



PIE 235 Process Voltage Calibrator

NEW!

*Source & Read DC Voltages
Calibrate recorders in live loops
Source pH*

- **Technician friendly operation**

Intuitive *EZ-DIAL Double Click Menu* makes it easier to setup than other calibrators. Turn on the backlight to easily see the display in dark areas of the plant. Connections diagrams are indicated on the display for each function along with a labeled connector panel on the top.

- **Calibrate with Confidence**

Accurate to $\pm 0.02\%$ of Reading + 0.01% Full Scale. Out of range or over current is indicated by an audible alarm, flashing display and the OVERLOAD LED will light.

- **Source three ranges of mV & V dc plus percent of 1 to 5 volts**

With the 235 you can check, calibrate and measure all your voltage, millivolt and pH signal instruments in your plant. Source -500.00 to 999.00 mV, 1.000 to 5.000 V, 0.0 to 100.0% of 1 to 5 V; 0.000 to 20.000 V.

- **Power your loops with over 1,000 Ohm loads**

The 20.000 V range has an extended span of up to 24.000 Volts giving you a portable source for powering your loops.

- **Read DC volts**

The 235 can measure from -500.00 to +999.00 mV, 0.000 to 5.100 V, 0.0 to 100.0 % of 1 to 5 V; 0 to 20.000 V and 0.00 to 60.00 V DC. Use it to check loop power supplies, I/V converters, 1 to 5 Volt signals, and other voltages.

- **Save time calibrating recorders and monitors in 4 to 20 mA loops**

Other brands of calibrators require that you break the loop to calibrate voltage inputs. With the PIE 235 you simply clip the test leads across the voltage inputs in a live 4 to 20 mA loop **without disconnecting any wires.**

- **Simulate pH probes into transmitters & analyzers**

Use the pH simulator to verify proper operation of pH devices before you place a probe into a calibrated buffer.

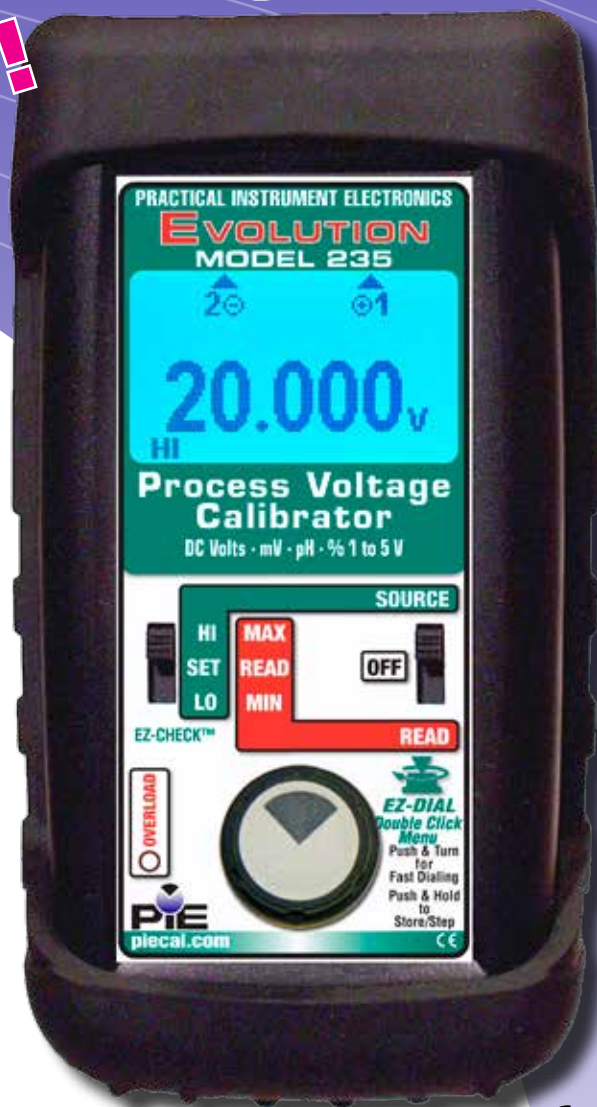
- **Quickly set any three outputs plus automatic stepping & ramping**

Easily set any value with the adjustable "DIAL" plus store any three output settings for instant recall with the EZ-CHECK™ switch. 2, 3, 5 & 11 steps automatically increment output in 100%, 50%, 25% or 10% of span plus continuous ramp. Set step/ramp time to 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 & 60 seconds.

- **Designed for you by experienced calibrator manufacturers**

PIE Calibrators are designed and built by members of the same team that designed and built the calibrators manufactured by Fluke* under the Altek* label. The 235 improves upon other brands by including a rubber boot, backlit display with larger digits, higher accuracy and more ranges for flexibility.

* PIE Calibrators are not manufactured or distributed by Fluke Corp or Altek Industries Inc, manufacturers of Altek Calibrators.



