

# High-Power Amplifier for Piezo Actuators

Modular System for Continuous Dynamic Applications



## E-619

- Peak power up to 1200 W
- High currents to 10 A
- Low power consumption due to integrated energy recovery
- Bandwidth to 20 kHz for high dynamics applications
- Overheat protection for piezo actuators with temperature sensor
- Optional upgrade for control and digital interfaces

### High-power amplifier for piezo actuators

High peak current, >5 A continuous current. High bandwidth for high dynamics. Suitable for PICMA® piezo actuators with special electrodes. Output voltage -30 to 130 V. Analog control. Evaluation of temperature sensor protects the piezo actuator against overheating

### High degree of efficiency

Class-D switched amplifier with capacitor for energy recovery. Low influence of the application thanks to reduced heat dissipation

### Optional servo controller upgrade

Optional control module for nanopositioning systems with integrated position sensors (SGS, capacitive). Optional interface module with wave generator, data recorder, digital interfaces (TCP/IP, USB, RS-232, SPI). Optional driver set for use with D/A converter boards from National Instruments and NI LabVIEW software

### Application fields

Mechanical engineering: High dynamics placement, vibration absorber, noncircular grinding, valve control, materials testing, test equipment

High dynamics tip/tilt mirror applications

## Specifications

	E-619.H, E-619.00	E-619.S	E-619.R1 / E-619.R3
Function	High-power amplifier module for PICMA® piezo actuators with special electrodes	Offset voltage source for tip/tilt platforms with PICMA® piezo actuators and special electrodes	Housing for E-619 amplifier modules
Channels	1	1	1 / 3

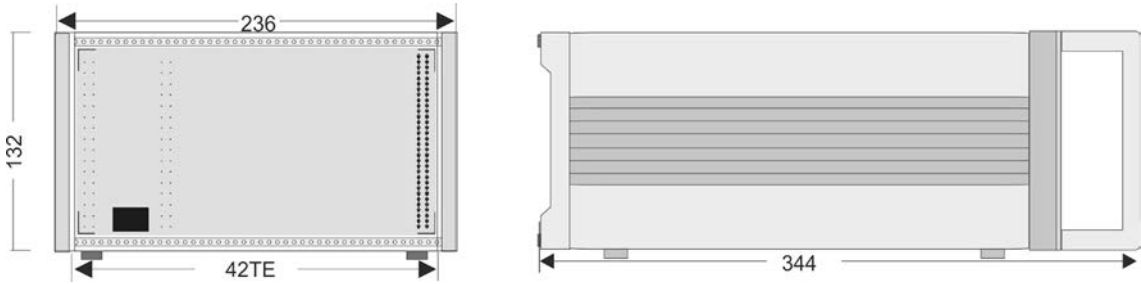
Amplifier	E-619.H / E-619.00	E-619.S
Input voltage range	-2 to 12 V	-
Output voltage	-30 to 130 V	100 V
Peak output power (<5 ms)	1200 W	1200 W
Average output power (>5 ms)	Equivalent to 800 VA reactive power	Equivalent to 800 VA reactive power
Peak current (<5 ms)	10 A	10 A
Average output current (>5 ms)	>5 A	>5 A
Current limitation	Short-circuit proof	Short-circuit proof
Voltage gain	10 ±0.1	-
Amplifier bandwidth, small signal	20 kHz / 3 kHz	-
Ripple, noise, 0 to 10 kHz	<2 mV <sub>rms</sub> <20 mV <sub>pp</sub>	<2 mV <sub>rms</sub> <20 mV <sub>pp</sub>
Capacitive base load (internal)	2 µF / 1 µF	2 µF
Recommended piezo load	>1 µF	>1 µF
Output impedance	0.1 Ω; 53 µH; 2 µF / 0.1 Ω; 1 mH; 1 µF	0.1 Ω; 53 µH; 2 µF
Amplifier resolution	<2 mV	<2 mV
Amplifier classification	Class D, switched 400 kHz / 100 kHz	Class D, switched 400 kHz
Input impedance	100 kΩ	-

