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MVX 206 Two-Wire Non-Isolated Millivolt Transmitter

MVX 226 Two-Wire Isolated Millivolt Transmitter

Instruction Manual

1.0 INTRODUCTION

These instructions refer to the above models. Supplementary sheets are attached if the unit has special options or features. For detailed specifications, see page 4 or refer to the Data Bulletin. All ADTECH instruments are factory calibrated and supplied with a label detailing the calibration. Adjustments are normally not necessary. A simple check should be performed to verify calibration before installation to ensure that it matches the field requirement.

2.0 GENERAL DESCRIPTION

The ADTECH Model MVX 206 and MVX 226 Two-Wire Millivolt Transmitters provides high accuracy conversion of -20 to 100 mv input signals to a standard 4-20 ma dc process signal.

The MVX 226 provides 600 volts AC or 1000 volts dc isolation from the input to output/power supply, whereas the MVX 206 is non-isolated.

The primary features of the MVX 206 and MVX 226 are:

- Wide range (-20) to 100 mv switch selectable.
- Zero Suppression of up to 100% of the major range with a 16 position switch.
- Field adjustable via internal switches and front potentiometers.
- High accuracy, repeatability, and ambient effect stability.
- RFI resistant.
- NO INTERACTION of ZERO and SPAN.
- Small size—DIN mounting package. Only 1" w x 3.1" h x 3.6" d.
- Options for NEMA housings, SNAP TRACK and surface mounting (DIN 46 277 standard).

3.0 INSTALLATION

The instrument is supplied in a non-metallic general purpose DIN rail mount enclosure as standard. NEMA 4 and 7 enclosures are optionally available. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions. For detailed mounting and installation refer to page 4 inside.

Electrical Connections

The wire used to connect the instrument to the control system **Input / Output** should be twisted pair(s) and sized according to normal practice. Shielded cable is not normally necessary (if used, the shield must be grounded at the input of the ADTECH instrument and left floating at the sensor).

A six position compression terminal block is provided for the I/O and power connections. A housing ground terminal is not required due to non-metallic housing.

Controls

Instrument controls consist of the following:

- Two 16 position range switches for **COARSE ZERO** and **SPAN** control.
- One 4 position jumper for input of major range selection.
- One 2-position jumper for 20 mv elevation.
- Two multiturn potentiometers; **FINE ZERO** and **SPAN** controls on front of the instrument.

4.0 MAINTENANCE

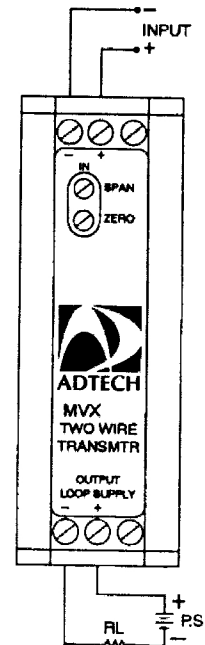
These instruments are electronic and require no maintenance except periodic cleaning and calibration.

If the unit appears to be mis-operating, field wiring and/or associated circuits should be checked. MOST problems are traced to these areas.

If the problem appears to be the instrument, it may be checked as installed or removed for a bench check as detailed in sections 6.0 and 7.0.

5.0 CONNECTIONS

Standard connections are shown below and on the instrument face plate, Data Bulletin or on attached supplementary sheets.



6.0 CONFIGURATION

All ADTECH units are factory calibrated per P.O. instructions. Usually, a complete recalibration is not required unless you want to change input type, output type, or the range of the unit. A calibration sticker located on the unit identifies the model, calibration and options present.

- A. If you want to recalibrate to a different range, open the case to gain access to the unit's pc boards. The larger pc board is the input pcb and the smaller pc board is the output/power pcb. Jumpers found in the input tables are found on the input pcb.
- B. To determine the MAJOR RANGE setting calculate:
 - 1. Input Span (mV) = millivolts full scale – millivolts zero scale.
 - 2. Input Zero (mV) = millivolts zero scale.The Major range is the number from Table 1 that is just larger (in magnitude) of the two calculations above. Set the jumper in Table 1 to the major range determined.
- C. Follow Table 2 to set the input zero type. An elevated setting is used when a zero input is less than 0 millivolts.

