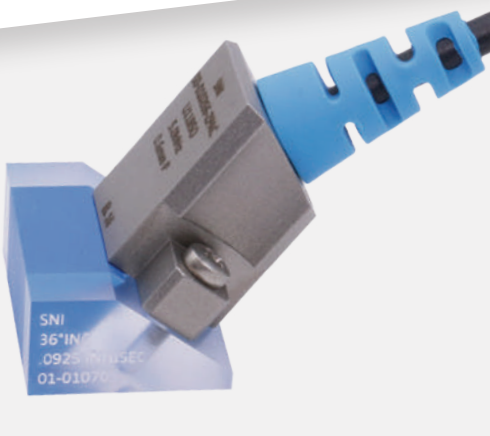


Ultrasonic Transducer Catalog

Standard • Custom • Applications Engineering

Angle Beam | Immersion | Thickness Gauges | Phased Array | Accessories



Contact | Delay Line | Dual Element | Angle Beam | Immersion | Thickness



SENSOR[®]
NETWORKS, INC

Inspection, Testing & Asset-Integrity Solutions

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(814) 466-7207 • www.sensornetworksinc.com

Version 4.0

Who We Are

Sensor Networks, Inc. (SNI) is a Pennsylvania-based technology company specializing in the design and fabrication of industrial ultrasonic transducers and tooling for demanding in-situ test and inspection applications. Engineered for precision, ease of use, and maximum durability, our offerings include ultrasonic transducers, fixtures, couplant-delivery systems, qualification/calibration standards, procedure development, personnel training and instrumentation.

SNI's deep domain expertise enhances NDT solutions through the selection, design, and optimization of the ultrasonic technique. The transducers' efficiency is paramount for converting electrical energy into sound, then coupling and directing that acoustic energy into the test piece to maximize its signal-to-noise ratio.



"The Transducer Enables and/or Optimizes the UT Exam"



With an average of 21 years and an aggregate of 916 years, our experienced team of engineers, technicians, assemblers, and general managers have an extremely deep level of knowledge and background in solving unusual, demanding, and complicated NDT projects. Industries served over this time include aerospace engines and airframes, nuclear vessels, heat exchangers, large gas turbines and others.



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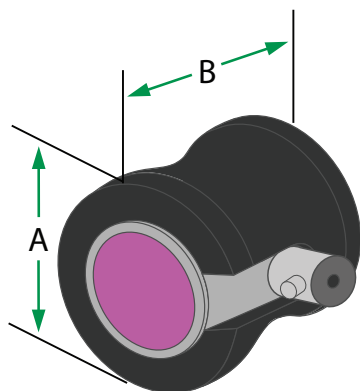
Contact Transducers

CR

Single-Element Contacts are longitudinal-wave (straight-beam) transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. They provide high sensitivity for better penetration, small-flaw detection, and have abrasion-resistant wear plates for extended service life.

Model CR Standard Contact Transducers

The larger element sizes of Model CR provide greater scan widths and penetration for applications such as plate, billet, bars, thick-section parts, pipe, and tanks. They have side-mounted BNC connectors and removable comfort grip to reduce operator fatigue. **GP series*** offer the best combination of sensitivity and resolution.



Model CR

Element Ø					
inch	mm	A		B	
0.50	12.7	1.5 in.	38.1 mm	1.3 in.	33 mm
0.75	19	1.75 in.	44.5 mm	1.3 in.	33 mm
1	25.4	2.0 in.	50.8 mm	1.4 in.	35.6 mm

Frequency (MHz)	Element Diameter		Part Number	
	inch	mm	GP	Accessories
1	0.5	12.7	00-010626	Cable BNC - BNC 6-ft (1.83 m) 07-010018
	0.75	19	00-010901	
	1	25.4	00-010902	
2.25	0.5	12.7	00-010616	
	0.75	19	00-010419	
	1	25.4	00-010416	
3.5	0.5	12.7	00-010903	
	0.75	19	00-010904	
	1	25.4	00-010905	
5	0.5	12.7	00-010617	
	0.75	19	00-010906	
	1	25.4	00-010907	
10	0.5	12.7	00-010908	

* GP = General Purpose.
 * See appendix for technical details.



Contact Transducers

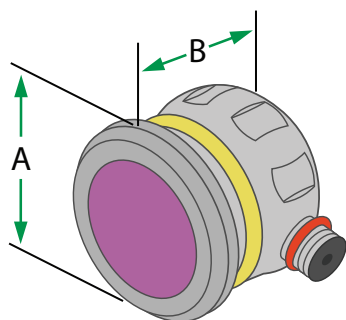
F Fingertip

Single-Element Contacts are longitudinal-wave (straight-beam) transducers designed for general purpose manual ultrasonic inspection where test materials are relatively flat and smooth. They provide high sensitivity for better penetration, small-flaw detection, and have abrasion-resistant wear plates for extended service life.



Model F Fingertip Contact Transducers

Model F are small diameter transducers with side-mounted Microdot connectors. **GP series*** offer the best combination of sensitivity and resolution for most applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration in highly-attenuative materials. All Model F transducers feature an ergonomic design for improved operator control and comfort.



Model F Fingertip

Element Ø		A		B	
inch	mm				
0.25	6.4	0.58 in.	14.7 mm	0.66 in.	16.8 mm
0.375	9.5	0.71 in.	18 mm	0.66 in.	16.8 mm
0.50	12.7	0.83 in.	21.1 mm	0.66 in.	16.8 mm

Frequency (MHz)	Element Diameter		Part Number			Accessories
	inch	mm	GP	HR	C	
2.25	0.25	6.4	00-010612		00-011084	Cable MD - BNC 6-ft (1.83 m) 07-010012
	0.375	9.5	00-010618		00-011085	
	0.5	12.7	00-010622		00-011086	
3.5	0.25	6.4	00-010613		00-011087	
	0.375	9.5	00-010619		00-011088	
	0.5	12.7	00-010623		00-011089	
5	0.25	6.4	00-010614	00-010602	00-011090	
	0.375	9.5	00-010620	00-010606	00-011091	
	0.5	12.7	00-010624	00-010610	00-011092	
10	0.25	6.4	00-010615	00-010603		
	0.375	9.5	00-010621	00-010607		

* GP = General Purpose; HR = High Resolution; C = Composite.
 * See appendix for technical details.



Delay-Line Contact

DFR

Delay-Line Contacts are single-element, longitudinal-wave (straight beam) transducers designed for detection of near-surface flaws and thickness measurement of thin-section materials. Replaceable delay lines (stand-offs) improve near-surface resolution and extend service life.



Model DFR Fingertip Delay-Line Transducers

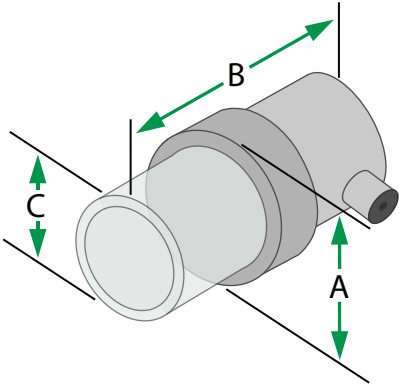
Model DFR are small-diameter delay-line transducers with side-mounted Microdot connectors. Removable delay lines and highly damped piezoceramic elements enable measurement of very thin parts or detection of small near-surface flaws. Delay lines can be contoured for improved coupling to I.D. or O.D. curved parts. Custom sizes and shapes also available upon request.

Model DFR

Element Ø		B							
inch	mm	A		0.38 in. Delay		0.5 in. Delay		C	
0.125	3.2	0.5 in.	12.7 mm	0.83 in.	21.1 mm	0.95 in.	24.1 mm	0.30 in.	7.6 mm
0.25	6.4	0.5 in.	12.7 mm	0.83 in.	21.1 mm	0.95 in.	24.1 mm	0.30 in.	7.6 mm
0.5	12.7	0.88 in.	22.4 mm	1.03 in.	26.2 mm	1.15 in.	29.2 mm	0.60 in.	15.2 mm
Mini-DFR									
0.125	3.2	0.41 in.	10.4 mm	0.77 in.		19.6 mm		0.19 in.	4.8 mm

Frequency (MHz)	Element Diameter		Part Number	Delay 10-PK	Delay 10-PK	Accessories
	inch	mm	HR	L=.38 in (10mm)	L=.5 in (12.7mm)	
2.25	0.25	6.4	00-010940	01-010810	01-010811	Cable MD - BNC 6-ft (1.83 m) 07-010012
	0.5	12.7	00-012301	01-011971	01-011973	
3.5	0.25	6.4	00-010824	01-010810	01-010811	
	0.5	12.7	00-010941	01-011971	01-011973	
5	0.25	6.4	00-010246	01-010810	01-010811	
	0.5	12.7	00-010492	01-011971	01-011973	
10	0.25	6.4	00-010247	01-010810	01-010811	
	0.5	12.7	00-012302	01-011971	01-011973	
15	0.25	6.4	00-011077	01-010810	01-010811	
	0.25	6.4	00-011077	01-010810	01-010811	

Frequency (MHz)	Element Diameter		Part Number	Delay 10-PK	Accessories
	inch	mm	HR	L=.41 in (10.4mm)	
Nominal 20MHz	0.125	3.2	00-012300	01-011974	See above

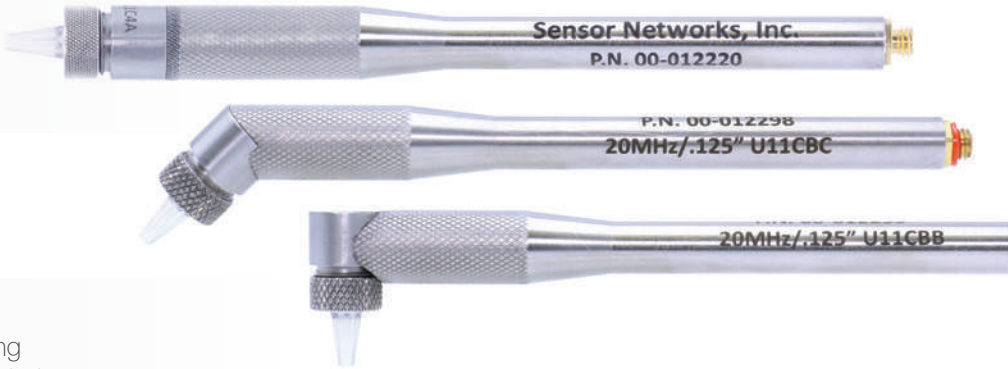




Delay-Line Contact

Pencil Probes

Delay-Line Contacts are single-element, longitudinal-wave (straight beam) transducers designed for detection of near-surface flaws and thickness measurement of thin-section materials. Replaceable delay lines (stand-offs) improve near-surface resolution and extend service life.



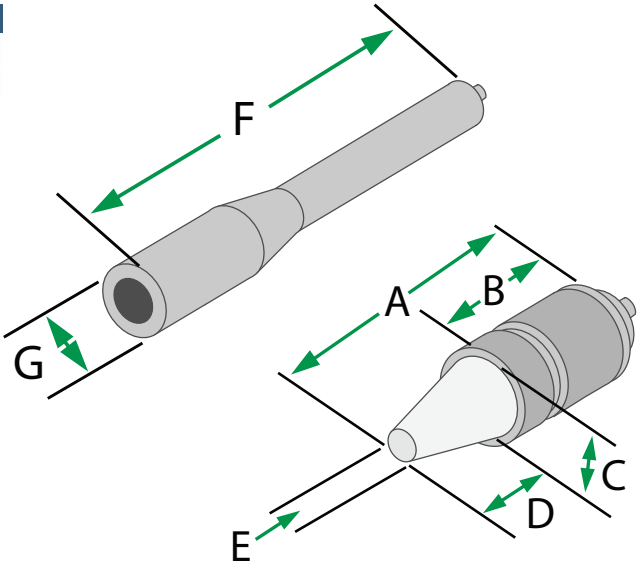
Replaceable Delay-Line Pencil Probes

Pencil probes are designed for applications requiring a very small contact face, such as curved turbine blades or thickness measurement from the inside of a pit. They can be used with most flaw detectors and precision thickness gauges. Interchangeable delay lines are tapered to tip diameters of 0.065 inch (1.7mm) and 0.090 inch (2.3mm). Replaceable delay lines are available in packs of 10. The straight model features a removable handle, which also allows it to be used as a fingertip probe. All models have Microdot connectors.

Pencil Probes

Frequency	A		B		C		D	
7.5	1.0 in.	25.4 mm	0.60 in.	15.2 mm	0.42 in.	10.7 mm	0.4 in.	10.2 mm
20	1.0 in.	25.4 mm	0.60 in.	15.2 mm	0.42 in.	10.7 mm	0.4 in.	10.2 mm

Frequency	E		F		G	
7.5	0.09 in.	2.3 mm	4.0 in.	101.6 mm	0.42 in.	10.7 mm
20	0.09 in.	2.3 mm	4.0 in.	101.6 mm	0.42 in.	10.7 mm



Frequency (MHz)	Part Number		
	Straight	45 Degree	90 Degree
7.5	00-011083	00-012296	00-012297
20	00-011039	00-012298	00-012299

Delay 10-PK .065" (1.7mm) Tip	Delay 10-PK .090" (2.3mm) Tip	Cable MD - BNC
00-012222	00-012221	6-ft (1.83 m) 07-010012

Extension Handle	Knurled Ring
00-012220	06-014005



Dual Element

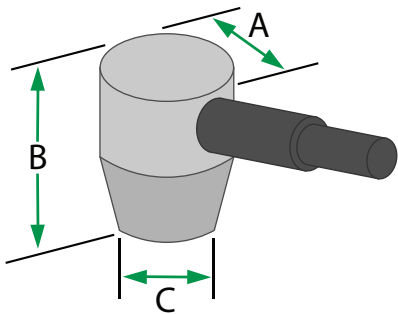
ADP

Dual-Element Contacts are longitudinal-wave (straight beam) transducers designed for near-surface and thin range flaw detection and thickness measurement. Two elements, one transmitter and one receiver, are mounted at an included (roof) angle to improve signal-to-noise ratio (SNR) and optimize near-surface resolution.



Model ADP Dual-Element Contact Transducers

Model ADP are small-diameter, low-profile transducers with 2 fixed co-axial cable and come standard with BNC connectors but are also available with Lemo-00. They are especially suitable for flaw detection and thickness measurement on pitted, curved, and irregular surfaces. Because the elements are mounted on internal delay lines they can be contoured to fit I.D. or O.D. curved surfaces.



