

# DC amplifier

## Model 136



### Key features

- Three-channel DC differential voltage amplifier
- 200 kHz bandwidth (-3dB corner)
- Auto-zero and shunt calibration
- Gain range 0 to 1000
- Four selectable excitation voltage levels
- Default 4-pole Butterworth low-pass filter
- Optional low-pass filter module with different corner frequencies

### Description

Endevco® model 136 is a three-channel, DC amplifier that is manually or computer programmable. Manual control is accomplished at the front panel by means of a "select channel" push-button, three (3) "channel LEDs", one "select function" push-button, five "function LEDs", a four character LED display, showing the state of each function/channel, and four "edit" push-buttons to change the entries in the LED display. There are three LEDs used as fault status indicators for the auto zero function.

There are two modes of operation, normal and programming/setup. Both modes of operation utilize the front panel LED display. In the normal mode, there are two states, monitoring mode and no-monitoring. In the monitoring mode the LED display indicates the RMS reading of the signal present at the output of the selected channel. The non-monitoring mode turns off the LED display for lower noise applications and to minimize power consumption. In the programming mode, the unit is ready for manual programming or editing of existing channel setups. The unit will automatically return to the normal mode of operation after 20 seconds of inactivity of the front panel or after pressing the "select function" push-button while the "monitoring state" function LED is flashing.

The rear panel contains (on a per-channel basis) a BNC output connector, a 9-pin "D" input connector, the RS-232 connector and the input power connector. Three model 136 units may be configured in a 19-inch rack mount adapter. The standard unit is powered by 90-264 VAC, 50/60 Hz.

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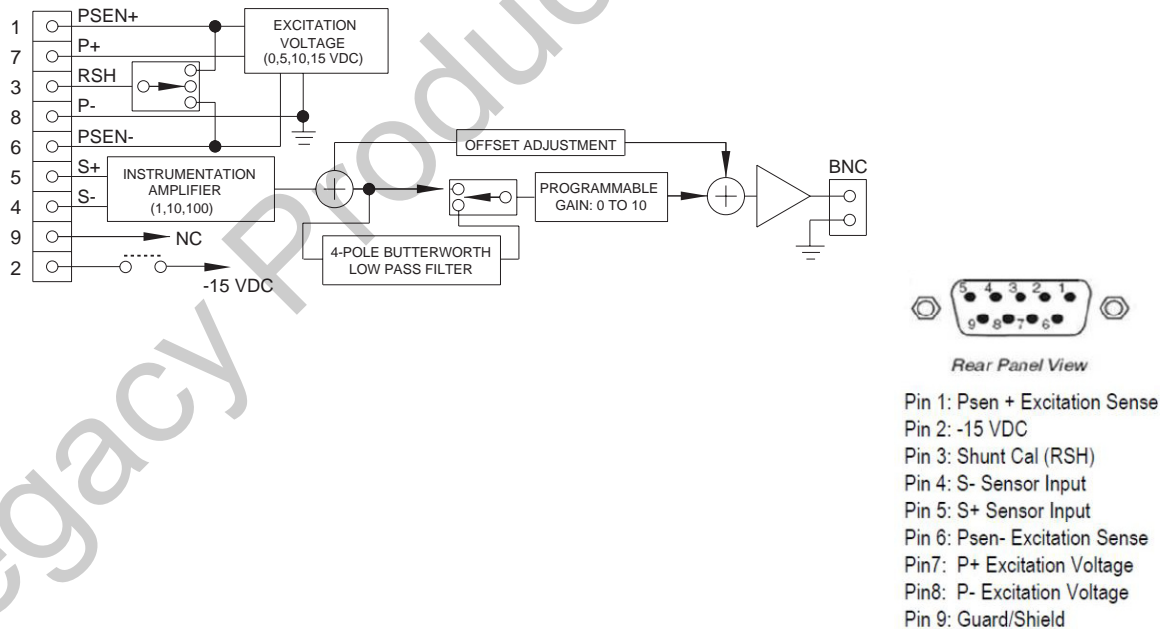
The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Specifications	
<b>Inputs</b>	
Input impedance	1 Meg Ohm minimum
Input range	
Differential	0 to ±10 VDC or peak VAC, 9 pin "D" connector for each bridge sensor
Common mode	±10 VDC or pk VAC, inclusive of signal, 50 Vpk without damage
Input imbalance adjustment	±100 mVDC, $100 \leq \text{gain} \leq 1000$ ±1 VDC, $10 \leq \text{gain} \leq 100$ ±10 VDC, $0 \leq \text{gain} \leq 10$
<b>Outputs</b>	
AC/DC voltage	
Type	Single-ended, short circuit protected
Output impedance	10 ohm typical
Linear output	10 V pk
Current output	10 mA, minimum
Output DC bias stability temp	±5 $\mu\text{V}/^\circ\text{C}$ RTI or ±0.1 $\text{mV}/^\circ\text{C}$ RTO
Output DC bias stability time	±20 $\mu\text{V}$ RTI or ±5 mV RTO, whichever is greater, for 24 hours, after a 1 hour warmup
Excitation voltage	
Amplitude	0, 5.0, 10.0, or 15.0 VDC; 1 selection for all 3 channels
Voltage accuracy	±1%
Excitation current	30 mA maximum, short circuit protected
Noise and ripple	1 mV rms maximum, 10 Hz to 50 kHz, with 1 kOhm load
<b>Transfer characteristics</b>	
Gain	
Range	Programmable from 0 to 1000
Resolution	0.0025, $0 \leq \text{gain} \leq 10$ 0.025, $10 \leq \text{gain} \leq 100$ 0.25, $100 \leq \text{gain} \leq 1000$
Accuracy	±0.5% of full scale maximum, DC to 1kHz, filters disabled
Linearity	±0.1% of full scale, best fit straight line at 1 kHz reference
Stability	±0.2% of full scale, 0°C to +50°C
Noise	20 $\mu\text{V}$ rms RTI plus 1 mV rms RTO, whichever is greater, DC to 50 kHz, with a 1 kOhm source resistance. Unit in non-monitoring state, 10 kHz internal lowpass filter enabled
Broadband frequency response	±5%, DC to 50 kHz, referenced to 1 kHz; -3 dB at 200 kHz
Filter characteristics/type	4-pole Butterworth
Corner frequency (-3 dB)	10 kHz ±12% (other corners available by changing internal module 31875: 10 Hz to 80 kHz)
Crosstalk between channels	80 dB RTI
<b>Power requirements</b>	
Voltage	90-264 VAC, 50 to 60 Hz
Power dissipation	10 Watts typical
Isolation	No isolation channel to channel No isolation signal ground to case ground
<b>Physical characteristics</b>	
Dimensions	5.57" x 2.52" x 12"
Weight	4 lbs typical
Case	Black aluminum cover, medium grey plastic bezel

Accessories		
Product	Description	136
IM136	Instruction manual	Download from website
EW1006-U	AC Power cord, 10 ft, 18 AWG	Included
31875-1000	10kHz 4-pole Butterworth low-pass filter module	Included
31875-XXXX	Lowpass filter modules (see 31875 data sheet)	Optional
EJ724-U	DB9 connectot kit (QTY 3)	Included
31979	Rack mounting kit	Optional
EHM1471	Blank panel for Rack mount	Optional
EJ807	Serial DB9 tp RJ11 adaptor	Included

**Notes**

1. Maintain high levels of precision and accuracy using Endeveco’s factory calibration services. Call Endeveco’s inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.



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