

## Operating manual model motors



# List of contents

---

List of contents .....	2
1. Notes regarding this document.....	3
Legal provisions .....	3
Scope of validity .....	4
Target group .....	5
Updated additional information .....	5
Symbols .....	5
Nomenclature.....	5
2. Savety .....	6
Intended use .....	6
Safety Information .....	6
3. Product overview .....	9
Type designation .....	9
Technical data .....	9
Environmental and climatic conditions .....	10
Structure of.....	11
in-running motor .....	11
Structure of.....	11
out-running motor .....	11
4. Commissioning.....	12
Safety during commissioning.....	12
Assembly.....	12
Cable connections.....	17
Visual inspection and mechanical inspection .....	17
5. Troubleshooting.....	19
6. Repetitive handling.....	19
Care for the gearbox.....	19
7. Disposal .....	19
8. Service / Contact .....	20
9. EU-Declaration of Conformity .....	21

# 1. Notes regarding this document

---

## Legal provisions

The information contained in this document is the sole property of Plettenberg Elektromotoren GmbH & Co. KG. Publication, in whole or in part, requires the express written consent of Plettenberg Elektromotoren GmbH & Co. KG. An internal company duplication, which is intended for the evaluation of the product or for the appropriate assignment, is permitted and not subject to approval.

### **Plettenberg Elektromotoren GmbH & Co. KG**

Rostocker Straße 30

34225 Baunatal – Großenritte

GERMANY

Phone: +49 (0) 56 01 / 97 96-0

Fax: +49 (0) 56 01 / 97 96-11

Internet: [www.Plettenberg-Motoren.com](http://www.Plettenberg-Motoren.com)

E-Mail: [Info@Plettenberg-Motoren.com](mailto:Info@Plettenberg-Motoren.com)

© 2016 Plettenberg Elektromotoren GmbH & Co. KG. All rights reserved.

## Scope of validity

This document applies for the following device types:

Motor type
Advance 30   Advance 50
Dinator 30 Gear
Dinator 30   Dinator 40   Dinator 50   Dinator 70
Extreme
HP 220/20   HP 220/20 Gear
HP 220/25 Gear
HP 220/30   HP 220/30 Gear
HP 220/30 Gear Evo
HP 220/37 Gear
HP 220/40
HP 220/40 Gear Evo
HP 220/50
HP 300/30   HP 300/40   HP 300/50
HP 320/30
HP 370/30   HP 370/40   HP 370/50
Indoor II
Kima 40   Kima 50
Magna 30
MAXXimum
Moskito
Moskito Gear
Orbit 10
Orbit 15
Orbit 20
Orbit 25
Orbit 30
Orbit 20 XL
Orbit 25 XL
Predator 25
Predator 25 Evo
Predator 30
Predator 30 Evo
Predator 37
Predator 37 Evo
Predator 50
Predator 50 Evo
Shadow
Teras 50
Terminator 30
Terminator 30 Evo
Xtra 25   Xtra 30
Xtra 25 Evo   Xtra 30 Evo

## Target group






The activities described in this document may only be executed by qualified, skilled workers. The qualified, skilled workers must possess the following qualifications:

- Knowledge regarding the functional methods and operation for the product
- Knowledge and observation of these instructions with all safety notes

## Updated additional information

Links regarding updated additional information can be found under [www.Plettenberg-Motoren.com](http://www.Plettenberg-Motoren.com).

## Symbols

Symbols	Clarification
	Warning, the non-observance of which leads directly to death or serious injury.
	Warning, the non-observance of which may result in serious injury.
	Warning, the non-observance of which may result in minor or moderate injury.
	Warning, non-observance of which may result in damage to property.
	Information which is important for a specific subject or goal, but not relevant to safety.

## Nomenclature

Complete designation	Designation in this document
Speedcontroller	Controller

## 2. Safety

### Intended use

The motor series of the validity range are intended for this purpose:

- as drive unit for manual and radio remote controlled original and true to scale models, functional models
- as drive unit for manual and radio remote controlled kits of original and scale models, functional models

Unapproved use in the sense of a foreseeable misuse shall be deemed to be improper use:

- the drive unit in man-bearing devices
- the drive unit in public transport and means of transport
- the drive unit for toys
- use in potentially explosive atmospheres
- use by children under 14 years of age
- any use other than those provided for

### Safety Information

This chapter contains safety instructions which must always be observed when working on and with the product. In order to prevent personal injury and property damage and to ensure continuous operation of the product, always read this chapter carefully and follow all safety instructions at all times.

