EN

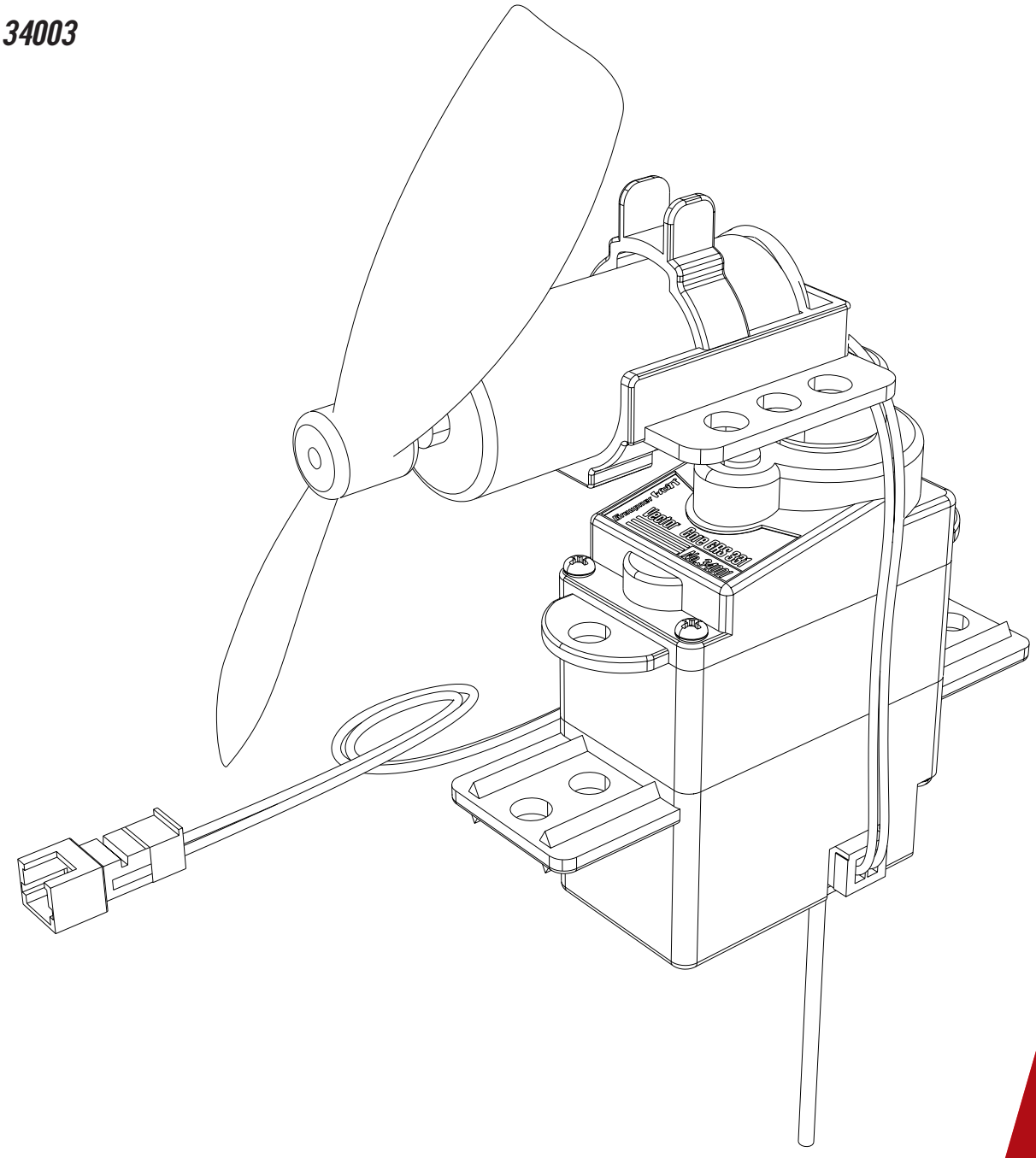
Manual

Vector Unit / Vector Unit Extreme

2 channel HoTT 2,4 GHz receiver/servo/speed controller unit

No. 34002

No. 34003



CE

Graupner

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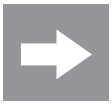
Introduction

Thank you very much for purchasing the ***Graupner*** **Vector** unit. This manual is valid for unit Numbers 34002 and 34003. Package content will change depending on the version.

Read through this entire manual before use. ***Graupner*** continuously enhances and updates its products and reserves the right to change its products, technology, user manuals and equipment at any time without prior notice.

Periodically check our website, **www.graupnerusa.com** for the most recent updates to the manual and firmware.

To maintain this condition and to ensure safe operation, you must read and follow this user manual and the safety notes before using the product!



NOTE

THIS MANUAL IS PART OF THE PRODUCT. IT CONTAINS IMPORTANT INFORMATION CONCERNING OPERATION AND HANDLING. KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE. PLEASE PASS ON TO FUTURE OWNERS.

Service Center

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Graupner **Online**

For service centers, downloads and product list, visit our web site at **www.graupnerusa.com.**

Intended use

This **Vector** unit is intended be used for the purpose specified by the manufacturer for operation of remote control models without passengers. Any other type of use is prohibited and may damage the system and cause significant property damage and/or personal injury. Improper use is not covered by this product's warranty.

Read through this entire manual before you attempt to install or use the transmitter.

Graupner continuously enhances and updates its products and reserves the right to change its products, technology, user manuals and equipment at any time without prior notice.

