



# E52 Series Piezo Controller

## User Manual

Version: V1.0



This document describes the following products:

- E52.B1S-H Servo piezo controller(standard version)
- E52.B1S-I Servo piezo controller(simplified version)
- E52.A1K-H Open loop piezo controller

# DECLARATION

## Declaration!

This user manual is a integrated user manual of the E52 series piezoelectric controller. Please read this user manual carefully before using this controller. Follow the instructions in the manual during use. If there is any problem, please contact us for technical support. If you do not follow this manual or disassemble and modify the product yourself, the company will not be liable for any consequences arising therefrom.

Please read the following to avoid personal injury and to prevent damage to this product or any other product connected to it. In order to avoid possible hazards, this product can only be used within the specified range.

## Notice!

Do not touch any exposed ends of the product and its accessories.

There is high voltage inside. Do not open the case without permission.

Do not connect or disconnect input, output, or sensor cables with power on.

Please keep surface of E52 clean and dry, don't operate in humid or static environment.

After use, output voltage should be cleared to zero before turning off the controller switch, such as switching the servo state to the open-loop state.

## Danger!

The piezoelectric power amplifier described in this manual is a high-voltage device capable of outputting high currents, which can cause serious or even fatal damage if not used properly.

It is strongly recommended that you do not touch any parts that connect to the high voltage output.

Special Note: If you connect it with other products in addition to our company, please follow the general accident prevention procedures.

Operating the high-voltage amplification requires training professional operators.

## Warning!

If the voltage exceeds the PZT's tolerable range, it will cause permanent damage to the PZT. Before adding voltage to the PZT poles, it must be ensured that the positive and negative poles of the PZT are connected correctly and the operating voltage is within the allowable range of this PZT.

## Cautious!

E52 housing should be installed on a horizontal surface in an area with a 3CM air flow area to prevent internal convection in the vertical direction.

Insufficient airflow can cause equipment to overheat or premature instrument damage.

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## 1. Security

### 1.1 Features

- ▶ High power (50W)
- ▶ Peak current (Higher than 17A)
- ▶ Optional sensor closed loop module
- ▶ Combination of active and passive heat dissipation
- ▶ Over-temperature protection

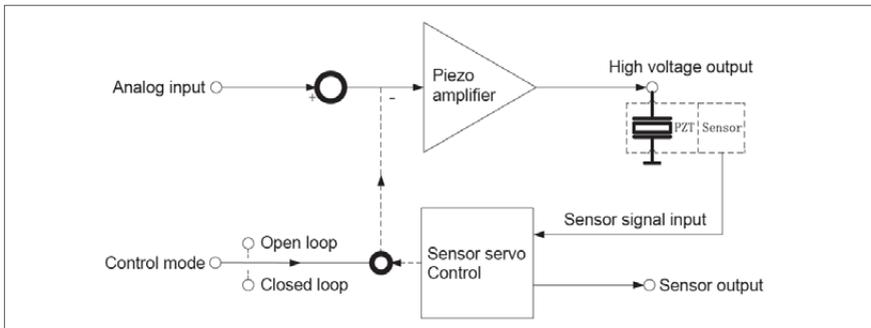
### 1.2 Applications

- ▶ Piezo spot rubber valve
- ▶ Piezo drives with large electrostatic capacity and requiring rapid response

### 1.3 Order information

- ▶ E52.B1S-H—SGS sensor closed loop standard version ,1 channel piezo controller
- ▶ E52.B1S-I—SGS sensor closed loop simplified version ,1 channel piezo controller
- ▶ E52.A1K-H—Open loop, 1 channel piezo controller
- ▶ Accept customized according to requirements:
  - ① 12bit gain/-20 ~ 120V output voltage (standard version)
  - ② 15bit gain/-20 ~ 150V output voltage

