OM-13

FEATURES

- **Complete Strain Gage Bridge Signal Conditioner**
- **Isolated 4-20 mA or 0-20 mA Output**
- **Output Capable of Driving 1000 ohm Loop**
- **Bridge Balance with 80% Tare Offset Capability**
- **High Gain Amplifier; Can Accept Full Scale Live Load Signals as Low as 5 mV and Provide 16 mA Output Span**
- **Excitation Supply Capable of Drivlng Four Load Cells**
- **AC Powered**
- **Rugged Epoxy Encapsulated Deslgn**

APPLICATIONS

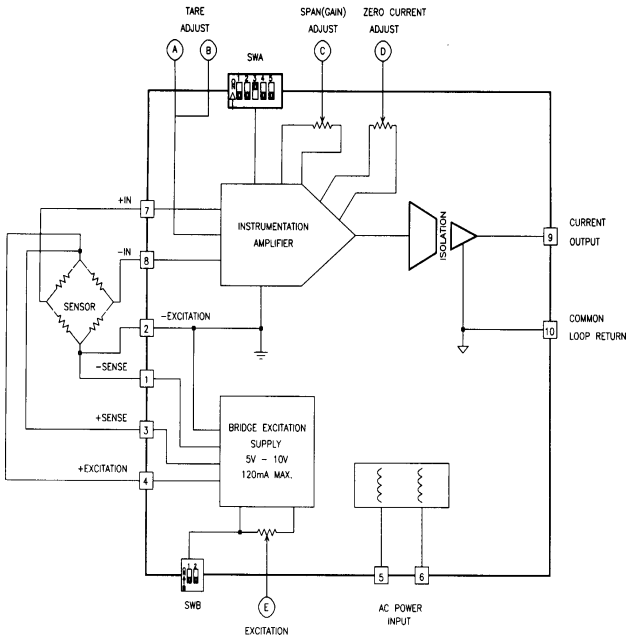
- **Weighing with Load Cells**
- **Process Control Add-on Loops**
- **Can Be Used With All Types of Low Output Sensors**

DESCRIPTION

The Model OM-13 is a self contained, AC powered signal conditioner for bridge type instrumentation. It contains a precision differential isolation amplifier with filtered output and a highly regulated, low noise, adjustable output bridge excitation source. The unit is completely encapsulated for use in rugged environments.

NOTE: Unless otherwise noted, specifications apply after one hour warm up at 25°C ambient. Temperature Coefficients apply between 0°C and 55°C ambient.

BLOCK DIAGRAM



Load Cell Central
P. O. Box 91 / 216 Main St.
Monroeton, PA 18832
Toll Free: 1-800-LOADCEL / 1-800-562-3235

Phone: 1-570-265-5015
Fax: 1-570-265-5148
Email: salesam@800loadcel.com
Web: www.800loadcel.com

SPECIFICATIONS

ISOLATION	
Input to Output	700VDC, 60pF
AMPLIFIER	
GAIN	
Adjustment Range	
Input for 4 - 20 mA Output	5mV to 50 mV
Linearity	±0.01% of Full Scale
Temperature Stability	50 PPM (0.005%/°C)
INPUT NOISE	
.1 Hz to 10 Hz	2µV PP
TARE ADJUSTMENT RANGE	
Bridge Offset	-3 mV to +25 mv (Equals 80% F.S. of 3mV/V cell)
INPUT RESISTANCE	
Differential and Common Mode	1000 megohm
COMMON MODE REJECTION, DC	100dB minimum
COMMON MODE INPUT	+5 Volts
OUTPUT	
ZERO ADJUST	0 to 4 mA
Temperature Coefficient	1µA/°C
CURRENT OUTPUT SPAN	4 to 20 mA or 0 to 20 mA
Compliance Voltage	-1 to +20 Volts
Current	-1 mA to +20 mA
Loop Resistance	0 to 1000 ohms
Frequency Response, -3dB	10 Hertz, 2 Pole Roll Off
Response Time	
Rise Time 10% to 90%	35 ms
To 0.1% of Final Value	100 ms
BRIDGE SUPPLY	
VOLTAGE ADJUSTMENT RANGE	5 to 10 Volts
Temperature Coefficient	100 PPM Typical
Fixed	10.2V ±2.5%
Temperature Coefficient	60 PPM Typical
LOAD CURRENT	0 to 120 mA
REGULATION - LOAD AND LINE	0.02% maximum
OUTPUT NOISE	
120Hz Bandwidth	1 mV RMS, maximum
POWER INPUT	115 VAC, ±1OV 50/60Hz @ 7 VA
Optional	100, 220 or 230 VAC, ±10%
LINE ISOLATION	
Capacitance	60pF
Dielectric Withstand	1100 Volts RMS
ENVIRONMENT	
Ambient Operating	-25°C to +55°C
Storage	-25°C to +85°C
WEIGHT	18 oz. (510 grams)
SIZE	3.75" L x 2.0" W x 3.0" H (9.53 cm x 5.1 cm x 7.62 cm)