#### **Danger**

##### **Slight, moderate or severe injuries**

Malfunction due to electromagnetic interference. Communication equipment and other devices in the surroundings must not be exposed to impermissible electromagnetic interference.

- The control and phase cables must not be extended. The product must be inspected and the fastening must be controlled again before commissioning.
- Modifications to the product are not permitted.
- The supply and return cables must be laid together.
- Always shield all cables.

 **Warning****Cut injuries, loss of eyesight**

Parts can be ejected from the housing by rotation .

- It must be therefore be ensured that the product is only used in the closed place of destination. It must also be ensured that no magnetic or non-magnetic parts get into the motor during transport and assembly.
- The product must always be protected against heat, dirt and moisture, otherwise the adhesive strength of the components may be lost.
- Always ensure proper handling .
- The product must never be contaminated with foreign bodies / adhesives / paint during assembly.
- Modifications to the product are forbidden.
- Always ensure that the motor is properly fastened.
- Always ensure that the controller settings are correct.
- The product must be sufficiently cooled.
- Operation of the motor at idling speed without load is prohibited.

 **Warning****Electric shock, burns, fire**

caused by energised parts.

- The product must always be protected against overheating, dirt and moisture, otherwise the components will be damaged. This can cause short circuits.
- The product as well as the contacts must be inspected for overheating, soiling, deformation, fire and moisture before commissioning.
- Modifications to the product are not permitted.
- The maximum bending radius of the connecting cables must not be undershot. 6 x outer diameter.
- To prevent high-impedance connections, only gold contact plugs from Multi-Contact, Plettenberg or Schnepf are permitted.
- Assembly and/or dismantling only when de-energised.

 **Warning****Injuries due to crushing, being caught up**

Malfunction due to electromagnetic interference .

- The control and phase cables must not be extended. The product must be inspected and the fastening must be controlled again before commissioning.
- Modifications to the product are not permitted.
- The supply and return cables must be laid together.
- Cables must be shielded.

 **Warning****Danger from magnetic radiation**

Malfunction / destruction of magnetically sensitive parts

- The motor must never come into contact with magnetically sensitive parts such as pacemakers or data carriers. The strong magnets can lead to damage and/or malfunction or extinction of these.

 **Warning****Crushing, pulling in / being caught up**

Caused by careless touching and too small a distance from rotating parts.

- There must be sufficient distance retained to the motor so that no people or objects can be caught up or drawn in.

 **Caution****Burns**

Caused by carelessly touching hot surfaces.

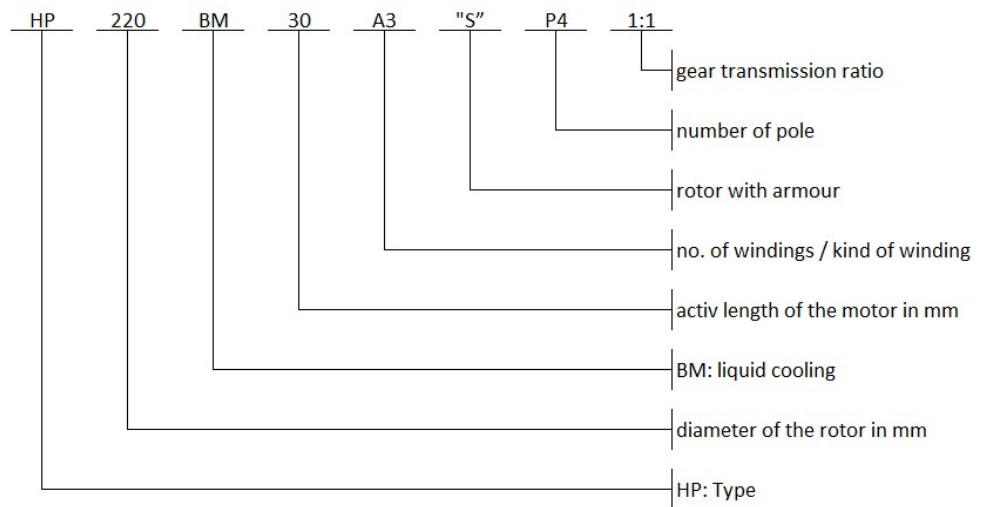
- After operation of the product, the surfaces may still be hot. Always allow the product to cool down.

**Notice****Thermal overload / destruction**

- Always ensure sufficient cooling for the motor (air or water cooling).
- A high load on the motor is only permissible in short operation. Under no circumstances may the motor exceed the temperature of 100°C.
- After each use, the motor must cool down again to ambient temperature.
- Only control systems and regulators approved by us may be used. You will find an overview on our homepage.

