

Instruction manual for AXJ Encoders

This encoders unit is designed for AXJ equatorial mounts as an angular position detector. Your AXJ mount will retain its positioning information on the celestial coordinates if you loosen the R.A. and DEC clamp levers while operation. This will allow you to move your telescope manually while watching the star chart screen on the STAR BOOK TEN controller.

Contents

The unit contains the items below. Check if all the items are included.

R.A. encoder unit (The one with large connector.)

DEC encoder unit (The another one with small connector.)

Retaining rings 2 pcs.

Grub screws M3×4mm 3 pcs.

Grub screws M3×8mm 3 pc

Encoder fitting tool

Allen wrench 6mm

Allen wrench 5mm

Allen wrench 2.5mm

Allen wrench 1.5mm

Allen wrench 1.27mm

Instruction manual

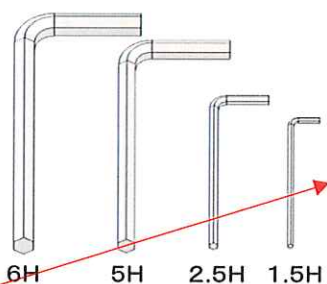
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赤経エンコーダ
R.A.



赤緯エンコーダ
DEC



6H 5H 2.5H 1.5H

六角レンチ

● ● ●
セットネジ
M3L=3 ×3

● ● ●
セットネジ
M3L=8 ×3

固定ネジ



固定リング ×2

Retaining rings



取付工具

Tool

add 1.27mm wrench

How to use the encoder fitting tool

Use the supplied encoder fitting tool to install the encoders on the AXJ mount body and affix them tightly. It has screw thread on one side and two protrusions on the other side. The thread corresponds to the thread on the encoders and the two protrusions are used to fix the encoders on the mount. Use the tool properly according to each stage of the installation.

1) Attach the encoders to the AXJ mount

Screwing down the encoder fitting tool onto the encoder enables you to use the tool as a grabbing part when you attach the encoder to/from the AXJ mount.

Fixing the encoders in place

The protrusion on the encoder fitting tool matches the notches on the retaining rings so that you can screw down the retaining rings tightly.

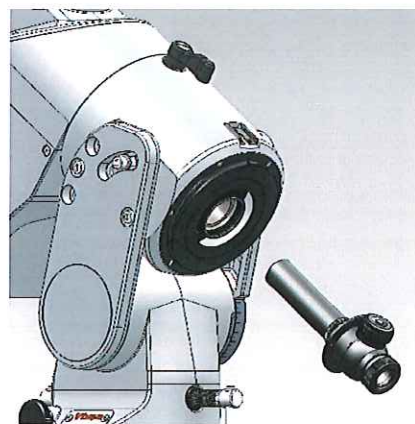


Procedure

How to install the R.A. Encoder unit.

- 1) Remove the polar scope cap.
- 2) Remove the polar alignment scope.

Procedure: Insert an Allen wrench of 1.27mm (the smallest one) on a side in to a hole on the brim of the polar alignment scope as handhold so that you can turn the polar alignment scope counter-clockwise to loosen.



