

# Differential Remote Charge Converter (DRCC)

## Model 1772M3-XX

(for use with the Model 6233C-10 Accel)



### Product description

This specification describes the Parker Meggitt Model 1772M3-XX Differential Remote Charge Converter with transducer resonance suppression designed for high-temperature differential piezoelectric (PE) (HTPE) transducer 6233C-10 connected with cable 2001M1. The 6233C-10 is operating at temperatures up to +482°C(+900°F).

The circuit provides suppression of the PE transducer's resonance and extends its frequency bandwidth about two times at the level of  $\pm 5\%$ . The DRCC converts the PE transducer high impedance charge output into a low impedance voltage output. The sensitivity is not affected by the PE transducer and cable capacitances. The combination of 6233C-10 with the 1772M3 creates the highest temperature widest bandwidth differential piezoelectric accelerometer available on the market.

#### Model Number Definition:

1772M3-01: Fixed gain of 1 mV/pC  
1772M3-05: Fixed gain of 5 mV/pC  
1772M3-10: Fixed gain of 10 mV/pC

### Key features and benefits

- Extends PE transducer frequency bandwidth about two times ( $\pm 5\%$  from 5 KHz to  $\sim 10$  KHz)
- Provides PE transducer's resonance suppression about 4 times
- Operates over voltage supply 24-30 Vdc and current supply 8-16 mA
- Has 2-wire output and 2-pin differential input.
- Radiation resistant: 1.0 MRads (integrated Gamma)
- Gains of 1, 5, 10 mV/pC
- Operation over temperature range of  $(-5^{\circ}\text{C to } +85^{\circ}\text{C})$   $+23^{\circ}\text{F to } +185^{\circ}\text{F}$
- Compliance: Industrial CE Standard Class A & RoHS
- Small size and weight

### Applications

- Operates with extreme high temperature Differential PE transducers having resistance of  $\geq 10 \text{ k}\Omega$
- Higher frequency bandwidth measurements.



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Specifications				
The following performance specifications are typical values, referenced at +24°C (+75°F) unless otherwise noted.				
Electrical Characteristics				
Input characteristics				
Input Connection	Input is 2-pin differential with cable shield connected to signal ground			
Source Resistance, RPE	RPE ≥ 10 kΩ			
Source Capacitance, CPE	CPE ≤ 5,000 pF			
Input Range	3000 pCpk (-01), 600 pCpk (-05), and 300 pCpk (-10)			
Common Mode Rejection Ratio	≥ 40dB			
Output characteristics				
Output Connection	The output is single ended with one side connected to signal ground			
Output Impedance	50 Ohm maximum			
Resistive Load	The output is direct coupled and requires capacitive decoupling for resistive loads			
DC Output Bias	+12.0 Vdc to +17.0 Vdc over all temperature range			
Vpk (6 V pk-pk)				
Maximum Output Voltage	3 Vpk (6 V pk-pk)			
Electrical Noise at the output				
CPE = 1000 pF				
Broadband noise		(-01)	(-05)	(-10)
(1 Hz - 10 kHz)	μV rms	40	20	30
Spectral density noise	μV/√Hz			
	1 Hz	12	16	25
	10 Hz	1.6	2.4	6
	100 Hz	0.3	0.3	0.5
	1 kHz	0.2	0.2	0.2

### Transfer Characteristics

Gain at 100 Hz	1772M3-01:	1 mV/pC +2/-4%
	1772M3-05:	5 mV/pC +2/-4%
	1772M3-10:	10 mV/pC +2/-4%
Total sensitivity of 6233C-10 with 1772M3-XX		
	6233C-10 & 1772M3-01:	10 mV/g +7/-9 %
	6233C-10 & 1772M3-05:	50 mV/g +7/-9 %
	6233C-10 & 1772M3-10:	100 mV/g +7/-9 %



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Frequency Response  
(Reference to 100Hz)

	<b>1772-M3-01 alone:</b>	<b>1772M3-05 alone:</b>	<b>1772M3-10 alone:</b>
5 %:	≤ 10 Hz - 6.5 kHz	≤ 10 Hz - 7.2 kHz	≤ 20 Hz - 7.4 kHz
+10 %:	≤ 5.6 Hz - 9.0 kHz	≤ 7.5 Hz - 9.0 kHz	≤ 13.5 Hz - 9.25 kHz
-3 dB:	≤ 3 Hz - 12.5 kHz	≤ 3 Hz - 13 kHz	≤ 6.5 Hz - 13.4 kHz