## 3. Product overview

### Type designation



### Technical data

The motor speed limits must not be exceeded. This must be controlled with a revolution measuring device.

type	weight [g]	max. RPM in [1/min]	Ø shaft [mm]
<b>Advance 30</b>	590	8.000	8/12
<b>Advance 50</b>	800	8.000	8/12
<b>Dinator 30 Gear</b>	425	10.000	6
<b>Dinator 40</b>	495	45.000	8
<b>Dinator 50</b>	580	45.000	8
<b>Dinator 70</b>	770	40.000	8
<b>Extreme</b>	175	70.000	3,175
<b>HP 220/20 „S“</b>	180	50.000	5
<b>HP 220/20 Gear</b>	225	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/25 Gear</b>	250	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/30</b>	240	15.000	5
<b>HP 220/30 „S“ (BM)</b>	240 (315)	50.000	5
<b>HP 220/30 Gear</b>	275	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/30 Gear Evo</b>	330	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/37 Gear</b>	330	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/40 „S“ (BM)</b>	300 (315)	50.000	5
<b>HP 220/40 Gear Evo</b>	385	(5:1) 13.500 (7:1) 10.200	6
<b>HP 220/50 BM</b>	385	50.000	5
<b>HP 300/30</b>	275	10.000	5
<b>HP 300/30 „S“ (BM)</b>	275 (305)	35.000	5
<b>HP 300/30 Gear</b>	335	9.600	6
<b>HP 300/40 BM</b>	375	35.000	5
<b>HP 300/50 BM</b>	485	35.000	5
<b>HP 320/30</b>	415	15.000	6
<b>HP 370/30</b>	340 (435)	10.000	5 (8/12)
<b>HP 370/30 „S“</b>	340	30.000	5

type	weight [g]	max. RPM in [1/min]	Ø shaft [mm]
HP 370/40	515	10.000	8/12
HP 370/40 „S“ (BM)	515 (590)	30.000	8/12 (6,35)
HP 370/50	625	10.000	8/12
HP 370/50 BM	690	30.000	6,35
Indoor II	135	70.000	3,175
Kima 40 BM	670	30.000	6,35
Kima 50 BM	785	30.000	6,35
Kima 50 CAR	830	30.000	10
Magna 30	485	25.000	6/8
MAXXimum	295	50.000	3,175/5
BigMAXXimum	355	50.000	5
Moskito (BM)	110 (125)	70.000	3,175
Moskito Gear	155	15.000	4
Orbit 10	135	25.000	5
Orbit 15	170	25.000	5
Orbit 20	215	25.000	5
Orbit 25	250	25.000	5
Orbit 30	305	25.000	5
Orbit 20 XL	360	8.000	6
Orbit 25 XL	430	8.000	6
Predator 25	1400	7.000	10
Predator 25 Evo	1400	7.000	10
Predator 30	1550	7.000	10
Predator 30 Evo	1550	7.000	10
Predator 37	1950	7.000	10
Predator 37 Evo	1950	7.000	10
Predator 50	2380	7.000	10
Shadow	150	70.000	3,715
Teras 50 BM	1220	30.000	6,35
Terminator 30	920	8.000	10
Terminator 30 Evo	920	8.000	10
Terminator 30 Heli	1080	8.000	8
Terminator 30 Heli Evo	1080	8.000	8
Xtra 25 Evo	520	8.000	8
Xtra 30 Evo	570	8.000	8

### Environmental and climatic conditions

Ambient temperature:  
 Permissible humidity:  
 Protection class depending on type:

-20°C bis +40°C  
 Non-condensing  
 IP21 / IP53

## Structure of in-running motor

The windings are located in the motor housing. Permanent magnets are attached to the axis and rotate in the magnetic field of the windings.

**Typ: HP 220/20 A2 P4**



1: motor phase 1 (red)

2: motor phase 2 (yellow)

3: motor phase 3 (blue)

4: gear (optionally)

5: shaft

**Typ: HP220BM/30/A3 "S" P4**

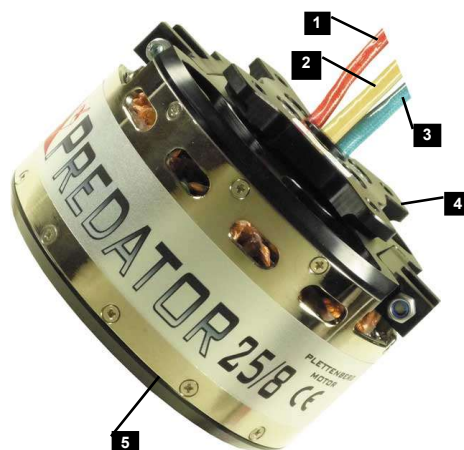


6: cooling (optionally)

## Structure of out-running motor

The permanent magnets are attached to the rotating motor bell. The motor bell (rotor) turns outside around the windings on the iron core (stator) inside. This is mounted on a stator support to which the motor is attached during installation.

