

## NEO 400-920 Manual (version-3)

<u>Airplane Type</u>	<u>Pounds</u>	<u>Ounces</u>	<u>Grams</u>	
Trainer or Slow flyer:	< 2.0	< 32	< 906	based on 11.1V (3s LiPo)
Aerobatic:	< 1.5	< 24	< 679	based on 11.1V (3s LiPo)
3D or Unlimited:	< 1.0	< 16	< 453	based on 11.1V (3s LiPo)

**Voltage range:** 10V – 24V, suggesting 3S-5S LiPo, NiCad and NiMH are also acceptable

**Props:** 9x7 to 11x4.7 Electric type props

**Brushless ESC:** 20A and up

### SPECIFICATIONS

- Diameter: 28mm (1.10 in)
- Shaft Diameter: 3.17mm (1/8 in)
- lo: 0.7 (no load current)
- Length: 31mm (1.22 in)
- Kv (rpm per Volt): 920
- Max Amp: 20A (100<sup>≡</sup> C or 220 F)
- Weight: 60g (2.1 oz)
- Max Watts: 150
- Resistance: 223 mΩ

### FEATURES

- Direct drive
- Quiet operation
- Reversible shaft
- Spare motor shaft
- Built for today's power demand
- Dual ball bearings
- High temp Neodymium magnets
- Complete installation tools & hardware
- Superior climbs
- Female ESC connectors
- Rear prop mount system
- multiple installation methods

### FINDING THE RIGHT POWER SYSTEM (simplified)

- 75 Watts per pound or 16 oz. ⇒ Trainer and slow flying scale models
- 100 Watts per pound or 16 oz. ⇒ Sport aerobatic and fast flying scale models
- 150 watts per pound or 16 oz. ⇒ 3D or unlimited maneuvers

• **Watts = Volts x Amps**

• **1 pound = 16 ounces = 454 grams**

• **1 Horsepower = 746 Watts**

1. Determine your model's gross flying weight. (Example: 27oz)
2. Identify your flying style for your model, (Example: 3D style flying)
3. Calculate your model's power or Watts requirement using the above base chart. (Example: 27oz 3D type of model requirement = (27 / 16) x 150 = 253.125 Watts or approximately 253 Watts)
3. Identify which NEO motor you will need. (Example: Need 253 W => NEO-480, because it is under the 280W)
4. Determine which kv motor within your power range is better for your usage. (Example: In this case you may prefer 900kv or 1,000kv to 1120kv because you have a 3D type of model. In general, lower kv, rpm per volt, motor generally will have greater torque than a higher kv motor of equal size.)
5. Select ESC: (Example: Calculate the approximate current draw using Watts = Volts x Amps formula, 22.8A = 253W / 11.1V. Now we have estimated that your motor will draw an average of 22.8Amp in a static situation. In this particular case we would choose the next higher Amp ESC such as a continuous 25A ESC or greater for a better margin of error.)
6. Select battery: (Example: your LiPo selection would be a little more difficult, because you will need to consider balancing. However, keeping most information intact, you will require the LiPo battery to be able to discharge at an average of 22.8Amp or better. Therefore a 2100mah LiPo with 25C (continuous discharge) will be fine because 25C rating on a 2100mah = 25 x (2100/1000) = 52.5Amp continuous draw. A 1320mah with 20C = 20 x (1320/1000) = 26.4A, which is also fine, because it is above 22.8Amp requirement. However a 15C rated 1320 pack will not be sufficient, because your motor's max current demand exceeds the battery pack's 19.8A continuous discharge ability.)
7. Estimate minimum static run time: (Example: You selection at this point will depend on weight balancing and run time. 2100mah provides a minimum run time at full power of 5.5 minutes = (2100 / (22.8 x 1000)) \* 60. 1320mah provides a minimum run time at full power of 3.5 minutes = (13200 / (22.8 x 1000)) \* 60.)

