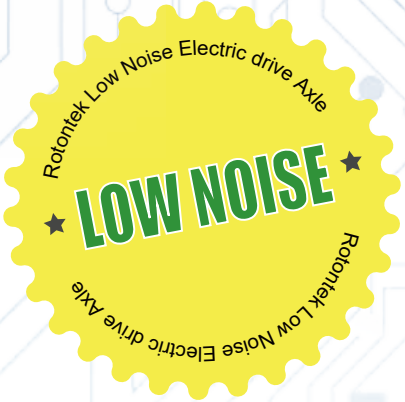
RotonTEK

Motor Controllers

User Manual
ID600A Motor Controller

DC24-72V 175A AC Asynchronous Motor Controller







www.rotontek.com

ID600A

Product Introduction

ID600A is an AC motor controller specifically designed for small electric vehicles, using state-of-the-art sine wave vector control algorithms both domestically and internationally. It also supports square wave control, providing very smooth, quiet, low-cost, and efficient motor speed and torque control. This controller adopts automotive grade electronic components, providing customers with high safety and supporting handheld programmers, suitable for any low-power permanent magnet brushless DC motor application. The ID600A series is a full bridge or four quadrant controller that can achieve flexible energy feedback control, effectively improving driving range. It is widely used in elderly scooters, electric cleaning vehicles, golf carts, electric special vehicles, etc.

Product Features

(1) Using TI's mainstream DSP as the main control chip and advanced sine wave vector control algorithm, the controller achieves precise control of motor torque and speed.
(2) The high-power MOSFET transistor from Infineon company was selected as the power device, achieving low noise and high efficiency energy conversion.
(3) Soft start, soft stop, and intelligent braking ensure safer and more comfortable driving in any situation.
(4) Braking or reverse energy feedback control to increase the vehicle's range.
(5) Equipped with Hall phase sequence automatic identification function, it is convenient for vehicle manufacturers to debug.
(6) Anti slip function, improving driving safety performance.
(7) The automatic motor load compensation function ensures that the vehicle maintains stable speed when crossing obstacles or climbing hills.
(8) By using a programmer, parameters can be flexibly adjusted to adjust the vehicle's handling performance, meeting the requirements of different road conditions and various usage environments.
(9) The comprehensive protection functions for accelerator faults, overvoltage, undervoltage, overcurrent, overload, overheating, etc. have improved the reliability of the system.
(10) Personalized software can be customized according to customer needs.
(11) The protection level of IP55.

Product specifications

Model	Rated voltage	Current Rating 60 minutes[1]	Current Rating 1 minutes[2]	Peak Current 10 second	CAN /SCI
ID600A	48V	100A	200A	250A	Yes

Note: [1]The 60 minute continuous current value is based on an ambient temperature of 25 ℃. The controller is installed on an 8mm thick aluminum plate with an air flow of no less than 6 kilometers per hour and operates for 1 hour.

[2] The 1-minute continuous current value is based on an ambient temperature of 25 . The controller is installed on a non thermal conductive surface and operates for 1 minute without airflow, and the temperature of the controller is below 75 ℃.

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Wire

·The connection between the battery and the controller should be placed last;
·The wiring between the motor, battery, and controller should be as short as possible and parallel;
·All switches must be in the off position and live operation is prohibited;
·All wiring cross-sectional areas must meet the carrying current requirements, as shown in the table below;
·The main fuse and control circuit fuse must be indispensable and must match the maximum current value of the controller.

Motor

A motor is a component that converts battery energy into mechanical energy and drives the wheels of an electric vehicle to rotate. Precautions for use are as follows:
·The surrounding area of the motor should be kept clean and dry, and no other objects should be placed inside or outside it;
·It is strictly prohibited to coexist with strong magnetic objects;
·The input voltage level needs to be ensured to be correct;
·If any abnormal noise or odor is found during use, the motor should be immediately stopped for inspection;
·The wiring between the motor and controller should be as short as possible;

Battery

·Do not use under overload, high humidity, or high wave intensity conditions;
·Keep the heat dissipation part of the battery unobstructed and avoid exposure to sunlight;
·Do not mix old and new batteries;
·If the lead-acid battery has been in use for more than 4 years and the lithium battery has been in use for more than 6 years, it needs to be replaced;
·When charging, do not reverse the polarity of the battery, otherwise it may cause the battery to be scrapped;
·Maintenance-free batteries need to be regularly charged when not in use, usually not exceeding one month;
·Open type liquid lead-acid batteries should not be short of water and generally require maintenance with water for two to three months;
·The cross-sectional area of battery B+ and B - short wiring must meet the current requirements, as shown in the table below;
·When removing the battery, the negative end should be removed first to avoid a short circuit between the positive end and a certain part of the vehicle body;

