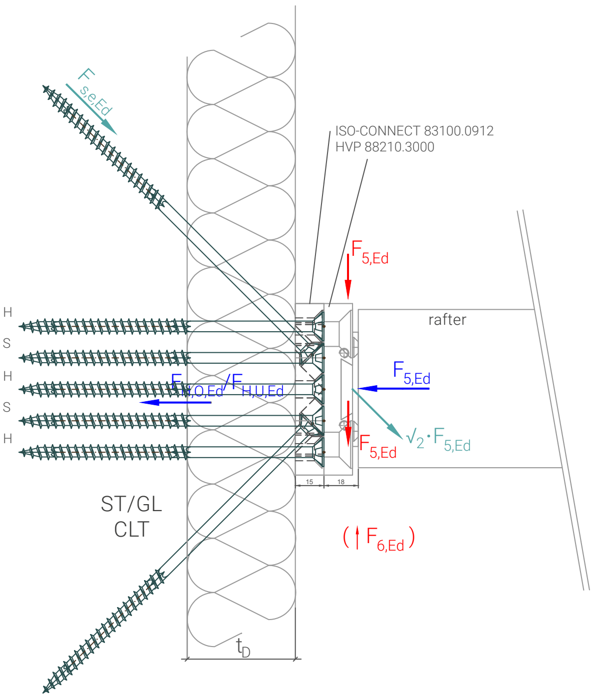
Direction F_4



Stress on the screws:

$F_{H,O,Ed} = F_{H,U,Ed} = F_{4,Ed}/2$ (Compression)

Direction F_5 | F_6



Stress on the screws:

$F_{se,Ed} = \sqrt{2} \cdot F_{5,Ed}$ (Tension)

$F_{H,O,Ed} = F_{H,U,Ed} = F_{5,Ed}/2$ (Compression)

Item no. 83600.0__

ISO-CONNECT Universal connection Uni 1

Dimensions connection plate: 90 x 100 x 15 mm
Oblique screws: 4 x Ø 8 mm
Horizontal screws: 6 x Ø 8 mm

Design values of the load-bearing capacity

The tables are calculated according to the dimensioning concept on page 16.
The maximum capacity is defined with the bolt-timber connection.
The load-bearing capacity is calculated for different purlin dimensions.

Bearing capacity M16 bolt – external thick steel plate / wood connection							
Thickness of the purlin	mm	60	80	100	120	140	160
Characteristic value	kN	7,90	10,53	13,16	15,79	18,42	21,05
Design value for k_{mod} = 0,9	kN	6,46	8,61	10,76	12,92	15,07	17,22

Load-bearing capacities of Uni 1 with eccentricities according to ISO-CONNECT Universal M16:

Version	Thickness of the insulation	Pressure screw Ø 8		Tension screw and lateral screws Ø8		Design load-bearing capacities					
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	k_{mod} = 0,9					
						40mm	60mm	80mm	100mm		
	t_D	l_c	$l_{ef,c}$	l_t	$l_{ef,t}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN	kN	kN
Insulation 60	60	180	75	220	100	11,46	8,76	7,09	5,96	29,79	29,79
Insulation 80	80	200	95	260	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 100	100	220	95	280	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 120	120	240	95	320	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 140	140	260	95	340	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 160	160	280	95	380	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 180	180	300	95	400	100	14,17	10,84	8,77	7,37	36,85	36,85
Insulation 200	200	320	95	400	82	12,59	10,84	8,77	7,37	36,85	36,85
Insulation 220	220	340	95	400	54	8,60	8,60	8,60	7,37	36,85	36,85

The values are only valid for carbon screws and the following composition: 15 mm ISO-CONNECT plate, 3 mm rubber panel, 5 mm plaster, thermal insulation.
If l_{ef} is greater than in the table, it is allowed to increase $F_{5/6,Rd}$ with the factor ($l_{ef,neu}/l_{ef}$).
The penetration length of the threaded part of the horizontal partially threaded screw must be at least the effective threaded length but maximum 5 mm longer.
For combined stresses in direction F_1 and F_4, the forces resulting from the acting forces must be assigned to the screws and summed up.

