



Building Instruction & Manual



KH -283 Outrunner Motor Kit Version 2
(Stick Style)



Introduction

Congratulations on your purchase of KH-283 Outrunner Motor Kit Version 2. KH-283 V.2 is a modified motor kit designed for powering 3D and Aerobatics RC airplanes. Modelers can choose either back mount style or stick style to meet the airplane requirement.

KH-283 V.2 powered with 2mm thickness curved NdFeB magnets. It delivers excellent acceleration for hovering and performing aggressive 3D aerobetic maneuvers. By the latest design of 9 degrees magnet gap, the motor can be started-up and run smoothly.

KH-283 V.2 motor kit includes high quality hardened steel main shaft and pre-assembled precision end-bell and flux ring. Those parts are produced by advanced technology. It allows the motor running at high rpm without vibration. Motor builders can utilize three-screw lock system to install and change main shaft without gluing. If you are a serious motor builders or modelers, Komodo Outrunner Motor kit is the only choice for you.

Warning

Radio Control Model and Outrunner Motor Kit are not toy!!! It contains sophisticated small parts and is designed for hobby use only. All parts of this outrunner motor kit have to be assembled and operated with great care. Outrunner motor can produce very high power to turn gear or spin propeller. It is capable of causing property damage and all bodily harm to operator or spectators. If you are a beginner of motor builder, please seek assemble and operational help from experienced motor builder.

Be caution!!!

If this outrunner motor kit is not assembled and operated properly, it can destroy your electronic speed control, receiver, batteries and relevant equipment completely.

Parts List

(QTY)	Items
(1)	Pre-pressed End-Bell and Flux Ring
(2)	23.8mm Stator
(2)	Ball Bearings
(1)	3.17mm Hardened Steel Shaft
(1)	40feets, AWG 23 Enameled Magnet Wire
(12)	NdFeB Curved Magnets
(1)	Propeller Saver
(2)	Propeller Saver Replacement Rings
(1)	O'ring
(3)	Connector Pairs (Male and Female)
(7)	Shrinking Tubes
(3)	M3 x 4 Screws
(2)	M3 x 8 Screws
(1)	C-Clip
(1)	Bearing Tube

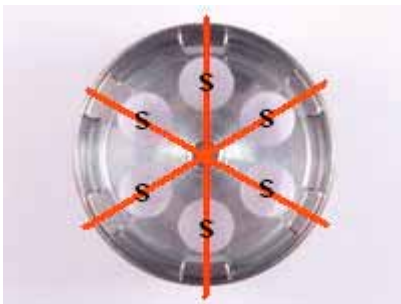


1. Marks color to magnets



Use marker to mark different color to North Pole and South Pole.

2. Place magnets inside the bell



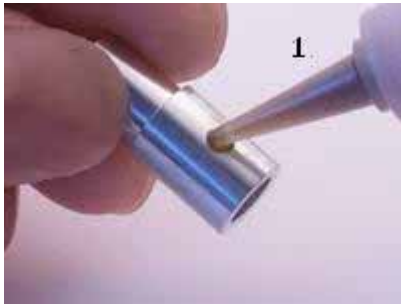
First, place six South Pole magnets inside the bell and aligned it with six vent holes. Then, use a drop of CA to secure the position of magnet.



Second, place six North Pole magnets in between South Pole magnets. Use a small clip to adjust the magnets until all magnets placed evenly. Then, use a drop of CA to secure the position of magnet.



3. Insert Bearing Tube into Two Stators



First, put Loctite to the whole area of bearing tube shoulder.



Second, insert the bearing tube into two stators until the bearing tube shoulder touch the edge of stator.



Third, align the stator teeth and wait for the Loctite dry.

After the Loctite dry, you can go to the next step, Winding.



4. Winding

It is an example of using three individual magnet wires to complete a 3-phases system. We recommend beginners to wind 10turns for their first motor. For experienced motor builders, they can wind more or less turns to get different potential power. Note: Since the last turn is not a complete circle, you need to wind 11times to get 10turns' power. Make sure that every coil has same number of windings.

