



TORCMAN BRUSHLESS MOTORS

User Manual for „*SUPERMAN Gear Motors*“

Dear Customer and Torcman User,

Welcome to the community of TORCMAN pilots and thank you for deciding to go with our products. We wish you a lot of fun and success when using your new High Torque Engine.

Your Torcman-Team

Please read this manual carefully before using our motors and follow the instructions. The manual describes all necessary hints for installation, operation and maintenance and guarantee a long life without troubles . If you do not follow these instructions you take the risk of damaging or destroying the product and loose warranty.

For all kind of questions please contact our hotline or write an email to info@torcman.de .

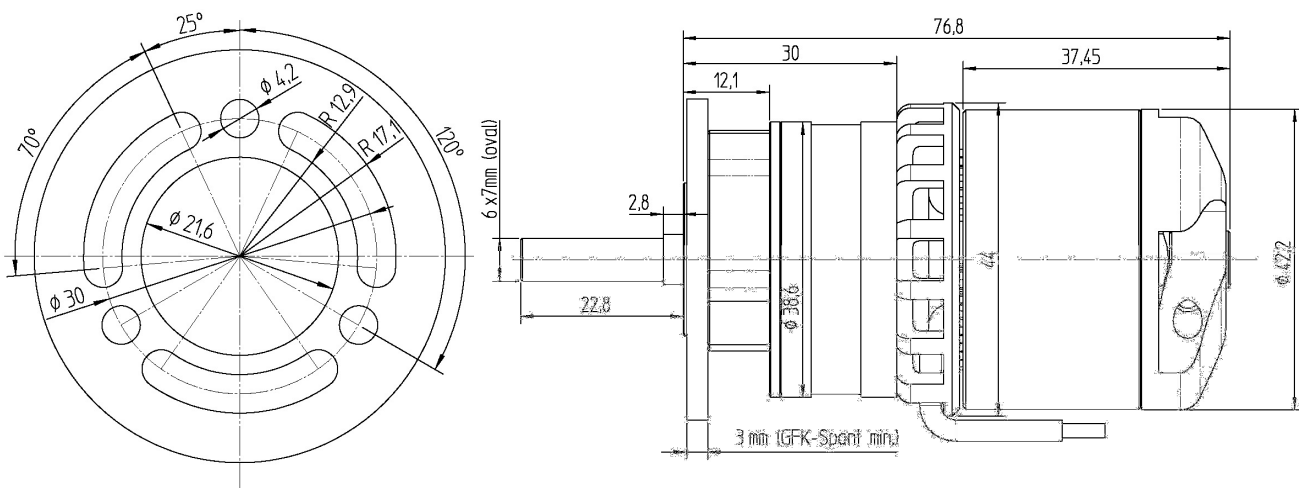
A lot of information can also be found on www.torcman.de

General Information :

All motors of the TORCMAN - „*Superman-Series*“ are 3 phase brushless outrunner motors with directly adapted planet gear. These motors need an electronic commutation by a brushless controller, due to the higher revs of these motors, the requirements for the controllers are higher – they need to be able to commutate upto 120000 to 200000rpm. We recommend to go with **Jeti Spin** Controllers, but most actual controllers from other suppliers can perhaps do the job also. Please ask the respective company for further information. If the controller doesn't have automatic setting or a preconfiguration for brushless outrunners, please make sure to set the correct timing manually. The motor will only then work efficient and in a safe temperature range. Timing settings see later in this text.

Installation and Operation of TORCMAN-Gear-Motors

Gear Motors always have to be mounted behind the motor rib, which has to be rigid enough to carry the high torque and power of these motors. The rib has to be perforated with cooling hoses – we recommend to use Epoxy-Glass-Ribs supplied by TORCMAN or build you own according to the drawing below. When mounting the gear to the rib, the max. screw-in depth for the M4-screws is 8mm and must not be exceeded. Please shorten the screws if required !



The prop adapter has to be located as close as possible near the motor rib to reduce the radial force applied to the shaft to a minimum and protect the ball bearings of the gear.

The adapted gears (Reisenauer Superchief 4:1) are equipped with an oval shaft 6x7mm made of Titanium. They may only be used with adequate prop adapters supplied by TORCMAN or Reisenauer .



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Electrical Connection :

Connect the 3 wires of your motor to the 3 cables on the controllers motor side. We recommend to do this by direct soldering and isolation or by using high current gold plated contacts. The assignment of the 3 contacts is not important, if the motor rotates the wrong direction, please exchange two of the 3 wires against each other. In addition, some controllers allow also to switch the rotating direction with programming features.

Please be aware, that the motor cables must **not** be cut or shortened, because they are only the motor winding wires lead through the housing. Also multiple hard bending can break the wires and damage the motor. Fix the cables at the fuselage wall to avoid touching the rotating outside parts of the motor.

Operation :

Recommended manual settings for TORCMAN-Gear-Motors :

Timing	: 18 – 24Deg (Hacker Step 3) for normally loaded motors
Timing	: 25 – 30Deg (Hacker Step 4) for high loaded motors
Switching Freq.	: 8kHz
Acceleration	: Soft to Medium (0.5 – 2 sec)
Brake	: Soft to Medium (0.5 to 1 sec)

Controllers without the ability for setting the timing in degree steps should be set to “*Motors with 10 or more poles*”. Please consult the respective controller manual or supplier for detailed information.

We recommend to do the first programming without a prop attached to avoid damages or injury, caused by wrong handling or operating error. First airborne tests should only be done when all ground tests have been passed and the motor runs smooth and as expected. Avoid to long running times on ground because of overheating danger.