### PRECAUTIONS

- Disconnect batteries whenever not in use.
- Always insulate exposed connector and wiring.
- Do not insert the screw beyond the 4mm into the motor.
- Always check the motor mounting screws to insure security.
- Avoid running your motor under dusty or wet condition.
- Do not attempt to straighten motor shaft without professional assistance.
- Organic solvent or cleaners washes out grease thereby shortening your motor life.
- Avoid overheating beyond the recommend temperature.
- Beware of foreign substance such as small screws or metal debris falling or sucked into the motor.
- Electric power system is quiet, but equally hazardous to user and spectators
- DO NOT cut the motor wires. Remove connectors by properly unsoldering. Cutting the motor wires is an improper modification of Neodym brushless motor. The process may cause your motor to fail, and will revoke your warranty. The motor wires are direct extension of the motor winding, and have clear insulation.

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### INSTALLATION

1. Solder and insulate the 3 female connectors, to your sensor-less brushless speed control (20A or better)
2. When mounting the motor, make certain that the screws DO NOT protrude 4mm past the inside of the end-bell. Any more can damage the copper windings inside of your brushless motor, resulting in an electrical short.
4. Identify the best installation method and direction in order to maximize access, CG balance while reducing interference. Please consider using a motor mount or building a motor box to maximize your model's appearance and effectiveness.

**Method A:** Mount the motor and x-mount directly to the outside of the firewall.

1. Drill a hole on the thrust line in the firewall so that the motor shaft can pass through.
2. Mark and drill out holes that the mounting screws using the X mount as a template.
3. Secure your motor onto the X mount using the counter sunk screws
4. Secure the X mount to the firewall.
5. Secure the prop mount assembly to the rotating portion, rear end-bell, with the hex cap screws.
6. Tighten the prop to the assembly by rotating the prop nut clockwise. The prop nut should be tightened with a small diameter screwdriver or hex wrench.

Note: We recommend dabbing a small amount of thin CA to further stiffen the screw area in the firewall.

**Method B:** Mount the motor inside the fuselage (requires a prop adapter that will fit over the shaft diameter).

1. Drill a hole on the thrust line in the firewall so that the motor shaft can pass through.
2. Mark and drill out holes that the mounting screws using the X mount as a template.
3. If you are limited in space, you can mount the motor directly into the motor without the X mount (go to 6)
4. Secure your motor onto the X mount using the counter sunk screws.
5. Secure the X mount to the firewall.
6. Secure an after market cullet type prop adapter assembly to the protruding motor shaft.

Note: We do recommend dabbing a small amount of thin CA to further stiffen the screw area in the firewall.

5. Install your Neodym brushless motor onto your vehicle accordingly (Method A or Method B).

### OPERATION

1. Connect your speed control your receiver, and then connect your motor to your brushless speed control (ESC).
2. Connect your speed control to your battery pack.
3. Check if your brushless motor is turning in the proper direction. If not, then swap any 2 of the 3 connectors between the motor and the speed control. Your Neodym brushless motor will now turn in the proper direction.
5. Disconnect your speed control to your battery pack.
6. Connect your speed control to your battery pack.
7. Install the propeller on the motor shaft.
8. Consult your speed control instruction included for proper setting and timing.
9. Once the battery is connected to the motor, please use extreme caution, and stay clear of the propeller.

#### **Warranty and Repair Policy:**

Your Neodym Brushless Motor is guaranteed to be free from original manufacturing defects in material and workmanship 30 days after the purchase date. This warranty does not cover any component parts damaged by use, misuse, unauthorized service or any form of modification. CERMARK assumes no liability for damages caused during the installation of this motor. At no time will CERMARK be responsible for any damages caused during the operation of this motor. CERMARK reserves the right to modify this warranty at anytime.

In the event that you require warranty service, please include your original sales receipt verifying the proof-of-purchase date. Providing that warranty conditions have been met, your motor will be repaired or replaced free of charge at the discretion of CERMARK service department. Please see your local hobby shop or contact CERMARK for details.

#### **Non-Warranty Repairs:**

- 1) Please call CERMARK at (562) 906-0808 to set up a MRA #. Please follow the instruction provided by staff.
- 2) Please print your name, return address, telephone #, and email inside the returned carton.
- 3) Include a brief description of the problem(s) you experienced or found.
- 4) Include specific instructions, if you wish your motor to be processed differently.
- 5) Please make certain that the MRA# (provided by our staff) appears on the outside of your carton

**Customer Service:** (562) 906-0809, [customerservice@cermark.com](mailto:customerservice@cermark.com) or [sales@cermark.com](mailto:sales@cermark.com)

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