Model ADP

Element Ø		A		B		C	
inch	mm						
0.25	6.4	0.50 in.	12.7 mm	0.64 in.	16.3 mm	0.28 in.	7.1 mm
0.375	9.5	0.62 in.	15.7 mm	0.64 in.	16.3 mm	0.41 in.	10.4 mm
0.5	12.7	0.75 in.	19 mm	0.68 in.	17.3 mm	0.60 in.	15.2 mm

Frequency (MHz)	Element Diameter		Part Number	
	inch	mm	C	Lemo-00
2.25	0.25	6.4	00-011405	00-011405-LEMO
	0.375	9.5	00-011406	00-011406-LEMO
	0.5	12.7	00-011407	00-011407-LEMO
3.5	0.25	6.4	00-011408	00-011408-LEMO
	0.375	9.5	00-011409	00-011409-LEMO
	0.5	12.7	00-011410	00-011410-LEMO
5	0.25	6.4	00-010656	00-010656-LEMO
	0.375	9.5	00-010655	00-010655-LEMO
	0.5	12.7	00-011411	00-011411-LEMO
10	0.25	6.4	00-011412	00-011412-LEMO
	0.375	9.5	00-011413	00-011413-LEMO
	0.5	12.7	00-011414	00-011414-LEMO



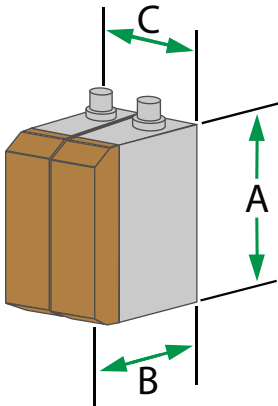
Dual Element

DU

Dual-Element Contacts are longitudinal-wave (straight beam) transducers designed for near-surface and thin-range flaw detection and thickness measurement. Two elements, one transmitter and one receiver, are mounted at an included (roof) angle to improve signal-to-noise ratio and optimize near-surface resolution.

Model DU Dual-Element Contact Transducers

Model DU are general purpose dual-element transducers with side-mounted Microdot connectors. Replaceable/interchangeable delay lines and cross-talk barriers greatly extend versatility, cost-effectiveness, service life and can be contoured to fit I.D. or O.D. curved surfaces.



Model DU

Element Dimensions		A		B		C	
inch	mm						
0.5 x 0.5	12.7 x 12.7	0.89 in.	22.6 mm	0.92 in.	23.4 mm	0.78 in.	19.8 mm
0.5 x 1	12.7 x 25.4	1.39 in.	35.3 mm	0.92 in.	23.4 mm	0.78 in.	19.8 mm

Frequency (MHz)	Element Dimensions		Part Number		
	inch	mm	GP	Delay Set	Accessories
2.25	0.5 x 0.5	12.7 x 12.7	00-012322	01-010740	Dual Cable MD - BNC 6-ft (1.83 m)
	0.5 x 1	12.7 x 25.4	00-012323	01-010741	
5	0.5 x 0.5	12.7 x 12.7	00-010487	01-010740	07-010012
	0.5 x 1	12.7 x 25.4	00-010584	01-010741	



Large Angle Beam

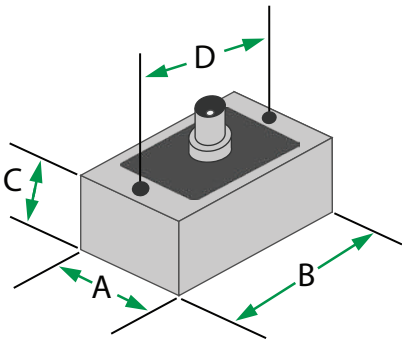
AWS

Angle-Beam Transducers and their wedges generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.



Model AWS Angle-Beam Transducers

Model AWS transducers and wedges meet the requirements of American Welding Society Structural Welding Code D1.1 and Bridge Welding Code D1.5. The transducers are available with piezoceramic elements (**GP series***) and piezocomposite elements (**C series***).



Model AWS

Element Dimensions		A		B		C		D	
inch	mm								
0.625 x 0.625	16 x 16	0.80 in.	20.3 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
0.625 x 0.75	16 x 19	0.80 in.	20.3 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
0.75 x 0.75	19 x 19	0.85 in.	21.6 mm	1.26 in.	32 mm	0.75 in.	19.1 mm	0.75 in.	19.1 mm
Thread									4-40

Frequency (MHz)	Element Dimensions		Part Number			
	inch	mm	GP	C	Wedges	Accessories
2.25	0.625 x 0.625	16 x 16	00-010393	00-010242	45° 01-010268	Cable BNC - BNC 6-ft (1.83 m) 07-010018
					60° 01-010269	
					70° 01-010270	
	0.625 x 0.75	16 x 19	00-010395	00-010394	45° 01-010268	
					60° 01-010269	
					70° 01-010270	
	0.75 x 0.75	19 x 19	00-010397	00-010396	45° 01-010268	
					60° 01-010269	
					70° 01-010270	

* GP = General Purpose; C = Composite.
* See appendix for technical details.



Large Angle Beam

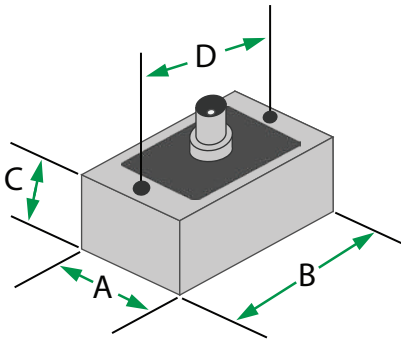
SWS

Angle-Beam Transducers and their wedges generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.



Model SWS Angle-Beam Transducers

Model SWS are designed for general weld inspection and other applications such as pipes, tanks, pressure vessels, forgings and castings. They have top mounted BNC connectors and are available with piezocomposite elements (**C series***). Interchangeable acrylic wedges provide maximum versatility and service life.



Model SWS

Element Size		A		B		C		D	
inch	mm								
0.5 Ø	12.7 Ø	0.72 in.	18.3 mm	1.0 in.	25.4 mm	0.75 in.	19 mm	0.81 in.	20.6 mm
0.5 x 1	12.7 x 25.4	0.73 in.	18.5 mm	1.5 in.	38.1 mm	0.75 in.	19 mm	1.31 in.	33.3 mm
0.75 x 1	19 x 25.4	1.0 in.	25.4 mm	1.5 in.	38.1 mm	0.75 in.	19 mm	1.31 in.	33.3 mm
1 Ø	25.4 Ø	1.22 in.	31.0 mm	1.65 in.	41.9 mm	0.75 in.	19 mm	1.38 in.	35.1 mm
Thread									4-40

Frequency (MHz)	Element Dimensions		C	Wedges	Accessories
	inch	mm			
0.5	0.5 Ø	12.7 Ø	00-010478	45° 01-010206	Cable BNC - BNC 6-ft (1.83 m) 07-010018
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010479	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010480	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010481	45° 01-010218	
				60° 01-010219	
				70° 01-010220	

Chart continues on page 12



Large Angle Beam

SWS Continued

Frequency (MHz)	Element Dimensions		C	Wedges	Accessories
	inch	mm			
1	0.5 Ø	12.7 Ø	00-010445	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010446	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010447	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010448	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
2.25	0.5 Ø	12.7 Ø	00-010449	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010450	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010451	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010452	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
3.5	0.5 Ø	12.7 Ø	00-010453	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010454	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010455	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010456	45° 01-010218	
				60° 01-010219	
				70° 01-010220	
5	0.5 Ø	12.7 Ø	00-010457	45° 01-010206	
				60° 01-010207	
				70° 01-010208	
	0.5 x 1	12.7 x 25.4	00-010458	45° 01-010210	
				60° 01-010211	
				70° 01-010212	
	0.75 x 1	19 x 25.4	00-010459	45° 01-010214	
				60° 01-010215	
				70° 01-010216	
	1 Ø	25.4 Ø	00-010460	45° 01-010218	
				60° 01-010219	
				70° 01-010220	

Cable
BNC - BNC
6-ft (1.83 m)
07-010018



Small Angle Beam

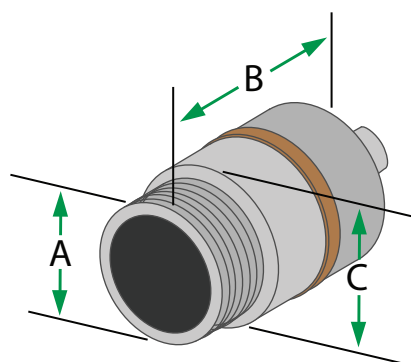
QS

Angle-Beam Transducers and their wedges, generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision-machined acrylic wedge that also minimizes wedge noise.



Model QS Angle-Beam Transducers

Model QS features Quick Swap screw-in wedge attachment. They are available with top-mounted Microdot (MD) or new MCX low-profile swivel connectors. Piezocomposite (**C series***) offer superior penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials.



Model QS

Element Ø		A	B		C	
inch	mm					
0.25	6.4	3/8 - 32 UNEF	0.58 in.	14.7 mm	0.43 in.	10.9 mm
0.375	9.5	1/2 - 28 UNEF	0.58 in.	14.7 mm	0.54 in.	13.7 mm
0.5	12.7	5/8 - 24 UNEF	0.65 in.	16.5 mm	0.69 in.	17.5 mm



MCX connectors are snap-in and can swivel, preventing the risk of back threading. (Shown above with 90° cable connector)

Frequency (MHz)	Element Diameter		C**	Wedges	Accessories
	inch	mm			
1	0.375	9.5	00-010137 MD or MCX	30° 01-010193	Cables
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010138 MD or MCX	30° 01-010197	MD - BNC 6-ft (1.83 m) 07-010012
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
1.5	0.25	6.4	00-010216 MD or MCX	30° 01-010189	MCX - BNC Straight 6-ft (1.83 m) 07-010007
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010217 MD or MCX	30° 01-010193	MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010218 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	

Chart continues on page 14

* C = Composite. See appendix for technical details.

** When ordering QS transducers, please include the part number followed by the connector type (MD or MCX)



Small Angle Beam

QS Continued

Frequency (MHz)	Element Diameter				
	inch	mm	C**	Wedges	Accessories
2.25	0.25	6.4	00-010122 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010123 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010124 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
3.5	0.25	6.4	00-010125 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010126 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010127 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
5	0.25	6.4	00-010128 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010129 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010130 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
7.5	0.25	6.4	00-010131 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010132 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010133 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	
10	0.25	6.4	00-010134 MD or MCX	30° 01-010189	Cables MD - BNC 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				45° 01-010190	
				60° 01-010191	
				70° 01-010192	
	0.375	9.5	00-010135 MD or MCX	30° 01-010193	
				45° 01-010194	
				60° 01-010195	
				70° 01-010196	
	0.5	12.7	00-010136 MD or MCX	30° 01-010197	
				45° 01-010198	
				60° 01-010199	
				70° 01-010200	

** When ordering QS transducers, please include the part number followed by the connector type (MD or MCX)

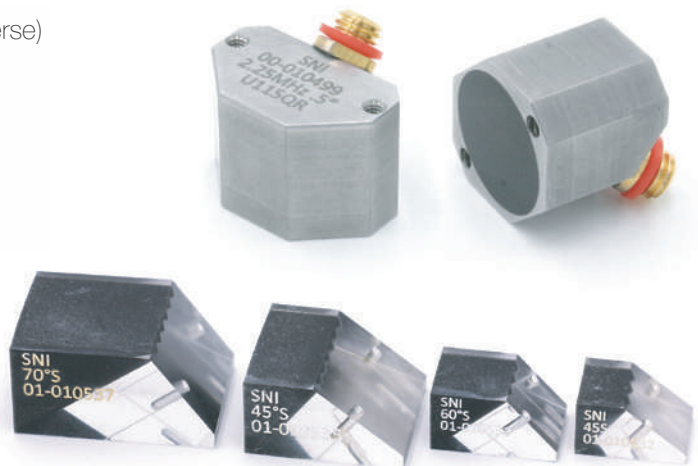


Miniature Angle Beam MSWS

Angle-Beam Transducers and their wedges, generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight-beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision machined acrylic wedge that also minimizes wedge noise.

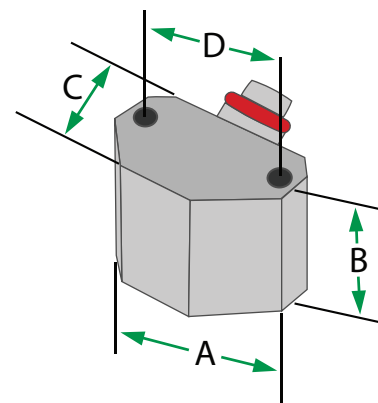
Model MSWS Angle Beam Transducers

Model MSWS have captive screws for wedge attachment and angled Microdot connectors for applications requiring low profile. Piezocomposite (**C series***) offer superior penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials.



Model MSWS

Element Ø		A		B		C		D	
inch	mm								
0.25	6.4	0.48 in.	12.2 mm	0.34 in.	8.6 mm	0.31 in.	7.9 mm	0.38 in.	9.7 mm
0.5	12.7	0.73 in.	18.5 mm	0.5 in.	12.7 mm	0.56 in.	14.2 mm	0.63 in.	16 mm
Thread									
1-64									



Frequency (MHz)	Element Diameter		C		Wedges	Accessories
	inch	mm				
1	0.5	12.7	00-010497		45° 01-010535	Cable MD - BNC 6-ft (1.83 m) 07-010012
					60° 01-010536	
					70° 01-010537	
2.25	0.25	6.4	00-010498		45° 01-010532	
					60° 01-010533	
					70° 01-010534	
	0.5	12.7	00-010499		45° 01-010535	
					60° 01-010536	
					70° 01-010537	
3.5	0.25	6.4	00-010500		45° 01-010532	
					60° 01-010533	
					70° 01-010534	
	0.5	12.7	00-010501		45° 01-010535	
					60° 01-010536	
					70° 01-010537	
5	0.25	6.4	00-010502		45° 01-010532	
					60° 01-010533	
					70° 01-010534	
	0.5	12.7	00-010503		45° 01-010535	
					60° 01-010536	
					70° 01-010537	
10	0.25	6.4	00-010504		45° 01-010532	
					60° 01-010533	
					70° 01-010534	
	0.5	12.7	00-010505		45° 01-010535	
					60° 01-010536	
					70° 01-010537	

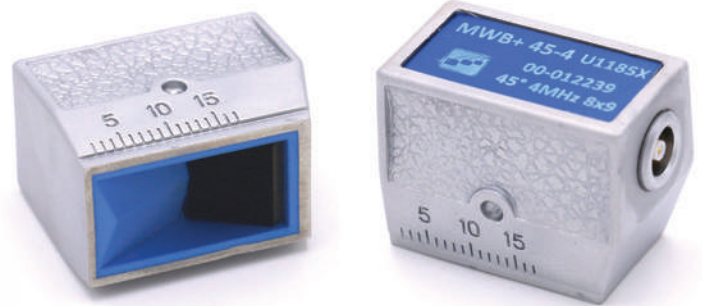
* C = Composite. See appendix for technical details.



