

Connecting systems

for modern timber construction engineering

Certainly a great connection.



KNAPP®
connectors.com



Friedrich Knapp
Company founder

Welcome to the World of KNAPP®!

As a producer of patented connecting systems we develop and produce high-quality products which are distributed worldwide. Not only will our connecting systems convince – but also inspire you with the wide range of applications. The comprehensive service offers you the possibility to find the best, the most efficient and innovative solution for the realisation of your products. On the following pages you will find our connector systems for modern timber engineering.

Our Service

The KNAPP®-Team provides competent advice and excellent service for your projects.

In Germany and Austria we offer full-coverage service by representatives on-site. You will find the right contact person easily and quickly.

www.knapp-connectors.com/contacts

You can reach our internal consultants in Germany and Austria, Monday – Tuesday 8 a.m. to 4.30 p.m. and on Friday 8 a.m. to 12 p.m.

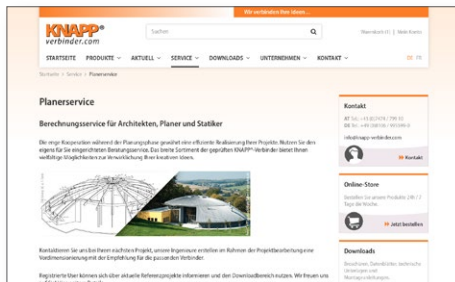
You can reach us on phone +43 (0)7474 / 799 10 and E-Mail: info@knapp-connectors.com

www.knapp-connectors.com/contacts

Our Planner Service



Planner service



You can visit our online-shop 24 hours a day. Here you will receive comprehensive information about products and service. After one-time registration you will be able to use the download area.

www.knapp-connectors.com/downloads

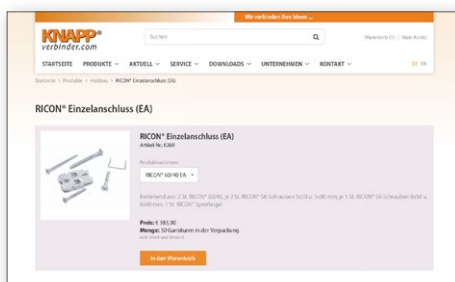
We offer comprehensive planning and structural-engineering calculations for architects, planners and structural engineers. Contact us for your next project! We'd like to offer you statics pre-dimensioning, recommending the right connector from KNAPP®. Benefit from our know-how, many years of experience and rely on our engineers consulting.

www.knapp-connectors.com/service/planerservice

KNAPP® online-store | Order around the clock



order 24h
online-store



You want to be flexible and order at any time? No problem! In our online-store you can easily find the most fitting connecting system for any purpose and send your order by one mouse click. After a quick registration, you can immediately start buying online.

www.knapp-connectors.com/products

KNAPP® offers the right connection for the areas of:

- Timber construction
- Post-beam wood-glass-facade
- Prefab walls
- Timber construction engineering
- Door- and window construction
- Furniture and interior design
- Glued glass elements for timber and metal construction



More information
www.knapp-connectors.com/downloads



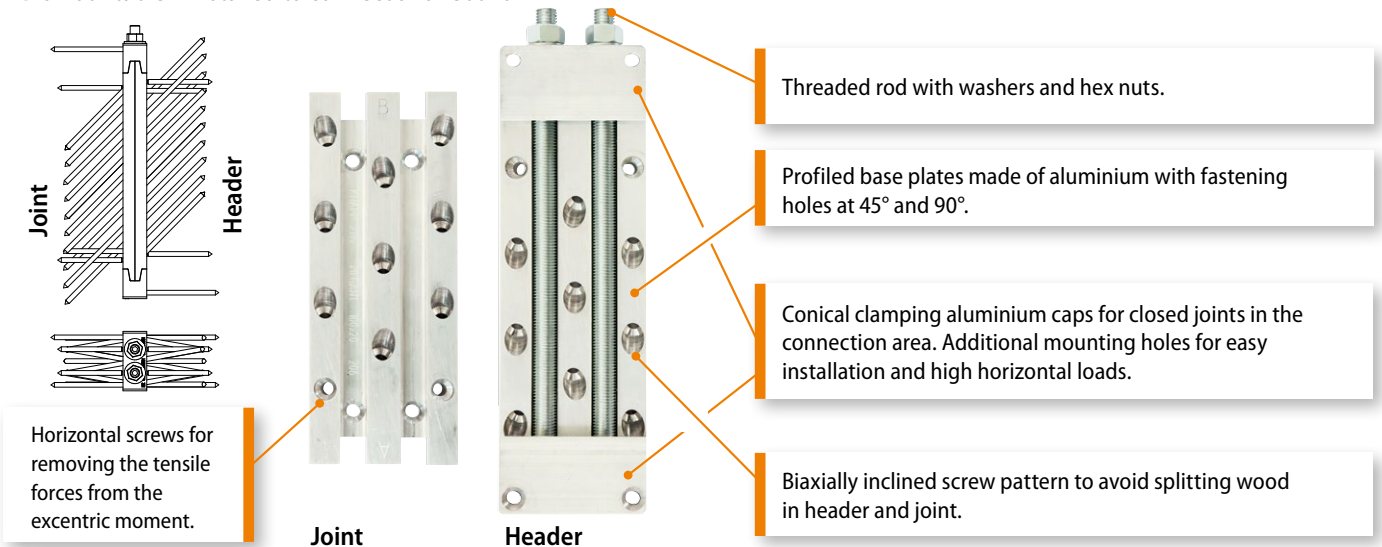
MEGANT® | The heavy-duty connector for timber construction engineering up to 500 kN

System advantages:

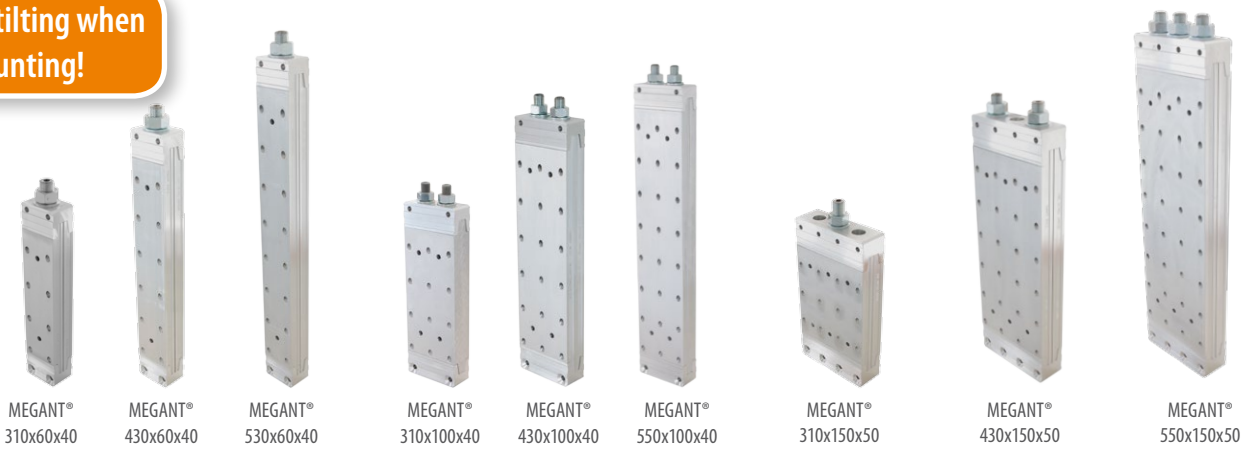
- | Load range – standard sizes up to 428 kN, customized solutions up to 500 kN
- | Minimum timber width ≤ 100 mm - 190 mm
- | Connection options – on wood, steel or concrete
- | ETA-assessment for solid and glued laminated timber of soft- and hardwood
- | Additional wood materials like LVL, CLT, Parallam (PSL), Intrallam (LSL)
- | MEGANT® ETA-assessment with stainless steel screws and threaded rods
- | Unique – mounting possible from all directions without tilting
- | Loadable in all directions
- | Fire protection – three sided concealed jointless installation
- | Short crane times by a high degree of prefabrication – only 2 cm hooking way
- | Dismountable – installed to connect and rebuild



Installation example with MEGANT®:
No reduction of the main beam.

