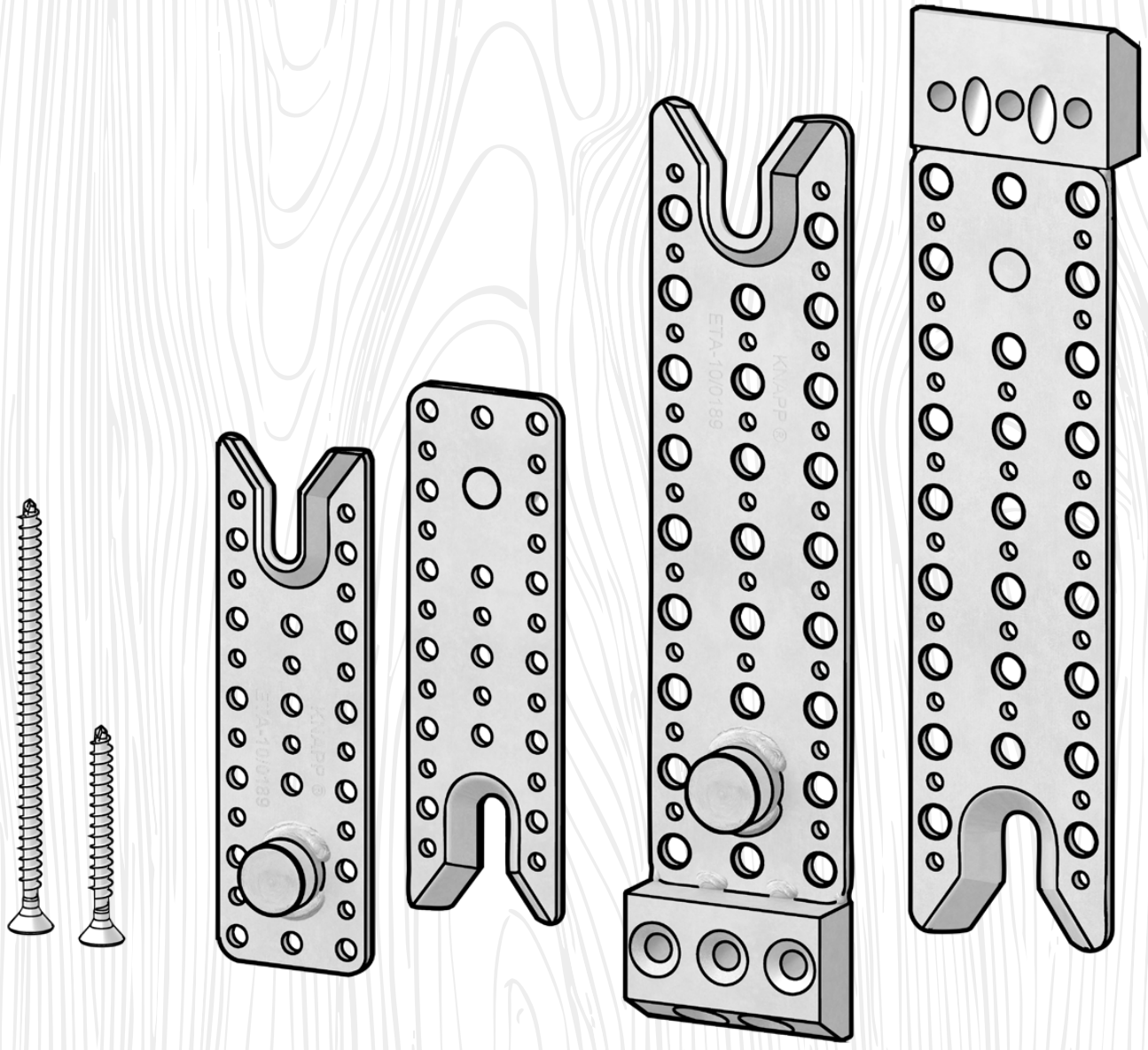
Installation Guide

MTC SOLUTIONS

RICON S VS / XL

Version 1.0



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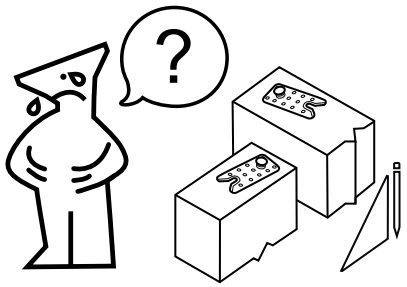
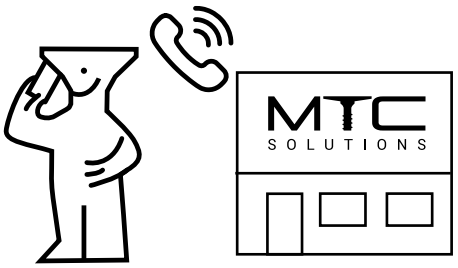




