

CONCEALED HOOK TIMBER-TO-TIMBER CONNECTOR

PRACTICAL

Easy and quick to install, it can be fastened with a single type of screw. Joint that can be easily disassembled, ideal for the construction of temporary structures.

SLENDER STRUCTURES

It can also be used concealed with wooden elements having small cross-section. Ideal for structures, gazebos and furnishings.

VERSATILE

It provides excellent assembly tolerance. It can be integrated with side locking plates and vertical anti-slip screw.



CHARACTERISTICS

FOCUS	joints that can be disassembled
TIMBER SECTIONS	from 35 x 80 mm to 200 x 440 mm
STRENGTH	$R_{v,k}$ up to 65 kN
FASTENERS	LBS

VIDEO

Scan the QR Code and watch the video on our YouTube channel



MATERIAL

Aluminium alloy three dimensional perforated plate.

FIELDS OF USE

Timber-to-timber shear joint

- solid timber and glulam
- CLT, LVL



AESTHETICS

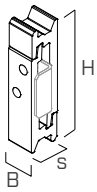
Completely concealed joint; satisfies fire safety requirements. Thanks to the assembly with only one type of screw, installation is quick and easy.

CLT FLOORS

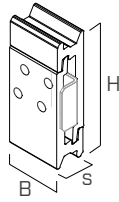
The rod version is specially designed for fastening CLT panel floors. Innovative joint with exceptional strength values.

CODES AND DIMENSIONS

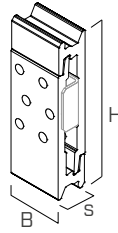
LOCK T Ø5



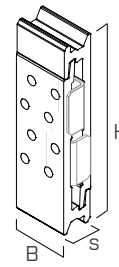
LOCKT1880



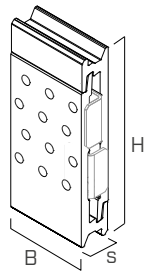
LOCKT3580



LOCKT35100



LOCKT35120



LOCKT53120

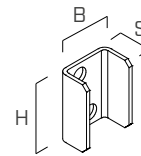
CODE	B [mm]	H [mm]	s [mm]	n _{screws} - Ø	n _{LOCKSTOP} - type	pcs *
LOCKT1880	17,5	80	20	4-Ø5	1 LOCKSTOP5U	50
LOCKT3580	35	80	20	8-Ø5	2 LOCKSTOP5	50
LOCKT35100	35	100	20	12-Ø5	2 LOCKSTOP5	50
LOCKT35120	35	120	20	16-Ø5	4 LOCKSTOP5	25
LOCKT53120	52,5	120	20	24-Ø5	4 LOCKSTOP5	25

Screws and LOCK STOP not included in the package.

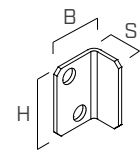
* number of connector pairs

LOCK STOP Ø5

CODE	B [mm]	H [mm]	s [mm]	pcs
LOCKSTOP5U	21,5	27,5	13	50
LOCKSTOP5	19	27,5	13	100



LOCKSTOP5U



LOCKSTOP5

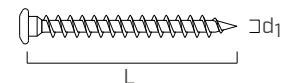
LOCKSTOP5U for use with LOCKT1880.

LOCKSTOP5 for use with other models.

The use of LOCK STOP is optional and does not affect structural performance.

LBS

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
LBS550	5	50	46	TX20	200
LBS570	5	70	66	TX20	200



MATERIAL AND DURABILITY

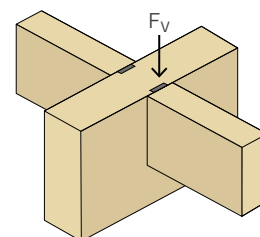
LOCK T: EN AW-6005A aluminium alloy

To be used in service classes 1 and 2 (EN 1995-1-1).

FIELD OF USE

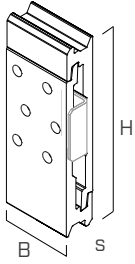
- Timber-to-timber joints between solid timber, glulam, LVL and CLT structural elements