1. Insert the 1.27mm Allen wrench and grab it along with the eyepiece part of the polar scope body.

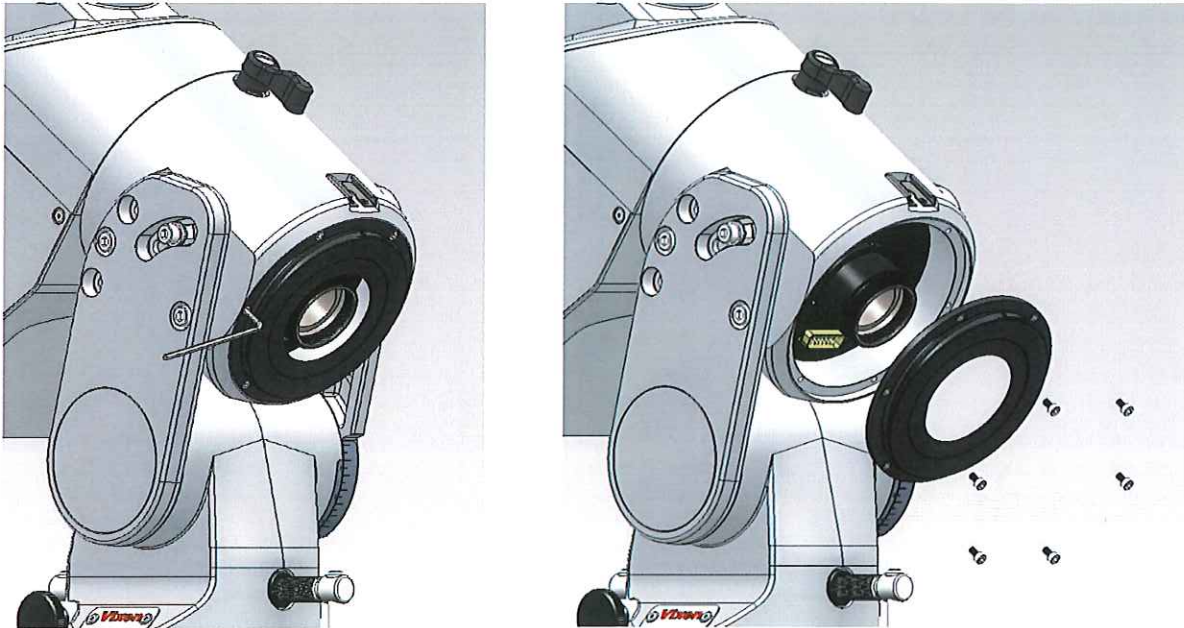
2. Turn the polar scope body counter-clockwise along with the Allen wrench.



3) Remove the rear end cover of the R.A body housing. Remove all the six screws placed evenly on the edge of the rear end cover with the 2.5mm Allen wrench.

Be careful not to lose the screws as they are very small in size.

4) The rear end cover of the R.A. body housing comes off.

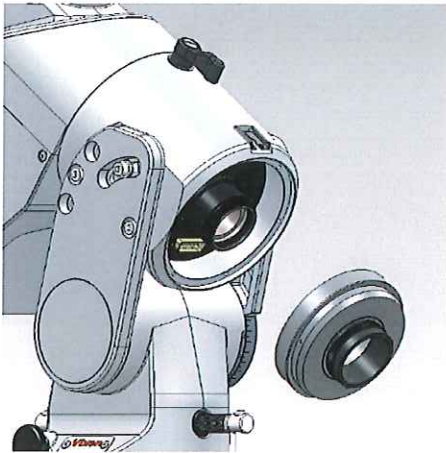


5) Screw the encoder fitting tool down to the R.A. encoder unit.

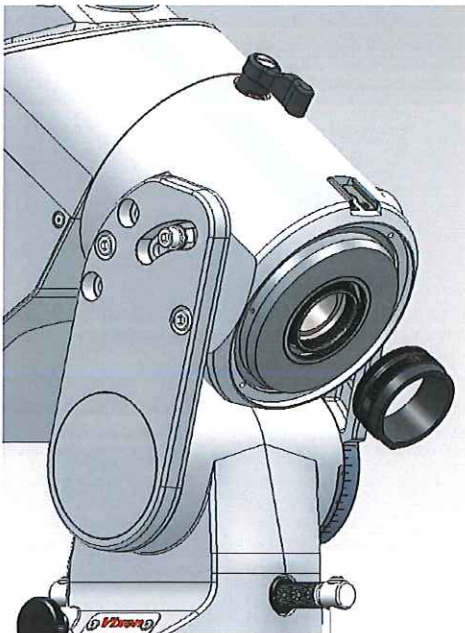


6) With holding the R.A. encoder unit by means of the encoder fitting tool, adjust the position of the connector on the R.A. encoder so that it faces the counterpart connector on the AXJ mount body to install. Insert the R.A encoder unit as deep as it will go and until it is snug.

