

V22 Version



Piezo Nano Motion

- Piezo Controllers -

Piezo Controllers



Piezo controller has power amplification function, controlled by analog or digital signal, used for driving capacitive load, such as PZT, piezo products, etc.



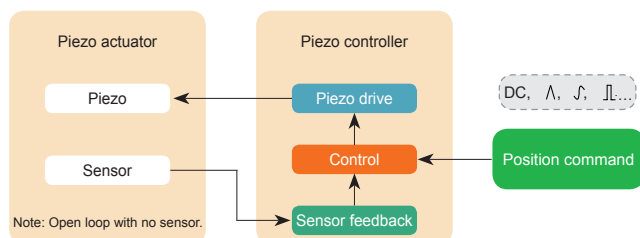
Piezo Controllers

Piezo controllers are used to drive and control piezoelectric ceramics, nano-positioning platforms and other capacitive load, mainly divided into modular, integrated, industrial, and board types.

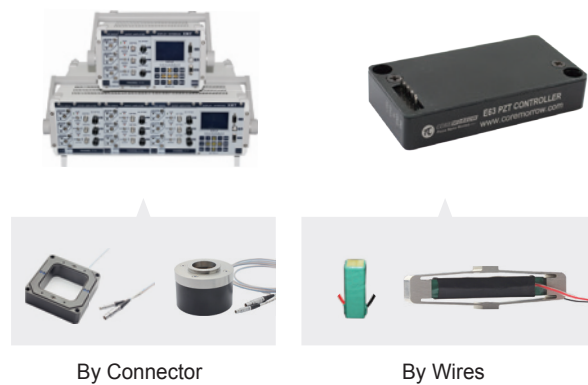
► Characteristics

Analog, digital, keyboard, I/O and other control methods. Available in servo-control, single-channel or multi-channel types. It can drive all kinds of piezoelectric products.

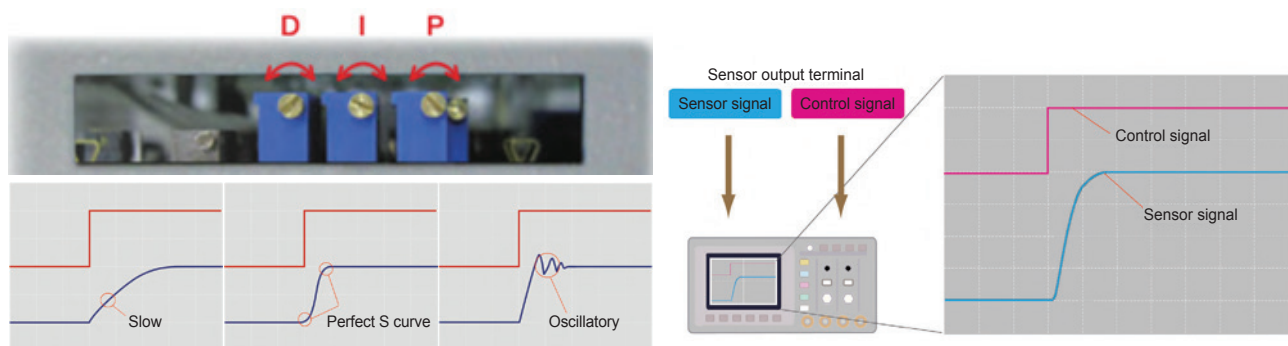
► Driving Principle



► Connection

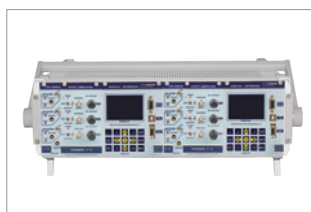


► Response Speed Adjustment



► Appearance

According to your channels, power, size and other requirements, you can choose different piezo controllers.



Modular type



Board type



Industrial type



Integrated type

► Applications



Driving Piezo Stack Actuator



Driving Piezo Stage



Driving Piezo Steering Mirror



Driving Piezo Scanner

► Product List

Type	Channels	Output voltage	Ave. current	Servo Control	Power supply	Software	Page
E00/E01	Channels to >100	Optional	5~625mA	Optional	220V AC	Yes	4
E51	3~18	0~120V/150V	25mA/channel	Optional	24V DC	Optional	12
E52	1	0~120V/150V	60~300mA	Optional	220V AC	No	16
E53	1	0~120V/150V	60mA	Optional	24V DC	Optional	18
E53.A2K-J	2	0~120V/150V	17mA	No	24V DC	No	20
E53.B1S-K	1	0~120V/150V	60mA	Yes	24V DC	No	21
E53.B1S-M	1	0~120V	21mA	Yes	24V DC	No	22
Small size piezo controller E61/E62	1	0~+120V/100V	5mA/3mA	No	-5~+130V/5VDC	No	23
E63.A	1	0~120V/150V	12mA	No	+15V DC/0.5A	No	24
E63.C	1	0~150V	2.5mA	No	USB Power Supply	Yes	25
3 channel E70	3	0~120V/150V	70mA/ channel	Optional	24V DC/3A	Yes	26
4 channel E70	4	0~120V/150V	70mA/ channel	Optional	24V DC/4A	Yes	28
Modular E70	6~96	0~120V/150V	70mA/ channel	Optional	24V DC	Yes	30
Custom piezo controller	3~6	0~120V/150V	70mA/ channel	Optional	24V DC	Yes	31
Board-Type E80.B5S	5	0~120V	-	Optional	DC28V	No	32
E80.D3S	3	0~120V/150V	70mA/ channel	Yes	20~30V DC3A	Yes	33
High voltage E80.D4S	4	0~800V	20mA/channel	Optional	28V/10A	Yes	35
E80.D12S	12	0~120V	7mA/74mA	Optional	24~30V DC	Yes	36
C47	1/2	0~±300V	1000mA	No	220V AC	Yes	38
E81	1	0~150V	2A	No	220V AC	No	38
E81-D	3/6/9	0~+150V	50mA	No	170V, ±15V, -24V, 0.2A	No	39
E82.A8K	8	0~150V	30mA	No	DC 28V 2A	No	40
E82.A64K	64	0~150V	30mA	No	DC 28V 15A	No	41
E82.C32K	32	100V/channel	13mA/channel	No	220V AC	Yes	42
E82	70~256	-20V~+120V (Optional±350V)	5~90mA	No	AC220V	Yes	43
Piezo Mirror Controller E24/E40/E48/E112	Channels to >100	Optional	5~10mA/channel	No	220V AC	No	45
XE-650	1channel	0~120V/150V	50mA	Optional	220V AC	No	46
Motion Control Software	Easy installation; standard control software; support for optical control and secondary development						47

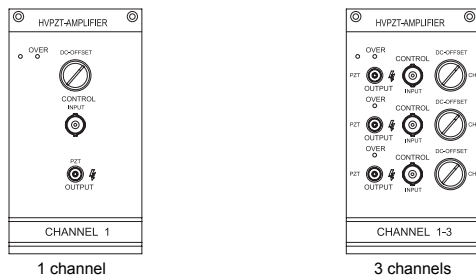
E00/E01 Piezo Controller



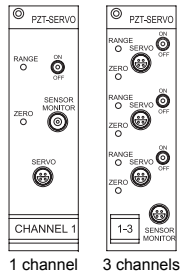
E00/E01 piezo controllers are used to drive and control piezoelectric ceramics and nanopositioning platforms and mainly grouped into modular, integrated, industrial and board controllers with analog, digital, keyboard, I/O and other control methods. Available in open loop, closed loop, single or multiple channels. They can drive all kinds of piezoelectric products.

► Modules

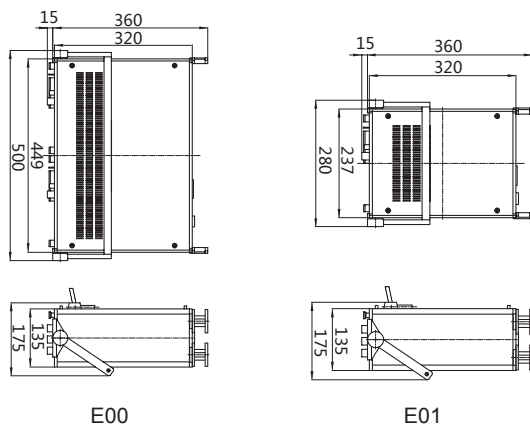
Piezo Amplifier Module



Sensor Control Module



Chassis & Power Supply Module Drawings



► Characteristics

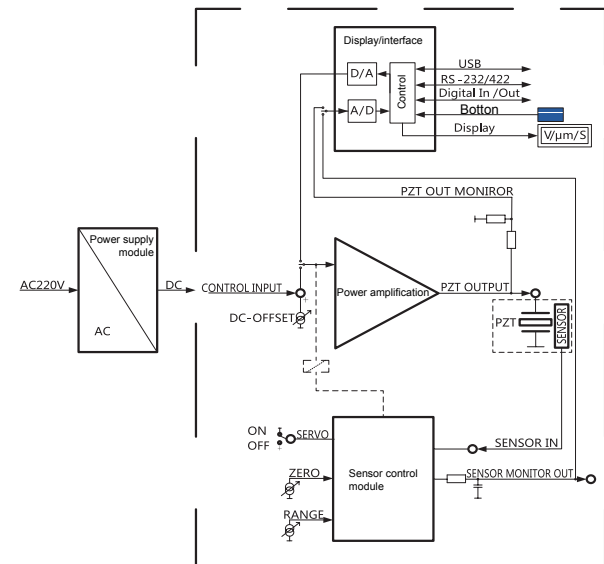
Modules

- Power amplifier module
- Sensor Control Module
- Display & Interface Module
- Chassis & Power Supply Module

Output Voltage

- 0~120V, 0~150V, 0~300V
- 0~600V, 0~900V, 0~1800V
- ±120V, ±150V, ±300V
- ±450V, ±900V...

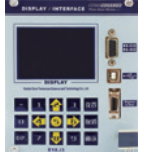
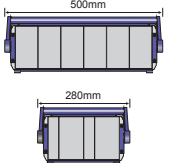
► Principle



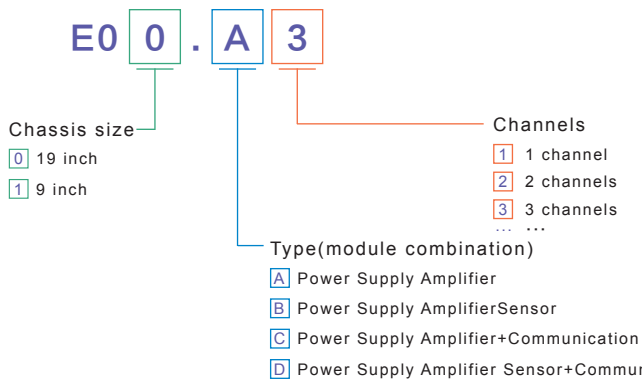
► For Driving Various Piezo Products



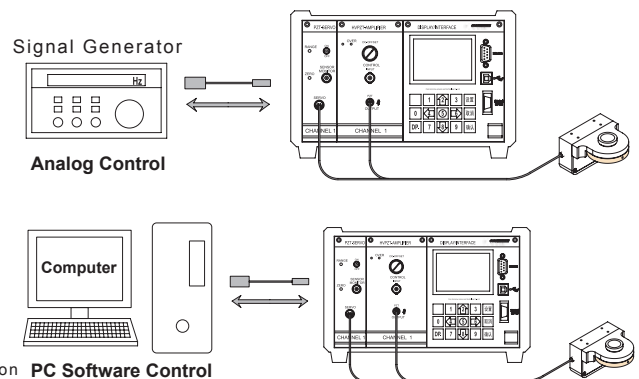
► Modular Combination Controller

Power Amplifier Module		Modules are freely combined into four types of A, B, C, D	Type A Power amplifier module Chassis & power supply module		
Sensor Control Module			Type B Power amplifier module Sensor control module Chassis & power supply module		
Display & Interface Module			Type C Power amplifier module Display & interface module Chassis & power supply module		
Chassis & Power Supply Module			Type D Power amplifier module Sensor control module Display & interface module Chassis & power supply module		

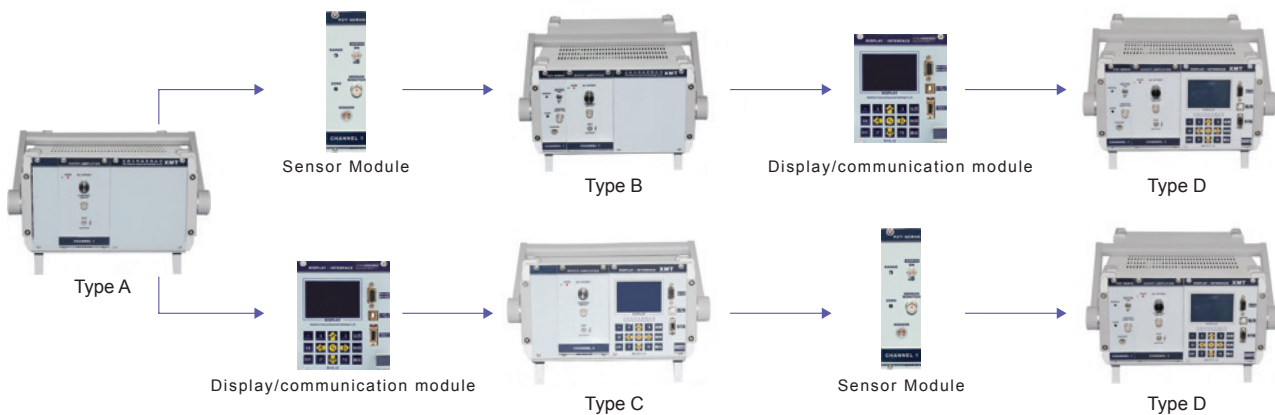
► Selection Guide



► Control Mode



► Module Upgrade Available



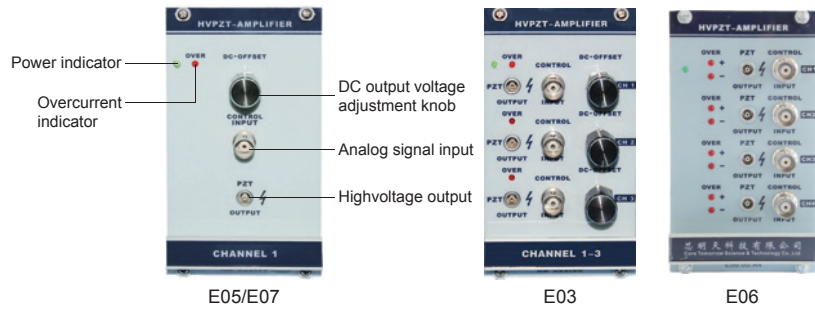
► Technical Data Range

Parameters List			
Type	E00		E01
Amplifier Module			
Extended amplifier only	1~18 channels		1~9 channels
Control analog input	Unipolar 0~+10V or 0~+5V, Bipolar -10~+10V or -5~+5V		
Optional output voltage	100V/150V/200V/300V/±150V	±200V/±300V/600V	900V/1800V/±900V
Ripple	5mV	≤10mV	≤20mV
Voltage stability	Unipolar 0~+10V or 0~+5V, Bipolar -10~+10V or -5~+5V		
Input impedance	100KΩ±20%		
Unloaded bandwidth	Optional 1K, 10K, 30K, 50KHz		
Channels/module	1~3 channels		
Ave. Power 1 channel	7W~35W		
Peak Power 1 channel	20W~110W		
Ave. Current	40mA~350mA		
Peak current	100mA~11A		
Bandwidth, small signal	5kHz~200kHz		
Bandwidth, large signal	1kHz~50kHz		
Voltage gain	10~180 times		
Knob adjustment	10 turns		
Sensor Module			
Sensor type	SGS, LVDT, CAP		
Sensor channels	1~3 channels		
Sensor	LEMO connector (sensor input)		
Sensor output	BNC connector for 1 channel, LEMO connector for 3 channels		
Sensor output voltage	Unipolar: 0~+10V , Bipolar: -10~+10V		
Display/Interface Module			
Channels	1~3 channels		
D/A converter	16/24 bit ±10V output		
A/D converter	16 bit ±10V input		
Output voltage resolution	16 bit(1/30000), 24 bit(1/100000)		
Communication	RS-232/RS-422/USB 2.0		
Baud rate	9600, 19200, 38400, 57600, 76800, 115200, 128000, 230400, 256000		
Chassis/Power Supply Module			
Power supply	AC 220V±10% 50Hz±10%		
Current limit	Short circuit protection		
L×H×D	500×175×375mm	280×175×375mm	
Functions			
Type	E00		E01
Combination	Available amplifier, sensor and interface modules, see the instructions		
Feature	Modules combined freely, upgradeable		
Basic control way	Manual adjustment, analog input, computer serial/USB interface, spontaneous waveform control, open-loop/servo control		
Basic Functions	Overcurrent protection, overtemperature protection, dynamic power protection		
Software configuration	Powerful standard computer control software		
Spontaneous waveform	Sine, square, triangular, sawtooth wave, 1kHz-10kHz frequency with no attenuation.		
LCD keyboard	Standard(LCD, membrane button, RS-232, RS-422, USB)		

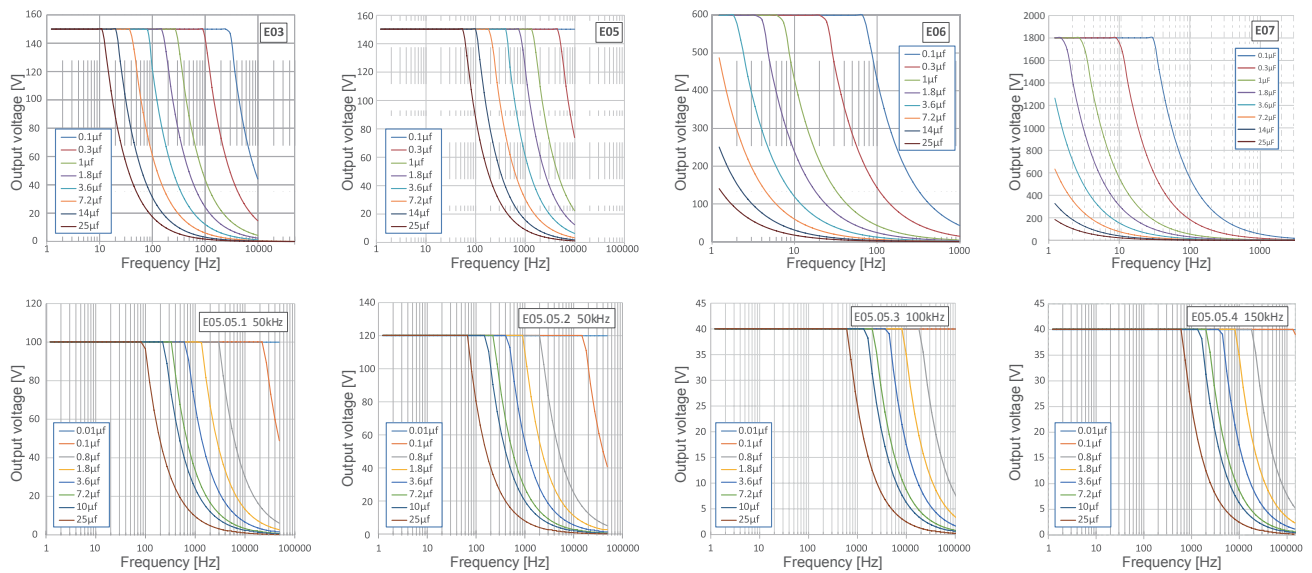
Module Introduction

Power Amplifier Module

Its main function is to amplify small signal from external analog input or given by the computer through DA or other control signals through a voltage and power amplifier circuit inside the Power Amplifier Module.



