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ECT 302 Economy Isolated Converter-DC Powered 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 ECT 302 is an Economy Isolated Signal Transmitter that accepts process input signals such as 4-20 ma dc and converts them into a standard control signal output such as 4-20 ma dc or 1-5 vdc etc.

The input is electrically isolated from the output and the power supply by 600 volts ac or 1000 vdc peak. The output is a true current source and provides process signals such as 4-20 ma dc or alternatively, a voltage signal of 5 vdc or 10 vdc full scale. The ECT 302 is powered by 24 vdc. The negative rail of the output is common with the negative rail of the dc power supply.

3.0 INSTALLATION

The instrument is supplied in a DIN rail mount general purpose enclosure as standard. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions.

Many optional mounting configurations are provided as shown in section 10 on page 4.

Mounting

Refer to the appropriate outline drawing for mounting and clearance dimensions. The instrument is surface mounted by means of DIN rails types G or T, 32mm and 35mm respectively.

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 negative of the ADTECH instrument and left floating at the sensor).

A 6 position compression terminal block is provided for I/O and power connection. A housing ground terminal is not required due to non-metallic housing.

Controls

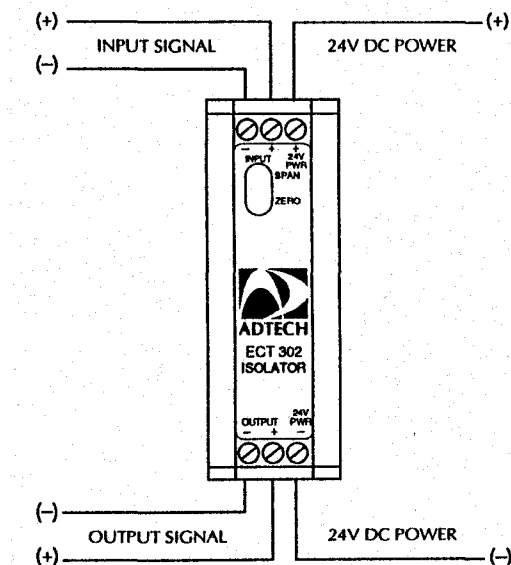
Multiturn ZERO and SPAN controls are provided to calibrate the instrument. The multiturn controls are accessible through the instrument front panel and are clearly marked for ease of use.

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 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 SET UP AND CALIBRATION

All ADTECH units are factory calibrated per your instructions. Usually, a complete recalibration is not required unless it is required to change input types, output types or the range of the unit. Most calibrations will only require a ZERO and SPAN adjustment.

The calibration process is broken into three separate steps as follows:

Input Configuration	Sec 6.1
Output Configuration	Sec 6.2
Calibration	Sec 6.3

6.1 INPUT CONFIGURATION

The ADTECH Model ECT 302 Isolated Voltage/Current Transmitter accepts both current and voltage inputs. **IMPORTANT:** refer to the connection diagram for the appropriate connections to the unit.

The ECT 302 has been set at the factory per the input/output marked on the label.

If you want to change the factory set type of input configuration, header jumpers J1, J2 and J3 may need to be changed for any of the standard inputs shown in Table 1.

For inputs not listed in Table 1, some removal and replacement of resistor values will be required. Consult Table 3 for the appropriate changes.

6.2 OUTPUT CONFIGURATION

The output has been factory set as marked on the serial number tag. However, it is easy to change the type of output if so desired. All outputs shown in Table 2 can be easily selected by selection of jumpers J4 and J5.

For outputs not listed in Table 2, change components per Table 4 for the desired output.

6.3 CALIBRATION

To perform a calibration check or re-calibration of the instrument follow this procedure.

- 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(s) must be adjustable from 0 to 100% in steps of 10% or at least 25%. The source(s) should be either precalibrated or an accurate meter must be used to monitor the input(s).
- C. The output may be monitored either as a direct voltage for a voltage output signal or as a current that can be represented as a voltage across a resistor shunt for a current output signal.
- D. Set the input source to minimum input value and adjust the multiturn potentiometer marked ZERO to provide the minimum calibrated output (e.g.) 4.00 ma \pm 0.01 ma dc. Note: For zero based outputs it is better to set input at 10% and adjust for 10% output for ZERO adjustment.
- E. Set the input source to maximum value and adjust the multiturn potentiometer marked SPAN to provide the maximum calibrated output (e.g.) 20.00 ma

\pm 0.01 ma dc.