Frequency Response of PE transducer 6233C-10 alone (typical plot is shown in Figure 1):

± 5 %:	10 Hz - 5 kHz
± 10 %:	1 Hz - 9 kHz
- 3 dB:	1 Hz - 12 kHz

Frequency Response of the PE Transducer 6233C-10 used with 1772M3-XX (typical plot shown in Figure 2):

	<b>6233C-10 &amp; 1772M3-01:</b>	<b>6233C-10 &amp; 1772M3-05:</b>	<b>6233C-10 &amp; 1772M3-10:</b>
5 %:	≤ 10 Hz - 10 kHz	≤ 10 Hz - 10 kHz	≤ 20 Hz - 10 kHz
+10 %:	≤ 5.6 Hz - 13 kHz	≤ 7.5 Hz - 13 kHz	≤ 13.5 Hz - 13 kHz
-3 dB:	≤ 3 Hz - 22 kHz	≤ 3 Hz - 22 kHz	≤ 6.5 Hz - 22 kHz



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6233C-10 Alone

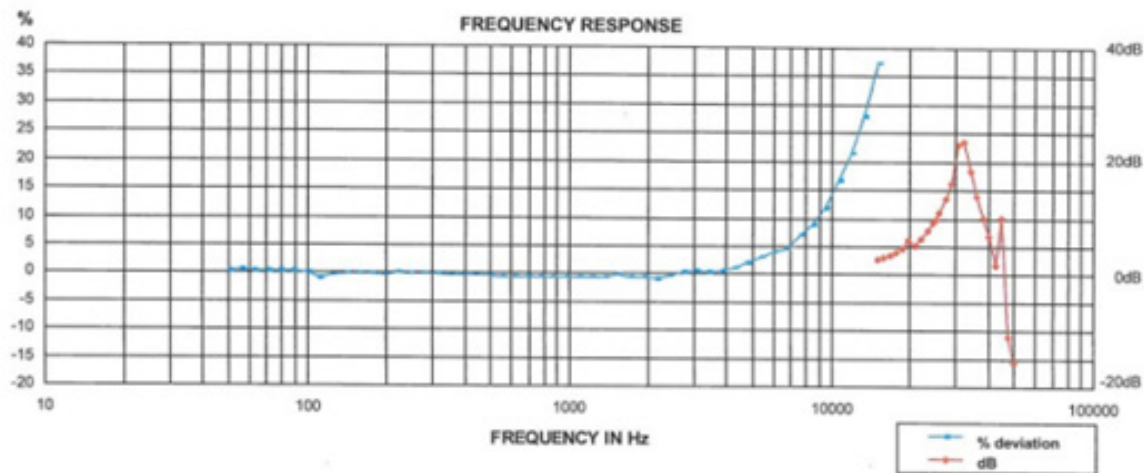


Figure 1

6233C-10 & 1772M3-XX

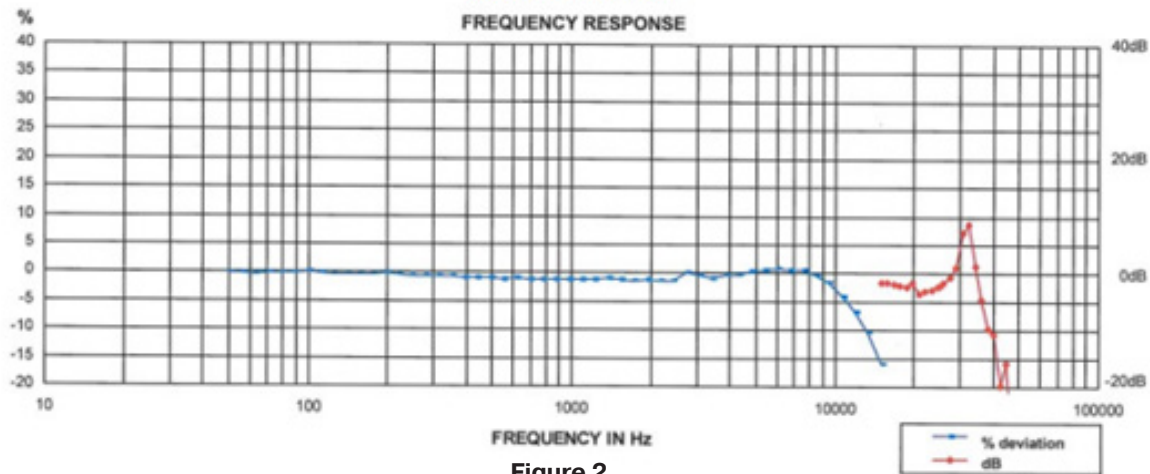


Figure 2



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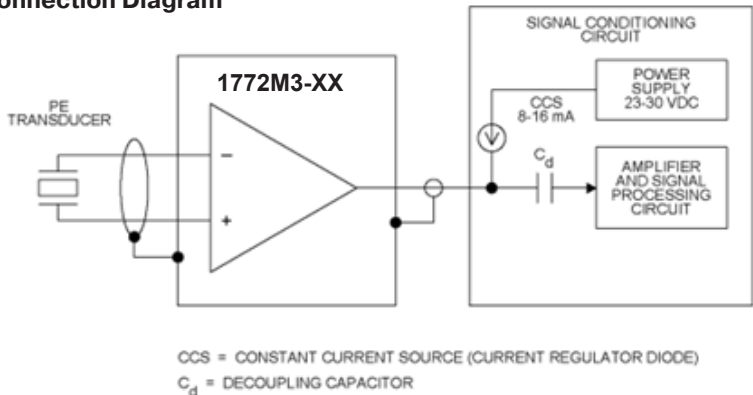
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Specifications	
<b>Gain Stability</b>	
With Temperature	The gain will change less than $\pm 1\%$ referred to the $+25^{\circ}\text{C}$ ( $+75^{\circ}\text{F}$ ) gain over the temperature range
Total Harmonic Distortion	Less than 1% for output signals
<b>Power requirements</b>	
The remote charge converter is designed to be powered from a positive constant current supply	
Current Requirement	+8 mA to +16 mA
Voltage Supply	+24 Vdc to +30 Vdc
Warm Up Time	10 seconds to meet 3 V pk output voltage
<b>Physical</b>	
