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ACT 340 Isolated AC Current/Voltage Transmitter Instruction Manual

1.0 INTRODUCTION

These instructions refer to the above model. 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 ACT 340 transmitter converts an AC input into a standard process DC signal such as 4-20 mA DC and also electrically isolates the input from the output and power supply. This instrument is powered by 15-42 VDC supply. The negative of the power and the output share a common connection. This is the reason it is called a three-wire transmitter.

The input can be either AC current or an AC voltage as per input ranges on page 4. The AC current input signal is terminated at terminals 1 and 3 and the voltage input signal is terminated at terminals 1 and 2 as shown in Section 5.0.

The input frequency range is 25 Hz to 1 KHz. For the highest accuracy calibrate the ACT 340 at the installed operating frequency.

The output is a true current source and provides process signals such as 4-20 ma, 0-1 ma, 0-10 ma, and 0-20 ma dc or alternatively, voltage signal 0-5 vdc, 1-5 vdc or 0-10 vdc as detailed in output specifications on page 4.

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 information refer to page 4 inside.

Electrical Connections

The wire used to connect the instrument to the control system I/O, should be a 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).

Six position compression terminal block are provided for I/O and power connection. A housing ground terminal is not required due to non-metallic housing.

Controls

Instrument controls consists of the following:

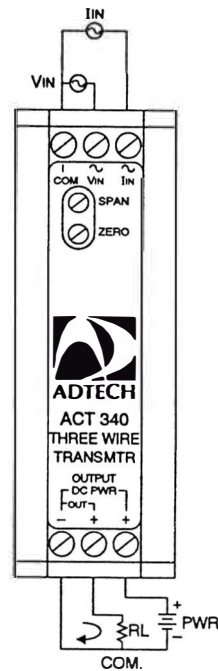
- A pair of two position jumpers for input range.
- One 16 position rotary switch for coarse span.
- A two position jumper for selection of zero or elev. zero output.
- A two position jumper for type of response.
- Two front access multiturn potentiometers for fine Zero and Span.

4.0 MAINTENANCE

These instruments are electronic and require no maintenance except periodic cleaning and calibration verification. If the unit appears to be mis-operating it should be checked as installed per section 6.0 or removed for a bench check per sections 6.0-7.0. MOST problems are traced to field wiring and/or associated circuits. If the problem appears to be with the instrument, proceed to 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 OF INPUT AND OUTPUT

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.

SAFETY CAUTION

If an AC Current Transmitter is in service, DO NOT open connection to terminals 1 and 3.

FIRST SHUT OFF the primary current circuit that is being monitored, then disconnect the leads from terminals 1 and 3. It is also IMPORTANT NOT to make jumper changes while an input is applied on terminals 1 and 2 or 1 and 3.

NOTE: For recalibration to the existing range proceed to section 6.1; for new input or output range proceed as follows.

- A. Open the case to gain access to pc boards. The larger pc board is the input pcb and the smaller pcb is the output/power pcb.
- B. The ACT 340 interfaces to both Current and Voltage AC Waveforms. The transmitter offers either True RMS or Average Responding measurements. Table 2 is used to select the type of response for your application.
- C. The ACT 340 is capable of both zero based and 20% elevated output zeros. Follow table 3 to select the Output Zero jumper. For example a 1 to 5 volt output would be considered a 20% elevated output, while a 0 to 5 volt would be a zero based output.
- D. To select the desired output follow table 4. Jumpers are located on pc board.
- E. Follow Table 1 to set the INPUT MAJOR RANGE. The range picked should be the smallest value in the table that is still greater than the input Full Scale.
- F. Now follow section 6.1 to calibrate.

6.1 CALIBRATION

- A. If the unit has been altered under *INPUT or OUTPUT CONFIGURATION*, the cover must remain off until calibration is complete. If no alterations have been made to the jumpers, there is no need to remove cover to fine adjust the zero and span of the unit.
- B. Make sure the unit I/O wiring is properly connected and that the correct power source per label is also connected. The instrument must be at normal power for a minimum of 2 minutes prior to proceeding.
- C. The input source must be adjustable from 0 to 100% in steps of 10% or at least 25%. The source should either be precalibrated or an accurate meter must be used to monitor the input.
- D. Monitor the output as a voltage or as a current that can be represented as a voltage across a resistor shunt.
- E. Apply power to the unit (see connection diagram) on page 1.
- F. Set the input to zero and adjust the potentiometer marked ZERO to provide zero output i.e. 4.00mA for 4-

20 mA output.