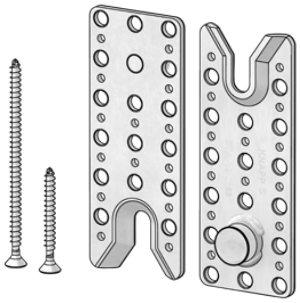
General Notes to the Installer

1. Carbon steel fasteners shall only be used in dry service conditions, as exposure to wet service conditions may lead to premature failure. Connections designed for dry service conditions should be protected from wetting and excessive moisture during construction.
2. During construction, mass timber elements may experience temporary surface wetting, potentially causing the timber surface moisture content (MC) to exceed 19%. In such cases, A3K electroplated carbon steel fasteners are acceptable for use, provided that the following three conditions are met. First, the surface wetting shall not exceed the moisture limits defined for dry service conditions for more than a few weeks per year. Second, the annual average MC during construction shall remain within the range of 10–16%. Third, the design must incorporate appropriate detailing to accommodate dimensional changes in the wood due to wetting and/or drying. If any of these conditions cannot be met, fasteners with enhanced corrosion resistance are recommended, and detailing must be adjusted accordingly.
3. Use a drill equipped with a feather (variable-speed) trigger to ensure proper torque management and mitigate the risk of overtorquing. Although impact guns are not expressly prohibited, their use is discouraged due to increased risk of overtorquing. If an impact gun is utilized, limit its use to short screws and maintain a continuous drive without pausing.
4. RICON S VS connectors must be installed with the listed ASSY screws. Substitution of fasteners is not permitted.
5. If splitting of a wood member or fastener damage is observed prior to or during installation of the fasteners, the installation process must be stopped, and the Engineer of Record (EOR) must be contacted immediately to provide appropriate site instructions to rectify the issue.
6. Pilot holes may be used to facilitate fastener installation with greater precision. Pilot holes shall be 1 in. *[25 mm]* deep and their diameters shall not exceed the minor diameter, D_m, of the fastener.
7. For fasteners installed in a countersunk hole, a pilot hole using the Predrilling Jig is recommended to ensure proper installation of the fasteners.
8. Predrilling can help reduce the insertion torque of self-tapping fasteners. Predrilling is recommended for installation of fasteners into dry (<10% MC) Southern Yellow Pine (SYP) to reduce installation torque.
9. Screws should be fully driven in an uninterrupted process, from tip insertion to head seating. If necessary, a torque wrench may be used to complete installation immediately after initial insertion of the screw.
10. Refer to the project's approved shop drawings or details from the glulam manufacturer for the required connector position. For additional information on routing and housing requirements, refer to MTC beam hanger design guide.

Table 1 - RICON S VS Hardware Package Installation Overview

RICON S VS		Plate Qty.	Fasteners				Installation Time
			Primary Member		Secondary Member		
Series	Model		Type	Qty.	Type	Qty.	min.
60	RICON S VS 140 x 60	2	**VG CSK 5/16" x 3-1/8"** *[8 x 80 mm]*	10	**VG CSK 5/16" x 3-1/8"** *[8 x 160 mm]*	10	**9**
	RICON S VS 200 x 60	2	**VG CSK 5/16" x 3-1/8"** *[8 x 80 mm]*	16	**VG CSK 5/16" x 3-1/8"** *[8 x 160 mm]*	16	**13**
80	RICON S VS 200 x 80	2	**VG CSK 3/8" x 4"** *[10 x 100 mm]*	16	**VG CSK 3/8" x 4"** *[10 x 200 mm]*	16	**13**
	RICON S VS 290 x 80	2	**VG CSK 3/8" x 4"** *[10 x 100 mm]*	20	**VG CSK 3/8" x 4"** *[10 x 200 mm]*	20	**14**
XL	RICON S VS XL 390 x 80	2	**VG CSK 3/8" x 4"** *[10 x 100 mm]*	28	**VG CSK 3/8" x 7-7/8"** *[10 x 200 mm]*	30	**20**
			VG CSK 3/8" x 7-7/8" *[10 x 200 mm]*	2			

One Installer
With Pilot Holes



VG CSK **RICON S VS Plates**

Note:

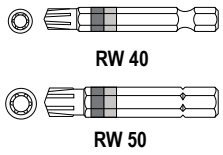
1. The estimated installation time is based on a time study and includes steps for layout and positioning, drilling a 1 in. [25 mm] deep pilot hole for each fastener, and structural screw installation for both plates.