Module Type	Channels	Ave. Power	Output voltage	Frequency
E03	3	7W/channel	0~100V/120V/150V/300V, $\pm 100V/\pm 150V$	1kHz, 10kHz, 30kHz, 50kHz
E05	1	35W	0~40V/100V/120V/150V/200V/300V/400V/600V, $\pm 100V/\pm 150V/\pm 200V/\pm 300V$	1kHz, 5kHz, 10kHz, 30kHz, 50kHz, 100kHz, 150kHz
E06	2/4	3W/channel	-300V~+300V	1kHz
E07	1	5W	0~600V/900V/ $\pm 450V$	3kHz
Combination/Bipolar	1	10W	0~1800V, $\pm 900V$	3kHz



E03 Power Amplifier Module

Channels	Type	Analog input	Output voltage	Frequency	Ave. current	Peak current	Ripple
1~3	E03.00.9	0~+10V	0~+100V	10kHz	70mA	1000mA	5mV
	E03.00.10		0~+120V		58mA	1000mA	
	E03.00.11		0~+150V		46mA	1000mA	
	E03.00.12		0~+100V		70mA	210mA	
	E03.00.13		0~+120V		58mA	174mA	
	E03.00.14		0~+150V		46mA	138mA	
	E03.00.15	-10~+10V	0~+200V	30kHz	35mA	105mA	
	E03.00.16		0~+300V		23mA	69mA	
	E03.00.17		-100~+100V		35mA	105mA	
	E03.00.18		-150~+150V		23mA	69mA	
	E03.05.1	0~+10V	0~+100V	50kHz	70mA	210mA	
	E03.05.2		0~+120V		58mA	174mA	

► E05 Power Amplifier Module

Channels	Type	Analog input	Output voltage	Frequency	Ave. current	Peak current	Ripple
1	E05.00.1	0~+10V	0~+100V	1kHz	350mA	1050mA	5mV
	E05.00.2		0~+120V		291mA	873mA	
	E05.00.3		0~+150V		233mA	700mA	
	E05.00.4		0~+200V		175mA	525mA	
	E05.00.5		0~+300V		116mA	348mA	
	E05.00.6		0~+400V		87mA	260mA	
	E05.00.7	-10~+10V	-100~+100V	5kHz	175mA	525mA	10mV
	E05.00.8		-150~+150V		116mA	348mA	
	E05.00.9		-200~+200V		87mA	260mA	
	E05.00.10*		-300~+300V		116mA	348mA	
	E05.00.11	0~+10V	0~+200V	10kHz	175mA	525mA	5mV
	E05.00.12		0~+300V		116mA	348mA	
	E05.00.13		0~+100V		350mA	1000mA	
	E05.00.14		0~+120V		291mA	1000mA	
	E05.00.15		0~+150V	5kHz	233mA	1000mA	5mV
	E05.00.16		0~+200V		175mA	1000mA	
	E05.00.17*		0~+600V	30kHz	120mA	350mA	10mV
	E05.03.1	-10~+10V	0~+100V		250mA	750mA	5mV
	E05.03.2		0~+120V		205mA	615mA	
	E05.03.3		0~+150V		170mA	510mA	
	E05.03.4		0~+200V		125mA	375mA	10mV
	E05.03.5		0~+300V		85mA	255mA	
	E05.03.6		-100~+100V		125mA	375mA	
	E05.03.7		-150~+150V		85mA	255mA	
	E05.05.1	0~+10V	0~+100V	50kHz	250mA	750mA	20mV
	E05.05.2		0~+120V		205mA	615mA	
	E05.05.3		0~+40V	100kHz	625mA	1875mA	20mV
	E05.05.4			150kHz			

► E06 Power Amplifier Module

Channels	Type	Analog input	Output voltage	Frequency	Ave. current	Peak current	Ripple
2	E06.00.A2	-10~+10V	-300~+300V	1kHz	5mA	15mA	20mV
4	E06.00.A4						

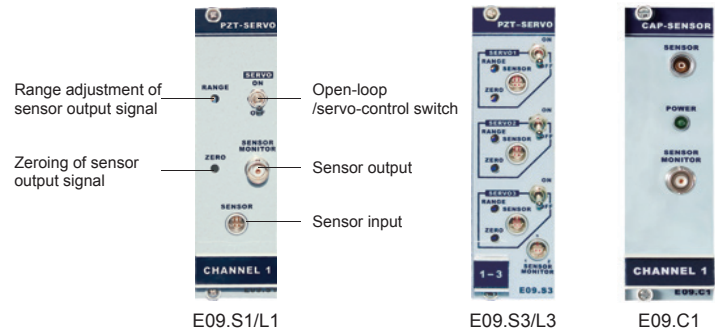
► E07 Power Amplifier Module

Channels	Type	Analog input	Output voltage	Frequency	Ave. current	Peak current	Ripple
1	E07.00.1	0~+10V	0~+600/±300V	3kHz	30mA	438mA	10mV
	E07.00.2		0~+900V				
	E07.00.3		0~+1000V				
	E07.00.4*		0~+1800V				
	E07.00.5*	-10~+10V	-450~+450V	3kHz	5.5mA	16mA	20mV
	E07.00.6*		-900~+900V				

*: Combination type, combined with 2 modules.

► E09 PZT Position Sensor Module

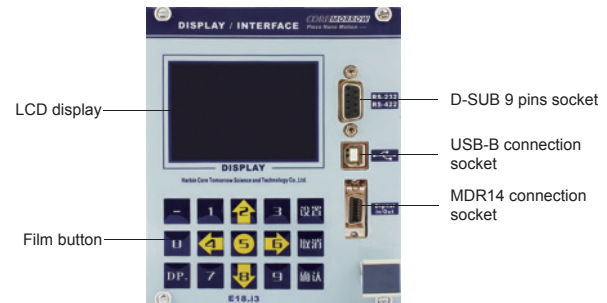
E09 PZT sensor module provides high precision, high stability and high reliability excitation signals for sensors in nanopositioning mechanisms such as PZT or micro-motion stages, and detects and processes feedback signals from PZT or micromotion stages. The servo control is done by the internal algorithm circuit. The E09 PZT sensor module is not a stand-alone device and needs to be integrated into the E00/E01 chassis.



Type	E09.S1	E09.S3	E09.L1	E09.L3	E09.C1
Functions	PZT Position Sensor Module				
Channels	1	3	1	3	1
Sensor type	SGS	SGS	LVDT	LVDT	CAP
Servo Characteristics	Analog P-I+notch filter	Analog P-I+notch filter	Analog P-I+notch filter	Analog P-I+notch filter	Analog P-I+notch filter
Sensor input port	ERA.0S.304.CLL	ERA.0S.304.CLL	ERA.0S.304.CLL	ERA.0S.304.CLL	ERA.0S.116.CLL
Sensor output port	BNC	ERA.0S.303.CLL	BNC	ERA.0S.303.CLL	BNC
Voltage output(V)	0~10				
Operating temperature(°C)	0~50	0~50	+10~+40	+10~+40	+10~+50

► E18 Display/Interface Module

With LCD and PC interface, E18 measures and displays the output voltage of Power Amplifier Module and the current displacement of sensor module, receives and processes control commands from computer, and with keyboard, LCD and is equipped software for human-computer interaction, and with servo control and other functions. It is not a stand-alone device and needs to be integrated into the E00/E01 chassis.



Type	E18.i1	E18.i3
Functions	Display/Interface Module	
Channels	1	3
Processor	32 Bit single core microprocessor, 168MHz	
Linearity	0.01%	
D/A converter	16 Bit $\pm 10V$	24 Bit $\pm 10V$
Output resolution	1/30000	1/100000
A/D converter	16 bit $\pm 10V$	
Film button	15 buttons	
Computer interface	RS-232/422, USB	
Baud rate	9600, 19200, 38400, 57600, 76800, 115200, 128000, 230400, 256000	
Output wave frequency(Hz)	10k	
I/O interface	1~3pcs, user can set the input or output, MDR14 connector	
LCD keyboard control function	Output and measure voltage and displacement, spontaneous waveform, selection function, set parameters	
Spontaneous waveform	Sine wave, square wave, triangle wave, sawtooth wave	
Software control function	Output and measure voltage and displacement, waveform control, selection function, set parameters	
Software waveform control	Programmable waveform output, standard waveform output	
Secondary development	VC++, Matlab, LabView routine and DLL dynamic link library function, easy for development	
Operating temperature(°C)	0~50	

► Examples

Type						
	E01.A1	E01.B1	E01.C1	E01.D1	E01.D3	E00.D3
Amplifier Module						
Channels	1	1	1	1	3	3
Analog input	0~10V	0~10V	0~10V	0~10V	0~10V	0~10V
Output voltage	0~120V	0~120V	0~120V	0~120V	0~120V	0~120V
Ripple	5mV	5mV	5mV	5mV	5mV	5mV
Input impedance	100KΩ±20%	100KΩ±20%	100KΩ±20%	100KΩ±20%	100KΩ±20%	100KΩ±20%
Unloaded bandwidth	10kHz	10kHz	10kHz	10kHz	10kHz	10kHz
Ave. current	291mA	291mA	291mA	291mA	58mA	291mA
Peak current	1A	1A	1A	1A	1A	1A
Bandwidth, small signal(1/10)	>20kHz	>20kHz	>20kHz	>20kHz	>20kHz	>20kHz
Voltage gain	12 times	12 times	12 times	12 times	12times	12 times
Knob adjustment	10 circles	10 circles	10 circles	10 circles	10 circles	10 circles
Sensor Module						
Sensor type	-	SGS	-	SGS	SGS	SGS
Channels	-	1	-	1	3	3
Sensor input	-	ERA.0S.304.CLL	-	ERA.0S.304.CLL	ERA.0S.304.CLL	ERA.0S.304.CLL
Sensor output	-	BNC	-	BNC	ERA.05.303.CLL	BNC
Sensor output voltage	-	0~10V	-	0~10V	0~10V	0~10V
Operating temperature	-	0~50℃	-	0~50℃	0~50℃	0~50℃
Display/Interface Module						
Channels	-	-	1	1	3	3
D/A converter	-	-	16 bit ±10V	16 bit ±10V	24 bit ±10V	16 bit ±10V
A/D converter	-	-	16 bit ±10V	16 bit ±10V	16 bit ±10V	16 bit ±10V
Output voltage resolution	-	-	1/30000	1/30000	1/100000	1/30000
Communication	-	-	RS-232/422, USB	RS-232/422, USB	RS-232/422, USB	RS-232/422, USB
Chassis/Power Supply Module						
Power supply	AC 220V±10% 50Hz±10%	AC 220V±10% 50Hz±10%	AC 220V±10% 50Hz±10%	AC 220V±10% 50Hz±10%	AC 220V±10% 50Hz±10%	AC 220V±10% 50Hz±10%
Current limit	Short-circuit protection	Short-circuit protection	Short-circuit protection	Short-circuit protection	Short-circuit protection	Short-circuit protection
L×H×D	280×175×375mm	280×175×375mm	280×175×375mm	280×175×375mm	280×175×375mm	500×175×375mm
Functions						
Basic control	Manual adjustment, Analog input		Manual adjustment, analog input, computer serial/USB interface, spontaneous waveform control			
Basic functions	Overcurrent protection, overtemperature protection, dynamic power protection					
Software	-	-	Powerful standard computer control software			
Spontaneous waveform	-	-	Sine, square, triangular, sawtooth wave, 1kHz-10kHz frequency with no attenuation			
LCD keyboard	-	-	Standard(LCD, membrane button, RS-232, RS-422, USB)			

► E00/01 Operation Instructions

Turn on the power switch, the "main menu" is displayed, as shown in the figure, with three options of "Control Way", "Device Info", "Version No.". We mainly introduce the control methods.

On the "Control way" page, press the up and down keys (No. "2" and "8") to move the cursor to "Keys Control" and press "Enter" to enter this interface. Press the "Cancel" to return to the main menu.

Menu	Control Way
1 Control Way	1 Keys Control
2 Device Info	2 Analog Control
3 Version No.	3 Pc Control

Keys Control

Keys Control
1 Single Point
2 Wave Control
3 Step Control

1. Single Point Control

After entering "Single Point", press the "left" and "right" (No. "4", "6") to switch and set the output voltage or displacement, press the "up" and "down" to select the channel to be set, press the "set" to input the value, and press the "confirm" to output after the input is completed. Press the "Cancel" button to return to the previous menu.

Single Point	Measured Value (D)
CH1 0.00000V	CH1 0.123 V
CH2 0.00000V	CH2 0.000 m
CH3 0.00000V	CH2 0.456 V
	CH3 0.000 um
	CH3 0.789 V
	CH3 0.000 um

2. Wave Control

In the "Wave Control" interface, press the "Left", "Right" to switch channels, press the "Up", "Down" to select parameter. After the cursor stays, press the "Set" to set or switch.

The cursor stays at "M1/M2/M3", press the "Set" to switch modes of single-channel control, multi-channel control and phase control. In multi-channel control, the three channels can send different frequencies and peak-to-peak waveforms simultaneously. The waveform frequency of each channel can reach 10kHz. Under phase control, three channels can send waveforms simultaneously. The frequency, wave, and I/O port direction must be the same. The waveform frequency can reach 1kHz. The phase angle setting range is 0~360 degrees. The three channels need to set their respective phase angles. And same waveform phase for three channels, they will output same. The cursor stays at the waveform icon $\sim/\square/\Delta/\slopedownarrow$, and press the "Set" to switch. There are four types of waveforms to choose from: sine, square, triangle and sawtooth wave. The cursor stays at "I/O", press the "Set" to switch. The cursor is at the On/Off icon, press the "Enter" to start or stop the waveform.

CH1 M1 $\sim/\square/\Delta/\slopedownarrow$ $\rightarrow$	CH1 M3 $\sim/\square/\Delta/\slopedownarrow$ $\rightarrow$ $\square$
Vp-p: 0.00000 V	Vp-p: 0.00000 V
Freq: 0.00000HZ	Freq: 0.00000HZ
Bias: 0.00000 V	Bias: 0.00000 V
CH3 M2 $\sim/\square/\Delta/\slopedownarrow$ $\rightarrow$	Phase: 180.000 °
Vp-p: 0.00000 V	Vp-p: 0.00000 V
Freq: 0.00000HZ	Freq: 0.00000HZ
Bias: 0.00000 V	Bias: 0.00000 V

Note:
M1: Single mode
M2: Multiple mode
M3: Phase mode
 $\rightarrow$: Off
 $\square$: On
 $\parallel$: Pause

3. Single Point Step Control

Before this function, the upper computer software needs to store stepping output voltage or displacement values in the E18 module. Each channel can store 192 voltages or displacements values. Press the "up" and "down" to select the parameter. Press "set", then number keys to enter the data. In the non-input data state, you can press the "left" or "right" to switch channels.

Note: The interval time range is 0.1~9999ms.