Dimensions	See Outline Details Below
Weight	Maximum 2.0 oz (56.7 grams)
Case material	
Case Material	Stainless steel
Input Connector	2 pin receptacle 70082, case shield connected to signal ground
Output Connector	BNC Coaxial Connector
<b>Environmental</b>	
Temperature	
Operating Temperature	$-5^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ ( $+23^{\circ}\text{F}$ to $+185^{\circ}\text{F}$ )
Humidity	The unit will withstand 95% relative humidity.
Vibration	20 g pk level with frequency sweep from 55 Hz to 2000 Hz
Shock	100g pk amplitude with 3.6ms half-sine pulse
Radiation	1.0 MRads (integrated Gamma)
Compliance	Industrial CE standard class A

### Connection Diagram



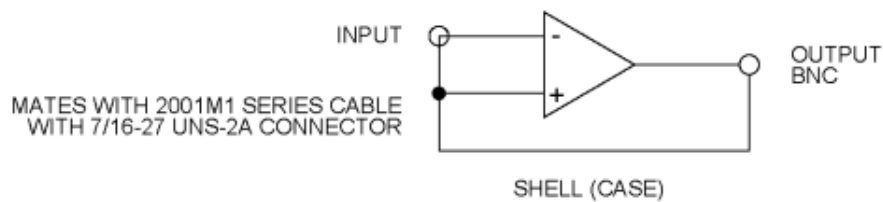
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# Differential Remote Charge Converter (DRCC)

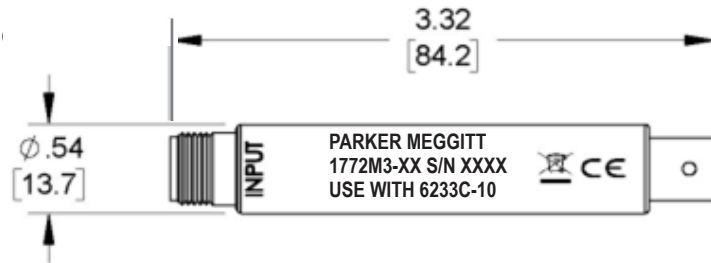
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### AMPLIFIER BLOCK DIAGRAM



### Outline Details



STANDARD TOLERANCE	
INCHES	[MILLIMETERS]
.XX = ± .02	[.X = ± .5]
.XXX = ± .010	[.XX = ± .25]



Continued product improvement necessitates that MEGGITT reserve the right to modify these specifications without notice. MEGGITT maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. 010121



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Note: Due to continuous process improvement, specifications are subject to change without notice. TCO Review # 352