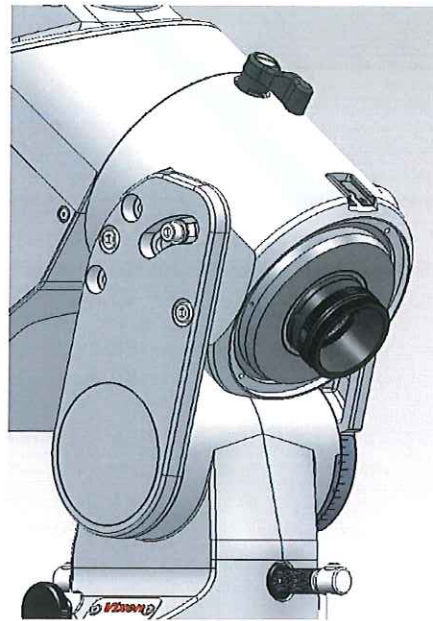
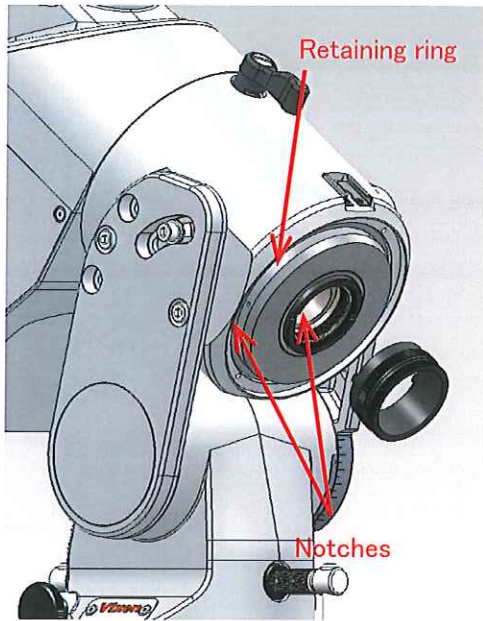
Do not force the encoder down into the mount body as it could cause breakage of the product. Try it again by slightly shifting the orientation.



7) Remove the encoder fitting tool from the R.A. encoder unit once you have successfully installed it to the AXJ mount. The tool won't come off if the encoder is installed properly.

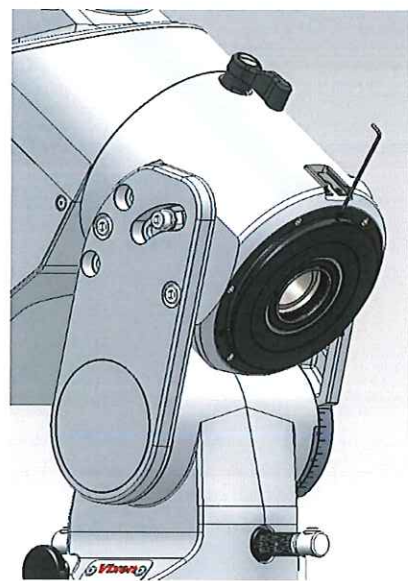
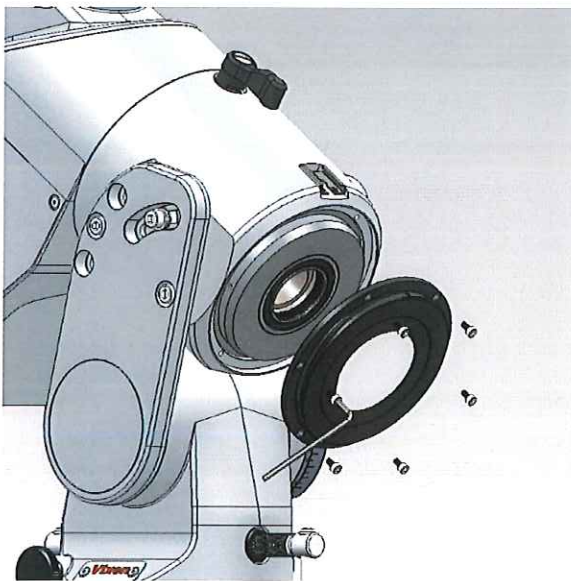


Screw the retaining ring down to the R. A. encoder unit so that the notches on the retaining ring faces outward. Place the encoder fitting tool over the retaining ring so that the protrusions on the tool and the notches face each other. Fit onto the retaining ring and tighten it securely.