Integral-Wedge Angle Beam

MWB+ & MWK+

European-Style Angle-Beam Transducers generate shear (transverse) waves at the specified angle in a given test material to detect flaws that cannot be detected by a straight beam transducer. Typical applications include weld inspection, tube and pipe, shafts, turbine blades and wheel rims. Shear waves are produced by refracting a longitudinal wave in a precision-machined acrylic wedge that also minimizes wedge noise.

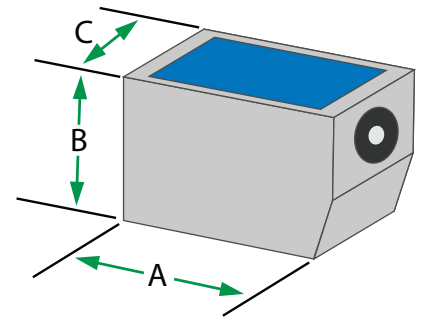


Model MWB+/MWK+ Angle-Beam Transducers

Models MWB+ and MWK+ are small transducers with side or top-mounted Microdot connectors and integral wedges for maximum versatility. **GP series*** (MWB+) offer the best combination of sensitivity and resolution. **C series*** (MWK+) with piezocomposite elements offer superior resolution, penetration and signal-to-noise ratio in highly-attenuative and coarse-grain materials such as austenitic stainless steel or cast iron.

Model MWB+/MWK+

Element Dimensions		A		B		C	
inch	mm						
0.31 x 0.35	8 x 9	1.07 in.	27.1 mm	0.86 in.	21.8 mm	0.66 in.	16.8 mm



Frequency (MHz)	Element Dimensions		Angle (Steel)	Connector Location	Part Number		
	inch	mm			GP (MWB+)	C (MWK+)	Accessories
2	0.31 x 0.35	8 x 9	35	Top	00-012227	00-012306	Cables MD - BNC Straight 6-ft (1.83 m) 07-010012 MCX - BNC Straight 6-ft (1.83 m) 07-010007 MCX - BNC Right Angle 6-ft (1.83 m) 07-010008
				Side	00-012226	00-012307	
			45	Top	00-012229	00-012308	
				Side	00-012228	00-012251	
			60	Top	00-012231	00-012309	
				Side	00-012230	00-012252	
			70	Top	00-012233	00-012310	
				Side	00-012232	00-012253	
			80	Top	00-012235	00-012311	
				Side	00-012234	00-012312	
			90	Side	00-012236	00-012313	
				Side	00-012237	00-012315	
4	0.31 x 0.35	8 x 9	35	Top	00-012238	00-012314	
				Side	00-012237	00-012315	
			45	Top	00-012240	00-012316	
				Side	00-012239	00-012248	
			60	Top	00-012242	00-012317	
				Side	00-012241	00-012249	
			70	Top	00-012244	00-012318	
				Side	00-012243	00-012250	
			80	Top	00-012246	00-012319	
				Side	00-012245	00-012320	
			90	Side	00-012247	00-012321	
				Side	00-012247	00-012321	

* GP = General Purpose; C = Composite.
 * See appendix for technical details.



Small Angle Beam TOFD

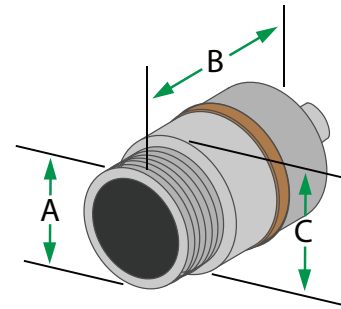
TOFD Angle-Beam Transducers

Time-Of-Flight Diffraction (TOFD) is a method used to determine the size of cracks in metallic welds. It requires highly-damped, broadband transducers and wedges that generate refracted longitudinal waves (L-waves). SNI's TOFD transducers have state-of-the-art piezocomposite elements (**C series***) and Quick Swap screw-in wedge attachment. Straight-mounted connectors are Microdot (3/8-32) or Lemo-00 (M12 case).



TOFD Microdot

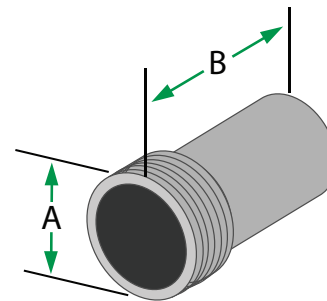
Frequency (MHz)	Element Diameter		Part Number		
	inch	mm	Connector	Wedges	Accessories
5	0.125	3	Microdot	45°L 01-010475	Cables MD - BNC 6-ft (1.83 m) 07-010012
				60°L 01-010476	
				70°L 01-010477	
	0.25	6	Microdot	45°L 01-010475	
				60°L 01-010476	
				70°L 01-010477	
10	0.125	3	Microdot	45°L 01-010475	
				60°L 01-010476	
				70°L 01-010477	
	0.25	6	Microdot	45°L 01-010475	
				60°L 01-010476	
				70°L 01-010477	
15	0.125	3	Microdot	45°L 01-010475	
				60°L 01-010476	
				70°L 01-010477	



	Element Ø		
	inch mm	0.125 3	0.25 6
A		0.37 in. 9.4 mm	0.37 in. 9.4 mm
B		0.72 in. 18.3 mm	0.72 in. 18.3 mm
C		0.41 in. 10.4 mm	0.41 in. 10.4 mm

TOFD Lemo-00

Frequency (MHz)	Element Diameter		Part Number		
	inch	mm	Connector	C	Accessories
5	0.125	3	Lemo-00	00-010299	Cables Lemo-00 - BNC 6-ft (1.83 m) 07-010014
	0.25	6	Lemo-00	00-010300	
10	0.125	3	Lemo-00	00-010298	
	0.25	6	Lemo-00	00-010386	
15	0.125	3	Lemo-00	00-010631	



	Element Ø		
	inch mm	0.125 3	0.25 6
A		0.47 in. 12 mm	0.47 in. 12 mm
B		0.83 in. 21 mm	0.83 in. 21 mm



Immersion Transducers

Immersion Transducers are typically used in automatic and manual scanning systems using water or other liquid as a coupling medium to enable the inspection of parts with complex geometries and with near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Frequency (Mhz)		Element Ø (Inches)					
		1	0.75	0.5	0.375	0.25	0.125
1	Near	4.3	2.4	1.1			
	Min	2	1.5	1			
	Max	3	2	1			
2.25	Near	9.5	5.4	2.4	1.4	0.6	
	Min	2	1.5	1	0.8	0.5	
	Max	6	4	2	0.8	0.5	
3.5	Near	15	8.4	3.7	2.1	0.9	
	Min	2	1.5	1	0.8	0.5	
	Max	8	6	2.5	0.5	0.5	
5	Near	21	12	5.4	3	1.3	0.3
	Min	2	1.5	1	0.8	0.5	0.3
	Max	8	8	4	1	0.8	0.3
10	Near		12	10.7	6	2.7	0.7
	Min		1.5	1	0.8	0.5	0.3
	Max		8	6	4.5	1.5	0.3
15	Near			16	9	4	1
	Min			1	0.8	0.5	0.3
	Max			6	6	2	0.5
25	Near					6.7	1.7
	Min					0.5	0.3
	Max					2	1

This table lists the near-field lengths of minimum and maximum practical focal lengths in water (inches). Customers should only request focal lengths within these limits to achieve good focal performance. SNI is aware that some customers have experience with transducers focused longer than the recommended maximum (sometimes called "Beam Correction" since the transducer cannot achieve a focal point that long). These are available on a best-effort basis.

N = Near-field practical focal length
 Min = Minimum practical focal length
 Max = Maximum practical focal length

$$N = \frac{(\text{Dia.})^2 \times (\text{Freq.})}{4 \times \text{Velocity}}$$

When ordering immersion transducers, please include the part number followed by type of focus and focal length in inches (if applicable).

(ex. 00-011321 NF, 00-011321 6.0S, 00-011321 8.0C)

NF = Non-focused (flat)

S = Spherical focus

C = Cylindrical focus



Immersion

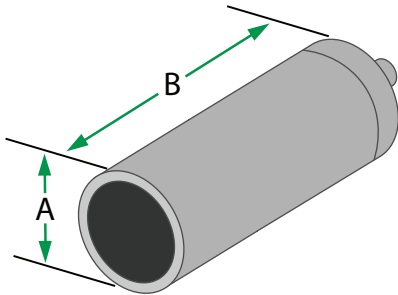
I1

Immersion Transducers are typically used in automated and manual-scanning systems using water or other liquid as a coupling medium. This enables the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Model I1 Immersion Transducers

Model I1 are small-diameter, pencil-type transducers with straight-mounted Microdot connectors. Because the connectors are not waterproof, sealing with non-water-soluble grease is recommended. **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly-attenuative and coarse-grain materials.



Model I1

Element Ø		A		B	
inch	mm				
0.25	6.4	0.38 in.	9.7 mm	1.25 in.	31.8 mm

Frequency (MHz)	Element Diameter		Focus	Part Number			Accessories
	inch	mm		GP	HR	C	
2.25	0.25	6.4	None	00-011300 NF	00-011301 NF	00-011302 NF	Cable MD - BNC 6-ft (1.83 m) 07-010012
			Spherical	00-011300 X.XS	00-011301 X.XS	00-011302 X.XS	
			Cylindrical	00-011300 Y.YC	00-011301 Y.YC	00-011302 Y.YC	
5	0.25	6.4	None	00-011303 NF	00-010593 NF	00-010711 NF	
			Spherical	00-011303 X.XS	00-010593 X.XS	00-010711 X.XS	
			Cylindrical	00-011303 Y.YC	00-010593 Y.YC	00-010711 Y.YC	
10	0.25	6.4	None	00-010822 NF	00-010377 NF	00-010823 NF	
			Spherical	00-010822 X.XS	00-010377 X.XS	00-010823 X.XS	
			Cylindrical	00-010822 Y.YC	00-010377 Y.YC	00-010823 Y.YC	
15	0.25	6.4	None		00-010596 NF	00-011304 NF	
			Spherical		00-010596 X.XS	00-011304 X.XS	
			Cylindrical		00-010596 Y.YC	00-011304 Y.YC	

* GP = General Purpose; HR = High Resolution; C = Composite.
 * See appendix for technical details.



Immersion

I2, I3, I4

Immersion Transducers are typically used in automated and manual-scanning systems using water or other liquid as a coupling medium. This enables the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Models I2, I3 and I4 Immersion Transducers

All model I2, I3 and I4 transducers have straight-mounted waterproof UHF connectors. Available I2 element diameters are 0.25, 0.375 and 0.5 inch (6, 10 and 13 mm). I3 have 0.75 inch (19 mm) and I4 have 1.0 inch (25 mm) element diameters. **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly-damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly- attenuative and coarse-grain materials.

Frequency (MHz)	Element Diameter		Case	Focus	Part Number		
	inch	mm			GP	HR	C
1	0.75	19	I3	None	00-011201 NF		00-011313 NF
				Spherical	00-011201 X.XS		00-011313 X.XS
				Cylindrical	00-011201 Y.YC		00-011313 Y.YC
	1	25.4	I4	None	00-011314 NF		00-010683 NF
				Spherical	00-011314 X.XS		00-010683 X.XS
				Cylindrical	00-011314 Y.YC		00-010683 Y.YC
2.25	0.25	6.4	I2	None	00-011315 NF	00-011316 NF	00-011317 NF
				Spherical	00-011315 X.XS	00-011316 X.XS	00-011317 X.XS
				Cylindrical	00-011315 Y.YC	00-011316 Y.YC	00-011317 Y.YC
	0.375	9.5	I2	None	00-011318 NF	00-011319 NF	00-011144 NF
				Spherical	00-011318 X.XS	00-011319 X.XS	00-011144 X.XS
				Cylindrical	00-011318 YC	00-011319 Y.YC	00-011144 Y.YC
	0.5	12.7	I2	None	00-010830 NF	00-011114 NF	00-011320 NF
				Spherical	00-010830 X.XS	00-011114 X.XS	00-011320 X.XS
				Cylindrical	00-010830 Y.YC	00-011114 Y.YC	00-011320 Y.YC
	0.75	19	I3	None	00-011321 NF	00-011322 NF	00-011146 NF
				Spherical	00-011321 X.XS	00-011322 X.XS	00-011146 X.XS
				Cylindrical	00-011321 Y.YC	00-011322 Y.YC	00-011146 Y.YC
	1	25.4	I4	None	00-011323 NF	00-011324 NF	00-011353 NF
				Spherical	00-011323 X.XS	00-011324 X.XS	00-011353 X.XS
				Cylindrical	00-011323 Y.YC	00-011324 Y.YC	00-011353 Y.YC
3.5	0.25	6.4	I2	None	00-011325 NF	00-011326 NF	00-011327 NF
				Spherical	00-011325 X.XS	00-011326 X.XS	00-011327 X.XS
				Cylindrical	00-011325 Y.YC	00-011326 Y.YC	00-011327 Y.YC
	0.375	9.5	I2	None	00-011328 NF	00-011329 NF	00-011141 NF
				Spherical	00-011328 X.XS	00-011329 X.XS	00-011141 X.XS
				Cylindrical	00-011328 Y.YC	00-011329 Y.YC	00-011141 Y.YC
	0.5	12.7	I2	None	00-011330 NF	00-011331 NF	00-010858 NF
				Spherical	00-011330 X.XS	00-011331 X.XS	00-010858 X.XS
				Cylindrical	00-011330 Y.YC	00-011331 Y.YC	00-010858 Y.YC
	0.75	19	I3	None	00-011332 NF	00-011333 NF	00-011334 NF
				Spherical	00-011332 X.XS	00-011333 X.XS	00-011334 X.XS
				Cylindrical	00-011332 Y.YC	00-011333 Y.YC	00-011334 Y.YC
	1	25.4	I4	None	00-011335 NF	00-011336 NF	00-010586 NF
				Spherical	00-011335 X.XS	00-011336 X.XS	00-010586 X.XS
				Cylindrical	00-011335 Y.YC	00-011336 Y.YC	00-010586 Y.YC

Chart continues on page 21

Velocity Testing

Frequency (MHz)	Element Diameter		Case	Focus	C
	inch	mm			
5	0.25	6.4	I2	None	00-011403
	0.375	9.5	I2	None	00-011404
	0.5	12.7	I2	None	00-010437

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.