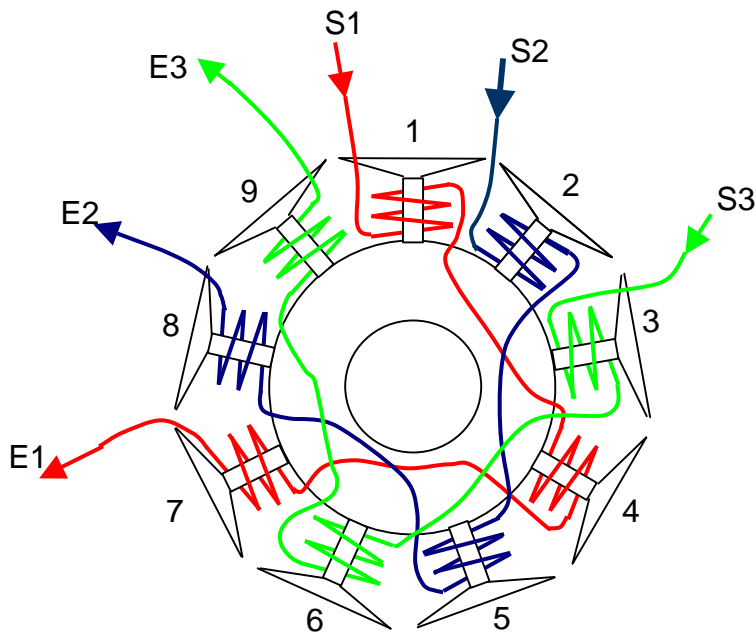
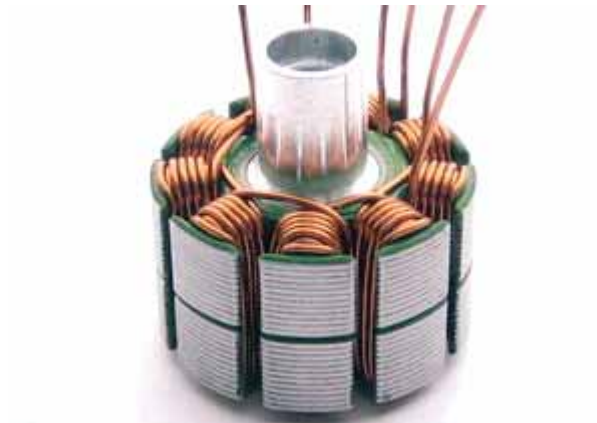


Diagram of winding system of 9-pole stator



Phase 1



Step (1): Remain 7-8cm long magnet wire for connection use afterward.
Use magnet wire “S1” to start to wind 11times in clockwise direction at tooth No.1. Wind from the hub to the outer edge of hammerhead then back to the hub.

Step (2): Jump to tooth No. 4 and start to wind 11times in clockwise direction as step (1).

Step (3): Jump to tooth No. 7 and start to wind 11times in clockwise direction as step (2).

Step (4): Cut the magnet wire “S1”. This ending of wire will be called “E1” in the following steps. Note: Remain 7-8cm long magnet wire for connection use.

Phase 2



Step (5): Remain 7-8cm long magnet wire for connection use afterward.
Use magnet wire “S2” to start to wind 11times in clockwise direction at tooth No.2. Wind from the hub to the outer edge of hammerhead then back to the hub.

Step (6): Jump to tooth No. 5 and start to wind 11times in clockwise direction as step (5).

Step (7): Jump to tooth No. 8 and start to wind 11times in clockwise direction as step (6).

Step (8): Cut the magnet wire “S2”. This ending of wire will be called “E2” in the following steps. Note: Remain 7-8cm long magnet wire for connection use.



Phase 3



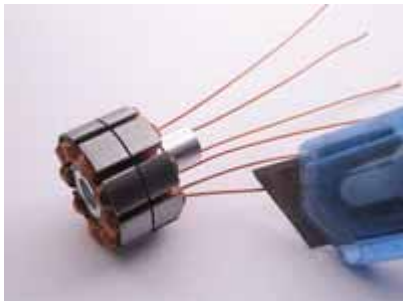
Step (9): Remain 7-8cm long magnet wire for connection use afterward.
Use magnet wire “S3” to start to wind 11times in clockwise direction at tooth No.3. Wind from the hub to the outer edge of hammerhead then back to the hub.