Be careful not to be injured by the notches on the retaining ring.

9) Screw the rear end cover back in place.

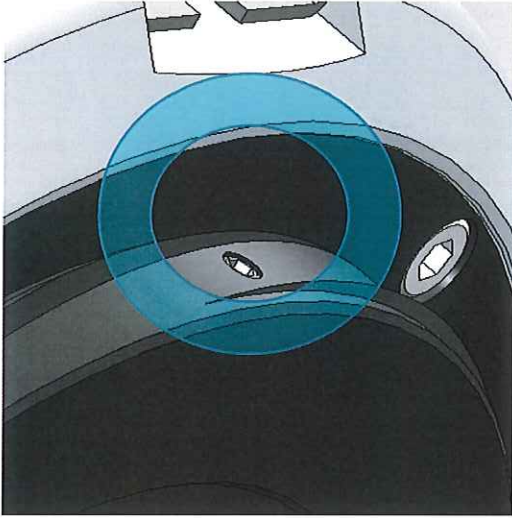


10) Fix the R.A. encoder unit to the rear end cover.

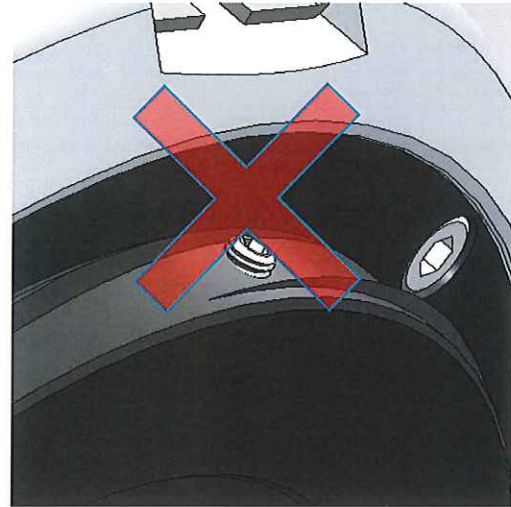
There are three threaded holes for M3 grub screws that are located 120 degrees apart to each other on the side of the rear end cover. Screw the M3x4mm grub screws down onto the threaded holes. Fix the R.A. encoder with Allen wrench of 1.5mm on a side. Tighten each of the grub screws gradually by degree of equal force.

Make sure that M3 grub screws of proper length are used to fix the encoder. Using other M3 grub screws will hinder the polar scope cap from attaching.

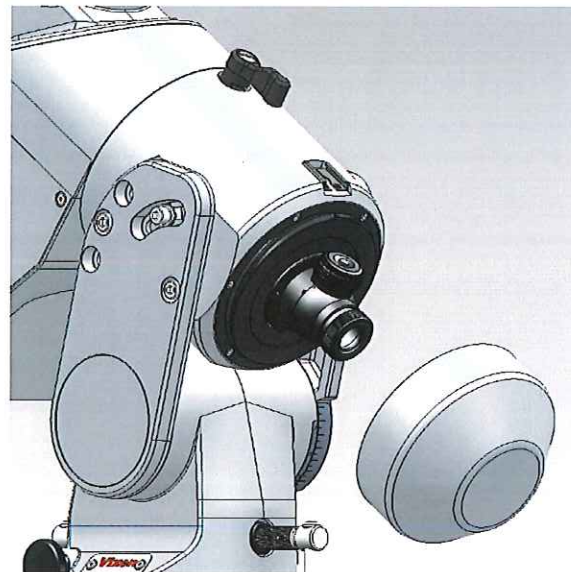
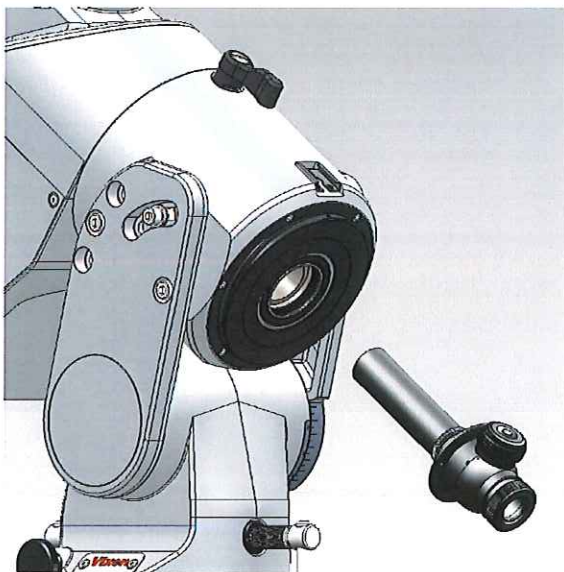
Correct: The top of the screw stays inside.