Target Group

This product is not a toy. It is not suitable for children under 14 years old. The operation of this product must be performed by experienced modelers. If you do not have sufficient knowledge about operating radio-controlled models, please contact an experienced modeler or a model club.

Package Content No.34002

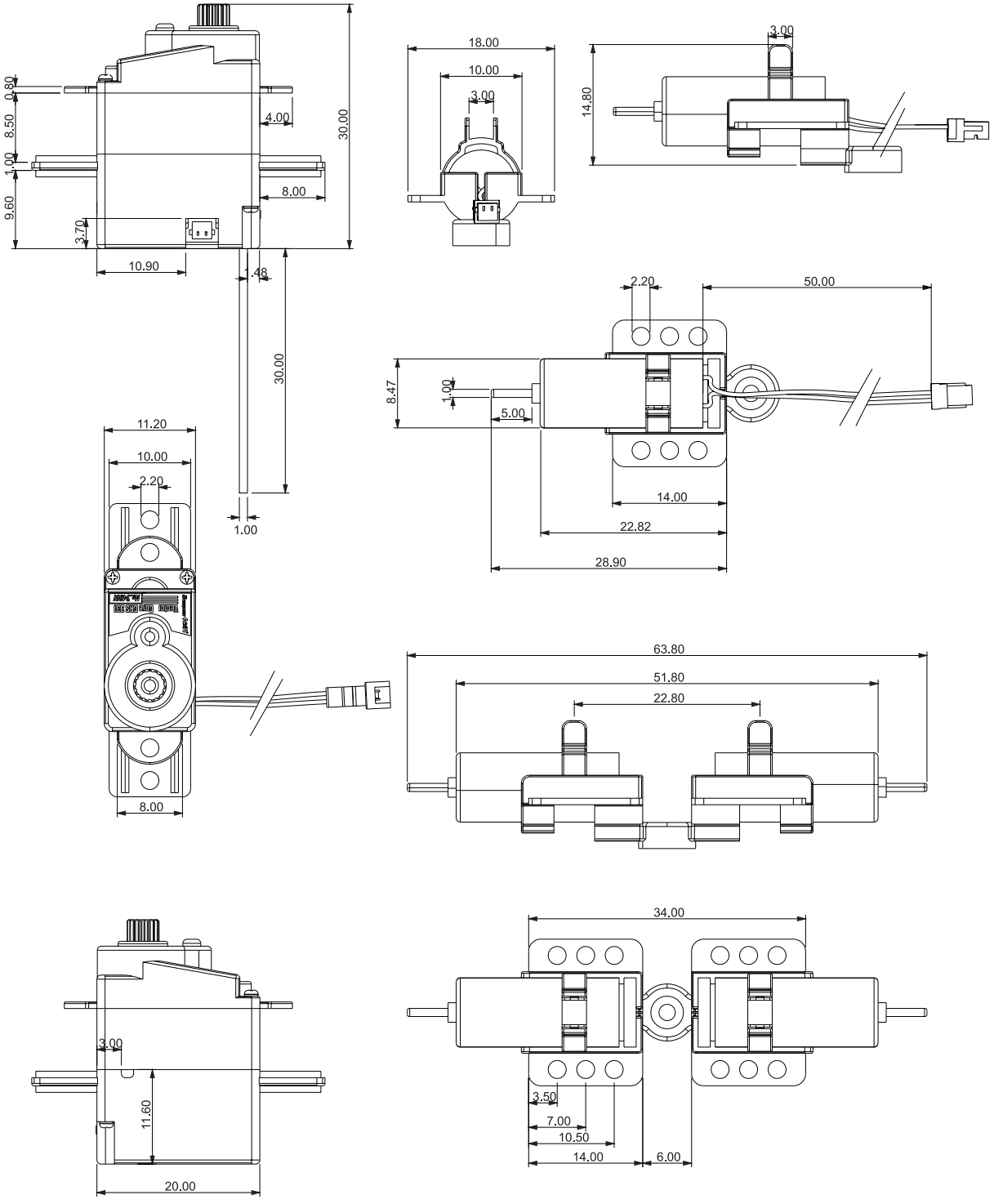
- **Vector Core GRS 331**
- No.78101.1 **Power Pack 160 mAh Battery**
- No.S2025 **Slim 150 Charger**
- 34001.4 **Vector Motor CW**
- 34001.30 **Vector Propeller 46 mm**
- Manual

Package Content No.34003

- **Vector Core GRS 331**
- No.78101.1 **Power Pack 160 mAh Battery**
- No.S2025 **Slim 150 Charger**
- 34001.4 **Vector Motor Extreme CW**
- 34001.31 **Vector Propeller 56 mm**
- Manual

Technical Data

Frequency band	2.4 to 2.4835 GHz	**Motor unit single**	approx. 6.8 g
Modulation	FHSS	**Motor unit double**	approx. 13.7 g
Temperature range	**14° to 130°F** (-10°C to 55°C)	**Current consumption**	max. 2A continuous current
Antenna	Wire 30 mm	**Stall torque/3.7 V approx**	5 Ncm
Operating voltage	3.0V to 4.2V	**Speed/3.7C approx.**	0.06 sec./40°
Weight Vector Core	approx. 6.6 g		

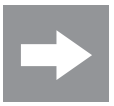


Symbols explication

Always observe the information indicated by this warning sign. Particularly those which are additionally marked with the following signal words:

WARNING indicates the potential for serious injury

CAUTION indicates possibility of lighter injuries.