- G. **This step is only required if unit has been altered (see text above).**
 1. Rotate the potentiometer marked SPAN fully clockwise.
 2. Rotate the 16 position rotary switch (inside unit) until the output just drops below the output full scale i.e. 20 mA for 4-20 mA output.
- H. With input at full scale adjust the SPAN potentiometer until the output reaches full scale output i.e. 20 mA ± 0.01 mA for 4-20 mA output.
- I. Repeat steps F and H until the readings are within calibration.
- J. Check the instrument at 25, 50 and 75% input settings.

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 power is present on the instrument terminals. 3. Check that the input source(s) is correct and that it changes magnitude between zero and full scale values when so adjusted. 4. If the output is a current signal (4-20 ma, etc.), 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.

The instrument is made of small components. 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. Contact the ADTECH factory for information on repair and return at 716-383-8280 or 716-383-8386 (FAX).

**TABLE 4
OUTPUT RANGE**

Output Type		
Output	J1	J2
4-20mA	A	A
0-20mA	A	A
0-10mA	A	B
0-1mA	A	C
1-5V	B	A
0-5V	B	A
0-10V	C	A

Note: Jumpers located on smaller pcb.

8.0 TABLES, PCB LAYOUT

**TABLE 1
INPUT MAJOR RANGE**

5 amp	J3-A	J2-A
250 mV	J3-A	J2-B
2.5 V	J3-B	J2-B
25 V	J3-C	J2-B
250 V	J3-D	J2-B

Jumpers located on larger pcb.

**TABLE 2
RESPONSE TYPE**

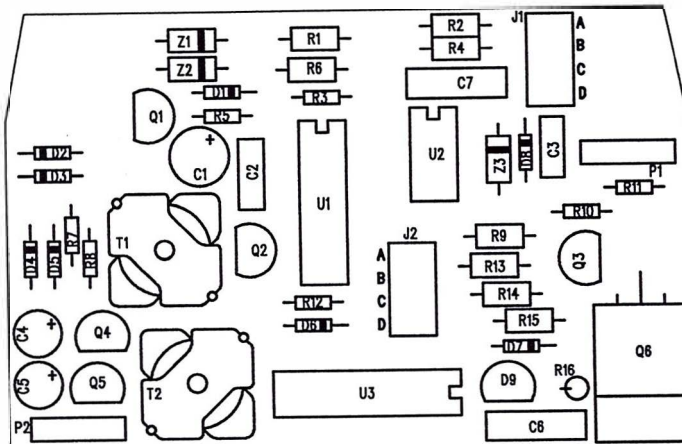
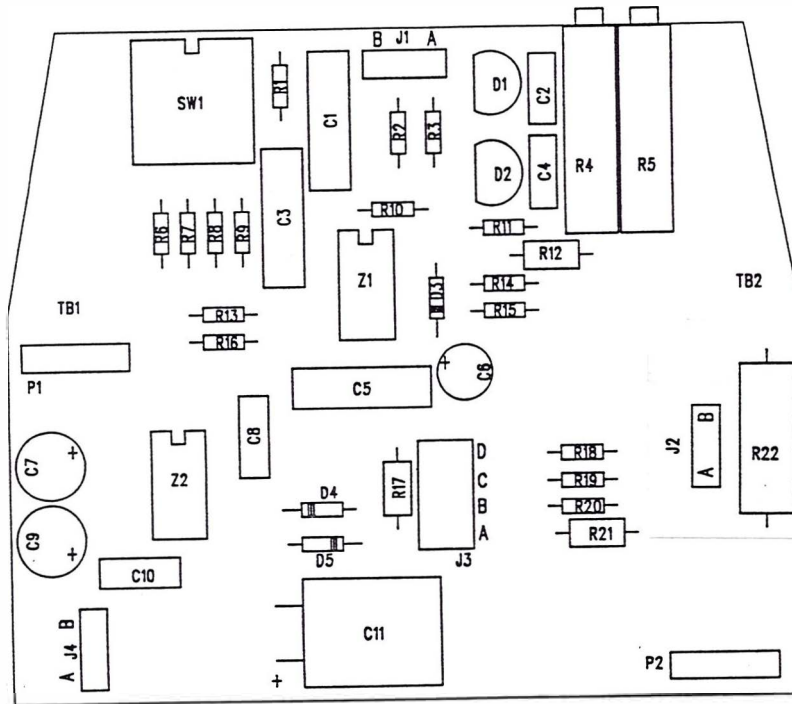
TRMS	J4-A
Average	J4-B

Note: Jumpers located on larger pcb.