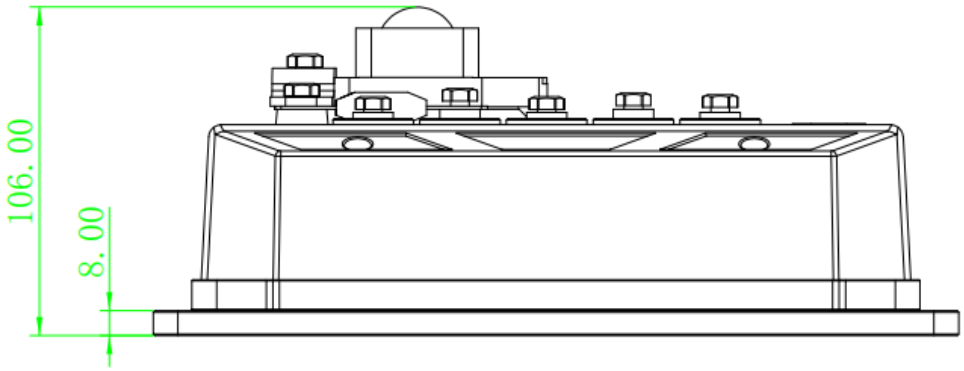
Charger

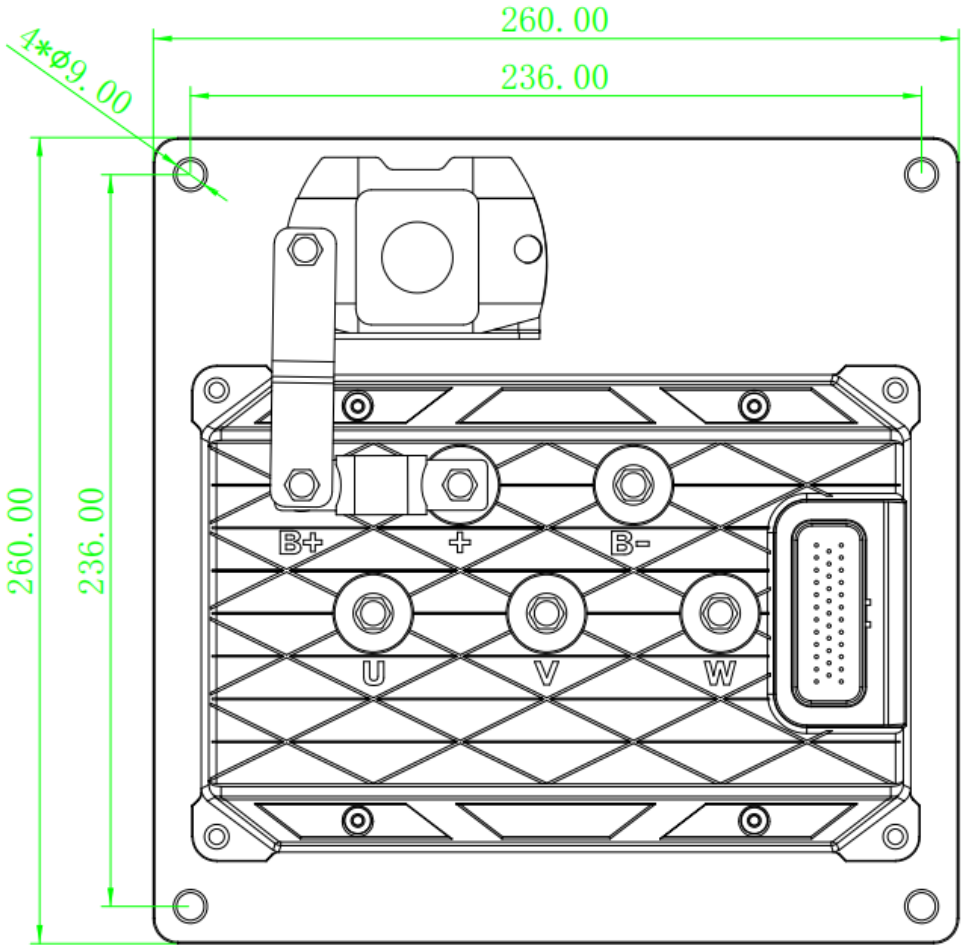
·The output voltage must be compatible with the battery;
·Do not place the charger in an area with high temperature or humidity;
·Regular cleaning of the charger and charging interface is required;
·Vehicle charger should pay attention to vibration protection;