EXTERNAL LOADS

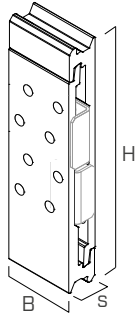


CODES AND DIMENSIONS

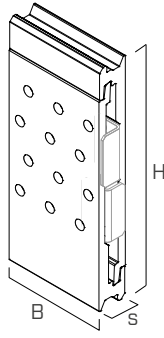
LOCK T Ø7



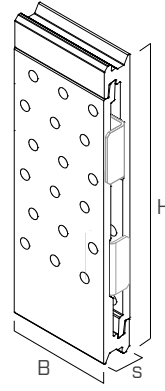
LOCKT50135



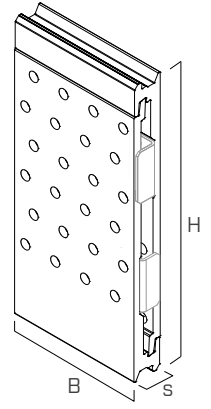
LOCKT50175



LOCKT75175



LOCKT75215



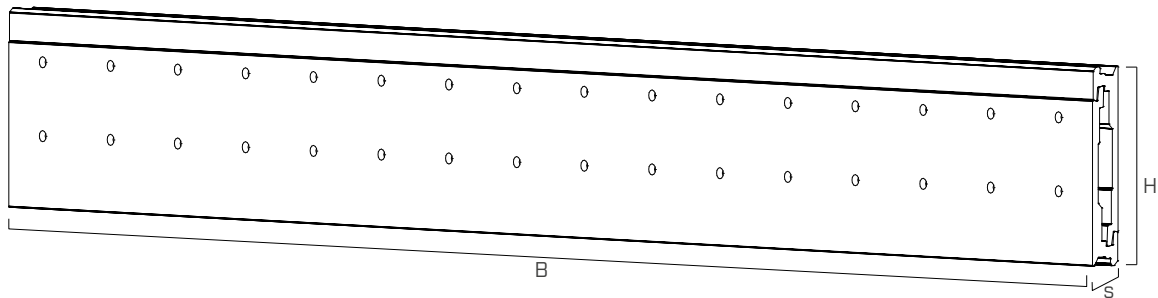
LOCKT100215

CODE	B [mm]	H [mm]	s [mm]	n _{screws} - Ø	n _{LOCKSTOP} - type	pcs*
LOCKT50135	50	135	22	12-Ø7	2 LOCKSTOP7	25
LOCKT50175	50	175	22	16-Ø7	4 LOCKSTOP7	18
LOCKT75175	75	175	22	24-Ø7	4 LOCKSTOP7	12
LOCKT75215	75	215	22	36-Ø7	4 LOCKSTOP7	12
LOCKT100215	100	215	22	48-Ø7	4 LOCKSTOP7	8

Screws and LOCK STOP not included in the package.

* number of connector pairs

LOCK T FLOOR Ø7



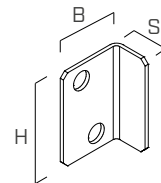
CODE	B [mm]	H [mm]	s [mm]	n _{screws} - Ø	pcs*
LOCKTFLOOR135	1200	135	22	64-Ø7	1

Screws not included in the box.

* number of connector pairs

LOCK STOP Ø7

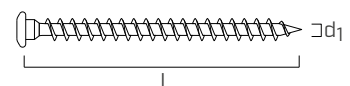
CODE	B [mm]	H [mm]	s [mm]	pcs
LOCKSTOP7	26,5	38	15	50

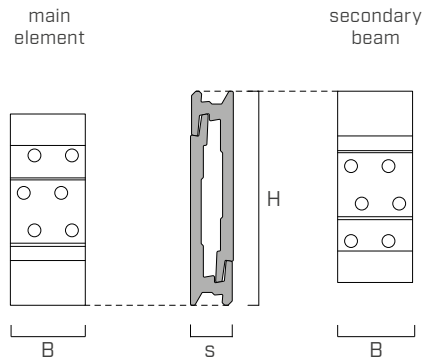


The use of LOCK STOP is optional and does not affect structural performance.

LBS

CODE	d ₁ [mm]	L [mm]	b [mm]	TX	pcs
LBS780	7	80	75	TX30	100





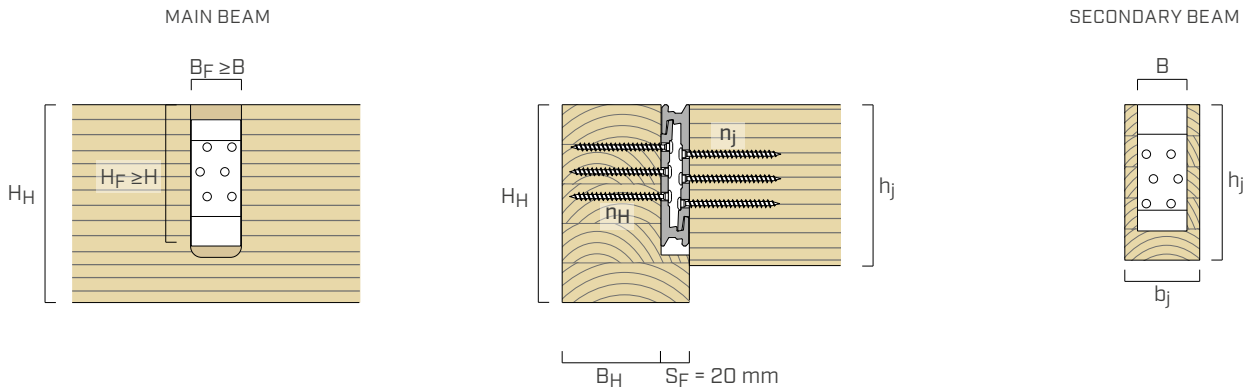
SINGLE CONNECTOR

LOCK T CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	LBS $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{j,min} \times h_{j,min}$ [mm]	
			$B_{S,min} \times H_{S,min}$ [mm] with pre-drilling hole	$B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKT1880	17,5 x 80 x 20	2+2 - Ø5x50 2+2 - Ø5x70	35 x 50 35 x 70	50 x 95 70 x 95	35 x 80	43 x 80
LOCKT3580	35 x 80 x 20	4+4 - Ø5x50 4+4 - Ø5x70	53 x 50 53 x 70	50 x 95 70 x 95	53 x 80	61 x 80
LOCKT35100	35 x 100 x 20	6+6 - Ø5x50 6+6 - Ø5x70	53 x 50 53 x 70	50 x 115 70 x 115	53 x 100	61 x 100
LOCKT35120	35 x 120 x 20	8+8 - Ø5x50 8+8 - Ø5x70	53 x 50 53 x 70	50 x 135 70 x 135	53 x 120	61 x 120
LOCKT53120	52,5 x 120 x 20	12+12 - Ø5x50 12+12 - Ø5x70	70 x 50 70 x 70	50 x 135 70 x 135	70 x 120	78 x 120