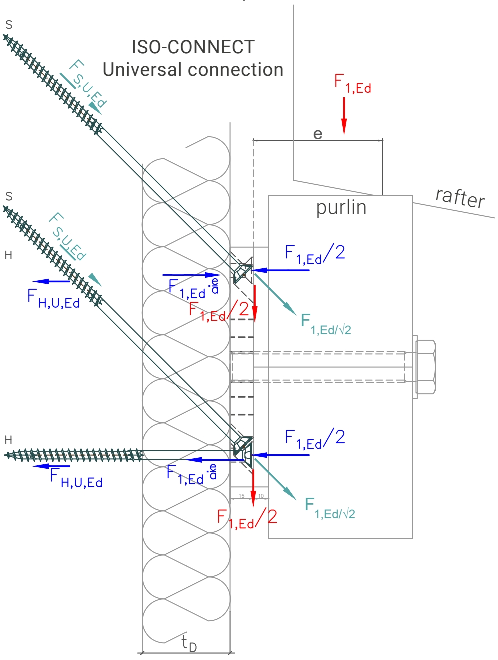
Stress on the screws depending on the acting loads

$F_{s,o,Ed}$: Stress on the upper inclined screws
$F_{H,o,Ed}$: Stress on the upper horizontal screws
$F_{s,u,Ed}$: Stress on the bottom inclined screw
$F_{H,u,Ed}$: Stress on the bottom horizontal screw

Calculation

The load distribution is similar to the HVP connection. The additional eccentricity has to be taken into account.

Direction F_1



Stress on the screws:

$$F_{S,O,Ed} = F_{S,U,Ed} = F_{1,Ed/\sqrt{2}}$$

(Tension)

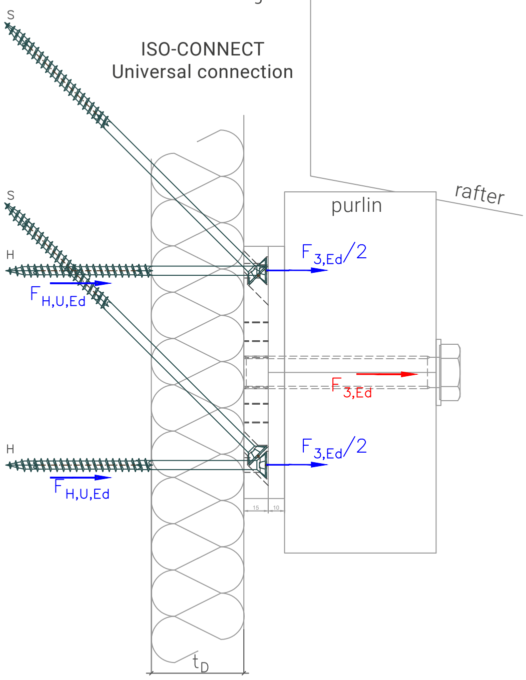
$$F_{H,O,Ed} = F_{1,Ed/2} - F_{1,Ed} \cdot \frac{e}{a}$$

(Compression)

$$F_{H,U,Ed} = F_{1,Ed/2} + F_{1,Ed} \cdot \frac{e}{a}$$

(Compression)