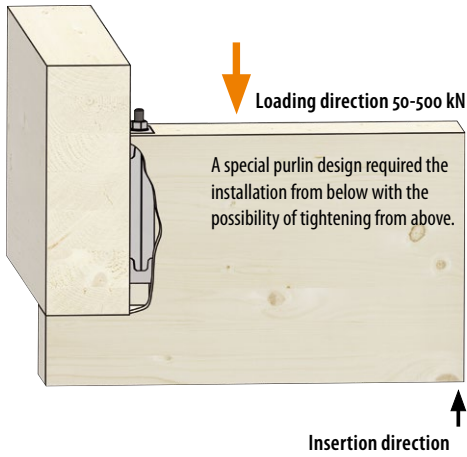


No tilting when mounting!



MEGANT®

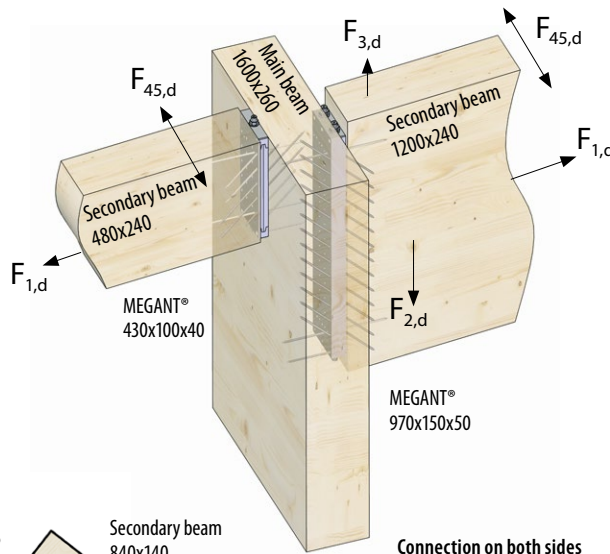
Application examples and connection details



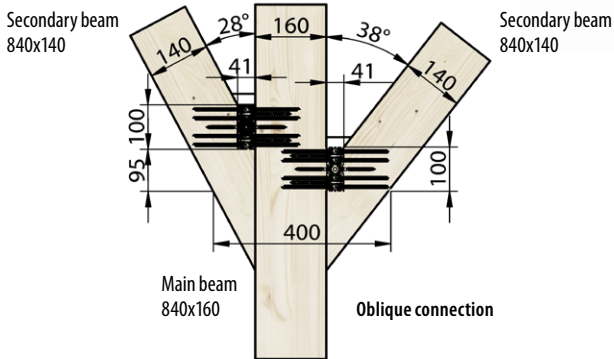
Concealed mounting on three sides by milling the secondary beam and visible mounting on main beam.



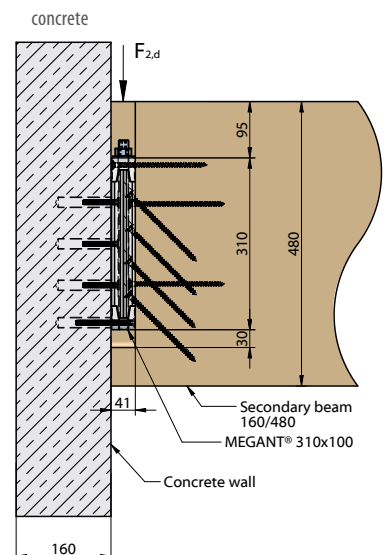
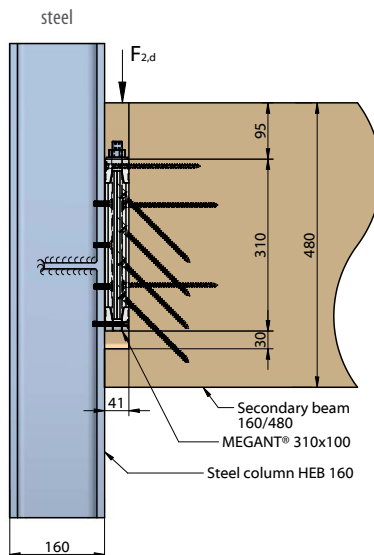
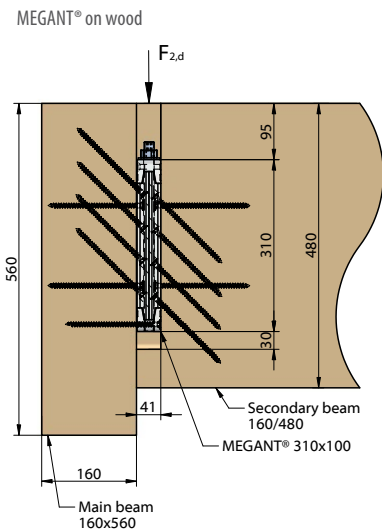
Connection finished: The secondary beams are placed in the clamping jaws.



With only 2 cm hooking way, a mounting in cutouts of concrete walls can be done.



MEGANT® oblique connection.



MEGANT® screws

CS-screws with cut point (MEGANT® is supplied with the appropriate CS-screws)

Art.-No. Z581 CS-screw 8x160 with patented half-peak



Application: For the positioning and slanted screwing as well as mounting of the clamping jaw of MEGANT®.

MEGANT®

Overview, static values

MEGANT® 60 - Static values with screws 8x160 in timber quality GL24h

Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
310x60x40	100x440	38,2	95,0	31,2	33,6
430x60x40	100x520		149,4	40,8	40,6
550x60x40	100x640		197,5	50,4	44,3

MEGANT® 100 - Static values with screws 8x160 in timber quality GL24h

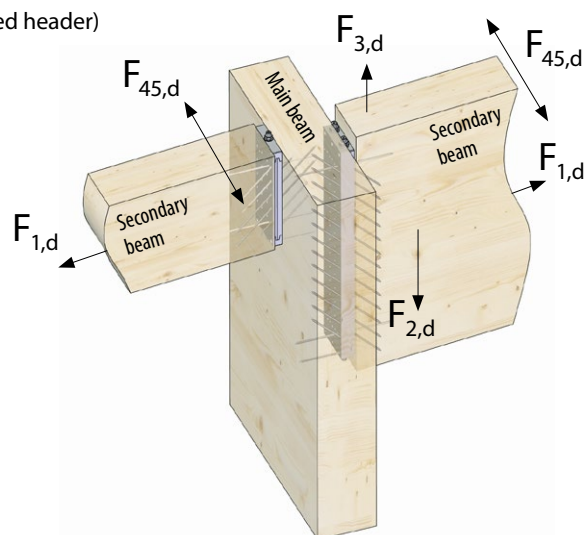
Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
310x100x40	140x440	59,4	122,2	50,4	43,2
430x100x40	140x520		203,7	64,8	68,6
550x100x40	140x640		261,3	79,2	74,9