Step Control	Step Control
CH1 $\rightarrow$	CH2 $\square$
Interval: 0.100ms	Interval: 9999ms

Analog Control

Measured Value
CH1 0.123 V
CH2 0.000 um
CH2 0.456 V
CH3 0.000 um
CH3 0.789 V
CH3 0.000 um

Connect the supplied BNC cable to the CONTROL INPUT (external analog signal input) end of the power amplifier module, and the other end to the analog signal. The red fish clip is the positive input while the black is the negative input. The analog signal is amplified through the amplifier. The amplified analog signal is output from the output terminal of the power. If you use the analog control function, you must enter the "analog control" interface or switch the system state to the analog input state through the host computer communication command, then use the analog control function.

(3) Software control

Connect one end of the supplied communication cable to the serial port of the computer, and the other end to the RS-232/422 serial port or connect the device and the computer through a USB connection cable.

When entering the "software control mode", the screen displays "Connecting...", after successful communication, it will jump to the software measurement value interface. Press the "Cancel" to return to the "Control Way" interface.

Note: Direct communication is possible in any interface without entering the "PC Control".

E51.B3/D3 Piezo Controller



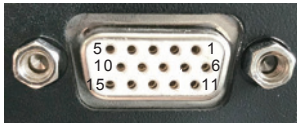
E51.B3



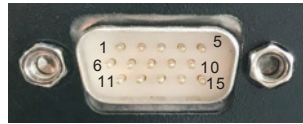
E51.D3

E51.B/D3 servo controller, an ultra-small 3-channel controller designed for driving fast steering mirror, differential drive and other systems. The controller uses a dedicated operational amplifier circuit to ensure high-voltage and high-current output, and the power supply part adopts switching power supply technology. Reliable circuit optimization and anti-interference design ensure high bandwidth.

► E51.B3 Pin Definition



Drive output and sensor input



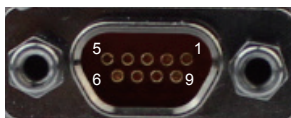
Power supply and control

No.	Pin definition	No.	Pin definition
1	CH 2 drive output	1	+24V power supply ground
2	CH 3 drive output	2	CH 2 sensor control switch
3	CH 3 sensor input -	3	AGND
4	CH 3 sensor input +	4	AGND
5	Sensor power supply: DC 10V	5	AGND
6	CH 1 drive output	6	+24V DC power supply
7	Drive output ground	7	CH 3 servo control switch
8	Sensor power supply: DC 10V	8	CH 1 sensor control switch
9	Sensing power supply ground	9	CH 1 analog input
10	Sensing power supply ground	10	CH 2 analog input
11	Drive output ground	11	CH 3 sensor output
12	CH 2 sensor input -	12	CH 2 sensor output
13	CH 2 sensor input +	13	CH 1 sensor output
14	CH 1 sensor input +	14	AGND
15	CH 1 sensor input -	15	CH 3 analog input

Note: E51.B3S adopts high and low level signals for open loop and servo control adjustment. The low level for open loop, high for servo control.

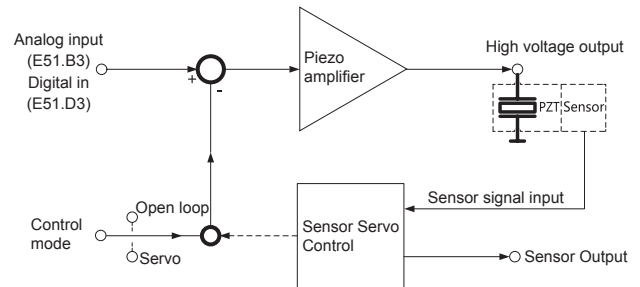
► E51.D3S Pin Definition

Pin Definition, drive output and sensor input connector of E51.D3S and E51.B3S are same. Power supply and control connector's pin definition are as below.

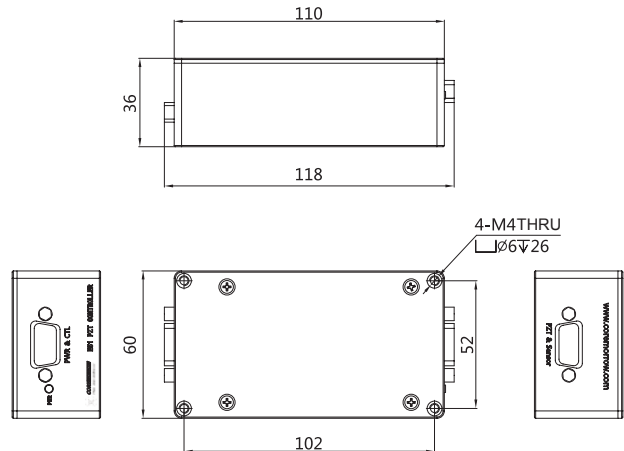


1~5: +24V power supply
6~9: +24V power supply ground

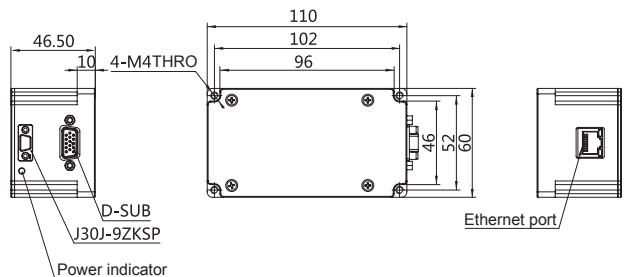
► Driving Principle



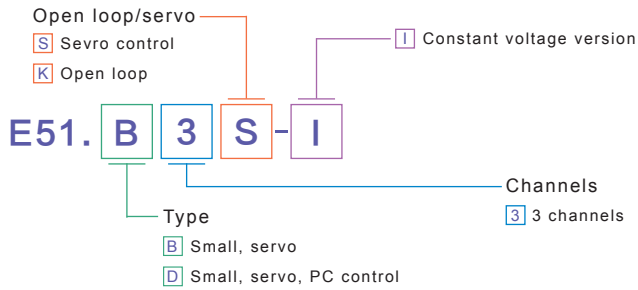
► E51.B3 Drawing



► E51.D3 Drawing

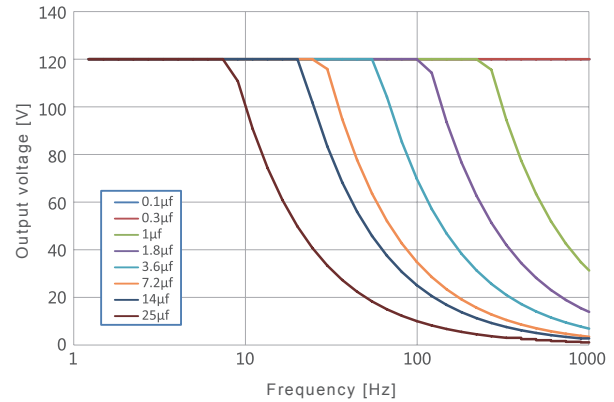


► Selection Guide



Type	Characteristics
E51.B3S	Small, 3 channels, standard version
E51.B3S-I	Small, 3 channels, constant voltage
E51.D3S	3 channels, constant voltage, digital

► Voltage, Frequency & Load Curves



► Technical Data

Type	E51.B3S	E51.B3S-I	E51.D3S
Functions	Analog servo controller	Analog servo controller	Analog servo controller
Control mode	Analog signal	Analog signal	Digital signal
Drive			
Channels	3	3(with 1 constant voltage output)	3(Optional constant voltage)
Analog input(V)	0~10	0~10	-
Output voltage(V)	0~120	0~120, the 3rd channel outputs constant voltage	0~120, Optional constant voltage
Peak current(mA)	185/channel	185/channel	185/channel
Ave. current(mA)	25/channel	25/channel	25/channel
Input power(W)	15	15	15
Bandwidth(kHz)	1	1	1
Output voltage ripple(mV)	5(1.8μF)	5(1.8μF)	5(1.8μF)
Sensor			
Sensor type	SGS	SGS	SGS
Servo characteristics	Analog P-I	Analog P-I	Analog P-I
Servo ripple(mV)	10	10	10
Others			
Size(mm)	110×36×60	110×36×60	110×46.5×60
Operating temperature(°C)	0~50	0~50	0~50
Input connector(PWR&CTL)	HDB15(needle)	HDB15(needle)	-
Output connector(PZT&Sensor)	HDB15(hole)	HDB15(hole)	HDB15(hole)
Protection	Over-current protection	Over-current protection	Over-current protection
Mass(g)	270	270	270
Static power(W)	3.6	3.6	3.6
Heat dissipation	Natural heat dissipation	Natural heat dissipation	Natural heat dissipation
Power supply(V DC)	24	24	24
Communication interface	-	-	Ethernet Port

E51.D7S Piezo Controller



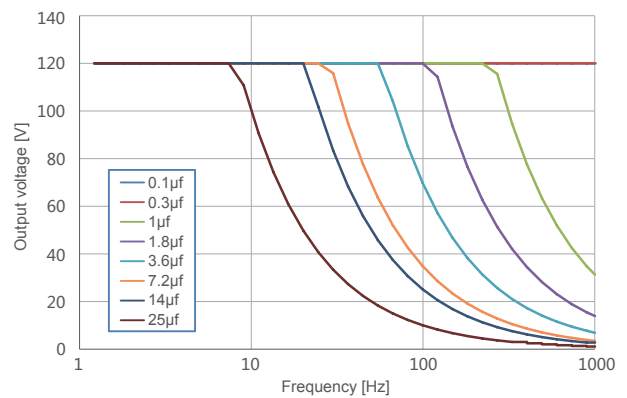
► Characteristics

- 7-channel output
- Output voltage 0~120V
- Software control
- Can drive a 6-axis piezo stage

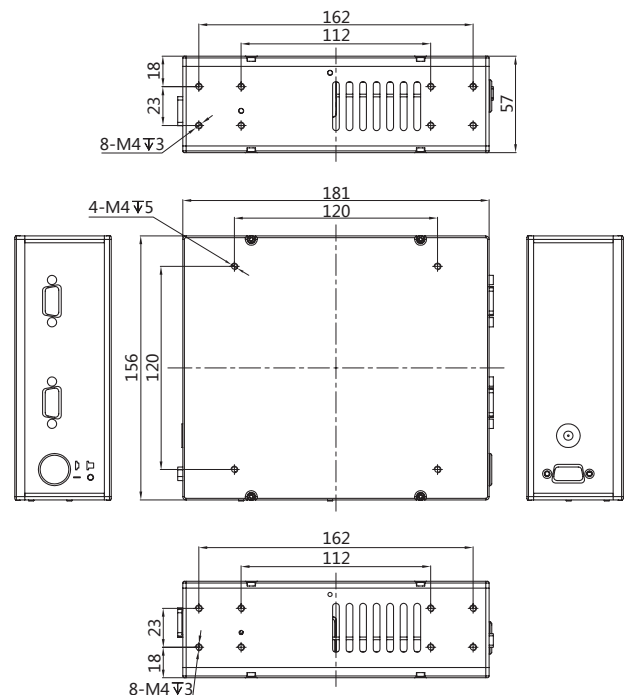
► Technical Data

Type	E51.D7S
Functions	Analog servo controller
Control method	Digital signal
Drive	
Channels	7
Analog input(V)	-
Output voltage(V)	0~120, one constant voltage
Peak current(mA)	185/channel
Ave. current(mA)	25/channel
Input power(W)	90
Bandwidth(kHz)	1
Output voltage ripple(mV)	5(1.8μF)
Servo control	
Sensor type	SGS
Servo	Analog P-I
Ripple(mV)	10
Others	
Size(mm)	156×57×181
Operating temperature(°C)	0~50
Input connector(PWR&CTL)	-
Output connector(PZT&Sensor)	HDB15(hole)
Over-current protection	Yes
Mass(g)	1450
Static power(W)	7.2
Heat dissipation	Natural
Power supply(V DC)	24
Communication	RS-422

► Frequency vs Load Curve



► Drawing



E51.D12S Piezo Controller



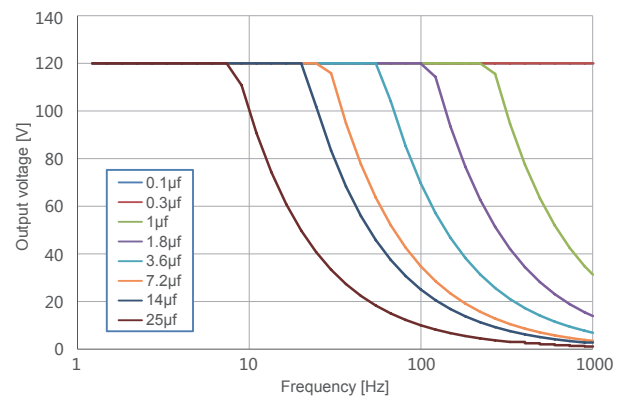
► Characteristics

- 18 channels with 6 channels of constant voltage
- Output voltage 0~120V
- Software control
- Can drive 6 piezo tip/tilt platforms

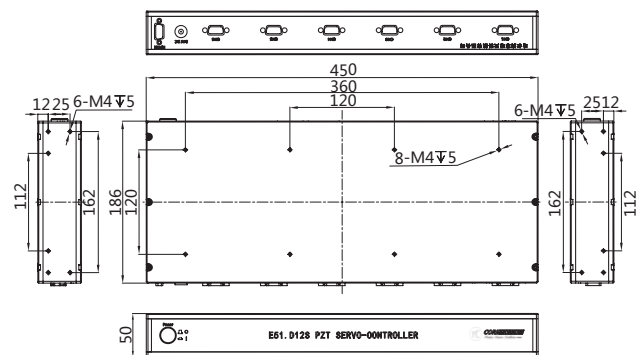
► Technical Data

Type	E51.D12S
Function	Analog servo controller
Control	Digital signal
Drive	
Channels	18
Analog input(V)	-
Output voltage(V)	0~120
Peak current(mA)	185/channel
Ave. current(mA)	25/channel
Input power(W)	90
Bandwidth(kHz)	1
Ripple(mV)	5(1.8μF)
Servo control	
Sensor type	SGS
Servo	Analog P-I
Ripple (mV)	10
Others	
Size(mm)	450×50×186
Operating temperature (°C)	0~50
Input connector(PWR&CTL)	-
Output connector(PZT&Sensor)	HDB15(hole)
Overcurrent protection	Yes
Mass(g)	3600
Static power(W)	21.6
Heat dissipation	Natural heat dissipation
Power supply(V DC)	24
Communication	RS-422

► Frequency, Voltage and Load Curves



► Drawing



► Piezo Deflection System

E51.D12S-I1 piezo controller drives six fast steering mirrors.



E52 Piezo Controller

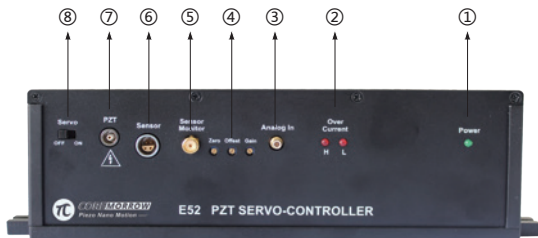


E52 piezo controller is specially developed for high-power applications like driving piezoelectric dispensing valve. It has a compact size. E52 piezo controller can control one dispensing valve. The dispensing parameters can be changed as required. The control mode is analog control, and easy to operate. Just change the amplitude and frequency of the input signal to adjust the dispensing volume and speed.

