COREMORROW
Piezo Nano Motion

E53 Series Piezo Controller

User Manual

Version: V1.0

This document describes the following products:

- E53.A Open loop 1 channel
- E53.B Servo 1 channel SGS sensor
- E53.C Open loop 1 channel Software
- E53.D Servo 1 channel SGS sensor Software

DECLARATION

Declaration!

This user manual is a integrated user manual of the E53 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 E53 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!

E53 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.

contents

1. Introduction

1.1 Features

- 1 channel small size
- 24V (20~30V) 1.5A 36W
- Peak current 1A
- Ave current 60mA
- Unload bandwidth 10KHz
- Output short circuit protection

1.2 Applicaitons

- Driving piezo actuators
- Driving piezo objective scanners

1.3 Order information

- E53.A——Open loop
- E53.B——Servo SGS sensor
- E53.C——Open loop Analog/software input control
- E53.D——Servo SGS sensor Analog/software input control

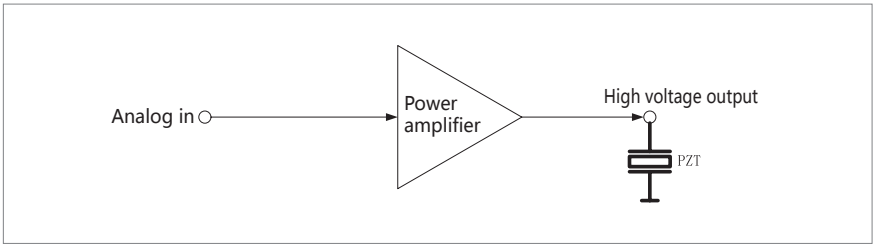
Accept customized according to requirements：

① 12bit gain/0 ~ 120V output voltage (standard version)

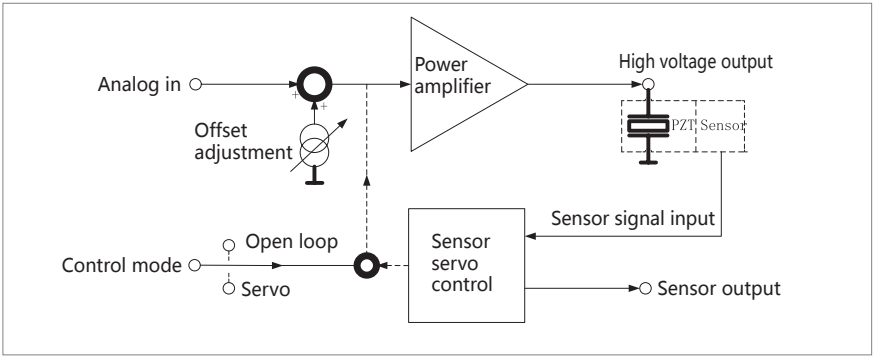
② 15bit gain/0 ~ 150V output voltage

2.Driving Principle

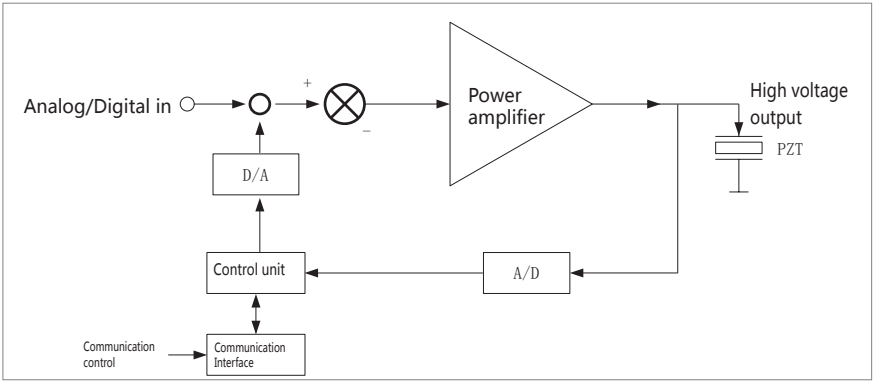
2.1 E53.A



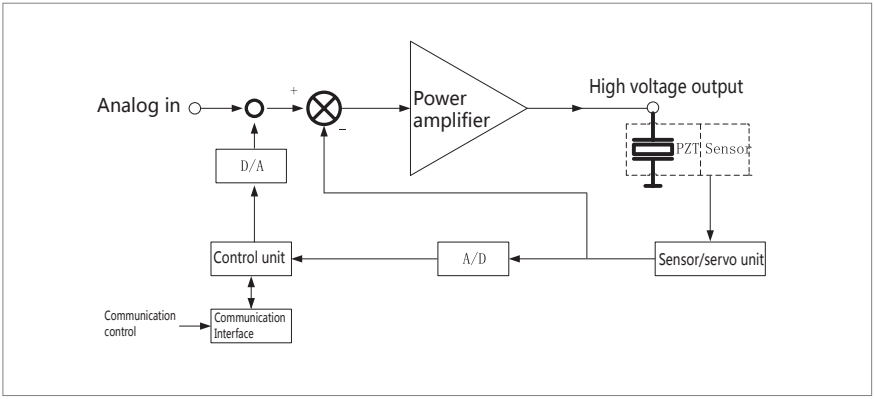
2.2 E53.B



2.3 E53.C



2.4 E53.D



3.Appearance

E53.A

E53.B

E53.C

E53.D

4.Power Calculation

● Average output (Sine wave operation mode)

Pa ≈ Upp • Us • f• Cpiezo

Pa=Average output[W]

