

#### **Airborne charge amplifiers** Model 2680M1-M7 OUTPUT (VIKING #VR5/4AG15 OR EQUIVALENT) 0 STANDARD TOLERANCE INCHES (MILLIMETERS) .XX = +/- .02 (.X = +/- .5) .XXX = +/- .010 (.XX = +/- .25) .154 (3.91) DIA 2 PL INPUT (MICRODOT #51-49 OR EQUIVALENT) 10-32 UNF-2A THD COUNTERBORED FOR #6 CAP SCREW ļ Ŵ (+ Å .755 (19.18) .745 (18.92) 1.000 (25.40) 1.000 (25.40) በተሰሰሰ .120 (3.05) .120 (3.05) .750 (19.05) .200 (5.08) 1.255 (31.75) 1.245 (31.62) 1.500 (38.10) .060 (1.52)

# Key features

- For use with piezoelectric transducers
- Small, rugged, light weight
- Dual outputs, biased and unbiased
- Adjustable gain
- Optional low pass filter

# Description

Models 2680M1-XXX through 2680M7-XXX charge amplifiers are designed for use with piezoelectric trans-ducers and are suitable for airborne applications. Hybrid microcircuit construction results in small size, ruggedness and low power consumption. The airborne charge amplifiers have an output voltage propor-tional to the input charge. As a result, the amplifier sensitivity is not appreciably affected by the capacitance of the input cable.

The use of modular construction techniques permits great versatility in gain and filter choices. This unit has two outputs, a biased output and an unbiased output. Both outputs are adjustable with a common gain control. The M1 through M7 defines the charge gain per Table 1.

The -XXX describes the upper cutoff frequency (-5% point) per Table 2. For example, a -101 has a low pass filter which is flat up to 100 Hz, a -502 has a low pass filter which is flat up to 5000 Hz.



# Airborne charge amplifiers | Model 2680M1-M7

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

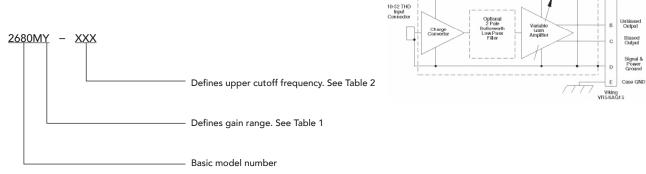
nputs				
nputs				
Туре	Piezoelectric single-ended with one side connected to signal ground			
Source resistance	3 MΩ minimum			
Source capacitance	10 000 pF max			
Overload recovery	A half sine pulse of 1ms duration and with an amplitude as specified in Table 1 (or less) will			
	cause no spurious effects at the amplifier output other than clipping.			
Outputs				
Туре	Both biased and unbiased outputs are single-ended with one side connected to circuit ground.			
Load impedance	The parallel combina	The parallel combination of both outputs load resistors shall be 10 k $\Omega$ or greater to meet all		
	specifications.			
Output impedance	Biased output	50 $\Omega$ max, direct coupled		
	Unbiased output	50 $\Omega$ max, in series with at least 16 $\mu$ F		
DC output bias voltage	Biased output	2.50 V ±3% with load resistances of 10 k $\Omega$ minimum		
1 0	Unbiased output	0.00 V +0.050 V / -0.00 V		
Linear output voltage	Biased output	4.65 V pk-pk minimum with 10 k $\Omega$ load		
	Unbiased output	4.65 V pk-pk minimum with 1 M $\Omega$ load		
		4.25 V pk-pk minimum with 10 k $\Omega$ load		
Limited output voltage (biased output)	0 00 V +0 075/-0 00	0.00 V +0.075/-0.000 V and 5.30 V +0.00/-0.30 V		
Limited output voltage (blased output) Limited output current (both output)				
	о.чоо писрк-рк піпі	0.465 mA pk-pk minimum with 10 kΩ load		
Transfer Characteristics				
Gain range		Adjustable as specified in Table 1		
Gain stability		0.05% maximum change per 1000 pF change in source capacitance at the input		
Gain stability with supply voltage		h changes in supply voltage over the specified limits		
Frequency response	The gain at the uppe 2.	The gain at the upper and lower cutoff frequencies is 5% lower than the gain at 20 Hz. See Table 2.		
Amplitude linearity	±0.5% of reading fro	m best fit straight line approximation		
Residual noise	0.01 pC rms + 0.01 p	C rms per 1000 pF RTI or noise RTO as specified in Table 1 whichever is		
		rred over a bandwidth of 3 Hz to 20 kHz		
Shock and vibration sensitivity	-	0.01 pC/g maximum RTI		
Environmental Characteristics				
Temperature	Operating	-67°F to 212°F (-55°C to 100°C)		
· · · · · · · · · · · · ·	Storage	-99°F to 257°F (-73°C to 125°C)		
Humidity	-	ling screw is soldered. Meets MIL-STD-810D, Method 507.2, Procedure III		
Altitude		ng screw is soldered.		
Vibration	120 mils D.A.	5 Hz to 55 Hz		
		5 Hz to 2000 Hz		
Shook 100 a	20 g			
Shock 100 g	6.5 millisecond sawto			
EMC capability		equirements of the following specifications:		
	MIL-STD-826, CLASS	5 Am; MIL-I-6181D; MSFC-SPEC-279, CLASS 1; AF/BSD EXHIBIT 62-87		
Power				
Voltage	20 to 32 VDC (28 VD			
Current	20 mA maximum for	unfiltered units, 25 mA maximum for filtered units		
Polarity protection	Not damaged by a p	olarity reversal of the 28 V supply		
Case isolation	Case and signal grou	Case and signal grounds isolated from each other by 50 M $\Omega$ or greater at 50 VDC		
Physical Characteristics				
Dimensions	1.00"   x 1.00" w x 0	.75" h (25.4 mm x 25.4 mm x 19.1 mm) exclusive of mounting flange and		
connectors				
Mounting	Unit mounts with two 6-32 screws			
Case material	Aluminum with electroless nickel plate finish			
Case material Weight	1.2 oz (34 am) mavin	num		
Weight	1.2 oz (34 gm) maxin Input			
	1.2 oz (34 gm) maxin Input Output	num 10-32 coaxial Viking VR5/4AG15. Pin A is the 28 VDC, Pin B unbiased output, Pin C		