Interfaces and operation	E-619.H, E-619.00	E-619.S
Piezo connection	LEMO EGG.1B.302.CLL, with safety cover	LEMO EGG.1B.302.CLL, with safety cover
Analog input	SMB	-
Temperature sensor (piezo actuator)	PT 1000; LEMO FFA.OS.303.CLAC32 Max. 150 °C, deactivation of the voltage output	-
Display and indicators	LEDs for Power, Temp Overflow	Power LED
DC offset setting	10-turn potentiometer, adds 0 to 10 V to the input voltage	-

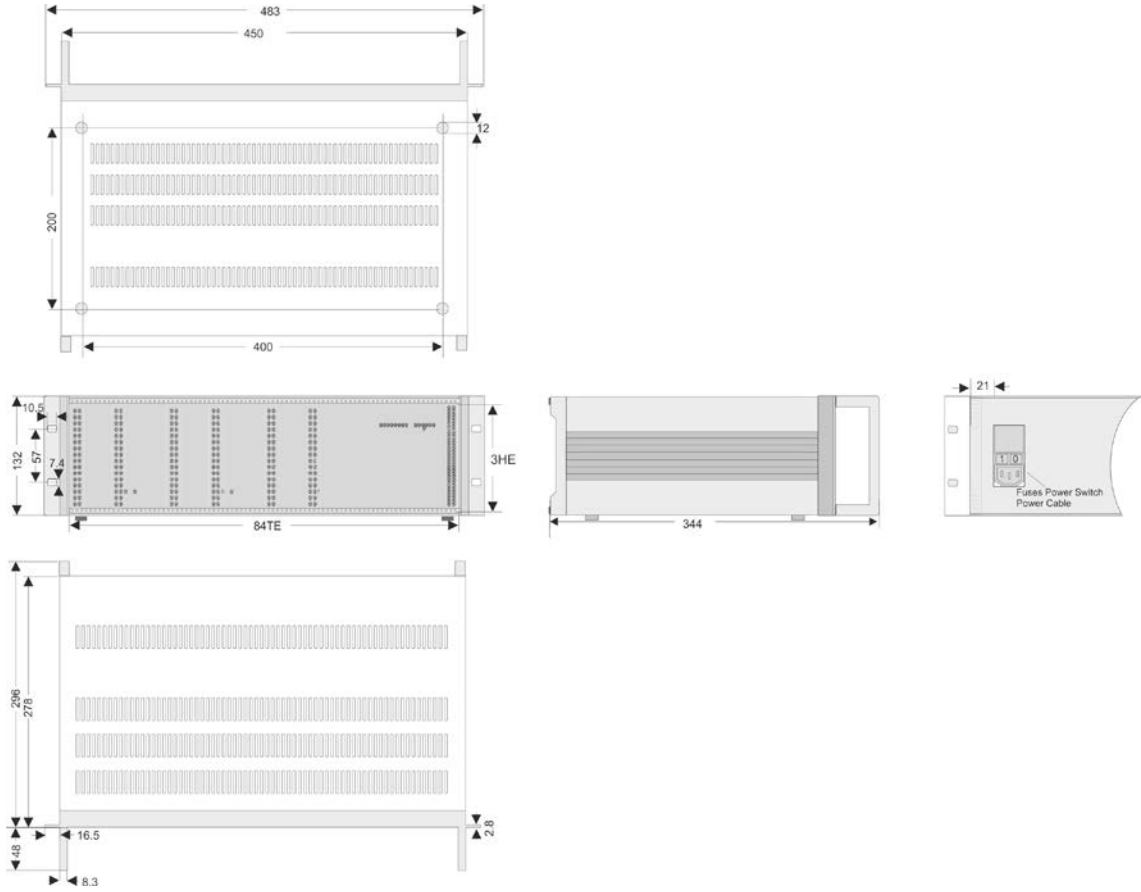
Miscellaneous	E-619.H, E-619.00, E-619.S	E-619.R1 / E-619.R3
Operating voltage	Supply via E-619 housing	100 - 240 V~, 50 - 60 Hz
Max. power consumption, full load	<150 W	150 VA / 360 VA
Max. power consumption without load	20 W	30 VA / 80 VA
Operating temperature range	5 to 40 °C	5 to 40 °C
Mass	3.5 kg	10 kg / 18 kg
Dimensions	21 HP/3 U	236 × 132 × 296 mm (without handles) / 450 × 132 × 296 mm (without handles)

