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SCT 302
Isolated Convertor–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 SCT 302 is an 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, 1–5 vdc or 0-10 vdc.

The input is electrically isolated from the output and the power supply by 600 volts ac or 1000 vdc peak. The SCT 302 is powered by 15-42 vdc. The negative rail of the output is common with the negative rail of the dc power supply.

The output is a true current source and provides process signals such as 4-20 mA, 0-20 mA DC, 0-1 mA, 0-10 mA, or alternatively, a voltage signal of 5 VDC full scale. Other current and voltagle Inputs/Outputs (I/O) **are available as specified on the Data Bulletin and on page 4 inside.**

3.0 INSTALLATION

The instrument is supplied in a DIN rail mount general purpose 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.

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).

Six position compression terminal blocks are 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. Other internal range selection jumpers are provided for ease of field rangeability as listed below.

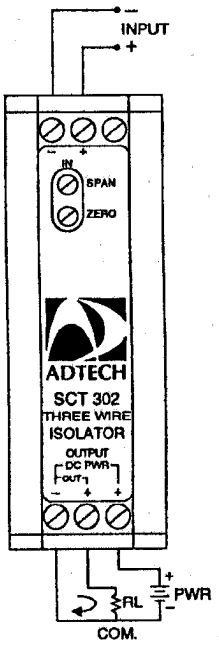
one 16-position coarse ZERO SWITCH (SWI)
one 16-position coarse SPAN SWITCH (SW2)

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.



(4-98) 190-A-000076-B

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 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.

NOTE: For recalibration to the existing range proceed to section 6.3; for new input or output range proceed as follows.

A. Open the case to gain access to pcb boards. The larger pcb board is the input pcb and the smaller pcb is the output/power pcb.

6.1 INPUT CONFIGURATION

The ADTECH Model SCT 302 Isolated Voltage/Current Transmitter accepts both current and voltage inputs.

The SCT 302 has been set at the factory per the input/output marked on the label. It is easy to change the type of input. All inputs listed in Table 1 can be changed by simply selecting the appropriate header jumpers J2 to J8 on page 3.

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 3 can be easily selected by selection of jumpers J1 and J2 on the output pc board.

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 read as a voltage across a resistor shunt e.g. 1-5 VDC across 250 ohms fro 4-20 mA DC.

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 ± 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 ± 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 for linearity.

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.

SYMPTOM	CORRECTIVE ACTION
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.

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).

8.0 TABLES, PCB LAYOUT

Standard Inputs/Outputs

TABLE 1–INPUT

INPUT	J2	J3	J4	J7	J8	
4 – 20 mA	A	B	B	B	A	
0 – 20 mA	A	B	A	B	A	
0 – 10 mA	A	B	A	C	A	
0 – 1 mA	A	B	A	D	A	
± 20 mA	D	A	A	B	A	
± 10 mA	D	A	A	C	A	
± 1 mA	D	A	A	D	A	
1 – 5 V	A	B	B	A	B	
0 – 5 V	A	B	A	A	B	
0 – 10 V	A	B	A	A	C	
± 5 V	D	A	A	A	B	
± 10 V	D	A	A	A	C	

All jumpers located on larger pcb.

TABLE 2–OUTPUT

Output Zero	J6
1-5V, 4-20 mA	A
All 0 Based	B

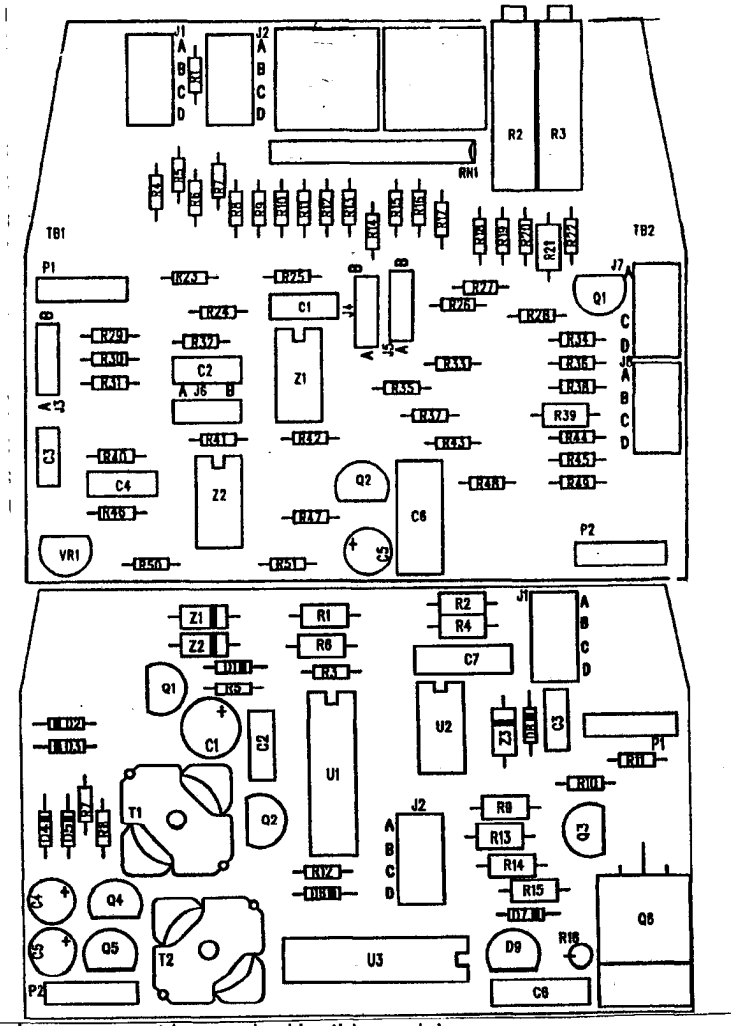
Note: Jumper on larger pcb.