This icon indicates information that may be helpful in diagnosing or troubleshooting, especially when accompanied by the following signal words:

Note indicates potential malfunctions.

Attention indicates potential damages to objects.

Safety notes

These safety instructions are intended to protect this product, yourself and the safety of others. Please read this section very carefully before using this product!

- Check all relevant laws and regulations before using this remote control model. These laws and regulations must be observed in for the safety of yourself and others and may vary by state, region, or country.
- *First-time users:* carefully familiarize yourselves with this model's functions and commands. Always exercise caution and operate this model responsibly.
- To avoid risk of suffocation, keep packaging materials away from babies and small children.
- Supervision by an experienced adult is required for children, persons mentally or physically handicapped, novices, or anyone not capable of safely using this product.
- Special liability insurance policies are mandatory for all device operations. If you already own a device, determine if the respective model is covered by your insurance.
- Protect all equipment from dust, dirt, moisture, vibration and excessive heat or cold. The models may only be operated remotely in normal outside temperatures ranging from **14° to 130°F** (-10°C to 55°C).

- To ensure safe operation, always perform a range test and functional test on the ground before you use your model!
- Maintain frequent updates of your HoTT components with the latest firmware version.
- Always use matching, original ***Graupner*** plug-in connections of the same design and material.
- Make sure that all of the plug-in connections are tight. When disconnecting the plug-in connections, do not pull the cables.
- For additional questions or support, contact the ***Graupner*** USA Service Center, or an experienced user.

WARNING

Safety notes during the use

Rotating propellers can cause injury. Never touch rotating propellers. This can cause serious injury.

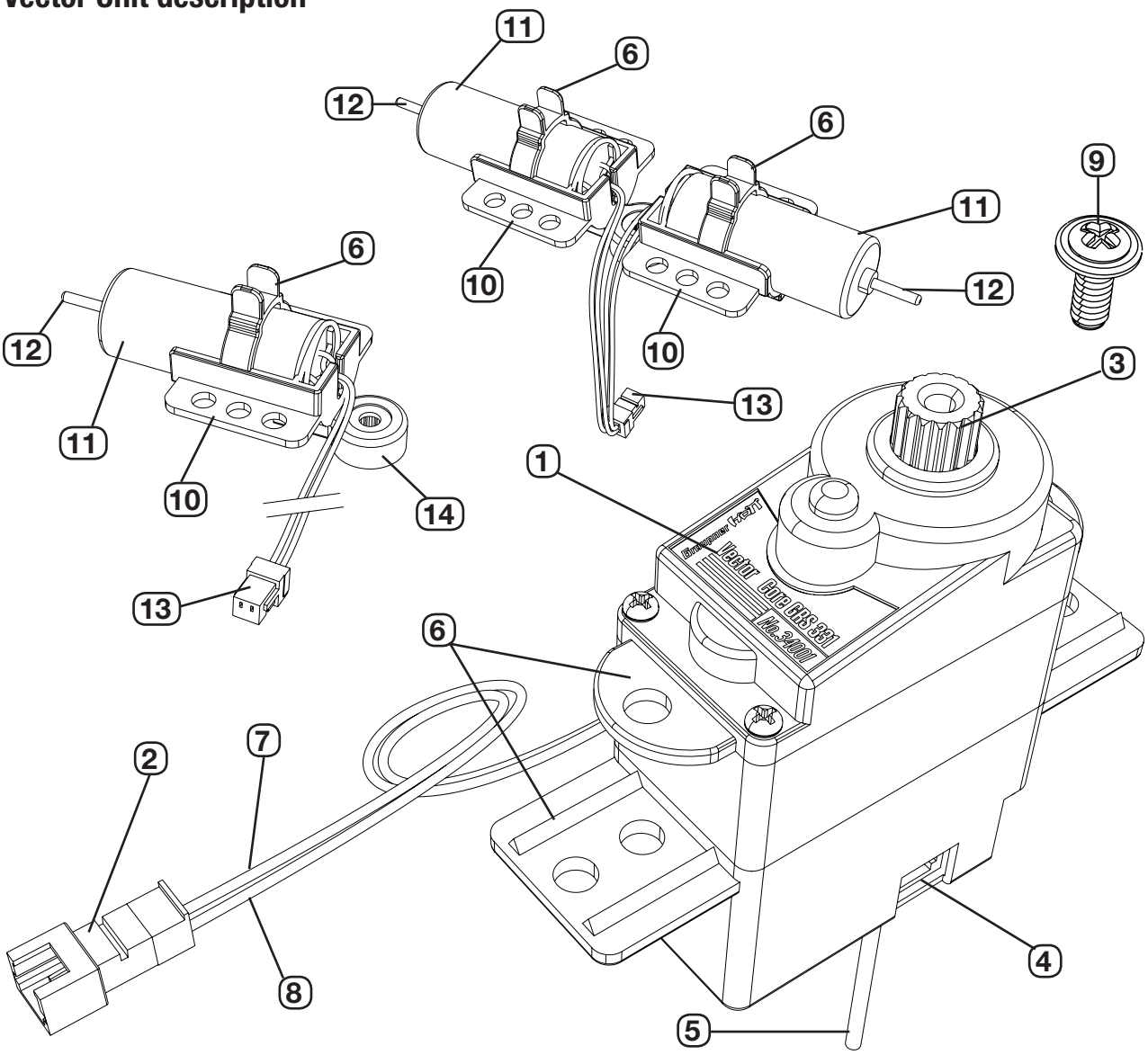
To make sure the connected motors cannot accidentally start when programming the transmitter, turn the transmitter's motor off, or detach the propellers.