6.1 CALIBRATION

- A. Make sure the unit I / O wiring is properly connected and that the correct power source per the label is also connected. The instrument must be at normal power for a minimum of 2 minutes before proceeding to B.
- B. The input signal source must be adjustable from 0 to 100% in steps of 10% or at least 25%. The source should be either precalibrated or an accurate meter must be used to monitor the input.
- C. The output may be monitored as a current or as a voltage across a resistor shunt.
- D. From the PCB layout, locate the position of coarse ZERO (SW1) and coarse SPAN (SW2).
- E. Apply an input corresponding to the zero input. Turn the **FINE ZERO** control fully counterclockwise. Turn the **COARSE ZERO** switch to a position where the zero level just goes below 4.00 ma output. Turn the **COARSE ZERO** switch back one number less than the previous position (but not less than zero).
- F. With the input set at the zero input, adjust the **FINE ZERO** control for 4.00 ma to the desired accuracy.
- G. Apply an input corresponding to the full scale input. Turn the **FINE SPAN** control fully counterclockwise. Turn the **COARSE SPAN** switch to a position where the output just exceeds 20.00 ma output. Turn the switch back one number less (but not less than 0).
- H. With the input set to the full scale input, adjust the **FINE SPAN** control for 20.00 ma to the desired accuracy.
- I. Repeat steps F and H until the readings remain within the desired calibration accuracy.
- J. Check the instrument at the 25-50-75% input settings minimum.
- K. Close the enclosure.

7.0 FIELD TROUBLE SHOOTING GUIDE

This section offers a simple, first level trouble-shooting aid for an apparent instrument malfunction.

SYMPTOM CORRECTIVE ACTION

- | | |
|-----------|---|
| No output | <ol style="list-style-type: none">1. Check the input and output connections carefully.2. Check that the power supply polarity is correct and that the output loop power is present on the indicated terminals.3. Check that the input source is correct and that it changes magnitude between zero and full scale values when so adjusted.4. Make sure the output loop is complete and that the correct meter range is selected. All external checks are complete. Problem seems to be internal. |
|-----------|---|

Troubleshooting beyond the above may be difficult without special equipment. We do not recommend attempting repair of the unit in the field. ADTECH offers a very responsive repair policy.

8.0 TABLES, OUTLINE / MOUNTING

INPUT TABLE 1

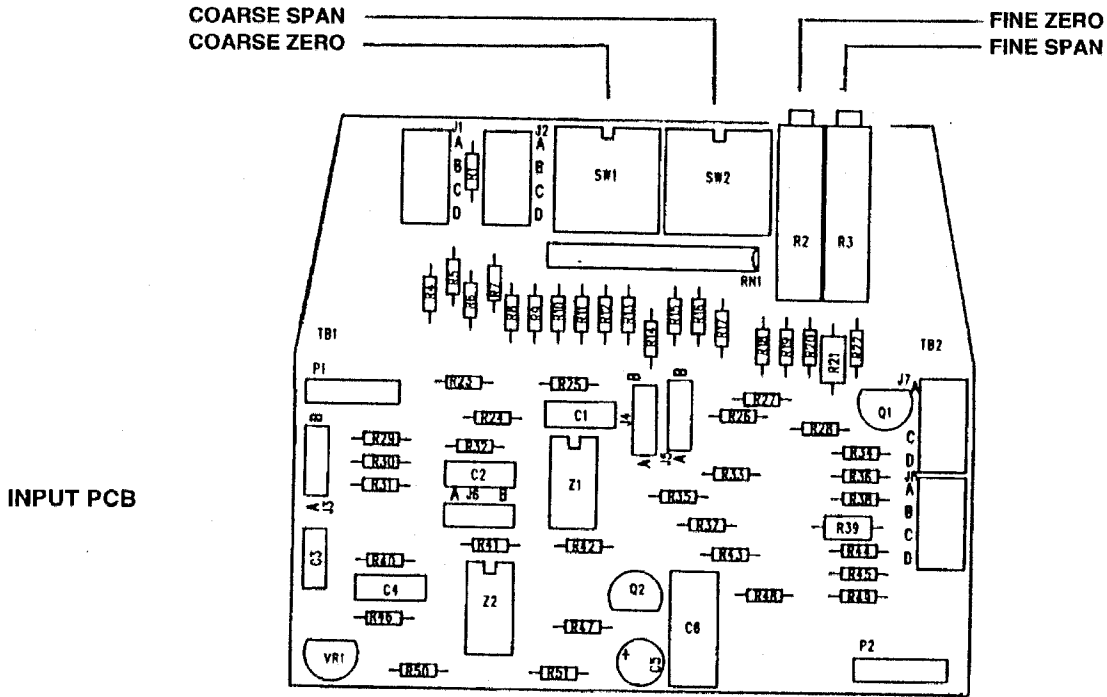
10mV	J2-B
30mV	J2-A
100mV	J2-D
Reserved	J2-C