COUPLED CONNECTORS

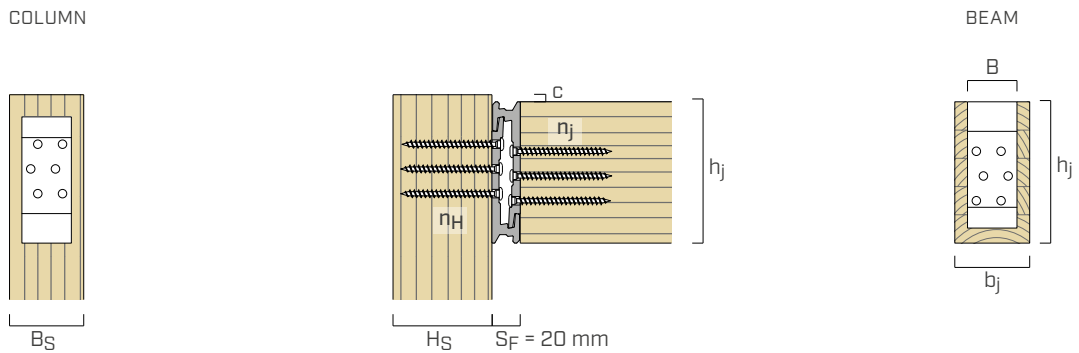
LOCK T CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	LBS $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{j,min} \times h_{j,min}$ [mm]	
			$B_{S,min} \times H_{S,min}$ [mm] with pre-drilling hole	$B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKT 35100 + 35100	70 x 100 x 20	12+12 - Ø5 x 50 12+12 - Ø5 x 70	88 x 50 88 x 70	50 x 115 70 x 115	88 x 100	96 x 100
LOCKT 35120 + 35120	70 x 120 x 20	16+16 - Ø5 x 50 16+16 - Ø5 x 70	88 x 50 88 x 70	50 x 135 70 x 135	88 x 120	96 x 120
LOCKT 35120 + 53120	87,5 x 120 x 20	20+20 - Ø5 x 50 20+20 - Ø5 x 70	105 x 50 105 x 70	50 x 135 70 x 135	105 x 120	113 x 120

INSTALLATION ON BEAM | LOCK T Ø5



The H_F dimension refers to the minimum height of the grooving at constant width. The rounded part must be taken into account when grooving.

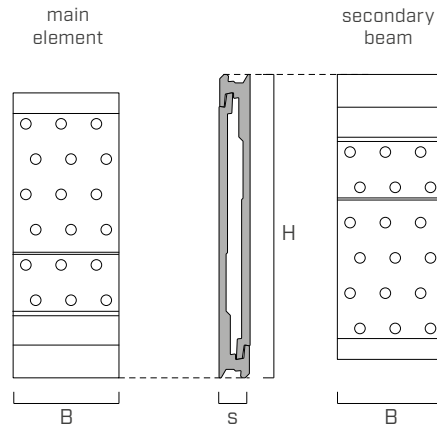
INSTALLATION ON COLUMN | LOCK T Ø5



CONNECTOR POSITIONING | LOCK T Ø5

connector	c_{min} [mm]
LOCKT1880	7,5
LOCKT3580	7,5
LOCKT35100	5,0
LOCKT35120	2,5
LOCKT53120	2,5

For installation on column, respecting the minimum distance of the screw from the unloaded end of the column, requires to lower the connector by a quantity c , compared to the end of the column. This can be achieved either by raising the column with respect to the top of the beam (as in the image) or by lowering the connector with respect to the top of the beam by a c amount.



SINGLE CONNECTOR

LOCK T CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	LBS $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{j,min} \times h_{j,min}$ [mm]	
			$B_{s,min} \times H_{s,min}$ [mm] with pre-drilling hole	$B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKT50135	50 x 135 x 22	6+6 - Ø7x80	74 x 80	80 x 155	74 x 135	80 x 140 ⁽¹⁾
LOCKT50175	50 x 175 x 22	8+8 - Ø7x80	74 x 80	80 x 190	74 x 175	80 x 175
LOCKT75175	75 x 175 x 22	12+12 - Ø7x80	99 x 80	80 x 190	99 x 175	105 x 175
LOCKT75215	75 x 215 x 22	18+18 - Ø7x80	99 x 80	80 x 230	99 x 175	105 x 215
LOCKT100215	100 x 215 x 22	24+24 - Ø7x80	124 x 80	80 x 230	124 x 215	130 x 215