MEGANT® 150 - Static values with screws 8x160 in timber quality GL24h

Connector	Min. secondary beam height [mm]	Characteristic values [kN]			
		max $F_{1,Rk}$	max $F_{2,Rk}$	max $F_{3,Rk}$	max $F_{45,Rk}$
310x150x50	190x410	80,5	158,0	67,2	57,6
430x150x50	190x520		263,4	86,4	74,8
550x150x50	190x640		368,8	105,6	81,6
730x150x50	190x830		492,4	105,6	81,6
Custom solutions of MEGANT® Special sizes on request (Examples on the list)					
790x150x50	190x890	80,5	492,4	105,6	82,7
850x150x50	190x950				
970x150x50	190x1170				
1090x150x50	190x1190				

- $F_{1,Rk}$ Characteristic values for traction
- $F_{2,Rk}$ Characteristic values in direction of insertion (table values for torsional fixed header)
- $F_{3,Rk}$ Characteristic values against the direction of insertion
- $F_{45,Rk}$ Characteristic values perpendicular to the direction of insertion

Additional connection loads for other wood materials are described in the ETA assessment 15/0667 or MEGANT® statics folder. The evaluated design loads are described in the MEGANT® statics folder.



More information:
www.knapp-connectors.com/downloads

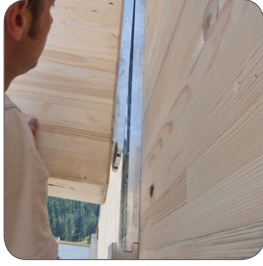


MEGANT®

Assembly procedure



13:16 | After aligning the secondary beam, MEGANT® is hooked.



13:21 | For threading and dropping, MEGANT® requires only 2 cm.



13:23 | Insert the threaded rods and drill them into the caps.



13:24 | Tighten the nuts.

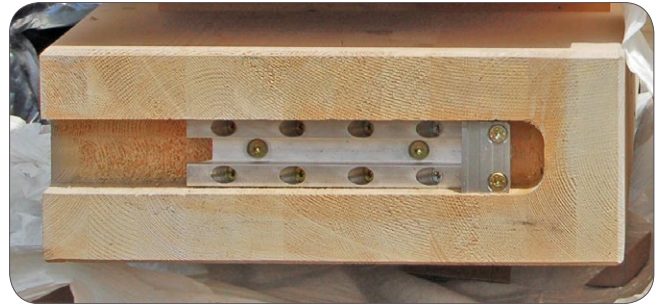


13:25 | Connection finished.

MEGANT®

Fire protection

- Is an invisible connection required or particular requirements for fire protection, the system can be easily processed on 3 sides covered.
- Jointless connection - no additional covers or fire protection ribbons required.
- According to EN 1995-1-2 28 mm wood covering are required for 30 minutes fire resistance. Even a higher fire resistance (i.e. R60) is possible.



MEGANT®

Custom solutions for forces up to 500 kN

- Comprehensive advice from your personal contact and our technical department
- Professional support for project-related detailed preparation and static predimensioning
- Create an optional project-based verifiable static

MEGANT® for 420 kN

Example: Warehouse biomass CHP Großarl (A)



Oblique connections

Example: Restaurant Schnepfenried (FR)

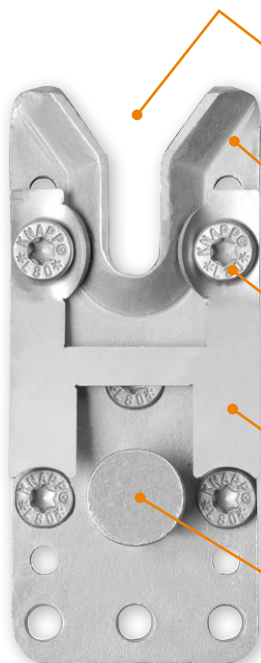




RICON® S | The connector for main and secondary beam up to 100 kN*

System advantages:

- | Connector for timber frame, wood frame buildings and halls
- | Timber width from 100 mm upwards
- | Universally applicable to timber, steel or concrete
- | Simple screwing without predrilling
- | Easy hooking by large V-shaping – only 3,5 cm hooking way
- | Three- and four-sided concealed connection
- | High fire resistance through three- and four-sided concealed mounting
- | Adjustable collar bolt up to 5mm length tolerance at full load capacity
- | Optional – securing against the insertion direction with clip lock
- | ETA additionally with hardwood material



The V-shape moulding provides perfect catch of the collar bolt. The strong tension and the short slide-in alleviates the connecting and guarantees joint sealing.

RICON® S is made of premium quality steel, hot-dip galvanized and produced in Germany.

KNAPP® CS-screws with cut point for extra fast starts and screwing. The reinforced shaft provides force-fit connection.

The RICON®S clip lock, made from stainless spring steel, locks the connection against slide-in direction and can optionally be used for stress against slide-in direction or wind suction.

There are different versions of the collar bolt available for RICON® S which offers four different connection options.



RICON® S60 VS
140x60x25

RICON® S60 VS
200x60x25



RICON® S80 VS
200x80x25

RICON® S80 VS
290x80x25



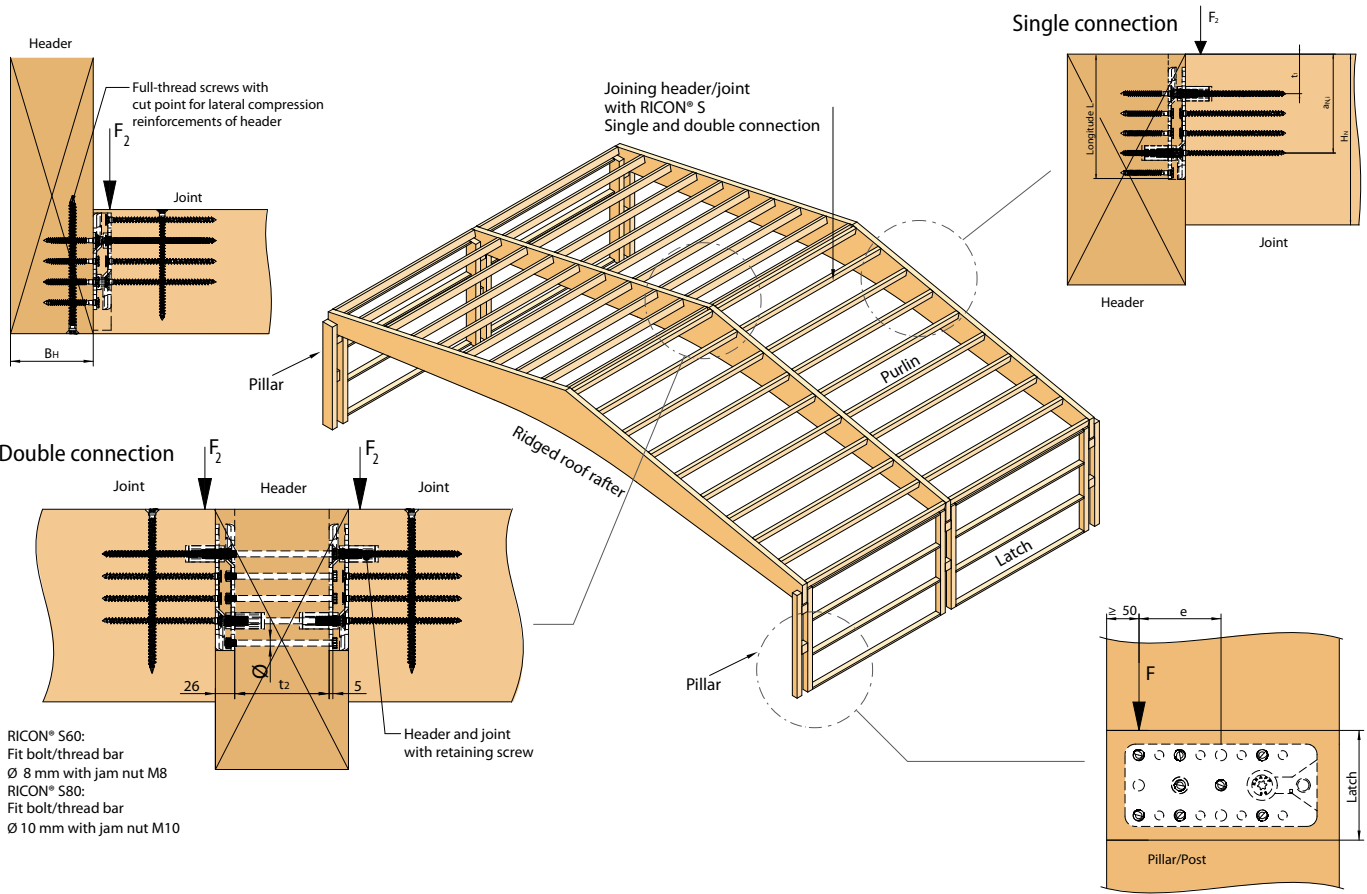
More information:
www.knapp-connectors.com/products

