R3I-AST Sensor

Integral Preamplifier
Acoustic Emission Sensor

Description and Features
PAC’s integral preamp sensors were specifically engineered to attain high sensitivity and have the capability to drive long cables without the need for a separate preamplifier. Incorporating a low-noise input, 40 dB preamplifier and a filter all inside the sensor housing, these transducers are completely enclosed in metal stainless steel (or aluminum) housings that are treated to minimize RFI/EMI interference. Care has also been taken to thermally isolate the critical input stage of the preamplifier in order to provide excellent temperature stability over the range of -35º to 75º C.

Their integrated Auto Sensor Test (AST*) capability allows these sensors to pulse as well as receive. This feature lets you verify the sensor coupling and performance at any time throughout the test.

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

Operating Specifications

Dynamic
Peak Sensitivity, Ref V/(m/s) .................... 120 dB
Peak Sensitivity, Ref V/µbar ..................... -38 dB
Operating Frequency Range ............. 10 - 40 kHz
Resonant Frequency, Ref V/(m/s) ...............26 kHz
Resonant Frequency, Ref V/µbar .................31 kHz
Directionality ................................... +/-1.5 dB

Environmental
Temperature Range ...................... -35 to 75ºC
Shock Limit ......................................... 500 g

Physical
Dimensions .................. 1.13” diameter x 1.54” h
............................................... (29 x 39 mm)
Weight ............................. 147g with 1m cable
Case Material ..................... Stainless Steel (304)
Face Material ................................ Ceramic
Connector .............................................. BNC
Connector Locations ...................... Side

Ordering Information and Accessories
R3I ........................................................ R3I-AST
Cable (specify cable length) .................. 1234 - X
Magnetic Hold-Down ................................ MHR3I
Amplifier ..................................................... AE2A

Sensors Include
NIST Calibration Certificate & Warranty

Frequency response of the R3I-AST. Calibration based on ASTM E1106; Calibration based on ASTM E976.

* AST — Auto Sensor Testing feature allows AE systems to control the sensor as a pulser and a receiver at the same time. It can therefore characterize its own condition as well as send out a simulated acoustic emission wave that other sensors can detect, so the condition of the nearby sensors also can be tested.