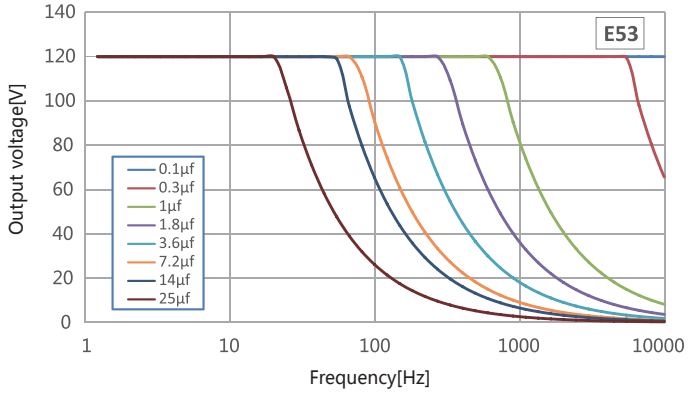
Upp=Peak and peak drive voltage [V]

Us=Drive voltage[V] ((Vs+) - (Vs-))

Cpiezo=Piezo actuator capacitance[F]

f=Operating frequency of the sine wave[Hz]

Frequency, Ouput Voltage and Load Curves



5.interface

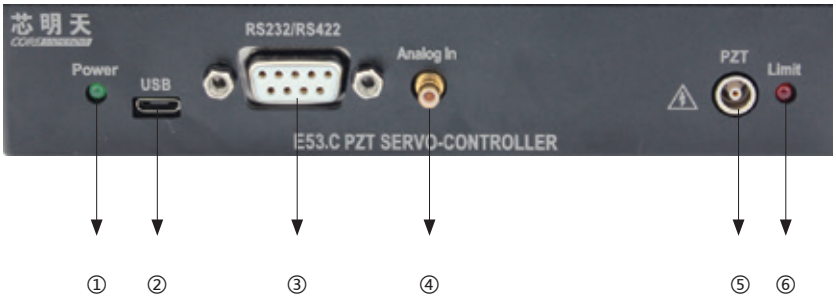
5.1 E53.A

No.	Function	No.	Function
①	Power switch	④	Driving output
②	Power indicator	⑤	Overcurrent indicator
③	Power	⑥	Analog input

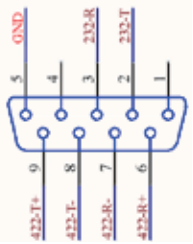
5.2 E53.B

No.	Function	Description
①	Power indicator	Green, lights when power's on
②	Servo	Open loop/Servo switching
③	Analog input	Analog voltage input interface
④	Integral	Adjustment of deviation integral in Servo
⑤	Sensor monitor	Monitoring output of the position signal returned by the sensor
⑥	Zero	Zero adjustment of sensor signal
⑦	Target	In Servo, yellow light is on when the control amount does not reach target value. Open loop is always on
⑧	Sensor connector	Sensor signal input
⑨	Drive connector	Voltage output interface for driving piezo actuator
⑩	Limit	Over-current indicator, red when the average current exceeds the rated value

5.3 E53.C

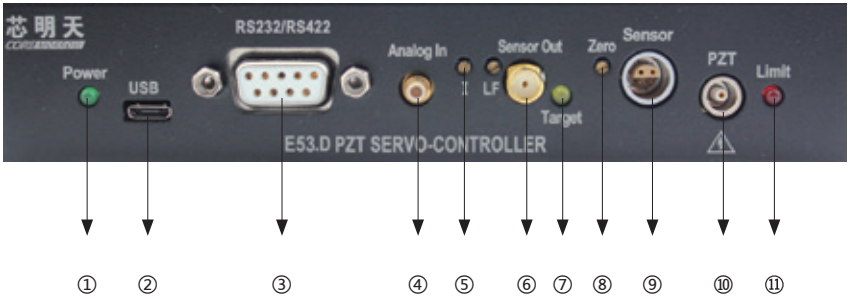


No.	Function	Description
①	Power indicator	Green, lights when power's on
②	USB port	MicroUSB port
③	RS-232/422	See interface pin definition
④	Analog input	Analog voltage input interface
⑤	Piezo connector	Driving piezo actuaotr
⑥	Limit	Over-current indicator

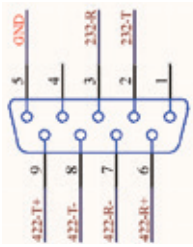


RS-232/422 interface pin definition

5.4 E53.D



No.	Function	Description
①	Power indicator	Green, lights when power's on
②	USB port	MicroUSB port
③	RS-232/422	See interface pin definition
④	Analog input	Analog voltage input interface
⑤	Servo integral	Adjust step response
⑥	Sensor monitor	0 ~ 10V
⑦	Target	Lights when the controlled displacement deviates from the target value
⑧	Zero	Zero adjustment of sensor signal
⑨	Sensor connector	Piezo actuator sensor connector
⑩	Drive connector	Piezo driving connector
⑪	Limit	Over-current indicator



RS-232/422 interface pin definition

No.	Function	Description
1	Signal source control switch	M : Signal source selection by communication instruction
		D : Digital circuit as signal source
		A : Using an external analog signal as a signal source
2	Open loop / Servo control switch	M : Open loop / Servo status controlled by communication instructions
		OFF : Switch to open loop state
		ON : Switch to Servo state

6.Notes and suggestions

- E53 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.

7.Contact us

Harbin Core Tomorrow Science & Technology Co., Ltd.

Tel: +86-451-86268790

Email: info@coremorrow.com

Website: www.coremorrow.com

Address: Building I2, No.191 Xuefu Road, Nangang District, Harbin, HLJ, China

CoreMorrow Official and CTO WeChat are below: