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Instructions for the
SA-BII (Switchable Gain) MODULE

008-0122-00

SA-BII MODULE .....

The SA-BII Switchable Gain Module is used to amplify millivolt level signals from a strain gage bridge transducer to a 0 to 5 volt or a 4 to 20 mA output. The gain of the amplifier is programmed by 3 switches located behind the removable front panel. The 3 switches form an eight-step range of full-scale input signals from 5mV to 40mV in 5mV steps.

Specifications

Input: Field programmable from 5mV FS to 40mV FS.

Output: 0-5 volts or 4-20 milliamps (optional).

Zero Potentiometer Adjustment:
Fine: +/-15% of full scale at 10 mv input range .
Coarse: +/-45% of full scale at 10 mv input range .

Gain Potentiometer Adjustment:
Fine: overlaps into each adjacent gain range.

Noise: 10 mv rms maximum.

Accuracy: 0.025% of full-scale output.

Front Panel Controls

Shunt Cal- This switch puts a known resistor value across one arm of the transducer bridge to furnish a known output. The shunt cal-calibration resistor is located behind the removable front panel. The shunt cal resistor is mounted in pin jacks so other values may be used if needed. See the Customer Information Sheet for the shunt calibration resistance value installed in this unit.

Gain - The Gain control allows for a fine adjustment between the ranges of the gain switch. After the Gain switch is set up, the Gain

control is adjusted to give a calculated output voltage at the rear terminal when the Shunt Cal switch is pressed.

Zero - There are two Zero controls provided, Coarse Zero and Fine Zero. The range of these two controls are dependent upon the gain of the amplifier. The range of the coarse zero is equal to 4.5mv divided by the full scale (transducer output) millivolts, multiplied by 5 volts. The range of the Fine Zero is equal to 1.5mV divided by the full scale millivolts, multiplied by 5 volts.

Examples:

Coarse Zero

$$\frac{4.5\text{mV}}{10\text{mV Input Full Scale}} \times 5\text{v} \quad 2.25 \text{ volts}$$

Fine Zero

$$\frac{1.5\text{mv}}{10\text{mV Input Full Scale}} \times 5\text{v} \quad 0.75 \text{ volts}$$

Total Zero Range = 2.25 + 0.75 3.00 volts

Field Calibration Procedure

1. Apply power and allow unit to warm up for 30 minutes.

2. Check excitation at the rear connector terminal of each channel of the SA-BII (5 or 10 volts, pins 5 to 6 and pins 11 to 12).

3. With no load or pressure on the transducer, adjust the front panel Coarse Zero control for 0.000 volts at the rear connector terminals. Pins I and 7 are output common terminals.

4. A Transducer Calibration Record is shipped with each Sensotec transducer shipped. Included on this record are the full scale millivolt output, the shunt cal output, and shunt cal resistance used. A Customer Information Sheet is included with each SA System. This record supplies information such as the shunt cal resistance value installed and input range set at the factory. From these records, with the format below, calculate the shunt cal output voltage at the output terminal when the Shunt Cal button is pressed. In most cases this has been calculated for you. See document-adjustment number 087-0134-00.

$$\frac{\text{Shunt cal output (mV)}}{\text{Full Scale output (mV)}} \times 5 \text{ volts} = \text{Shunt cal output voltage}$$

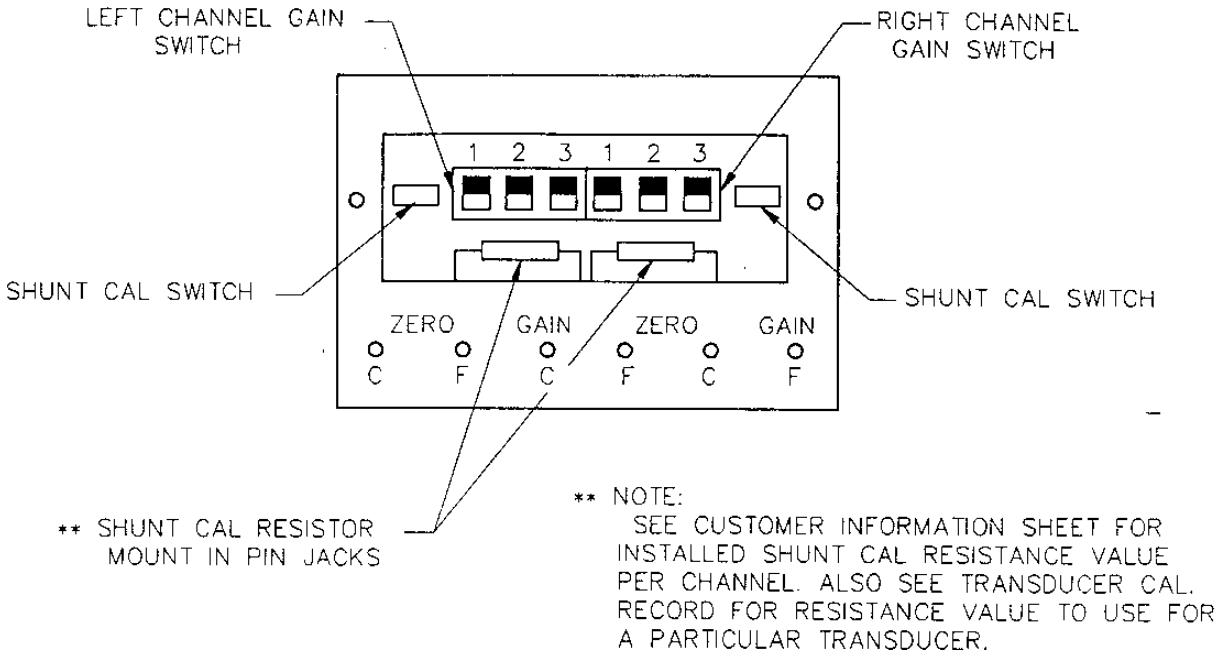
5. Press the Shunt Cal switch while reading the voltage at the rear output terminal. Adjust the Gain control for the voltage calculated in step 4. If this voltage cannot be obtained with the Gain control, the Gain switches must be changed. Remove the two screws near the side of the Shunt Cal switches and remove the panel. Behind the panel there are two sets of switches, one for each channel. Refer to the Transducer Calibration Record for the full scale output of the transducer

