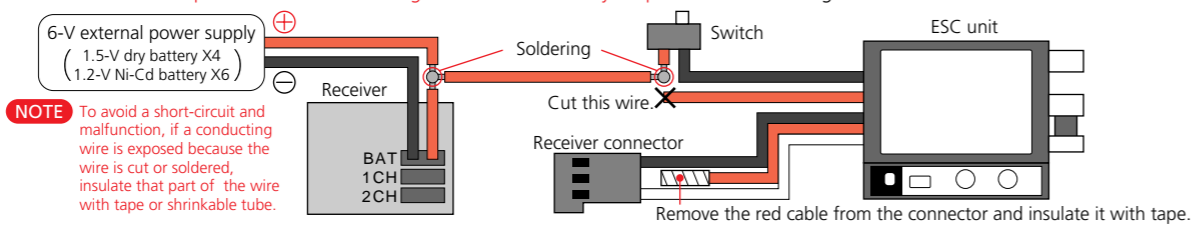


Using a separate power supply (Our warranty does not cover the usage of a separate power supply. Exercise added care in wiring.)

⚠ WARNING: To prevent fumes, fire, and burns

Be sure to remove the Ni-Cd battery and external power supply before changing the wiring. Ensure that the polarity of the wiring is correct. Incorrect polarity may cause a malfunction in the ESC, receiver, and servo.

★ When you use a high-torque motor, it is effective to use a separate power supply for the ESC, receiver, and servo. This is because they continue stable operation even if the voltage of the Ni-Cd battery drops. Provide the wiring as described below.



Troubleshooting

Symptom	Cause	Remedy
Cannot set "High point"	Improper setting of ESC Improper transmitter setting	Reset transmitter throttle setting to normal before setting "High point". Set "High point" position at 90% of full throttle. Correct transmitter throttle setting.
Brake fails.	Improper setting of ESC Improper transmitter setting	Reset transmitter brake setting to normal before setting "Brake point". Set "Brake point" position at 90% of full throttle. Correct transmitter brake setting.
Motor and servo both do not work.	Bad contact with battery Improper wiring of receiver Receiver failure Transmitter failure	Check that contact with battery is good. Check that wiring of receiver and servo is correct. Replace crystal or request repair. Replace crystal or request repair.
Motor does not work, but servo works.	ESC failure Improper setting of ESC Motor failure Bad contact with battery Bad contact with receiver connector ESC failure	Request repair. Setup ESC again from the beginning. Replace motor. Check that battery and cables are properly connected. Confirm whether the Rx connector pin is broken or loose. Request repair.
ESC gets too hot.	Input voltage is too high Insufficient cooling Driving load is too high Schottky diode failure	Use 6-cell power supply. Attach radiating fin to improve air flow and heat radiation. Adjust driving system. Confirm whether the schottky diode connected between the body and the motor is loose or damaged. If the diode appears to be damaged, exchange it.
Acceleration is decreased.	Improper ESC setting Current limiter value is too low Schottky diode failure	Setup ESC again from the beginning. Increase current limiter value. Confirm whether the schottky diode connected between the body and the motor is loose or damaged. If the diode appears to be damaged, exchange it.
Car behaves incorrectly.	Failure in motor capacitor Bad position of receiver Transmitter/receiver failure Incorrect wiring	Replace motor capacitor. Keep receiver as far from battery or ESC as possible. Request repair. Make silicone cables as short as possible.

Specifications

Power supply	6-cell Ni-Cd battery	Weight (ESC unit)	18 g
Maximum current	Max. current of Ni-Cd battery	Regulator for receiver/servo	5.8 V output, 1 A max. (when 7.2 V is input)
ON resistance	0.00060 ohm (Actual Data) 0.00045 ohm (FET Data)	PWM frequency	2930 Hz
Dimensions	30.6 (W) x 26.1 (D) x 13.1 (H) (except for terminal)		

Repair regulations

- The part that can be repaired is as follows. Internal electronic circuit (Damage caused by incorrect connection or running operation is not covered by the warranty.)
- Note that repairing the ESC is impossible in the following cases.
 - When opening the ESC housing.
 - When using a power supply other than the specified 6-cell Ni-Cd battery (7.2 V).
 - When modifying the wiring in order to use a separate power supply.
- KEYENCE assumes no responsibility for damage of the receiver or servo caused by incorrect connection of the ESC.
- Note that if the repair card is not filled out, repair and return of the ESC may be delayed.