To avoid electrical shock, check the **Vector** unit regularly for damages to the housings and cables, especially after a model crashes. Discontinue using any electronic components that have become wet; short-circuiting and shock risk is still prevalent even after components have dried.

The propellers must be mounted securely; thrown parts can cause serious injury.

Keep long hair, loose clothing such as scarves, loose shirts, etc., away from the propeller. Damage to the propellers may occur and flying debris may cause serious injury.

Vector Unit description



1	Vector Core, Servo DES 131 with integrated receiver and speed controller
2	Battery connection cable
3	Drive gear to install a motor unit or a servo lever
4	Motor connection socket max. 2A continuous current
5	Receiver antenna
6	Fixture arms
7	**+** cable (red)
8	**-** cable (black)
9	Motor mount fixing screw, flat-head screw 1.2 x 3 mm
10	Motor mount
11	Motor
12	Propeller
13	Motor connection plug
14	Drive gear joint

Preparation Before Use

The **Vector** unit should only be powered by a 1S LiPo battery **Power Pack** (No. 78101.1).

The input voltage of the drive battery is monitored during flight through the **HoTT** transmitter telemetry function.

If the voltage drops under 3.2 V, the **HoTT** transmitter will emit a warning alarm. Immediately discontinue use and charge or change the drive battery!

Connecting the Battery

Turn on the Vector unit by connecting the drive battery to the battery connection cable.

Only use the recommended 1S LiPo battery **Power Pack** (No. 78101.1).

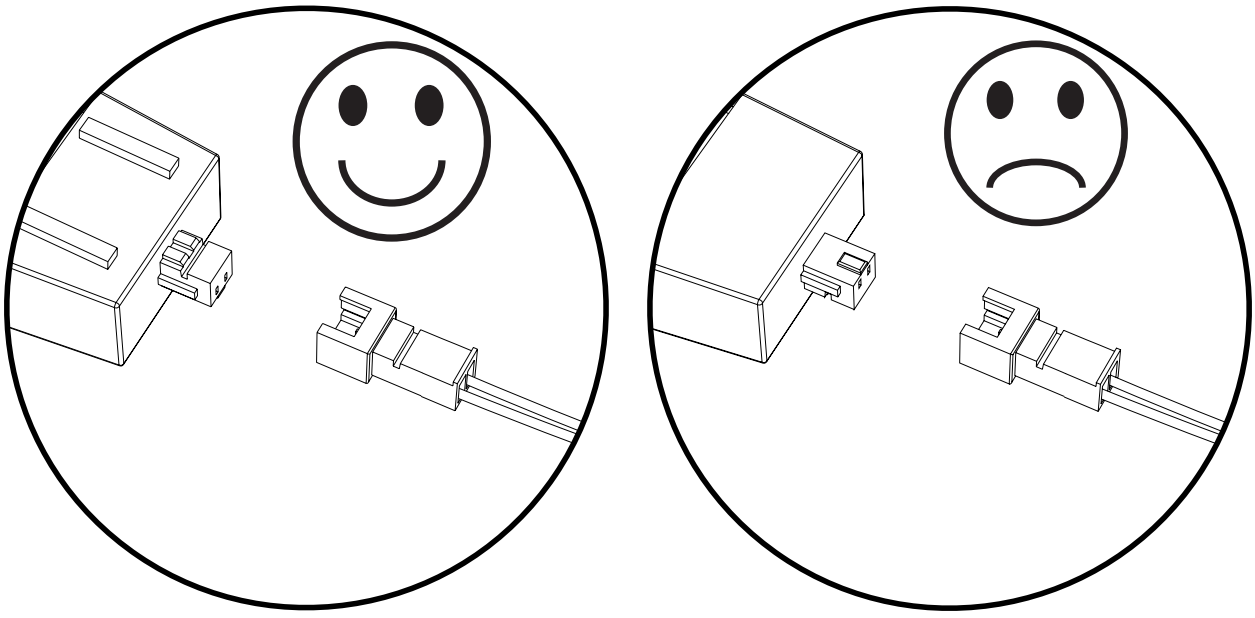
The connectors are reverse polarity protected: note the small chamfers on the sides of the plug. **Never use force** – the connectors should engage easily.

Attention

If the connection system is forcibly connected in the wrong direction, the battery connection cable plug will be irreparably damaged.

Never connect a battery with voltage higher than 4.2 V DC to the unit! The receiver and the servo will be irreparably damaged.

Never connect a battery to the unit's motor port! The receiver and the servo will be irreparably damaged.



Charging the Battery

Only charge the battery with the **Slim 150 Charger** included in the package contents.

For battery safety, refer to the charger's manual.

