SYSTEM CALIBRATION TECHNOLOGY

VISHAY PRECISION GROUP

BLH

MODEL 125
Weigh System Calibrator
Operator's Manual

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Call (781) 298-2216 for BLH Field Service

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SECTION 1. Introduction

1.1 GENERAL

The model 125 pocket calibrator (Figure 1-1) is a portable, lightweight simulator designed to supply millivolt-per-volt (mV/V) level signals for testing and calibrating load cell/scale indicators. Precise output references for 0, 1, 2, or 3 mV/V are achieved by using a metal film resistor network, discrete wire wound resistors, and a 2-pole, 4-position rotary switch. The 350 ohm input and output impedance matches typical strain gage devices. Four permanent binding posts, integral to the rugged palm-size case, provide connection points for the indicator or transmitter.

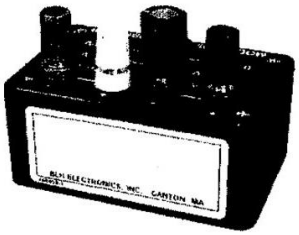

Figure 1-1. The Model 125 Calibrator

The Model 125 unit substitutes for platform or scale transducers. Lightweight construction, compact size, and good accuracy make the Model 125 Calibrator an excellent choice for calibrating scale indicators.

1.2 SPECIFICATIONS

Model 125 Specifications

Output Accuracy Accuracy Stability	0.02% of selected range less than 0.01% in 24 Hours less than 0.02% in 1 year less than 3 uV
Zero Stability	+ /- 10 ppm/degree C
Span TC	350 ohms + /- 0.05%
Input Impedance (Excitation) Output Impedance (Signal) Output Ranges	350 ohm + /- 0.08%
Input Voltage Level	4 steps: 0, 1, 2, and 3 mV/V 25V dc maximum
Operating Temperature Range	32 to 120°F (0 to 50°C)
Dimensions (inches)	3.3 x 2.35 x 1.4 (LVVFI)
Unit Weight	4.8 ounces

1.3 WARRANTY POLICY

BLH warrants the products covered hereby to be free from defects in material and workmanship. BLH's liability under this guarantee shall be limited to repairing or furnishing parts to replace, f.o.b. point of manufacture, any parts which, within three (3) years from date of shipment of said product(s) from BLH's plant, fail because of defective workmanship or material performed or furnished by BLH. As a condition hereof, such defects must be brought to BLH's attention for verification when first

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1.4 FIELD ENGINEERING

Authorized BLH Field Service Engineers are available around the world to install and/or repair BLH Baldwin products. The field service department at BLH is the most important tool to assure the best performance from your application. Field service phone numbers are listed below.

Factory: (Main Number) (781) 298-2200

Canada: (416) 251-2690 or (800) 567-6098 in Canada

SECTION 2. Installation

2.1 GENERAL

The Baldwin Model 125 calibrator is a hand-held device and requires no mechanical installation instructions. Figure 2-1 provides outline dimensions for reference and storage considerations.

2.2 LOCATION

Units perform accurately in temperatures ranging from 32 to 120 degrees Fahrenheit. If used in harsh or dirty environments, wipe clean before storing. When not in use, store in a clean, dry, vibration free area that is exempt from unusual temperature fluctuations.