**Typ: Predator 25/8**



1: motor phase 1 (red)

2: motor phase 2 (yellow)

3: motor phase 3 (blue)

4: mounting flange

5: rotating housing

## 4. Commissioning

### Safety during commissioning

#### **Danger**

**Severe, moderate or minor injuries .  
Destruction or damage to the product**

Safety instructions from Chapter 2 must be complied with !

**The motor phases must not be shortened without prior consultation. Crimping of connections may also not be executed without previous consultation.**

The accumulator may only be connected to the motor speed regulator recommended by us immediately before use.

Test runs should only be executed outdoors in principle.

During motor operation, it is essential to ensure that no people are located to the side or in front of the rotation plane.

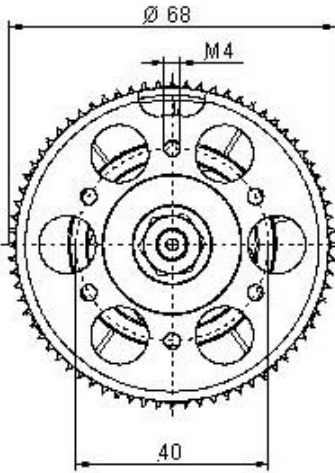
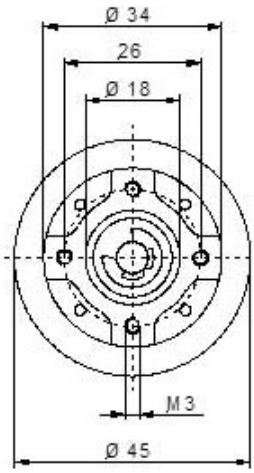
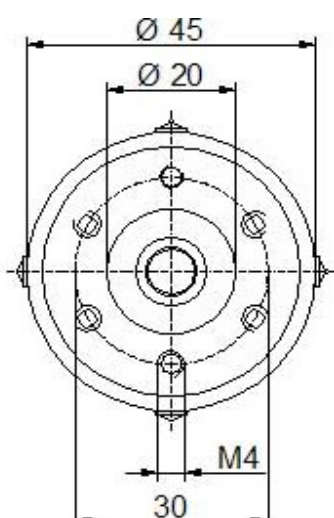
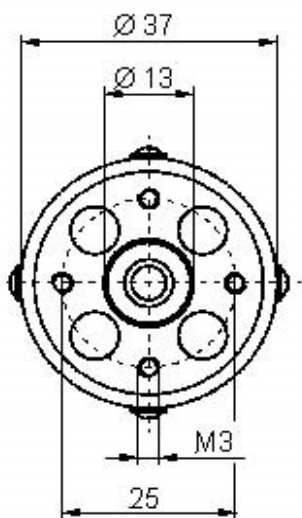
### Assembly

#### **Notice**

##### **Destruction / damage of the motor**

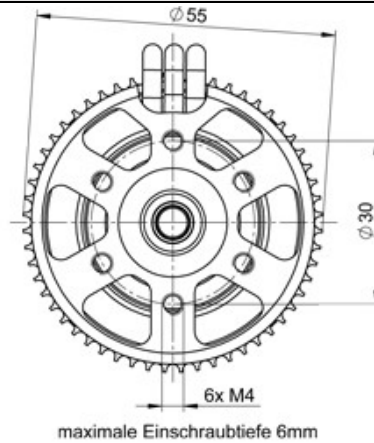
- Always use suitable screws or bolts.
- Sawed or ground screws or bolts can destroy the thread in the motor's bearing shield.
- After each use, the motor must cool down again to ambient temperature.
- Only control systems and regulators approved by us may be used. You will find an overview on our homepage.
- Never exceed the maximum screw-in depth. Screws or bolts which are screwed in too far will damage or destroy the motor.
- Only use original screws or bolts.
- Always position distance spacers between the screw or bolt and the head frame of the model.

Tightening torques depend on the chip material used.  
Specifications apply to an aluminium chip material in combination with medium strength screw locking.