Wrong: The top of the screw comes outside.

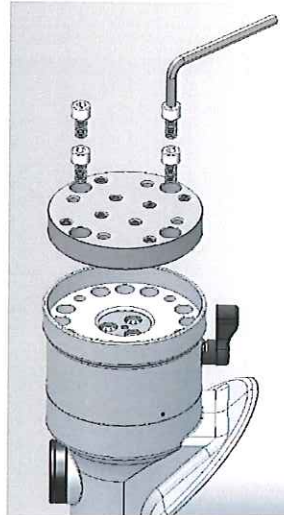
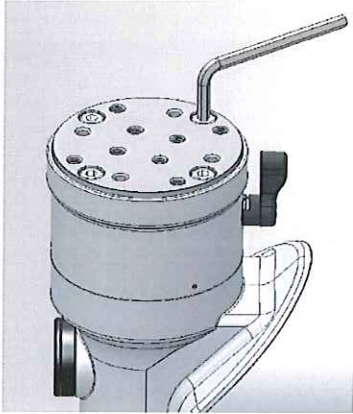


11) Replace the polar alignment screw and attached the polar scope cap to finish the installation.

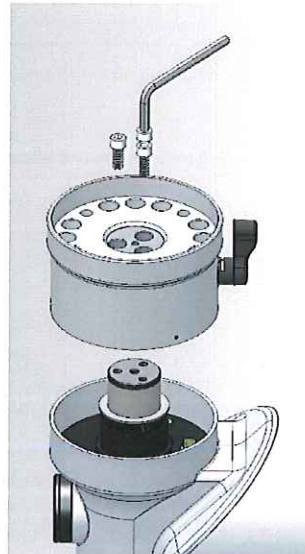
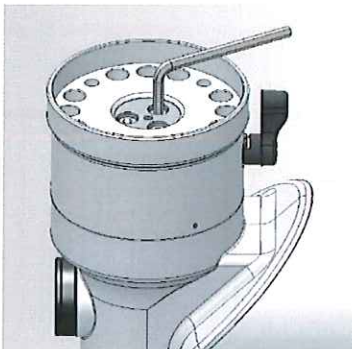


How to install the DEC Encoder Unit.

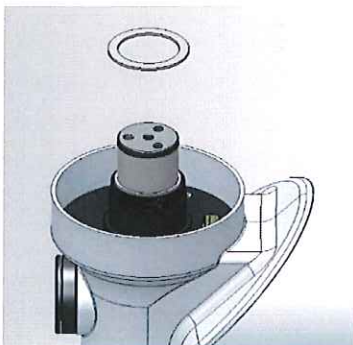
1) Unscrew four socket head cap screws on the mount head with the supplied 6mm Allen wrench to remove the mount head top plate.



2) Unscrew three socket head cap screws underneath the mount head top plate with 5mm Allen wrench to remove the mount head unit.

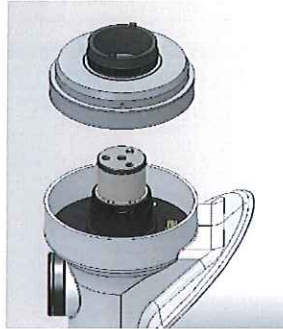


3) Remove the washer from the DEC axis.



