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PTX 273 Two-Wire Non-Isolated Potentiometer 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 PTX 273 Two-Wire Potentiometer Transmitter provides high accuracy conversion of 50 to 100,000 ohm potentiometer input signals to a standard 4-20 ma dc process signal.

The primary features of the PTX 273 are:

- Zero Suppression of up to 100% of the potentiometer rotation with a 16 position switch.
- Field adjustable via rotary switches and 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.

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 terminal 1 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 **COARSE SPAN** control.
- Two multiturn potentiometers; **FINE ZERO** and **FINE SPAN** controls, accessible on the front.

4.0 MAINTENANCE

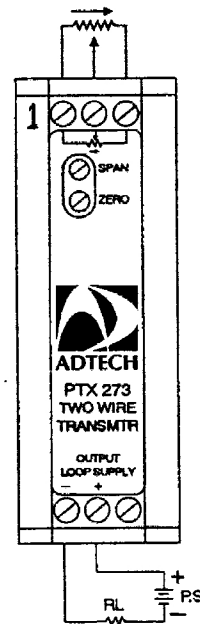
These instruments are electronic and require no maintenance except periodic cleaning and calibration.

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 CALIBRATION

All ADTECH instruments are calibrated per P.O. instructions at the factory. A calibration sticker located on the unit identifies the model, calibration, and options present.

To perform a calibration check or re-calibration of the instrument, proceed as follows.

- 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 2.
- 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, e.g. 1-5 Vdc across 250 ohms.

Note 1: To access COARSE ZERO (SW1) and COARSE SPAN (SW2), open the instrument and remove the right hand cover. Refer to PCB Layout for Coarse Zero and Span Locations. This step is required for calibration to a new range only.
- D. Apply an input corresponding to the zero input. Rotate the **FINE ZERO** control fully clockwise. Rotate the **COARSE ZERO** switch (Note 1) to a position where the zero level just goes below 4.00 ma output. Rotate the **COARSE ZERO** switch back one number less than the previous position (but not less than zero).
- E. With the input set at the zero input, adjust the **FINE ZERO** control for 4.00 ma to the desired accuracy.
- F. Apply an input corresponding to the full scale input. Rotate the **FINE SPAN** control fully counter-clockwise. Rotate the **COARSE SPAN** switch to a position where the output just exceeds 20.00 ma output. Rotate the switch back one number less (but not less than 0).
- G. With the input set to the full scale input, adjust the fine span control for 20.00 ma to the desired accuracy.
- H. Repeat steps E and G until the readings remain within to desired calibration accuracy.
- I. Check the instrument at the 25-50-75% input settings for linearity.

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

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.

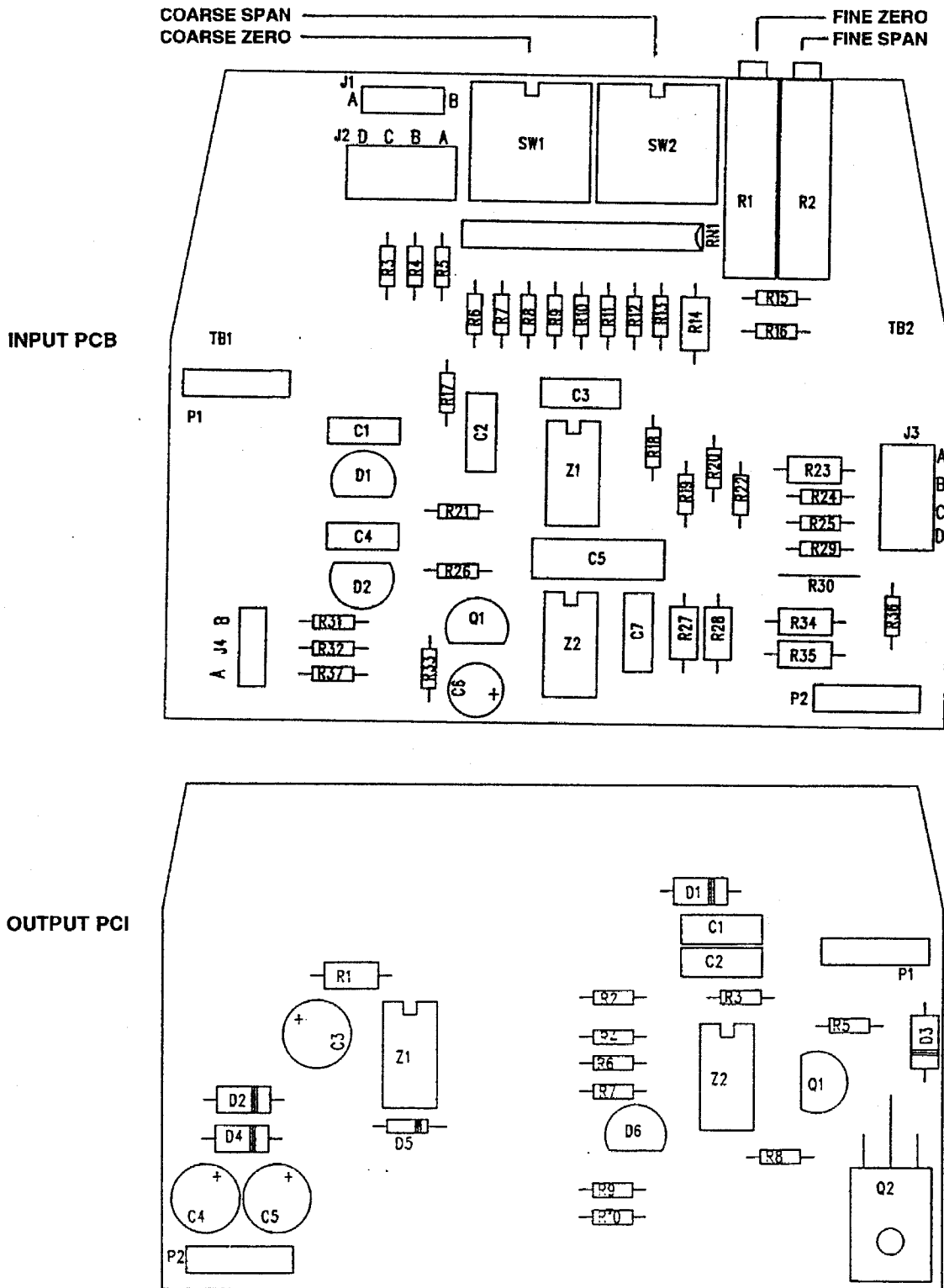
Troubleshooting beyond the above may be difficult without special equipment. We do not recommend attempting repair of the unit in the field. ADTECH offers a very responsive repair policy.