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Dimensions and standard wiring diagrams

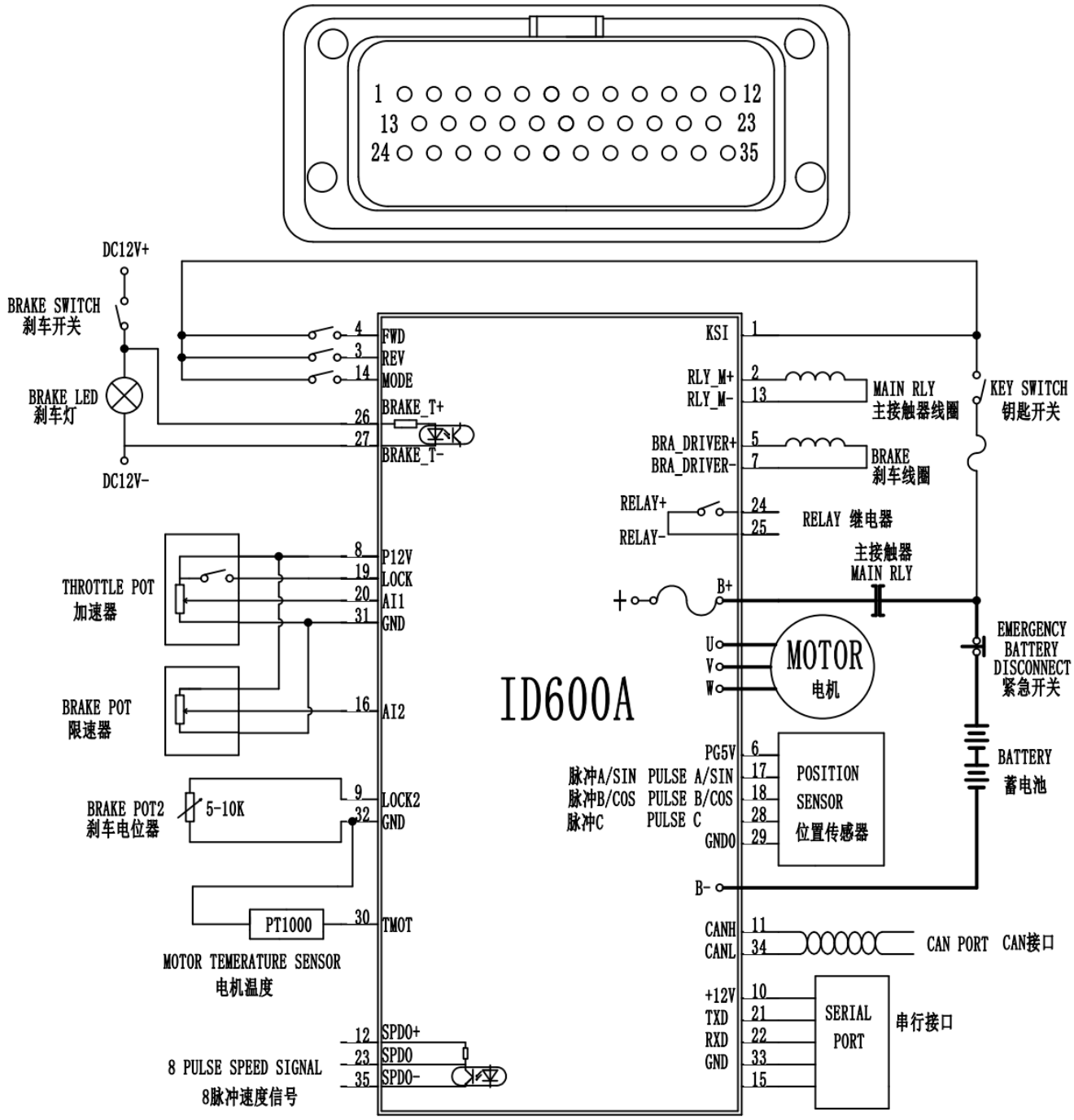
Dimension-1





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Standard wiring diagram



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Use Warning

Please carefully read the following content before using the product (if you have any questions, please contact the manufacturer):

(1)Do not pull the cable when unplugging!
(2)Controller + and - terminals must not be connected in reverse!
(3)Pay attention to moisture and corrosion prevention!
(4)Pay attention to moisture and corrosion prevention, and do not plug or unplug the controller wiring port with power!
(5)Do not short circuit the motor wiring!
(6)It is strictly prohibited to connect wires without following the wiring diagram!

