

2

02

CONCEALED CONNECTORS



CONCEALED CONNECTORS

(Invisible connectors)

TOP UV CONCEALED CONNECTORS

- Invisible dovetail connection
 - Safety catch
 - Optimised hole pattern
 - For loading in 4 load directions
 - Quick assembly of secondary beams
 - Conical dovetail guide pulls together
 - Milling radii
- up to 72 kN**



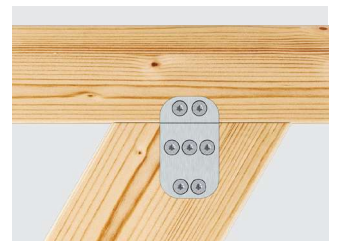
Basics of statics **from page 68** / Products & statics **from page 66**

CONCEALED CONNECTORS TOP OV

„Simple and ingenious“

More flexibility in connection technology

- **In the factory:** Simply mill out the connection form or attach and mount on the secondary beam with a maximum of 4 tensile and 2 pressure screws.
 - **On the building site:** Insert the secondary beam in the recess of the main beam or only place it down. Turn 2 pressure screws into the main beam/support.
- up to 27 kN**



Basics of statics **from page 84** / Products & statics **from page 82**

BEAM HANGER

- Connection to timber, concrete and masonry
 - Type alu combi without holes for rod dowels. By drilling through the secondary beam and connector, you receive a connection with a perfect fit.
 - Type alu SD 12 and SD 16 with assembly fix tab.
- up to 258 kN**



Basics of statics **from page 90** / Products & statics **from page 88**

INTEGRAL CONNECTORS

- GH integral connectors type M, 2- and 4-row with assembly fix tab for concealed connections with connections between the main/secondary beam and connections to the columns. For both versions, the secondary beam with pre-fitted rod dowel is suspended in the assembly fix tab.
 - 2-row integral connectors with embossed reinforcement studs. This gives you the necessary accuracy of fit and the same slot width as with a 4-row integral connector.
 - 4-row integral connections with even higher load-bearing capacities!
- up to 58 kN**



Basics of statics **from page 90** / Products & statics **from page 88**

CONCEALED CONNECTORS

2 ASSORTMENT

					Basics Statics & Diagrams from page	Products & Statics from page
TOP UV CONNECTORS TIMBER/TIMBER						65 66
TOP UVB CONNECTORS TIMBER/CONCRETE						65 / 68 78
TOP OV CONNECTORS						65 / 84 82
BEAM HANGER TYPE ALU COMBI					 	65 / 90 88
BEAM HANGER TYPE ALU COMBI SD 12					 	65 / 90 88
BEAM HANGER TYPE ALU COMBI SD 16					 	65 / 90 88
INTEGRAL CONNECTOR 2-ROW TYPE M						65 / 90 88
INTEGRAL CONNECTOR 4-ROW TYPE M						65 / 90 88
INTEGRAL CONNECTOR ANGLED CONNECTION						102



CE symbol



Steel with indication of the steel quality and galvanisation



Aluminium



Timber/timber connection



Timber/concrete-connection

**Usage class 1**

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated. Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.

**Usage class 2**

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof. Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.

**Usage class 3**

Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

INTEGRAL CONNECTORS/BEAM HANGERS

2 TECHNICAL FEATURES

Geometry

H	Height (mm)
D(T)	Depth (mm)
W(B)	Width (mm)
T(S)	Material thickness (mm)

Tables

HT	Main beam
H _{NT}	Minimum height of secondary beam
NT	Secondary beam
B _{NT}	Minimum width of secondary beam
n _{HT}	Number of holes in main beam
n _{NT}	Number of holes in secondary beam
n _a	Number of connecting elements
n _{o Ø}	Number of connecting elements with Ø
L _s	Length of self-drilling rod dowels

Timber connecting element

Ø [mm]	Diameter of connecting element
L [mm]	Length of connecting element
	Grain direction of component

Connecting element concrete/ steel

Bo	Dowel/bolt
----	------------

Force directions

F _{2,Rk} ↓	Force in insertion direction (main load)
F _{1,Rk} ↑	Force against insertion direction (lifting load)



Aluminium



Steel with indication of the steel quality and galvanisation



Timber/timber connection



Timber/concrete connection



Usage class 1

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 65% for a few weeks per year, e.g. in the case of buildings that are closed on all sides and heated. Comment: In UC 1, the average moisture content of most softwoods does not exceed 12 %.



