

MANUAL FOR BRUSHLESS PLETTENBERG ELECTRIC MOTORS

Thanks and congratulations for purchasing a Plettenberg motor. This motor is a German high quality product that keeps up its power over a long period of time. These motors were designed with the help of our customers for everyday use. The sizing for the propellers or the ship screws, and the number of accumulator cells can be varied, so that a wide application range can be realised. Due to the flexibility of the motor the high power is achieved over a wide speed range whilst achieving excellent efficiency. Please observe our power tables and corresponding graphics.

PLEASE OBSERVE THE FOLLOWING NOTES BEFORE TAKING A MOTOR INTO OPERATION:

SECURITY MEASUREMENTS

The motor should be protected from dirt and dampness. Please take good care that no soiling gets into the motor. Any object would destroy the rotor and the stator. Before taking into operation, all screws and bolts for the motor and the propeller have to be checked for tightness. A loose propeller can cause severe injuries to any bystanders near the model.

Take care to plug in the accumulators to the switched-off power regulator only immediately before use. Please use only the power controllers that we recommend. Test runs may be executed only outside.

Please take care to use only balanced propellers. Unbalanced propellers may be destroying your motor and model.

Permissible maximum speed (rpm) of propellers should be strictly observed. When exceeding the rotation limits, the propeller may break and causing severe injuries. Please take care that all wires and plugs are correctly isolated, so that the motor cannot start by accident when two cables touch themselves. Uncontrolled activating of the motor and thus running of the propeller can cause severe injuries.

When running the motor take care that nobody stands next to, or in front of, the propeller or ship screw. A contact with the rotating parts can cause severe injuries. Please take care that the motors should not be brought close to objects that can be influenced by strong magnetic fields, such as watches, heart pacemakers, floppy disks, and computer hard disks. The strong magnetic fields of the motor can cause mail function, or delete the memory, of electronic objects! It is continuous necessary to check the propellers or the screws for damaging and tear. This is especially important after bumpy landings or when the propeller had contact with the ground. Using a damaged propeller may lead to severe injuries or to model crashing. For high loads and high performance we recommend propellers made of GFK or CFK.

The power controllers should be mounted on a support to avoid vibrations. If not, cables may break through the oscillations and thus cause the controller to fail. This can lead to destruction of the motor and the model.

The following max. Speeds (rpm's) may not be exceeded, if not stated differently:

HP 220:	25.000 1/min	HP220 S:	70.000 1/min
HP 300:	20.000 1/min	HP300 S:	35.000 1/min
HP 370:	15.000 1/min	HP370 S:	30.000 1/min

The speed should be checked with a speedometer.

Motors, recommended for use in helicopter, boats and cars are principle fitted with a speed-resistant rotor, so they aren't marked with an "S" in their type number.

The recommended number of cells relate to NiMh / NiCd cells with a nominal voltage of 1,2 V/cell. By use of Li-Ionen or Li-Polymer cells, you have to calculate the voltage appropriate to the numbers of cells.

You have to pay attention to the max speed limit of your controller. Otherwise your motor and controller may be destroyed. You will find details of the max speed limit in the manual of your controller, please look at the right number of poles.

When using a geared motor, the maximum number of cells should not be exceeded; this may destroy the motor and the model.

All motors used with a gearbox must be fitted with a speed-resistant rotor. These motors carry an „S“ in their type number.

This is valid even if the max. Speed should not be exceeded; otherwise this may cause destruction of the motor, the controller or the complete model.

Motors used in model boats, even they aren't recommended for it, must also be fitted with a speed-resistant rotor.

Motors of the series HP 220 / HP 300 with gearbox may not be used in motor models; these motors are only constructed for short-interval use. Otherwise the motor may overheat.

The motors may not be used without load; otherwise you can simply cross the max speed of motor and controller. Should the motor be opened, any guarantee expires.

MOTOR MAINTENANCE

Please take special care that no obstacles can penetrate into the inside of the motor. Furthermore it is necessary to protect the motor from dampness, dirt, paint, glues, etc.. Do not lubricate the motor. If these rules are not observed, a correct function of the motor cannot be guaranteed or damage may occur beyond repair. For a self-repair, please only use original parts. Please contact us if necessary.

TURNING DIREKTION OF THE MOTORS

The direct-driving motors can be used turning right or left, without any difference in performance.

Geared motors are always right turning motors.

When changing the turning directory of helimotors or such with an adapted cooling fan, you have to count with a reduced cooling.

To change the turning directory of the motor, you have to change the two outer phases (please check up with your controller manual).

Turning to the right is defined as follows: When looking onto the motor cable connections, and when the motor axle points away, the motor turns in clockwise direction.

MOTOR COOLING

Please enable sufficient cooling of the motor within the model (with air or water cooling). A high loading of the motor is only allowed for short intervals. The temperature of the motor should never exceed 100°C. After every use the motor should cool down to the ambient temperature.

When changing to Li-Ionen or Li-Polymer cells, you have a longer motor run time, please check the right cooling of the motor.