Once the courtesy car is traveling in an unexpected direction, please release the joystick. In any case, this action will stop the ride.
The user of a ride must be able to drive the ride safely. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Dangerous

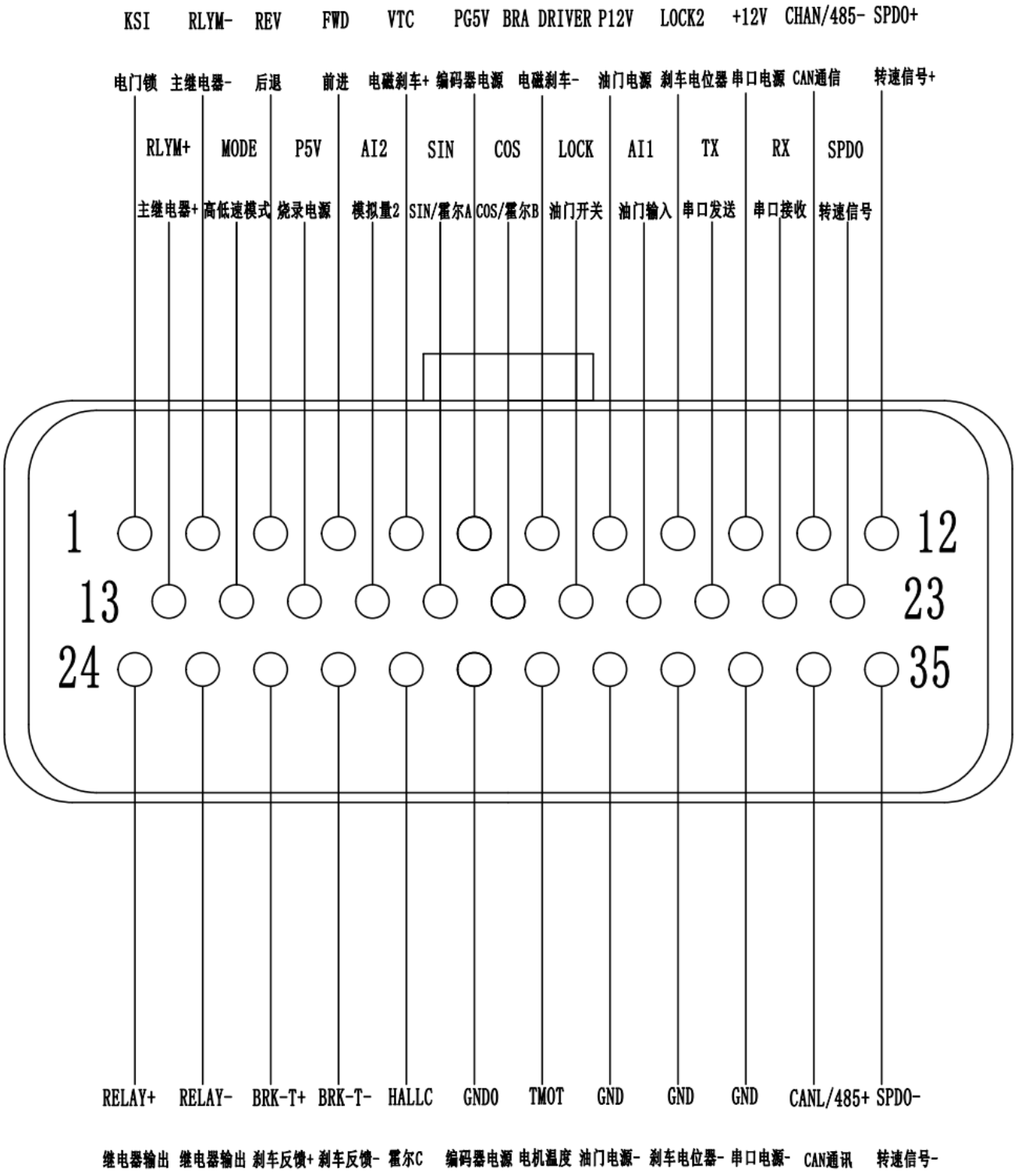
Don't drive a ride like this:
(1)Exceeding the limits specified in the user manual of the ride, such as slopes, curb heights, etc.
(2)In areas or surfaces where losing tire grip can cause danger, such as slippery grass slopes.
(3)If you know that the controller or other critical components need to be repaired.
Note in the user manual of the ID600A motor controller: Although the ID600A controller is designed to have extremely high reliability and each device is strictly tested during the production process, there is always a possibility of system malfunction (although the probability is small). In the event of some system malfunctions, the controller must immediately stop the ride (for safety reasons).
If the user may fall out of the ride due to a sudden braking action, they must provide safety equipment (such as a seat belt) with the ride and ensure that the safety equipment is always used during the ride. The manufacturer shall not be liable for any losses caused by the accidental stop or incorrect use of the ride or controller.
If the behavior of the courtesy car is abnormal or shows abnormal heating, sparks, or smoke, do not operate the ID600A controller. Please immediately shut down the ID600A controller and contact your service agent. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.
Electrical equipment may be affected by electromagnetic interference (EMI). These interferences may be generated by radio stations, television stations, or other radio transmitters and mobile phones. If the seat exhibits abnormal behavior due to EMI, please immediately turn off the controller and contact your service agent. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.
The manufacturer of the ride will be responsible for ensuring that the ride complies with relevant national and international EMC regulations. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Warn