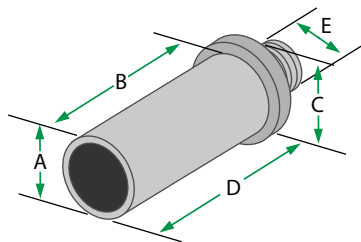


Immersion

I2, I3, I4 Continued

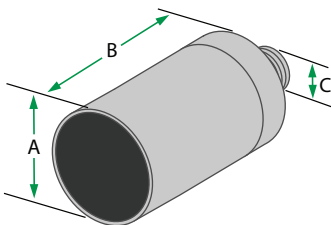
Frequency (MHz)	Element Diameter		Case	Focus	Part Number		
	inch	mm			GP	HR	C
5	0.25	6.4	I2	None	00-011337 NF	00-011351 NF	00-011338 NF
				Spherical	00-011337 X.XS	00-011351 X.XS	00-011338 X.XS
				Cylindrical	00-011337 Y.YC	00-011351 Y.YC	00-011338 Y.YC
	0.375	9.5	I2	None	00-011339 NF	00-011340 NF	00-010679 NF
				Spherical	00-011339 X.XS	00-011340 X.XS	00-010679 X.XS
				Cylindrical	00-011339 Y.YC	00-011340 Y.YC	00-010679 Y.YC
	0.5	12.7	I2	None	00-010778 NF	00-010594 NF	00-011013 NF
				Spherical	00-010778 X.XS	00-010594 X.XS	00-011013 X.XS
				Cylindrical	00-010778 Y.YC	00-010594 Y.YC	00-011013 Y.YC
	0.75	19	I3	None	00-010585 NF	00-011341 NF	00-010868 NF
				Spherical	00-010585 X.XS	00-011341 X.XS	00-010868 X.XS
				Cylindrical	00-010585 Y.YC	00-011341 Y.YC	00-010868 Y.YC
	1	25.4	I4	None	00-011152 NF	00-011350 NF	00-011153 NF
				Spherical	00-011152 X.XS	00-011350 X.XS	00-011153 X.XS
				Cylindrical	00-011152 Y.YC	00-011350 Y.YC	00-011153 Y.YC
10	0.25	6.4	I2	None	00-011352 NF	00-010833 NF	00-011342 NF
				Spherical	00-011352 X.XS	00-010833 X.XS	00-011342 X.XS
				Cylindrical	00-011352 Y.YC	00-010833 Y.YC	00-011342 Y.YC
	0.375	9.5	I2	None	00-010825 NF	00-010644 NF	00-011343 NF
				Spherical	00-010825 X.XS	00-010644 X.XS	00-011343 X.XS
				Cylindrical	00-010825 Y.YC	00-010644 Y.YC	00-011343 Y.YC
	0.5	12.7	I2	None	00-010595 NF	00-011349 NF	00-011344 NF
				Spherical	00-010595 X.XS	00-011349 X.XS	00-011344 X.XS
				Cylindrical	00-010595 Y.YC	00-011349 Y.YC	00-011344 Y.YC
	0.75	19	I3	None	00-011148 NF	00-010369 NF	00-011345 NF
				Spherical	00-011148 X.XS	00-010369 X.XS	00-011345 X.XS
				Cylindrical	00-011148 Y.YC	00-010369 Y.YC	00-011345 Y.YC
15	0.25	6.4	I2	None		00-011149 NF	00-011346 NF
				Spherical		00-011149 X.XS	00-011346 X.XS
				Cylindrical		00-011149 Y.YC	00-011346 Y.YC
	0.375	9.5	I2	None		00-010597 NF	00-011347 NF
				Spherical		00-010597 X.XS	00-011347 X.XS
				Cylindrical		00-010597 Y.YC	00-011347 Y.YC
	0.5	12.7	I2	None		00-010774 NF	00-011348 NF
				Spherical		00-010774 X.XS	00-011348 X.XS
				Cylindrical		00-010774 Y.YC	00-011348 Y.YC

Immersion I2



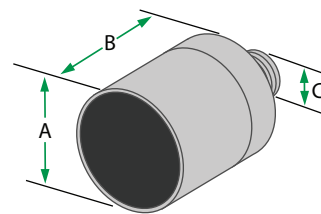
		Element Ø		
	inch mm	0.25 6.4	0.375 9.5	0.5 12.7
A		0.63 in.	0.63 in.	0.63 in.
		16 mm	16 mm	16 mm
B		1.4 in	1.4 in	1.4 in
		35.6 mm	35.6 mm	35.6 mm
C		0.73 in.	0.73 in.	0.73 in.
		18.5 mm	18.5 mm	18.5 mm
D		1.55 in.	1.55 in.	1.55 in.
		39.4 mm	39.4 mm	39.4 mm
E		5/8 - 24 UNEF		

Immersion I3



	Element Ø	
	inch mm	0.75 19
A		1.0 in. 25.4 mm
B		1.3 in. 33 mm
C		5/8 - 24 UNEF

Immersion I4



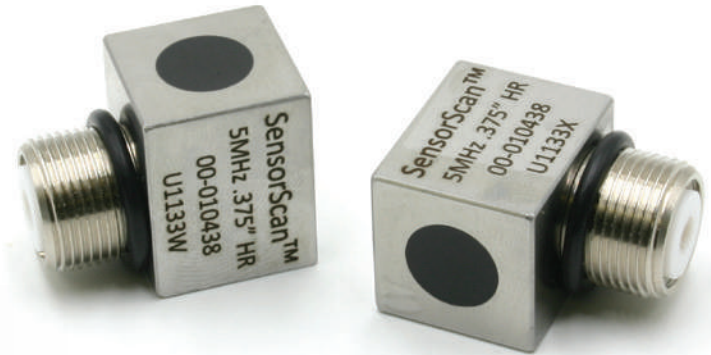
	Element Ø	
	inch mm	1 25.4
A		1.35 in. 34.3 mm
B		1.25 in. 31.8 mm
C		5/8 - 24 UNEF



Immersion

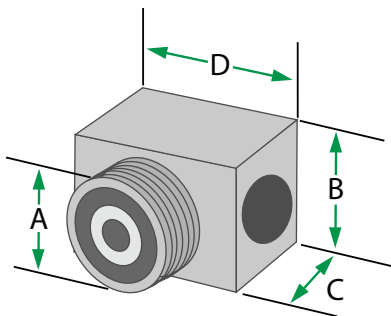
IR

Immersion Transducers are typically used in automatic and manual scanning systems using water or other liquid as a coupling medium to enable the inspection of parts with complex geometries and near-surface resolution superior to that of contact transducers. Spherical (point) or cylindrical (line) focusing can further improve sensitivity and resolution. Focal length must be specified.



Models IR Immersion Transducers

Model IR transducers have right-angle-mounted waterproof UHF connectors and small case design for applications where space is limited. Available element diameters are 0.25, 0.375 and 0.5 inch (6, 10 and 13 mm). **GP series*** offer the best combination of sensitivity and resolution for general applications. **HR series*** are highly damped for applications where high resolution is required. **C series*** have piezocomposite elements and offer superior penetration, resolution and signal-to-noise ratio in highly attenuative and coarse grain materials.



Immersion IR

Element Ø		A	B	C	D
inch	mm				
0.25	6.4	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm
0.375	9.5	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm
0.5	12.7	5/8 - 24 UNEF	0.75 in. 19 mm	0.75 in. 19 mm	0.94 in. 23.9 mm

Frequency (MHz)	Element Diameter		Focus	Part Number		
	inch	mm		GP	HR	C
2.25	0.25	6.4	None	00-011385 NF	00-011386 NF	00-011387 NF
			Spherical	00-011385 X.XS	00-011386 X.XS	00-011387 X.XS
			Cylindrical	00-011385 Y.YC	00-011386 Y.YC	00-011387 Y.YC
	0.375	9.5	None	00-011388 NF	00-011389 NF	00-011390 NF
			Spherical	00-011388 X.XS	00-011389 X.XS	00-011390 X.XS
			Cylindrical	00-011388 Y.YC	00-011389 Y.YC	00-011390 Y.YC
	0.5	12.7	None	00-011391 NF	00-011392 NF	00-011393 NF
			Spherical	00-011391 X.XS	00-011392 X.XS	00-011393 X.XS
			Cylindrical	00-011391 Y.YC	00-011392 Y.YC	00-011393 Y.YC
5	0.25	6.4	None	00-011394 NF	00-011395 NF	00-011396 NF
			Spherical	00-011394 X.XS	00-011395 X.XS	00-011396 X.XS
			Cylindrical	00-011394 Y.YC	00-011395 Y.YC	00-011396 Y.YC
	0.375	9.5	None	00-011397 NF	00-011398 NF	00-011399 NF
			Spherical	00-011397 X.XS	00-011398 X.XS	00-011399 X.XS
			Cylindrical	00-011397 Y.YC	00-011398 Y.YC	00-011399 Y.YC
	0.5	12.7	None	00-011400 NF	00-011401 NF	00-011402 NF
			Spherical	00-011400 X.XS	00-011401 X.XS	00-011402 X.XS
			Cylindrical	00-011400 Y.YC	00-011401 Y.YC	00-011402 Y.YC

Velocity Testing

Frequency (MHz)	Element Diameter		Focus	C
	inch	mm		
5	0.25	6.4	None	00-010591
	0.375	9.5	None	00-010438
	0.5	12.7	None	00-010475

* GP = General Purpose; HR = High Resolution; C = Composite.
* See appendix for technical details.



Immersion Paintbrush

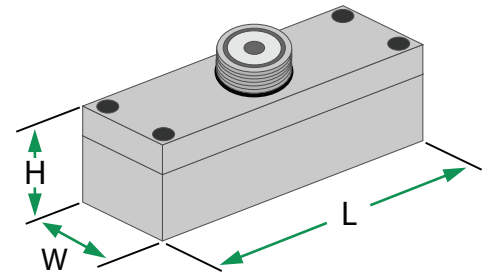
Paintbrush Transducers

are single-element immersion transducers which give a greater scanning width than conventional transducers with round or rectangular elements. They are often used in scanning tanks where large plates, bars, and other parts are tested which have large surface areas. Their large coverage decreases scan time dramatically. Like other conventional probes, they can be ordered with GP*, HR* or C* performance and are available in flat or cylindrical focuses.



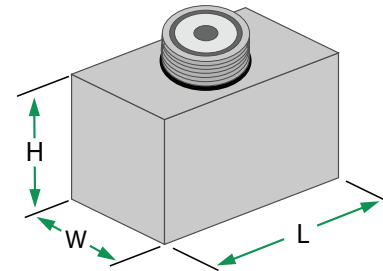
Frequency (MHz)	Element Dimensions		Focus	Part Number
	Short Axis	Long Axis		HR
10	0.25 in (6.4 mm)	2.5 in (63.5 mm)	Flat	00-010590 NF
			Cylindrical	00-010590 Y.YC

Element Dimensions		H	L	W
inch	mm			
0.25 x 2.5	6.4 x 63.5	0.65 in. 16.5 mm	2.85 in. 72.4 mm	0.75 in. 19 mm



Frequency (MHz)	Element Dimensions		Focus	Part Number
	Short Axis	Long Axis		HR
10	0.25 in (6.4 mm)	1 in (25.4 mm)	Flat	00-010175 NF
			Cylindrical	00-010175 Y.YC

Element Dimensions		H	W	L
inch	mm			
0.25 x 1	6.4 x 25.4	0.95 in. 24.1 mm	0.75 in. 19 mm	1.5 in. 38.1 mm



The majority of paintbrush transducers are built to specific customer requirements. These are a few examples of SNI Paintbrush Transducers but do not represent our full capabilities. Please contact us for specific probe requests.



Thickness Gauges

Single Element, Dual Element, Phased Array

Precision (Single Element) Thickness Gauging Transducers

For use with commercial thickness gauges and flaw detection instruments.

Model	Transducer Type	Contact Diameter inch mm	Measuring Range in Steel	Nominal Frequency	SNI Part Number
Alpha2 DFR Plus	Delay Line Removable	0.3 7.6	0.007 to 1 inch 0.18 to 25.4 mm	15 MHz	00-010417
CA211 Plus	Standard Contact	0.75 19	0.60 to 20 inch 1.5 to 508 mm	5 MHz	00-010415
Alpha2 F Plus	Small Contact	0.38 9.7	0.60 to 10 inch 1.5 to 254 mm	10 MHz	00-010625
Alpha2 Mini DFR Plus	Thin Range Delay Line	0.19 4.8	0.005 to 0.2 inch 0.13 to 5.1 mm	20 MHz	00-010589
Pencil Probe	Delay Line Pencil Case	0.065 or 0.090 1.7 or 2.3	0.008 to 0.175 inch 0.20 to 0.44 mm	20 MHz	00-011039



Corrosion (Dual Element) Thickness Gauging Transducers

For use with commercial corrosion thickness gauges and flaw detection instruments.