<p><b>Serie Advance</b></p> <p>The motor is fixed with 6 M4 bolts. Maximum screw-in depth: 6mm Maximum tightening torque: 2,5Nm</p>	<p><b>Serie Dinator 30 Gear</b></p> <p>The motor is fixed with 4 M3 bolts. Maximum screw-in depth: 5mm Maximum tightening torque: 1,2Nm</p>
	
<p><b>Serie Dinator 40   50   70</b></p> <p>The motor is fixed with 6 M4 bolts. Maximum screw-in depth: 5mm Maximum tightening torque: 2Nm</p>	<p><b>Serie Extreme   HP 220   Indoor II   MAXXimum   Shadow</b></p> <p>The motor is fixed with 4 M3 bolts. Maximum screw-in depth: 4mm Maximum tightening torque: 1,2Nm</p>
	

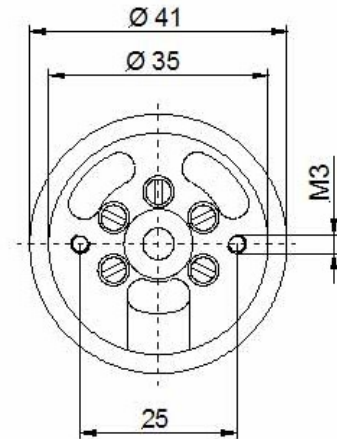
### Serie HP 320

The motor is fixed with 6 M4 bolts.  
Maximum screw-in depth: 6mm  
Maximum tightening torque: 2,5Nm



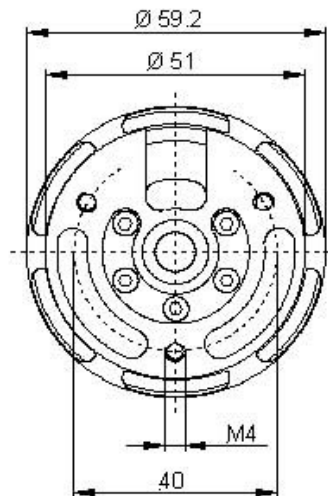
### Serie Orbit

The motor is fixed with 2 M3 bolts.  
Maximum screw-in depth: 4mm  
Maximum tightening torque: 1,2Nm



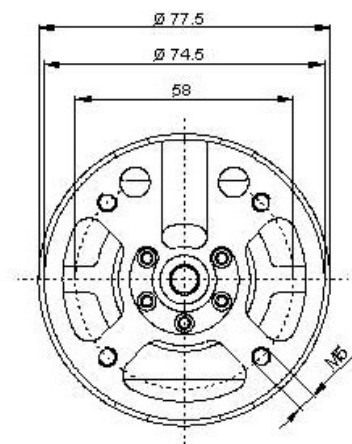
### Serie Xtra | Xtra Evo

The motor is fixed with 3 M4 bolts.  
Maximum screw-in depth: 5mm  
Maximum tightening torque: 2,5Nm



### Serie Terminator | Terminator Evo

The motor is fixed with 4 M5 bolts.  
Maximum screw-in depth: 6mm  
Maximum tightening torque: 5,5Nm

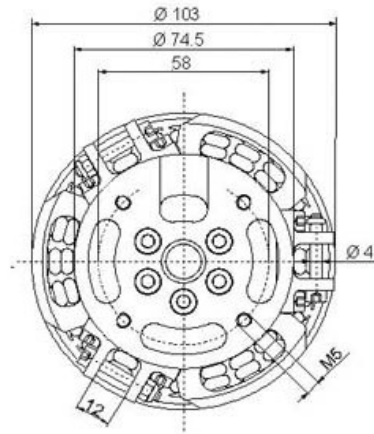


#### Serie Predator | Predator Evo

The motor is fixed with 4 M5 bolts.

Maximum screw-in depth: 7mm

Maximum tightening torque: 6Nm

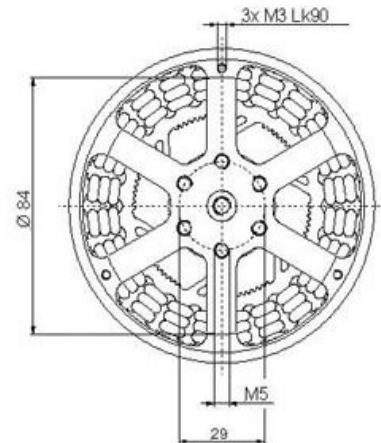


#### Serie Predator | Predator Evo

The propeller is fixed with 6 M5 bolts.

Maximum screw-in depth: 8mm

Maximum tightening torque: 6Nm

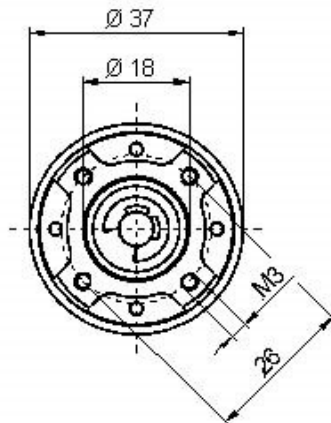


#### Serie HP 220 Gear

The motor is fixed with 4 M3 bolts.