Direction F_3

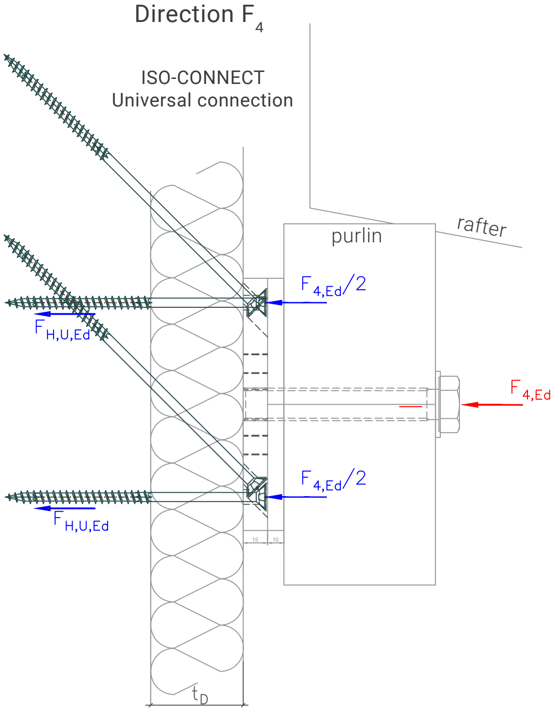


Stress on the screws:

$$F_{H,O,Ed} = F_{H,U,Ed} = F_{3,Ed}/2$$

(Tension)

Direction F_4



Stress on the screws:

$$F_{H,O,Ed} = F_{H,U,Ed} = F_{4,Ed}/2$$

(Compression)

Item no. 83300.0___

ISO-CONNECT Universal connection Uni 2

Dimensions connection plate: 120 x 155 x 15 mm
Oblique screws: 6 x Ø 8 mm
Horizontal screws: 8 x Ø 8 mm

Design values of the load-bearing capacity

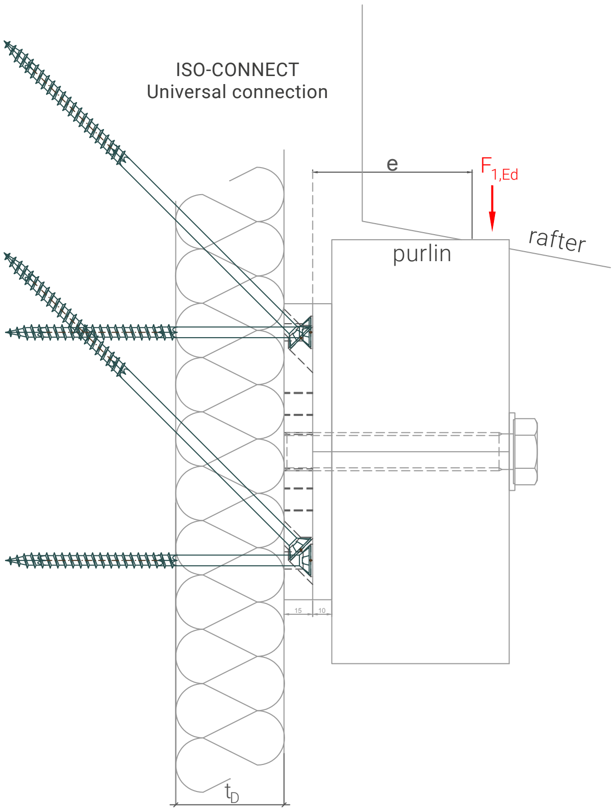
The tables are calculated according to the dimensioning concept on page 16.
The maximum capacity is defined with the bolt-timber connection.
The load-bearing capacity is calculated for different purlin dimensions.

Bearing capacity M20 bolt – external thick steel plate / wood connection							
Thickness of the purlin	mm	60	80	100	120	140	160
Characteristic value	kN	9,05	12,06	15,08	18,09	21,11	22,41
Design value for k_{mod} = 0,9	kN	7,40	9,87	12,33	14,80	17,27	18,33