Step (10): Jump to tooth No. 6 and start to winds 11times in clockwise direction as step (9).

Step (11): Jump to tooth No. 9 and start to wind 11times in clockwise direction as step (10).

Step (12): Cut the magnet wire “S3”. This ending of wire will be called “E3” in the following steps. Note: Remain 7-8cm long magnet wire for connection use.

3. Remove the coating of magnet wires



When you finish the winding steps above, you have 6 endings of magnet wire attached to coils. Use a shape model knife to scrape off the coating of these six magnet wires.

Then, it is necessary to check any short between magnet wire and stator metal, and need to check any short between magnet wires, S1, S2 and S3. If you find any short between them, please be patience to rewind them again.

Note: your Electronic Speed Controller, Receiver and Battery can be destroyed by part defect of windings.



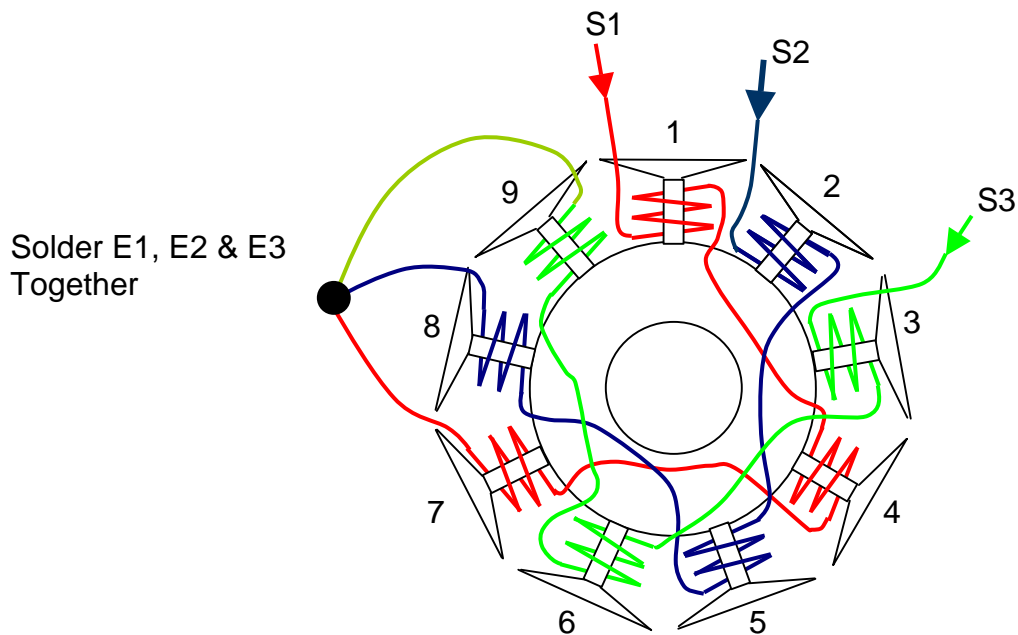
4. Solder magnet wires to Delta or Wye system

Now, you can make your own decision to solder the magnet wires to either Star (wye) or Delta system.