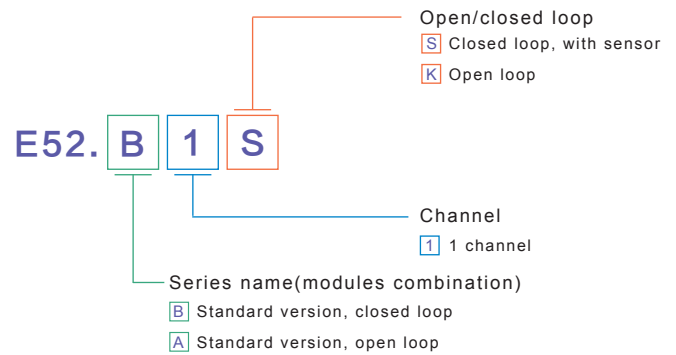
► Characteristics

- Self-developed piezo dispensing valve controller
- Only 50μs step time at 10μF load
- Analog control

► Appearance and Functions

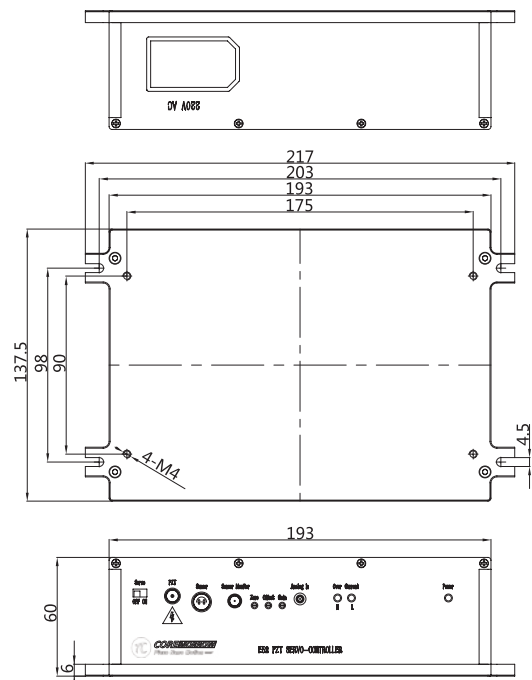


► Selection Guide

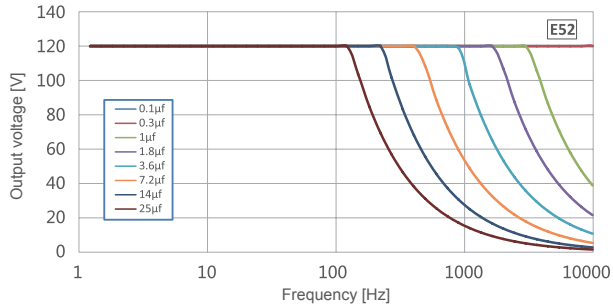


No.	Functions	Description
①	Power indicator	Green, lights when power's on
②	Overcurrent indicator	Red, lights when the output current exceeds the rated value
③	Analog input	Analog voltage input interface
④	Potentiometer	Parameters adjustment(sensing zero, offset, gain)
⑤	Sensor monitor	Detect sensor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

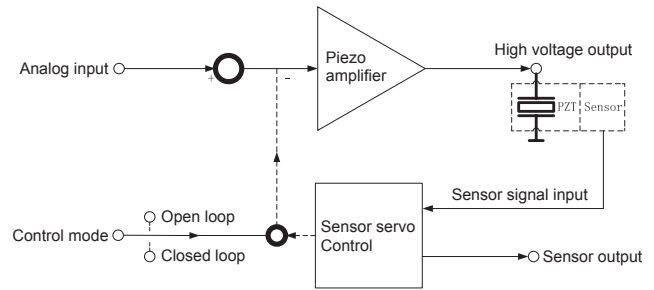
► Drawing



► Frequency, Voltage and Load Curves



► Driving Principle



► Technical Data

Type	E52.B1S-H	E52.B1S-I	E52.A1K-H
Functions	Closed loop piezo controller(standard version)	Closed loop piezo controller(simplified version)	Open loop piezo controller
Drive			
Channels	1	1	1
Control input voltage(V)	0~10	0~10	0~10
Output voltage(V)	0~120(Optional 0~150)	0~120(Optional 0~150)	0~120(Optional 0~150)
Peak current(A)	17	0.35	17
Ave. current(A)	0.3	0.06	0.3
Bandwidth(kHz)	10	10	10
Ripple(mVpp)	3(0.1µF)	5(2.2µF)	3(0.1µF)
PZT connector	LEMO	LEMO	LEMO
Control input connector	SMB connector	SMB connector	SMB connector
Sensor			
Sensor type	SGS	SGS	-
Servo	Analog P-I+notch filter	Analog P-I +low pass+notch filter	-
Sensor connector	LEMO	LEMO	-
SensorOutput connector	SMA connector	SMA connector	-
Others			
Operating temperature(°C)	0~50	0~50	0~50
Fan on temperature(°C)	40±5	40±5	40±5
Overtemperature protection(°C)	75±5(Power supply is cut off)	75±5(Power supply is cut off)	75±5(Power supply is cut off)
Overtemperature protection recovery(°C)	60±5	60±5	60±5
Overcurrent protection	When output ave. current > 0.3A	When output ave. current > 0.06A	When output ave. current > 0.3A
Static power(W)	<8	4.2	<8
Dimensions(mm)	L193×H60×D137.5	L193×H60×D137.5	L193×H60×D137.5
Mass(kg)	1.76	1.76	1.76
Power supply	220V AC(198V~242V)	220V AC(198V~242V)	220V AC(198V~242V)

E53 Piezo Controller



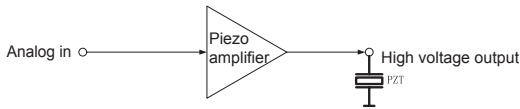
To meet the small-volume application requirements, CoreMorrow develops E53 series piezo controller. It is a single-channel controller controlled by analog and digital signals. It has three specification versions with different functions. The power supply is 24VDC/1A. The body has a heat-dissipating area that quickly conducts the heat generated.

► Characteristics

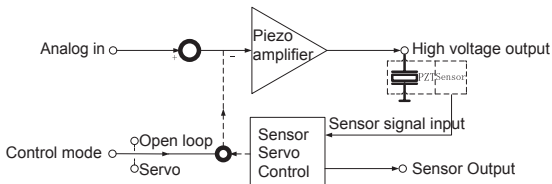
- Small Size
- Three versions with different functions
- Single channel
- 24VDC power supply
- Easy to integrate

► Principle

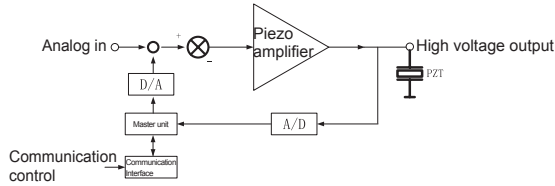
E53.A(amplifier))



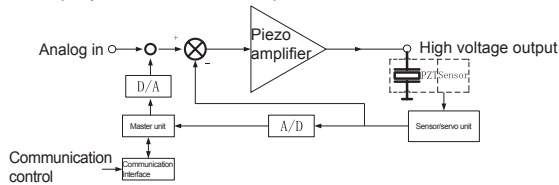
E53.B (amplifier+servo)



E53.C(amplifier+software)



E53.D(amplifier+servo+software)



► Selection Guide

- Control
- S Sensor control
 - K Open loop

E53. B 1 S

Type

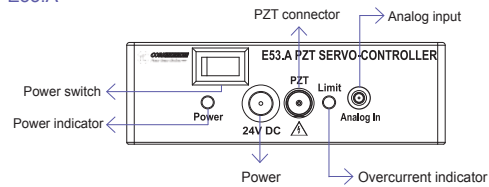
- A 1 channel, open loop, analog
- B 1 channel, servo, analog
- C 1 channel, open loop, analog & digital
- D 1 channel, servo, analog & digital

Channels

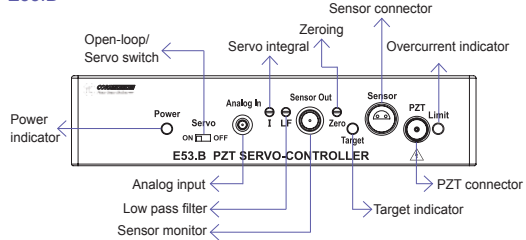
- 1 1 channel
- 2 2 channels
- 3 3 channels

► Panel Introduction

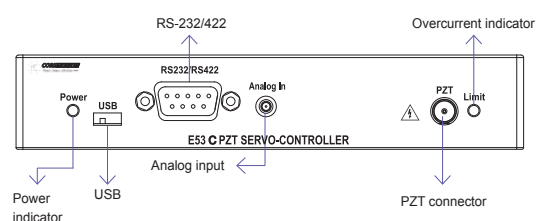
E53.A



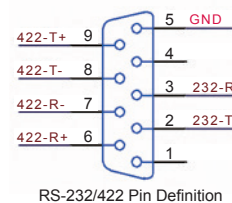
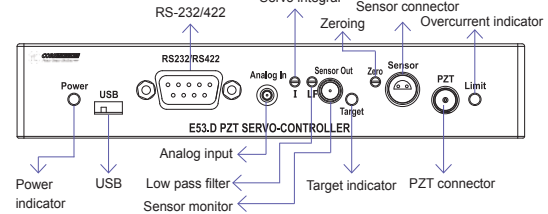
E53.B



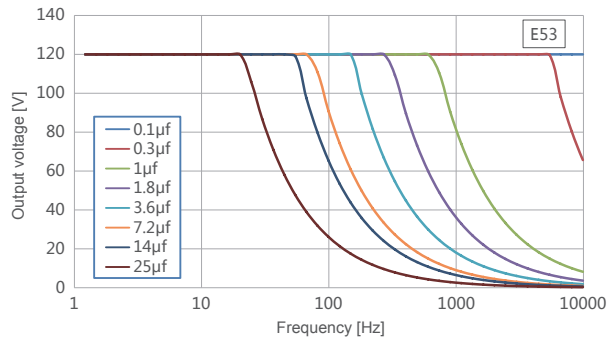
E53.C



E53.D



► Frequency, Voltage and Load Curves

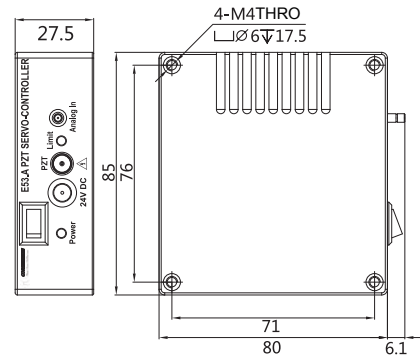


► Technical Data

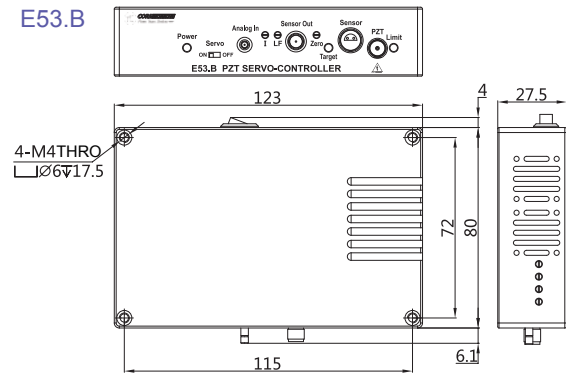
Appearance	E53.A1K	E53.B1S	E53.C1K	E53.D1S
Type				
Channels	1			
Input voltage(V)	0~10			
Output voltage(V)	0~120(Optional 0~150)			
Peak current(A)	1			
Ave. current(mA)	60			
Bandwidth(kHz)	10			
Ripple(mVpp)	10(@2.2μF)			
PZT connector	LEMO			
Input connector	SMB			
Sensor				
Sensor type	-	SGS	-	SGS
Servo characteristics	-	Analog P-I+Notch filter +Low pass filter	-	Analog P-I+Notch filter +Low pass filter
Sensor connector	-	LEMO	-	LEMO
Sensor output connector	-	SMA	-	SMA
Interfaces/Communication				
Interface	-	-	USB, RS-422, RS-232	
Baud rate	-	-	9600, 19200, 38400, 115200	
Secondary development baud rate	-	-	9600, 19200, 38400, 57600, 76800, 115200, 128000, 230400, 256000	
Processor	-	-	32 bit 168MHz	
D/A converter	-	-	16 bit	
A/D converter	-	-	16 bit	
Others				
Operating temperature(°C)	0~50			
Output current, short-circuit(mA)	60			
Overcurrent indicator	Lights when output ave. current > 60mA			
Static power(W)	1.8	<4	<5	<5
Size(mm)	85×27.5×80	123×27.5×80	148×27.5×80	148×27.5×80
Mass(kg)	0.24	0.28	0.35	0.35
Power supply	24V(20~30V)DC1.5A(36W)			

► Drawing

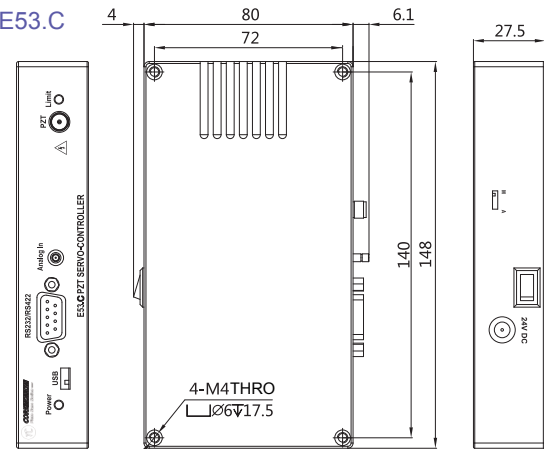
E53.A



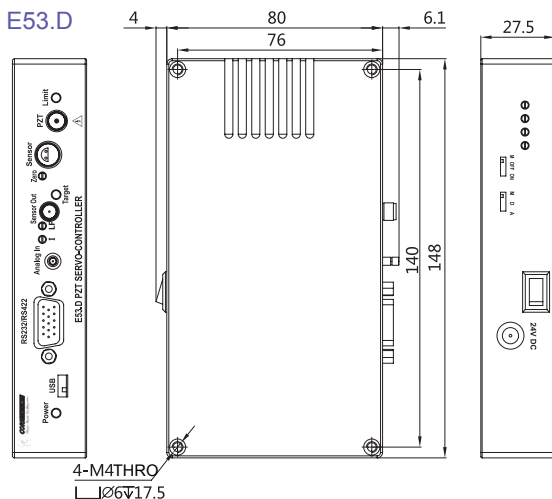
E53.B



E53.C



E53.D



E53.A2K-J Piezo Amplifier



Industrial, small size, dual-channel piezo amplifier E53.A2K-J is specially designed for industrial applications. It features small size, light mass, dual-channel and low dynamics. It adopts analog input control mode and industrial wiring terminals, provides a highly reliable electrical connection, and can meet the high requirements for volume in applications with limited space. Besides, E53.A2K-J can drive two capacitive loads at the same time.

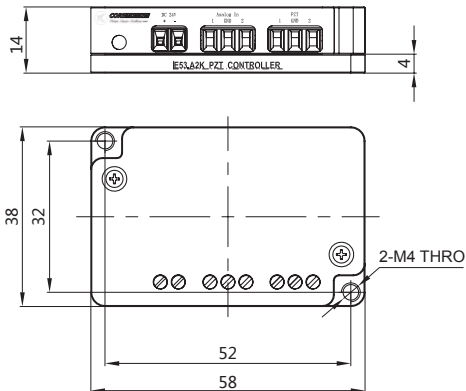
► Characteristics

- Output voltage: 0~120V/150V
- Industrial application
- Dual channel, open-loop control
- Analog input 0~10V

► Technical Data

Type	E53.A2K-J
Channels	2
Analog input(V)	0~10
Output voltage(V)	0~120(Optional 0~150)
Peak current(mA)	120
Ave. current(mA)	17
Static power(W)	1
Bandwidth -3dB(kHz)	1
Ripple@2.2μF(mVpp)	<10
Interface	Industrial terminal
Operating temperature(°C)	0~50
Size(L×W×H, mm)	58×38×14
Power supply	24V DC
Heat dissipation	Shell needs heat dissipation

► Drawing



► Pin Definition

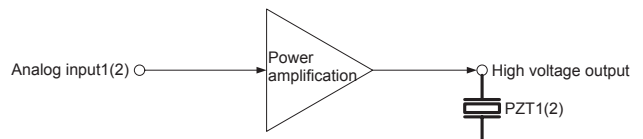
Module	No.	Function
DC 24V + - Power supply	+	DC24V power supply +
	-	DC24V power supply -
Analog In 1 GND 2	1	PZT1 analog input +
	GND	PZT1/PZT2 analog input -
	2	PZT2 analog input +
PZT 1 GND 2 Drive output	1	PZT1 output +
	GND	PZT1/PZT2 output -
	2	PZT2 output +

► Customizable



► Driving Principle

The E53.A2K-J piezo amplifier is controlled by external analog signals. The analog input range is 0~10V. After the power amplification of the amplifier, the output voltage is 0~120V, and optional 0~150V output.



E53.B1S-K Industrial Piezo Controller



This controller is designed for industrial applications and can be used to drive capacitive loads such as piezo ceramic actuators. The customized interface is more suitable for industrial applications.

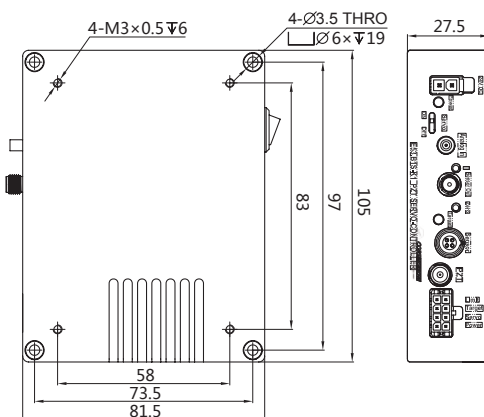
► Characteristics

- OEM
- Custom industrial interface
- 1 channel output, servo control
- Suitable for driving various capacitive loads, such as PZT

► Technical Data

Type	E53.B1S-K
Channels	1
Nominal analog input(V)	0~10
Nominal output voltage(V)	0~120(Optional 0~150)
Peak current(A)	1
Ave. current(mA)	60
Bandwidth(kHz)	10
Ripple(mVpp)	10(loading 2.2μF)
PZT connector	LEMO
Control input connector	SMB connector
Servo control	
Sensor type	SGS
Servo	Analog P-I+ band stop + low pass
Sensor connector	LEMO
Sensor output connector	SMA connector
Others	
Operating temperature(°C)	0~50
Output short-circuited current (mA)	60
Overcurrent indication	Lights,when ave. current>60mA
Static power(W)	<4
Dimensions(mm)	L105×W27.5×D 81.5
Mass(kg)	0.28
Power supply	24V(20~30V) DC1.5A(36W)

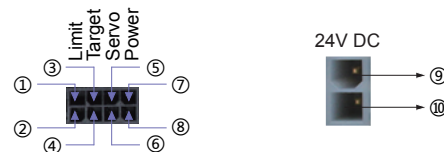
► Drawing



► Panel Introduction



No.	Functions	Description
①	Power supply	24V DC
②	Power light	Always on after power on
③	Servo	Servo switch
④	Analog input	Analog voltage input
⑤	Integral	Servo deviation integral adjustment
⑥	Sensor monitor	Monitor output signal returned by sensor
⑦	Zero adjustment	Adjust the zero point of the sensor
⑧	Target indication	Lights when the displacement deviates
⑨	Sensor connector	Sensor signal input
⑩	Drive connector	Voltage output interface
⑪	Status indicator interface	Over-current, target, servo-control, power



Marking	Function	No.	Description
Limit	Overcurrent indicator, ON: 5V/OFF: 0V	①	Output +
		②	Output -
Target	Target indicator, ON: 5V/OFF: 0V	③	Output +
		④	Output -
Servo	Non-servo/servo indicator, non-: 5V/ Servo: 0V	⑤	Output +
		⑥	Output -
Power	Power indicator ON: 24V/OFF: 0V	⑦	Output +
		⑧	Output -

No.	Function	Description
⑨	Power supply -	24V DC, -
⑩	Power supply +	24V DC, +

E53.B1S-M Piezo Controller



This controller is designed for industrial applications. It uses a custom-designed industrial interface and is suitable for driving various capacitive loads, such as PZT piezoelectric actuator. It can be used in various industrial applications, such as optical detection and interference shifting.