GETTING STARTED WITH THE MODEL OM-13

1. Excitation Supply. If remote sensing is not used, connect +Sense to +Excitation, terminal 3 to 4, and connect -Sense to -Excitation, terminal 1 to 2.

2. Apply power to the Model OM-13 and adjust the Excitation supply. Turn SWB-1 "ON" for a fixed 10 Volts. This will set the supply to 10.2±2.5% and provide the best temperature stability. For voltages between 5 and 10 Volts, place SWB-1 in the "OFF" position and set the Excitation Supply with potentiometer E. SWB-2 may be in either position.

3. Turn the power to the Model OM-13 off and connect the load cell to the Model OM-13 Excitation terminals and the Amplifier Inputs.

4. Turn on power to the OM-13.

5. Turn SWA-3 “ON”. (To set output ZERO current with pot D.)

6. Select the expected full scale signal range according to the table with SWA-4 and SWA-5. If the output from the load cell is not known, set both SW-4 and SW.5 “ON” for the 40-50mV range.

7. Set SWA-2 “OFF" for 4mA or SWA-2 "ON" for 0mA output ZERO.

8. Adjust D potentiometer for desired ZERO current.

9. Turn SWA-3 ‘OFF”. Expect output current to change.

10. Apply no load or dead weight to load cell.

11. Adjust TARE potentiometers A and B for the same ZERO current set in Step 8. SWA-1 “OFF” provides a bridge output balance of -3mV to +l5mV, and “ON” between +15mV and +25mV.

12. Apply full scale load and adjust SPAN (GAIN) potentiometer C for the desired full scale output current. Set Range switches SWA-4 and SWA-5 as required..

13. Remove full scale load and check ZERO output current. Adjust FINE TARE potentiometer A if required..

14. Recheck full scale as in Step 12.

15. End..

Note: If the amplifier is used without using the OM-13 Excitation Supply, the external power supply low side must be connected to the -EXCITATION terminal 2 on the Model OM-13, or one of the inputs must be tied to terminal 2, -EXCITATION. This provides a DC return path for the finite amplifier input current.

AMPLIFIER

The amplifier is a true differential input, low drift Instrumentation Amplifier with less than 100pA input current. It has a common mode-range of 5 Volts with respect to the -EXCITATION supply terminal and

a minimum of 100dB rejection of the common mode voltage. The input amplifier and excitation supply are DC isolated from the AC line and the current output.

The isolated output current source has a compliance of 20 Volts to allow the Model OM-13 to operate with zero to 1000 Ohms of loop resistance.

TARE WEIGHT COMPENSATION

The Model OM-13 has two different zero controls. One is called the OUTPUT zero and can be set to 0mA or 4mA with SWA-2. The other zero control is called TARE. SWA-1 allows the selection of one of two TARE ranges, -3mV to 15mV or +15mV to +25mV. Potentiometers are available for COARSE and FINE TARE adjustments.