Usage class 2

Moisture content in the building materials that corresponds to a temperature of 20° C and a relative humidity of the ambient air that only exceeds a value of 85% for a few weeks per year, e.g. in the case of open buildings covered by a roof. Comment: In UC 2, the average moisture content of most softwoods does not exceed 20 %.

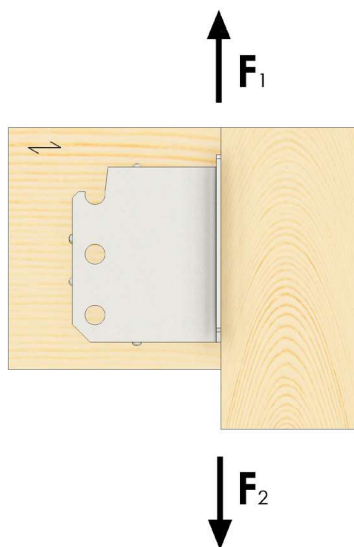


Usage class 3

Includes climatic conditions that lead to higher moisture contents than in UC 2, e.g. structures that are exposed to the weather without protection. Eurocode 5 / DIN EN 1995-1-1 section 2.3.1.3

INTEGRAL CONNECTORS/BEAM HANGERS

2 LOAD DIRECTIONS

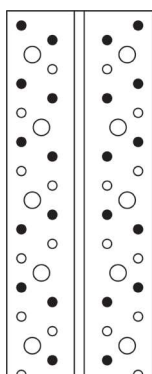


Timber/timber connection

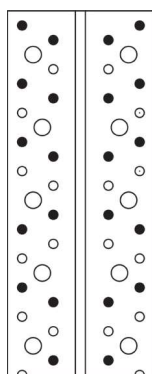
Partial and full nail fitting or partial and full screw fitting

Nail patterns

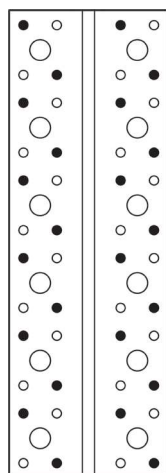
Beam hanger
Alu Combi



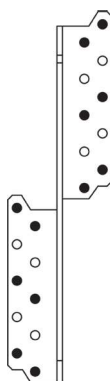
Beam hanger
Alu Combi SD



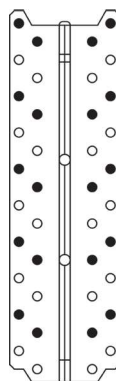
Beam hanger
Alu Combi Maxi SD



Integral connectors
2-row



Integral connectors
4-row



Connection over intermediate layers

The characteristic load capacities for the connection indicated in the tables also apply to an intermediate layer.

The following conditions must be met:

The intermediate layer must be connected to the timber component without being able to be moved.

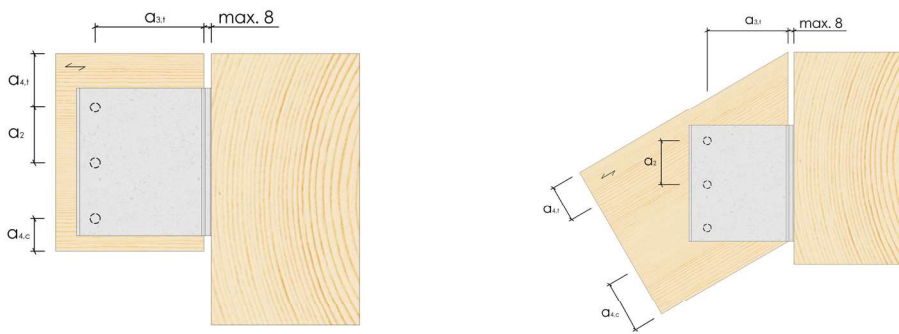
The integration depth of the connecting element in the timber component must be the same or greater.

For this, a correspondingly long connecting element must be used.

The characteristic perforation strength $f_{h,k}$ of the connecting element in the intermediate layer must be the same or greater.

INTEGRAL CONNECTORS/BEAM HANGERS

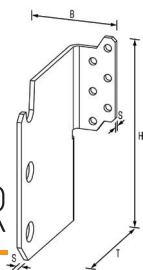
MINIMUM AND EDGE SPACING 2



			Rod dowels Ø 12 mm
a_2	Right angle to the grain direction	$3d$	36 mm
$a_{3,t}$	End grain with stress	$\max (7d; 80 \text{ mm})$	84 mm
$a_{4,t}$	Loaded edge	$\max [(2+2\sin\alpha) d; 3d]$	48 mm
$a_{4,c}$	Unloaded edge	$3d$	36 mm

Connection to masonry, concrete or steel

Proof of the dowel's load-bearing capacity must be provided separately in accordance with the manufacturer's specifications.



