



TORCMAN BRUSHLESS MOTORS

User Manual for Series TM280, TM/NT350, TM/NT430 and TM685

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 TORCMAN motors are 3 phase brushless motors and therefore need an electronic commutation by a controller. The controllers sold by TORCMAN are the recommended choice and have been tested intensely. They allow the setting of all required parameters like Timing, Switching Frequency, Acceleration/Brake and low voltage behaviour. Controllers from most other manufacturers or suppliers can also be used, please contact the respective company for more 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-Motors

In most cases, the motor will be mounted behind the motor rib which is glued into the fuselage and the shaft penetrates the rib. All motors except the Triton Versions allow a reverse mounting which requires modification of the assembly or directly ordering the motor with reverse mounting option. More information can be found on the TORCMAN Website.

When mounting your motor, please make sure that the maximum intrusion depth of the screws into the thread of the motor is not beyond the limits. Using screws with too much thread length can cause shorts in the motor and damage it.

The maximum immersion depth for the screws are as follows :

TM280	4.5 mm	Thread Size M2.5
TM280 Triton	10.0mm	Thread Size M4
TM350	6.0mm	Thread Size M3
TM350 Triton	5.0mm	Thread Size M3
NT350/Triton	5.0mm	Thread Size M3
TM/NT430	7.0 mm	Thread Size M4
TM/NT430 Triton	10.0mm,	Thread Size M4
TM685-Serie	10.0mm	Thread Size M5

Depending on type and thickness of motor rib, the screws need to be adjusted in length to meet the above needs !!!

The prop adapter has to be mounted as close as possible to the motor rib and therefore near to the front ball bearing. When using prop adapters which are fixed on the shaft with set screws, we recommend to grind a small flat (0.5mm deep) at the position of one screw.



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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.

Operation :

Recommended Settings for Torcman-Motors :

Timing	: 18 – 24Degree for normally loaded motors and 10pole geared motors
Timing	: 25 – 30Deg for high loaded 14 pole motors
Switching Freq.	: 8kHz
Acceleration	: depending on application, recommended 1s
Brake	: depending on application

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 for detailed information. We recommend to do the first programming without a prop attached to avoid damages or injury, cause 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 100° Celsius (212F), for less than 3 minutes they can stand 120° Celsius (248F). 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
- Too lengthy power on ramp 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 motor 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.



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Safety Instructions – Please Notice :

The maximum revolution speed of a TORCMAN motor is 30000 rpm (Triton Types 15000rpm) and should not be exceeded for safety reasons. The best efficiency of the 14pole type however is achieved between 5000 and 12000 rpm, the 10pol versions are reaching the maximum efficiency between 10000 and 25000 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. Also the controller must be suitable for high speed application.

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, Torcman Service, Gartenstr.5, 71088 Holzgerlingen, Germany

You will then receive a defect analysis and 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 into our ongoing development efforts.