**INPUT TABLE 2
ZERO ELEVATION**

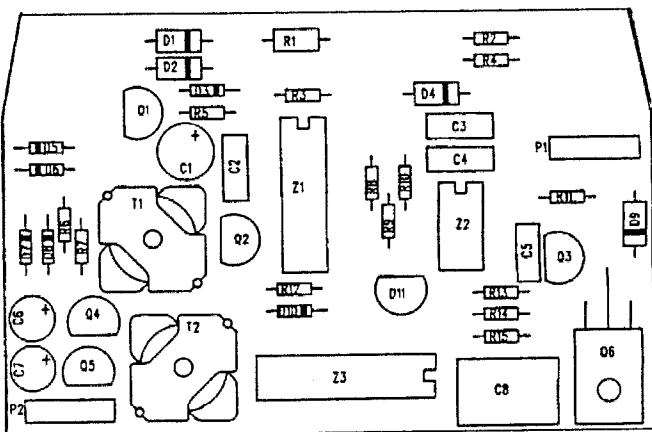
0mV	J3-B
20mV	J3-A

Note: Jumpers located on larger pcb.
J6 - location 'A' fixed.

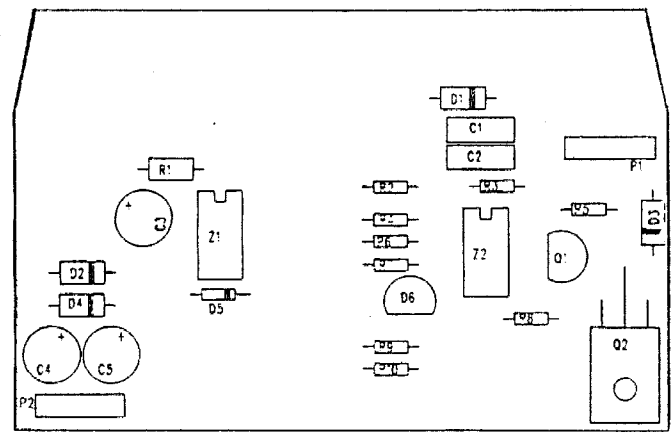
8.1 PCB LAYOUT



INPUT PCB



MVX 226 Two-Wire Isolated



MVX 206 Two-Wire Non-Isolated

NOTE: All components shown may not be required by this model.

9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS

- 0.5 mv to 100 mv span (Z in greater than 10 megohm)
- Zero Suppression: up to 100% of the major range selected in 16 divisions of the coarse zero adjustment switch.
- Span: from 0.5 mv to 100 mv full scale—switch selectable. The coarse span switch adds 16 divisions to each major range.
- Upscale/Downscale protection optional.