Maximum screw-in depth: 4mm

Maximum tightening torque: 1,2Nm

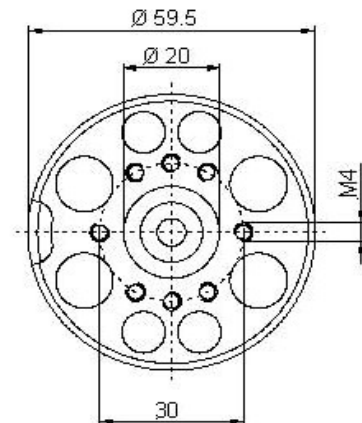


#### Serie Magna

The motor is fixed with 4 M4 bolts.

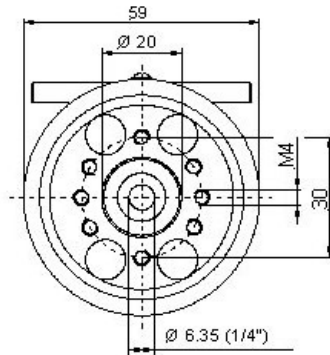
Maximum screw-in depth: 5mm

Maximum tightening torque: 2Nm



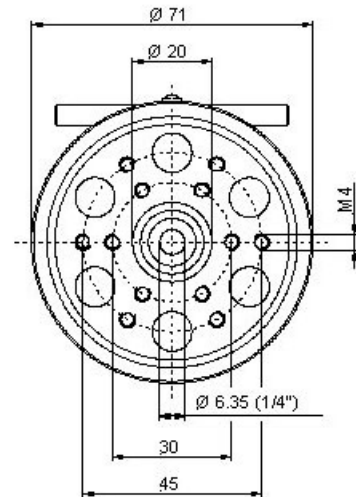
#### Serie Kima / HP 370

The motor is fixed with 4 M4 bolts.  
Maximum screw-in depth: 5mm  
Maximum tightening torque: 2Nm



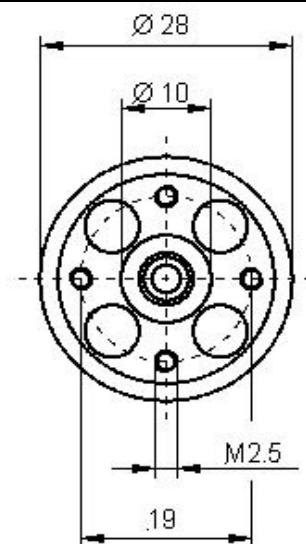
#### Serie Teras

The motor is fixed with 4 M4 bolts.  
Maximum screw-in depth: 7,5mm  
Maximum tightening torque: 2,5Nm



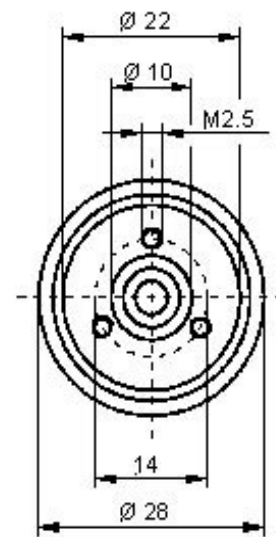
#### Serie Moskito

The motor is fixed with 4 M2,5 bolts.  
Maximum screw-in depth: 4mm  
Maximum tightening torque: 0,7Nm



#### Serie Moskito Gear

The motor is fixed with 3 M2,5 bolts.  
Maximum screw-in depth: 3,5mm  
Maximum tightening torque: 0,7Nm



## Cable connections



Only control systems and regulators approved by us may be used. You can read about them in the catalogue or on our current homepage. If other control systems or regulators are used, then we cannot assume any guarantee or liability in the event of destruction of the motor, regulator or the controller.

Motor connection cables must never be shortened or extended.