Model	Transducer Type	Contact Diameter inch mm	Measuring Range in Steel	Temperature Maximum	SNI Part Number
FH2E Plus	Fingertip	0.38 9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010424
FH2E Plus WR	Fingertip Wear Resistant	0.55 14	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010565
FH2E Plus MD	Fingertip	0.38 9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-011017
FH2E Plus M	Fingertip Small Diameter	0.28 7.1	0.030 to 1.0 inch 7.6 to 25.4 mm	<130° F <54° C	00-010675
FH2E Plus with BNC	Fingertip	0.38 9.7	0.030 to 2.0 inch 7.6 to 50.8 mm	<130° F <54° C	00-010532
FH2E Plus BT	Studded Boiler Tube	0.38 9.7	0.060 to 2.0 inch 1.5 to 50.8 mm	<130° F <54° C	00-010676
DA 512 Plus	Fingertip	0.295 7.5	0.024 to 2.4 inch .6 to 61 mm	<130° F <54° C	00-010638
SNI 525	Potted Fingertip	0.2 5	0.025 to 2 inch .6 to 50.8 mm	<130° F <54° C	00-012223



Dual-Linear Phased-Array™ for Corrosion Inspection

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number	Case
5	32 Transmit 32 Receive	0.060 1.50	0.20 5	Dual linear, corrosion inspection	00-010863	Corrosion

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number	Case
5	32 Transmit 32 Receive	0.030 0.75	0.20 5	Dual linear, corrosion inspection	00-011200	Corrosion

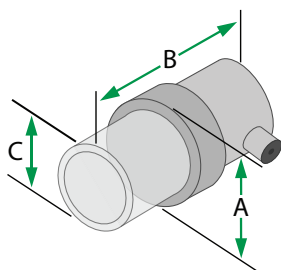




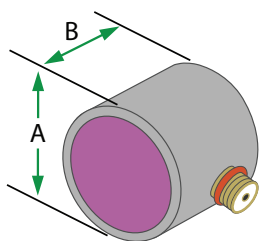
Thickness Gauges

Case Dimensions

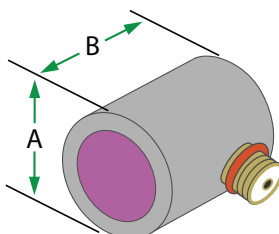
Alpha2 DFR +



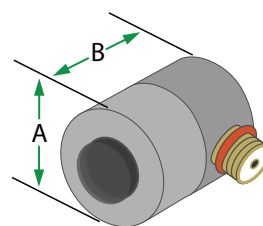
CA211 Plus



Alpha2 F +



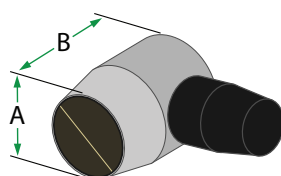
Alpha2 Mini DFR +



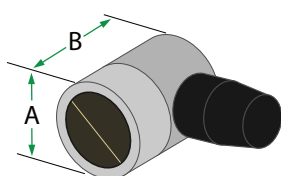
Pencil Probe

See page 7
for Pencil Probe
Dimensions

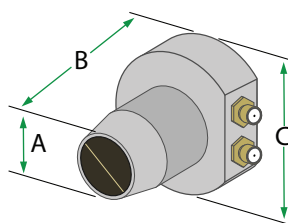
FH2E +



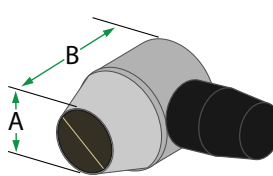
FH2E + WR



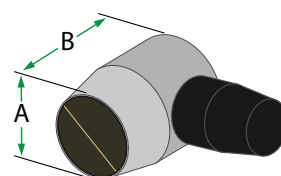
FH2E + MD



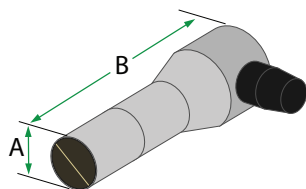
FH2E + M



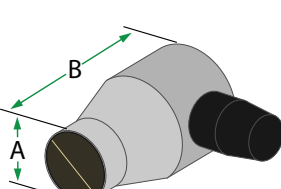
FH2E + w/ BNC



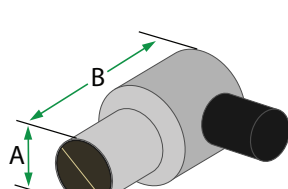
FH2E + BT



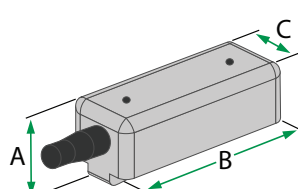
DA 512 +



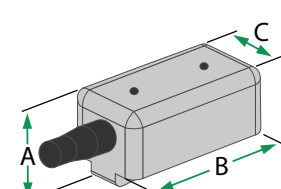
SNI 525



Corrosion (1.5mm pitch)



Corrosion (.75mm pitch)



Case Type	Case Dimensions					
	A		B		C	
Alpha2 DFR +	0.51 in.	13 mm	0.83 in.	21.1 mm	0.3 in.	7.6 mm
CA211 +	0.75 in.	19.1 mm	0.65	16.5 mm		
Alpha2 F +	0.5 in.	12.7 mm	0.65	16.5 mm		
Alpha2 Mini DFR +	0.4 in.	10.2 mm	0.46 in.	11.7 mm		
Pencil Probe	See page 7 for Pencil Probe Dimensions					
FH2E +	0.38 in.	9.7 mm	0.73 in.	18.5 mm		
FH2E + WR	0.54 in.	13.7 mm	0.73 in.	18.5 mm		
FH2E + MD	0.38 in.	9.7 mm	1.04 in.	26.4 mm	1.0 in.	25.4 mm

Case Type	Case Dimensions					
	A		B		C	
FH2E + M	0.28 in.	7.1 mm	0.725 in.	18.4 mm		
FH2E + w/ BNC	0.38 in.	9.7 mm	0.73 in.	18.5 mm		
FH2E + BT	0.38 in.	9.7 mm	2.0 in.	50.8 mm		
DA 512 +	0.29 in.	7.4 mm	0.67 in.	17 mm		
SNI 525	0.2 in.	5.1 mm	0.79 in.	20.1 mm		
Corrosion (1.5mm Pitch)	0.95 in.	65.5 mm	2.58 in.	65.5 mm	1.0 in.	25.4 mm
Corrosion (.75mm Pitch)	0.95 in.	24.1 mm	1.61 in.	40.9 mm	1.0 in.	25.4 mm



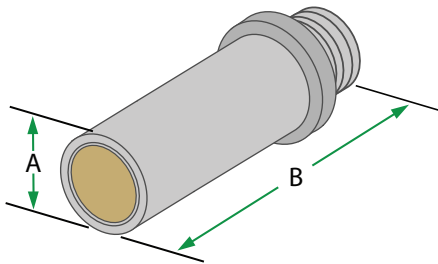
Polymer Transducers

Polymer Transducers

Polymer transducers, also known as PVdF transducers, have a wide bandwidth and short impulse response. Variations in focusing can be requested either as unfocussed, cylindrical or spherical. Standard frequency ranges between 5MHz and 15MHz. Higher frequencies can be requested but there are other limitations beyond 15MHz.

Typical applications include immersion scanning of components for small or near-surface defects in:

- Aerospace forgings
- Small-diameter bar stock
- Acoustic microscopy
- Thickness gauging of precision, thin-walled tubing



Element Ø		A		B	
inch	mm				
0.4	10.2	0.62 in.	15.75 mm	2.05 in.	52.1 mm

Polymer transducers are manufactured based on specific customer requirements. Please contact us for polymer transducer requests.



Matrix Arrays

Standard Models

Matrix Array Transducers*

Matrix-Array transducers enable enhanced phased-array inspections and full-matrix capture which brings better POD, improved flaw sizing & characterization, enhanced imaging and faster inspection scans. Whether it's a simple 4 x 8 element array for weld inspection or as complicated as an 800-element array for heavy-wall forgings, SNI can prove-out a design in 3D computer simulation and easily change key variables such as frequency and pitch before the final design and fabrication process begins.

Dual Matrix

Frequency (MHz)	Number of Elements	Primary Pitch in mm	Secondary Pitch in mm	Array Description and Application	SNI Part Number**	Case
1.5	2x15 5x3 element	0.150 3.80	0.160 4	Dual matrix (T/R) - coarse-grain materials	00-010278	E4
2	2x32 16x2 element	0.070 1.75	0.160 4	Dual matrix (T/R) - coarse-grain materials	00-010342	E5
4	2x32 16x2 element	0.040 1.00	0.120 3	Dual matrix (T/R) - coarse-grain materials	00-013823	A27

10x6

Frequency (MHz)	Number of Elements	Primary Pitch in mm	Secondary Pitch in mm	Array Description and Application	SNI Part Number**
1	60	0.108 2.75	0.181 4.6	1" x 1" Aperature, Primary Axis Steering in Wedge: +/-26 DEG, Secondary: +/-15 DEG	00-013818
2.25	60	0.063 1.60	0.083 2.1	0.6" x 0.5" Aperature, Primary Axis Steering in Wedge: +/-20 DEG, Secondary: +/-15 DEG	00-013819
4	60	0.043 1.1	0.067 1.7	0.45" x 0.4" Aperature, Primary Axis Steering in Wedge: +/-16 DEG, Secondary: +/-10 DEG	00-013820

9x7

Frequency (MHz)	Number of Elements	Primary Pitch in mm	Secondary Pitch in mm	Array Description and Application	SNI Part Number**	Case
5	63	0.043 1.10	0.043 1.1	General Purpose	00-013821	AM
2.25	63	0.070 1.75	0.070 1.75	General Purpose	00-013822	AL

7x4

Frequency (MHz)	Number of Elements	Primary Pitch in mm	Secondary Pitch in mm	Array Description and Application	SNI Part Number**	Case
2.25	28	0.106 2.70	0.120 3	General Purpose	00-013824	A17

* See page 39 for matrix-array transducer connector types.

** When ordering matrix-array transducers, please include the part number followed by the desired connector type (ex. 00-010328 ZPAC).



Phased Array

Standard Models

Phased Array Transducers*

SNI's phased array transducers are available in many configurations, including linear, matrix, dual matrix, curved, annular and annular sectorial. Standard cable length is 8.2-ft (2.5 m) with ZPAC, IPEX, Phasor, Mentor, or Hypertronics connector. Other cable lengths and connectors are available upon request.

General Purpose

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
1.5	16	0.040 1.00	0.47 12	Low-frequency linear, coarse-grain materials	00-010276	E2
2.25	16	0.030 0.75	0.47 12	General purpose linear	00-010265	AM
2.25	16	0.030 0.75	0.47 12	General purpose linear	00-011419	A1
2.25	16	0.060 1.50	0.75 19	General purpose linear	00-010277	E3
2.25	64	0.024 0.60	0.38 10	General purpose linear	00-010267	LM
2.25	64	0.024 0.60	0.38 10	General purpose linear	00-011420	A12
2.25	64	0.030 0.75	0.47 12	General purpose linear	00-011421	A2
4	16	0.020 0.50	0.35 9	General purpose linear	00-010275	E1
5	16	0.024 0.60	0.38 10	General purpose linear	00-010266	AM
5	16	0.024 0.60	0.38 10	General purpose linear	00-011422	A10
5	16	0.024 0.60	0.38 10	General purpose linear	00-011423	A1
5	32	0.024 0.60	0.38 10	General purpose linear	00-010329	A11
5	64	0.024 0.60	0.38 10	General purpose linear	00-010268	LM
5	64	0.024 0.60	0.38 10	General purpose linear	00-011426	A12
5	64	0.024 0.60	0.38 10	General purpose linear	00-011427	A2
10	32	0.012 0.31	0.28 7	General purpose linear	00-011429	A10
10	32	0.012 0.31	0.28 7	General purpose linear	00-011430	A1
10	64	0.024 0.60	0.38 10	General purpose linear	00-010269	LM

Immersion

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
3.5	64	0.040 1.00	0.28 7	Near wall linear immersion (elements close end)	00-010331	Near Wall
5	64	0.040 1.00	0.28 7	Near wall linear immersion (elements close end)	00-010332	Near Wall
5	128	0.030 0.75	0.38 10	Linear immersion	00-010333	I3
5	64	0.024 0.60	0.38 10	Linear immersion	00-011431	I1
5	128	0.024 0.60	0.38 10	Linear immersion	00-011432	I2
5	32	0.052 1.32	0.24 6	Curved array for composite radius inspection	00-010334	R4
5	64	0.050 1.27	0.31 8	Hardwater linear (minimizes water gap needed)	00-010327	HW

Deep Penetration

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
1.5	16	0.110 2.80	1.02 26	Deep penetration probes	00-011416	A4
2.25	16	0.080 2.00	1.26 32	Deep penetration probes	00-011417	A4
2.25	32	0.030 0.75	0.94 24	Deep penetration probes	00-011418	A5
5	32	0.024 0.60	0.76 20	Deep penetration probes	00-011424	A5

* See page 39 for phased-array transducer connector types.

** When ordering phased-array transducers, please include the part number followed by the desired connector type (ex. 00-010328 ZPAC).



Phased Array

Standard Models

Small Footprint

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
2.25	32	0.016 0.40	0.50 12.7	Miniature angle beam; fits conventional wedges	00-010340	.5 in. MSWS
3.5	32	0.016 0.40	0.50 12.7	General purpose linear	00-010381	.5 in. MSWS
3.5	16	0.016 0.40	0.25 6.25	General purpose linear	00-010379	.25 in. MSWS
5	16	0.016 0.40	0.25 6.25	General purpose linear	00-010380	.25 in. MSWS
5	32	0.016 0.40	0.50 12.7	Miniature angle beam; fits conventional wedges	00-010339	.5 in. MSWS
7.5	16	0.016 0.40	0.25 6.25	General purpose linear	00-010867	.25 in. MSWS
10	16	0.012 0.31	0.20 5	Small footprint, high frequency linear	00-010341	A00
10	16	0.016 0.40	0.25 6.25	General purpose linear	00-011207	.25 in. MSWS
10	32	0.016 0.40	0.50 12.7	Miniature angle beam; fits conventional wedges	00-010338	.5 in. MSWS

Wedge Mount

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
2	8	0.040 1.00	0.35 9	Low-frequency linear, coarse-grain materials	00-010274	E1

Low Profile

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
5	16	0.020 0.50	0.38 10	Low-profile linear	00-011211	Cobra
7.5	16	0.020 0.50	0.38 10	Low-profile linear	00-011212	Cobra
7.5	32	0.010 0.25	0.38 10	Low-profile linear	00-011213	Cobra
10	16	0.020 0.50	0.38 10	Low-profile linear	00-010214	Cobra
10	32	0.010 0.25	0.38 10	Low-profile linear	00-010215	Cobra

Pipeline Probe

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
5	60	0.040 1.00	0.38 10	General purpose linear	00-011425	A14
7.5	60	0.040 1.00	0.38 10	General purpose linear	00-011428	A14

Weld Inspection

Frequency (MHz)	Number of Elements	Element Pitch in mm	Elevation in mm	Array Description and Application	SNI Part Number**	Case
2.25	16	0.040 1.00	0.63 16	AWS linear	00-010477	AWS

* See page 39 for phased-array transducer connector types.

