

## THE PLETTENBERG ELECTRIC MOTOR - INSTRUCTIONS FOR USE

We congratulate you on your purchase and thank you for choosing from the PLETTENBERG ELECTRIC MOTOR Series. This motor is a top quality German product, which, when handled correctly, will retain its efficiency and will have a long life. The motors are developed from practical experience and built for practical use. Both the choice of the size of propeller and ships propeller and the number of cells in the NC-accumulator can be varied, in order to offer you wide usage possibilities. Due to the flexibility of the motor, a wide range of capabilities are achieved with an excellent operating ratio. Please refer to our efficiency tables and graphics.

### PLEASE NOTE THE FOLLOWING POINTS BEFORE INITIAL OPERATION

#### SAFETY MEASURES

The motor is to be protected from dirt and water. It is important to ensure that no foreign substances whatsoever enter the interior of the motor. Foreign substances lead to destruction of the armature and magnets.

The motor must be run in before use (see "Running In"). If a motor is operated without being run in, the carbon and the collector can burn. Warning! Danger of fire.

All motor and propeller fastening screws must be examined and tightly fixed before initial operation. If a screw becomes loose, it could lead to serious injury of persons in the immediate area.

Warning: the NC battery may only be connected immediately before using the switched off motor switch and speed controlling device. Test runs may only be made in the open.

The allowed maximum speed of the propeller must be observed. If the maximum speed is exceeded, there is danger of the propeller breaking, which could lead to serious injury. It must be observed that all electrical cables, plugs and sockets are isolated, so that it is impossible to accidentally switch on the motor when touching the cable. Accidental switching on of the motor and therefore the propeller, can lead to serious injury.

It must be observed that during motor operation, no person may stand to the side or in front of the plane of propeller rotation, as contact with the rotating propeller can lead to serious injury. Further, the motors may not be placed near magnetically sensitive instruments, such as clocks, heart pace makers and data carriers. The strong magnets can lead to damage, malfunction or erasure of the above instruments!!

It is important to ensure that through the installation of a speed regulator or soft switch, the switching on is 'slow', so that damage to the propeller is avoided. All electronic parts, such as speed regulators or receivers must be protected from carbon dust with a covering.

It is necessary to constantly examine the propellers for damage, cracks etc. This is especially important after bad landings. Using a damaged propeller can lead to serious injury or to the model crashing. When heavy loads and high demands are required, we recommend the use of more speed resistant propellers made of glass/ carbon fibre reinforced plastic.

If it has not been specifically requested, we set our motors during construction to rotate to the right and they may only be operated in this way. The rotation to the right is described as follows: when observing the motor (cable contacts pointing towards person and shaft pointing away from person) the shaft rotates in a clockwise direction.

According to wishes, we can set the motor to rotate to the left. Please contact us if necessary.

Unofficial changing of the rotation direction can lead to destruction of the motor and burning off of carbons.

#### Special measures for the series HP 500 motors:

In order to avoid fatal accidents, it must be guaranteed that an outside connection between motor and regulator (both negative pole) is created. This is to be done by an additional plug connector in the form of a cable loop or bridge. This connection must be made immediately before starting, in order to avoid under all circumstances, accidentally starting the motor or to avoid the possibility of an 'emergency shut down' due to regulator damage.

The motor must be operated exclusively with the appropriate regulator from the company, 'Schulze Elektronik'.

**The guarantee is immediately invalid if the motor is opened or dismantled !!**

#### RUNNING-IN

Before using the motor, the carbons must be run in. This is done with low voltage (see table) and cooling until the whole area of the carbons is supported by the collector. Carbons which are not run in leave thin stripes on the collector. Only when they join to make a wide, even field on the collector is the whole area of the carbon supported. The running-in process lasts a few hours.

The running-in voltage must be chosen as follows:

<u>Operational voltage (Volts):</u>	<u>Running-in voltage (Volts):</u>
7 - 8	2
10 - 12	3
14 - 18	4
20 - 30	5

If in doubt, it is better to choose a lower rather than higher running-in voltage, as otherwise carbons and collectors can be destroyed. The maximum temperature of the housing must not exceed 45°C (approx. hand temperature). Overheating of the motor leads to danger of fire and destruction.

**Warning!** The motor must not be used in no-load operation with the factory specified commutation angle and relevant operational voltage. Motors with variable commutation angles are to be adjusted according to the instructions, "Adjusting the commutation angle", before the running-in process on -3. After finishing the running-in, the commutation angle is to be returned to the original state. If this is not observed, carbons and collectors will be destroyed. A cooling down period is absolutely necessary if the maximum temperature is exceeded.

## ADJUSTING THE COMMUTATION ANGLE (MOTOR TIMING)

The commutation angle is to be adjusted in order to run the motor at optimal efficiency. This adjustment does not serve to alter the speed of the motor in order to assimilate the propeller. It is set up in the factory for average use of plus one (+1). If the operational voltage or the operational electricity is higher, it is therefore necessary to increase the timing. If the operational voltage (operational electricity) is low, then the timing should be reduced. This keeps the commutator sparking as low as possible. Before changing the commutation angle, the work side adjustment is to be noted.

### 1. Motors without adjustable ground ring

When adjusting, loosen the fastening screws on the brush support mount, although do not remove. Turn the brush support mount to the desired position and tighten the fastening screws again.

### 2. Motors with automatically adjustable ground ring (ASE)

When adjusting, loosen the fastening screws on the brush support mount, although do not remove.

