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PAM 59

Accumulating Module

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 PAM 59 is a Non-Isolated Pulse Accumulating Module that integrates/totalizes the number of pulses from primary sensors to a standard control signal output such as 4-20 ma dc.

The output is a true current source and provides process signals such as 4-20 ma, 0-1 ma, 0-10 ma, 1-5 ma and 10-50 ma dc or alternatively, a voltage signal of 5 vdc full scale. Other current and voltage **Inputs/Outputs (I/O)** are available as specified on the Data Bulletin.

3.0 INSTALLATION

The instrument is supplied in a general purpose enclosure as standard. NEMA 4, 7 or 12 and plug in chassis enclosures are optionally available. Installation area/location must agree with the supplied instruments including operating temperature and ambient conditions.

Mounting

Refer to the appropriate outline drawing for mounting and clearance dimensions. The instrument is surface mounted with two #10-32 screws on 8.00 inch centers.

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).

A 12 position barrier terminal block with #6-32 screws and 3/8" spacing is provided for I/O and power connection. A housing ground terminal marked G is also provided.

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.

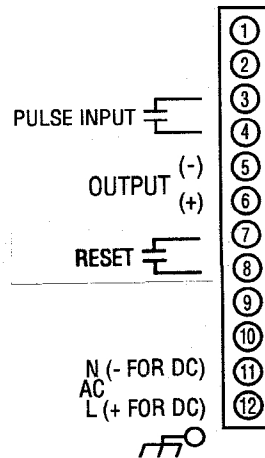
4.0 MAINTENANCE

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 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

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

- A. Carefully remove the instrument from the housing to gain access to the inside components observing all normal safety and equipment precautions.
- B. 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 C.
- 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.
- D. Verify that jumpers and resistors are selected per the input table on page 3.
- E. Reset the output to zero and connect a temporary jumper across the input. Adjust the multi-turn potentiometer marked ZERO to provide the minimum calibrated output e.g. 4.00 ± 0.01 mADC.
- F. Remove the input jumper and apply the desired number of input pulses. Adjust the multi-turn potentiometer marked SPAN to provide the maximum calibrated output e.g. 20.00 ± 0.01 mADC.
- G. Repeat steps E and F until the output readings are within calibration.
- 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 contacts are correct and that they change their state from open to close.
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 following information is provided for a qualified technician or serviceman as check points for use in internal troubleshooting.

<u>CHECKPOINT/ COMPONENT</u>	<u>VOLTAGE/RANGE</u>
(across) C20	26 ± 4 vdc
Term 1(-) to E ₂ (+)	12 ± 0.6 vdc
Term 1(-) to E ₁ (+)	-12 ± 0.6 vdc
Term 1(-) to pin 19 of Z ₄ (+)	9.4 ± 0.5 vdc

8.0 TABLES, PCB LAYOUT

INPUT TABLE

F.S. COUNT	R59	J24	J23	J8	J9	J22	J21	J6	J7	J19	J20	J12	J13	J4	J5	J11	J10
4096-2048	100k	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B
2048-1024	49.9k	B	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B
1024-512	24.9k	B	B	A	A	A	A	A	A	A	B	B	B	B	B	B	B
512-256	12.1k	B	B	B	A	A	A	A	A	A	A	B	B	B	B	B	B
256-128	6.04k	B	B	B	B	A	A	A	A	A	A	A	A	B	B	B	B
128-64	3.01k	B	B	B	B	B	A	A	A	A	A	A	A	A	B	B	B
64-32	1.5k	B	B	B	B	B	B	A	A	A	A	A	A	A	A	B	B

(A) = Present (B) = Absent

OUTPUT TABLE

OUTPUT SIGNAL FULL SCALE	OUTPUT SHUNT FL	FEEDBACK RES RF
50 ma dc	NONE	20 ohm
20 ma dc	NONE	49.9 ohm
10 ma dc	NONE	100 ohm
1 ma dc	NONE	1K ohm
10 vdc	604 ohm, 1/4 W	49.9 ohm
5 vdc	250 ohm, 1/2 W	49.9 ohm