The user of a ride must comply with the ride safety warning. The manufacturer shall not be liable for any losses caused by failure to comply with the sub conditions.

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Terminal Definition



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Technical specifications

Number	Name	Specifications
1	Rated input voltage	24V/36V/48V
2	PWM frequency	10KHz
3	KSI input current	＜1A
4	Logic port input current	＜10mA
5	Relay output current	5A
6	Encoder Type	AB Encoder
7	Interface	CAN
8	Motor temperature measurement type	PT1000/KTY84
9	Electromagnetic brake impedance	32-200Ω
10	Speed control signal	0-10KΩ/0-5V
11	Throttle type	Single-ended
12	Ambient Temperature	-25℃~50℃
13	Storage environment temperature	-40℃~65℃
14	Over temperature current limiting	80℃ Current-limiting 105℃ Cut off
15	Low temperature current limiting	-10℃ Current-limiting -25℃ Current-limiting 50%
16	Protection grade	IP55
17	Relevant standards	EN12184,EN55022,ISO7176-14 IEC 801

If the battery is about to fully discharge, do not use a scooter. If this condition is not complied with, it may trap the user in an unsafe location such as the center of the road. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

According to the type of inertial coasting mechanism, the scooter may perform inertial coasting at dangerous speeds. Therefore, do not push the scooter up or down on slopes where it cannot be stopped or controlled. When the inertial sliding mechanism is separated, never ride on a courtesy car. The manufacturer shall not be liable for any losses caused by the movement of the scooter during the separation of the inertial sliding mechanism.

Programming should only be carried out by professionals with a deep understanding of electronic control systems. Incorrect programming may cause unsafe ride settings for users. If the factory preset values of the control system are changed, the manufacturer shall not be responsible for any type of loss.

If not used in accordance with the ID600A technical manual, misused or abused, or modified or repaired by unauthorized personnel, the warranty will become invalid. The manufacturer shall not be liable for any losses caused by unauthorized opening, adjustment, or modification of the ID600A scooter control system.

If the control system of the ID600A scooter is damaged in any way, or internal damage may have been caused by a collision or fall, please have qualified personnel inspect the product before operation. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of scooters is responsible for providing a measure to prevent the use of scooters during battery charging. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of the scooter will be responsible for determining the suitability of the specific wiring scheme used on the scooter for normal usage and stall conditions. ID600A manufacturers can provide general recommendations for the wiring of the scooter controller, but they are not responsible for the actual wiring scheme used or any losses caused by it.

