

Non-Intrusive Ultrasonic Sensors for Corrosion/Erosion Monitoring

Sensor Networks, Inc. (SNI) offers its smartPIMS product line with 3 different ultrasonic transducer types: Single-element, dual-element and delay-line.

Each “sensor” type should be selected based largely on temperature range, number of point to be monitored and the severity of the expected metal loss.

SNI can assist in the sensor selection process.

single-element
transducer

dual-element
transducer

high-temp
delay-line
transducer

“We only use smartPIMS[®] magnetic UT probes for in situ corrosion monitoring; we’re forbidden to weld on operating equipment.”

- REFINERY CUSTOMER

“With multiple magnetic probes, we can measure several locations and then reposition based on UT and AUT data.”

- MIDSTREAM CUSTOMER

monitor corrosion rate

resolution to 0.001" (0.025mm) • high-risk areas • historically problematic locations

monitor “low spots”

post-NDE screening of pits to monitor remaining thickness • measures down to 0.040" (1.02mm)

replace/augment intrusive methods

validation of coupons, ER probes, etc.

reduce costs

reduce scaffolding and insulation removal/refitting for internal corrosion monitoring • more accurate/reliable data improving operations

Transducers available to withstand -22°F (-30°C) to 932°F (500°C).

Maintains 1 mil (0.001" / 0.025mm) precision and 0.040" (1mm) minimum wall thickness.

Sensors install buried or above-ground, temporarily or permanently.

ATEX, IECEx, UL/CSA and Japanese hazardous-area certifications.



Specifications



XD-101 and XD-301 attached with magnets



XD-101 and XD-301 attached with hose clamp



Non-magnetic vessel monitoring with "duals" via stud-welded brackets.






XD-201 probes attached with U-bolt

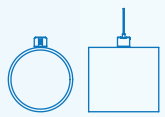
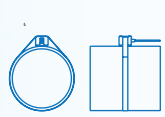
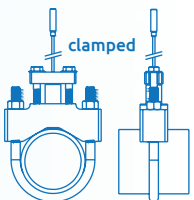


XD-201 probes attached with clamp

Transducers

type	standard-temp single-element	high-temp dual-element	ultra-high-temp single-element delay line
model no.	XD-101	XD-301	XD-201
			
application	general purpose	severe corrosion	ultra-high-temp
overall (dia. x h)	1.25x1.5" / 31.8x12.7 mm	1.25x1.0" / 31.8x25.4 mm	0.8x2.4" / 20.3x61.0 mm
probe face (dia.)	0.3"/7.6mm	0.43"/11mm	0.6"/15.2mm
active area (dia.)	0.25"/6.35mm	0.375"/10mm	0.375"/10mm
cable exit	0 deg (top)	90 deg (side)	0 deg (top)
rigid stem length	n/a	n/a	13"/330mm
resolution	0.001" / 0.025mm	0.001" / 0.025mm	0.001"/0.025mm
thickness range	0.200-6.0" / 5.1-150.0mm	0.040-6.0" / 1.0-150.0mm	0.125-1.0" / 3.0-25.0mm
temp range	-5 to +150°F / -20 to +80°C	-5 to +275°F / -20 to +132°C	-5 to +932°F / -20 to +500°C
frequency	5 MHz	5 MHz	7 MHz
cable protection	plastic conduit, high-temp spiral wrap, steel armored cable		high-temp spiral wrap, steel armored cable
cable length	10' / 3m, 25' / 7.62m, 50' / 15.24m		
weight (w/ housing)	7 oz. / 200 g	7 oz. / 200 g	varies with clamp size
coupling	temporary: Stopaq (<200°F / <93.3°C) semi-permanent: epoxy		temporary/permanent: gold foil
hazardous rating	UL-CSA Class I Div II, Groups A-D, T4, ATEX/ IEC Ex Zone 2 and Japanese Certified		
mounting	magnetic and/or band clamp		U-bolt or band clamp

Mounts

	magnetic	banded	clamped
			
attributes	ease of installation and relocation	stability, ease of installation and relocation	ultra high temps, maximum stability
dimensions		banded clamp 5.9x1.95x2.9" / 150x50x74mm	u-bolt clamp 9.25x1.75x2.6" / 235x44.5x66mm
weight		6 lbs / 2.75 kg	10 lbs / 4.54 kg

Epoxies

	EA E-20HP	EA-9394	EA-9394 C2
cure temp.	60-100°F / 15-38°C	77-200°F / 25-93°C	200-350°F / 93-177°C
operating temp.	-20 to +150°F / -28 to +65°C	-20 to +275°F / -28 to +132°C	-20 to +400°F / -28 to +204°C
misc.	1.69 oz. tube for up to 8 sensors	mixing solution for up to 8 sensors	mixing solution for up to 8 sensors

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