**TABLE 3
OUTPUT ZERO TYPE**

Elevated 20%	J1-A
Zero Based	J1-B

Note: J1 located on small pcb.



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

9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS

- AC Current—any 0-1 to 0-5 amps ac, burden less than 0.5 va
- AC Voltage—any 0-0.25V to 0-250 vac rms signal, burden less than 0.5 va (4 major ranges)
- Zero Adjustment: ± 5% of span
- Coarse Span Adjustment: ±100% of major range (voltage only)
- Fine Span Adjust: ±5% of major range (±1 amp for current inputs)

Input Frequency Range: 25-1,000 Hz

Input Overload Capability: 200 % of input continuous

OUTPUT SIGNALS

4-20 ma dc, 0-20 ma dc, 0-10 ma dc, 0-1 ma dc, 1-5 vdc, 0-5 vdc, 0-10 vdc

OUTPUT LOOP DRIVE CAPABILITY

$$R(\text{ohm}) = \left[\frac{(V \text{ supply} - 5) 1000}{I \text{ out max. ma}} \right]$$

I out	0-20 ma or 4-20 ma			
V supply	15	24	36	42
R (ohm)	500	950	1550	1850

PERFORMANCE

- Calibrated Accuracy:** ± 0.25%
- Independent Linearity:** ± 0.15% maximum, ± 0.06% typical
- Repeatability:** ± 0.005% maximum; ± 0.002% typical

- Zero TC:** ± 0.01% of span max/°C
 - Span TC:** ± 0.02% of span max/°C
 - Load Effect:** ± 0.005% zero to full load
 - Output Ripple:** 10 mv P/P maximum
 - Response Time:** 350 milliseconds average responding (10 to 90% step response)
 - Bandwidth:** (-3 db): 1 Hz
 - Temperature Range:**
 - 25° to 185°F (-31° to 85°C) operating
 - 40° to 200°F (-40° to 93°C) storage
 - Power Supply Effect:** ± 0.005% of span max.
 - Isolation:** Input/output/case: 600 VAC, 1000 VDC
- Note: All accuracies are given as a percentage of span

POWER

- 15 to 42 vdc—standard, 28 ma typical, 33 ma max.

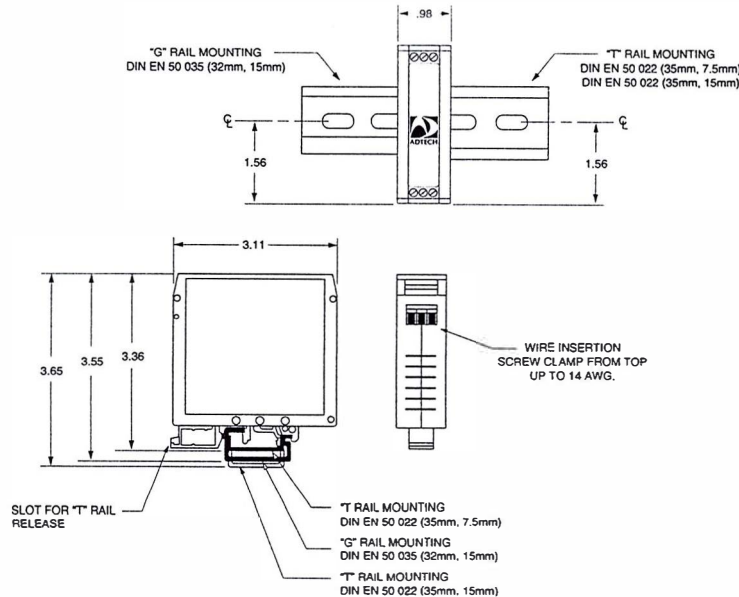
MECHANICAL

- Electrical Classification:** General purpose
- Connection:** Screw, compression type, accepts up to 14 AWG
- Controls:** Two front access multiturn potentiometers for fine zero and span control,
 - : One 16 position rotary switch for coarse span.
 - : Jumpers for input range, output range and type of response.
- Mounting:** DIN, Surface, Snap-Track, or NEMA 4 & 7.
- Weight:** Net Unit: 4 oz. (115 grams)
Shipping: Nominal 7 oz. (200 grams)

OPTIONS

Option Number	Description
H 15D through H 30	Mounting

10.0 OUTLINE & MOUNTING



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

- | | | |
|--------|-------|--|
| Option | H-15D | 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-28 | T35 DIN T rail 2 Ft. Long |
| Option | H-28 | T32 DIN G rail 2 Ft. Long |