** When ordering phased-array transducers, please include the part number followed by the desired connector type (ex. 00-010328 ZPAC).



Phased Array

Flexible Array

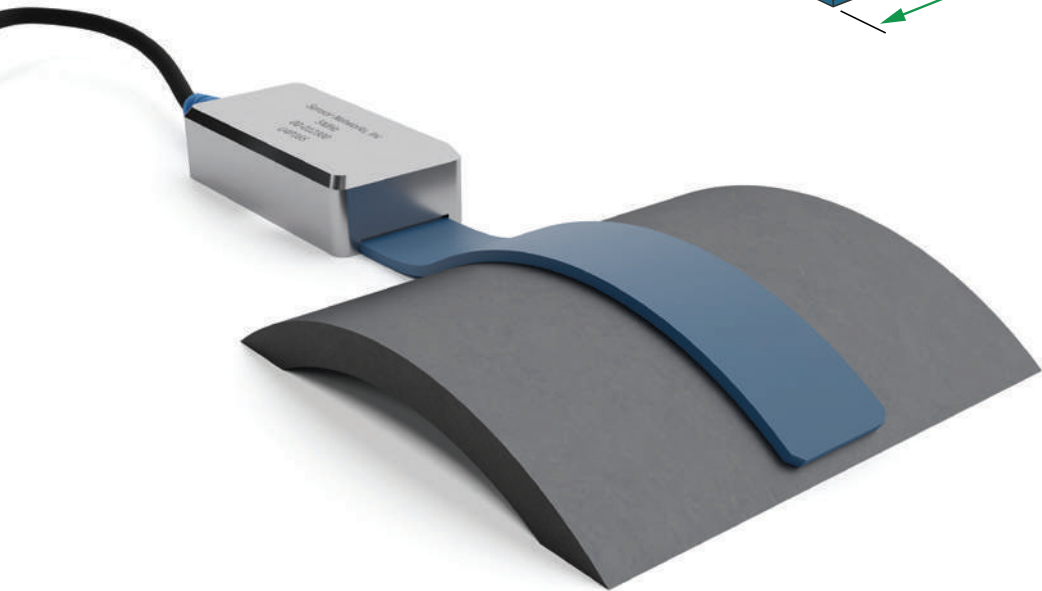
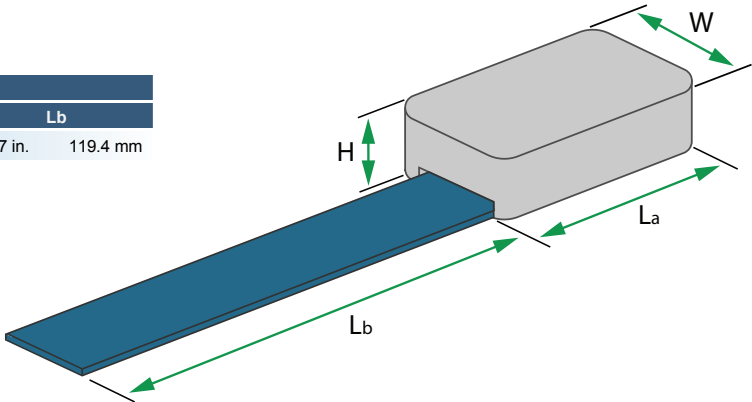
Flexible Array Transducers

Flexible arrays are perfect for applications on curved metals and composites and can flex to fit a wide range of radii. Flexible arrays improve the inspection on complex geometry by reducing distortion and loss of sensitivity created by complex coupling requirements. Sensor Networks' flexible array is designed to meet the needs of various complex inspections with increased flaw detection and quicker inspection time.



Frequency (MHz)	Number of Elements	Element Pitch		Elevation		Array Description and Application	SNI Part Number**
in	mm	in	mm	in	mm		
7	64	0.04	1	0.28	7	NDT and thickness measurement of curved surfaces	00-012975

Case Dimensions							
La		H		W		Lb	
2.57 in.	65.3 mm	0.64 in.	16.3 mm	1.27 in.	32.3 mm	4.7 in.	119.4 mm

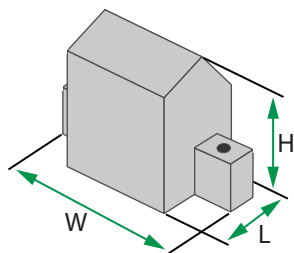




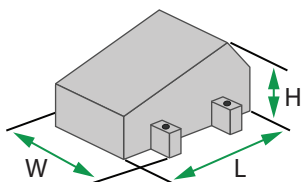
Phased Array

Case Dimensions

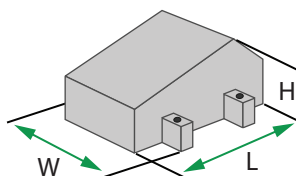
A1



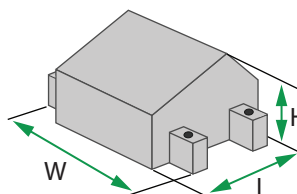
A2



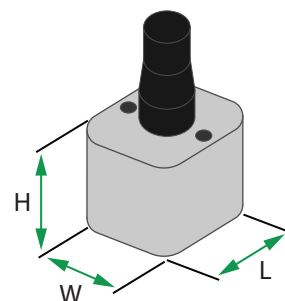
A4



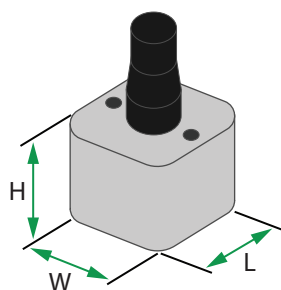
A5



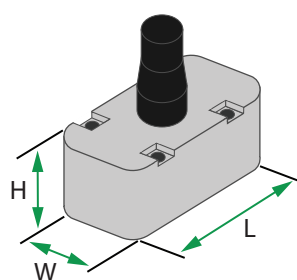
A10



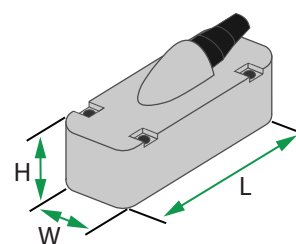
A11



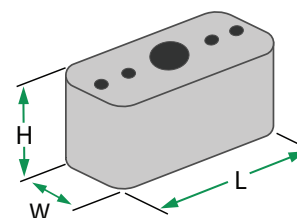
A12



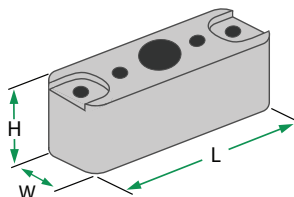
A14



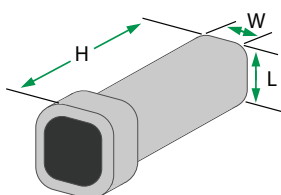
A17



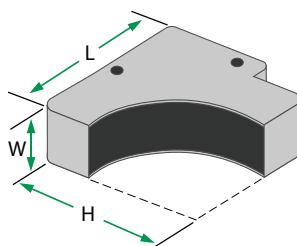
A27



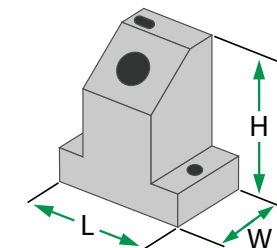
A00



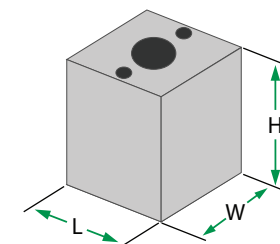
R4



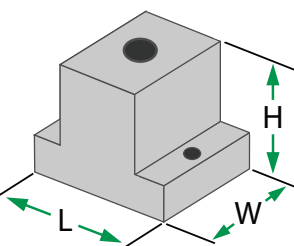
E1



E2



E3



Case Type	Case Dimensions		
	Length	Width	Height
A1	0.67 in. 17 mm	1.14 in. 29 mm	0.98 in. 24.9 mm
A2	2.09 in. 53.1 mm	1.14 in. 29 mm	1.38 in. 35.1 mm
A4	2.24 in. 56.9 mm	1.81 in. 46 mm	1.18 in. 30 mm
A5	1.14 in. 29 mm	1.69 in. 42.9 mm	0.94 in. 23.9 mm
A10	0.91 in. 23.1 mm	0.63 in. 16 mm	0.79 in. 20.1 mm
A11	0.98 in. 24.9 mm	0.91 in. 23.1 mm	0.79 in. 20.1 mm
A12	1.77 in. 45 mm	0.91 in. 23.1 mm	0.79 in. 20.1 mm
A14	2.67 in. 67.8 mm	0.91 in. 23.1 mm	0.79 in. 20.1 mm

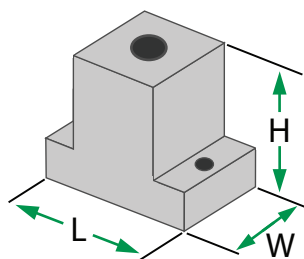
Case Type	Case Dimensions		
	Length	Width	Height
A17	1.34 in. 34 mm	0.63 in. 16 mm	0.98 in. 24.9 mm
A27	1.12 in. 28.4 mm	0.39 in. 9.9 mm	0.79 in. 20.1 mm
A00	0.31 in. 7.9 mm	0.31 in. 7.9 mm	0.91 in. 23.1 mm
R4	1.67 in. 45.2 mm	0.59 in. 15 mm	1.67 in. 42.4 mm
E1	1.1 in. 27.9 mm	0.59 in. 15 mm	1.06 in. 26.9 mm
E2	0.75 in. 19 mm	0.75 in. 19 mm	1.0 in. 25.4 mm
E3	1.45 in. 36.8 mm	1.25 in. 31.8 mm	1.0 in. 25.4 mm



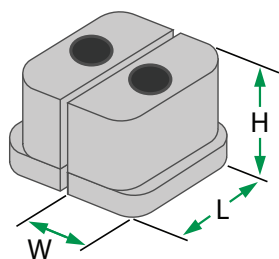
Phased Array

Case Dimensions

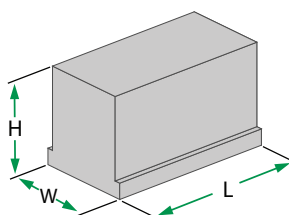
E4



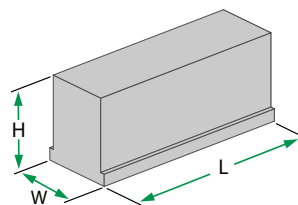
E5



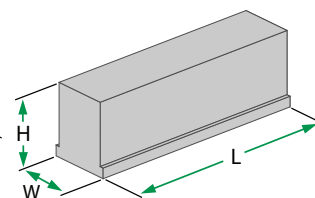
I1



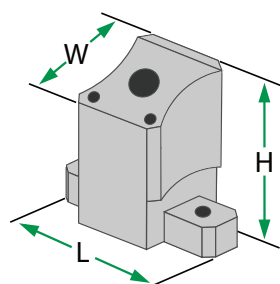
I2



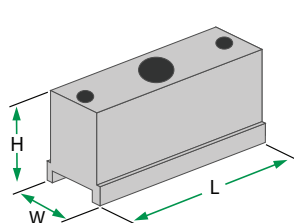
I3



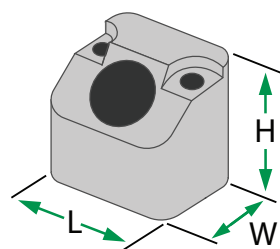
AM



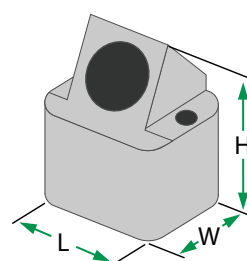
LM



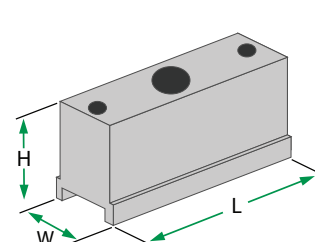
0.25 MSWS



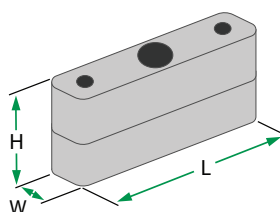
0.5 MSWS



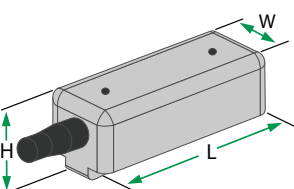
Near Wall



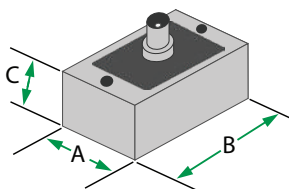
HW



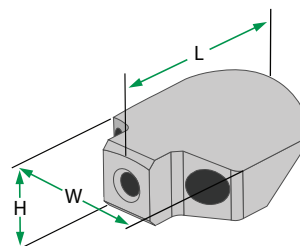
Corrosion



AWS



Cobra



Case Type	Case Dimensions					
	Length		Width		Height	
E4	1.33 in.	33.8 mm	0.65 in.	16.5 mm	1.0 in.	25.4 mm
E5	1.41 in.	35.8 mm	.62 in.	15.7 mm	1.0 in.	25.4 mm
I1	1.97 in.	50 mm	0.75 in.	19 mm	0.98 in.	24.9 mm
I2	3.27 in.	83.1 mm	0.83 in.	21.1 mm	1.38 in.	35.1 mm
I3	4.02 in.	102.1 mm	0.83 in.	21.1 mm	1.38 in.	35.1 mm
AM	1.18 in.	30 mm	0.63 in.	16 mm	0.98 in.	24.9 mm
LM	1.69 in.	42.9 mm	1.1 in.	27.9 mm	0.98 in.	24.9 mm

Case Type	Case Dimensions					
	Length		Width		Height	
0.25 MSWS	0.5 in.	12.7 mm	0.37 in.	9.4 mm	0.5 in.	12.7 mm
0.5 MSWS	0.76 in.	19.3 mm	0.61 in.	15.5 mm	0.75 in.	19 mm
Near Wall	2.6 in.	66 mm	0.75 in.	19 mm	0.98 in.	24.9 mm
HW	3.4 in.	86.4 mm	0.5 in.	12.7 mm	1.25 in.	31.8 mm
Corrosion	2.58 in.	65.5 mm	1.0 in.	25.4 mm	0.95 in.	24.1 mm
AWS	1.26 in.	32 mm	0.80 in.	20.3 mm	0.75 in.	19 mm
Cobra	0.98 in.	24.9 mm	0.87 in.	22.1 mm	0.39 in.	9.9 mm