### Airborne charge amplifiers | Model 2680M1-M7

Accessories				
Options	Description	2680M1-M7		
21997	Accessory Kit:			
	EP38 - Mating plug (Viking #VP5/4CE6), QTY 1	Included		
	EP35 - Hood (Viking #VS4/16C5), QTY 1	Included		
	EP31- Potting sleeve (Viking #VS4/16C9), QTY 1	Included		
	EHW172 - Lockwasher, #6, QTY 2	Included		
	EH293 - Screw, CAP 6-32 X 3/4, QTY 1	Included		
	EH535 - Screw, CAP 6-32 X 1/4, QTY 1	Included		

### Notes

- Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 1. 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.
- 2. Model number definition:



"M" number	Gain range [mV/pC]	Input pulse [pC]	Residual noise [mV rms]
M1	0.1 to 1.0	50 000	1.5
M2	0.2 to 2.0	25 000	1.5
M3	0.5 to 5.0	10 000	1.5
M4	1.0 to 10.0	5000	1.5
M5	2.0 to 20.0	2500	1.5
M6	5.0 to 50.0	1000	1.5
M7	10.0 to 100	500	2.0

Dash No.	Lower cutoff freq. [-5%]	Upper cutoff freq. [-5%]
None	5 Hz	20 kHz (10 kHz for M7)
101	5 Hz	100 Hz
201	5 Hz	200 Hz
501	5 Hz	500 Hz
102	5 Hz	1 kHz
202	5 Hz	2 kHz
502	5 Hz	5 kHz
103	5 Hz	10 kHz
203	5 Hz	20 kHz (10 kHz for M7)
402	5 Hz	4 kHz
250	5 Hz	25 Hz

Table 1: Gain ranges

Table 2: Frequency response



10869 NC Highway 903, Halifax, NC 27839 USA

endevco.com | sales@endevco.com | 866 363 3826

© 2021 PCB Piezotronics - all rights reserved. PCB Piezotronics is a wholly-owned subsidiary of Amphenol Corporation. Endevco is an assumed name of PCB Piezotronics of North Carolina, Inc., which is a wholly-owned subsidiary of PCB Piezotronics, Inc. Caroumetrics, Inc. and The Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. The Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. The Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. Inter Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. The Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. Inter Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc. Inter Modal Shop, Inc. are wholly-owned subsidiaries of PCB Piezotronics, Inc., PCB Piezotronics of North Carolina, Inc. (d/b/a Endevco), The Modal Shop, Inc. or Accumetrics, Inc. Detailed trademark ownership information is available at www.pcb.com/trademarkswership.

A +28 VDC