After landing in dirty or dusty surroundings please remove any dirt, which may have penetrated the cooling openings. Should this not be observed, a correct function of the motor cannot be guaranteed, and this could lead to destruction and injuries.

When using a water-cooled motor, please check the correct function and tightness of the cooling system before every use.

If you have difficulties in finding a constructive solution for correct cooling, please contact us.

MOTOR SCREENING

When building a model, it is extremely important to place the receiver as far away from the motor and the controller as possible. The antenna should not be placed near the motor or any connecting wires. Should it not be possible to keep the antenna apart from these parts, then the motor and the wires should be covered with steal sheeting as screening material. The length of the wires between the motor and the accumulator should not exceed 20 cm. A wire rod as antenna or an antenna dangling loose of the model increases the reliability of the radio control. The cables coming out of the motor should not be lengthened, as disturbances could occur. The motor screening is tested acc. to the basic standards EN 50081 part 1.

MOTOR CONNECTIONS

ONLY THE CONTROLLERS RECOMMENDED BY US SHOULD BE USED. PLEASE CHECK THE CORRECT, UP-TO-DATE TYPES IN OUR CATALOG OR ON OUR WEBSITE. BY USING OTHER CONTROLLERS, WE CANNOT ACCEPT ANY GUARANTY WHEN THE MOTOR OR CONTROLLER WILL BE DESTROYED.

You have to connect the three motor phases as follows:

Controller produced by the company „Schulze“:	blue = blue, yellow = yellow, red = red.
Controller produced by the company „Kontronik“:	blue = blue, yellow = green, red = red.
Controller produced by the company „Jeti“:	blue = black, yellow = yellow, red = red.

For the plug connection between motor and controller only use 3.5mm gold plated plugs with the type marking PP35-st-future.

For the plug connection between controller and battery only use 4 mm gold plated plugs from the manufactures “Multi Contact” or “Schnepf”, the are marked with “MC” or “S” on the fin.

Please control the condition of the plug connections for every use. If the coating is worn, the fin of the plug becomes backlash or looses their clamping force, or the plug was burn-in on the fin, you must exchange the plugs.

Damage plugs or plugs of inferior quality may be destroy your motor, your controller or the complete model.

The plug connections at the battery cables must be expertly, and save for wrong polarity, soldered and isolated. A wrong polarity by plug on the battery, destroyed your drive unit and means acute dangerous for burning and live.

Please pay attention about the maximal cable length of your controller. By crossing the maximal cable length you will destroy your controller and maybe the motor. You have to calculate battery connections b the cable length. Please read the manual of your controller for information about the maximal cable length.

By use in rc-cars you must pay specially attention that the controller is safe about sliding and protected against exterior mechanical influence. Should this be ignored, the plug connection can be disconnecting by collisions or overturns. This can destroy the controller and the motor.

If the connecting cables must be shortened, remove the isolation and tin the copper wires with solder. Afterward you can shorten the wire. Pay attention that the copper braids are completely tined.

If the motor contacts are fitted incorrectly, the motor, the controller and the model may be destroyed. Warning: Wires and the motor may overheat, and causing severe burns!

If the motor was installed in another way as you can read here, maybe the motor, the controller or the complete model, can be destroyed by malfunction.

ADJUSTING HINT

If deviations from the power tables are necessary, follow these guidelines:

When using a higher operating voltage, the propeller should be smaller (and vice versa). I.e. when the voltage is raised, the propeller should have a smaller diameter or a smaller Pitch. If the operating voltage is to be lower, the propeller to be used should have a larger diameter or a higher Pitch.

For the ideal combination of model and motor please take into account that the motor speed and the motor power should be in correct proportion to the characteristics of the model, such as size, airspeed and weight. The following guidelines can be used here:

For large, slow flying models use a motor with low speed and a high torque, and for small, fast models use motors with high speeds and low torque.

MAINTAINING THE GEARBOX

In short intervals or when grease comes out of the gearbox, check if there is still enough lubricant in the gearbox. The amount is sufficient if a grease film completely covers the gearwheels and the bearings. To inspect this, remove the four capstan screws on the motor body with a Phillipscrewdriver and then take off the gearbox from the motor. In the next step you must loosen the 4 capstan screws in the gearbox and carefully pull the gearbox cover open. Take care that no parts get lost and no obstacles get into the inside of the gearbox.

If necessary, add missing lubricant as **thin** film. This special grease can be obtained through us. Do not fill in too much lubricant, this could lead to high friction resistance! Then carefully reassemble the gearbox. Pay attention that the washers are positioned behind the planet wheels, on the bearings and not behind. Otherwise the gear may jam and you have to count with high power consumption. The gearbox could be destroyed.

Please also take care that the teeth of the cogwheels fit correctly into the planet wheels (do not use any force). Then mount the capstan screws and secure them with threadlocking, medium strength.

SERVICE

If problems occur despite correct handling and maintenance or if the motor was damaged, then please send the motor and a description of the problems, faults or damages to:

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We wish you lots of fun and success with your

PLETTENBERG ELECTRIC MOTOR