Actual Size



Practical Instrument Electronics

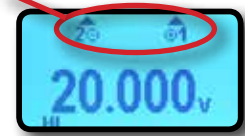
82 E. Main Street Suite 3.14 • Webster, NY 14580 Tel: 585.872.9350 • Fax: 585.872.2638 • sales@piecal.com • www.piecal.com

Easy to use

• Technician friendly operation

Intuitive *EZ-DIAL Double Click Menu* makes it easier to setup than other calibrators. Turn on the backlight to easily see the display in dark areas of the plant. Connections diagrams are indicated on the display for each function along with a labeled connector panel on the top.

Connections



Check your process voltage inputs

• Source three ranges of mV & V dc

With the 235 you can check, calibrate and measure all your voltage, millivolt and pH signal instruments in your plant. Source -500.00 to 999.00 mV, 1.000 to 5.000 V, -25.00 to +100.00% of 1-5 V; 0.000 to 20.000 V. The 20.000 range has an extended span to power loops with up to 1,200 Ohm loads with 24.000 Volt output.



Measure your process voltages

• Read DC volts

The 235 can measure from -500.00 to +999.00 mV, 0.000 to 5.100 V, -25.0 to 125.0 % of 1 to 5V; 0 to 20.000 V, 0.00 to 60.00 V DC. Use it to check loop power supplies, I/V converters, 1 to 5 Volt signals, and other voltages.



pH Simulator

• Simulate pH probes into transmitters & analyzers

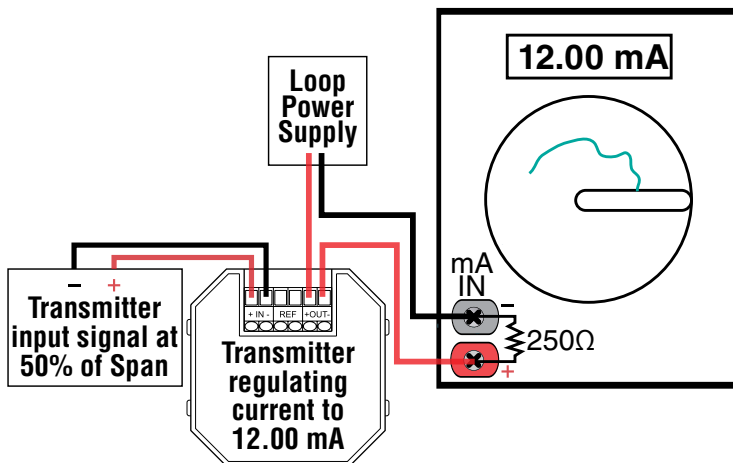
Use the pH simulator to verify proper operation of pH devices before you place a probe into a calibrated buffer. Adjusting the pH transmitter or analyzer without a probe allows you to make sure the device is calibrated and doesn't require too much offset with the probe. If the probe requires more than the manufacturer's recommendations (typically 5%) it is time to replace the probe. The 235 simulates 0.000 to 14.000 pH @ 25°C corresponding to +414.12 to -414.12 mV.



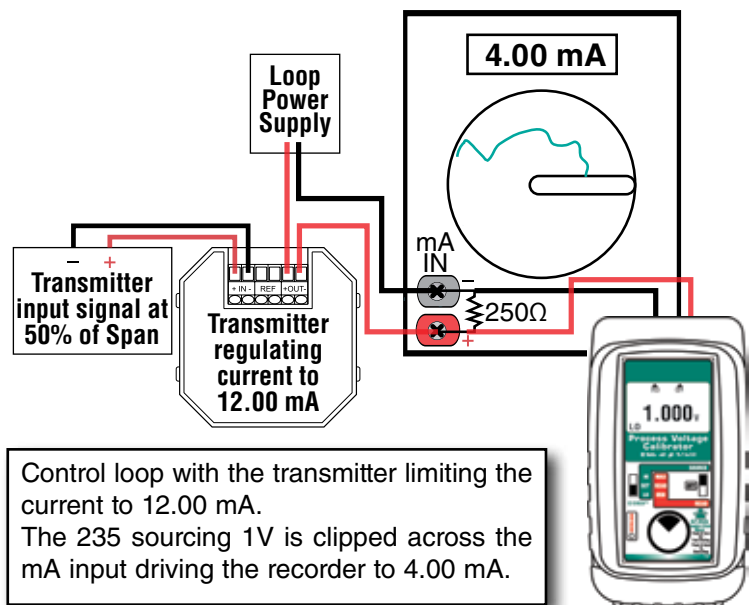
Calibrate 1 to 5 V instruments in live 4 to 20 mA loops

• Test 1-5 V inputs without disconnecting 4-20 mA loop wiring

Calibrate 1 to 5 volt instruments without breaking the loop or turning off the loop current. You do not need to remove any 250 Ohm resistors. The PIE Model 235 drives only the voltage instrument it is connected to and has no effect on any other instruments in the 4 to 20 mA loop.



Control loop with the transmitter limiting the current to 12.00 mA.
The recorder indicates 12.00 mA.



Control loop with the transmitter limiting the current to 12.00 mA.
The 235 sourcing 1V is clipped across the mA input driving the recorder to 4.00 mA.