8.0 TABLES

TABLES NOT APPLICABLE

Fixed Jumpers J4-A

8.1 PCB-LAYOUT



9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS

- Potentiometers/slidewire sensors 3 wire.
- 50 ohm to 100K ohm resistance spans: standard.
- Zero Suppression: up to 100% of the potentiometer rotation selected in 16 divisions of the coarse zero adjustment switch.
- Span: from 0-100% full scale—switch selectable. The coarse span switch adds 16 range divisions.

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: $\pm 0.007\%$ of span max/ $^{\circ}\text{C}$
- Span TC: $\pm 0.010\%$ of span max/ $^{\circ}\text{C}$
- 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

Note: All accuracies are given as a percentage of span

POWER

- 8 to 42 vdc—standard

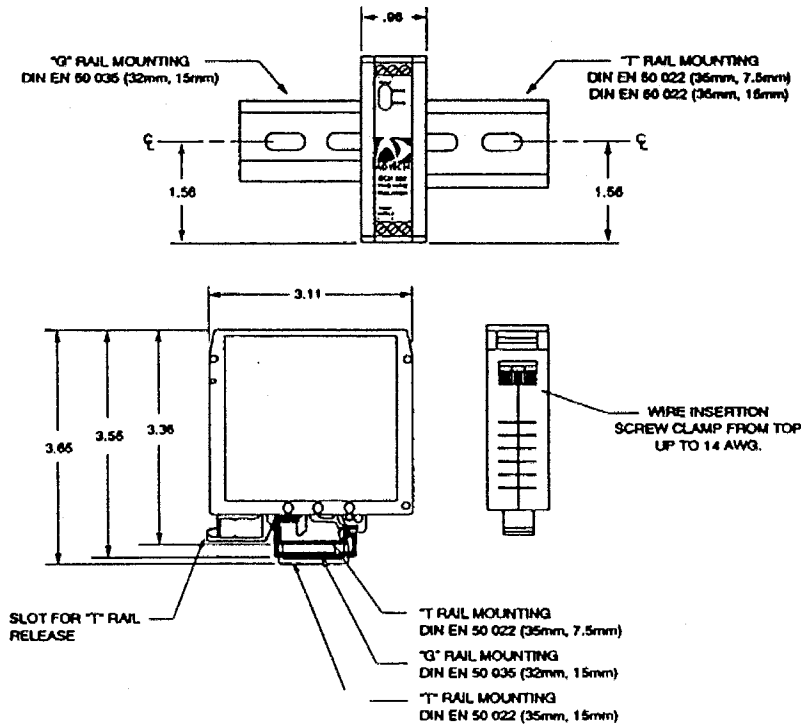
MECHANICAL

- Electrical Classification: General purpose
- Connection: Screw, compression type, accepts up to 14 AWG
- Controls: 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 15D through H 30	Mounting
LPI 40D	Loop-power Indicator

10.0 MOUNTING



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

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|--------|------|--|
| 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 |