## 2. Driving Principle



### 3.Appearance

Front Panel



Rear Panel



Side Inlet



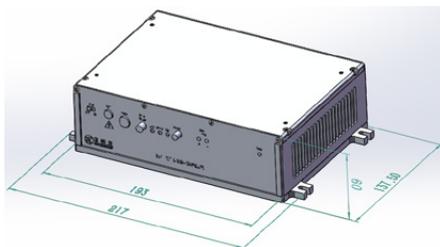
Side Outlet



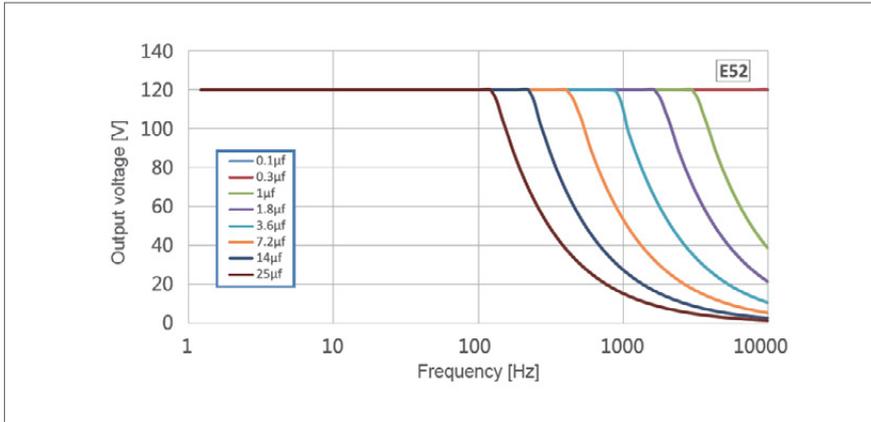
Top Heat Dissipation



Drawing



## 4. Frequency Load Curves



## 5. Interface



No.	Functions	Description
①	Power indicator	Green, lights when power's on
②	Overcurrent indicator	Red, lights when the output current exceeds the rated value
③	Analog input	Analog voltage input interface
④	Potentiometer	Parameters adjustment(sensing zero, offset, gain)
⑤	Sensor monitor	Detect sensor output, voltage range 0~10V
⑥	Sensor	Sensor input
⑦	PZT	Voltage output interface
⑧	Servo	Open/closed loop switch

## 6. Power Calculation

- Average output (Sine wave operation mode)

$$P_a \approx U_{pp} \cdot U_s \cdot f \cdot C_{piezo}$$

$P_a$ =Average output[W]

$C_{piezo}$ =Piezo actuator capacitance[F]

$U_{pp}$ =Peak and peak drive voltage [V]

$f$ =Operating frequency of the sine wave[Hz]

$U_s$ =Drive voltage[V] (  $(V_{s+}) - (V_{s-})$  )

## 7. Notes and Suggestions

▶ When the power used is large or the ambient temperature is high, external auxiliary heat dissipation can be considered.

▶ The temperature of the over-temperature power off protection is  $75\pm 5\text{ }^{\circ}\text{C}$  , but this function should be used as the protection against accidents under the limit condition. When in normal use, please try to keep the top heat dissipation shell below  $55^{\circ}\text{C}$  .

▶ When the step amplitude is less than 3V, the peak current is small, less than 0.5A. As the step amplitude increases, the peak current also increases. When the step amplitude is greater than 10V, the peak current is greater than 17A.

▶ When the output power is too large or the output is short circuited to the ground, the overcurrent indicator will light up, and the power supply part will output with a smaller cross-current. When the short circuit or power output is withdrawn, the overcurrent indicator goes out and the power supply returns to normal. But do not overflow for a long time.

▶ E52 cannot be used to drive inductive loads. If the inductive loads are driven, the product may be damaged.

▶ If there is no need, please do not twist the potentiometer easily.

## 8. Maintenance, Storage, Transportation

### 8.1 Cleaning Measures

Note! The PCB board of the function module in the E52 is an ESD (electrostatic discharge) sensitive device. Take precautions against any static build-up of these devices before use to avoid contact with circuit component leads and PCB wiring. Before touching any electronic components, the body first touches the grounding conductor to discharge static electricity, ensuring that any type of conductive particles (metal, dust or debris, pencil lead, screws) enter the device. Be careful not to drop the equipment when cleaning, to avoid any form of mechanical shock!

▶ Disconnect the power plug of the E52 system before cleaning.

▶ Prevent cleaning fluid and any liquid from entering the system module to avoid short

circuits.

▶ The surface of the system chassis and the front panel of the module, please do not use an organic solvent for surface wiping.

## 8.2 Transportation and Storage

▶ This product is packed in carton. Transportation must be carried out under product packaging conditions, and direct rain and snow, direct contact with corrosive gases and strong vibrations should be avoided during transportation.

▶ The instrument can be transported under various conditions of normal transportation, and should avoid damp, load, collision, extrusion, irregular placement and other adverse conditions during transportation.

▶ If the instrument is not used for a long time, the instrument should be packaged and stored.

▶ The instrument should be stored in a non-corrosive atmosphere and in a well ventilated, clean room.

▶ In the process of transportation, storage and use, attention should be paid to fire prevention, shockproof, waterproof and moisture proof.

**Note:** Pay attention to frost when the E52 series piezo controller is powered on in winter to avoid burning the controller!

▶ Check whether the controller has frost before power on (frost usually occurs when moving from outdoor to indoor).

▶ If the controller is frosted, wipe it or dry it and store it indoors for more than two hours before powering it up for relevant operation.

# 9. Service and Maintenance

## 9.1 Disposal

▶ When disposing of old equipment, please abide by the national regulations and local regulations. Please dispose of the old equipment properly. Please contact CoreMorrow for the upgrade and replacement of old equipment in order to meet the customer's handling of system products.

▶ If you have an old device or an unusable device that cannot be handled, you can ship it to the following address:

Address: 1F, Building I2, No.191 Xuefu Road, Nangang District, Harbin, Heilongjiang

## 9.2 After-sales Service

- ▶ E52 does not contain user repairable components.
- ▶ E52 must be returned to factory for any service and repair.
- ▶ Any part of E52 is dismantled, there will be no warranty service.
- ▶ E52 is a precision instrument which should be handled with care.
- ▶ In case of any problem, please record the problem and contact CoreMorrow to be repaired by professional technicians.

## 10.Contact us

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**CoreMorrow Official and CTO WeChat are below:**