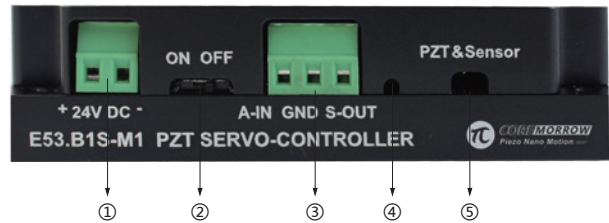
► Characteristics

- Customized industrial interface
- Analog input, single channel output
- Servo control
- 24VDC/1A power supply

► Technical Data

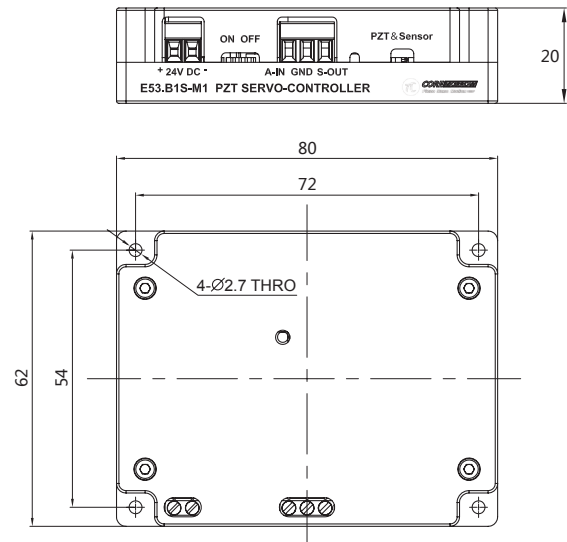
Type	E53.B1S-M
Power supply(V)	24VDC/1A
Static power(W)	<4
Servo control	
Sensor	SGS
Servo	Analog P-I
Drive	
Nominal analog input(V)	0~10
Output voltage(V)	0~120
Peak current(mA)	125
Ave. current(mA)	21
Bandwidth(kHz)	1
Ripple(mVpp)	10(load 2.2μF)
Rated output power(W)	2.5W
Protection	
Operating temperature(°C)	0~50
Output short-circuited current (mA)	21mA
Overcurrent indication	No
Connector	
Control input connector	-
Sensor output connector	KF128-3P
PZT connector	-
Sensor connector	-
Communication connector	-
Appearance	
Size(mm ³)	80×62×20
Mass(g)	105

► Panel Introduction

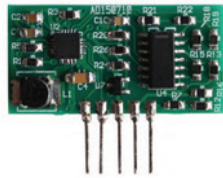
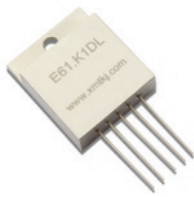


No.	Functions	Description
①	Power port	24V power supply interface.
②	Servo	Servo Switch. ON: servo; OFF: non-servo
③	Signal monitor port	A-IN: analog input signal; GND: ground; S-OUT: sensor monitor signal
④	Analog input	Analog control signal input port
⑤	PZT&Sensor	Voltage output port and sensor signal input port

► Drawing



E61/E62 Ultra Small Size Piezo Controller



Board-type piezo controller is specially designed for industrial application.

► Characteristics

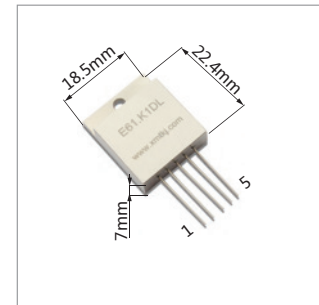
- 1 channel
- Analog input
- Open loop
- 120V output
- Can connect directly to PCB

► Technical Data

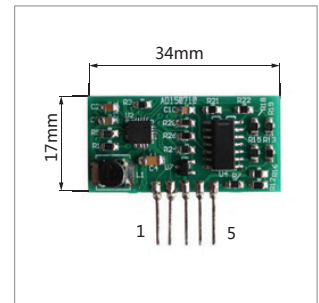
Type	E61.K1DL	E62.K1DL
Functions	Board Type Miniature Piezo Amplifier	
Channels	1 channel	1 channel
Control	Analog input	Analog input
Input range(V)	0~+10	0~+10
Input impedance(KΩ)	100	100
Output voltage(V)	0~+120	0~+100
Ripple(mV)	10	10mV(Cload=1μF)
Peak current(mA)	35	20
Unloaded Bandwidth(kHz)	5(-3dB)	3(-3dB)
Operating temperature(°C)	0~+50	0~+50
Heat dissipation	Shell	-
Power supply(V)	+VS=+130V, -VS=-5V (+VS to -VS), 140V	5VDC
Ave. current(mA)	5	3
Interface	5-PIN SIP, Ø 0.5mm, 15mm	5-PIN SIP, Ø 0.5mm, 10mm
Voltage stability	<0.1%F.S/8hours	<0.1%F.S/8hours
Size(mm)	22.4×18.5×7	34×17×4

► Small size

E61.K1DL



E62.K1DL



No.	E61.K1DL	Description	E62.K1DL	Description
1	VS+	Power supply +	VOUT+	+ output
2	VS-	Power supply -	VOUT-	- output
3	+VOUT	Output	+VS	Power supply
4	GND	GND	GND	GND
5	Vin	Analog input	Vin	Analog input

E63.A Piezo Controller

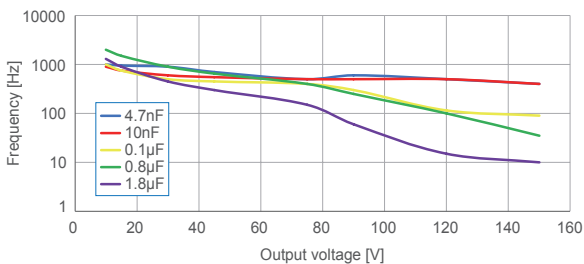


E63.A1K is a small-volume, single-channel, open-loop low-dynamic piezoceramic controller with analog input control and pin-type connection. The product is small in size, and suitable for industrial application.

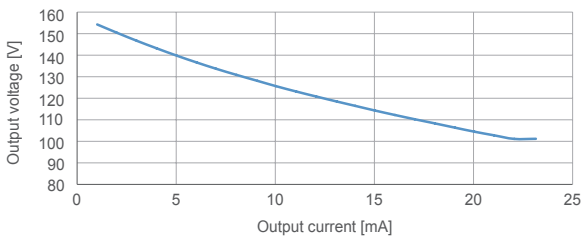
► Characteristics

- Output voltage: 0~120V/150V
- Single-channel open-loop control
- Analog input 0~10V
- Suitable for industrial applications

► Voltage, Frequency and Load Curves



► Voltage Drop Curve



Note: The maximum output voltage will decrease as the output current increases.

► Technical Data

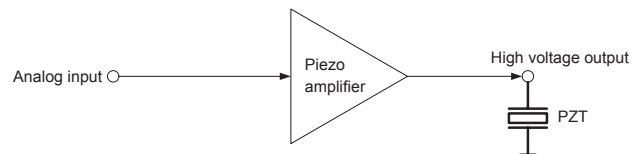
Type	E63.A1K
Functions	Power Amplifier
Drive	
Channels	1
Control input voltage(V)	0~10
Output voltage range(V)	0~120(Optional 0~150)
Peak current(mA)	170
Ave. current(mA)	12
Static power(W)	0.2
Bandwidth(kHz)	1
Out ripple(mVpp)	5(2.2μF)
Connection	5 Pins(2.54 pitch)
Others	
Operating temperature(°C)	0 ~ 50
Dimensions(mm)	60×30×12.5
Mass(g)	30
Power supply	+15VDC/0.5A
Heat dissipation function	-

► Pin Definition

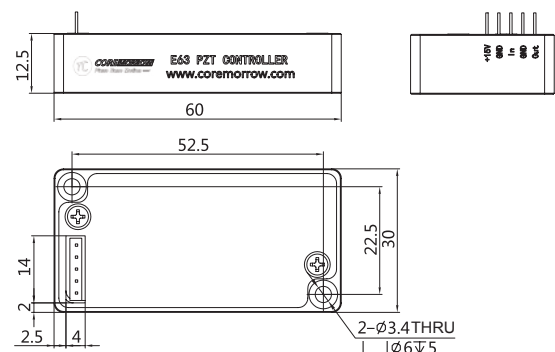


Pin No.	Functions
1	Power supply: +15VDC/0.5A
2	Supply voltage ground and control input ground, AGND
3	Analog voltage input
4	Voltage output ground: SGND
5	Analog voltage output
Housing	Shielding ground GND

► Principle



► Drawing



E63.C Piezo Controller

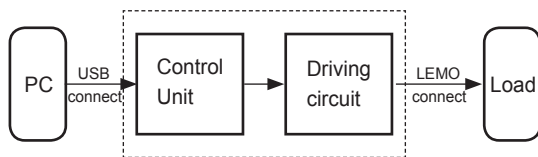


E63.C1K is also a small-volume, single-channel, open-loop low-dynamic piezoelectric ceramic controller with USB power supply and computer software control, and suitable for industrial applications. The product is only the size of the U disk, which is convenient for the integration and is the first choice for the open-loop small-volume piezoelectric controller.

► Characteristics

- Output voltage: 0~150V
- Single-channel and open-loop control
- Software control
- Suitable for Industrial application

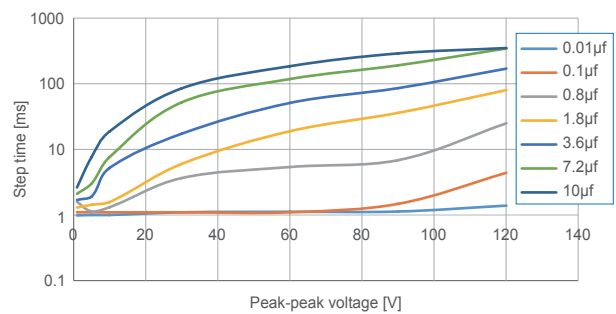
► Driving Principle



► Technical Data

Type	E63.C1K	Units
Functions	Power Amplifier	
Channels	1	
Power supply	USB	
Output voltage	0~150	V
Processor	32	MHz
D/A converter	12bit	
A/D converter	No	
Peak current	35	mA
Ave. current	2.5	mA
Output current, short-circuit	6	mA
Short circuit protection	Yes	
Input power	1.2	W
Static power	0.4	W
Amplifier bandwidth	1	kHz
Output ripple	8(2.2 μ F)	mVpp
Operating temperature	0 ~ 50	°C
Size	89×30×14	mm
Mass	52	g
Heat dissipation function	-	
PZT connector	LEMO	
Connector	USB-A	

► Voltage, Step Time and Load Curve

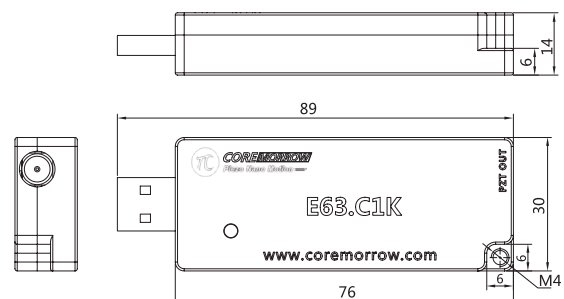


► Application Example

Below image shows that E63.C1K driving a preloaded piezo actuator, which is very compact and easy to integrate, making it ideal for applications such as interferometers.



► Drawing



The 3-Channel E70 Piezo Controller



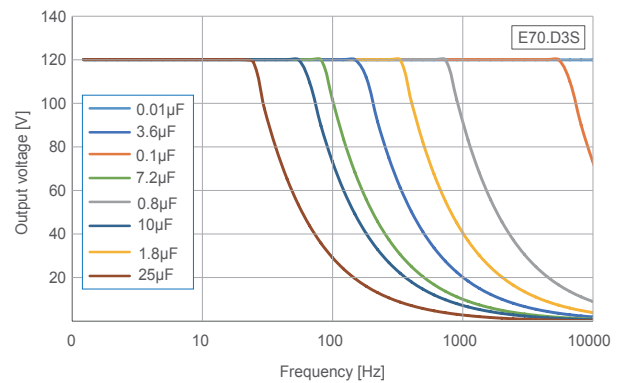
This controller is a 3-channel piezoelectric controller with small size, high power, low power consumption, high bandwidth, and low ripple noise. The controller adopts a dedicated operational amplifier circuit to ensure the output capability of high voltage and high current. By optimizing the sensing servo module, the accuracy and stability of PI adjustment and control are improved, and the reliable anti-interference design ensures the high frequency response of the controller.

The controller adopts DC24V power supply with integrated digital and analog control functions, optional servo control, RS-232/RS-422/USB communication, integrated PZT&Sensor mini interface for easy connection, external control functions can be set with simple and convenient operation.

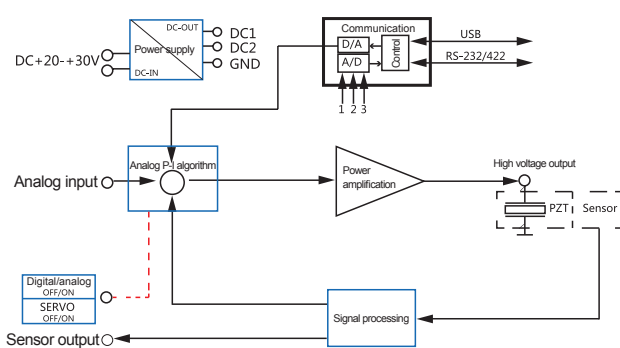
► Characteristics

- Analog & digital control
- 3-channel output
- Small size, large output power
- High amplifier bandwidth
- Low ripple noise
- Low static power
- Excellent frequency response performance
- Stable PI adjustment, control & fast response
- DC24V3A DC power supply
- USB/RS-232/RS-422 communication interface

► Frequency, Voltage and Load Curves



► Driving Principle



► Type Guide

Non-servo/servo control

S servo control

K non-servo

E70.D3S

Channels

3 3 channels

Series name

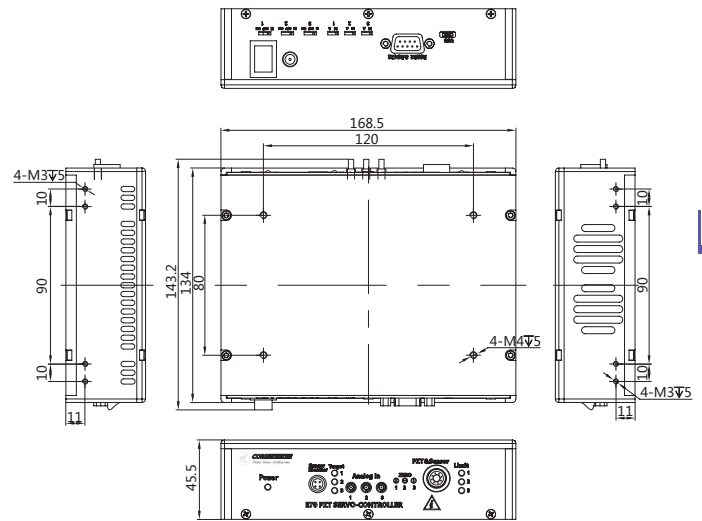
C With software control function

D Standard version, with servo and software control

► Technical Data

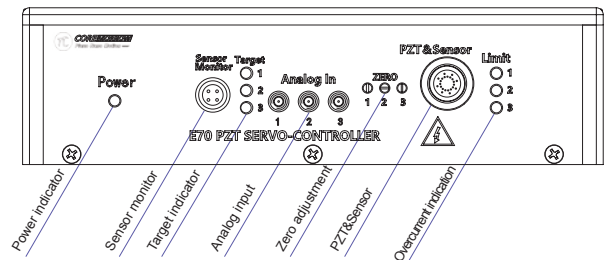
Type	E70.C3K	E70.D3S
Functions	Digital and analog piezo controller	
Drive		
Channels	3	
Nominal analog input(V)	0~10	
Nominal output voltage(V)	0~120V(Optional 0~150V and one constant voltage)	
Input power(W)	56	
Peak current(A)	1.1/channel	
Ave. current(mA)	70/channel	
Bandwidth(Hz)	10k/channel	
Bandwidth, 1/10(Hz)	10k	
Bandwidth(-3DB)(Hz)	37k	
Bandwidth, 1/10(-3DB)(Hz)	54k	
Ripple(mV)	5/channel(2.2μF)	
PZT connector	LEMO-ECG-2B-312	
Control input connector	SMB	
Servo control		
Sensor type	-	SGS
Servo	-	P.I+Low pass+Notch filter
Sensor output connector	-	EPG.0B.304(LEMO)
Sensor output ripple(mV)	-	10
Master control		
Communication	RS-232/422, USB	
Baud rate	9600, 38400, 57600, 115200	
Settable baud rate for Software secondary development	9600, 19200, 38400, 57600, 76800, 115200 , 128000, 230400, 256000	
Processor	ARM 32 bit	
D/A converter	16 bit ±10V	
A/D converter	16 bit ±10V	
PC software control function	Output voltage & displacement, waveform control, setting parameters	
PC software waveform control	Programmable/standard waveform output	
Secondary development	VC++, Matlab, LabView, DLL dynamic link library functions, etc	
Others		
Operating temperature(°C)	0~50	
Over-current protection	Yes	
Static power(W)	11	
Cooling method	Fan	
Size(mm)	168.5×134×45.5	
Mass(kg)	1.2	
Power supply	24V DC3A	
Control way	Analog/digital signal	

► Drawing

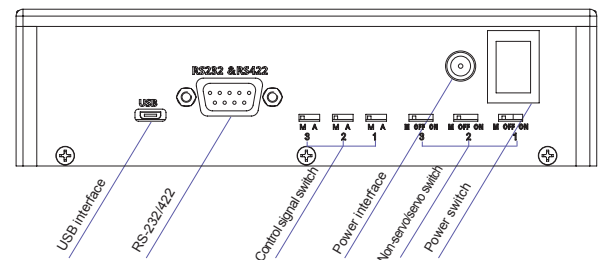


► Panel Introduction

E70.D3S front panel



E70.D3S rear panel



Note: E70.C3K has no servo control function.