CAUTION

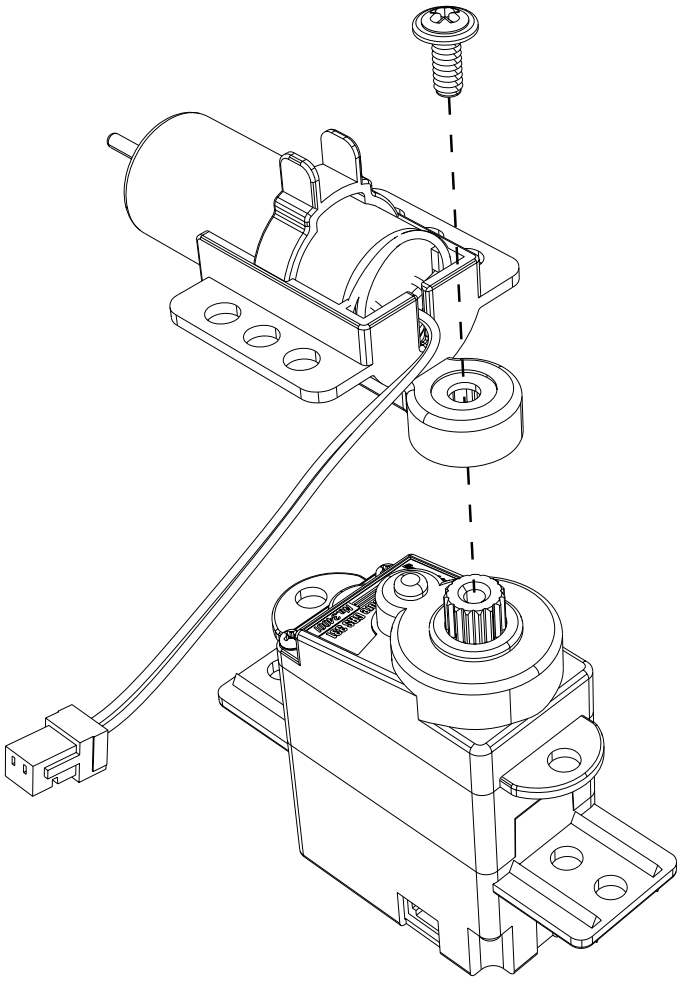
To avoid fire risk or damage to the battery, never use a non specific charger.

Installing the Motor Unit

The motor unit is attached to the drive gear via a fixture screw.

A servo arm can be installed onto the drive gear.

- The servo arm can be used to move the control surface.
- The motor can now be installed in the model.



Connecting the Motor Unit

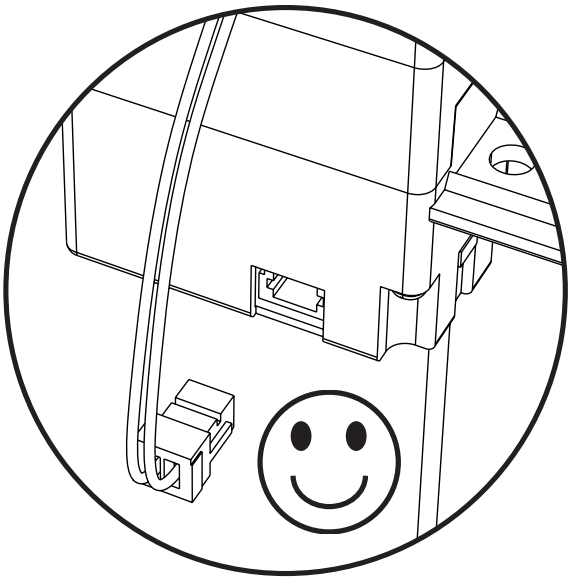
Only use recommended motor units.

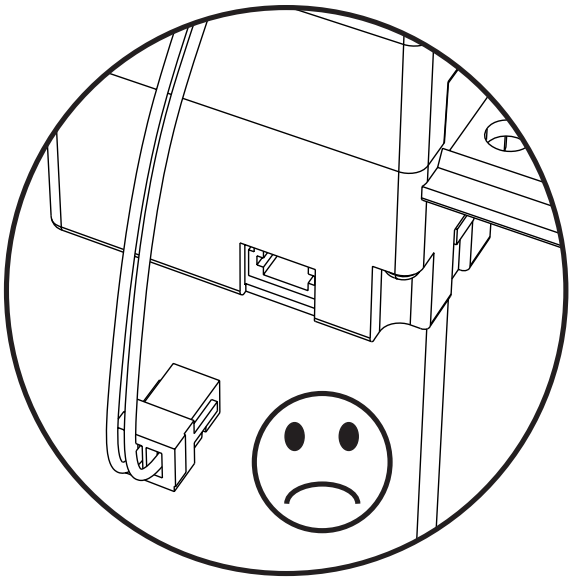
The connectors are reverse polarity protected: note the small chamfers on the sides of the plug. **Never use force** – the connectors should engage easily.

Attention

If the connection system is forcibly connected in the wrong direction, the motor connection cable plug will be irreparably damaged.

Never connect a battery with voltage higher than 4.2 V DC to the unit! The motor will be irreparably damaged.





Binding the Unit

Prior to operation the transmitter and motor unit must be bound to establish a communication connection. Each transmitter/receiver combination requires only one binding. The binding process can be repeated at any time if, for example, a new transmitter is utilized. Refer to the **Binding** section in the transmitter's manual for additional information on the binding process.

1. Turn on transmitter.
2. Connect the drive battery to the motor unit. The **Vector** unit is already in binding mode.
3. Follow the binding process directions outlined in the transmitter's manual.
4. The transmitter will confirm a successful bind. If unsuccessful, repeat the directions as needed to establish a connection. Bind settings will be saved when the transmitter and motor are turned off; the model can be used immediately after turning on.

Successful Binding Process

If the binding process was successful, the transmitter will immediately begin controlling the unit.