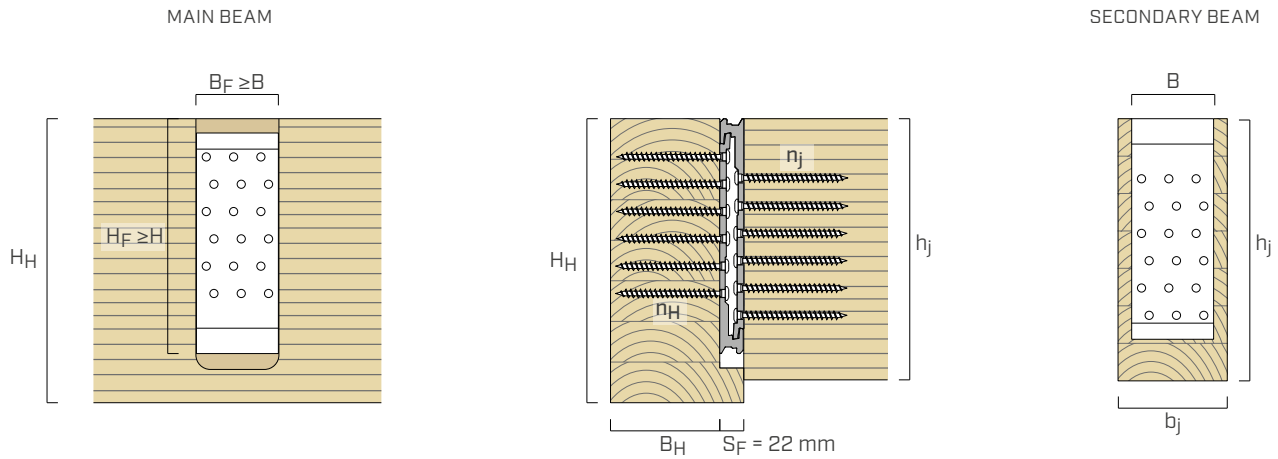
COUPLED CONNECTORS

LOCK T CONNECTOR		SCREWS	MAIN ELEMENT		SECONDARY BEAM	
type	B x H x s [mm]	LBS $n_H+n_j - \varnothing \times L$ [mm]	column	beam	$b_{j,min} \times h_{j,min}$ [mm]	
			$B_{s,min} \times H_{s,min}$ [mm] with pre-drilling hole	$B_{H,min} \times H_{H,min}$ [mm] without pre-drilling hole	with pre-drilling hole	without pre-drilling hole
LOCKT 50135 + 50135	100 x 135 x 22	12+12 - Ø7x80	124 x 80	80 x 155	124 x 135	130 x 140 ⁽¹⁾
LOCKT 50175 + 50175	100 x 175 x 22	16+16 - Ø7x80	124 x 80	80 x 190	124 x 175	130 x 175
LOCKT 50175 + 75175	125 x 175 x 22	20+20 - Ø7x80	149 x 80	80 x 190	149 x 175	155 x 175
LOCKT 75215 + 75215	150 x 215 x 22	36+36 - Ø7x80	174 x 80	80 x 230	174 x 215	180 x 215
LOCKT 75215 + 100215	175 x 215 x 22	42+42 - Ø7x80	199 x 80	80 x 230	199 x 215	205 x 215

NOTES:

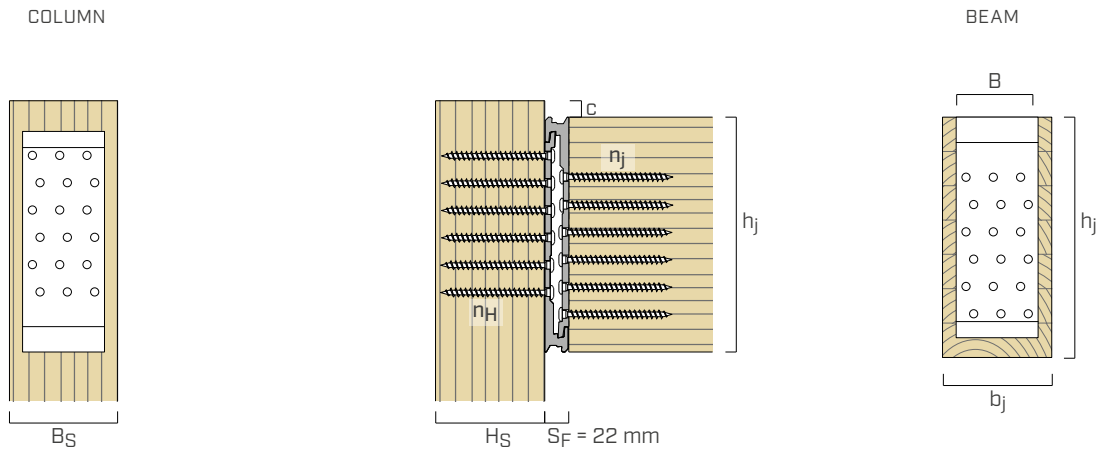
⁽¹⁾ In case of installation without pre-drilling hole, the LOCKT50135 connector must be installed 5 mm lower than the upper wire of the secondary beam, in order to respect the minimum distances of the screws.

INSTALLATION ON BEAM | LOCK T Ø7



The H_F dimension refers to the minimum height of the grooving at constant width. The rounded part must be taken into account when grooving.

INSTALLATION ON COLUMN | LOCK T Ø7

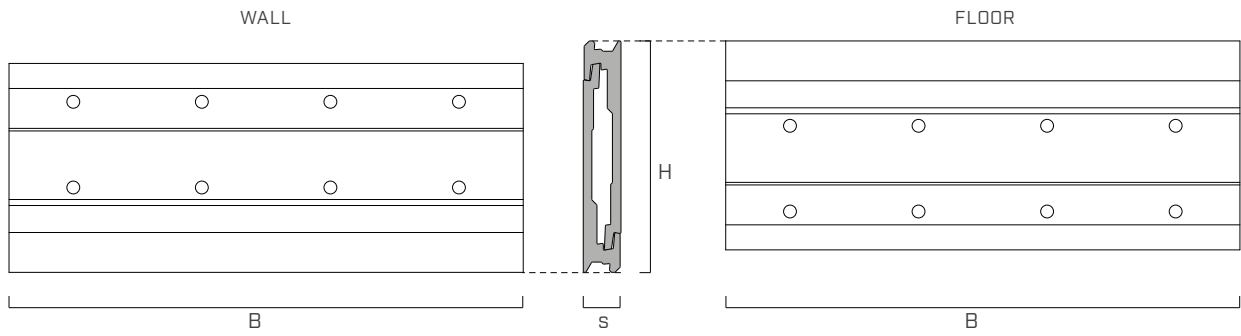


CONNECTOR POSITIONING | LOCK T Ø7

connector	c_{min} [mm]
LOCKT50135	15
LOCKT50175	5
LOCKT75175	5
LOCKT75215	15
LOCKT100215	15