Star vs Delta

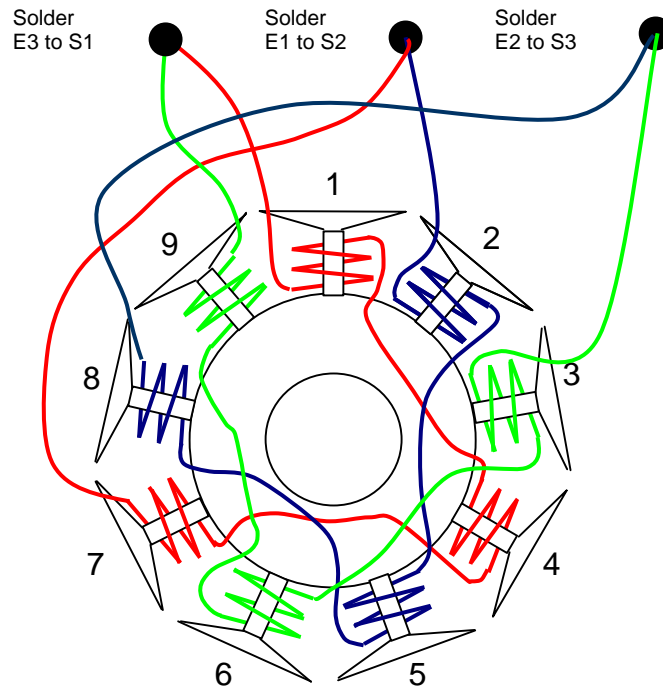
- ✓ Star (wye) system gives more torque and uses fewer amps.
In Star system, 1.73 less turns need to be wound to get the same power and Kv as DELTA system does.
- ✓ Delta system gives 1.73 higher power and amps draw compare to STAR system.
In Delta system, the Kv is 1.73 higher than Star system while the Kt (Torque) is 1.73 lower

Star (wye) system





Delta System



5. Insert three soldered wires to Shrinking Tubes



Now, you have three soldered wires attached to coils. Insert those soldered wires into shrinking tubes for insulating.



6. Place ball bearings to bearing tube.



7. Insert a main shaft to endbell and put the wound stator into the bell.



8. Put a c-clip to the slot of main shaft.



Put a C-clip to the slot of main shaft to secure whole motor system.

9. Place three screws at the end-bell.

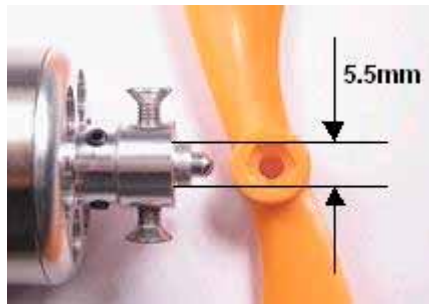


Place three M3 x 4 screws to end bell to secure the position of main shaft. Each screw must be turned a bit by each time until all screws tighten up.

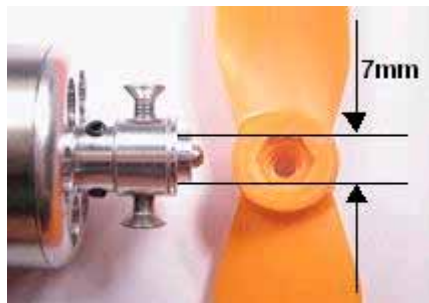


10. Propeller saver and Replacement rings

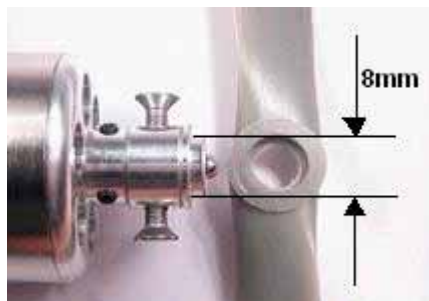
By using the propeller saver and replacement rings, it not only protects your propeller from hitting the ground but also let you install different brand of propeller easily.



GWS 5.5mm



GWS 7mm



APC 8mm





Warning!!!

The Propeller Saver uses only one O-ring to hold a propeller. As long as the motor starts to run, the propeller has possibility to fly out from the Propeller Saver Hub. It can cause all bodily harm, property damage, kits loss and death results. User must wear protective goggle and protective mask and protective cloth and make sure nobody close to the propeller before run the motor.

By using or installing the propeller saver in any, you agree to and understand the high risk of using propeller saver. It is your own decision to use the propeller saver or not. Komodo Hobby (Trading) Company has no control over of it, no liability may be assumed, nor will any liability be accepted for crash damage, property damage, kits loss, all bodily harm and death resulting from the use of the propeller saver.

Congratulation!

You finished the assemble work of your unique outrunner motor project. For more other selections of outrunner motor kit, please visit the site at www.komodohobby.com

Should you have any comments of this outrunner motor kit, please feel free to contact us at enquire@komodohobby.com