Accessories

Standard Wedges & Cables

Standard Wedges

Transducer Type	Element Dimensions		Wedges
	inch	mm	
AWS	0.625 x 0.625	16 x 16	45° 01-010268
			60° 01-010269
			70° 01-010270
SWS	0.5 Ø	12.7 Ø	45° 01-010206
			60° 01-010207
			70° 01-010208
	0.5 x 1	12.7 x 25.4	45° 01-010210
			60° 01-010211
			70° 01-010212
	0.75 x 1	19 x 25.4	45° 01-010214
			60° 01-010215
			70° 01-010216
	1 Ø	25.4 Ø	45° 01-010218
			60° 01-010219
			70° 01-010220

Transducer Type	Element Dimensions		Wedges
	inch	mm	
QS	0.25	6.4	30° 01-010189
			45° 01-010190
			60° 01-010191
			70° 01-010192
	0.375	9.5	30° 01-010193
			45° 01-010194
			60° 01-010195
			70° 01-010196
	0.5	12.7	30° 01-010197
			45° 01-010198
			60° 01-010199
			70° 01-010200
MSWS	0.25	6.4	45° 01-010532
			60° 01-010533
			70° 01-010534
	0.5	12.7	45° 01-010535
			60° 01-010536
			70° 01-010537
TOFD	0.125	3.2	45°L 01-010475
			60°L 01-010476
			70°L 01-010477
	0.25	6.4	45°L 01-010475
			60°L 01-010476
			70°L 01-010477

Cables

Cable	Material	Length	Part Number
BNC - BNC	RG58	6-ft (1.83 m)	07-010018
BNC - MD	RG174 TPR	6-ft (1.83 m)	07-010012
BNC - MCX	RG174 TPR	6-ft (1.83 m)	07-010007
BNC - 00-Lemo	RG174 TPR	6-ft (1.83 m)	07-010014
00-Lemo - MD	RG174 TPR	6-ft (1.83 m)	07-010028
00-Lemo - 00-Lemo	RG174 TPR	6-ft (1.83 m)	07-010034

Cable	Material	Length	Part Number
00-Lemo - MCX	RG174 TPR	6-ft (1.83 m)	07-010035
BNC - MCX (RA)	RG174 TPR	6-ft (1.83 m)	07-010008
Dual BNC - Dual MD	RG174 TPR	6-ft (1.83 m)	07-010030
Dual 00-Lemo - BNC	RG174 TPR	6-ft (1.83 m)	07-010032
Lemo 1 - MD	RG174 TPR	6-ft (1.83 m)	07-020175
Lemo 1 - BNC	RG174 TPR	6-ft (1.83 m)	07-020176



Accessories

Phased-Array Wedges

Phased-Array Wedges

SNI's proprietary **Low-Noise-Blue™** damping material minimizes wedge noise for improved resolution and signal-to-noise ratio.

Type	Description	Part Number
E1	Wedge, REX, 38.0 DEG INC, Flat, A	01-010293
E1	Wedge, REX, 38.0 DEG INC, Flat, B	01-010294
E1	Wedge, 30-70 Shear	01-011731
E2	Wedge, REX, 38.0 DEG INC, Flat, A	01-010295
E2	Wedge, REX, 38.0 DEG INC, Flat, B	01-010296
E3	Wedge, REX, 38.0 DEG INC, Flat	01-010297
E4	Wedge, Dual, REX, 18.0 DEG INC, Flat	01-010298
E5	Wedge, Dual 18 INC 2.3RF, REX, Flat	01-010035
MSWS 1/2	Wedge, .5" MSWS, 45S, Plex	01-010535
MSWS 1/2	Wedge, .5" MSWS, 60S, Plex	01-010536
MSWS 1/2	Wedge, .5" MSWS, 70S, Plex	01-010537
MSWS 1/2	Wedge, .50" MSWS PA, REX, 35-75 SW, Flat	01-011015
MSWS 1/2	Wedge, .50" MSWS PA, REX, 35-75 L-WAVE, Flat	01-011016
AM	Wedge 40-70L, AM Case	01-010531
AM	Wedge 40-70S, AM Case	01-010703
AM	Wedge 0 Degree, AM Case	01-011975
LM	Wedge 0 Degree, LM Case	01-010706
LM	Wedge 40-70S, LM Case	01-010707
LM	Wedge 40-70L, LM Case	01-010708
A00	Wedge 30-60S, A00 Case	01-010710
A00	Wedge 45-70S, A00 Case	01-010711
A1	Wedge 0 Degree, A1 Case	01-011733
A1	Wedge 45-70 Shear, A1 Case	01-011734
A2	Wedge 0 Degree, A2 Case	01-011741
A2	Wedge 30-70 Shear, A2 Case	01-011742
A4	Wedge 0 Degree, A4 Case	01-011743
A4	Wedge 30-70 Shear, A4 Case	01-011744
A5	Wedge 0 Degree, A5 Case	01-011745
A5	Wedge 30-70 Shear, A5 Case	01-011746
A10	Wedge 0 Degree, A10 Case	01-011735
A10	Wedge 30-70 Shear, A10 Case	01-010944
A11	Wedge 0 Degree, A11 Case	01-011749
A11	Wedge 30-70 Shear, A11 Case	01-010709
A12	Wedge 0 Degree, A12 Case	01-011737
A12	Wedge 30-70 Shear, A12 Case	01-011738
A14	Wedge 0 Degree, A14 Case	01-011739
A14	Wedge 30-70 Shear, A14 Case	01-011740
A31	Wedge 30-70 Shear, A31 Case	01-010943
MSWS 1/4"	Wedge, .25" MSWS PA, REX, 35-75 SW, Flat	01-010705
MSWS 1/4"	Wedge, .25" MSWS PA, REX, 35-75 L-WAVE, Flat	01-010977
MSWS 1/4"	Wedge, .25" MSWS, 45S, Plex	01-010532
MSWS 1/4"	Wedge, .25" MSWS, 60S, Plex	01-010533
MSWS 1/4"	Wedge, .25" MSWS, 70S, Plex	01-010534
Cobra	Low profile wedge, fits Cobra Style Prbs, Flat	01-011229
Cobra	Low profile wedge, fits Cobra Style Prbs, Curved to Customer request	01-011230-XX



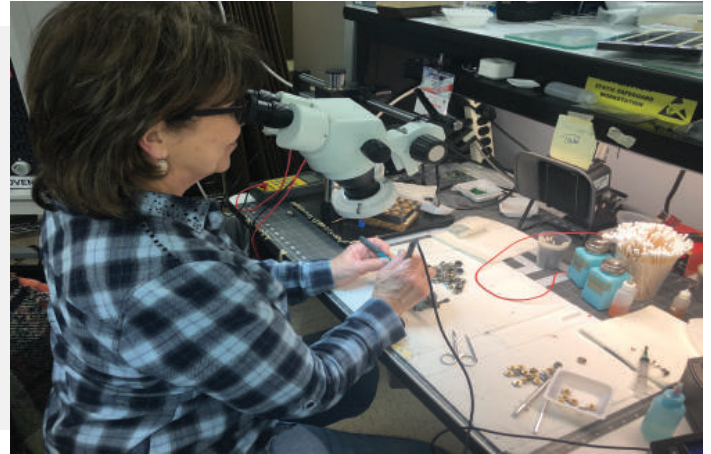
Applications Engineering

Custom Transducer Capabilities

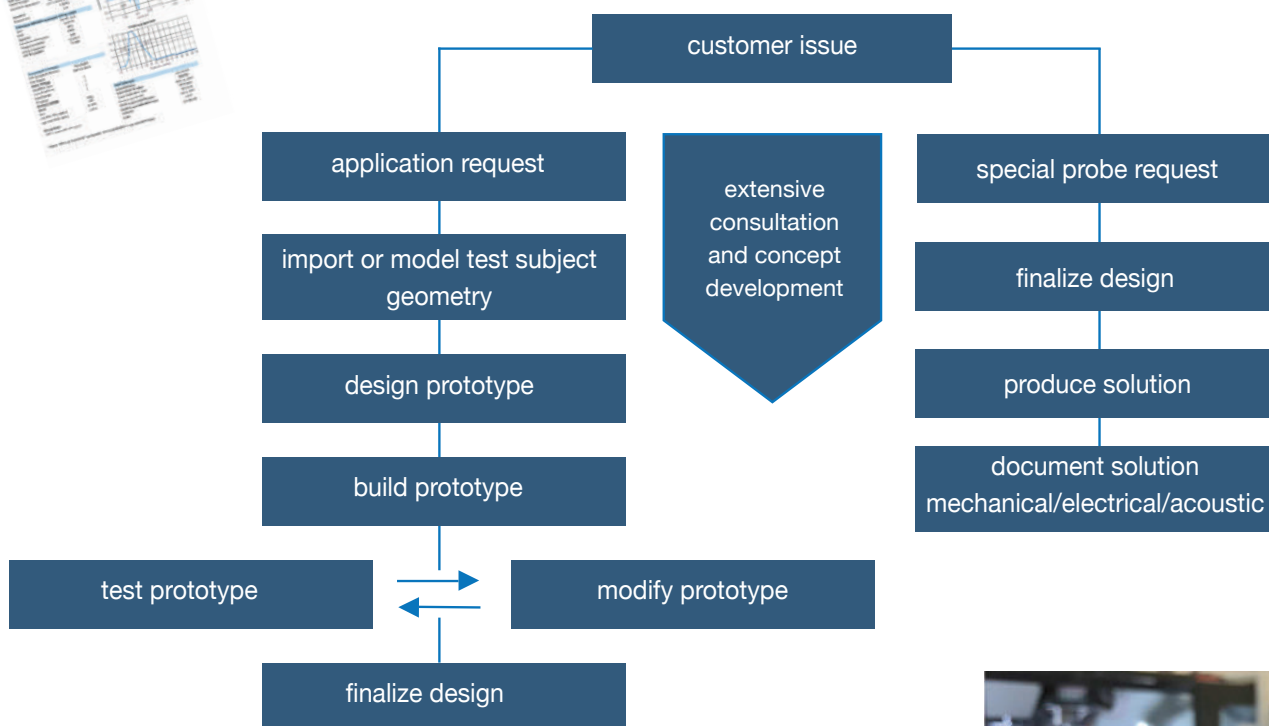
Successful Ultrasonic Applications Engineering

is the result of three major elements:

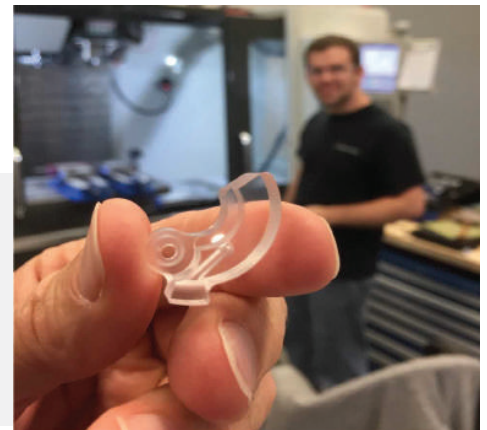
- ▶ Experience
- ▶ Capabilities
- ▶ Process

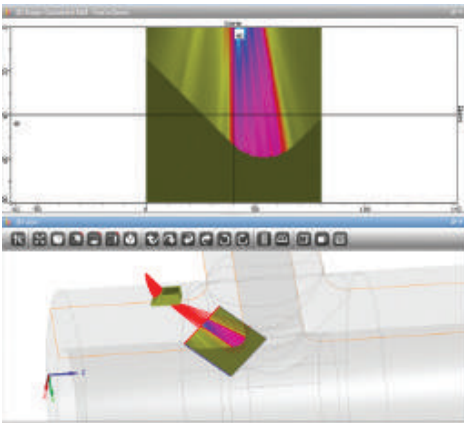


Our Process



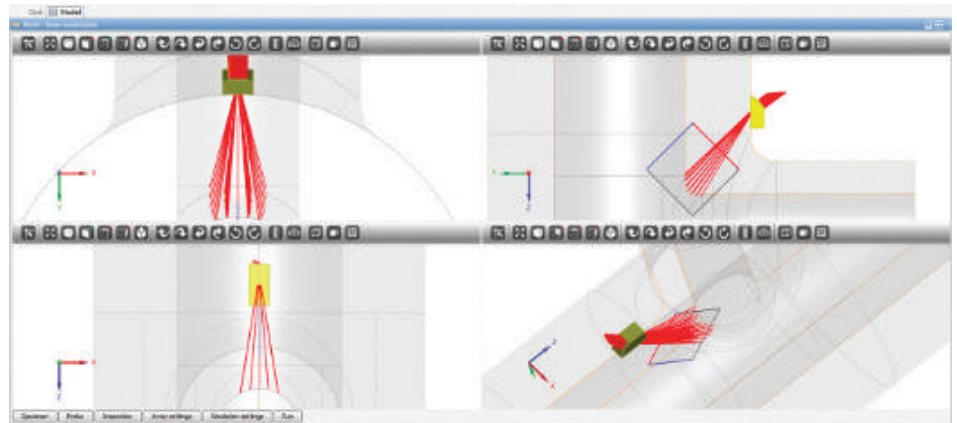
SNI's customers have direct access to our highly experienced team of NDT professionals.





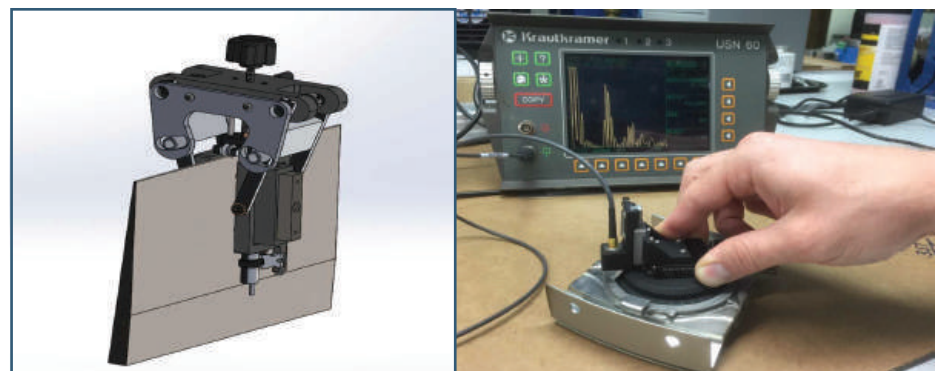
In-house CAD/CAM capabilities, including our 5-axis CNC Mill and CNC Lathe, allows for rapid prototyping of complex shapes in most engineering materials.