Warranty

Item	Ultra-small digital speed controller A-01B series	Date of purchase	Warranty term
Manufacture no.			3 months from the date of purchase
Customer's address			
Telephone no.		TEL ()	
Name			

Note that if the date and location of the A-01 purchase are not entered on the warranty card, you will be charged for repairs even within the warranty term.
If a failure should occur within three months of the date of purchasing the ESC, write the symptoms of the problem and the working condition on a separate sheet. Request a repair of the ESC from either the distributor where you purchased the ESC or from KEYENCE (Service Section of the Hobby Department).

KEYENCE CORPORATION Hobby Div.
1-3-14 Higashinakajima, Higashi-yodogawa-ku, Osaka 553-8555, Japan
Phone 06-6379-1191 Fax 06-6379-1190

Request card for repair

- Symptom (Condition)**
Please describe condition of the ESC as detailed as possible.

2. Your equipment

Please fill in the blanks below.

Description	Maker	Model No.	Others
Motor			Turn No.
Battery		Voltage: V Capacity: mAh	
Receiver			
Transmitter			
Servo			
R/C Car	<input type="checkbox"/> F-1 <input type="checkbox"/> Touring Car	<input type="checkbox"/> Buggy (4WD) <input type="checkbox"/> Buggy (2WD)	

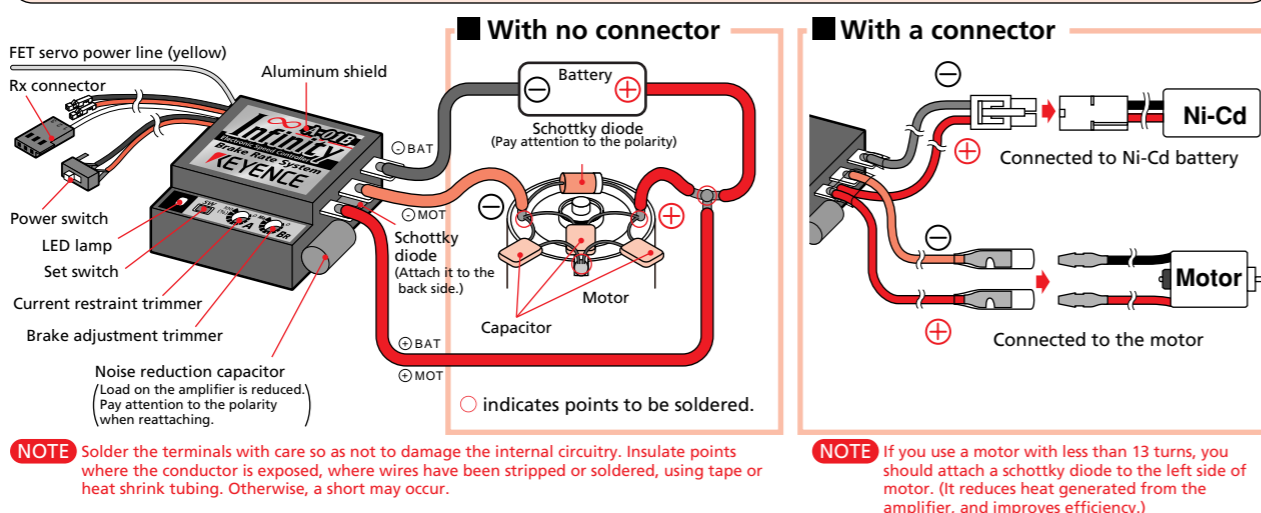
3. Shop where you bought the ESC

Name : _____
Address : _____
Tel. No. : _____

Part names and wiring

⚠ WARNING: Precautions to prevent smoke, fire, or an explosion

Be extremely careful to observe the correct polarity for the wiring of the battery and Schottky diode. Be sure to install a capacitor and Schottky diode to the motor. If you do not, the ESC may malfunction.



Receiver connector

⚠ WARNING: Precautions to prevent smoke, fire, or an explosion

Be sure to remove the batteries before modifying the wiring. Be extremely careful that the wires' polarity is correct. Note that we do not repair servos and receivers.