*Charact. load carrying capacity $F_{z,Rk}$ in insertion direction applies only to the use of original KNAPP® cs-screws according to ETA 10/0189.

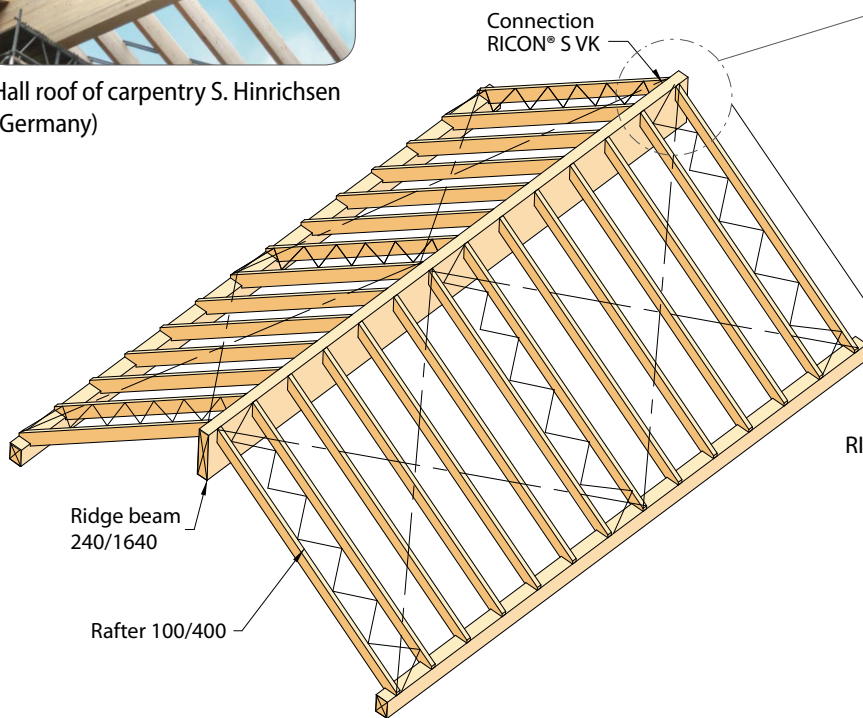
RICON® S

Application examples and connection details

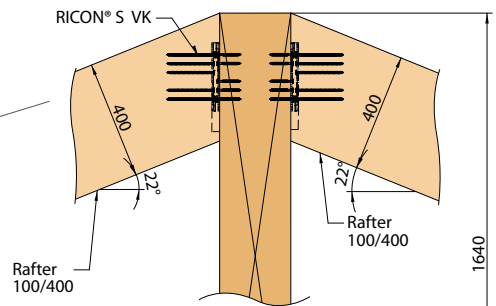
Ridged roof with purlins and latch connections



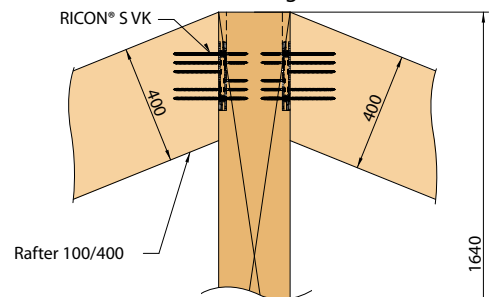
Hall roof of carpentry S. Hinrichsen (Germany)



RICON® S housed into a rafter



RICON® S housed into the ridge beam

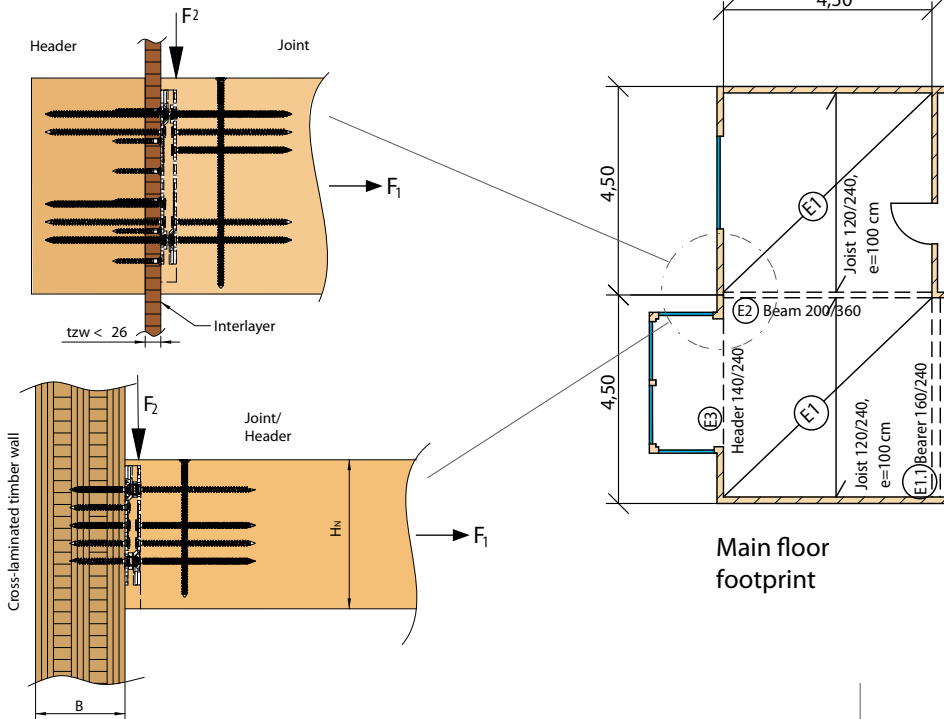


(All dimensions in mm)