- F. Repeat steps D and E until readings are within calibration.
- G. The instrument should now be checked at 25-50-75% of span minimum.
- H. This completes the calibration.

7.0 FIELD TROUBLE SHOOTING GUIDE

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

<u>SYMPTOM</u>	<u>CORRECTIVE ACTION</u>
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- | | |
|-----------|---|
| No output | 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.

If the problem seems to be internal, replace the instrument with a spare and return the defective instrument to ADTECH for prompt check out and repair. To avoid unnecessary delays always send a cover note with name and telephone number of the contact and return address. Along with a brief description of what the unit is doing when it fails.

8.0 TABLES, PCB LAYOUT

Standard Inputs/Outputs

**TABLE 1
STANDARD INPUTS**

INPUT	J1	J2	J3
4-20 mA DC	B	A	A
0-20 mA DC	A	A	A
1-5V DC	B	B	B
0-5V DC	A	B	B

**TABLE 2
STANDARD OUTPUTS**

OUTPUT	J4	J5
4-20 mA DC	A	B
0-20 mA DC	B	B
1-5V DC	A	A
0-5V DC	B	A

Alterable Inputs/Outputs

(Some pcb component changes required)

**TABLE 3
ALTERABLE INPUTS**

INPUT	J1	J2	J3	R16	R12
0-1 mA DC	A	A	A	200	NC
0-10 mA DC	A	A	A	20	NC
0-10 V DC	A	B	B	NC	20K

NOTE A: "NC" = No change from standard unit configuration.

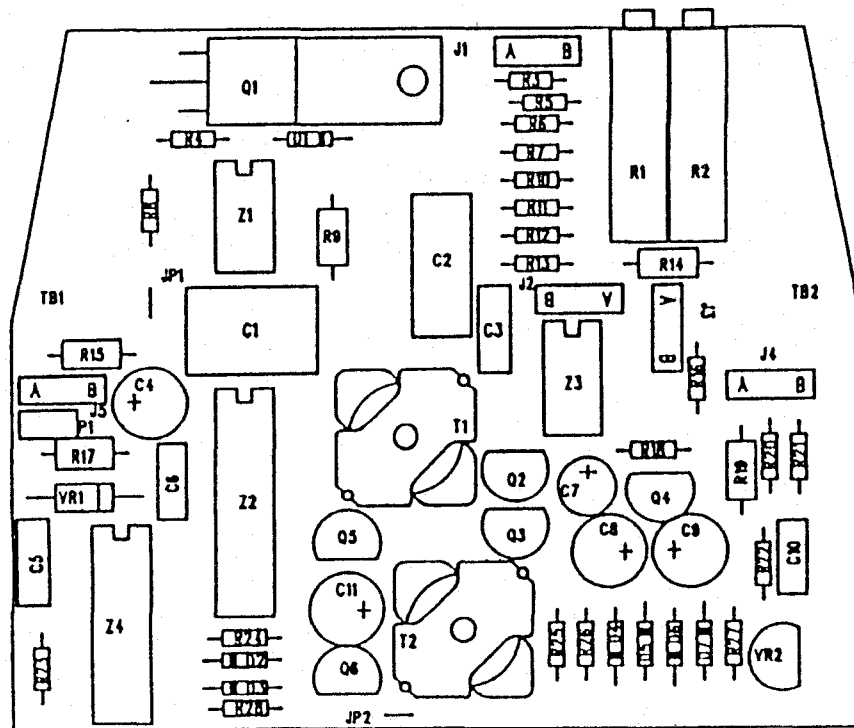
NOTE B: All resistors are 1%, Metal Film, 1/4W, 50 ppm.

**TABLE 4
ALTERABLE OUTPUTS**

OUTPUT	J4	J5	R15	R9
0-1 mA DC	B	B	NC	1K
0-10 mA DC	B	B	NC	NC
0-10 V DC	B	A	499	NC

NOTE A: "NC" = No change from standard unit configuration.

NOTE B: All resistors are 1%, Metal Film, 1/4W, 50 ppm.