Change the A-01's receiver connector cable connection according to the receiver type you are using (varies with manufacturer), as shown in the table on the right. Be sure to observe the proper connector orientation in order to secure the connector pins. **Incorrect cable connection or reverse insertion of the connector may damage the servo and receiver.** When you use a receiver which is manufactured by SANWA (old type), FUTABA, or KO, leave the white cable as it is and connect the red and black cable as illustrated in the figure. When you use a receiver which is manufactured by JR, SANWA (new type) disconnect the white cable, and then connect other cables as illustrated in the figure. When you use a receiver other than those described above, contact the distributor or KEYENCE.

Manufacturer of your receiver	SANWA (old type)	FUTABA	KO	JR•SANWA (new type)
Shape of connector insert port (of receiver)	Avoid reverse insertion.	You can use your receiver without changing it.	KO provides both SANWA and FUTABA types of receivers. Check the shape of the connector insert port to find the type of your receiver.	Avoid reverse insertion.
Wiring	White Red	White Black	White Black	Black White

★ While using a pointed object to hold down the claw on the upper part of the connector pin, slowly disconnect each cable from the connector sequentially.
★ When removing the cables from the connector, be careful not to apply excessive pressure to the claw (metallic part that can be viewed from the top of the connector).
Otherwise, the connector pin contacts will be degraded, causing the unit to malfunction.

Usage

- **Setup** Perform each setup procedure within 10 seconds after the LED begins flashing. (This is because the unit is automatically reset after 10 seconds.)

- Ensure that the ESC's power switch is turned off.
- To lock a car, eliminate any driving force on the tires by disconnecting the motor cable, etc.
- Turn the transmitter on. Reset each throttle function (throttle curb, ABS, trimmer point, etc.) to the normal position.
- Turn the ESC on.
- Hold down the SET switch for approximately 5 seconds.
- The LED indicator flashes. (The ESC enters setup mode.)
- Set the transmitter throttle to "Neutral", and then press the SET switch once.
- The LED indicator flashes faster.
- Set the transmitter throttle to "High point" (at 90% of full throttle), and then press the SET switch once.
- Setup is completed.

● Setup confirmation

With a correct setting, the LED will light at neutral, turns off as the throttle is gradually opened, and light again at high point and brake point. If the setting of the transmitter interferes the correct setting, repeat the procedure after setting the reverse switch of the transmitter's throttle to the opposite side. See also the separate sheet "Key to setting".



KEYENCE
KEYENCE CORPORATION

Introduction

Thank you for purchasing the A-01. To get the best from your A-01, please read this manual carefully. After reading it, be sure to keep it in a convenient location.

Ultra-small digital speed controller Instruction Manual

Features

- The A-01 is an ultra-small controller filled with electronics components packed in high density. It can be mounted anywhere.
- The new version of the super-small power MOSFET (SOP*) is 0.5m less than the standard FET value. (0.45m less than standard FET value).
- The MPRS system** is adapted to a large current circuit. The ultra-small controller minimizes heat generation and significantly reduces loss of battery energy.
- The current limiter setting enables smooth start-up and improves run-time.
- The terminal system enables easy cable replacement and decreases the unit's weight.
- The brake rate adjustment enables faster braking.

* SOP: A surface-mount package. It is a fraction of the weight of a conventional FET.
** MPRS (Metal Plate Radiation of heat Structure): Hybrid structure which conducts current not through a copper foil but through a metal plate on the PC board. It allows the best configuration with the FET.

⚠ CAUTION

The following symbols alert you to important messages. Be sure to read these messages carefully.

- ⚠ **WARNING** Instructions to prevent serious injury
- ⚠ **CAUTION** Instructions to prevent accidents or product damage
- NOTE Additional information on proper operation

Precautions

1. Ni-Cd battery

⚠ WARNING: To prevent fumes, fire, and burns

Improper use of the Ni-Cd battery is very dangerous. The battery must be handled carefully. Incorrect wiring or short-circuiting of the cables may cause fire or fumes. Before connecting or disconnecting the battery to or from the ESC, be sure to turn off the ESC's power switch. Do not charge the battery while it is connected to the ESC. When the battery is not in use, disconnect it from the ESC or charger, and store it in a location with no wires or screws.