The three motor phases must be connected to the regulator according to the manufacturer's instructions:

Firma **JETI model s.r.o**

Firma **KONTRONIK / SOBEK Drives GmbH**

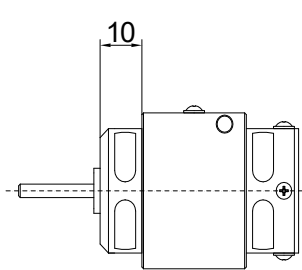
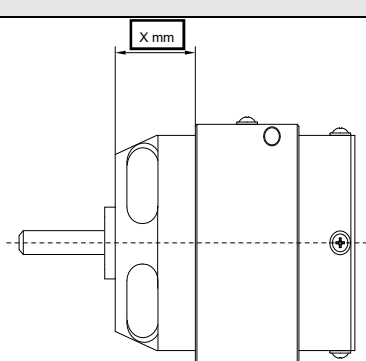
Firma **YGE**

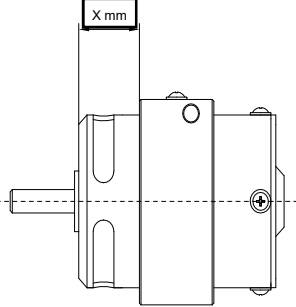
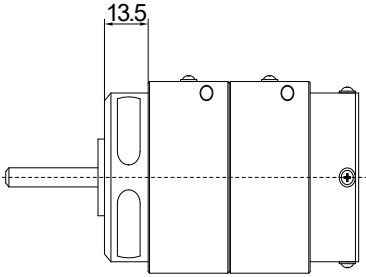
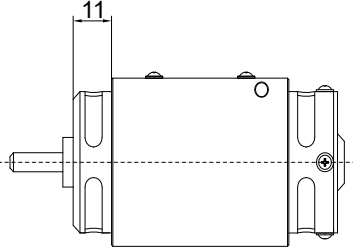
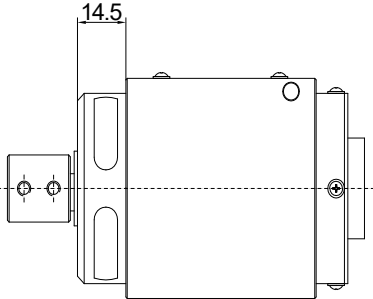
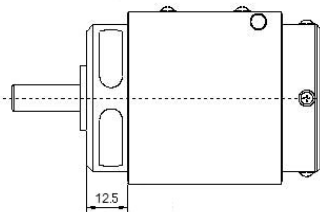
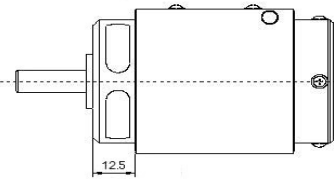
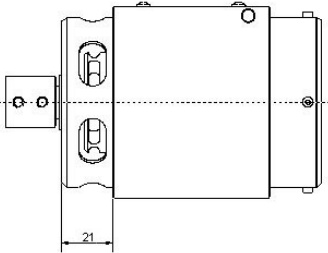
## Visual inspection and mechanical inspection

All fastening screws or bolts for the motor must be checked for tightness before commissioning.

It must always be ensured that all energised cables or plugs and sockets are insulated so that unintentional switching on of the motor by cable contact is impossible.

The position of the water cooling ring and its tightness must be inspected before the initial commissioning of water-cooled motors. All indicated dimensions are in mm.

Moskito BM (10mm)	<b>HP 300BM/20 (19,5mm)</b> <b>HP 300BM/30 (19,5mm)</b> <b>HP 300BM/40 (14,5mm)</b>
	

<b>HP 220BM/20 (14,5mm)</b> <b>HP 220BM/30 (12,5mm)</b> <b>HP 220BM/40 (17,5mm)</b>	<b>HP 300BM/50 (13,5mm)</b>
	
<b>HP 220BM/50 (11mm)</b>	<b>HP 370BM/40 (14,5mm)</b> <b>HP 370BM/50 (14,5mm)</b> <b>Kima 40 BM (14,5mm)</b> <b>Kima 50 BM (14,5mm)</b>
	
<b>Dinator 40 BM (12,5mm)</b>	<b>Dinator 50 BM (12,5mm)</b>
	
<b>Teras 50 BM (21mm)</b>	
	

## 5. Troubleshooting

---

It is absolutely necessary to install the receiver as far away as possible from the motor, regulator, controller and/or its current-carrying cables. The aerial must not be laid past the motor and its current-carrying cables. If this is not possible for structural reasons, then these elements must be shielded with sheet steel or foil.

## 6. Repetitive handling

---

### Care for the gearbox

Always inspect whether there is still sufficient lubricant in the gear unit at short intervals or when the lubricant escapes. This is the case when there is a comprehensive lubricating film on gears and needle bearings. For this purpose, the four Phillips screws on the motor housing must be loosened and removed using a suitable Phillips screwdriver. The gear unit must then be disconnected from the motor. Now loosen the four Phillips screws or Allen screws in the gear unit with a suitable screwdriver or Allen key and then carefully pull apart the gear unit cover. Always ensure that no parts are lost and that no foreign bodies can ingress into the gear unit. Apply a thin layer for any possible missing lubricant (this special grease can be obtained from us with Article Number: getr-00026). Never overfill the gear unit with lubricant. Too much grease means too much friction loss!