4-Channel E70 Piezo Controller



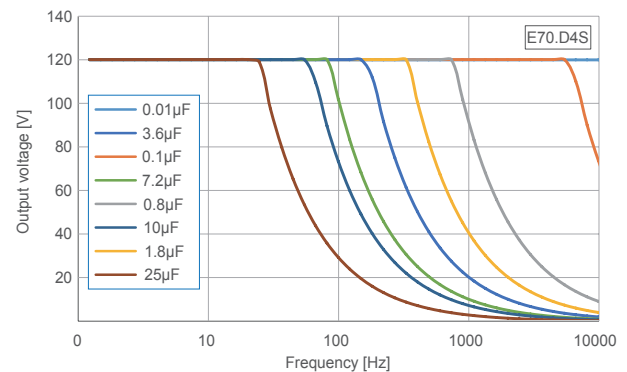
This is a 4-channel piezoelectric controller with small size, high power, low power consumption, high bandwidth, and low ripple noise. The controller adopts a dedicated operational amplifier circuit to ensure the output capability of high voltage and high current. By optimizing the sensing servo module, the accuracy and stability of PI adjustment and control are improved, and the reliable anti-interference design ensures the high frequency response of the controller.

The controller adopts DC24V power supply, integrated digital and analog control functions, optional servo control, RS-232/RS-422/USB communication, external control functions can be set, and the operation is simple and convenient.

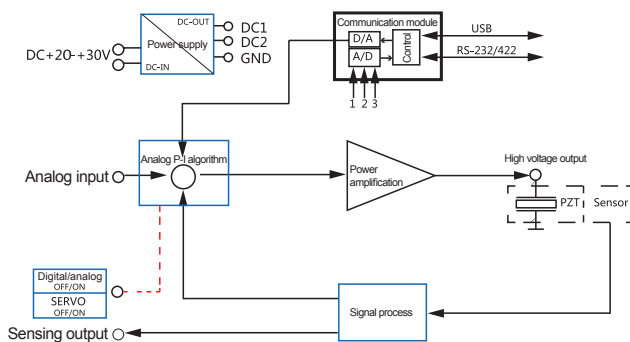
► Characteristics

- Analog & digital control
- 4-channel output
- Small size, high output power
- Wide amplifier bandwidth
- Low ripple noise
- Lower static power
- Excellent frequency response
- Stable PI adjustment, control ability & fast response
- DC24V4A DC power supply
- USB/RS-232/RS-422 communication interface

► Frequency vs Load Curve



► Driving Principle



► Type Guide

Non-servo/servo control

- S servo control
- K non-servo

E70. D 4 S

Channels

4 4 channels

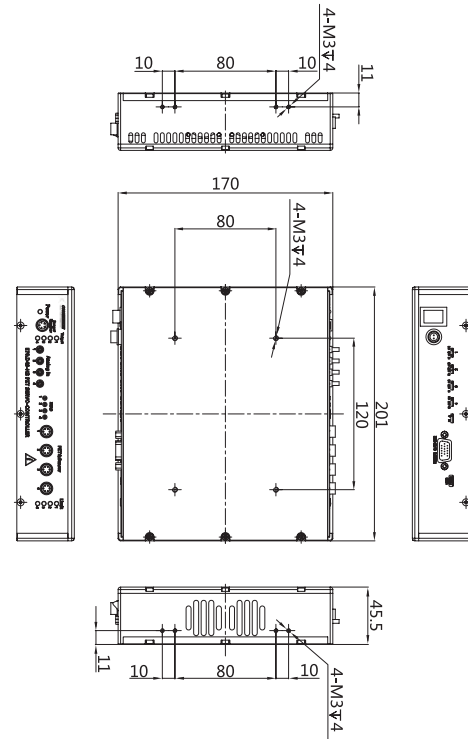
Series name

- C With software control function
- D Standard version, with servo feedback & software control function

► Technical Data

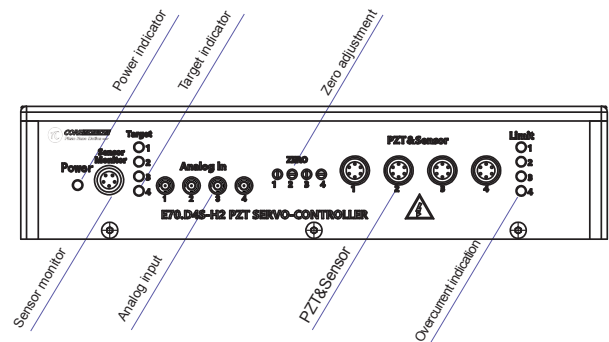
Type	E70.C4K	E70.D4S
Characteristics	Digital & analog integrated controller	
Drive		
Channels	4	
Nominal analog input (V)	0~10	
Nominal output voltage(V)	0~120(Optional 0~150)	
Input power(W)	76	
Peak current(A)	1/channel	
Ave. current(mA)	70/channel	
Bandwidth(Hz)	10k/channel	
Bandwidth, 1/10 (Hz)	10k/channel	
Bandwidth, -3DB(Hz)	37k/channel	
Bandwidth, -3DB, 1/10(Hz)	54k/channel	
Ripple(mV)	5/channel(2.2μF)	
PZT connector	LEMO-ECG-0B-306	
Control input connector	SMB	
Servo control		
Sensor type	-	SGS
Servo	-	P.I+low pass+notch filters
Sensing output connector	-	LEMO-EPG.0B.305
Ripple(mV)	-	10
Master control		
Communication	RS-232/422, USB	
Baud rate	9600, 38400, 57600, 115200	
Settable baud rate for Software secondary development	9600, 19200, 38400, 57600, 76800, 115200 , 128000, 230400, 256000	
Processor	ARM 32 bit	
D/A converter	16 bit ±10V	
A/D converter	16 bit ±10V	
PC software control function	Output voltage & displacement, waveform control, parameters set	
PC software waveform control	Programmable/standard	
Secondary development	VC++, Matlab, LabView & Program & DLL dynamic link library functions, etc.	
Others		
Temperature(°C)	0~50	
Overcurrent protection	Yes	
Static power(W)	15	
Cooling	Fan	
Size(mm)	201×170×45.5	
Mass(kg)	2.1	
Power supply	24V DC4A	
Control mode	Analog/digital signal	

► Drawing

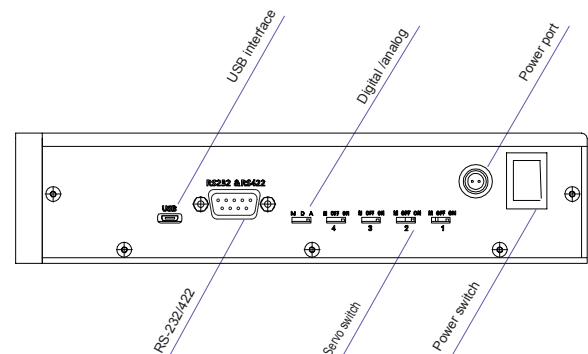


► Panel Introduction

E70.D4S front panel



E70.D4S rear panel



Note: E70.C4K has no servo feedback function.

Modular E70 Piezo Controller



This controller can freely choose the number of cascaded modules according to the user's needs. The number of channels for a single module is 3 channels/module, and up to 32 modules can be cascaded. It can be controlled by external analog signals or digital signals via RS-422 interface and optional servo control function.

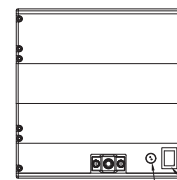
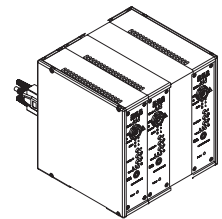
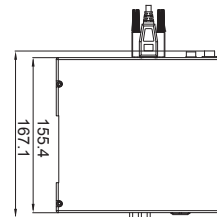
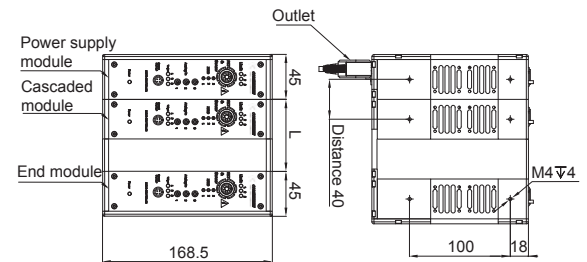
► Technical Data

Type	Modular E70
Functions	Digital & analog integrated controller
Drive	
Channels/module	3
Assemble modules	2~32 pcs
Optional channel number	6/9/12/.../96
Nominal analog input(V)	0~10
Nominal output voltage(V)	0~120(Optional 0~150)
Input power(W)	60/module
Peak current(A)	1/channel
Ave.current(mA)	70/channel
Bandwidth(Hz)	10k/channel
Bandwidth, 1/10(Hz)	10k/channel
Bandwidth, -3DB(Hz)	37k/channel
Bandwidth, -3DB, 1/10(Hz)	54k/channel
Ripple(mV)	5/channel(2.2μF)
PZT connector	LEMO-ECG-2B-312
Control input connector	SMB
Servo control	
Sensor type	SGS
Servo	PI+ low pass + notch
Sensing output connector	LEMO-EPG.0B.304
Ripple(mV)	10
Master control	
Communication	RS-422
Baud rate	9600, 38400, 57600, 115200
Settable baud rate for Software secondary development	9600, 19200, 38400, 57600, 76800, 115200, 128000, 230400, 256000
Processor	ARM 32 bit
D/A converter	16 bit ±10V
A/D converter	16 bit ±10V
PC software control function	Output voltage & displacement, waveform control, setting parameter
PC software waveform control	Programmable/standard
Secondary development	VC++, Matlab, LabView, DLL dynamic link library functions, etc.
Others	
Operating temperature(°C)	0~50
Over-current protection	Yes
Static power(W)	11/Module
Cooling	Fan
Width(mm)	No. of modules ×40+10
Height × depth(mm)	168.5×155.4
Mass(kg)	1.2/Module
Power supply	24V DC3A/module
Control mode	Analog/digital signal

► Characteristics

- Modular, free to choose the number of modules
- Digital & analog control
- 6~96 channels freely selectable
- Closed loop servo control power supply

► Drawing



Type	E70.D6S	E70.D9S	E70.D12S	...	E70.D96S
L(mm)	0	40	80	...	1280

Note: When two modules are cascaded, the total width is 90mm, and each increase for a module, the total width increases by 40mm, and so on.

► Custom Anti-Vibration Piezo Controller – E70.D3S-I

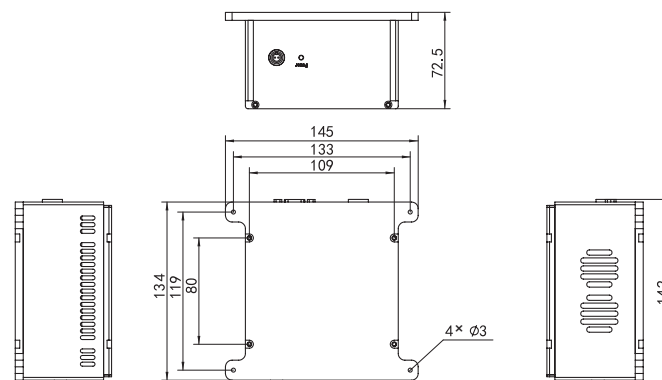


► Custom Piezo Controller – E70.D3S

- Communication interface: RS-422
- Digital signal control
- Suitable for industrial applications



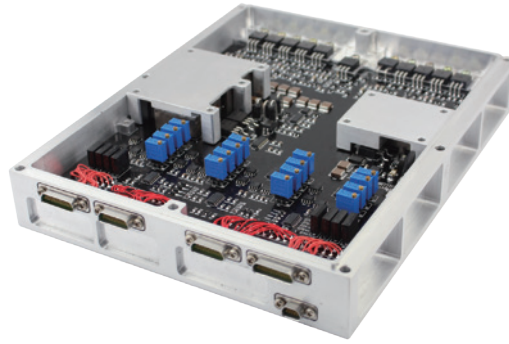
► Drawing



► Custom Piezo Controller



E80.B5S Board-Type Piezo Controller



E80.B5S is specially designed for driving two FSMs at the same time and suited for application with limited space.

► Characteristics

- Closed loop
- Small size
- 5 channels(4 channels variable voltage output, 1 channel constant voltage output)
- Output voltage 0~120V
- For driving two FSMs

► Technical Data

Type	E80.B5S	Units
Channels	5	channel
Sensor type	SGS	
Sensor feedback output	-10~10	V
Analog input voltage	-10~10(or 0~10)	V
Output voltage	0~120	V
Ripple	≤10	mV
Bandwidth	1	kHz
Peak power dissipation	≤30	W
Ave. power dissipation	≤15	W
Mass	0.8	kg
Bandwidth	700Hz/400μrad	Driving P33.T2 FSM
Power supply interface	J30J-9ZKS	
Input and monitor interface	J30J-21ZKS	
Voltage output interface	J30J-25ZKS	
Power supply	DC28	V
Size	222×180×40	mm
Can drive double FSMs	Two piezo deflecting mirrors can be driven simultaneously	

E80.D3S-K Piezo Controller



► Characteristics

- 3-channel piezo controller
- Analog servo control, digital control
- Power supply 20~30V DC
- Suitable for driving PDM

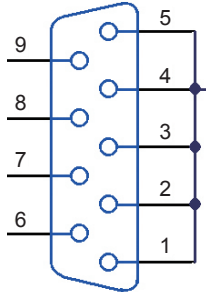
► Panel Introduction



Identifier	Type	Function
Power	J30J-9ZKSP	Power supply connector
PZT	J30J-15ZKSP	The output voltage for driving PZT Sensor input signal
Communication	J30J-9ZJSP	Software control Sensor output signal monitor. Output range 0~10V

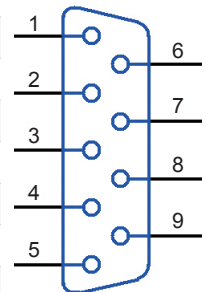
► Power Supply

Pin No.	Definition
1	Power supply +
2	Power supply +
3	Power supply +
4	Power supply +
5	Null
6	Power supply -
7	Power supply -
8	Power supply -
9	Power supply -



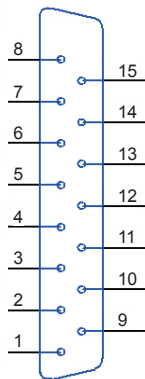
► RS-422 Communication Interface

Pin No.	Definition
1	Sensor monitor signal 2 + (S2+)
2	Sensor monitor signal 1 + (S1+)
3	Receive data + (422-R+)
4	Send data - (422-T-)
5	Signal ground (GND)
6	Sensor monitor signal 2 - (S2-)
7	Sensor monitor signal 1 - (S1-)
8	Receive data - (422-R-)
9	Send data + (422-T+)