Centre the ground ring with the '0' indication to the screw which lies under it and turn the brush support mount in the appropriate direction to adjust. When adjusted, tighten the screws again.

### 3. series HP 290 torque motors

Loosen the headless pin, but do not remove. Centre the ground ring with the 'R' indication to the screw which lies under it. Re-tighten the headless pin. When adjusting, loosen the fastening screws on the brush support mount, although do not remove. Now turn the brush support mount in the appropriate direction to adjust. When adjusted, tighten the screws again.

Please do not hesitate to ask if you have further questions about adjusting the commutation angle.

## AUTOMATIC STATOR RING ADJUSTMENT TO DISPLACE THE CROSS-INDUCTION FIELD WHEN UNDER LOAD (ASE)

This information is relevant only to Evolution series motors.

When using the motor for dynamic purposes (e.g. aviation acrobatics), the optimal return path is achieved through the ASE, whereby a higher magnetic flow is attained with minimal material requirement and therefore minimal weight expenditure. This adjustment does not just serve as speed/propeller assimilation of the motor. To use the ASE in the model to its optimum, it is extremely important to install the motor so that the ground ring moves freely. Regarding the function of the ASE, it is important to note that the ground ring is constantly positioned as it is, so that the flattened side of the ring points to the red markings. If the ring is rotated 90°, the automatic return movement is no longer possible (dead point).

## CHANGE IN ROTATING DIRECTION OF SERIES HP 290/30 and HP 290/40 TORQUE MOTORS

Motors are set up in the factory to rotate to the right, but it is possible to alter this to allow them to rotate to the left.

To do this, the headless pin in the ground ring is loosened, the ground ring is turned to the left until the 'L' is facing the drilled hole underneath in the middle. The headless pin is then re-tightened, the three screws on the brush support mount are loosened and removed. It is important to note that no foreign substances whatsoever are to enter the motor. Twist the brush support mount so that it faces the red markings in the scaling for rotation to the left. (Adjustment plus 1). Re-tighten the brush support mount and the three screws and run in the motor. (see, 'Running -In').

The relevant work sequence is to be carried out if the motor is to be reconstructed to rotate to the right.

These instructions are to be followed exactly. Mistakes in the procedure will lead to destruction of the motor when next operated.

## MOTOR CARE

It is important to note that no foreign particles whatsoever may enter the motor interior. Further, it is necessary to protect the motor from dampness, dirt, paint, glue etc. Do not oil the motor. This leads to destruction of the carbons and collector. The formation of carbon abrasions due to air pressure in the motor must be removed in order to avoid tracking currents.

It is equally important to note that the carbon conductors have freedom of movement and that the carbons have a material strength of at least 4 mm. If this limit is underachieved, it is necessary to change the carbons. If this action is not undertaken, the motor will not function properly. Only original parts may be used. Please contact us for further information.

## MOTOR COOLING

The motor in the model must be sufficiently cooled every time (air or water cooling). High demands on the motor is only allowed for short periods. The motor temperature must not exceed 100°C at any time. The motor must cool down to the temperature of its surroundings after every use.

If the model lands on dirty or dusty ground, the dust and dirt which entered the cooling vent must be removed before further operation. If this action is not undertaken, the motor will not function properly and damage or injury may occur as a result.

The seals and functions of the cooling system of water cooled motors must be examined before each use. If you have constructive problems with cooling the motor, please contact us.

**FIXTURE**

To fasten your motor, please use the following drawings, scale 1:1

Series HP 270-290  
Motor fixed with 2  
screws M3, screw  
depth max. 4.5 mm

Series HP 320-355  
Motor fixed with 3  
screws M4, screw  
depth max. 5 mm

Series HP 365-400  
Motor fixed with 4  
screws M3, screw  
depth max. 4 mm

Series HP 500

Motor fixed with 6 screws M4, screw depth max. 8 mm.  
A support is necessary at the rear end plate with min. 2 screws M4, screw depth max. 8 mm.

front

rear

## **RADIO SUPPRESSED MOTOR**

The motor is already radio suppressed when delivered. When building the model, it is necessary to install the receiver as far away as possible from the motor or its electrical cables. When doing this, the antenna may not be laid alongside the motor or its electrical cables and the flight or speed regulator may not be placed directly next to the motor. If this is not possible due to technical problems, these parts must be protected with aluminium sheet or foil. The cable length between the motor and accumulator may not exceed a maximum of 20 cm. A trailing or rod antenna additionally increases the operational security of the RC unit.

The motors are examined according to the main specialist norm for interference emissions EN 50081, part 1.

## **ADJUSTMENT NOTICE**

The following rule of thumb is valid in the case of differences in the results table:

The larger the operational voltage, the smaller the propeller and vice versa. This means: if the nominal voltage is increased, the propeller must have a smaller diameter or a lower gradient. If the nominal voltage sinks, the propeller must have a larger diameter or a higher gradient.

To ideally adjust the motor to the model, please note that speed and engine torque of the motor should suit the specifically constructed qualities of the model, such as size, speed and weight. Please note the following rule of thumb: a motor with lower speed and higher engine torque should be chosen for large and slow models and a motor with higher speed and lower engine torque should be chosen for small and fast models .

## **SERVICE**

If problems occur despite careful handling and proper care or if the motor becomes damaged, please send us the motor stating the problem, deficiency or damage, to:

Firma Bergemann  
Plettenberg Elektromotore  
Werner-Hilpert-Str. 15  
D - 34117 Kassel

We wish you many hours of pleasure and much success with your  
PLETTENBERG ELECTRIC MOTOR