ETA-10
0009



INTEGRAL CONNECTOR

2-ROW TYPE M (ASSEMBLY FIX TAB)

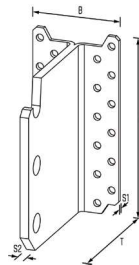
Art. No.	Type	Dimensions [mm]							nH	nBo	EAN	Weight	Pallet	PU		
		H	x	W(B)	x	D(T)	x	T(S)	Ø 5	Ø 13	4019346	kg				
30200	MO	84	x	60	x	98	x	3,0 / 6,0	8	2	105061	0.195	1200	25	■	
30201	MI	124	x	60	x	98	x	3,0 / 6,0	12	3	105078	0.295	900	25	■	
30202	MII	164	x	60	x	98	x	3,0 / 6,0	16	4	105085	0.395	1000	25	■	
30203	MIII	204	x	60	x	98	x	3,0 / 6,0	20	5	105092	0.495	600	25	■	
30204	MIII	244	x	60	x	98	x	3,0 / 6,0	24	6	105108	0.595	600	25	■	

Slot width in secondary beam: 6.0 mm



2-ROW TYPE M (ASSEMBLY FIX TAB) 2

Timber / Timber																	
Art. No.	Dimensions [mm]				Secondary beam			Main beam									
	H	W(B)	D(T)	T(S)	H _{NT}	B _{NT}	n _{a,012}	n _a	4.0x60	F2,rk	F1,rk						
30200	84	60	98	3,0	108	60	2	8	Full	6,17	2,73						
							2	4	Partial	2,93	1,15						
						80	2	8	Full	6,38	2,73						
							2	4	Partial	3,03	1,15						
						100	2	8	Full	6,83	2,73						
							2	4	Partial	3,24	1,15						
						120	2	8	Full	7,44	2,73						
							2	4	Partial	3,53	1,15						
						30201	124	60	98	3,0	144	60	3	12	Full	12,14	8,06
													3	8	Partial	10,05	6,80
80	3	12	Full	12,54	8,32												
	3	8	Partial	10,38	7,03												
100	3	12	Full	13,44	8,92												
	3	8	Partial	11,12	7,53												
120	3	12	Full	14,63	9,71												
	3	8	Partial	12,11	8,20												
30202	164	60	98	3,0	180							60	4	16	Full	19,36	15,17
													4	8	Partial	13,78	10,57
						80	4	16	Full	20,00	15,67						
							4	8	Partial	13,78	10,92						
						100	4	16	Full	21,43	16,80						
							4	8	Partial	13,78	11,70						
						120	4	16	Full	22,47	18,29						
							4	8	Partial	13,78	12,56						
						30203	204	60	98	3,0	216	60	5	20	Full	26,06	23,65
													5	12	Partial	20,66	16,22
80	5	20	Full	26,92	24,43												
	5	12	Partial	20,66	16,76												
100	5	20	Full	28,84	25,77												
	5	12	Partial	20,66	17,96												
120	5	20	Full	31,41	25,77												
	5	12	Partial	20,66	19,55												
30204	244	60	98	3,0	252							60	6	24	Full	34,85	33,07
													6	12	Partial	20,66	20,66
						80	6	24	Full	36,00	33,35						
							6	12	Partial	20,66	20,66						
						100	6	24	Full	38,57	33,35						
							6	12	Partial	20,66	20,66						
						120	6	24	Full	38,77	33,35						
							6	12	Partial	20,66	20,66						



INTEGRAL FASTENER

2 4-ROW TYPE M (ASSEMBLY FIX TAB)

Art. No.	Type	Dimensions [mm]									nH	nBo	EAN	Weight	Pallet	PU		
		H	x	W(B)	x	D(T)	x	T1(S1)	x	T2(S2)	Ø 5	Ø 13	4019346	kg				
302004	M0-4	84	x	60	x	98	x	3	x	6	16	2	479704	0.390	1000	25	■	
302014	MI-4	124	x	60	x	98	x	3	x	6	24	3	479711	0.590	1000	25	■	
302024	MII-4	164	x	60	x	98	x	3	x	6	32	4	479728	0.790	1000	25	■	
302034	MIII-4	204	x	60	x	98	x	3	x	6	40	5	479735	0.990	600	25	■	
302044	MIIII-4	244	x	60	x	98	x	3	x	6	48	6	479742	1.190	600	25	■	