The motor must be sent in for maintenance of the gear unit.

The housing surfaces can be cleaned with compressed air and a dry, lint-free cloth.

The motor must never be oiled. If this is not observed, then the correct functioning of the motor cannot be guaranteed or irreparable damage may occur

## 7. Disposal

---

A motor with exceeded service life is electronic scrap. E-scrap consists on the one hand of valuable materials which can be recovered as secondary raw materials and, on the other hand, it contains environmentally hazardous substances.

Information regarding optimum material recycling is available from commercial waste disposal companies.

## 8. Service / Contact

---

Should, despite proper handling and sufficient care, problems should still occur or the motor will be damaged, then please send the motor back to our address stating the problem, defect or damage.

### **Plettenberg Elektromotoren GmbH & Co. KG**

Rostocker Straße 30

34225 Baunatal – Großenritte

GERMANY

Telefon: +49 (0) 56 01 / 97 96-0

Fax: +49 (0) 56 01 / 97 96-11

Internet: [www.Plettenberg-Motoren.com](http://www.Plettenberg-Motoren.com)

E-Mail: [Info@Plettenberg-Motoren.com](mailto:Info@Plettenberg-Motoren.com)

## 9. EU-Declaration of Conformity

In the sense of the EU Directives

- **EMC Directive 2014/30/EU Appendix IV**
- **Low Voltage Directive 2014/35/EU Appendix IV**
- **RoHS Directive 2011/65/EU Appendix I**



**Plettenberg Elektromotoren GmbH & Co. KG**

Rostocker Straße 30

34225 Baunatal – Großenritte

hereby declares, as the manufacturer, that the articles and objects described below comply with the provisions of the relevant community harmonisation legislation referred to above..

Motor type	Motor type
Advance	Magna
Dinator Gear	MAXXimum
Dinator	Moskito
Extreme	Moskito Gear
HP 220	Orbit / Orbit XL
HP 220 Gear	Predator
HP 220 Gear Evo	Predator Evo
HP 300	Shadow
HP 300 Gear	Teras
HP 320	Terminator
HP 370	Terminator Evo
Indoor II	Xtra
Kima	Xtra Evo

Interference emission	EMC Directive Article 6 Appendix I.1.a
DIN EN 61000-6-3:2011-09	Electromagnetic Compatibility (EMC)- Part 6-3: Generic standards - Interference emission for residential areas, business and commercial areas as well as small businesses (IEC 61000-6-3:2006 + A1:2010); German Edition EN 61000-6-3:2007 + A1:2011

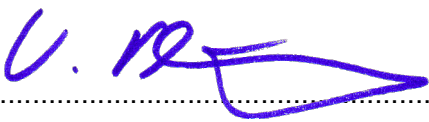
Interference immunity	EMC Directive Article 6 Appendix I.1.b
DIN EN 61000-6-1:2007-10	Electromagnetic Compatibility (EMC)- Part 6-1: Generic standards - Immunity for residential environments, business and commercial areas as well as small businesses (IEC 61000-6-1:2005);

<b>Safety of machinery</b>	
DIN EN 60335-1:2012-10	Household and similar electrical appliances - Safety - Part 1: General requirements (IEC 60335-1:2010, modified);
DIN EN ISO 12100:2010	General principles for design - Risk assessment and risk mitigation ISO 12100:2010 (): German Edition EN ISO 12100
DIN EN 60204-11:2014-10	Safety for Machinery – Electrical Equipment for Machinery – Part 1: General requirements (IEC 44/709/CDV:2014); German Edition FprEN 60204-1:2014
<b>Maximum permissible concentrations in homogeneous materials in % by weight</b>	<b>RoHS Directive Appendix II</b>
Lead	0,1%
Cadmium	0,01%
Polybrominated biphenyl (PBB)	0,1%
Polybrominated diphenyl ether (PBDE)	0,1%
Mercury	0,1%
Hexavalent chromium	0,1%

**Note:**

The sole responsibility for drawing up this declaration of conformity lies with the manufacturer. This declaration of conformity will lose its validity when the product is converted, extended or altered in any other manner without the express consent of Plettenberg Elektromotoren GmbH & Co. KG and when components, not belonging to Plettenberg Elektromotoren GmbH & Co. KG, or accessories are installed in the product as well as in the event of improper connection or improper use of the product.

Baunatal, 12. June 2018

  
 .....  
 (Uwe Plettenberg, Director)