RICON S VS Installation Procedure

Tool Requirements

Tools - Use the Correct Bit

MTC Solutions fasteners should only be driven using RW bits, or appropriately sized star bits. This ensures good centering and positioning with optimal torque transmission. For the RICON S VS, use an RW 40 bit for 5/16 in. *[8 mm]* screws and an RW 50 bit for 3/8 in. *[10 mm]* screws.



RW 40

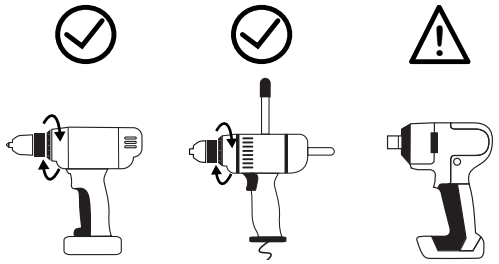
RW 50

Tools - Use the Correct Drill

Use low-RPM, high-torque drills equipped with a feather (variable speed) trigger to install fasteners. Avoid excessive acceleration and deceleration during the drive-in process. **Do not overtorque, spin out, or auger out fasteners**. Although impact guns are not expressly prohibited, their use is discouraged - particularly for beam hanger systems - due to an increased risk of overtorquing. Use the appropriate drill chuck size according to the fastener.

Table 2 - Recommended Torque, Drill Bits, and Power Drill

Nominal Fastener Diameter [D]		HSS Drill Bit Size		Power Voltage Drill	Allowable Insertion Torque	
in.	*[mm]*	in.	*[mm]*	V	lbs. · ft.	*[N · m]*
5/16	*[8]*	3/16	*[4.8]*	20	12.30	*[16.67]*
3/8	*[10]*	1/4	*[6.4]*	60	22.13	*[30.00]*



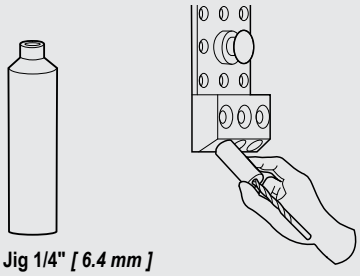
Cordless Clutched Drill

Double Handle Drill

Impact Drill

Tools - Predrilling Jig 1/4 in. [6.4 mm]

The Predrilling Jig ensures precise alignment of the RICON S VS XL 30° inclined fasteners. It guides the drill bit to create accurate pilot hole, and ensures proper fastener seating. The hole in the jig accommodates standard imperial and metric drill bit diameters. For the 3/8 in. *[10 mm]* inclined fasteners, pilot holes 1/4 in. *[6.4 mm]* in diameter and 1 in. *[25.4 mm]* long are recommended.

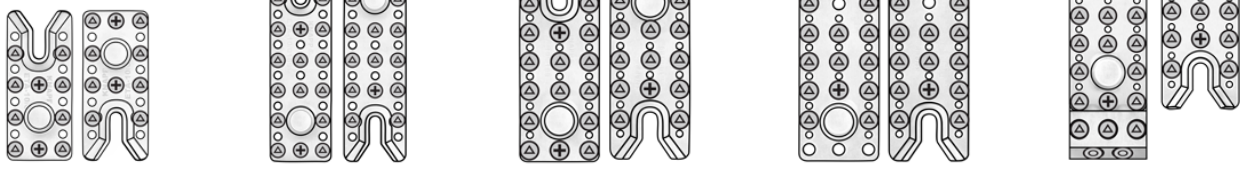


Predrilling Jig 1/4" *[6.4 mm]*

Fastener Layout

Fastener Orientation

- Structural Positioning Screws (without Clip Lock)
- Horizontal Screws
- Inclined Screws



RICON S VS 140 x 60

RICON S VS 200 x 60

RICON S VS 200 x 80

RICON S VS 290 x 80

RICON S VS XL 390 x 80

Note:

1. Alternative locations for positioning screws are required when using a Clip Lock System.

General Installation Steps

Estimated Installation Time

The estimated time for a single person to install a complete RICON S VS product is shown in Table 3

This process includes the following steps:

1. Layout (~10%–15%)
2. Positioning (~15%–20%)
3. Pilot Holes (~20%–30%)
4. Screw Installation (~45%–55%)
5. Optional Measures (not included in the time installation % breakdown)

Table 3 - RICON S VS Estimated Installation Time

RICON S VS Model	Average Installation Time [min.]
140 x 60	9
200 x 60	13
200 x 80	13
290 x 80	14
XL 390 x 80	20