Ask about customized versions.

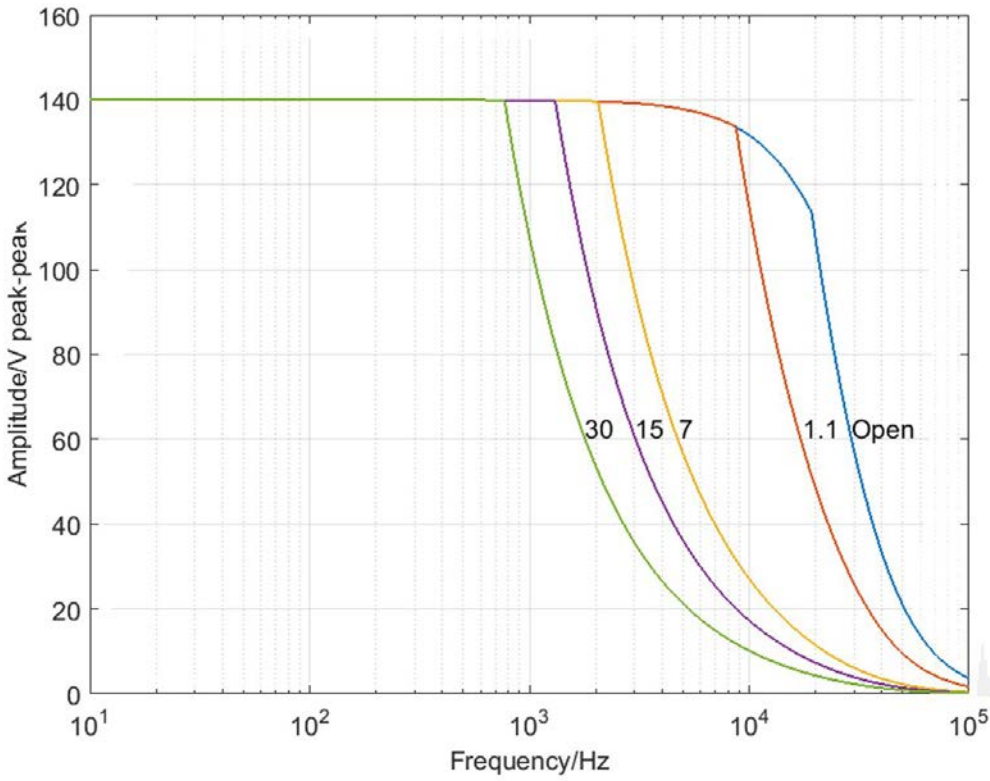
## Drawings / Images



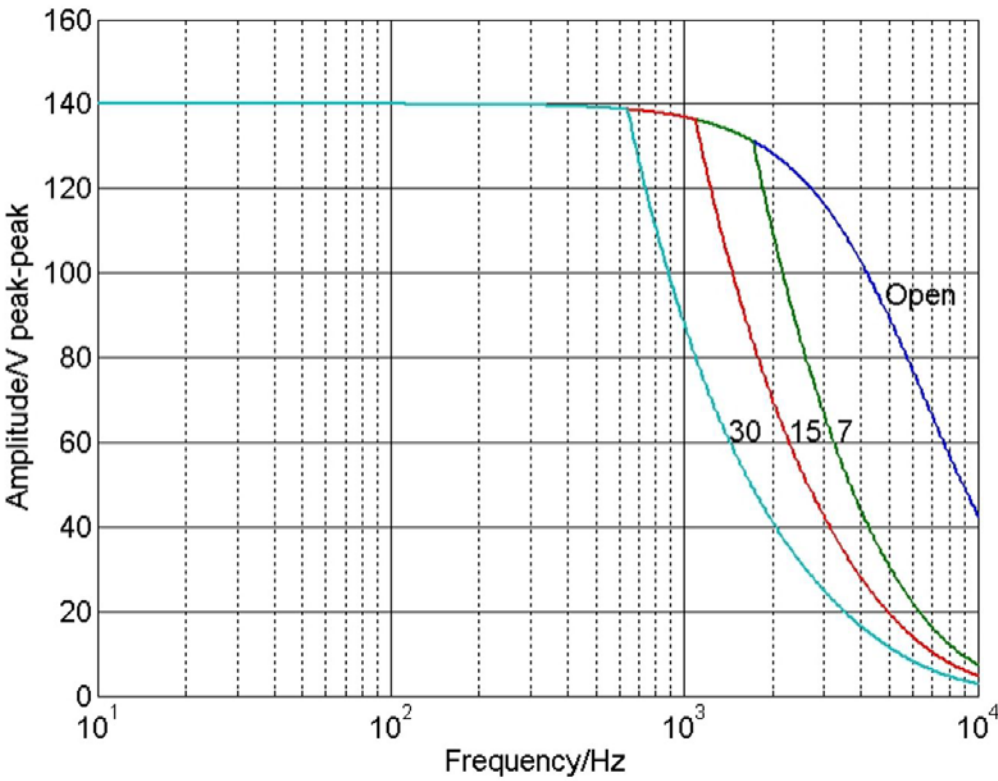
E-619.R1: dimensions in mm



E-619.R3: dimensions in mm



E-619.H: Operating limits (open loop) with various piezo loads, capacitance values in  $\mu\text{F}$



E-619.00: Operating limits (open loop) with various piezo loads, capacitance values in  $\mu\text{F}$

## Ordering Information

### **E-619.H**

High-power piezo amplifier module, 1 channel, 20 kHz bandwidth, 1200 W peak output power, -30 to 130 V

### **E-619.00**

High-power piezo amplifier module, 1 channel, 3 kHz bandwidth, 1200 W peak output power, -30 to 130 V

### **E-619.S**

Offset voltage source for tip/tilt platforms, 1 channel, 1200 W peak output power, 100 V fixed voltage

### **E-619.R1**

9.5" housing for E-619 high-power piezo amplifier module, 1 channel

### **E-619.R3**

19" housing for E-619 high-power piezo amplifier module, 3 channels

## Optional upgrades

### **E-509.C1A**

Sensor / servo controller module, capacitive sensor, 1 channel

### **E-509.C2A**

Sensor / servo controller module, capacitive sensors, 2 channels

### **E-509.C3A**

Sensor / servo controller module, capacitive sensors, 3 channels

### **E-509.E03**

PISeca modular evaluation electronics for single-electrode capacitive sensors, 3 channels

### **E-509.E3**

PISeca Sensor / servo controller module for capacitive single-electrode sensors, 3 channels

### **E-509.S1**

Sensor / servo controller module, strain gauge sensor, 1 channel

### **E-509.S3**

Sensor / servo controller module, strain gauge sensors, 3 channels

### **E-515.01**

Display module for piezo voltage and displacement, 1 channel

### **E-515.03**

Display module for piezo voltage and displacement, 3 channels

### **E-518.I3**

Interface module, 3 channels, TCP/IP, USB, and RS-232 interfaces

### **E-500.ACD**

Driver set for use with NI LabVIEW software, for analog controllers