4) Screw the encoder fitting tool down to the DEC encoder unit.

5) With holding the DEC encoder unit by means of the encoder fitting tool, adjust the position of the connector on the DEC encoder so that it faces the counterpart connector on the AXJ mount body to install.

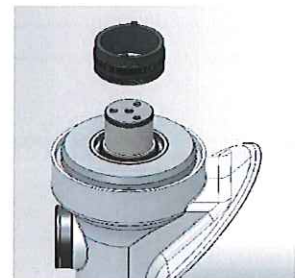


Insert the DEC encoder unit as deep as it will go and until it is snug.

Do not force the encoder down into the mount body as it could cause breakage of the product. Try it again by slightly shifting the orientation.

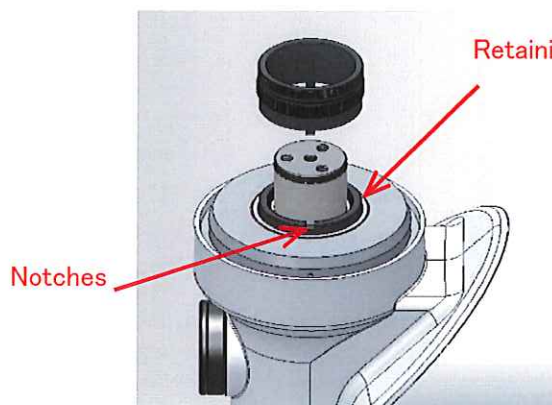
6) Remove the encoder fitting tool from the DEC encoder unit if you installed it successfully to the AXJ mount.

The tool won't come off unless the encoder is installed properly.

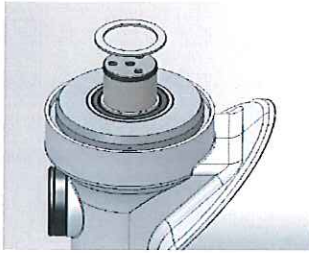


Screw the retaining ring down to the DEC encoder unit so that the notches on the retaining ring faces outward. Place the encoder fitting tool over the retaining ring so that the protrusions on the tool and the notches face each other. Fit to the retaining ring and tighten it securely.

Be careful not to be injured by the notches on the retaining ring.

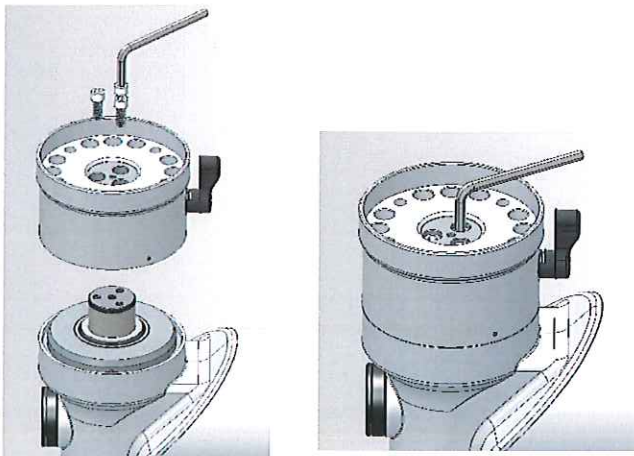


8) Replace the washer in place. Be sure to put back the washer on the DEC axis. Note that the DEC axis becomes hard to rotate without the washer.



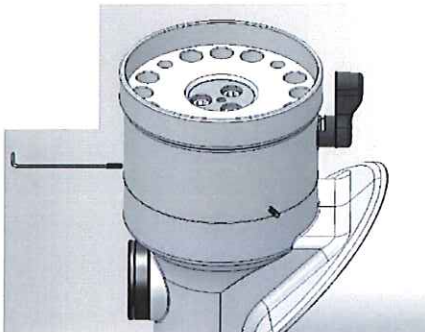
9) Replace the mount head unit in place.