RICON® S

Application prefabricated houses

Connecting header with timber frame construction or cross-laminated timber wall

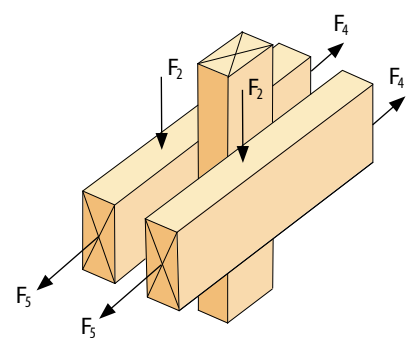
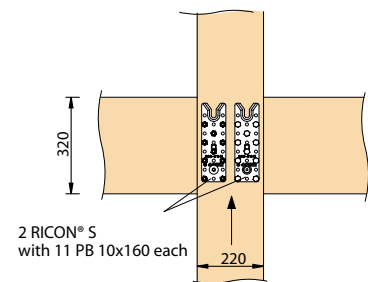
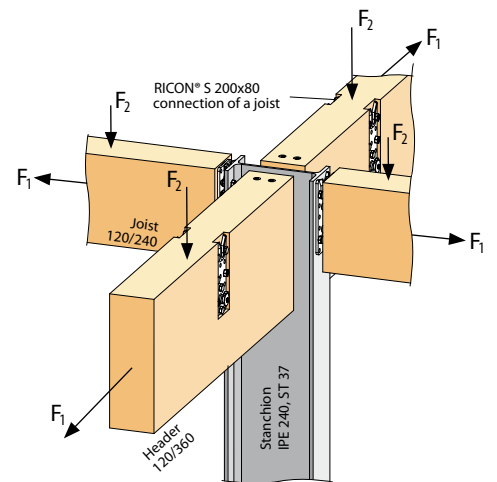
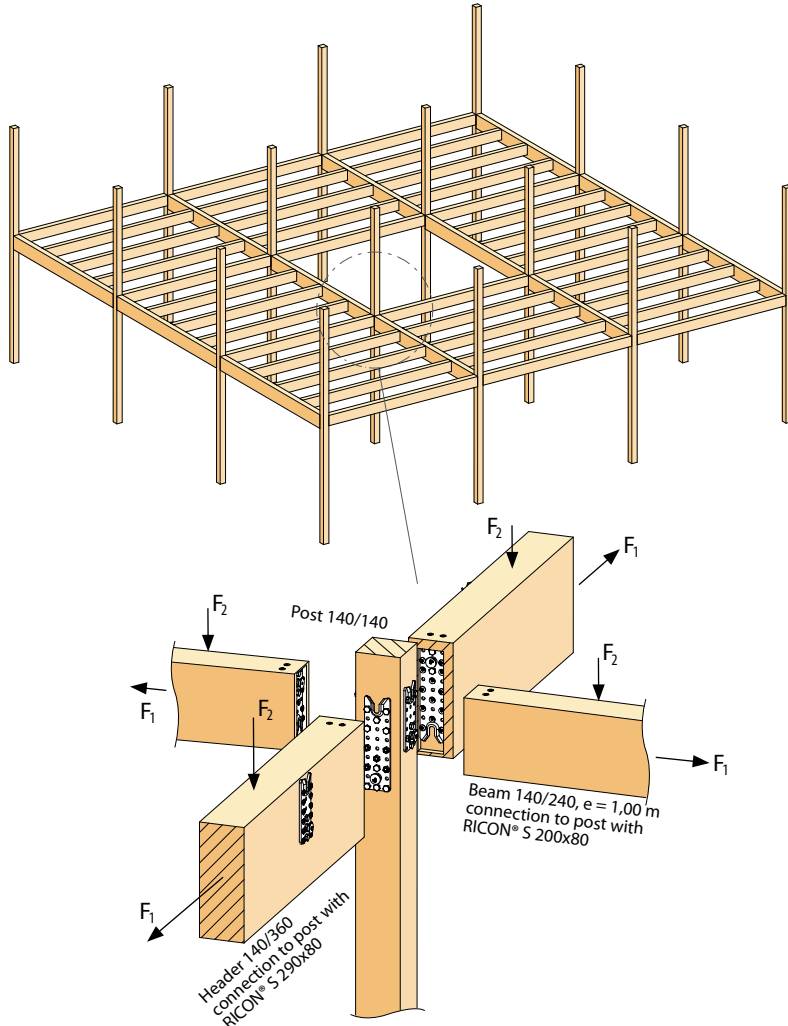


Steel connection



First node for dome

Ceiling of a timber frame construction



Alternative ways to connect

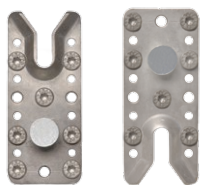
RICON® S60

Characteristic values for dimensioning can be taken from the ETA Static Folder.

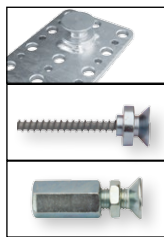
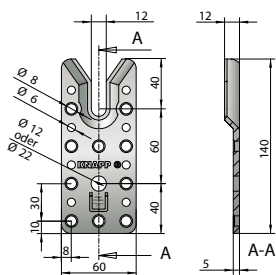
RICON® S 140/60 - Collar bolts and screwing

Art.-No. VS: K126 / VK: K130 / EK: K146

Header Joint



Minimum screwing: n = 7



Connector	Collar bolt	Screwing		Charact. values [GL24h] F _{2,Rk} [kN]
		Joint	Header	
140/60	VS	10 x CS 8x160	10 x CS 8x80	43,2
140/60	VK D12	8 x CS 8x160	8 x CS 8x80	37,9

Available on request:

140/60	EK M12	7 x CS 8x160	7 x CS 8x80	36,0
--------	--------	--------------	-------------	------

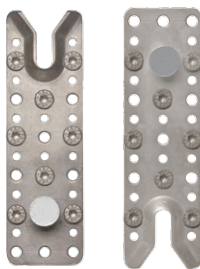
Clip lock: F_{3,Rk} = 18,0 kN

Minimum timber cross section: 100 x 160 mm

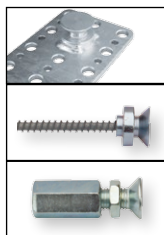
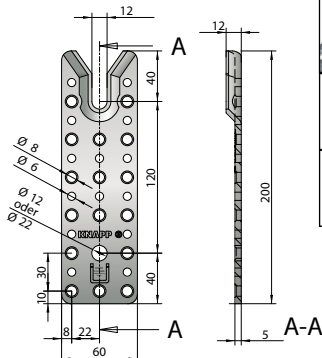
RICON® S 200/60 - Collar bolts and screwing

Art.-No. VS: K127 / VK: K132 / EK: K148

Header Joint



Minimum screwing: n = 8



Connector	Collar bolt	Screwing		Charact. values [GL24h] F _{2,Rk} [kN]
		Joint	Header	
200/60	VS	16 x CS 8x160	16 x CS 8x80	67,5
200/60	VK D12	9 x CS 8x160	9 x CS 8x80	49,0

Available on request:

200/60	EK M12	8 x CS 8x160	8 x CS 8x80	44,7
--------	--------	--------------	-------------	------

Clip lock: F_{3,Rk} = 18,0 kN

Minimum timber cross section: 100 x 220 mm

RICON® S80

Characteristic values for dimensioning can be taken from the ETA Static Folder.