and the excitation voltage at which the transducer was calibrated. If the excitation voltage on the Transducer Calibration Record and the excitation checked in step 2 are the same, refer to figure 1. Find the nearest full scale input range to the transducer full scale output. Set the 3 switches to correspond with the configuration shown and repeat the first part of this step. If the two excitation voltages are different, use the follow following formula to find the correct input range.

$$\frac{\text{Full Scale Output}}{\text{Excitation on Transducer Record}} \times \text{Excitation at unit} = \text{Input}$$

Repeat the first part of this step. The shunt cal output calculated in step 4 will still be correct.

FIGURE 1
SA-BII SWITCH LOCATIONS



Millivolt. Input Full Scale	Switch S1	Switch S2	Switch S3
40 Millivolts	Down	Down	Down
35 Millivolts	Up	Down	Down
30 Millivolts	Down	Up	Down
25 Millivolts	Up	Up	Down
20 Millivolts	Down	Down	Up
15 Millivolts	Up	Down	Up
10 millivolt.	Down	Up	Up
5 Millivolts	Up	Up	Up

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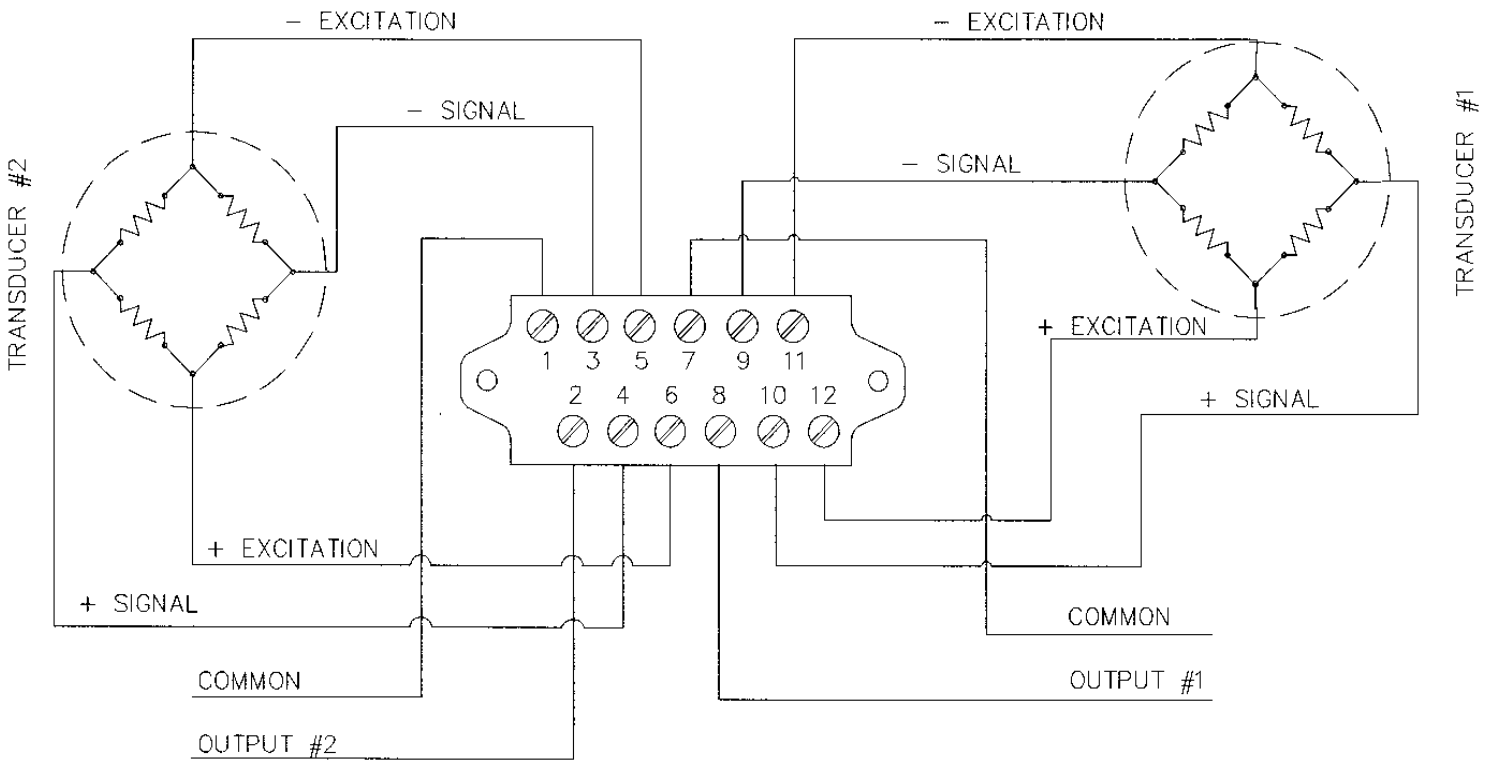

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