In-house ceramic fabrication capabilities enable rapid prototyping of complex, piezo-composite materials. This capability creates a fast and efficient project turn around.



Sensor Networks, Inc. uses industry-preferred design and simulation tools to create an optimized mechanical, electrical, and ultrasonic model of the inspection task, including its scan plan.

- ▶ **SolidWorks:** Parametric 3D CAD and Mechanical Properties Modeling
- ▶ **AutoCad:** 2D CAD and Ray-Tracing
- ▶ **CIVA:** Acoustic Beam Modeling and Delay Law Calculation for Conventional and Phased Arrays
- ▶ **PiezoCad:** Transducer Construction and Performance Modeling
- ▶ **Field II:** Transducer Construction and Performance Modeling
- ▶ **UltraVision 3D:** NDT Data Imaging and Analysis Software for Conventional and Phased Arrays
- ▶ **ES Beam Tool:** Ultrasonic Inspection Plan Design and Validation Software



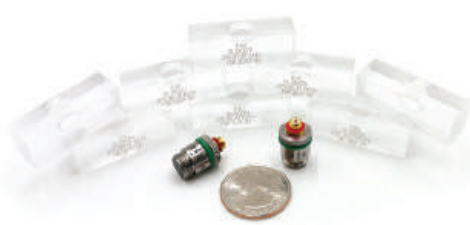
Precision fixturing is key to reproducible test results

Optimized Solutions for Cost-Effective Productivity

Sensor Networks offers transducers and UT solutions in a variety of styles, compatible with any major manufacturer's conventional or phased-array instruments.



Small Diameter (<0.25"/6mm) ID Bore Probes: shear-wave, L-wave, duals and tandem types.



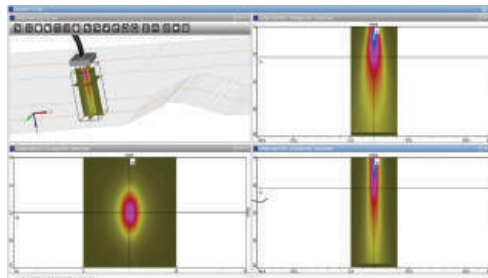
SensorScan® QS: conventional transducers for the quick swapping onto delay lines or wedges.



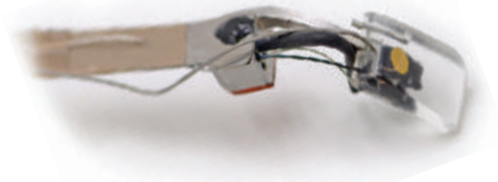
ASME Section XI: compound radius wedges, refracted longitudinal, phased array duals, contact or immersion, TOFD, complex wedges & delays.



O.D. Transducers: for tube weld or braze joints.



CIVA of Dual: Acoustic modeling of dual-element transducer performance on a small pit.



In-Situ: self aligning wand transducers for the hard to access rotating equipment.



Phased Array: linear & matrix, annular, daisy & circular, contact & immersion, single & dual, flat & curved.



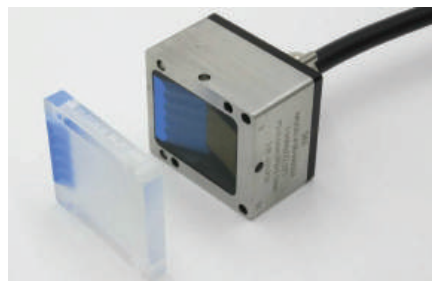
2MHz PAUT Dual: with 2x16 elements per probe and detachable wedge.



7MHz Ultra High-Temp Delay Line: transducer and mounting clamp for continuous 500°C (932°F).



10MHz PAUT Dual: special 64-element dual for HTHA exams.



1.5MHz PAUT: replaceable wear face on 64-element phased-array Matrix probe.

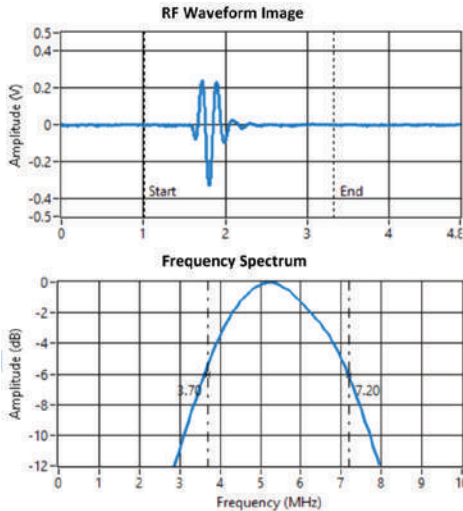


5MHz PAUT: 92-element transducer for bar testing machines.



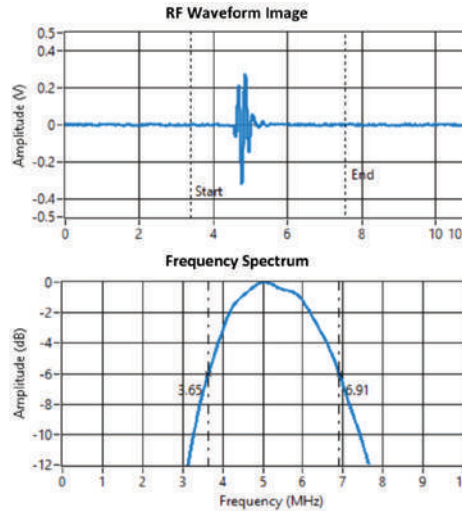
Appendix

► High Resolution Series



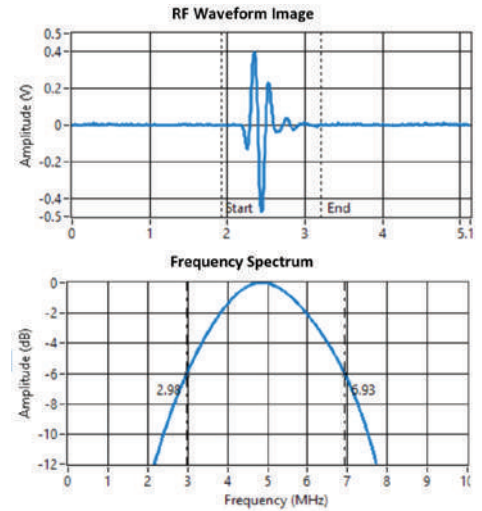
HR: High Resolution Series of transducers are highly damped and recommended for applications where enhanced axial and near-surface resolution are more important. Generally includes thickness measurement and near-surface flaw detection. HR series have less sensitivity than the GP or C series with -6db frequency bandwidth of 50-100% range.

► General Purpose Series



GP: General Purpose Series of transducers are recommended for most applications and have a good trade-off between sensitivity and resolution. They have a medium frequency bandwidth of 30-40% at -6db but with more ring-down cycles in the waveform.

► Composite or Piezo-composite Series



C: Composite (Piezocomposite) Series of transducers have superior sensitivity and penetration especially in highly-attenuative materials. C Series have both higher resolution, sensitivity, and have wide bandwidth (60-120% at -6db) due to the lower acoustic impedance of the material. They couple more efficiently into plastic wedges, delay lines, and water.

Ultrasonic Transducer Certification



Phone: 814-466-7207
Website: www.installedsensors.com

Transducer Information

*Part Number: 00-010778NF
*Serial Number: 778PRETESTK2
Transducer Description: I-12.5MHz-50°-GP-NF-UHF
Frequency: 5MHz
Element Size: 50°

Transducer Measurements per ASTM E1065

Date: Jun 4, 2018
Time: 6:44 PM
Operator: DEH
**Transducer Disposition: PASS
Relative Sensitivity: 58dB
Center Frequency: 5.37MHz
-6dB Bandwidth: 67.66%

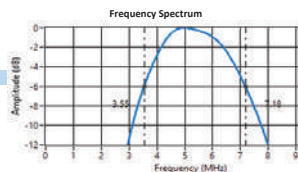
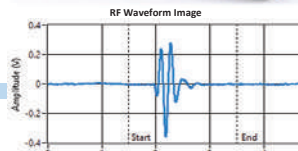
Test Setup & Conditions

Test Procedure Number: Tp
Test Object: 3" H2O-SST
Pulser Settings
Repetition Rate: 4
Pulse Amplitude: 5
Pulse Energy: 2 - LowZ
Damping: 9

Receiver Settings

Pulse Echo
Mode: 10 + 1
Gain: 35 MHz
Low Pass Filter (MHz): 1 MHz

Generic Image of Transducer



Test Equipment

Pulser/Receiver: IDPR300
Pulser Serial Number: DA0901
Pulser Calibration Due Date: Dec 14, 2018
Oscilloscope Model: DPO2022B
Oscilloscope Serial Number: C030032
Oscilloscope Calibration Due Date: Oct 12, 2018
Software: 1.2.0
Cable: 6FT RG-58

*Please reference Transducer Part Number and Serial Number in any correspondence

Ultrasonic Beam Profile



Phone: 814-466-7207
Website: www.installedsensors.com

Transducer Information

*Part Number: XDCR100N
*Serial Number: U11CA7
Transducer Description: XDCR 100, 75° DIA, 5 MHz, 2.5" C/NL
FCS, 13A-1967, B CASE
Frequency: 5MHz
Element Size: .75"

Transducer Measurements per ASTM E1065

Date: Jun 4, 2019
Time: 10:18 AM
Operator: KPR
Transducer Disposition: PASS
-3dB Beam length (in): 0.505"

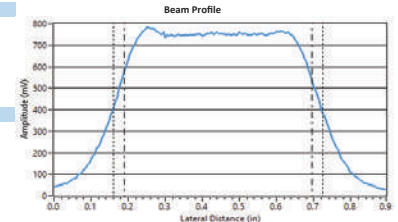
Test Setup & Conditions

Test Procedure Number:
Test Object: 1/4" SST ROD
Water Path (in): 3.0"
Pulser Settings
Repetition Rate: 4
Pulse Amplitude: 5
Pulse Energy: 2 - LowZ
Damping: 9

Receiver Settings

Mode: Pulse Echo
Gain: 20 + 2
Low Pass Filter (MHz): 35 MHz
High Pass Filter (MHz): 1 MHz

Special Notes:



Test Equipment

Pulser/Receiver: JSR DPR300
Pulser Serial Number: DA0901
Pulser Calibration Date: Dec 19, 2019
Oscilloscope Model: DPO2022B
Oscilloscope Serial Number: C030032
Oscilloscope Calibration Date: Oct 11, 2019
Software: 1.0.3
Cable: 6FT RG-58

*Please reference Transducer Part Number and Serial Number in any correspondence



Appendix

► Matrix/Phased-Array Transducer Connector Types

SONI can build any phased-array transducer with:



Phasor

Mentor



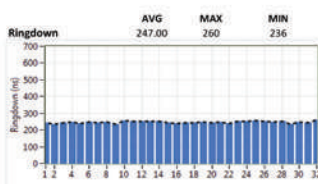
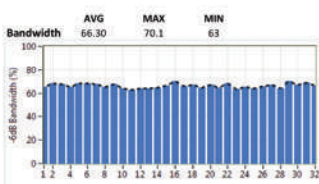
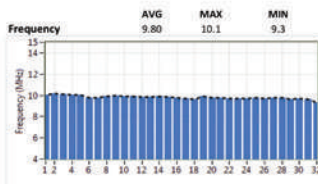
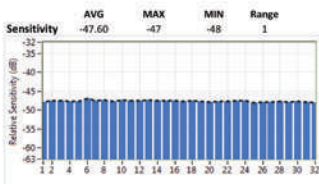
(L to R) IPEX, ZPAC, Hypertronics

Linear Phased Array Ultrasonic Transducer Certification



Transducer Information
*Part Number: 00-010848
*Serial Number: U11795

Parameter	Measurement	Specification	RESULT
Average Center Freq	9.8	+/-10%	PASS
Average Bandwidth	66.3	>=60%	PASS
Sensitivity deviation	1	+/-3dB	PASS
Probe Wiring Configuration Check			PASS
Probe Cable/Connector Check			PASS



*Please reference Transducer Part Number and Serial Number in any correspondence

Linear Phased Array Ultrasonic Transducer Certification



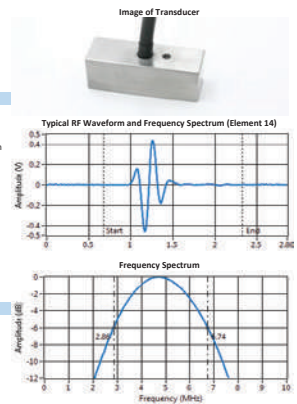
Transducer Information
*Part Number: 00-010536-SMT
*Serial Number: U115CV
Transducer Description: 5MHz, 28EL, 1.6mmP X 10mm, 30mm CBL, Rectangular

Probe Type: Rectangular
Frequency: 5.0MHz
Element Pitch: 1.6 mm
Element Elevation: 10 mm
Number of Elements: 28
Cable Jacket: PU
Cable Length: 30M
Connector Type: SAMTEC

Transducer Measurements per ASTM E1065
Date: 6/13/2018
Time: 9:20:55AM
Operator: KYLE RYAN
**Transducer Disposition: PASS

Average Relative Sensitivity: -45dB
Average Center Frequency: 4.80MHz
Average -6dB Bandwidth: 78.70%

Test Setup & Conditions
Test Procedure Number: TP
Test Object: 20mm REX BW
Pulse Width: 100ns
Pulse Voltage: -12.3V

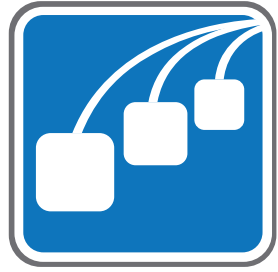


Special Notes:

*Please reference Transducer Part Number and Serial Number in any correspondence

**This item was manufactured and tested according to product specific parameters. The "Pass" Disposition confirms that all steps in the manufacturing process were completed satisfactorily and that all test requirements were satisfied.

All SensorScan® Transducers carry a one-year warranty from the date of purchase, for the original owner, covering defects in materials and workmanship.



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