The estimated installation time can be improved upon with efficient fabrication and site practices such as:

1. Drilling pilot holes for the structural positioning screws at the time of fabrication
2. Utilizing templates to drill pilot holes for structural screws
3. Optimizing beam positioning to reduce worker fatigue

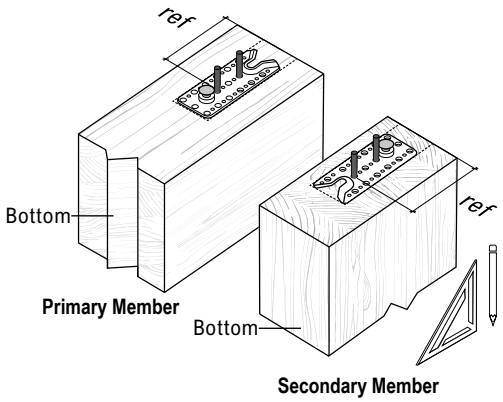
Step-by-Step Installation Guidelines

1.1 Layout - Reference Points

Begin by laying out the installation locations in the primary and secondary members using a pencil and square.

The connector's point of reference is the top of the beam. The **lower structural positioning screw** should be measured from that point of reference.

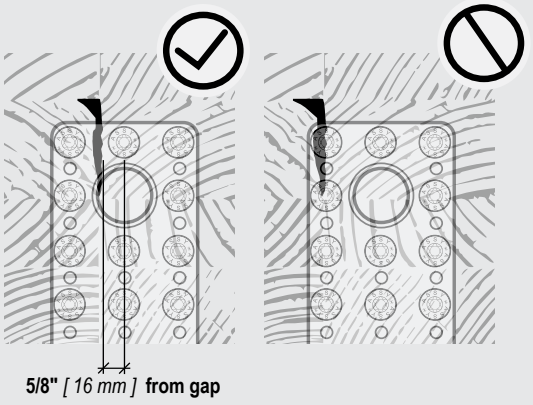
The **collar bolt** should be at the **bottom** on the primary member and on the **top** on the secondary member.



1.2 Layout - Split Lamination Considerations

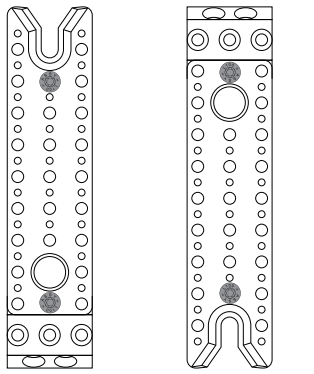
It is recommended that vertical joints in split lamination glulam beams be tight at the time of manufacturing. Gaps between adjacent plies may occur due to wood shrinkage. Gaps up to 1/8 in. *[3.2 mm]* are acceptable for typical RICON S VS installation.

If vertical gaps between plies greater than 1/8 in. *[3.2 mm]* exist in the beam-end, the RICON S VS shall be positioned so that fasteners can be installed at least 5/8 in. *[16 mm]* away from those gaps, as measured from the center of the fastener. Full hanger capacity may be used when installed in this manner.



2.1 Positioning - Structural Positioning Screw Installation

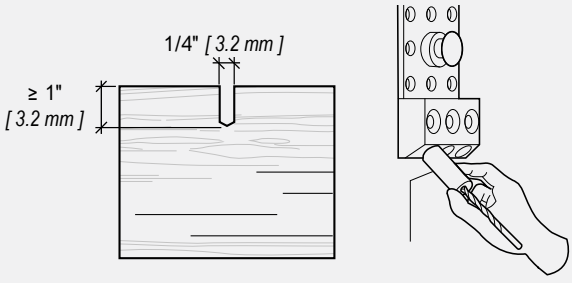
Positioning screws ensure accurate placement of the RICON S VS connector. To facilitate accuracy and installation time, it is recommended to predrill the structural positioning screw locations during member fabrication. Note that structural screws cannot be reused if the connector requires adjustment. Install one structural positioning screw into the hole highlighted at the top of the plate. Check to ensure alignment is maintained and then install the second structural positioning screw into the hole highlighted at the bottom of the plate.