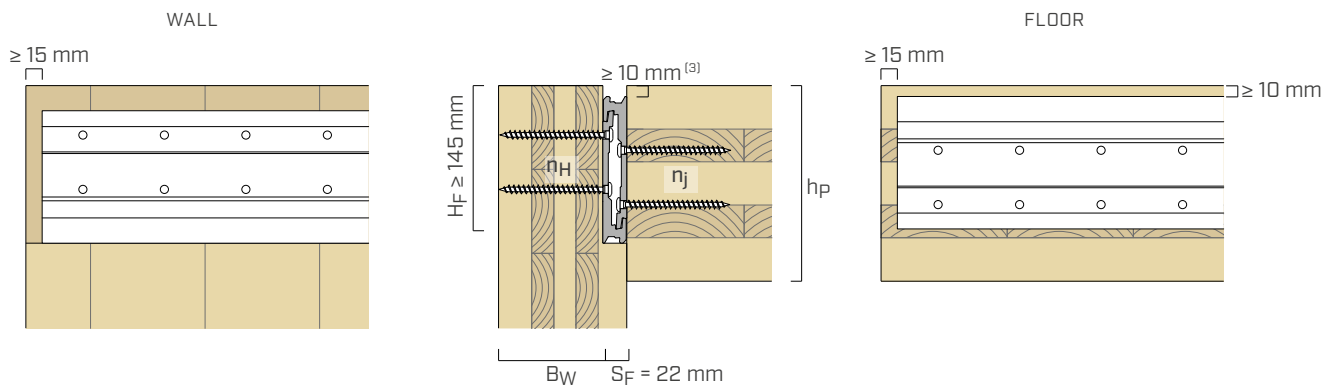
For installation on column, respecting the minimum distance of the screw from the unloaded end of the column, requires to lower the connector by a quantity c , compared to the end of the column. This can be achieved either by raising the column with respect to the top of the beam (as in the image) or by lowering the connector with respect to the top of the beam by a c amount.

GEOMETRY | LOCK T FLOOR

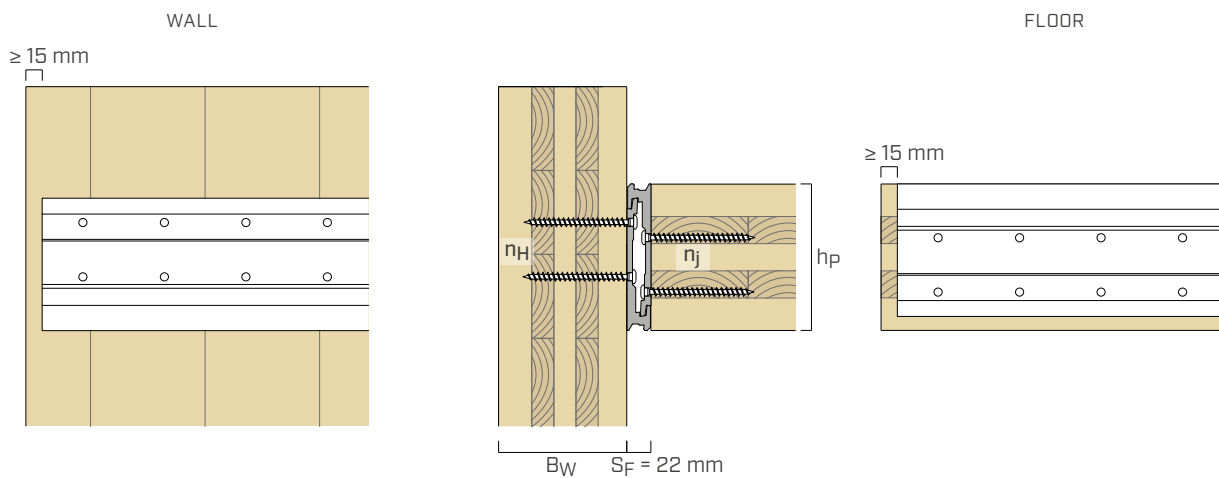


CONNECTOR LOCK T FLOOR			SCREWS	WALL	FLOOR
type	no. of modules ⁽²⁾	B x H x s [mm]	LBS $n_H+n_J - \varnothing \times L$ [mm]	$B_{W,min}$ [mm]	$h_{p,min}$ [mm]
LOCKTFLOOR135	1	300x135x22	8+8 - $\varnothing 7 \times 80$	80	135 ⁽³⁾
LOCKTFLOOR135	2	600x135x22	16+16 - $\varnothing 7 \times 80$		
LOCKTFLOOR135	3	900x135x22	24+24 - $\varnothing 7 \times 80$		
LOCKTFLOOR135	4	1200x135x22	32+32 - $\varnothing 7 \times 80$		

CONCEALED INSTALLATION | LOCK T FLOOR



EXPOSED INSTALLATION | LOCK T INSTALLATION



NOTES:

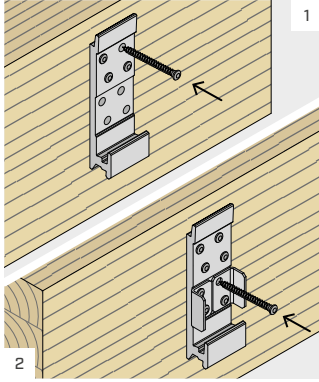
⁽²⁾ The connector with 1200 mm length can be cut into modules with 300 mm width.

⁽³⁾ In case of installation with the floor aligned with the top wire of the wall, the connector should be installed 10 mm from the top edge of the CLT floor. This allows the minimum distance between the screws in the wall with respect to the top of the panel. In this case, the minimum thickness of the h_p floor is 145 mm.