Unsuccessful Binding Process

If the binding process was unsuccessful, move the transmitter 3 feet (1 meter) from the receiver, and repeat the binding process as needed until a successful bind is achieved.

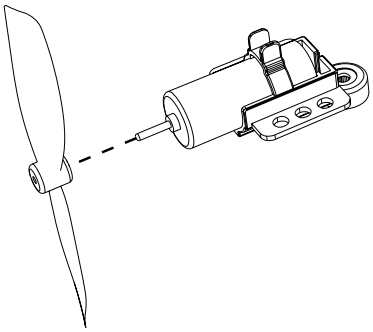
Binding Multiple Units

This function is designed for pilots who want to build and fly custom-designed multi-channel models. The **Vector** Unit is very versatile and can accommodate up to 12 channels for channel mapping.

Binding multiple units is possible only if the function is supported by the transmitter. Refer to the transmitter's manual for more information. The process would be described in the **Binding Multiple Receivers** or **Change Model** sections of the transmitter's manual.

Installing and Upgrading Propellers

CAUTION
To avoid injury by rotating propeller(s) in case of accidental motor starts, **always unplug the battery connector plug** prior to removal/ installation.

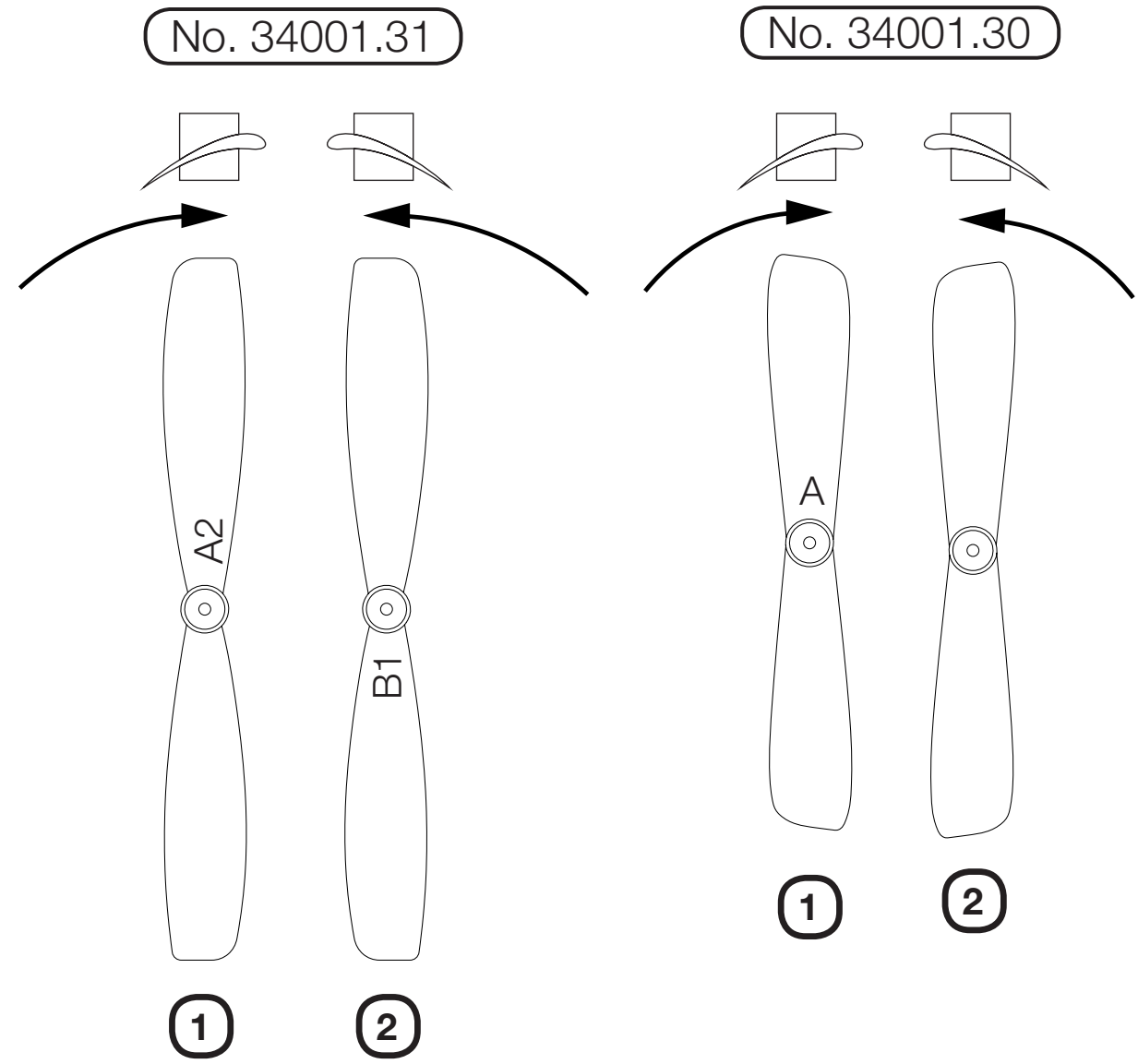


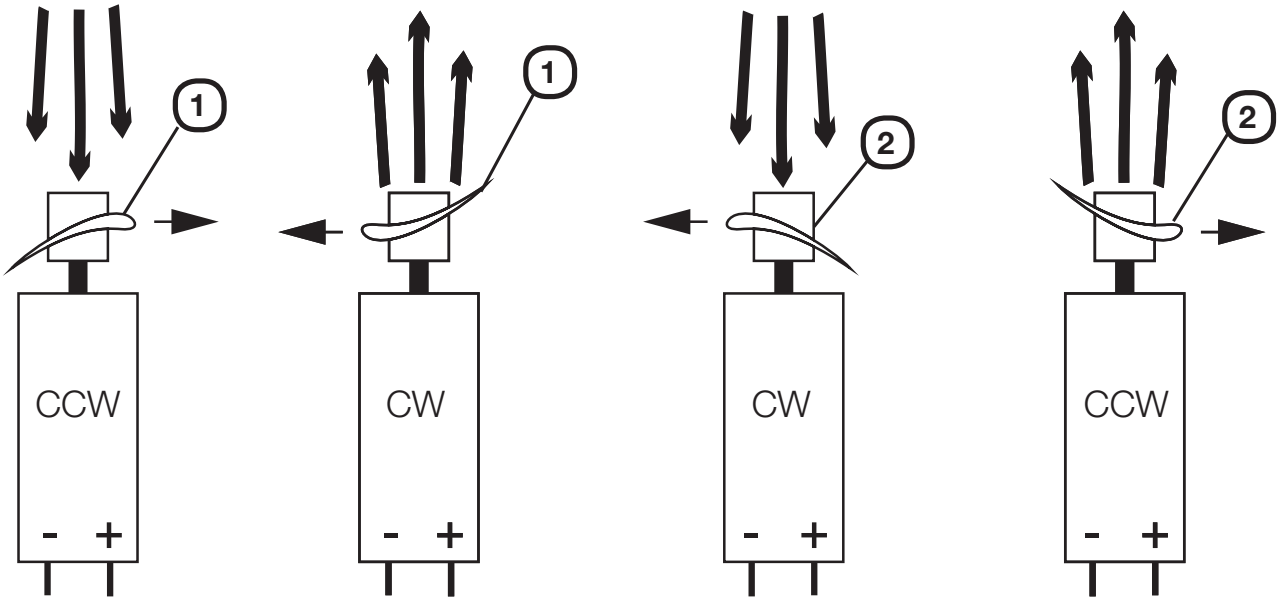
Propeller removal:

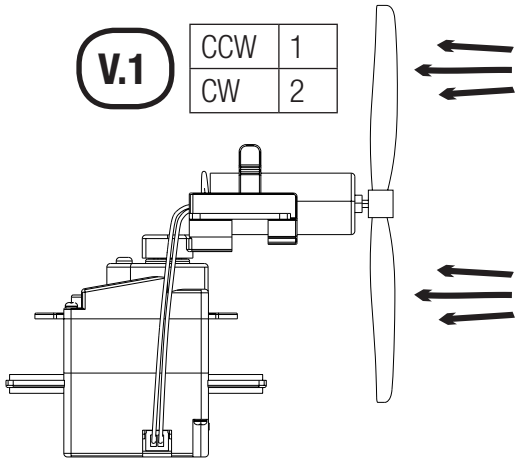
- Hold the motor by the motor case, **not by the motor mount.**
- Pull the propeller straight out.

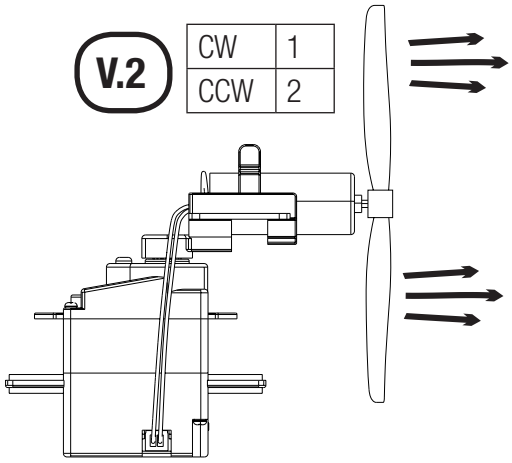
Propeller installation:

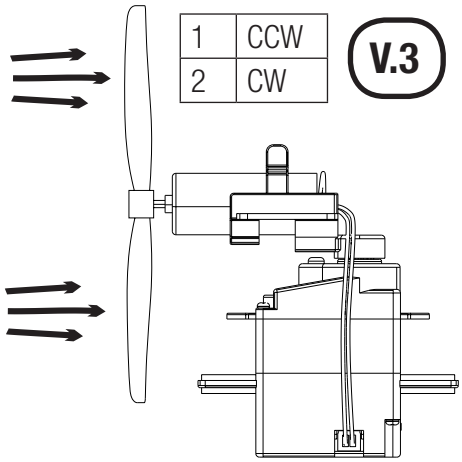
- Hold the motor by the motor case, **not by the motor mount.**
- Gently push the propeller onto the motor shaft. **Do not use excessive force.**
- Pay careful attention to the motor turning direction: clockwise (CW) or counter-clockwise (CCW).
- Pay careful attention to the propeller profile (curvature).
- Pay careful attention to the turn direction of the propeller.
- Pay careful attention to the incisions on the propeller.
- Pay careful attention to the air flow arrow.