Version	Thickness of the insulation	Horizontal screw Ø 8		Oblique and lateral screws Ø8		Design load-bearing capacities k_{mod} = 0,9						
		Nominal length	Threaded part in timber	Nominal length	Threaded part in timber	e = 40 mm	e = 60 mm	e = 80 mm	e = 100 mm	no influence of eccentricity		
	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{1,Rd}$	$F_{3,Rd}$	$F_{4,Rd}$	$F_{5/6,Rd}$
	mm	mm	mm	mm	mm	kN	kN	kN	kN	kN	kN	kN
Insulation 60	60	160	75	220	100	14,59	14,59	12,82	11,22	29,91	29,91	3,91
Insulation 80	80	180	75	260	100	15,62	14,62	12,82	11,22	29,91	29,91	3,92
Insulation 100	100	220	95	280	100	14,62	14,62	14,62	14,21	37,88	37,88	3,92
Insulation 120	120	240	95	320	100	14,62	14,62	14,62	14,21	37,88	37,88	3,92
Insulation 140	140	260	95	340	100	14,62	14,62	14,62	14,21	37,88	37,88	3,92
Insulation 160	160	280	95	380	100	14,62	14,62	14,62	14,21	37,88	37,88	3,92
Insulation 180	180	300	95	400	100	14,62	14,62	14,62	13,04	37,88	34,78	3,92
Insulation 200	200	320	95	400	82	11,96	11,96	11,96	11,07	37,88	29,52	3,20
Insulation 220	220	340	95	400	54	7,82	7,82	7,82	7,82	37,88	25,35	2,10

The values are only valid for carbon screws and the following composition: 15 mm ISO-CONNECT plate, 3 mm rubber panel, 5 mm plaster, thermal insulation.
If l_{ef} is greater than in the table, it is allowed to increase $F_{5/6,Rd}$ with the factor ($l_{ef,neu}/l_{ef}$).
The penetration length of the threaded part of the horizontal partially threaded screw must be at least the effective threaded length but maximum 5 mm longer.
For combined stresses in direction F_1 and F_4, the forces resulting from the acting forces must be assigned to the screws and summed up.

Calculation
The load distribution is similar to the HVP connection. The additional eccentricity has to be taken into account.



Proof purlin connection with universal connection Uni 2

Situation:
Installation of a 5 m wide canopy (projecting roof) on an existing building with a CLT-wall structure with a thickness of 100 mm and a thermal insulation of 140 mm. The rafters are supported on a purlin with 120/160 mm which is fixed with the universal connector to the facade.

Load assumptions:
Dead weight roof: g_k = 0,5 kN/m²
Snow load: s_k = 1,3 kN/m²

Stress on the connector:
$F_{1,Ed}$ = (1,35 * 0,5 + 1,5 * 1,3) * 5/2 = 6,56 kN/m

Bearing capacity of the connector, e = 80 mm:
Insulation 140: $F_{1,Rd}$ = 14,6 kN (standard)
Maximum load capacity due to bolts (see table): $F_{1,Rd,max}$ = 14,8 kN

Maximum spacing of the ISO-CONNECT: e = 14,6/6,56 = 2,23 m

A distance of 2.20 m is selected between the connectors.

Item no. 83400.0___

ISO-CONNECT Awning connection V1

Dimensions connection plate: 80 x 220 x 15 mm
Oblique screws: 2 x Ø 8 mm
Horizontal screws: 4 x Ø 8 mm

Item no. 83500.0___

ISO-CONNECT Awning connection Uni 1

Dimensions connection plate: 220 x 220 x 15 mm
Oblique screws: 2 x Ø 8 mm
Horizontal screws: 4 x Ø 8 mm

Design values of the load-bearing capacity
Dimensioning concept for the ISO-CONNECT V1 and Uni 1 awning connections
(applies accordingly to V2 and Uni 2: see page 28)