9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS—STANDARD

- 4-20 mA dc (Z in 10 ohm)
- 0-20 mA dc (Z in 10 ohm)
- 1-5 VDC (Z in 1 meg ohm min)
- 0-5 VDC (Z in 1 meg ohm min)

INPUT SIGNALS—ALTERABLE

- 0-1 mA (Z in 200 ohm)
- 0-10 mA (Z in 20 ohm)
- 0-10 VDC (Z in 1 meg)
- Any Zero based voltage from 100 mV to 200 VDC

OUTPUT SIGNALS—STANDARD

- 4-20 mA DC 900 ohms max.
- 0-20 mA DC 900 ohm max.
- 1-5 VDC 1 meg ohm min.
- 0-5 VDC 1 meg ohm min.

OUTPUT SIGNALS—ALTERABLE

- 0-1 mA DC 20 k ohms max.
- 0-10 mA DC 1800 ohm max.
- 0-10 VDC 1 meg ohm min.

PERFORMANCE

- Calibrated Accuracy:** $\pm 0.1\%$
- Linearity:** $\pm 0.1\%$ maximum, $\pm 0.04\%$ typical
- Repeatability:** $\pm 0.05\%$ maximum
- Temperature Stability:** $\pm 0.01\%/^{\circ}\text{F}$ maximum, $\pm 0.004\%/^{\circ}\text{F}$ typical
- Load Effect:** $\pm 0.01\%$ zero to full load
- Output Ripple:** 10 mv P/P typical
- Response Time:** 150 milliseconds (2.3 Hz band width)
- Temperature Range:** 0° to 140°F (-18° to 60°C) operating
 -40° to 185°F (-40° to 85°C) storage
- Power Supply Effect:** $\pm 0.05\%$ for a $\pm 10\%$ power variation
- Common Mode Rejection:** 100 db @ 60 Hz
- Isolation:** Input/output/power 600 vac, 50/60 Hz, 1000 vdc

Note: All accuracies are given as a percentage of span

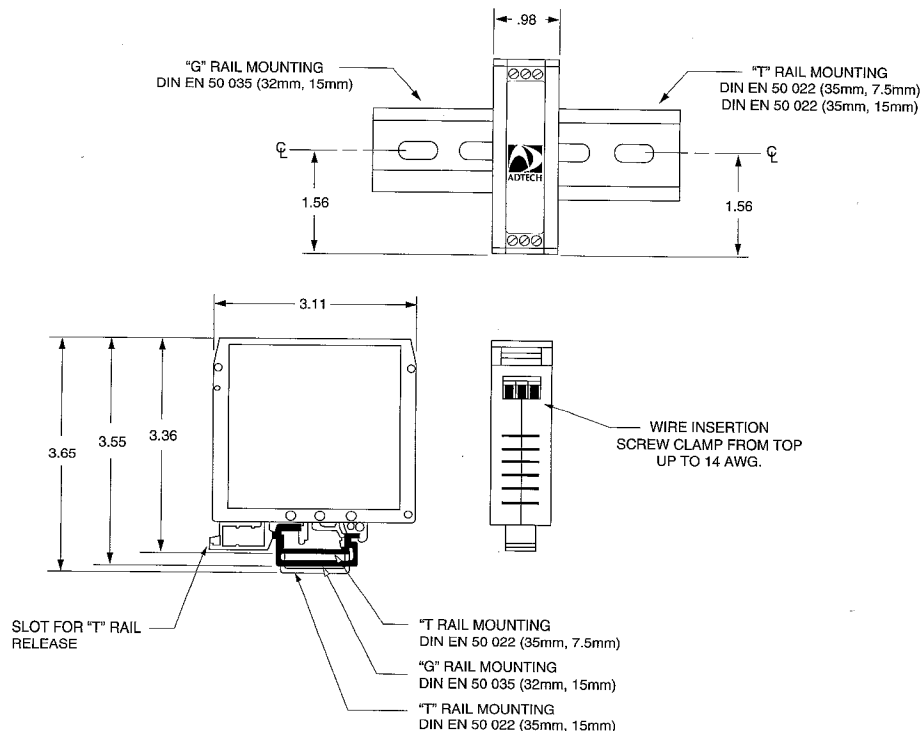
POWER

- 24 vdc: $\pm 10\%$, 1 watt (standard)

HOUSINGS

See Section 10.0

10.0 OUTLINE & MOUNTING



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

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