Slot width in secondary beam: 6.0 mm



TOOLS

INTEGRAL CONNECTOR DRILLING TEMPLATE



Art. No.	EAN	Weight	PU
	4019346	kg	
33000120	000731	2.100	1

4-ROW TYPE M (ASSEMBLY FIX TAB) 2

Timber / Timber											
Art. No.	Dimensions [mm]				Secondary beam			Main beam			
	H	W(B)	D(T)	T(S)	H _{NT}	B _{NT}	n _{a,812}	n _a	4.0x60	F2,rk	F1,rk
302004	84	60	98	6,0	108	60	2	16	Full	9,00	5,28
							2	8	Partial	6,70	1,57
						80	2	16	Full	9,30	5,28
							2	8	Partial	6,92	1,57
						100	2	16	Full	9,45	5,28
							2	8	Partial	7,41	1,57
						120	2	16	Full	9,45	5,28
							2	8	Partial	8,07	1,57
302014	124	60	98	6,0	144	60	3	24	Full	16,43	13,92
							3	12	Partial	12,98	7,32
						80	3	24	Full	16,97	14,38
							3	12	Partial	13,40	7,57
						100	3	24	Full	18,19	15,16
							3	12	Partial	14,36	8,11
						120	3	24	Full	19,80	15,16
							3	12	Partial	15,27	8,83
302024	164	60	98	6,0	180	60	4	32	Full	27,31	23,75
							4	16	Partial	19,36	12,98
						80	4	32	Full	28,21	24,54
							4	16	Partial	20,00	13,40
						100	4	32	Full	30,23	26,19
							4	16	Partial	21,43	14,36
						120	4	32	Full	31,81	26,19
							4	16	Partial	23,34	15,64
302034	204	60	98	6,0	216	60	5	40	Full	39,76	36,31
							5	20	Partial	26,06	20,61
						80	5	40	Full	41,08	36,99
							5	20	Partial	26,92	21,30
						100	5	40	Full	43,50	36,99
							5	20	Partial	28,84	22,82
						120	5	40	Full	43,50	36,99
							5	20	Partial	31,41	24,85
302044	244	60	98	6,0	252	60	6	48	Full	50,33	46,77
							6	24	Partial	33,17	29,30
						80	6	48	Full	52,00	48,32
							6	24	Partial	34,27	30,27
						100	6	48	Full	55,72	50,52
							6	24	Partial	36,72	32,44
						120	6	48	Full	58,07	50,52
							6	24	Partial	39,99	34,86



INTEGRAL CONNECTOR

2 TYPE M FOR ANGLED CONNECTION FROM 30° - 90°



Art. No.	Type	Dimensions [mm]							nH	nBo	EAN	Weight kg	PU		
		H	x	W(B)	x	D(T)	x	T(S)							
30200R	O-R	84	x	30	x	98	x	3,0 / 6,0	8	2	105306	0.195	1	■	
30200L	O-L	84	x	30	x	98	x	3,0 / 6,0	8	2	595053	0.195	1	■	
30201R	I-R	124	x	30	x	98	x	3,0 / 6,0	12	3	105320	0.295	1	■	
30201L	I-L	124	x	30	x	98	x	3,0 / 6,0	12	3	595060	0.295	1	■	
30202R	II-R	164	x	30	x	98	x	3,0 / 6,0	16	4	105344	0.395	1	■	
30202L	II-R	164	x	30	x	98	x	3,0 / 6,0	16	4	595077	0.395	1	■	
30203R	III-R	204	x	30	x	98	x	3,0 / 6,0	20	5	105368	0.495	1	■	
30203L	III-R	204	x	30	x	98	x	3,0 / 6,0	20	5	595084	0.495	1	■	
30204R	IIII-R	244	x	30	x	98	x	3,0 / 6,0	24	6	105382	0.595	1	■	
30204L	IIII-L	244	x	30	x	98	x	3,0 / 6,0	24	6	595091	0.595	1	■	

Slot width in secondary beam: 6.0 mm

Set up costs per degree and attachment direction

30210	Set up costs	105405	1
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Angled connections left/right of 30° - 90° are available