TABLE 3—OUTPUT

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.

8.1 PCB LAYOUT



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

9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS

a. 4-20 mA DC (z in 10 ohms)
b. 0-20 or ± 20mA DC (z in 10 ohms)
c. 0-10 or ± 10mA DC (z in 20 ohms)
d. 0-1 or ± 1mA DC (z in 200 ohms)
e. 1-5 VDC (z in 1 megohm)
f. 0-5 or ± 5 VDC (z in 1 megohm)
g. 0-10 or ± 10 VDC (z in 1 megohm)
h. Any zero or bipolar voltage from 100 mV to 200 VDC (option 1 14).

Zero Suppression: ± 10%
Span Adjustment: ± 10%

OUTPUT SIGNALS

a. 4-20 mA DC
b. 0-20 mA DC
c. 0-10 mA DC
d. 0-1 mA D
e. 1-5 VDC
f. 0-5 VDC
g. 0-10 VDC

OUTPUT LOOP DRIVE CAPABILITY:

$$R(\text{ohm}) = \frac{(V\ \text{supply}-5)1{,}000}{I\ \text{out max. mA}}$$

V Supply: 15 to 42 VDC

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

PERFORMANCE

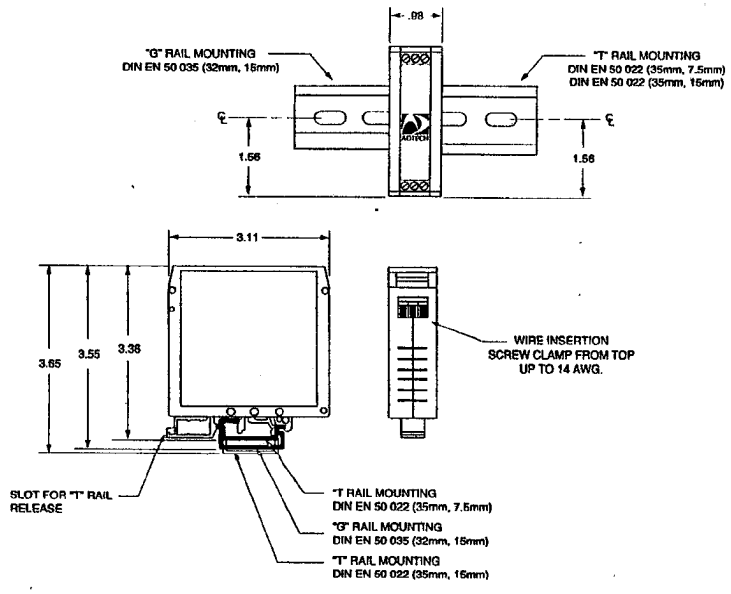
a. **Calibrated Accuracy:** ± 0.1%
b. **Independent Linearity:** ± 0.025% max., ± 0.01% typical
c. **Repeatability:** ± 0.005% max. ± 0.002% typ.
e. **Zero TC:** ± 0.007% of span max./°C
f. **Span TC:** ± 0.008% of span max./°C
g. **Load Effect:** ± 0.005% zero to full load
h. **Output Ripple:** 10 mV P/P maximum
h. **Response Time:** 110 milliseconds (10 to 90% step response)
i. **Bandwidth:** (-3 db): 3.2 Hz
j. **Temperature Range:** -25° to 185°F (-31° to 85°C) operating; -40° to 200°F (-40° to 93°C) storage
k. **Power Supply Effect:** ± 0.005% of span, max.
l. **Isolation:** Input/output/case: 1000 VDC or 600 VAC

Note: All accuracies are given as a percentage of span

POWER

a. 15-42 VDC: 28 mA typical; 33 mA maximum

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