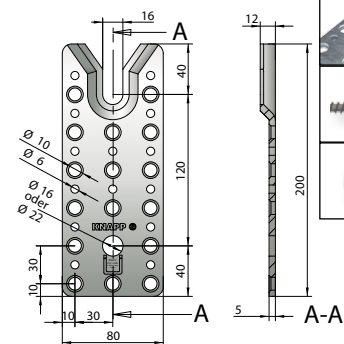
RICON® S 200/80 - Collar bolts and screwing

Art.-No. VS: K128 / VK: K138 / EK: K153

Header Joint



Minimum screwing: n = 8



Connector	Collar bolt	Screwing		Charact. values [GL24h] F _{2,Rk} [kN]
		Joint	Header	
200/80	VS	16 x CS 10x200	16 x CS 10x100	95,5
200/80	VK D16	9 x CS 10x200	9 x CS 10x100	69,9

Available on request:

200/80	EK M16	8 x CS 10x200	8 x CS 10x100	63,0
--------	--------	---------------	---------------	------

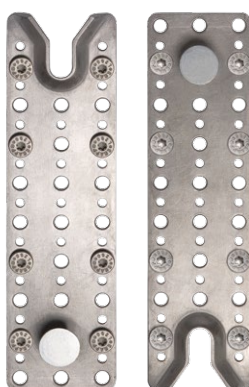
Clip lock: F_{3,Rk} = 18,0 kN

Minimum timber cross section: 120 x 230 mm

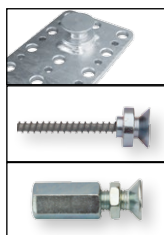
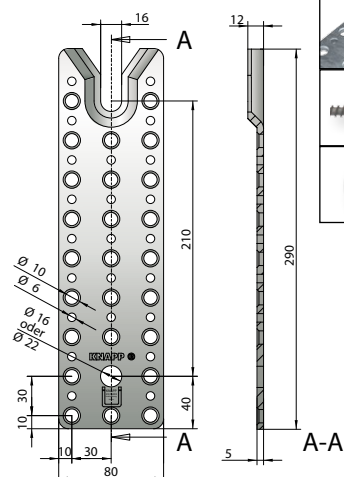
RICON® S 290/80 - Collar bolts and screwing

Art.-No. VS: K129 / VK: K141 / EK: K156

Header Joint



Minimum screwing: n = 8



Connector	Collar bolt	Screwing		Charact. values [GL24h] F _{2,Rk} [kN]
		Joint	Header	
290/80	VS	20 x CS 10x200	20 x CS 10x100	116,7
290/80	VK D16	9 x CS 10x200	9 x CS 10x100	70,5

Available on request:

290/80	EK M16	8 x CS 10x200	8 x CS 10x100	63,0
--------	--------	---------------	---------------	------

Clip lock: F_{3,Rk} = 18,0 kN

Minimum timber cross section: 120 x 320 mm

RICON® S

Pre-dimension

Minimum timber cross section for joint for RICON® S connection in reference to uniformly distributed load q_k and span L for glued laminated timber and GL 24 h according DIN 1052 (release 2008) and Eurocode 5

Roofs, rafters, rafter latches

(service classes 1-2, load-duration class: **short-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	$q_k = 3,00 \text{ kN/m}$	$q_k = 4,00 \text{ kN/m}$	$q_k = 5,00 \text{ kN/m}$	$q_k = 6,00 \text{ kN/m}$	$q_k = 7,00 \text{ kN/m}$	$q_k = 8,00 \text{ kN/m}$
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/20 140/60	10/22 140/60	10/24 200/60	10/26 200/80	12/26 200/80	12/28 200/80
5,00 m	10/26 200/60	12/26 200/60	12/28 200/60	12/30 200/80	12/32 200/80	12/34 200/80
6,00 m	12/28 200/60	12/32 200/80	12/34 200/80	12/36 200/80	12/38 290/80	12/40 290/80
7,00 m	12/34 200/80	12/36 290/80	12/40 290/80	12/42 290/80	12/44 290/80	
8,00 m	12/38 290/80	12/42 290/80	12/46 290/80	12/48 290/80		

Residential building, ceilings

(service classes 1-2, load-duration class: **medium-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	$q_k = 3,00 \text{ kN/m}$	$q_k = 4,00 \text{ kN/m}$	$q_k = 5,00 \text{ kN/m}$	$q_k = 6,00 \text{ kN/m}$	$q_k = 7,00 \text{ kN/m}$	$q_k = 8,00 \text{ kN/m}$
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/20 140/60	10/22 140/60	10/26 200/60	12/26 200/80	12/28 200/80	12/28 200/80
5,00 m	10/26 200/60	12/26 200/60	12/28 200/60	12/32 200/80	12/34 200/80	12/36 200/80
6,00 m	12/28 200/60	12/32 200/80	12/34 200/80	12/38 200/80	12/40 290/80	12/42 290/80
7,00 m	12/34 200/80	12/36 290/80	12/40 R290/80	12/44 290/80		
8,00 m	12/38 290/80	12/42 290/80	12/46 290/80	12/50 290/80		

Storage building, ceilings

(service classes 1-2, load-duration class: **long-term**) Dead-load g_k (40%) e. g. self-weight and alternating load q_k (60%) e. g. wind, snow, live-load

Span L	Uniformly distributed load q_k					
	$q_k = 3,00 \text{ kN/m}$	$q_k = 4,00 \text{ kN/m}$	$q_k = 5,00 \text{ kN/m}$	$q_k = 6,00 \text{ kN/m}$	$q_k = 7,00 \text{ kN/m}$	$q_k = 8,00 \text{ kN/m}$
	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]	Cross timber section w/l [cm/cm]
	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S	RICON® S
4,00 m	10/22 140/60	10/24 140/60	10/26 200/60	12/26 200/80	12/28 200/80	12/30 200/80
5,00 m	10/26 200/60	12/28 200/60	12/30 200/60	12/34 200/80	12/36 290/80	12/38 290/80
6,00 m	12/28 200/60	12/32 200/80	12/36 200/80	12/40 290/80	12/42 290/80	
7,00 m	12/34 200/80	12/38 290/80	12/42 290/80	12/46 290/80		
8,00 m	12/38 290/80	12/44 290/80	12/48 290/80			

The table values are only to be applied for loading in direction of insertion. The minimum cross section of the secondary beam is calculated for timber C24 (S10). For the connection force of GIGANT, the live load over the bearing was set to 1,0 kN (man load upon the bearing).

Detailed information for static calculation are indicated in the ETA Static Folder. Find more information at www.knapp-verbinder.com/download



RICON® S screws

CS-screws RICON® S60 with cut point (RICON® S will supplied with the appropriate CS-screws)

Art.-No. Z580 CS-screw 8x80 with patented half-peak

Art.-No. Z581 CS-screw 8x160 with patented half-peak

Application: To screw in longitude (8x80) or end grain (8x160).



CS-screws RICON® S80 with cut point (RICON® S will supplied with the appropriate CS-screws)

Art.-No. Z58 CS-screw 10x100 with patented half-peak

Art.-No. Z583 CS-screw 10x200 with patented half-peak

Application: For screwing RICON® S into main (post) or secondary beam (latch).



RICON® S Accessories

Routing-jig RICON® S S60/S80

Art.-No. K510 Routing-jig MULTI F60 (plywood) for all RICON® S60 sizes

Art.-No. K511 Routing-jig MULTI F80 (plywood) for all RICON® S60 sizes

Advice: The routing-jig MULTI F is suitable for a $\varnothing = 30$ mm guide bush (for plunge router) and a $\varnothing = 15$ mm TCT router cutter.

Application: For milling in concealed mounting.



TCT-router cutter

Art.-No. Z068 TCT router cutter $\varnothing = 15$, Length = 40 mm and $\varnothing = 12$ mm Schaft

Application: To recess the rebate for RICON® S.