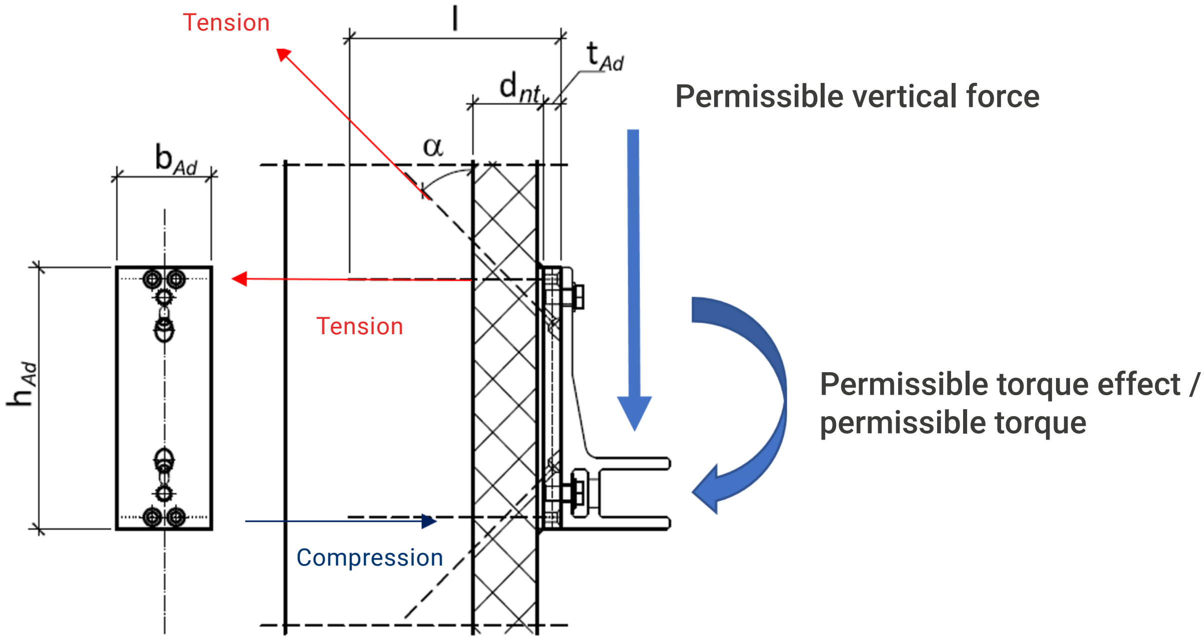
Loads apply to fischer wood construction screws *Power-Fast* made of carbon steel.

- Screw angle of the oblique screws 45°
- Service class 2
- Class of the load action duration (CLAD): short / very short (wind) --> k_{mod} = 1.0
- Partial safety factor of resistance material γ_m = 1.3 (or 1.1 against buckling)
- Partial safety factor of the effect $\gamma_{F,G}$ = 1.35 (permanent effects) / $\gamma_{F,Q}$ = 1.5 (variable effects)
- Timber frame made of coniferous wood >= C24
- Distance from the outer edge to the middle of the fabric shaft: T_m = 141 mm

Caution: This is merely a planning aid. The load-bearing capacities vary depending on the structure of the entire construction. Projects are to be dimensioned exclusively by structural engineers or structural designers.

	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	1,62	11,5
Insulation 80	80	200	100	200	55	0,75	1,62	11,5
Insulation 100	100	220	100	240	66	0,75	1,62	11,5
Insulation 120	120	240	100	260	57	0,75	1,62	11,5
Insulation 140	140	260	100	300	69	0,75	1,62	11,5
Insulation 160	160	280	100	320	61	0,75	1,45	10,2
Insulation 180	180	300	100	340	72	0,75	1,22	8,5
Insulation 200	200	320	100	380	64	0,75	1,05	7,2
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

The values are only valid for carbon screws and the following composition: 15 mm ISO-CONNECT plate, 3 mm rubber panel, 5 mm plaster, thermal insulation. The penetration length of the threaded part of the horizontal partially threaded screw must be at least the effective threaded length but maximum 5 mm longer.