Fix the mount head unit using the three socket head cap screws which were removed in procedure 2. Tighten the socket head cap screws securely with the 5mm Allen wrench.



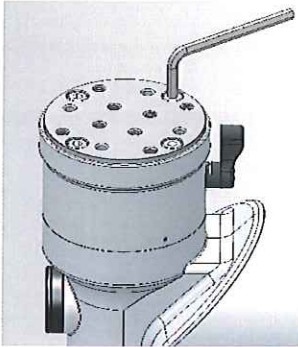
10) Fix the DEC encoder and the mount head unit each other.

There are three threaded holes for M3 grub screws that are located 120 degrees apart to each other on the side of the mount head unit. Screw the M3x8mm grub screws down onto the threaded holes. Fix the DEC encoder with Allen wrench of 1.5mm on a side. Tighten each of the grub screws gradually by degree of equal force.



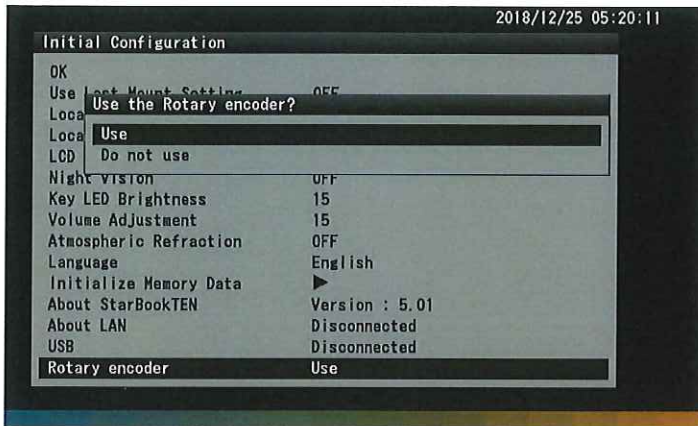
11) Replace the mount head top plate in place.

Fix the mount head top plate using the four socket head cap screws which were removed in procedure 1. Tighten the socket head cap screws securely with the 6mm Allen wrench.



Using the AXJ Encoders

In the “Initial Configuration” menu, choose “Rotary Encoder” to call up the dialog box. Next, choose “Use” to start up the encoders in the dialog box.



Unfasten both the R.A. and DEC clamp levers on the AXJ mount and confirm if the star chart on the screen of the STAR BOOK TEN changes as you slew the mount in R.A. and DEC directions.

Note:

The encoder function does not appear on the screen of the STAR BOOK TEN correctly if the versions of your STAR BOOK TEN are previous to version 4.30. Be sure to update to version 5.00 when you use the AXJ encoders on the AXJ mount.

Be sure to tighten the R.A. and DEC clamp levers while you use the automatic Go-To function. It will not be completed if the clamp levers are set in a loose position.

Do not rotate the R.A. or DEC axis very quickly more than 1 second per rotation when you turn it by hand.

Do not rotate the RA or DEC quickly at speed of more than 1 second per rotation when you turn it by hand. The encoders will fail to read the signals. It is advisable to turn the R.A. and DEC slowly.

Specifications

	R.A. Encoder	DEC Encoder
Applicable to	AXJ equatorial mount	
Sensor type	Reflective type laser sensor×2 ※1	Reflective type optical sensor
Scale	Reflective rotary disc made of glass	Reflective rotary disc made of PET
Resolving power	0.1arc second	0.2arc seconds
Periodic error ※2	<0.5arc sec. rms (typical)	-

Power supply (from AXJ mount)	DC5V 0.2A	DC5V 0.1A
Electric terminal	D-SUB15PIN female (Connected to AXJ)	D-SUB9PIN female (Connected to AXJ)
Operating temperature	0~40°C	
Size	Φ99.5×27mm (excluding protrusion)	Φ99.5×25mm (excluding protrusion)
Weight	350g	320g

※1 This is Class 1 Laser product. (IEC60825-1:2014)

※2 Periodic errors at celestial tracking speed when installed to the AXJ mount (according to the method of measurements prescribed by Vixen).

Dimensions