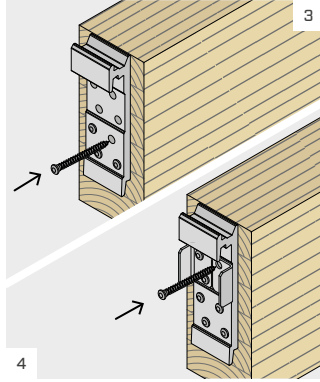
INSTALLATION



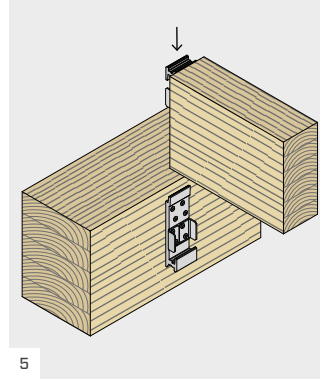
EXPOSED INSTALLATION WITH LOCK STOP



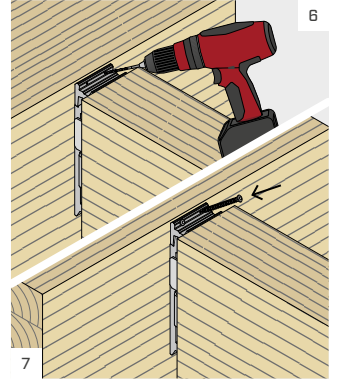
Place the connector on the main element and fasten the first screws. When using LOCK STOP (optional) position LOCK STOP and fasten the remaining screws.



Place the connector on the secondary beam and fasten the first screws. When using LOCK STOP (optional) position LOCK STOP and fasten the remaining screws.

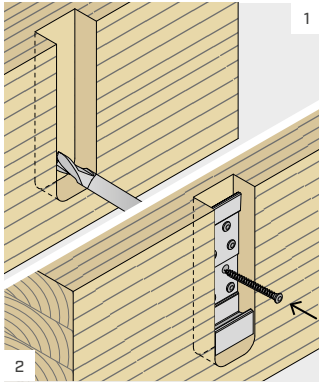


Hook the secondary beam fitting it from the top to the bottom.

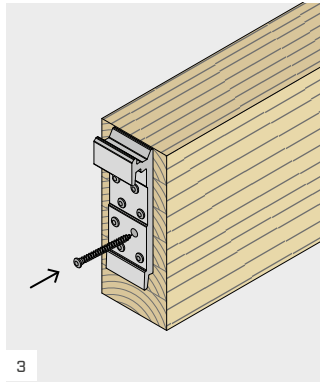


It is possible to insert anti-slip screws without structural function, by drilling one hole $\varnothing 5$ inclined at 45° in the upper part of the connector. A $\varnothing 5$ screw must be inserted in the hole.

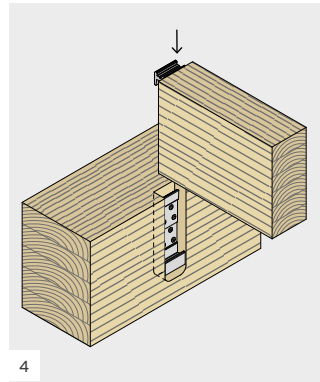
CONCEALED INSTALLATION



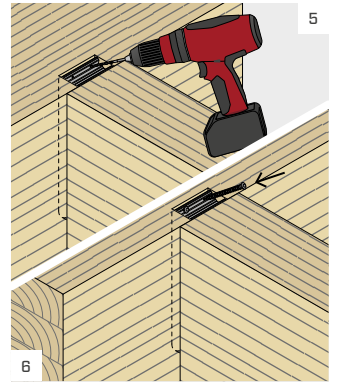
Carry out the grooving on the main element. Place the connector on the main element and fasten all screws.



Place the connector on the secondary beam and fasten all screws.

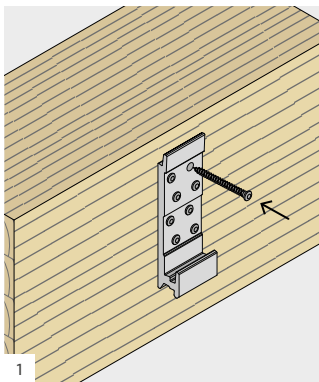


Hook the secondary beam fitting it from the top to the bottom.

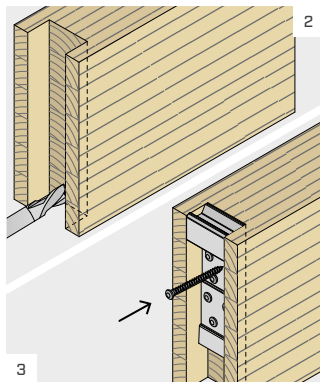


It is possible to insert anti-slip screws without structural function, by drilling one or more holes $\varnothing 5$ inclined at 45° in the upper part of the connector. A $\varnothing 5$ screw must be inserted in the holes.

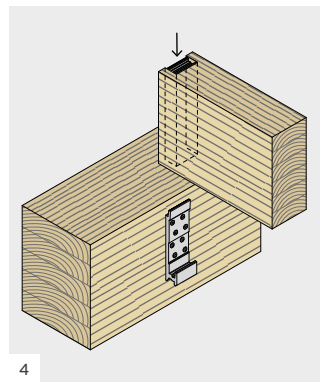
SEMI-CONCEALED INSTALLATION



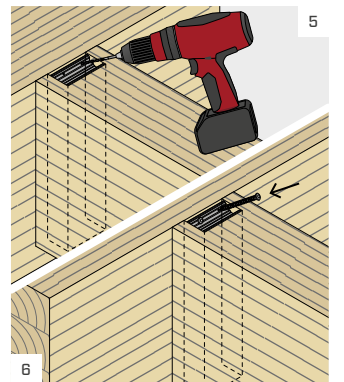
Place the connector on the main element and fasten all screws.



Perform full grooving on the secondary beam. Position the connector and fasten all screws.