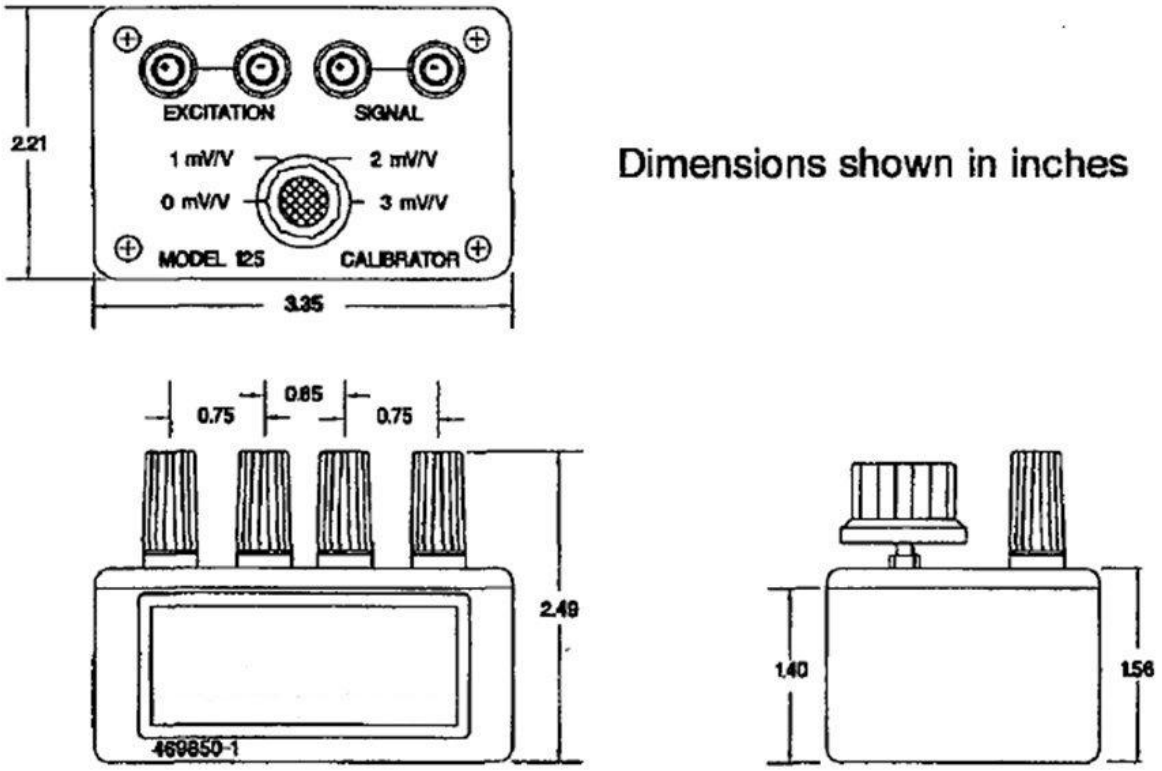

Figure 2-1. Model 125 Outline Dimensions

2.3 ELECTRICAL INSTALLATION

2.3.1 Excitation Lead Connections

Power for the 125 is supplied by the instrument (indicator, transmitter, etc.) being tested. Simply connect the instrument excitation output to the 125 excitation input binding posts as shown in Figure 2-2 (black and green leads).

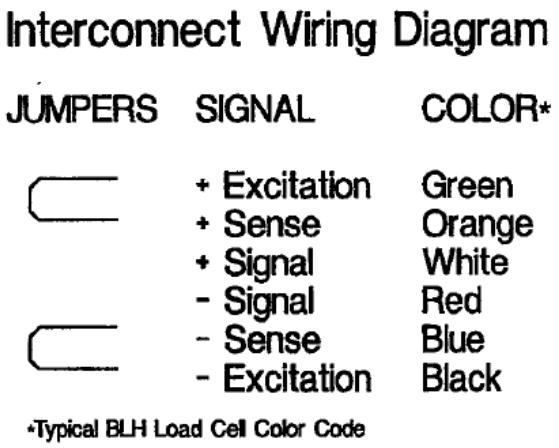

Figure 2-2. Wiring Connections

2.3.2 Remote Sense Lead Connections

For maximum calibration accuracy on systems equipped with remote sense lines, connect those leads in parallel with the excitation leads on the green and black binding posts.

2.3.3 Signal Connections

Simply connect the leads for the input of the indicator/transmitter to the red and white binding posts as shown in Figure 2-2.

NOTE: The Model 125 is designed to simulate compression type systems. To simulate a tension system, the signal leads (white and red) may have to be reversed.

NOTE: BLH load cell wiring color code conventions may differ from other load cell manufacturers.

SECTION 3. Operation

3.1 GENERAL

The Model 125 Calibrator is a multi-purpose tool designed to simulate scale/system transducers when calibrating system instrumentation. After completing SECTION II installation instructions, the 125 calibrator is ready for operation.