OUTPUT SIGNAL

4-20 ma dc

OUTPUT LOOP DRIVE CAPABILITY

$$R(\text{ohm}) = \frac{(V \text{ supply} - V \text{ minimum}) 1000}{I \text{ out max. ma}}$$

V minimum = 8.0 vdc

I out	4 - 20 ma			
V supply	12	24	36	42
R (ohm)	200	800	1400	1700

PERFORMANCE

- Calibrated Accuracy: $\pm 0.1\%$
- Independent Linearity: $\pm 0.01\%$ maximum, $\pm 0.006\%$ typical (14 bit digital linearity)
- Repeatability: $\pm 0.005\%$ maximum, $\pm 0.002\%$ typical
- Zero TC: $\pm \left(\frac{0.025}{\text{input span (MV)}} + 0.005 \right)$ % of span max/°C

- Span TC: $\pm 0.008\%$ of span max/°C
- Load Effect: $\pm 0.005\%$ zero to full load
- Output Ripple: 10 mv P/P maximum
- Response Time: 110 milliseconds (10 to 90% step response)
- Bandwidth: (-3 db): 3.2 Hz
- Temperature Range: -25° to 185°F (-31° to 85°C) operating
-40° to 200°F (-40° to 93°C) storage
- Power Supply Effect: $\pm 0.005\%$ over operating range
- Isolation: (MVX 226 only) Input/Output 600 vac
1000 vdc

Note: All accuracies are given as a percentage of span

POWER

- 8 to 42 vdc—standard

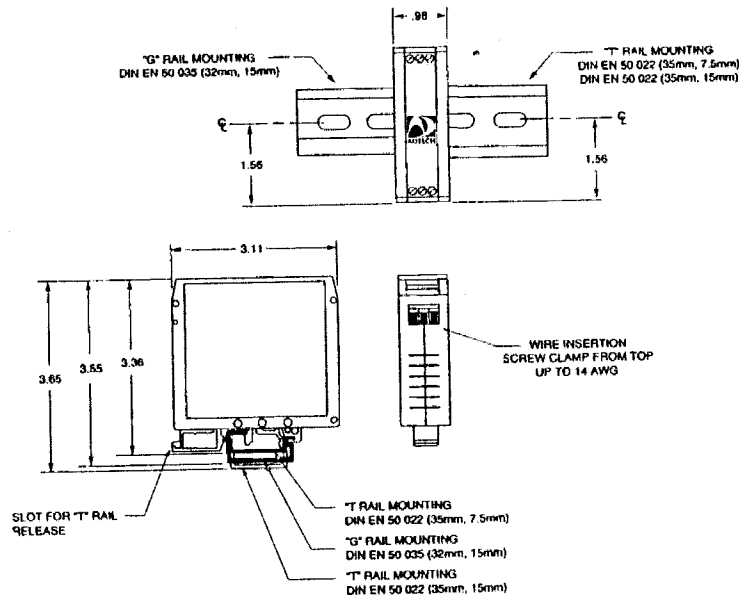
MECHANICAL

- Electrical Classification: general purpose
- Connection: Screw, compression type, accepts up to 14 AWG
- Controls: One 4 position jumper for major range
Two 16 position rotary switches for **COARSE ZERO** and SPAN control
Two multiturn potentiometers for **FINE ZERO** and SPAN control
- Mounting: DIN, Surface, Snap-Track, or NEMA 4, 7 or 12
- Weight: Net Unit: 4 oz. (115 grams)
Shipping: Nominal 7 oz. (200 grams)

OPTIONS

Option Number	Description
H 13 through H 27	Mounting
I 14	Voltage/Current Inputs
LPI 40D	Loop Indicator

10. OUTLINE MOUNTING



OPTIONAL MOUNTINGS — see separate drawings provided or request from the factory

- | | | |
|--------|------|--|
| Option | H-15 | D Explosion Proof, Class 1, Group B, C & D |
| Option | H-25 | Snap Track Mounting N/C (Specify) |
| Option | H-26 | Surface Mounting N/C (Specify) |
| Option | H-27 | NEMA 4 Enclosure |
| Option | H-29 | T35 DIN T rail 2 Ft. Long |
| Option | H-30 | T32 DIN G rail 2 Ft. Long |