Running TORCMAN motors with conventional controllers for brushed motors or by directly connecting them to a power source **is not possible** and will destroy the motor.

TORCMAN motors are designed for temperatures up to 80° Celsius (176F), for less than 3 minutes they can stand 100° Celsius (212F). Higher temperatures can cause damage inside the motor. Especially efficient cooling as well as proper layout of the propulsion system (motor-propeller-battery-controller) helps avoiding such situations. Following circumstances can (individually or in combination) cause overheating:

- Usage of improper controllers or bad setup of such controllers
- Blocked shaft or rotor unit of the motor
- Defective ball bearings
- Bad maintained gear (few or too much grease)
- Too lengthy power up time
- Wrong combination of battery voltage and prop (overload)

Please check that moving parts are not blocked and do not touch any other parts inside the model before each run. Make sure that the propeller is not overloading the motor. If you are not sure that your configuration will result in safe operating conditions, please monitor the motor temperature and gradually increase the load by increasing voltage or propeller size.

TORCMAN Gear Motors are supplied completely assembled, provided with grease and ready for use. Depending on application and load, the gear needs to be maintained after some hours of use. If the drive set becomes noisy or has a rough sound, the gear needs to be cleaned and supplied with grease. TORCMAN provides a *Toolkit*, consisting of 2 special wrenches and some high performance grease which allows to easily service the gear – for details see the Service Manual on our website.

Spare Parts for the gear can directly be ordered from Reisenauer (<http://www.reisenauer.de/>) .

The motor itself normally doesn't require regular service and should be sent back to TORCMAN if problems occur.



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Safety Instructions – Please Notice :

The maximum revolution speed of a TORCMAN gear motor is 20000 to 30000 U/min and should not be exceeded for safety reasons. The best efficiency of the 14pole type however is achieved between 5000 and 10000 rpm, the 10pol versions are reaching the maximum efficiency between 8000 and 16000 rpm. Using the motors at higher revolution speed is possible for very short time, but we do not recommend doing so. In this case we will not fulfill any warranty claims.

As soon as the battery pack is connected to the controller the motor may start running (if power setting on the RC transmitter is not zero, defective electrical or electronic parts). Therefore we strongly recommend being very careful when connecting power.

An electric motor (especially with propeller attached to it) can cause serious injuries. Parts, breaking apart can do so as well. Therefore TORCMAN motors shall only be used where damage or injuries are very unlikely to occur.

In case you discover any damage to the motor (e.g. mechanical defects, electrical impact or water intrusion), please refrain from using the motor immediately. A massive damage to the motor and/or controller may occur otherwise. TORCMAN motors may only be operated with qualified power supply (battery and proper controller). By no means it is allowed to attach the motors to the 230V/110V power line. **YOU WILL BE IN SERIOUS DANGER OF LIFE IF YOU TRY TO DO THIS!!**

TORCMAN motors are designed for environments where electrostatic discharge is not occurring.

Using TORCMAN motors in real airplanes or other manned vehicle is not allowed.

Never try to open the motor by violence – sensitive parts inside could be damaged. In general, opening the motor housing is not required, because there are no wearing parts inside. If the ball bearings get noisy, we recommend to send the motor back to TORCMAN for exchange. Reason for loud or damaged bearings are mostly caused by bad balanced props, crashes or when the prop touched the ground.

CE- Regulations

The products mentioned are fully compliant with the mandatory EU regulations

EMC regulations 89/336/EWG
 92/31/EWG
 93/68/EWG

If reception problems occur anyhow, the reason can be found in most cases in the combination and/or location of the electrical and RC components.



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Warranty Terms for TORCMAN Motors:

For TORCMAN motors the extent of warranty is as follows:

1) TORCMAN GmbH will, according to terms 2-5, repair damaged or defective motors within 24 months after delivery to end customer, if those damages or defects are a proven result of faulty manufacturing and customer immediately informs TORCMAN GmbH of such damages or defects. There will be no repair or replacement in case of minor tolerance of the published condition of the product(s), given that the tolerances have no negative impact on the usability of the product(s). The same applies for damages, caused by chemical and electro chemical impact, exposure to water as well as damages caused by other improper handling and/or operation.

2) Warranty fulfillment will either be done at our own decision by replacement or repair. In case of a warranty claims, please send the motor to your dealer or directly to TORCMAN GmbH together with a receipt or note of delivery and a thorough description of the defective product. Replaced parts will not be sent back to customers.

3) Warranty will not apply if :

- a) repair or any change to the product has been made by unauthorized personnel or
- b) original parts have been replaced with third party vendors parts or
- c) the motors have been overloaded by improper configuration.

4) Replace or repair during warranty does not affect the duration of the warranty period for the entire product or the replaced/repared parts.

5) Liability for damages outside is excluded if not legally compulsory.

Repair and Test

In case of malfunction or other problems with your motor or after a defect by plane crash please contact us for the correct procedure (email to j.zaiser@torcman.de).

Please send your motor with a detailed description of the problem, a copy of your invoice and contact information directly to the following address :

Jochen Zaiser, Abt. Torcman Modellbau, Gartenstr.5, 71088 Holzgerlingen, Germany

You will then receive a defect analysis an a cost estimate.

About us:

We are putting our best efforts in providing leading edge quality of our products and documentation. If you encounter problems or are aware of any defects in our products, please get back to us. We will do our best to incorporate your feedback