Primary Member **Secondary Member**

3.1 Pilot Holes - Recommendations

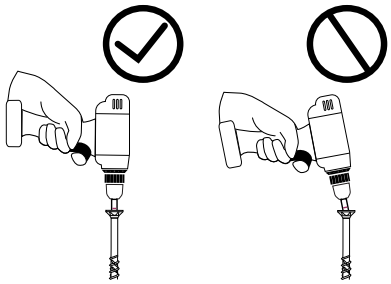
Pilot holes are optional; however, they facilitate screw thread engagement, help reduce splitting risks, ensure a proper penetration path which reduces screw wandering, and reduce insertion torque. For the structural fasteners used with the RICON S VS series, pilot holes 1/4 in. *[6.4 mm]* in diameter and 1 in. *[25.4 mm]* in length are recommended. The use of MTC Predrilling Jig for the inclined screws of the RICON S VS XL is recommended to ensure proper hole placement.



MTC Predrilling Jig

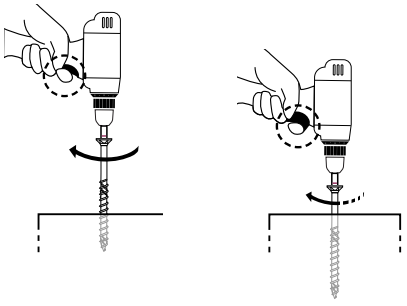
4.1 Screw Installation - Align Drill Bit Axis

Align the drill bit axis parallel to the fastener axis during installation to allow proper torque transmission and to avoid stripping.



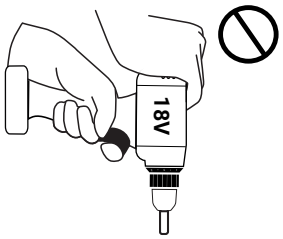
4.2 Screw Installation - Decrease RPM

To avoid overtorquing the screw, decrease the rotation speed about 1/2 in. *[13 mm]* away from the final installed position. This is crucial to prevent wood crushing due to overtorquing, which can impact beam hanger tolerances, potentially impeding overall connection assembly. This is especially important when using an impact drill.



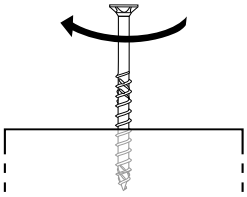
4.3 Screw Installation - Drill Pressure

Do not apply excessive pressure on the drill while driving the fastener to prevent fastener buckling or deviation during installation. Only apply the required force or use the recommended holder case to eliminate cam-out effects.



4.4 Screw Installation - One-Step Process

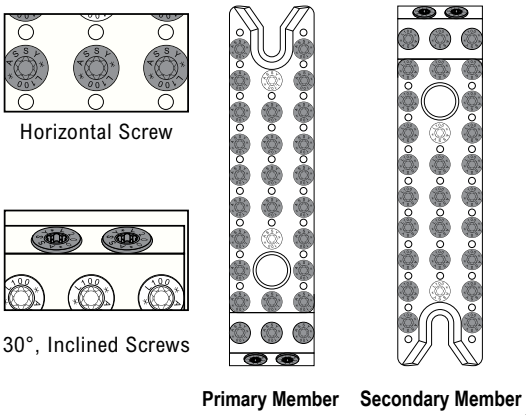
To avoid increased torque peaks caused by stopping and restarting the drive-in process, install the screw in one run until the head is lightly seated against the side member. If necessary, a torque wrench may be used to complete installation immediately after the screw has been driven.



4.5 Screw Installation - Structural Screws

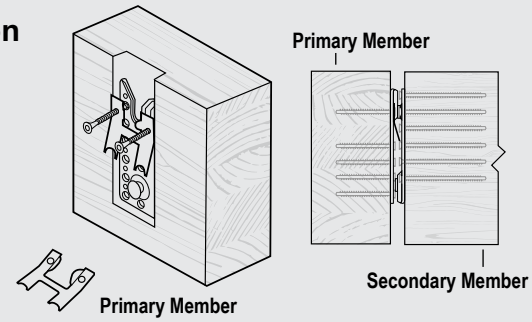
Install properly sized VG CSK screws in all perpendicular holes. If using a Clip Lock system, refer to Step 5.1 and page 37 in the Beam Hanger Design Guide for further information.

For the RICON S VS XL only: install 3/8" x 7-7/8" *[10 mm x 200 mm]* VG CSK screws into all angled holes after all 90° horizontal screws have been installed.



5.1 Optional Measures - Clip Lock Installation

The Clip Lock system must be installed with a modified screw pattern in the primary member. Refer in the Beam Hanger Design Guide page 37 for further details on the screw pattern for the Clip Lock.



5.2 Optional Measures - Wood Plug

Where connectors are housed in the secondary beam, it is recommended to seal the void in the routing below the connector for aesthetics and fire protection. A wood plug may be used, and installation instructions shall be provided by the EOR.