Pan head screws RICON® S80

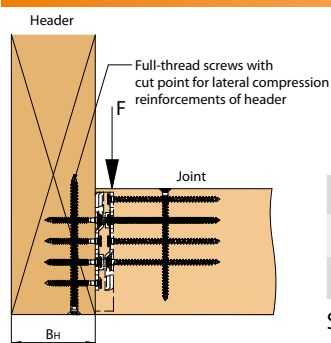
Art.-No. Z521 PH-screw 10x80

Art.-No. Z522 PH-screw 10x120

Application: For screwing the interlayer on slanted screw connections.



Full threaded CS-screws with cut-point



Diameter (d1)	Length (mm)													
$\varnothing = 8$ mm	160	180	200	220	240	260	280	300	350	400	450	500	550	600
$\varnothing = 10$ mm	160	180	200	220	240	260	280	300	350	400	450	500	550	600

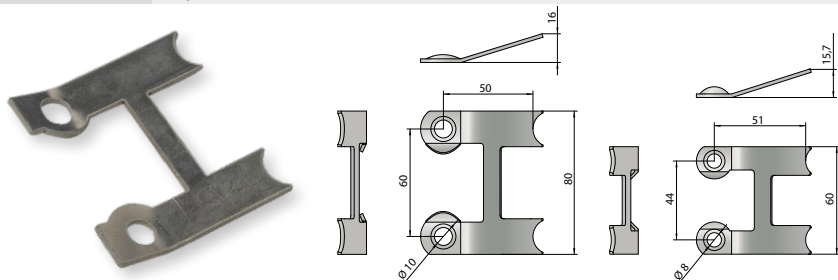
Sizes available on request.

Application: Full threaded countersunk screws for lateral compression reinforcements of header and/or joint.

Clip lock RICON® S (made of stainless spring steel)

Art.-No. K157 Clip lock RICON® S60

Art.-No. K158 Clip lock RICON® S80



Application: The clip lock locks the connection against slide-in direction and is used for stress against slide-in direction or wind suction.

RICON® S collar bolt

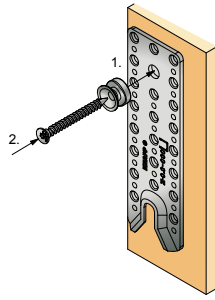
Screwed collar bolt (VK)

Art.-No. Z595 S80: VK D16

Art.-No. Z594 S60: VK D12

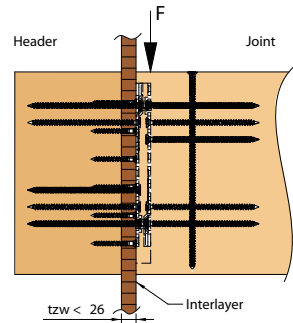
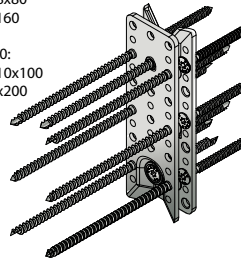


1. Position collar bolt into the provided hole
2. Fasten collar bolt with full threaded CS-screw



Necessary screws :
RICON® S60:
Header: 8x80
Joint: 8x160

RICON® S80:
Header: 10x100
Joint: 10x200



Application: Screwed collar bolt for fast and direct screwing, especially on interlayers.
Hint: This way of connection requires very accurate rebate depth (no tolerances).

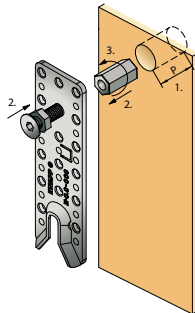
Retaining screw collar bolt (EK)

Art.-No. Z558 S60: EK M12

Art.-No. Z559 S80: EK M16

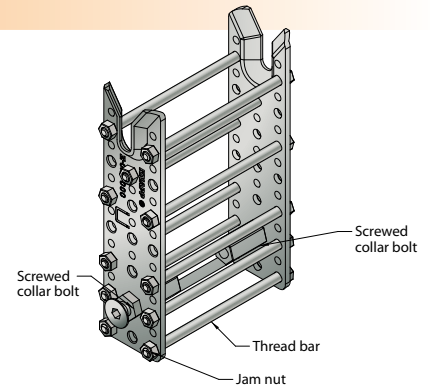
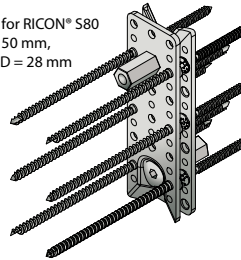


1. Bore blind hole
2. Fasten socket head screw with coupling nut and jam nut to the connector
3. Adjust height and tighten up
4. Plug connectors in blind hole and fasten with RICON® S CS-screws



Blind hole for RICON® S60
Depth: t = 40 mm,
Diameter: D = 22 mm

Blind hole for RICON® S80
Depth: t = 50 mm,
Diameter: D = 28 mm



Application: Retaining screw collar bolt for connections to concrete and/or wood components for timber engineering. Coupling nuts are used to connect pieces of threaded rod, anchor bolt or connecting bolts.

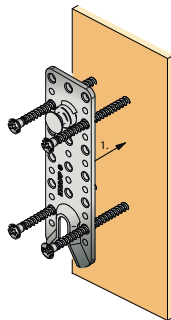
Welded collar bolt (VS)

RICON® S60 : VS M12

RICON® S80 : VS M16

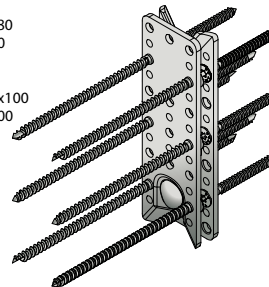


1. Fit the connector plate and fix it with RICON®S screws



Necessary screws :
RICON® S60:
Header: 8x80
Joint: 8x160

RICON® S80:
Header: 10x100
Joint: 10x200



Application: For maximum load recovery or for fixing on steel or concrete. The number of screws used for fixing may vary depending on the load to be recovered.

RICON® S

Fire resistance

- Is an invisible connection required or particular requirements for fire protection, the system can be easily processed on three- or four-sides covered.
- Jointless connection – no additional covers or fire protection ribbons required.
- According to EN 1995-1-2 28 mm wood covering are required for 30 minutes fire resistance. Even a higher fire resistance (i.e. R60) is possible.



RICON® S

Installation

- Routing machine with KNAPP® routing-jig.
- Installation with CNC joinery machine possible – all data for the standard CNC joinery machine programs are included.



CNC joinery machine



1) Routing with routing-jig and routing machine.