2. Connection of silicone cables

⚠ WARNING: To prevent fumes, fire, and burns

Connecting the cables incorrectly may cause fire or fumes which can damage both the ESC and battery beyond repair. Refer to the connection diagram (colors and positions) for assistance in connecting the cables properly.

3. Mounting motor

⚠ WARNING: To prevent fumes, fire, and burns

Be sure to mount the attached diode and capacitor to the motor being used. Confirm the correct polarity of the diode (⊕ or ⊖) before mounting it.

4. Heat sink (Radiating fin)

⚠ WARNING: To prevent fumes, fire, and burns

Electricity flows through the metallic part at the top of the ESC. Therefore, do not allow wiring cables, other metallic parts and the carbon chassis to make contact with the ESC. When a heat sink is attached, electricity flows through the heat sink. Exercise the same precautions.

5. Proper operation

⚠ CAUTION: To prevent accidents and product damage

Do not modify the ESC. Use it only for its intended purpose. Keep the ESC away from flames or heat. Avoid splashing any liquid, such as water, on the ESC.

6. ESC mounting orientation

NOTE: To prevent accidents and product damage

Except for at the outer side of the car, mount the ESC with its terminal side oriented to prevent the cable connector (terminal) side and PC board from any damage caused by car bodies contacting, collision, or turnover.

● Current limiter Limiting the maximum current to the motor prevents a skid and improves battery efficiency.

NOTE The trimmer turns within a range of 240 degrees. Do not force it past this range.



As illustrated on the right, changing the current limiter value changes the maximum current capacity. When the road surface is slippery, lower the limiter value (close to 0%). When you need high torque, raise the value. If you set the current limiter value to 100%, the current limiter function does not work and maximum torque can be produced. If you set the value to 0%, the current is limited to the minimum value and some motors may revolve at a slow speed. Set the value according to your needs.

● Brake adjustment function Adjusting the brake to match the road surface enables smooth running

NOTE The trimmer turns within a range of 240 degrees. Do not force it past this range.



In normal mode, the minimum brake level can be changed by setting the brake adjustment trimmer. When the trimmer is set to minimum, the brake level changes linearly with the trigger level. When the trimmer is set to maximum, the minimum brake level is 70% of the maximum brake level. If you need strong brakes, gradually increase the setting value until you find a suitable level. Turning on the power switch while holding down the SET switch and then releasing the SET switch activates the neutral brake mode. The neutral brake level is the value specified with the brake adjustment trimmer. (The neutral brake mode is reset when you turn the A-01B off and on again without holding the SET switch. The operation mode setting is not retained.)

Brake trigger level: The level of the throttle opening between the neutral and brake-high point.

● Dash power mode When a car is started, the current limiter can be canceled only with the first throttle operation if you want to make a quick start.

- Turn the transmitter on and hold down the SET switch for approximately 5 seconds. The LED flashes. (Same as in setup mode.)
- Wait until the LED stops flashing. (Approximately 10 seconds) The dash power mode is set.

NOTE If any noise interferes with the above setting procedure, the ESC may mistake the noise for throttle operation and may not set the dash power mode.

Mounting heat sink (Radiating fin)

⚠ WARNING: To prevent fumes, fire, and burns

Electricity flows through the radiating plates. If you mount a radiating fin, the electricity might flow through it. Do not allow other cables and metallic parts to make contact with the radiating fin.

If you run a car under normal conditions, the radiating fin is not necessary. When running a car under a blazing sun or if you are using a high-torque motor, mounting the radiating fin enables a more stable run. Mount the radiating fin as described below:

- Remove an aluminum top sticker at the top of the ESC housing.
- A metallic plate is exposed.
- Remove dust from the plate surface.
- Attach the double-sided tape (included) to a radiating fin. (Be sure to always use thin double-sided tape.)
- Securely attach the heat sink to the metallic plate of the ESC.

(To improve radiation, apply 2-gel type epoxy resin adhesive instead of the double-sided tape. Knead the gels well and apply a light coat of it to the heat sink. Attach the heat sink to the metallic plate and fix them until the adhesive dries. Note that you cannot remove the heat sink once you attach it.)

Installing the protective case

- Insert the Rx cable into the protective case.

- Extend the protective case outward on both sides and press the amplifier downward.

- When you hear a "click", the protective case is secured the amplifier.

★ When removing it, perform this procedure in reverse.