**R3α Sensor**

*General Purpose, 30 kHz Resonant Frequency Acoustic Emission Sensor*

**Description and Features**

The R3α sensor cavity is machined from a solid stainless steel rod, making the sensor extremely rugged and reliable. The ceramic face electrically isolates the sensor from the structure to assure a low noise operation.

Most low frequency AE sensors are relatively large. However, the R3α sensor has the same compact size as our other Alpha series sensors and boasts a low frequency, 30 kHz resonant response. This feature makes it extremely useful in tight areas that require a low frequency sensor for testing.

The Alpha series family of sensors features SMA connectors versus the Microdot connectors found on PAC’s RXX series of passive sensors. The Alpha series includes R3α, R6α, R15α, R30α, R50α, R80α and WSα sensors.

**Application**

This sensor is normally selected for structural health monitoring of small to medium concrete and geologic structures and for concrete and metal pipeline leak detection applications where there needs to be high acoustic background noise rejection and distances between sensors can be relatively close (tens of feet).

**Operating Specifications**

**Dynamic**

- Peak Sensitivity \( V/(m/s); [V/\mu bar] \) ..... 80 [-63] dB
- Operating Frequency Range .............. 25 - 530 kHz
- Resonant Freq. \( V/(m/s); [V/\mu bar] \) ..... 29 [140] kHz
- Directionality .............................. ±1.5 dB

**Environmental**

- Temperature Range ......................... -65 to 175°C
- Shock Limit ................................. 500 g
- Completely enclosed crystal for RFI/EMI immunity

**Physical**

- Dimensions ...... 0.75” dia. x 0.88” h (19 x 22.4 mm)
- Weight ........................................... 41 grams
- Case Material ............................. Stainless Steel
- Face Material ................................. Ceramic
- Connector ........................................ SMA
- Connector Locations ............................ Side
- Seal .................................................. Epoxy
- Sensor to Preamp Cable (1 or 2 meters) ...... 1232-X-SMA

**Ordering Information and Accessories**

R3α ............................................... R3α or R3a
Magnetic Hold-Down .............................. MHR15A
Preamplifier ...................................... 0/2/4, 2/4/6
Preamp to System Cable (specify length in meters) ...... 1234 - X

Sensors include
- NIST Calibration Certificate & Warranty

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*Frequency response of the R3α.  Calibration based on ASTM E1106; Calibration based on ASTM E976.*

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Due to continuing improvement, Physical Acoustics Corp. (PAC) reserves the right to amend specifications without notice.

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Rev. 02/05  #201-04