3.2 FRONT PANEL CONTROL

A 4-position rotary switch (Figure 3-1) controls the operation of the 125 unit. Use this switch to select 0, 1.0, 2.0, and 3.0 mV/V output ranges. Input and output impedance levels are fixed at 350 ohms.

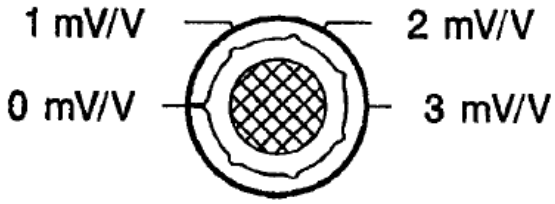

Figure 3-1. Range Selector Switch

3.3 CALIBRATION

The typical procedure for calibrating a transducer indicating/transmitting instrument is to apply known input mV/V levels and adjust the instrument to display the correct equivalent value in engineering units such as lb, kg, etc. For example, when 0 mV/V is selected the instrument display should read 0 pounds. If the indicator does not read 0 pounds at 0 mV/V, adjust the instrument zero selector (consult instrument operator's manual for instructions) until the read-out is correct. If the system/platform rated capacity is 10,000 pounds at 2 mV/V, setting the 125 simulator switch to 2 mV/V should result in a 10,000 pound display. If the indicator does not read 10,000 pounds at 2 mV/V, adjust the instrument span selector (consult instrument operator's manual for instructions) until the read-out is correct.

If the system full scale rated output is 2 mV/V, a midrange linearizing calibration adjustment can be made by selecting 1 mV/V and adjusting the read-out to display 50% of capacity (re-check 0 and full scale displays afterwards). Similarly, for a 3 mV/V system, two linearizing adjustments can be made at 1 and 2 mV/V.

3.3.1 Dead Weight Signal Calibration

With BLH indicators/transmitters it is not necessary to initially calibrate out the load cell output corresponding to dead load, or empty vessel weight. This step will normally

be accomplished by simply re-acquiring a new calibrated zero value on the system after the live load calibration is complete.

3.3.2 Establishing Zero

To establish zero, perform the following:

1. Select 0 mV/V on the Model 125 Calibrator.
2. Adjust the indicator/transmitter to display zero and/or output a value corresponding to zero (i.e. set 4-20 mA output to 4 mA).

3.3.3 Calculate the Live Load mV/V Signal

The next requirement is to determine the live load mV/V signal (portion of load cell output corresponding to actual product weight). Use the formula presented in Figure 3-2 to determine this value.

$$\textbf{Live Weight}\left(\frac{\textbf{mV}}{\textbf{V}}\textbf{signal}\right) = \frac{\textbf{Live Weight(Product Weight)}}{\textbf{System Capacity (Total Weight)}}\ \textbf{X Full Transducer Output}\ (\frac{\textbf{mV}}{\textbf{V}})$$

Figure 3-2. Live Weight Signal Calculation Formula

3.3.4 Calculate the Interpolated Span Value

Since the 125 has only 3 discrete settings, establishing a live load span point typically requires an interpolation process to determine a new span point value corresponding to one of the fixed 125 mV/V values. Use the formula shown in Figure 3-3 to determine this value. When interpolating, always choose a Model 125 mV/V selection lower than the full transducer output value.

$$\textbf{Interpolated Span Value} = \frac{\textbf{Model 125}\ \frac{\textbf{mV}}{\textbf{V}}\textbf{Selection}}{\textbf{Calculated Live Weight}\ \frac{\textbf{mV}}{\textbf{V}}\textbf{Signal}}\ \textbf{X Live Weight (Product Weight)}$$

Figure 3-3. Span Value Interpolation Formula

3.3.5 Entering a Span Point

To enter a span point, perform the following:

1. Select the desired 125 mV/V setting.
2. Acquire and adjust the span point in the indicator/transmitter (refer to the indicator/transmitter instruction manual).

Calibration functions described in this chapter pertain to digital indicator/transmitters that can acquire a dead weight zero in place. Analog indicators may require a different procedure (consult operator's manual supplied with unit).

NOTE: Make sure the instrument is in gross mode with all automatic functions turned OFF before attempting calibration.

NOTE: After the weighing system is re-connected to the instrument, simply perform acquire zero before beginning operation.

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