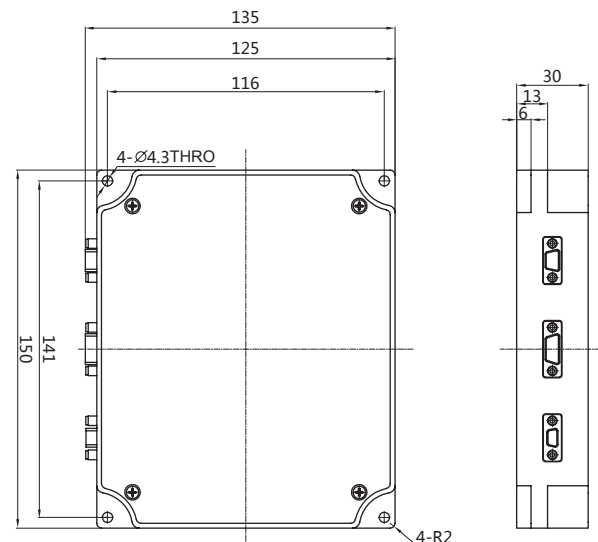


► PZT Interface

Pin No.	Definition
1	Sensor 2 reference voltage signal(VREF2)
2	Sensor 2 signal + (S2+)
3	Sensor 1 reference voltage signal(VREF1)
4	Sensor 1 signal + (S1+)
5	Null
6	PZT drive signal ground(PZT1_GND)
7	PZT drive signal ground(PZT2_GND)
8	PZT drive signal ground(PZT3_GND)
9	Sensor 2 signal analog ground(AGND2)
10	Sensor 2 signal - (S2-)
11	Sensor 1 signal analog ground(AGND1)
12	Sensor 1 signal - (S1-)
13	PZT drive signal channel 3
14	PZT drive signal channel 2
15	PZT drive signal channel 1



► Drawing



► Technical Data

Type	E80.D3S-K
Function	Digital controller
Drive	
Channels	3
Nominal analog input(V)	-
Nominal output voltage (V)	0~120V(optional 0~150V), one constant voltage output
Input power(W)	56
Peak current(A)	1/channel
Ave. current(mA)	70/channel
Bandwidth(Hz)	10k/channel
Ripple(mV)	5/channel(2.2μF)
PZT connector	J30J-15ZKSP
Input connector	J30J-9ZJSP
Servo control	
Sensor type	SGS
Servo	P.I + low pass
Output connector	J30J-9ZJSP
Ripple(mV)	20
Master control	
Communication	RS-422
Baud rate	9600, 38400, 57600, 115200
Settable baud rate for software secondary development	9600, 19200, 38400, 57600, 76800, 115200, 128000, 230400, 256000
Processor	ARM 32 bit
D/A converter	16 bit ±10V
A/D converter	16 bit ±10V
PC software control function	Output voltage and displacement, waveform control, setting parameters
PC software waveform control	Programmable/standard
Secondary development	VC++, Matlab, LabView, DLL dynamic link library functions, etc.
Others	
Operating temperature(°C)	-40~65°C
Overcurrent protection	Yes
Static power(W)	11
Cooling	At the bottom of the shell
Size(mm)	150×125×30
Mass(kg)	0.649
Power supply	20~30V DC3A
Control mode	Digital signal control

E80.D4S High Voltage Piezo Controller



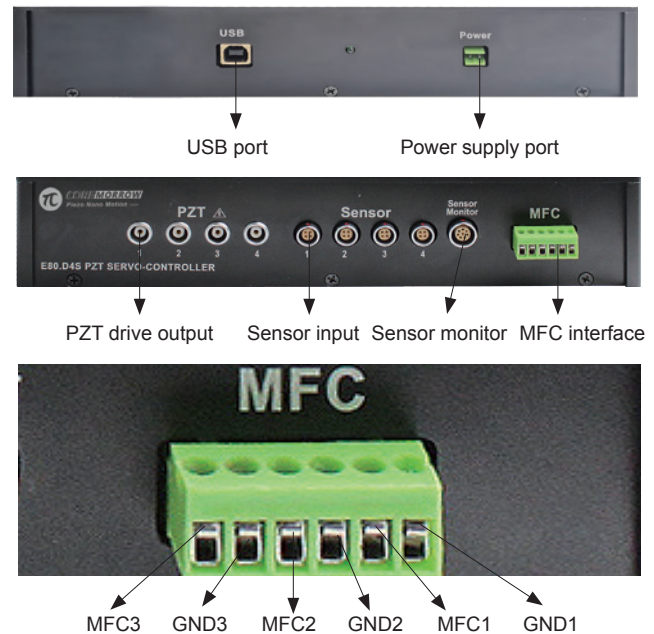
► Characteristics

- 4 channels
- Output voltage 0~800V
- Peak current up to 100 mA
- Bandwidth up to 1kHz
- Integrated charge amplifier

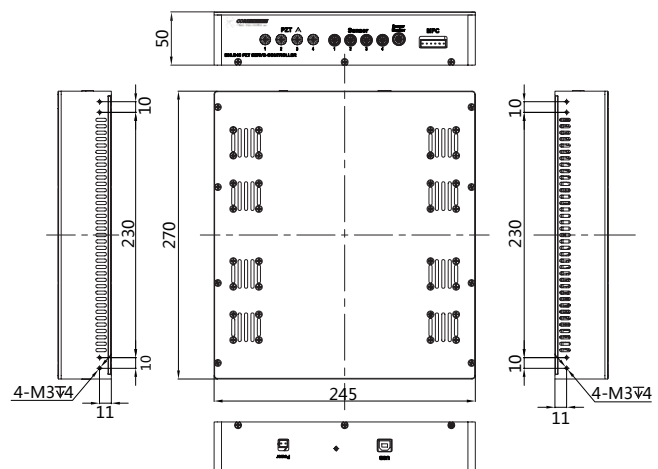
► Technical Data

Type	E80.D4S
Characteristics	Piezo controller
Drive	
Channels	4
Nominal analog input(V)	0~10V
Nominal output voltage(V)	0~800V
Peak current(mA)	100/channel
Ave. current(mA)	20/channel
Bandwidth(Hz)	1k/channel
Ripple(mV)	200
PZT connector	ZRA.0S.116.CLL
Input connector	USB interface
Servo control	
Sensor type	SGS
Servo	AnalogP-I
Sensor connector	LEMO-EPG-0B-304
Output connector	LEMO-EPG-0B-308
Master control	
Communication	USB
D/A converter	16 bits
A/D converter	16 bits
Others	
Operating temperature(°C)	-30~+65
Storage temperature(°C)	-50~+70
Humidity	Max: 80%, 30°C Minimum: 50%, 40°C
Output short-circuited current(mA)	20
Overcurrent indication	No
Static power(W)	74
Dimensions(mm)	270×245×50
Mass(kg)	1.66
Power supply	28V/10A

► Interface Definition



► Drawing



E80.D12S Integrated Piezo Controller

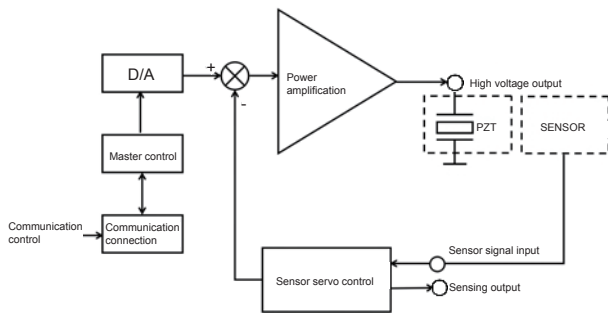


The E80.D12S integrated piezo controller is designed for driving piezo deflection mirrors. It can drive 4 piezoelectric deflection mirrors at the same time, with a bandwidth of up to 5kHz. E80.D12S is digitally controlled by the upper computer with servo control function.

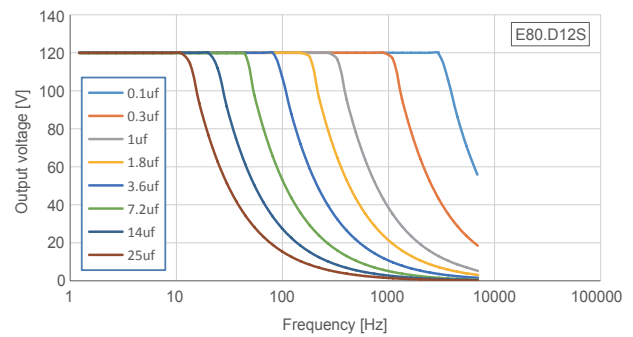
► Characteristics

- Integrated
- 12-channel output
- Output voltage 0~120V
- Servo control
- Can drive 4 piezo deflection mirrors

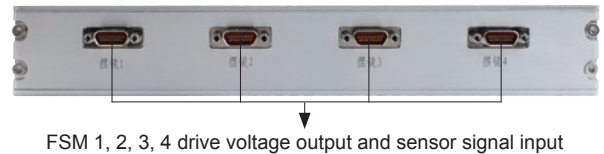
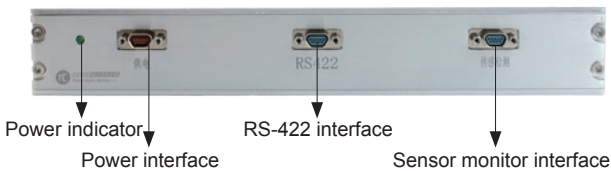
► Driving Principle



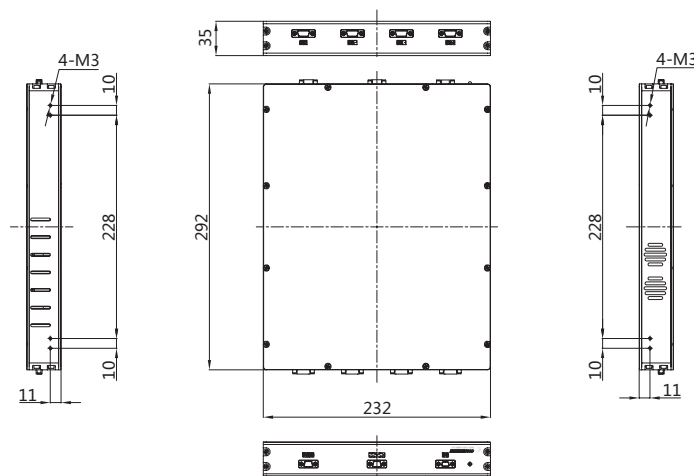
► Frequency vs Load Curve



► Panel Interface



► Drawing



► Technical Data

Type	E80.D12S
Functions	Digital integrated controller
Drive	
Channels	12
Nominal output voltage(V)	0~120(1~4# 3rd channel constant voltage output 120V)
Peak current(mA)	1~3# interface: 85; 4# interface: 1100
Ave.current(mA)	1~3# interface: 7; 4# interface: 74
Static power(W)	12
Bandwidth(Hz)	1~3# interface: 1k/channel; 4# interface: 5k/channel
Ripple(mV)	<5/channel(2.2μF)
PZT output & sensor input connector	J30J-15ZKSP
Servo control	
Sensor type	SGS/LVDT
Servo	Analog P-I
Output connector	J30J-9ZKSP
Ripple(mV)	10
Master control	
Communication	RS-422
Processor	ARM 32 bit
D/A converter	16 bits
PC software control function	Output voltage & displacement, waveform control, setting parameters
PC software waveform control	Programmable/standard
Secondary development	VC++, Matlab, LabView , DLL dynamic link library functions, etc.
Others	
Overcurrent protection	Yes
Cooling	Shell(can install a cooling fan inside)
Size(mm)	292×232×35
Mass(kg)	1.9
Supply voltage	24~30V DC
Power interface	J30J-9ZJSP
Control mode	Digital signal control
Humidity	Max: 80%, 30°C Minimum: 50%, 40°C
Operating temperature(°C)	0~+50
Storage temperature(°C)	-25~+85

High Power Piezo Controller(C47, E81)



C47



E81

Both C47 and E81 are high-power piezoceramic controllers that are ideally suited for driving and testing of large quantities of piezoceramics with adjustable frequency and output voltage.

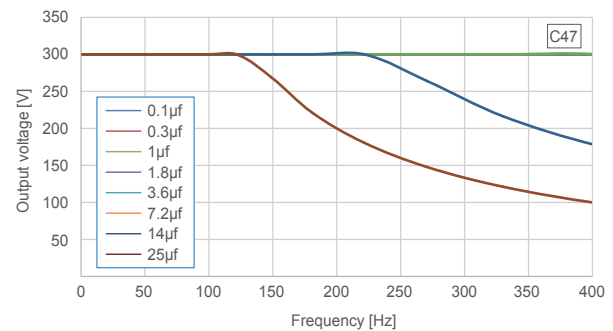
► The Difference between C47 and E81

Type	C47	E81
Output waveform	Square wave	Arbitrary waveform, depending on the analog input
Work mode	Pulse	Power amplification
Power	300W	400W
Output voltage	0~±300V	0~150V

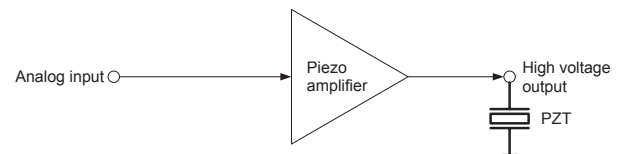
► C47 Technical Data

Type	C47.K1AL	
Functions	Large power pulse	
Drive		
Channels	2	1
Output voltage(V)	Unipolar 0~300/0~300	Bipolar -300~300
Peak current(mA)	3000	
Ave. current(mA)	1000	
Amplifier bandwidth(Hz)	400	
Output ripple(mVpp)	50	
Control input voltage(V)	AC 0~250	
Output voltage range(V)	Control input voltage × 1.4	
Input connector	JXZ-2 type terminal	
Output connector	JXZ-2 type terminal	
Interface and operation		
Communication	RS-232	
D/A converter	16 bit	
A/D converter	16 bit	
External feature	Film keyboard LCD display	
Software configuration	Standard computer software	
Output waveform type	Square wave	
Others		
Operating temperature(°C)	0~50	
Size(mm)	L343×H133×D343	
Power supply	220VAC 50Hz±10%	

► Output, Load and Frequency Curve



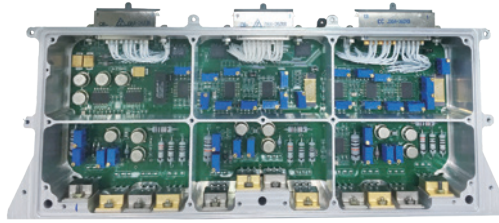
► E81 Driving Principle



► E81 Technical Data

Type	E81.A1K
Input voltage range	0~10V
Output voltage range	0~150V
Peak current	>6A
Ave. current	2A(±10%)
Gain	15
Amplifier bandwidth	10kHz
Ripple	20 mVpp(2.2µF)
Protection	
Operating temperature	0~50 °C
Output current, short-circuit	80mA
PZT connector	LEMO
Power	
Power supply	220VAC
Static power	<35W
Shape	
Size	L535×H170×D360mm

E81-D Board-Type Piezo Controller



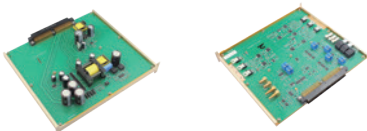
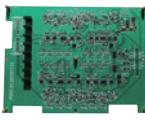
► Characteristics

Analog control, optional 3, 6 or 9 channels, could drive 1, 2 or 3 FSMs respectively.

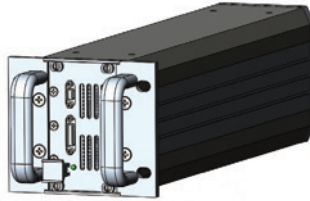
► Technical Data

Type	E81-D
Input	Analog input
Channels	3/6/9
Analog input voltage(V)	0~5
Input impedance(K Ω)	100
Bandwidth(Hz)	1k
Output voltage(V)	0~+150
Ripple(mVpp)	≤ 20
Peak current(mA/channel)	150
Ave. current(mA/channel)	50
Interface	DB scoket
Length×width(mm)	280×170
Height(mm)	30
Operating temperature(°C)	-45~80
Operating voltage	+170V, $\pm 15V$, -24V 0.2A
Protection	Over current, short circuit

► Customized Board-Type Piezo Controller

E80.A4K-I1	E80.D3S-J1	E80.D3S-I1	E80.B6S-J1	E80.B3S-I1
				
4 channels, Open loop, Analog input	3 channels, Servo control, Driving FSM	3/6 channels, Driving FSM	6 channels, Servo control, Driving FSM	3 channels, Servo control Driving FSM

E82.A8K Piezo Controller



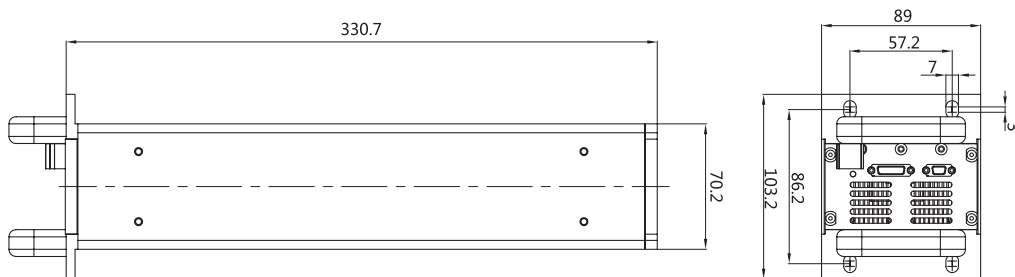
► Characteristics

- 8-channel output
- Analog input control
- Output 0~150V
- With handle, easy to install

► Technical Data

Type	E82.A8K
Channels	8
Output voltage range(V)	0~150
Output voltage resolution(mV)	<5/channel
Control mode	Analog input
Analog input voltage(V)	0~5
Ave. output power(W)	3/channel
Ave. current	30mA
Peak current	300mA
Output bandwidth(kHz)	75(unloaded, 10V), 30(3nF load, 150V)
Output ripple(mV)	<20
Power supply	DC 28V 2A
Operating temperature(°C)	-20~+40
Analog input connector	J30J-9TJW
Voltage output connector	J30J-21TJW
Output protection	Current limit/over-current /over-temperature proof
Size(mm)	330.7×89×103.2
Mass(kg)	2

