

## **MANUAL FOR BRUSHLESS PLETTENBERG ELECTRIC MOTORS**

Thank you for purchasing a Plettenberg motor. We congratulate you on your choice: 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 boat's prop, and the number of cells can vary, so that a wide application range can be realized. Due to the flexibility of the motor 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 obstacles get 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 NC-accumulators to the switched-off power regulator only immediately before use. Please use only the power controllers that we recommend. Test runs should in general only be undertaken in the open.

Permissible maximum speed (rpm) of propellers should be strictly observed. When exceeding the rotation limits, the propeller may break, 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 boat's prop as 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 emitted by the motor can delete the memory of electronic objects!

It is definitely necessary to check the propellers or the screws for wear 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 the model crashing. For high loads and high performance we recommend propellers made of GFK or CFK.

The motor 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) may not be exceeded, if not stated differently:**

HP 220: 25,000 rev/min.

HP 300: 20,000 rev/min.

HP 370: 15,000 rev/min.

**The speed should be checked with a speedometer. When using motors with gearbox, the maximum number of cells should not be exceeded, as this may destroy the motor and the model.**

**All motors used with a gearbox must be fitted with a high revolution-resistant rotor. These motors carry a „S“ in their type number. This is valid even if the max. rpm should not be exceeded, otherwise this may cause destruction of the motor, the controller or the complete model.**

**Motors used in model boats must also be fitted with a high revolution-resistant rotor. These motors carry a „S“ in their type number.**

**Motors of the series HP 220 with gearbox may not be used in motor models, as these motors are only constructed for short-run time. Otherwise the motor may overheat.**

**The motors may not be used without load.**

**Should the motor be opened, any guarantee expires.**

#### **MOTOR MAINTENANCE**

Please take special care that no particles can penetrate inside 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. Please only use original parts. Please contact us if necessary.

## Changing rotation direction of the motors

If not especially stated, motors with sensor are adjusted as rotating to the right, and may only be used in this direction. Exceptions to this rule are the motors HP 300/30/A2 and /A3, and the motors HP 370/30/A1 to /A3, which can be used rotating to the left without any change of the commutation. Sensorless direct-drive motors can be used rotating right or left. Attention: when rotating left cooling is not so efficient. When motors are used turning in the wrong direction, the motor and the power controller may be destroyed.

The rotating direction of sensor motors can only be changed by reprogramming the controller.

The connection cables may not be changed. When changing the turning direction of sensorless motors the two outer phases should be exchanged (it is indispensable to check the description of the controller). 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. If necessary, we can re-adjust the motor to rotate to the left. Please contact us if necessary.

Incorrect changing of the rotating direction can lead to destruction of the motor.

## MOTOR COOLING

Please enable sufficient cooling of the motor within the model (air or water cooling). A high load 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.

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

When using water-cooled motors the correct function and tightness of the cooling system should be checked.

Should you have difficulties in finding a constructive solution for correct cooling then 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 aluminium 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 MOUNTING

Please refer to the following drawings for mounting your Plettenberg motor:

Attention! Always use the correct screws. Screws cut short or filed down can destroy the thread in the fixing plate of the motor. If necessary put extra washers between the fixing plate and the screws so that the max. depth as stated below is not exceeded. Screws turned in too far can damage or destroy the motor.

Series HP 220,300  
370/30

Series HP 220 gear

Series HP 370/20, HP

The motor is fixed with

The motor is fixed with

The motor is fixed with

4 screws size M3, and the

4 screws size M3, and the

4 screws size M3, and the

screw depth is max. 4.5 mm

screw depth is max. 4 mm

## 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. WE ACCEPT NO RESPONSIBILITY OR GUARANTEE WHATSOEVER IF ANY OTHER CONTROLLER IS USED.**

The connections for sensor motors are as follows: Three main phases (blue, yellow, red) or five steering wires with a plug with five contacts.

Controller produced by the firm „Schulze“: blue = blue, yellow = yellow, red = red, fix the plug with the five contacts without any alterations.

If the five contacts were delivered without the relevant plug, then it is indispensable to contact us. If the motor contacts are fitted incorrectly, the motor, the controller and the model may be destroyed. Warning:

Wires and the motor may overheat, causing severe burns! If any other controllers than those stated here are used, then we cannot accept any responsibility in case of malfunction.

Sensorless motors are to be connected with the three main phases as follows

„Schulze“controller: blue = blue, yellow = yellow, red = red

**Attention! It is important to check the turning direction!!**

**If the connecting cables have to be shortened, then proceed as follows: remove the isolation, cover the copper wires with solder, and then shorten the wire.**

#### **ADJUSTING HINT**

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

When using a higher number of accumulator cells than stated, 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 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, then 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 screws on the motor body and then take off the gearbox from the motor. Next step loosen the 4 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 as this could lead

to high friction! Then carefully reassemble the gearbox. Pay attention that the washers are positioned behind the planet wheels on the bearings and not behind. Otherwise the gears may jam and the motor current increases. 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 screws, tighten them and secure them with special screw securing paint.

#### **SERVICE**

If problems should 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:

Plettenberg Elektromotoren, Rostocker Strasse 30, D-34225 Baunatal, Germany

Tel.: (+49) 5601 9796-0, Fax: (+49) 5601 9796-11

e-mail: [plettenberg.elektromotoren@t-online.de](mailto:plettenberg.elektromotoren@t-online.de) • <http://www.plettenberg-motoren.com>

We wish you lots of fun and success with your

**PLETTENBERG ELECTRIC MOTOR**

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**ICARE/IKARUS**  
381 Jospeh-Huet  
Boucherville, Qc, J4B 2C5  
Canada  
[www.icare-rc.com](http://www.icare-rc.com)  
(450) 449-9094  
[info@icare-rc.com](mailto:info@icare-rc.com)