Rowan Astronomy

NEQ6 Zero Backlash RA Worm Mounting Kit.

Thank you for your purchase. Please read these instructions fully before fitting.

Your package should contain – 1 x ZB-RA6 worm mount assembly. 2 x M6x35 long socket cap screws 2 x M6x50 long socket cap screws 2 x allen keys, 2.0, 3.0mm

Installation.

The installation of the Zero Backlash worm mount requires the mount to be disassembled which needs a degree of mechanical skill. Please seek local help if you are unsure of any of the techniques required.

The installation of the ZB worm mount requires the mount to be converted to a belt drive.

If a belt drive is being installed at the same time please refer to those instructions in conjunction with this document.

Additional tools are required to those supplied with the kit.

We recommend leaving the mount on its tripod and placing a clean and clear working table along side. Keep all bearings, worm wheels and parts completely free from dirt, dust and contamination.

1. Remove 4 x screws from control panel.



2. Taking anti-static precautions disconnect the motors and polar illumination leads from the circuit board on the reverse of the control panel.



3. Remove the polar scope.



4. Remove 4 M4 grubscrews from the RA polar scope collar and remove the RA pointer.



5. Using grips loosen the polar scope mounting collar. Protect the surface using thick card. An alternative to grips is to use an automotive oil filter wrench.



6. Remove the RA axis clutch lever and loosen the brass clutch bolt several turns.



www.rowanastronomy.com © Copyright Rowan Engineering Ltd. 7. Withdraw the RA axis shaft assembly from the main housing. It may be necessary to use a soft faced mallet to gently tap out the shaft. Note the position and number of any plastic shim washers.



8. Loosen 2 socket cap bolts marked A and remove completely 3 bolts marked B. Carefully withdraw the RA motor from the housing taking care not to snag the tooth belt. Then remove the lower plate too.



9. Loosen the RA worm engagement grub screws.



10. Remove 4x M6 socket cap screws from the RA worm housing.



11. Remove the worm housing from the RA shaft.



12. Remove the worm end caps with the removal tool or circlip piers.



13. Using the bearing nut removal tool remove the slotted nut from the worm housing.



14 Remove 2x M4 grub screws from the 47T pulley and remove the worm shaft from the side of the housing.



www.rowanastronomy.com © Copyright Rowan Engineering Ltd. 15. Remove the 5 x M4 socket cap bolts from the zero backlash worm housing. Note the low profile cap screw in the centre position.



16. Remove the worm block from the housing and remove the slotted nut and right side bearing only.



17. Take the worm, pulley and belt and fit to the ZB worm block. Fit the slotted nut to the assembly. Lightly tighten the slotted nut just enough to remove any axial play in the worm.



18. Replace the worm block in to the housing and replace the worm end cap.



19. Replace 5 x M4 socket bolts and gently tighten.



20. Carefully feed the belt through the slot in the main casting while re-fitting the ZB worm housing.



21. Fit new 4 x M6 socket head screws and leave just finger tight. Final worm-wheel mesh adjustment can be carried out last.



22. Remove the 2 RA setting circle thumbscrews. Place to one side in a safe place.



23. Replace the RA shaft in the main bearing housing taking care to refit any spacer washers in the correct position. Replace the RA clutch lever.



24. Replace the Polar scope collar and gently tighten to pre-load the RA bearings. Gently tighten the 4 x M4 grub screws in the collar. Replace the polar scope pointer.



25. Replace the lower RA motor mounting plate using tweezers to align the belt in between the idler rollers.



26. Refit the RA motor and engage the pulley with the belt. Replace 3xM4 cap bolts and apply light tension to the belt.



27. Connect the motors and polar illumination led to their respective sockets on the control board.



28. Fit the control panel in position checking that the cables are routed so as not to touch any moving parts.

Continued next page.

29. Worm gear mesh adjustment.

The 4 x M6 socket head bolts left finger tight from earlier steps should be just loose enough to allow the worm housing to move when the worm-wheel adjustment screws are turned.

The photo below shows the RA screw that tightens the worm wheel mesh. The opposing screw on the opposite side of the housings releases the mesh. Before tightening one screw, always loosen the opposite screw.



With the RA axis clutch locked take hold of the axis and gently 'feel' for play in the worm-wheel mesh. Slowly screw in the grub screw and progressively feel as the backlash becomes less and less until the worm just makes contact with the worm gear and the backlash is essentially zero.

Then turn the grub screw <u>a further $\frac{1}{4}$ turn</u> in to preload the worm in to the worm gear.

Gently tighten the 4 x M6 socket bolts to secure the worm housing.

Run the mount a full 360' stopping every 20-30 degrees or so to check there is no binding or backlash at any point.

If backlash is felt at any point turn in the grub screw 1/16 turn to close the worm mesh.

If binding does occur it will be necessary back out the worm mesh 1/16 turn on the grub screws and try the 360' slew test again.

When the mesh setting is complete the outer grub screws in the base of the worm housing labelled B in the photo below can be set.

These screws limit how far the worm can spring away from the worm gear in the event the mount is bumped or becomes accidentally highly imbalanced. Loosen both locknuts and screw both grubs screws in until they feel to just make contact with the worm block. Then back them out ½ turn and lock them in position with the lock nuts.

The zero backlash RA conversion is completed.



If working on your mount in the future, remember to release the belt tension and remove the motor assembly before separating the worm block.

For further information or advice about fitting the Zero Backlash RA kit please e-mail Rowan Astronomy at sales@rowanastronomy.com

A .pdf version of this instruction sheet with higher resolution photos is available in the support section of www.rowanastronomy.com