

Linear Accelerometer

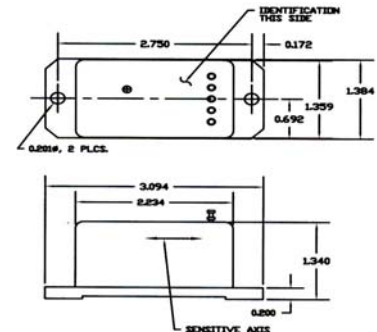
SA-100MR

The Columbia Model SA-100MR offers the superior performance of force balance technology with the flexibility of multiple operating ranges for DC and low frequency measurements. The accelerometer is self-contained and provides a high level, low impedance output. No signal conditioning is required in most applications.

The full range for Model SA-100MR is specified when the accelerometer is ordered. The range may then be adjusted from 0.05 to 1 times the full range by means of an external resistor. The selected range always corresponds to an output of ± 7.5 volts. The noise floor remains constant and does not increase as the scale factor is increased, thereby achieving the optimum signal-to-noise ratio for any range selected.

Note: Exports of accelerometers from the United States are subject to the licensing requirements of the Export Administration Regulations (EAR) and/or the International Traffic in Arms Regulations (ITAR).

- * **Selectable-Range Sensor**
- * **+/-15 VDC Operation**
- * **Low Cost / Flexibility**



Specifications

SA-100MR	
Operational	
Full Scale Ranges Available	$\pm 1G$, $\pm 5G$, $\pm 10G$, $\pm 50G$
Output Voltage	± 7.5 Volts Adjustable from F.R. to 10% of F.R.
Excitation	± 12 VDC To ± 15 VDC 8 mA Standby, 20 mA @ F.R.
Output Impedance	100 Ohms Typical
Sensitive Axis Alignment	Better Than 0.25 Deg.
Scale Factor Tolerance	$\pm 1\%$
Scale Factor Temp Coefficient	$\pm 0.02\%$ / Deg C
Zero Bias	$\pm 0.15\%$ F.R.
Null Temp Sensitivity	0.00015% F.R. / Deg C
Natural Frequency	50 To 500 Hz Min., Dependent upon Range
Damping	Refer to Figure 1
Output Noise	0.002 V RMS Independent of S.R.
Cross Axis Sensitivity	0.002 G/G Exclusive of Axis Alignment
Non-Linearity	$\pm 0.1\%$ F.R.
Hysteresis & Non-Repeatability	0.02% F.R.
Threshold & Resolution	0.0005% F.R.

Environmental

Temperature, Operating	-50 To +85 Deg C
Temperature, Storage	-50 To +85 Deg C
Vibration Survival (2 To 2,000 Hz)	
Range $\pm 1G$	5 G P/P
Ranges $\pm 5G$, $\pm 10G$, $\pm 50G$	10 G P/P
Shock Survival	
Range $\pm 1G$	50 G, 1 mSec Half Sine
Ranges $\pm 5G$, $\pm 10G$, $\pm 50G$	150 G, 1 mSec Half Sine
Ambient Pressure	0 To 5 Atmospheres
Humidity	95% R.H.

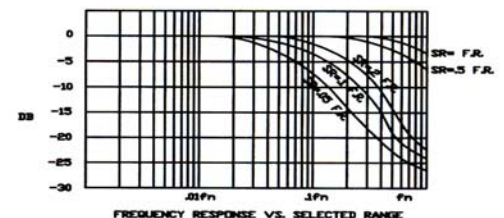
Physical

Weight	4 Oz (113.4 Gm)
Size	3.09 In L x 1.38 In W x 1.34 In H (79.5 cm L x 35.1 cm W x 34.1 cm H)
Case Material	Anodized Aluminum
Sealing	Environmental
Electrical Interface	5 Terminal Pins

I/O Terminal Pin Functions:

Pin	Function	Pin	Function
A	+15 VDC	D	Output
B	Ground	E	Range Select
C	-15 VDC		

Figure 1



Full Range (F.R.) is defined as the maximum measuring range of the accelerometer obtained with the sensitivity adjusted to the minimum value. The full range is specified when the accelerometer is purchased. The user may then adjust the selected range (S.R.) from 0.05 to 1 times the full range. The selected range (S.R.) always has an output voltage equal to ± 7.5 for any SA-100MR.

The selected range (S.R.) is adjusted by means of a resistor placed between the output terminal and the range select terminal. The resistor should be limited to values between 1,000 ohms and 20,000 ohms corresponding to a selected range (S.R.) determined from the following relation:

$$R_{sel} = \frac{F.R. \times 1000}{S.R.}$$

R_{sel} should have as stable a temperature coefficient as possible and a power rating of no less than 0.125 watt.

Ordering Information:

SA-100MR (+/- X G)
Standard Accelerometer
 Full Range +/- X G (Required)

R111505