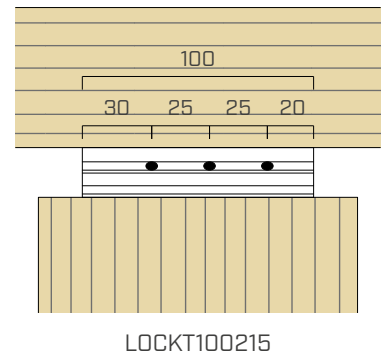
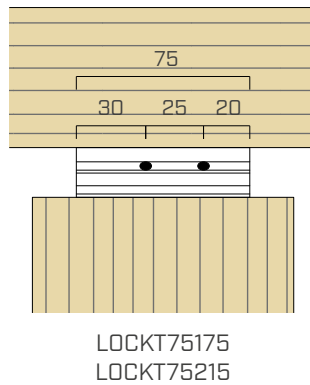
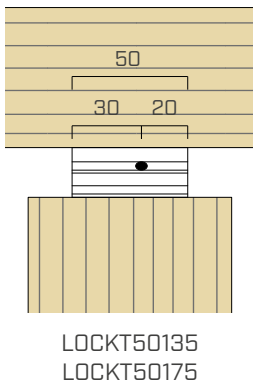
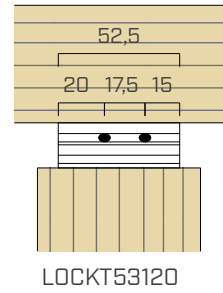
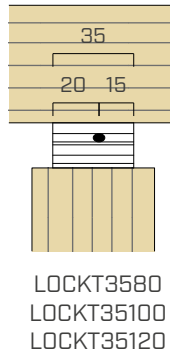
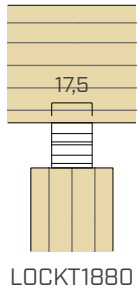
Hook the secondary beam fitting it from the top to the bottom.



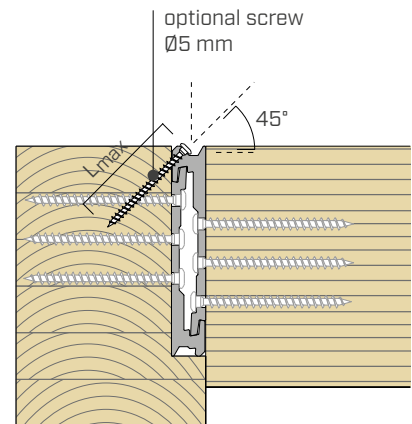
It is possible to insert anti-slip screws without structural function, by drilling one or more holes $\varnothing 5$ inclined at 45° in the upper part of the connector. A $\varnothing 5$ screw must be inserted in the holes.

OPTIONAL INCLINED SCREWS

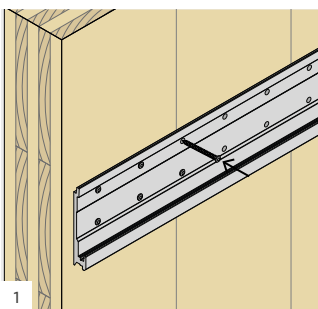
The holes inclined at 45° must be drilled on site using a drill and iron drill bit with a diameter of 5 mm. The image shows the positions for the optional inclined holes.



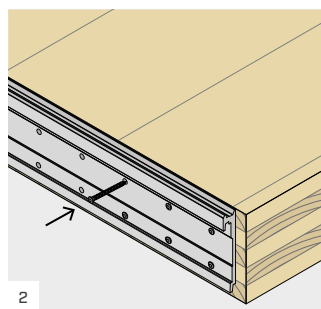
type	optional screws Ø5 L_{max} [mm]
LOCKT1880	50
LOCKT3580	
LOCKT35100	
LOCKT35120	
LOCKT53120	
LOCKT50135	80
LOCKT50175	
LOCKT75175	
LOCKT75215	
LOCKT100215	



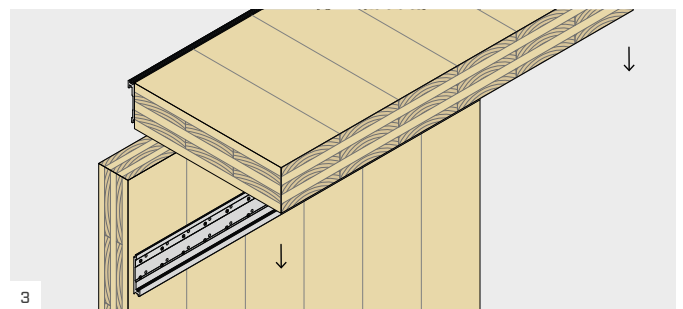
LOCK T FLOOR INSTALLATION ON CLT



Place the connector on the wall and fasten all screws.



Place the connector on the floor and fasten all screws.



Hook the floor fitting it from the top to the bottom.

STATIC VALUES

LOCKT Ø5

LOCK T CONNECTOR		TIMBER				ALUMINIUM
type	B x H x s [mm]	LBS screws $n_H+n_J - \varnothing x L$ [mm]	$R_{v,timber,k}$ [kN]			$R_{v,alu,k}$ [kN]
			C24 ⁽⁴⁾	GL24h ⁽⁵⁾	LVL ⁽⁶⁾	
LOCKT1880	17,5 x 80 x 20	2+2 - Ø5x50	2,33	2,54	2,58	10,0
		2+2 - Ø5x70	2,86	3,00	2,99	
LOCKT3580	35 x 80 x 20	4+4 - Ø5x50	4,65	5,07	5,17	20,0
		4+4 - Ø5x70	5,72	6,00	5,97	
LOCKT35100	35 x 100 x 20	6+6 - Ø5x50	6,98	7,61	7,75	20,0
		6+6 - Ø5x70	8,57	8,99	8,96	
LOCKT35120	35 x 120 x 20	8+8 - Ø5x50	9,31	10,15	10,33	20,0
		8+8 - Ø5x70	11,43	11,99	11,94	
LOCKT53120	52,5 x 120 x 20	12+12 - Ø5x50	13,96	15,22	15,50	30,0
		12+12 - Ø5x70	17,15	17,99	17,92	
LOCKT 35100 + 35100	70 x 100 x 20	12+12 - Ø5x50	13,96	15,22	15,50	40,0
		12+12 - Ø5x70	17,15	17,99	17,92	
LOCKT 35120 +35120	70 x 120 x 20	16+16 - Ø5x50	18,61	20,30	20,66	40,0
		16+16 - Ø5x70	22,87	23,98	23,89	
LOCKT 35120 + 53120	87,5 x 120 x 20	20+20 - Ø5x50	23,27	25,37	25,83	50,0
		20+20 - Ø5x70	28,58	29,98	29,86	