PIE 235 Specifications

(Unless otherwise indicated all specifications are rated from a nominal 23°C, 70% RH for 1 year from calibration)

General	
Operating Temperature Range	-20 to 60 °C (-5 to 140 °F)
Storage Temperature Range	-30 to 60 °C (-22 to 140 °F)
Temperature effect	$\leq \pm 0.005 \text{ }^\circ\text{C}$ of Full Scale
Relative Humidity Range	10 % \leq RH \leq 90 % (0 to 35 °C), Non-condensing 10 % \leq RH \leq 70 % (35 to 60 °C), Non-condensing
Common Mode Rejection	50/60 Hz, 100 dB
Normal Mode Rejection	50/60 Hz, 50 dB
Noise	$\leq \pm 1/2$ Least Significant Digit from 0.1 to 10 Hz
Size	5.63 x 3.00 x 1.60 in, 143 x 76 x 41 mm (L x W x H)
Weight	12.1 ounces, 0.34 kg (including boot & batteries)
Batteries	Four "AA" Alkaline 1.5V (LR6)
Battery Life	≥ 50 hours
Low Battery	Low battery indication with nominal 1 hour of operation left
Protection against misconnection	Over-voltage protection to 60 vrms (rated for 30 seconds). Red LED and audible alarm indicates OVERLOAD for out of range conditions.
Display	High contrast graphic liquid crystal display with 0.35" (9 mm) high digits on main & 0.2" (5 mm) on mA display. LED backlighting for use in low lit areas.

Voltage Source	
Ranges and Resolution	Accuracy
-500.00 to 999.00 mV	$\leq \pm (0.02 \text{ \% of Reading} + 0.01\% \text{ of Full Scale})$
1.000 to 5.000 V	$\leq \pm (0.02 \text{ \% of Reading} + 0.002 \text{ V})$
0.000 to 20.000 V	$\leq \pm (0.02 \text{ \% of Reading} + 0.01\% \text{ of Full Scale})$
-25.0 to 125.0% of I to 5 V	$\leq \pm 0.1\%$
Source Current	$\geq 20 \text{ mA}$
Sink Current	$> 16 \text{ mA}$
Output Impedance	$\leq 0.3 \text{ Ohm}$ at $\leq 20 \text{ mA}$ load
Short Circuit Duration	Infinite

Voltage Read	
Range and Resolution	Accuracy
-500.00 to 999.00 mV	$\leq \pm (0.02 \text{ \% of Reading} + 0.01\% \text{ of Full Scale})$
1.000 to 5.000 V	$\leq \pm (0.02 \text{ \% of Reading} + 0.002 \text{ V})$
0.000 to 20.000 V	$\leq \pm (0.02 \text{ \% of Reading} + 0.01\% \text{ of Full Scale})$
-25.0 to 125.0% of I to 5 V	$\leq \pm 0.1\%$
0.00 to 60.00 V	$\leq \pm (0.02 \text{ \% of Reading} + 0.02 \text{ V})$
Input resistance	$\geq 1 \text{ M}\Omega$

pH Source	
Accuracy in mV	$\leq \pm (0.02 \text{ \% of Reading in mV} + 0.1 \text{ mV})$
Accuracy in pH	$\leq \pm 0.003 \text{ pH @ } 25^\circ\text{C}$

Specifications subject to change without notice.



Hands free carrying case with pockets for the PIE 235 & test leads.

Designed to be worn around your neck so that you can safely use both hands to calibrate.

Ordering Information

Description

PIE Model 235 Process Voltage Calibrator.....

Part No

PIE Model 235

Included:

Four "AA" Alkaline batteries, NIST Traceable Calibration Card

Black Rubber Boot 020-0209

Evolution Hands Free Carrying Case 020-0211

Evolution mA/V Test Leads 020-0207

1 Red & 1 Black Lead with Banana Plugs & Alligator Clips

Optional

Certified Test Data when ordered new from the factory Certified Test Data-1

Three Year Repair/Replacement Warranty..... RP-WAR-A

Ni-MH 1 Hour Charger with 4 Ni-MH AA Batteries 020-0103

Standard Warranty

Our equipment is warranted against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under warranty can be made by returning the equipment prepaid to our factory. The equipment will be repaired, replaced or adjusted at our option. The liability of Practical Instrument Electronics (PIE) is restricted to that given under our warranty. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Practical Instrument Electronics, Inc. be liable for any special, incidental or consequential damage.

Optional Repair/Replacement Warranty

Under our Repair/Replacement Warranty (RP-WAR-A), our equipment is warranted against ANY damage or malfunction that may cause the unit to fail for a period of three (3) years from the date of shipment.

This warranty is limited to one complete replacement against any damage or malfunction during the warranty period. If replaced, the new calibrator will carry our Standard Warranty for the remainder of the three (3) years or a minimum of one (1) year from the date of shipment.



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Additional Information

PIE Calibrators are manufactured in the USA. This product is calibrated on equipment traceable to NIST and *includes* a Certificate of Calibration. Optional Test Data is available for an additional charge.

Practical Instrument Electronics recommends a calibration interval of one year. Contact your local representative for recalibration and repair services.



Flip out stand for bench use

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