Awnings place high demands on the fastener system, especially when installed on a non-pressure-resistant substrate. In addition to shear and tensile forces, a tilting moment on the system needs to be taken into account. Especially when the awning is extended, the tilting moment produces high tensile and compressive forces, which are diverted via the upper horizontal tension screws and the lower horizontal pressure screws.

The oblique screws pointing upwards bear the constant loads from the awning's own weight.

The screws that are fastened downwards at an angle transfer loads that may affect the awning, when exposed to wind, for example.

Basically, the creation of the load-bearing capacity values for the awning adapter is subject to some boundary conditions. Apart from the structure of the facade construction, in particular the thickness of the insulation layer, the distance between the fabric shaft and the adapter, for example, plays a major role, as this results in part of the permissible tilting moment. The exact details should therefore be taken into account in the design.

In the load capacity tables for the ISO-CONNECT awning adapters, a distance of 141 mm between the fabric shaft and the adapter was taken into account. If this value is exceeded, the load-bearing capacities are therefore reduced. The specified values are only intended as a planning aid. This should be taken into account if the values differ.

Item no. 83400.1___

ISO-CONNECT Awning connection V2

Dimensions connection plate: 80 x 220 x 15 mm
Oblique screws: 3 x Ø 8 mm
Horizontal screws: 3 x Ø 8 mm

Item no. 83500.1___

ISO-CONNECT Awning connection Uni 2

Dimensions connection plate: 220 x 220 x 15 mm
Oblique screws: 3 x Ø 8 mm
Horizontal screws: 3 x Ø 8 mm

Design values of the load-bearing capacity
Dimensioning concept for the ISO-CONNECT V2 and Uni 2 awning connections
(applies accordingly to V1 and Uni 1: see page 26)

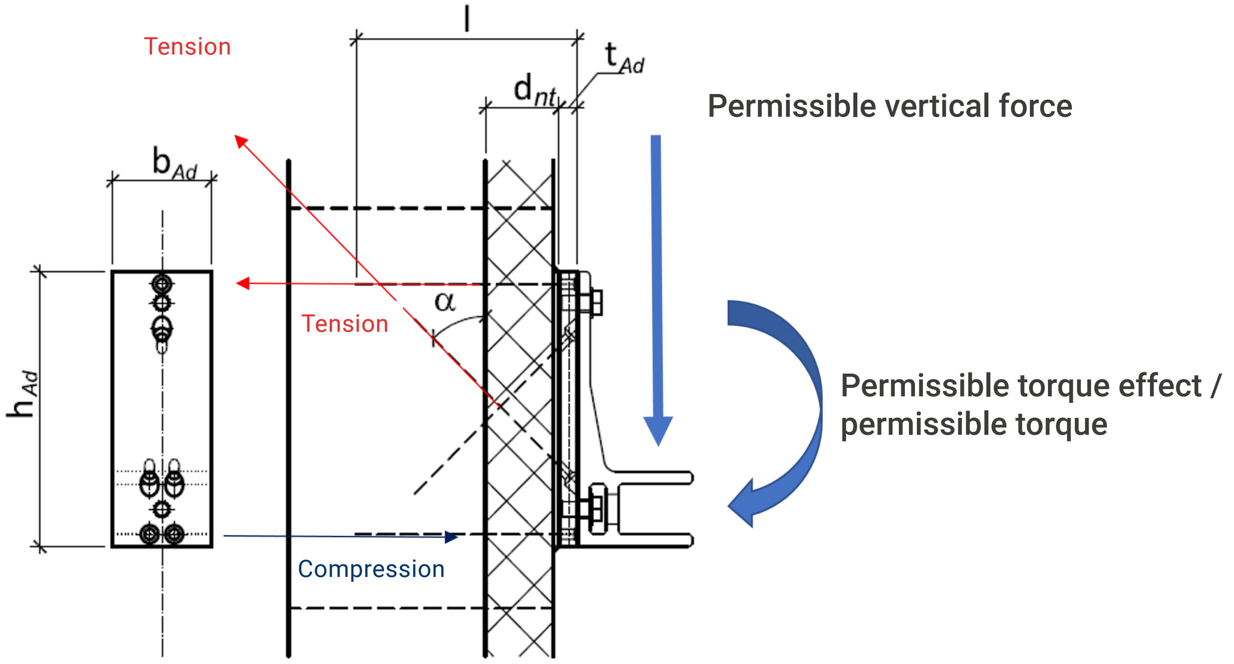
Loads apply to fischer wood construction screws *Power-Fast* made of carbon steel.