The commuting vehicle manufacturer will be responsible for ensuring the use of suitable connectors and securely connecting these connectors throughout the entire wiring system of the commuting vehicle, and ensuring that the processes related to the wiring system have sufficient quality. If this condition is not met, it may result in discontinuous operation, sudden stop or turning, and may even cause a risk of burns or fire. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of the scooter will be responsible for ensuring that all wire numbers are suitable for use in the intended occasion. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Motor vehicle manufacturers must install suitable circuit breakers to provide short circuit protection for battery lines, power equipment, or controllers. Failure to comply with this regulation may result in a fire hazard. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Motor vehicle manufacturers must install appropriate fuses to protect the motor vehicle wiring. Failure to comply with this regulation may result in a fire hazard. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

At any time, the current passing through the pins of the ID600A scooter controller must not exceed the rated current. Failure to comply with this regulation may result in a fire hazard. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of the scooter will be responsible for ensuring that the controller matches the motor resistance. Otherwise, it may lead to poor control performance, and in extreme cases, it may cause the courtesy car to lose control, which may cause danger. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of the scooter will be responsible for ensuring that any replacement motor or gearbox is fully compatible with the original design of the controller at all times. Otherwise, it may lead to poor control performance, and in extreme cases, it may cause the courtesy car to lose control, which may cause danger. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Users or service personnel are not allowed to install controllers from one type of ride into another. Controllers with different part numbers may have differences in hardware and software to ensure compatibility with the electrical and dynamic characteristics of specific target vehicles. The characteristics of a controller may not be compatible with different, unauthorized scooters. If this warning is not followed, it may cause unsafe setting conditions for commuter users, and according to the motors, wiring, connectors, and disconnect switches installed on unauthorized seats, it may lead to a fire. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

The manufacturer of the scooter will be responsible for ensuring that sufficient measures are taken to warn users of the danger of coasting and speeding due to inertia. Motor vehicle manufacturers will also be responsible for utilizing appropriate inertial sliding mechanisms to reduce these risks. The manufacturer shall not be liable for any losses caused by the coasting and speeding of the courtesy car.

Under high-intensity driving conditions, the metal part of the controller chassis may exceed the normal ambient temperature. In these situations, ride manufacturers should ensure that users cannot come into contact with these surfaces, or warn users not to come into contact with these surfaces. Although it may be very close to normal body temperature, prolonged contact with the surface above may cause skin burns. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

If any losses are caused due to the failure of the ride manufacturer to specify appropriate safety barrier values for a specific ride application, the manufacturer shall not be held responsible.

The manufacturer of the scooter will be responsible for ensuring that sufficient measures are taken to warn users of the danger of coasting and speeding due to inertia. Motor vehicle manufacturers will also be responsible for utilizing appropriate inertial sliding mechanisms to reduce these risks. For any losses caused by the coasting and speeding of the courtesy vehicle,The manufacturer does not assume any responsibility.

The manufacturer of the scooter will be responsible for ensuring that any replacement motor and controller are fully compatible with the original design. Otherwise, it may lead to poor control performance, and in extreme cases, it may cause the courtesy car to lose control, which may cause danger. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Security Check

The circuit design in the ID600A controller is designed to have extremely high safety and reliability. The onboard microcomputer will perform security checks at a speed of up to 100 times per second. To supplement this security monitoring, the following periodic checks should be performed. If the controller fails any of the checks, stop using the ride and contact your service agent. These checks should be conducted in open spaces and safety devices such as seat belts should always be used. The manufacturer shall not be liable for any losses caused by failure to comply with this condition.

Security Check

Joystick: With the power off on the scooter, check that the mechanical device of the joystick is not bent or damaged, and after pushing and releasing it, it will return to the parking position. If there are issues, please stop the security check and contact the service agent.

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Weekly inspection

Joystick: Push the joystick to the full speed forward position, and then turn on the power supply of the courtesy car. The courtesy car should not move. If the courtesy car moves, please contact your service agent。

Parking brake: This test should be conducted on a horizontal surface, with a free distance of at least one meter around the ride. Connect the power supply of the courtesy car. Drive the courtesy car slowly in the forward direction until you hear the sound of the parking brake working. The courtesy car may start moving. Immediately release the control lever. It must be possible to hear the sound of the parking brake working within a few seconds. Repeat the test in the reverse direction.

Wires and connectors: Check that all connectors on the scooter are correctly paired and ensure that all wires are undamaged.

Note: Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.

WARRANTY One year limited warranty from time of delivery.

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