CONNECTING TO A SENSOR

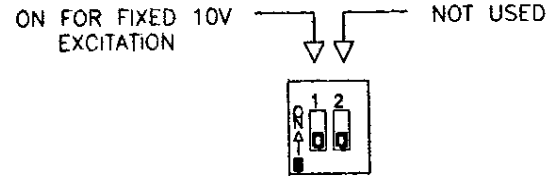
Any amplifier has a finite input current which must have DC return path to the amplifier power supplies. This path is automatically provided when the Model OM-13 Bridge Excitation Supply is used to excite the sensor. If an external supply is used, one side of the external supply must be connected to the Model OM-13 common, Terminal 2. Be sure that the common mode voltage limits are observed. This would generally limit the external power supply to 10 Volts assuming that half the voltage would be common mode, as is the case when exciting a full bridge.

When the full scale output of a sensor is measured in millivolts, say 10 millivolts, care must be exercised in wiring systems. At 10 millivolts full scale, each microvolt (10^{-6} volts) contributes 0.01% of full scale output. Wire connections can generate microvolts of potential due to contact potentials. These will also be thermoelectric potentials and thus vary with temperature differences. All wires used in connecting up the Model OM-13 should be of the same material. If any intervening connections are made such as a terminal block, the terminal block connecting points should have good thermal contact so they will always be at the same temperature and thus cancel each other.

TRANSDUCER EXCITATION

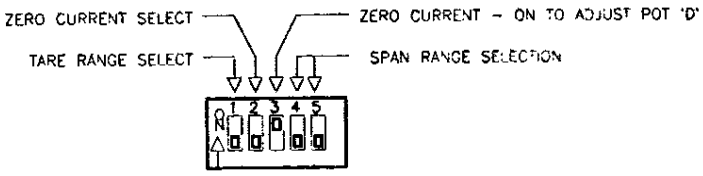
The bridge excitation supply voltage is set by SWB-1 and potentiometer E. Set SWB-1 ON for a fixed 10 Volts. This will provide the best temperature stability. The supply can be adjusted between 5 and 10 Volts by setting SWB-1 OFF and adjusting potentiometer E. The supply will deliver up to 120mA current at any voltage setting to power up to four 350 ohm sensors.

SWB - EXCITATION VOLTAGE



SWB-1	EXCITATION VOLTAGE
ON	FIXED 10 VOLTS
OFF	ADJUSTABLE

SWA - CONTROL SWITCH

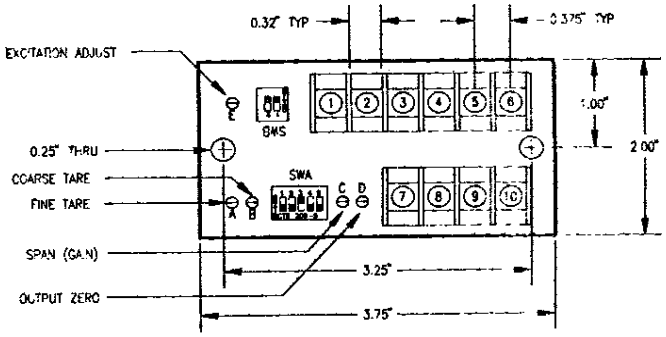


SWA-1	TARE RANGE
OFF	-3mV to +15 mV
ON	+15 mV to +25 mV

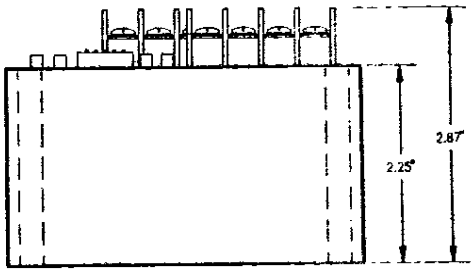
SWA-2	ZERO CURRENT
OFF	4 mA
ON	0 mA

SWA-4	SWA-5	SPAN RANGE
ON	ON	40 mV to 50 mV
OFF	ON	20 mV to 40 mV
ON	OFF	10 mV to 20 mV
OFF	OFF	5 mV to 10 mV

CASE DIMENSIONS



TOP VIEW



SIDE VIEW

TERMINAL STRIP ASSIGNMENTS			
SCREW TERMINAL	FUNCTION	SCREW TERMINAL	FUNCTION
1	-SENSE	6	AC
2	-EXCITATION	7	+SIGNAL
3	+SENSE	8	-SIGNAL
4	+EXCITATION	9	OUTPUT
5	AC	10	RETURN