LOCKT Ø7

LOCK T CONNECTOR		TIMBER				ALUMINIUM
type	B x H x s [mm]	LBS screws $n_H+n_J - \varnothing x L$ [mm]	$R_{v,timber,k}$ [kN]			$R_{v,alu,k}$ [kN]
			C24 ⁽⁴⁾	GL24h ⁽⁵⁾	LVL ⁽⁶⁾	
LOCKT50135	50 x 135 x 22	6+6 - Ø7x80	15,38	16,36	15,90	30,0
LOCKT50175	50 x 175 x 22	8+8 - Ø7x80	20,50	21,81	21,20	40,0
LOCKT75175	75 x 175 x 22	12+12 - Ø7x80	30,75	32,72	31,80	60,0
LOCKT75215	75 x 215 x 22	18+18 - Ø7x80	46,13	49,08	47,70	60,0
LOCKT100215	100 x 215 x 22	24+24 - Ø7x80	61,51	65,43	63,60	80,0
LOCKT 50135 + 50135	100 x 135 x 22	12+12 - Ø7x80	30,75	32,72	31,80	60,0
LOCKT 50175 + 50175	100 x 175 x 22	16+16 - Ø7x80	41,01	43,62	42,40	80,0
LOCKT 50175 + 75175	125 x 175 x 22	20+20 - Ø7x80	51,26	54,53	53,00	100,0
LOCKT 75215 + 75215	150 x 215 x 22	36+36 - Ø7x80	92,26	98,15	95,40	120,0
LOCKT 75215 + 100215	175 x 215 x 22	42+42 - Ø7x80	107,64	114,51	111,30	140,0

STATIC VALUES

LOCK T FLOOR FOR CLT

CONNECTOR LOCK T FLOOR		TIMBER		ALUMINIUM
type	B x H x s [mm]	LBS screws n _H +n _J - ØxL [mm]	R _{v,timber,k} [kN] CLT ⁽⁷⁾	R _{v,alu,k} [kN]
LOCKTFLOOR135	300 x 135 x 22	8+8 - Ø7x80	20,40	240,0
LOCKTFLOOR135	600 x 135 x 22	16+16 - Ø7x80	40,79	480,0
LOCKTFLOOR135	900 x 135 x 22	24+24 - Ø7x80	61,19	720,0
LOCKTFLOOR135	1200 x 135 x 22	32+32 - Ø7x80	81,59	960,0

CONNECTION STIFFNESS

The sliding module can be calculated according to ETA-19/0831, with the following expression:

$$K_{v,ser} = \frac{n \cdot \rho_m^{1,5} \cdot d^{0,8}}{30} \frac{kN}{mm}$$

where:

- d is the diameter of the screw thread in the secondary beam, in mm;
- ρ_m is the average density of the secondary beam, in kg/m³;
- n is the number of screws in the secondary beam.

NOTES:

- ⁽⁴⁾ Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. $\rho_k=350$ kg/m³ has been taken in consideration in the calculation.
- ⁽⁵⁾ Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. $\rho_k=385$ kg/m³ has been taken in consideration in the calculation.
- ⁽⁶⁾ Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws with pre-drilling hole. $\rho_k=480$ kg/m³ has been taken in consideration in the calculation.
- ⁽⁷⁾ Values calculated according to ETA-19/0831, ETA-11/0030 and EN 1995-1-1 for screws without pre-drilling hole. The strength value can be accepted as valid, for higher safety standards, even in the presence of pre-drill. $\rho_k=350$ kg/m³ has been taken in consideration in the calculation.

GENERAL PRINCIPLES:

- The design values are obtained from the characteristic values as follows:
- The coefficient γ_{M2} is the partial coefficient for aluminium sections subject to tension, to be taken according to the current regulations used for the calculation. If there are no other provisions, it is suggested to use the value provided by EN 1999-1-1, equal to $\gamma_{M2}=1.25$.
- The coefficient γ_M the relevant safety coefficient, on the timber connection side, to be taken according to the current regulations used for the calculation.
- The design strength is obtained from the characteristic values as follows:

$$R_{v,d} = \min \begin{cases} R_{v,timber,d} = \frac{R_{v,timber,k} \cdot k_{mod}}{\gamma_M} \\ R_{v,alu,d} = \frac{R_{v,alu,k}}{\gamma_{M2}} \end{cases}$$

- Dimensioning and verification of the timber elements must be carried out separately. In particular, for loads perpendicular to the beam axis, it is recommended to perform a splitting check in both wooden elements.
- If coupled connectors are used, special care must be taken in alignment during installation to avoid different stresses in the two connectors.
- Screws with the same length must be used in all holes, separately for each side of the connector. It is possible to use screws of different length in the two connectors, main element side and secondary beam side.
- The connector must always be fully fastened using all the holes.
- The pre-drill is not required for screws on main or secondary beam, with characteristic density $\rho_k \leq 420$ kg/m³. The pre-drill is mandatory on main or secondary beam with characteristic density $\rho_k > 420$ kg/m³.
- For screws on column, pre-drilling is always mandatory.
- For the LOCKTFLOOR135 connector installed on CLT panels no pre-drilling hole is required.