Routing dimensions for RICON® S60 / S80

Width	Length	Depth (VK, EK, VS)
60 mm / 80 mm	var.	25 mm

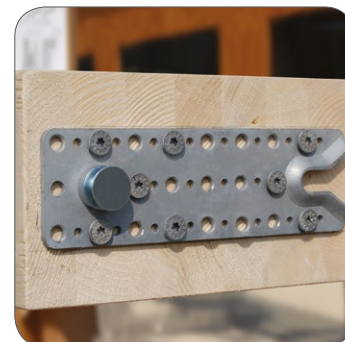
Installation RICON® S VS



2) Position the screws

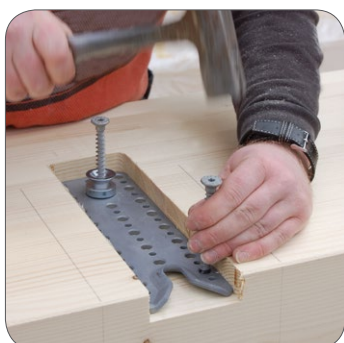


3) Screw on



4) Screw on counter part

Installation RICON® S VK




2) Position the screws



3) Screw on



4) Screw on counter part

 Fot construction manuals and .DXF drawings for RICON® S-System, please visit:
www.knapp-connectors.com/downloads

Recommended software partners for machine processing:

 **cadwork**

 **SEMA**
SOFTWARE

 **Dietrich's**

 **hsbcad**
CAD/CAM für den Holzbau

 **Wessinger
HOLZBAU
PROGRAMME**

 **WETO AG
technologies**

RICON®, RICON® S, MEGANT®

Selected reference project



Object: renovation of a restaurant in Schnepfenried/France; SMA Syndicat mixte d'aménagement des stations de montagne de la vallée de Munster, F-68140 Munster; Architect: Ateliers d-Form, F-68230 Soultzbach Les Bains, www.atelier-d-form.com; Statics: Optime Ingénierie, 68230 Soultzbach Les Bains, contact@optime-be.com, Construction Company: Dattler, 20 rue des Prés, 68640 Feldbach, www.dattler.fr



Object: Eurospar Attnang-Puchheim; Architect: Dworschak+Mühlbacher Architekten ZT GmbH; Planner: Dworschak+Mühlbacher Architekten ZT GmbH; Statics: Ingenieurbüro Meinhart und Partner Ziviltechniker GmbH; Timber Construction: Schmid Baugruppe Holding AG www.schmid-baugruppe.at Prefab: Buchacher Holzleimbau GmbH; Constructor: GNIPL Projektentwicklung und Errichtungs GmbH Client: Spar Österreichische Warenhandels AG; Modded surface: 2.150 m² Usable Area: 310 m²



Contact

+43 (0)7474 / 799 10
+49 (0)8106 / 99 55 99 0
info@knapp-connectors.com

knapp-connectors.com/contact



Service

Do you have questions about an optimal solution for your project? Find your sales representative easily on our website:

knapp-connectors.com/contact



order 24h online-store

You want to order around the clock? Our **KNAPP® online-store** is open 24h each day.*

knapp-connectors.com/products
* not available in Switzerland.



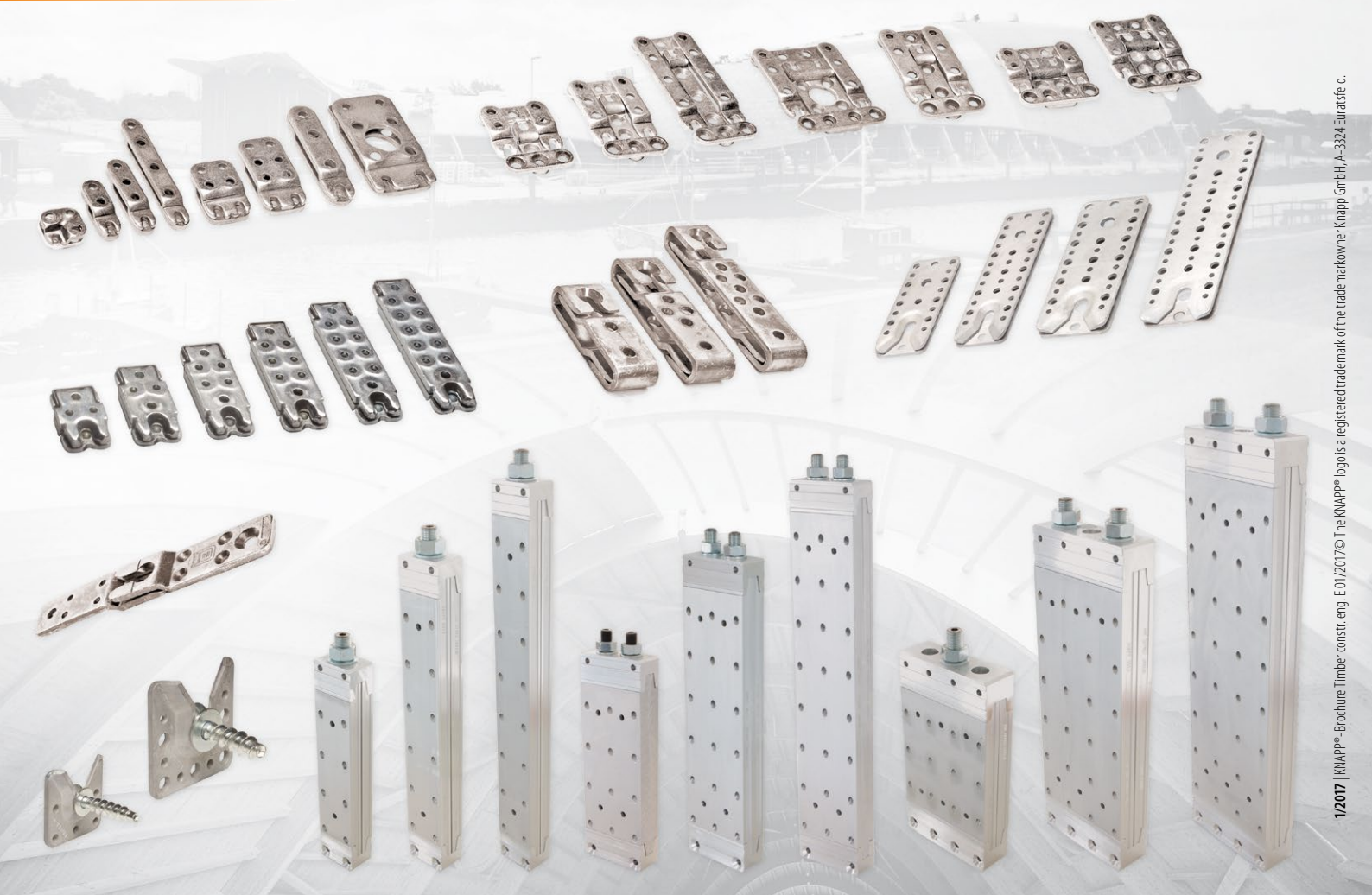
Downloads

All brochures, data sheets, technical details are downloadable from our website.

knapp-connectors.com/downloads



Concealed | Self-tightening | Demountable



1/2017 | KNAPP®-Brochure Timber constr. eng. E 01/2017© The KNAPP® logo is a registered trademark of the trademarkowner Knapp GmbH, A-3324 Euratsfeld.

The technical contents in this brochure are valid, until a (on our website for download) new brochure is available. This brochure is the exclusive property of Knapp GmbH. Duplication, reproduction or publication, including excerpts, only with the prior written permission of Knapp GmbH. All calculations given in this brochure are made in subject to any printing and typing errors and other mistakes. Technical drawings and calculations, especially those affecting the statics, on customer's own responsibility. Any calculations and drawings in this respect by the company Knapp GmbH are subject to proposals for the orientation and / or liability for the accuracy and therefore not free the customer to wear it even for a proper drawing and calculation by a professional concern. Picture credits are available and can be requested if required. All rights reserved. Copyright © 2017 by Knapp GmbH.

Knapp GmbH | Wassergasse 31 | A-3324 Euratsfeld | Tel.: +43 (0)7474 / 799 10 | Fax: +43 (0)7474 / 799 10 99

Knapp GmbH Niederlassung Deutschland | Föhrenweg 1 | D-85591 Vaterstetten
Tel.: +49 (0)8106 / 99 55 99 0 | Fax: +49 (0)8106 / 99 55 99 20 | E-Mail: info@knapp-connectors.com

KNAPP®
connectors.com