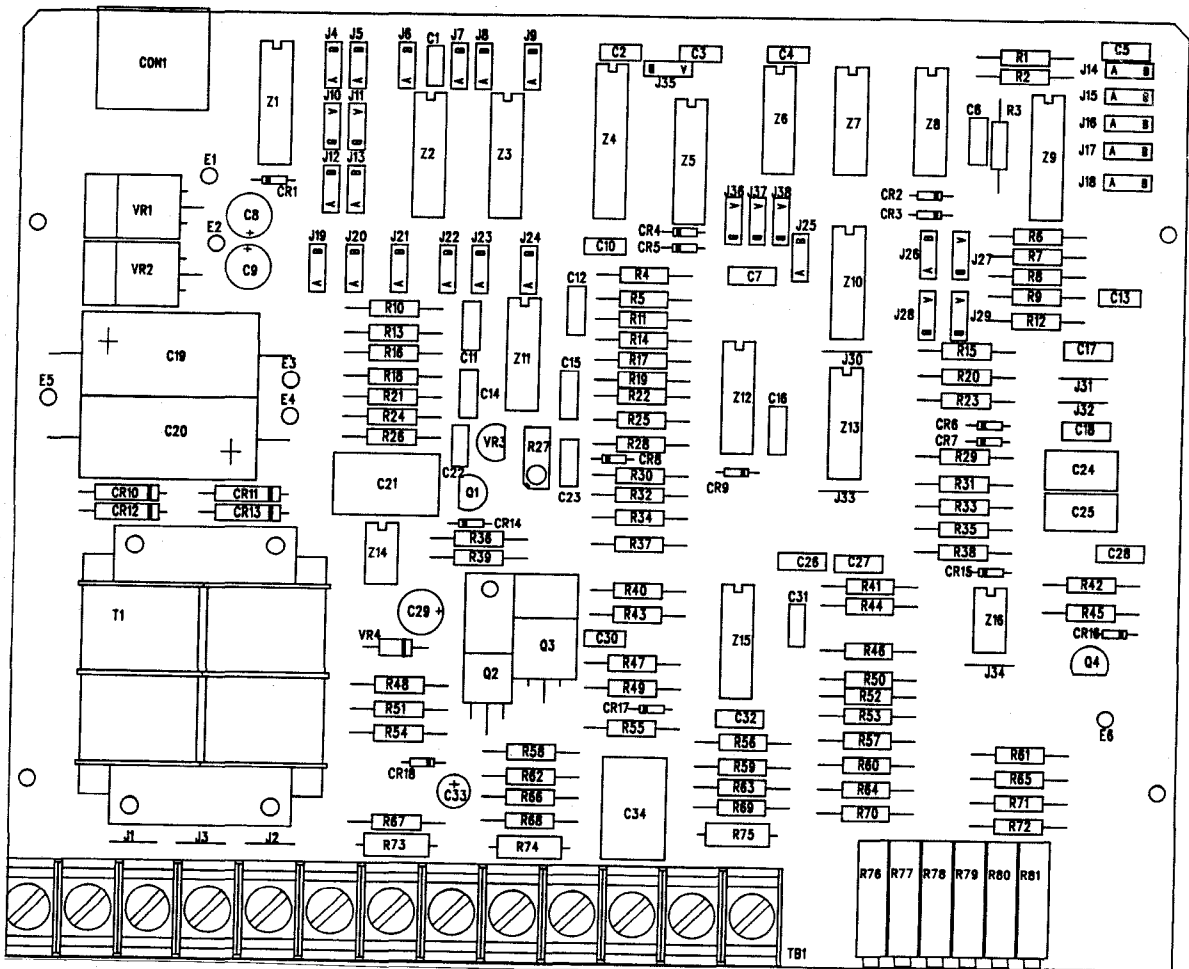
All selected resistors are 1%, M.F., 1/4 W, 50 PPM, unless otherwise noted.

NOTE A: Components as shown may or may not be present on the p.c. board due to design updates or options.

PAM 59

RL = R74

RF = R58



9.0 SPECIFICATIONS

INPUT/OUTPUT

INPUT SIGNALS

- Voltage:** Sine or square wave 9 volt to 24 volt pulse.
Other ranges: consult factory
- Frequency Range:** DC to 100 KHz
- Contact:** Dry 2 mA @ 24 VDC rating: specify
- Full Scale Count:** Up to 4096 pulses: specify

OUTPUT SIGNALS/OUTPUT DRIVE

AC Power

DC Power

- | | | |
|----------------|--------------------|--------------------|
| a. 4-20 ma dc | 0-1000 ohms max. | 0-900 ohms max. |
| b. 10-50 ma dc | 0-400 ohms max. | 0-350 ohms max. |
| c. 0-1 ma dc | 0-20,000 ohms max. | 0-18,000 ohms max. |
| d. 1-5 vdc | 250 ohms Z out | 250 ohms Z out |
| e. 0-10 vdc | 500 ohms Z out | 500 ohms Z out |

Or zero based in the same ranges. Other voltage and currents optional.

PERFORMANCE

- Calibrated Accuracy:** 1 pulse or 0.1% of range
- Linearity:** 1 pulse
- Repeatability:** 1 pulse
- 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 maximum
- Temperature Range:** 0° to 140°F (-18° to 60°C) operating
 -40° to 185°F (-40° to 85°C) storage

Note: All accuracies are given as a percentage of span

MECHANICAL

- Electrical Classification:** general purpose
- Connection:** Barrier terminal strip
(3/8 in. spacing, No. 6 screws)
- Controls:** Multiturn Zero and Span Controls
- Mounting:** Standard Surface Mounting
Optional Configurations: See Housing Section
- Weight:** New Unit: 2.6 pounds (1.18 kilograms)
Shipping: 3.0 pounds (1.36 kilograms)

POWER

- 115 vac: $\pm 10\%$, 50/60 Hz, 3 watts, 0.7 Pf (standard)
- 24 vdc: $\pm 10\%$ non-isolated, 3 watts (Option P1)
- 24 vdc: $\pm 10\%$ isolated, 3 watts (Option P2)
- 48 vdc: $\pm 10\%$ isolated, 3 watts (Option P3)
- 125 vdc: Nominal (105-140 vdc) isolated, 3 watts (Option P4)
- 230 vac: $\pm 10\%$, 50/60 Hz, 3 watts, 0.7 PF (Option P5)

10.0 OUTLINE & MOUNTING

