PIEZOMECHANIK GmbH

Operating manual

for

piezo amplifier

LE 430/015

General aspects:

The LE 430/015 amplifier has been designed to operate capacitive loads like piezoactuators or electrostrictive actuators with elevated dynamics together with a low noise level to achieve excellent position stability under steady state conditions.
The LE 430/015 amplifier can be used together with all loads which are able to withstand at least + 430 Volts. (Preferentially are used Piezomechaniks PSt/HPSt 500 series)
The attenuating function „amplitude" allows to adjust the device to a wide signal range (5V or 10V) for full range amplification.

Safety instructions:

This amplifier is able to produce voltages and currents which are potentially harmfull to persons

The installation and operation of this amplifier and the involved piezoelements must be carried out from authorized personal only

All electrical installations involved in the actuator systems must be according general safety regulations for the operation of electrical devices

Do not open the device's cabinet.When it is done,be aware,that high capacitance storage capacitors are inside.Only after a long time after switch off,these capacitors are discharged to uncritical levels.

Operating procedures:

Operation with input signal level 5V

Use the center dial switch to display the channel under test on the front LCD

Turn the potentiometer „Amplitude" maximum to the left !
Set „Offset" to 0 V
The amplifier gain is now 86: this means that a +5V step input signal is converted into + 430Volts output.

„Offset" function

By using the potentiometer „offset" a DC-voltage level can be generated

xx when no external input signal is applied,the full output voltage range of 0V to + 430 V can be produced,eg.for testing piezoactuators.
Each channel can be adjusted individially in this way,the set DC-voltage is shown on the LCD.

xx when additionally an inputsignal is applied , the amplified signal and the DC-level are superimposed.Hereby the zeroline of an amplified dynamic output signal can be shifted by using the „offset".

Example:
Do not apply an inputsignal and adjust the „Offset" to 100V output.
Now apply a sine signal of 10 Hz and +/- 1 V: the ouput shows now a sine signal ranging between 14V and 186 V

Now vary the „Offset": the output sine signal is shifted now by the superposition of a DC-level.
When the total output voltage reaches the amplifier's operating voltage range, the signal is clipped.
At 0V „Offset" and „amplitude = 0 " (see above) an input signal of 0V thru + 5 V covers the full output range of 0 V thru + 430 V

Operation with input signals higher 5 V (eg. 10 V)

A lot of signal sources produce voltage levels higher than 5V . It is no problem to use the LE amplifier together with these signal sources.
Here the „amplitude" function is used to vary the amplifier's gain.So the full input signal range is converted to the full output signal range.
Adjustment procedure:
1, No input signal, „Offset" to 0 V,no load to output
2, Turn the „amplitude" potentiometer to the maximum right
3, apply a square wave 0,5 to 1 Hz / 0V to + 10 V to input now
Turn now the **„Amplitude „** potentiometer slowly to the left and check ,when the LCD shows an output voltage of 430 Volts.
Then you have adjusted the gain to 43 and you are capable to put in a 10V signal with optimum amplification to 430 V
The adjustment to any other input signal level X can be done in the same way using a square wave with amplitude X during the adjustment procedure.

„Monitor"

The LC-displays are only able to show very slow varying output voltage levels with sufficient precision eg. for monitoring the „Offset" function.
Dynamic signals are best observed via the"Monitor" output:
The piezo output power signal is reduced by a 1:1000 voltage divider , so the „Monitor" shows + 430mV for +430 V at the piezo power output.

Technical data

Input:
Connector BNC
Signal range : +/-5 V without attenuation via „amplitude“
Signal range exceeding +/-10 V: use attenuation via“amplitude“
Input resistance: 10 kOhms

Output
Connector BNC
Voltage range „offset“: 0 V thru + 430 V
Total voltage range: 0 V thru + 430 V
Max.output current: approx. 150 mA
Average current: 30 mA
Noise: < 10mV with capacitive loads > = 100 nF

Monitor:
Connector BNC
Reduction factor: 1:1000 of output signal

Line:
115 V or 230 V preset from factory
fuses:
integrated to plug on rear side

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