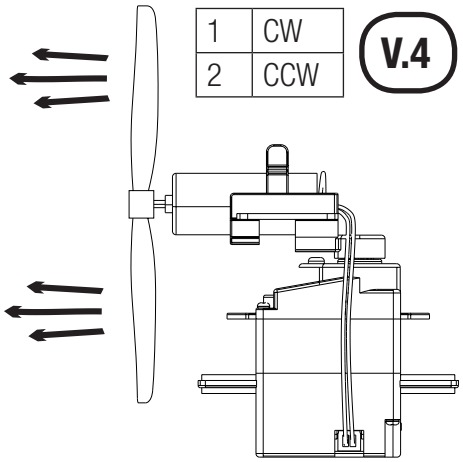

No. 34001.31
No. 34001.30
A2
B1
A
1
2
1
2

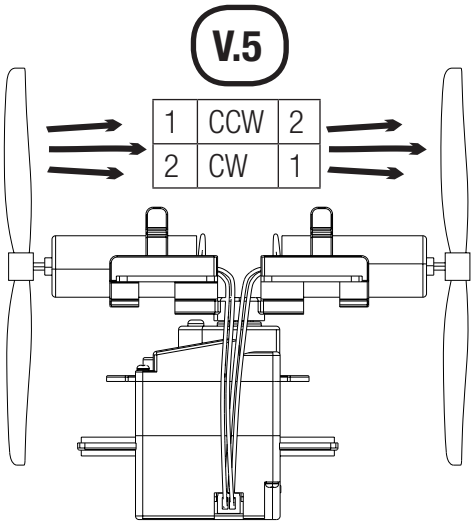

1
1
2
2
CCW
CW
CW
CCW
- +
- +
- +
- +

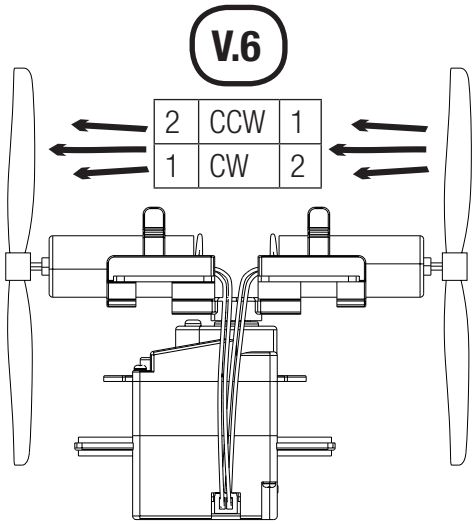

V.1
CCW 1
CW 2


V.2
CW 1
CCW 2

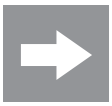

V.3
1 CCW
2 CW


V.4
1 CW
2 CCW


V.5
1 CCW 2
2 CW 1


V.6
2 CCW 1
1 CW 2

Free Mixers



```
FREE MIXER        < >
>MIXER:             1
FROM CHANNEL:       1
TO CHANNEL:         6
TRIM:             +0%
TRV - :         +100%
TRV + :         +100%
```

Note

Make sure previously programmed mixer functions (in the "Wing mixers" or "Free mixers" menu of the HoTT transmitter) do not overlap with these menu options.

MIXER:

Up to five mixers can be contemporaneously programmed. Switch between each mixer in the MIXER line of the menu screen.

Settings only affect the mixer selected in this line.

FROM CHANNEL:

The signal source (or source channel) is mixed in to the target channel (**TO CHANNEL**) with programmable values. The method of setting up the values is analogous to the "**Free Mixers**" menu in **HoTT** transmitters. Refer to the transmitter's manual for additional information.

Flying, Assembling and Experimenting with the Vector Unit

Ground ideas

The **Vector** unit has been developed for simple free-flight airplane models.

The **Vector** unit has been launched in tandem with specially-designed Vector Planes (e.g. **LEO** No.13301). The gliders are not intended for flying as remote controlled models, but can be controlled as such so long as their weight does not exceed 50g.

- Foam launch gliders.
- Rubber motor models.
- Small balsa models.
- Everything which an RC model fan can conceive

Installation

While installing the **Vector** unit into a glider or model, note:

1. Mark the glider or model's center of gravity and install battery and unit accordingly. This allows the model to fly properly by itself.
2. For a pulling motor, install the **Vector** unit tilted 1-2° upwards. For a pushing motor, install the **Vector** unit 1-2° downward. This gives the unit a little ascending elevator effect while accelerating and prevents the model from flying downward while accelerating.
3. The pushing or pulling point on the drive gear thrust:
    - must always be at least 10-20mm before the center of gravity according to the wing geometry
    - *or* just after the wing front edge according to the wing geometry (for example, see **LEO** No.13301)
    - must always be on the wing
    - *or* wide under the wing (for example, see **Hexe** No.13304)
4. Do not restrict or limit the propeller airflow. Constricted air flow reduces thrust and shortens flight time as well as negatively impacts the control reaction.
5. Affix the **Vector** unit by screwing it through the fixture arms, attaching it on each side with strips of adhesive tape or with contact glue (for example, **UHU por**).

Flying Tips

While flying with the unit note:

1. Rudder cannot be controlled without throttle.
2. Do not set a large rudder travel for the first flight. Start with 15-20% of the normal servo travel.
3. If the model starts to rear up, reduce the throttle control or, when it is in the apex of the rearing up, use the rudder control to fly a curve.
4. If #3 does not work and the model cannot be controlled well, check and reset the unit angle (motor inclination) or the center of gravity.
5. Note the torque of the motor:
    - Correctly trim the unit.
    - Turning in the torque direction is easier as less travel is required.
    - Turning against the torque direction is harder as more travel is required.

Declaration of conformity

Vector Unit GRS 331

CE

Graupner/SJ declares that the product is conform to EU norms.

NOTES