► Drawing



E82.A64K Piezo Controller



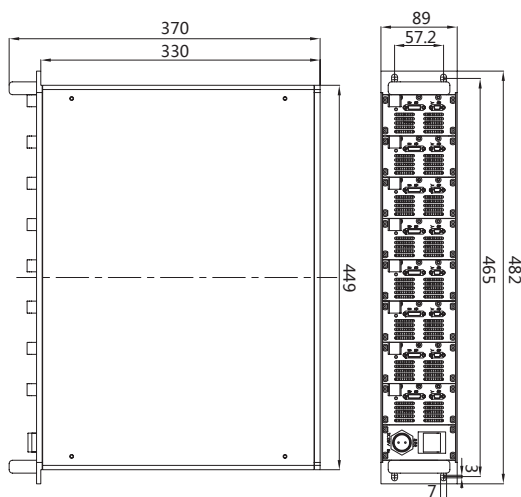
► Characteristics

- 64 channels
- Analog input control
- Output voltage 0~150V
- Can drive PZT in optical fiber sensor

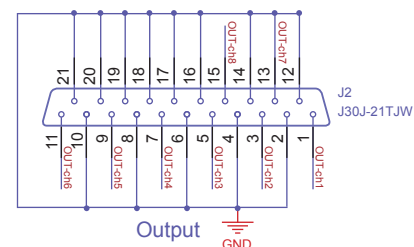
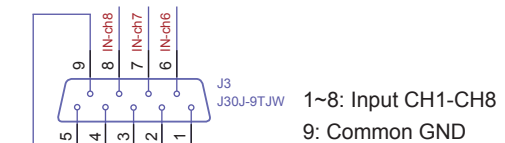
► Technical Data

Type	E82.A64K
Channels	64 channels
Output voltage(V)	0~150
Output voltage resolution(mV)	<5/channel
Control mode	Analog input
Analog input voltage(V)	0~5
Ave. output power(W)	3/channel
Ave. current	30mA
Peak current	300mA
Bandwidth(kHz)	75(unloaded, 10V), 30(3nF load, 150V)
Ripple(mV)	<20
Supply voltage	DC 28V 15A
Operating temperature(°C)	-20~+40
Analog input connector	J30J-9TJW
Voltage output connector	J30J-21TJW
Output protection	Current limit/over-current /over-temperature proof
Size(mm)	Standard 19 inch 2U chassis, 449×330×89
Mass(kg)	13

► Drawing



► Input & Output Interface Definition



1, 3, 5, 7, 9, 11, 13, 15: CH1-CH8 Output
2, 4, 6, 8, 10, 12, 14, 16, 17-21: Common GND

E82.C32K Piezo Amplifier



The 32-channel E82.C32K piezo amplifier has USB communication interface to realize real-time communication with the host computer. The 32-channel voltage output can be controlled by the upper computer, and the real-time voltage can be read through the AD. It supports the secondary development of the upper computer software which can set voltage parameters.

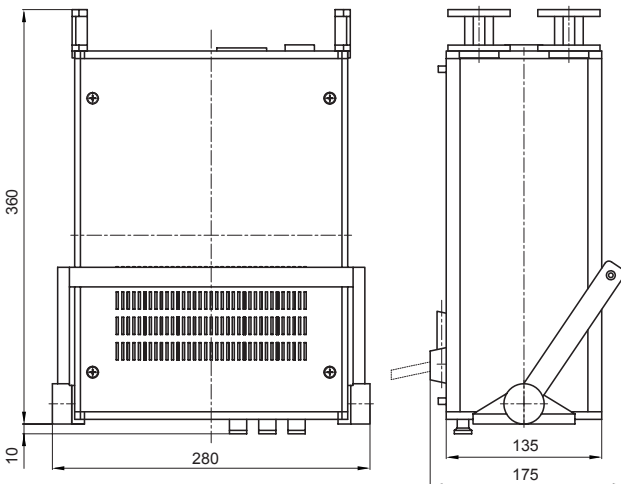
► Characteristics

• 32 channels • Ave. current up to 13mA/channel • USB communication • Bandwidth up to 1kHz • Support secondary development

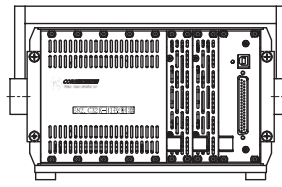
► Technical Data

Type	E82.C32K
Function	Piezo Controller
Output voltage(V)	0~100
Communication	USB
Peak current(mA)	170/channel
Ave. current(mA)	13/channel
Bandwidth(Hz)	1k/channel
Ripple(mVpp)	10/channel
Operating temperature(°C)	0~50
Over-temperature protection(°C)	70±5 stop working
Over-temperature protection recovery(°C)	60±5
Power supply	220VAC
Output connector	D-SUB
Size(mm)	280×370×175
Mass(kg)	12

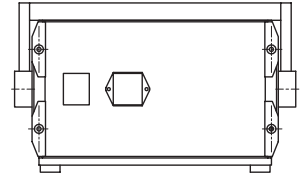
► Drawing



► Panel Introduction



Front panel

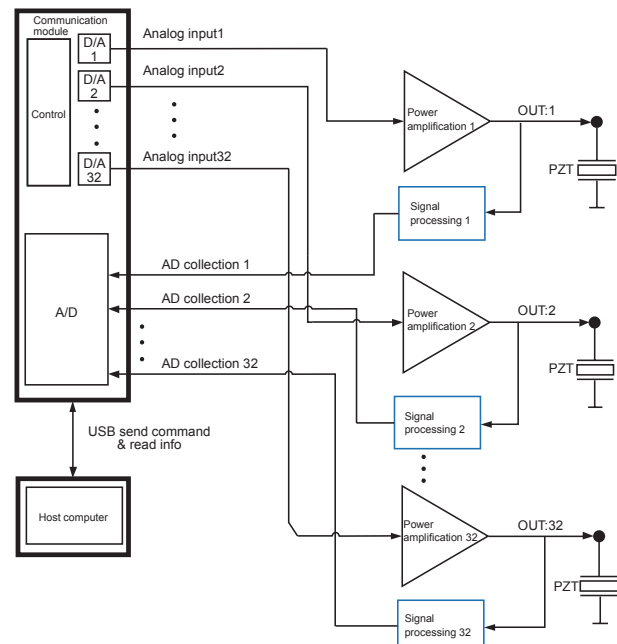


Rear panel

Identifier	Type	Front panel function
Power Indicator	LED	The light is always on, E82 works
Communication	USB	PC communication interface
Output	⚠ D-SUB 37 contacts output terminal	Output voltage signal

Identifier	Type	Rear panel function
Power outlet	AC-220A	Power connector socket
Rocker switch	KCD3-3104A	Power on and off

► Principle Diagram

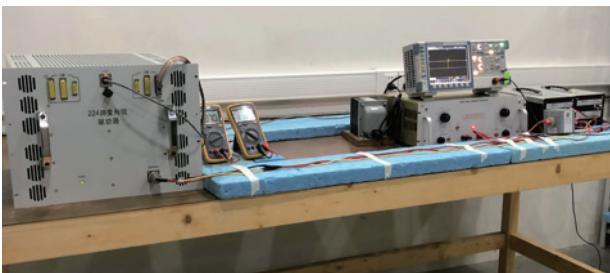


E82 Piezo Controller for PDMs



E82 is specially designed for driving PDMs. It is grouped into 4 types: 70-channel, 130-channel, 224-channel and 256-channel type. Due to the extreme working environment, the controller has passed very strict environmental experiments, such as salt spray test, mold test, damp heat test, electromagnetic compatibility test, vibration test, etc.

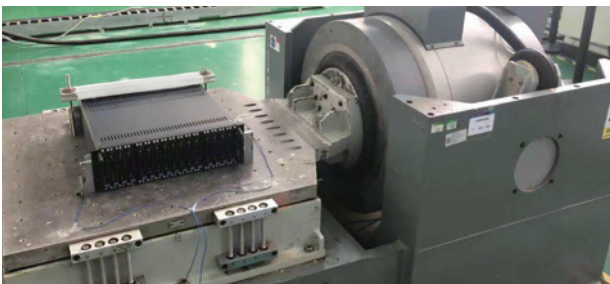
► Test



Electromagnetic Compatibility Test



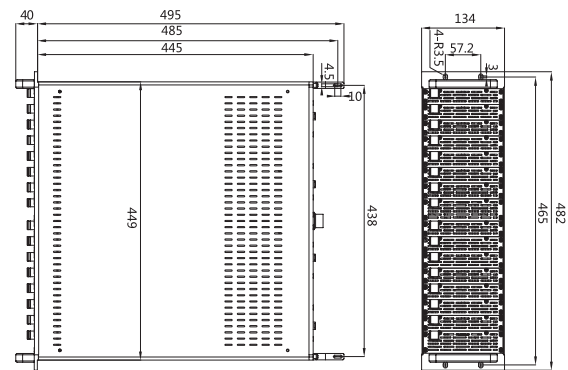
High and Low Temperature Test



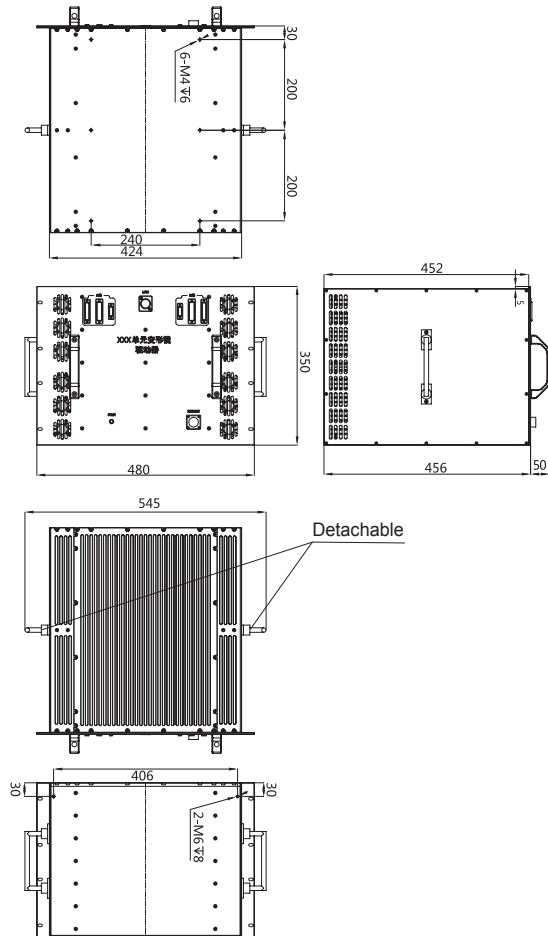
Vibration Test

► Drawing

E82.C256



E82.C70/130/224



► Technical Data

Type	E82.C70K	E82.C130K	E82.C224K	E82.C256K
Channels	70	130	224	256
Output voltage(V)	-20~+120	±350	-20~+120	-20~+120
Output voltage resolution(mV)	5	25	5	5
Output voltage ripple(mV)	10(RMS)	20(RMS)	10(RMS)	10(RMS)
Ave. current/channel(mA)	90	5	25	30
Peak current/channel(mA)	300	15	80	90
Output bandwidth(kHz)	1	0.3	1	1
Protection	Over current	Over current	Over current	Over current
Communication	Ethernet port	Ethernet port	Ethernet port	Ethernet port
AD gathering function	Software showed in	Software showed in	Software showed in	Software showed in
Power supply	AC 220V	AC 220V	AC 220V	AC 220V
Input power(W)	1300	600	1000	1300
Mass(kg)	55	40	55	26
Size(mm)	19 inch, standard 8U, W480×H351×D506			19 inch, standard 3U W482×H134×D495
Operating temperature(°C)	-10~+40			
Store temperature(°C)	-25~+50			
Customization	Available			

Piezo Controller for Driving PDMs



CoreMorrow has a lot of experience in customizing piezoceramic controllers, and the professional R&D team can quickly provide the best solution for users. The controllers are specially designed for driving PDM and could be customized according to the customer's deformable mirror that requires the number of control channels, voltage, and control methods.

► Characteristics

Industrial/board/rack, control mode, input/output voltage, interface, size, channel number, operating environment, etc., can be customized.

► Technical Data

Type	E24	E40	E48	E112
Functions	Piezo Deformable Mirror Controller			
Control	Analog input			
Channels	24	40	48	112
Input range(V)	-10~+10	±5(difference)	-5~+10	±5(difference)
Knob(turns)	-	10	-	10
Input impedance(KΩ)	100			
Bandwidth(Hz)	1k			
Output voltage(V)	-300~+300	0~+300	-200~+400	0~+400
Ripple(mVpp)	≤30	≤5	≤30	≤10
Peak current(mA/channel)	30	30	30	30
Ave. current(mA/channel)	10	5	5	5
Interface	BNC/LEMO	DB	51	DB
Length×Width(mm)	433×308	365×308	433×308	510×380
Height	Standard 3U	Standard 6U	Standard 3U	Standard 6U
Operating temperature(°C)	-10~50			
Power supply	220VAC 50Hz±10%			
Protection	Overcurrent and short circuit protection			



E24



E40



E48



E112

XE-650 Piezo Controller

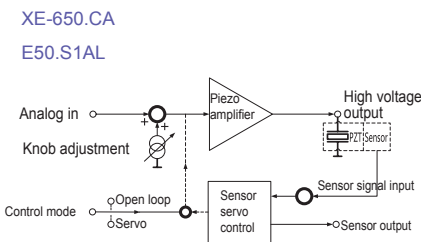


XE-650 piezoelectric ceramic controller is a small-volume single-channel piezo driver with 0~120V output voltage, which can be selected as analog input, spontaneous waveform or I/O port control, and open-loop/servo control model.

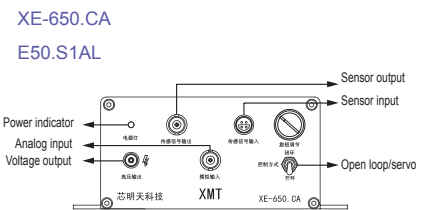
► Three Versions



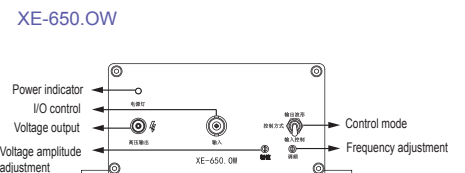
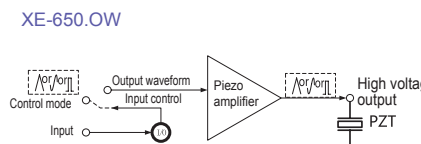
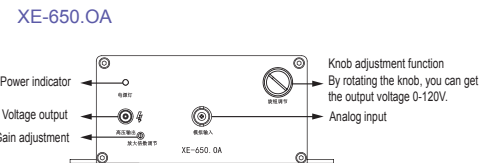
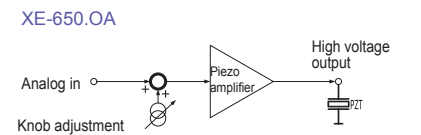
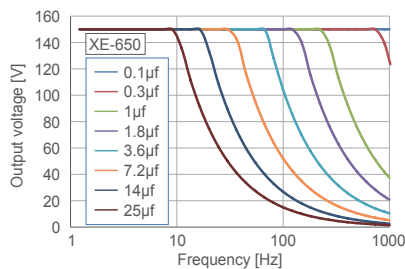
► Principle



► Panel Introduction



► Frequency vs Load Curves



► Technical Data

Type	XE-650.CA	XE-650.OA	XE-650.OW	E50.S1AL
Functions	Analog servo controller	Analog open-loop controller	Spontaneous waveform open-loop controller	Analog servo controller
Drive				
Output channels	1	1	1	1
Control analog input(V)	0~10	0~10	I/O control, 0 or 5	0~10
Output voltage range(V)	0~120(or 0~150)	0~120(or 0~150)	0~120(or 0~150) (sine wave / square wave or triangle wave)	0~120
Peak current(mA)	150	150	150	165
Ave. current(mA)	50	50	50	50
Bandwidth(kHz)	1	1	1	8
Output ripple(mVpp)	20	20	20	<5
PZT connector	LEMO ERA.00.250.CTL	LEMO ERA.00.250.CTL	LEMO ERA.00.250.CTL	LEMO ERA.00.250.CTL
Input connector	BNC	BNC	BNC	BNC
Control mode	Analog input, knob adjustment	Analog input, knob adjustment	I/O control	Analog input, knob adjustment
Sensor				
Sensor type	SGS	-	-	SGS
Servo characteristics	Analog P-I+notch filter	-	-	Analog P-I+notch filter
Sensor connector	LEMO ERA.0S.304.CLL	-	-	LEMO ERA.0S.304.CLL
Others				
Operating temperature(°C)	0~50	0~50	0~50	0~50
Size(mm)	L147×H61×D141	L147×H61×D141	L147×H61×D141	L147×H61×D141
Mass(kg)	1.3	1.3	1.2	1.3
Power supply	220VAC 50Hz±10%	220VAC 50Hz±10%	220VAC 50Hz±10%	220VAC 50Hz±10%

► Characteristics

- ## ► Language and Software Environments

- ## ► Software functions

-

► Read System Information



Challenge the Limits of Nano Motion and Control Technology...

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Wechat



CTO