- Screw angle of the oblique screws 45°
- Service class 2
- Class of the load action duration (CLAD): short / very short (wind) --> k_{mod} = 1.0
- Partial safety factor of resistance material γ_m = 1.3 (or 1.1 against buckling)
- Partial safety factor of the effect $\gamma_{F,G}$ = 1.35 (permanent effects) / $\gamma_{F,Q}$ = 1.5 (variable effects)
- Timber frame made of coniferous wood >= C24
- Distance from the outer edge to the middle of the fabric shaft: T_m = 141 mm

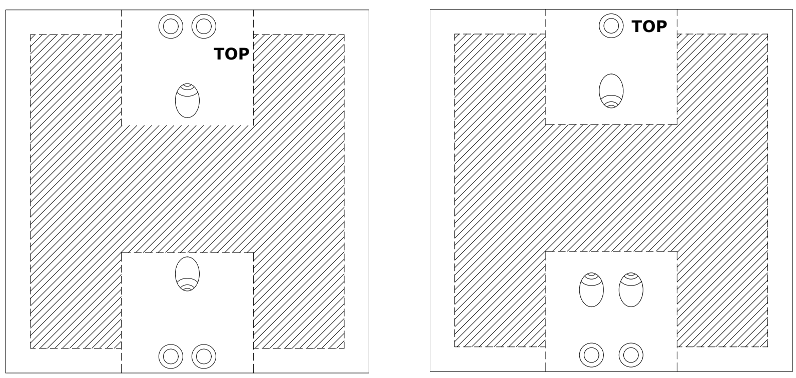
Caution: This is merely a planning aid. The load-bearing capacities vary depending on the structure of the entire construction. Projects are to be dimensioned exclusively by structural engineers or structural designers.

	t_D	l_h	$l_{ef,h}$	l_s	$l_{ef,s}$	Permissible shear load	Permissible tilting moment	Design load tension screws at the top
	mm	mm	mm	mm	mm	kN	kNm	kN
Insulation 60	60	200	100	180	62	0,75	0,92	6,2
Insulation 80	80	200	100	200	55	0,75	0,92	6,2
Insulation 100	100	220	100	240	66	0,75	0,92	6,2
Insulation 120	120	240	100	260	57	0,75	0,92	6,2
Insulation 140	140	260	100	300	69	0,75	0,92	6,2
Insulation 160	160	280	100	320	61	0,75	0,92	6,2
Insulation 180	180	300	100	340	72	0,75	0,92	6,2
Insulation 200	200	320	100	380	64	0,75	0,92	6,2
Insulation 220	220	340	100	400	56	0,75	0,92	6,2

The values are only valid for carbon screws and the following composition: 15 mm ISO-CONNECT plate, 3 mm rubber panel, 5 mm plaster, thermal insulation.
The penetration length of the threaded part of the horizontal partially threaded screw must be at least the effective threaded length but maximum 5 mm longer.



Both Uni 1 and Uni 2 adapter plates can be used for individual applications. For this purpose, there is the option of machining threaded holes according to customer requirements in the hatched areas. Based on the screw pattern already used for the V1 and V2 awning connectors, the same load-bearing capacities can be achieved.



Naturally, there is also the option of machining additional threaded holes onto the V1 and V2 awning connectors.

If you have any questions, please do not hesitate to contact our support team.

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