

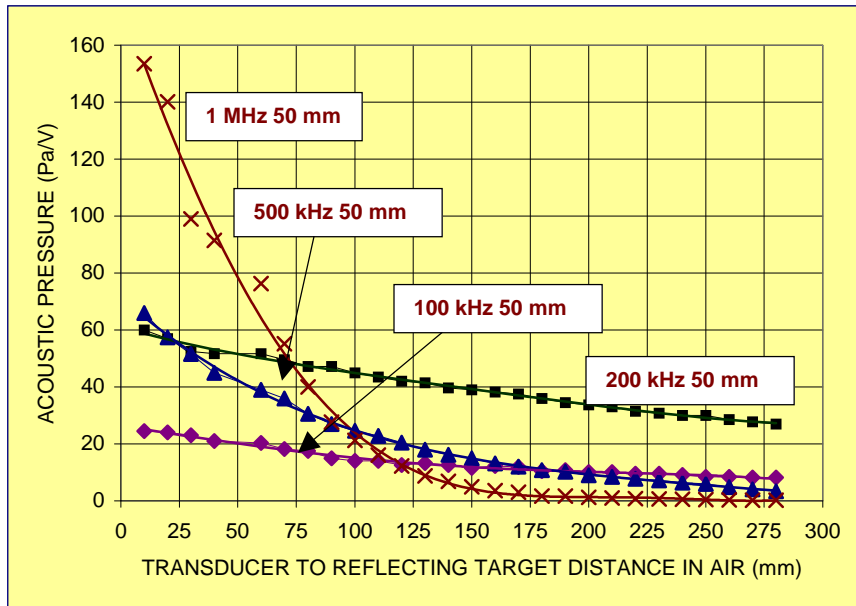
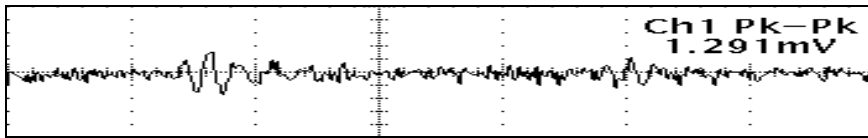
# PHENOMENALLY HIGH EFFICIENCY NON-CONTACT ULTRASOUND TRANSDUCERS



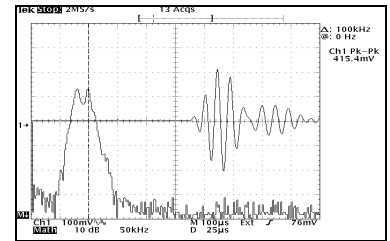
www.secondwavesystems.com  
sales@secondwavesystems.com

Non-contact – gas/air coupled -- ultrasonic transducers offered by SecondWave represent the epitome of transducer design. These devices have been under development since 1978, reaching perfection in 1997 with US and several international patents. NCU transducers are based upon piezoelectric phenomena and feature perfect Z-matching for 100% transduction in air from <100 kHz to 10 MHz.

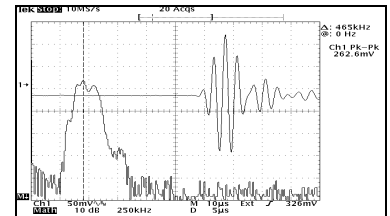
The new NCU transducers generate immense acoustic pressure in air between <100 kHz to 5 MHz. This is the key to Non-Contact Ultrasound and the magnitude of this development. *Imagine 2.0 MHz transmission in 25 mm steel (6 orders of magnitude Z mismatch) with only one burst 16 Vpp and 64 dB amplification!*



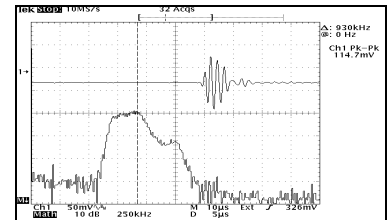
- ✓ Total freedom from touch or contamination
- ✓ Efficiency rivaling contact transducers
- ✓ High frequency -- <100 kHz to >10 MHz
- ✓ Robust construction



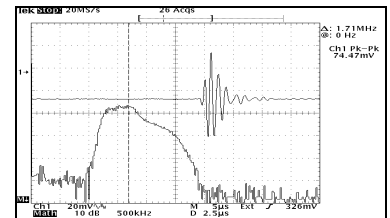
100 kHz. 16 vpp. ZERO dB amplification



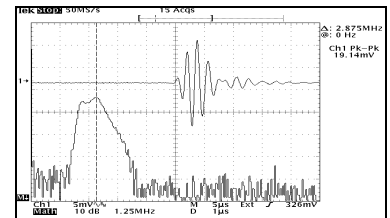
500 kHz. 16 vpp. ZERO dB amplification



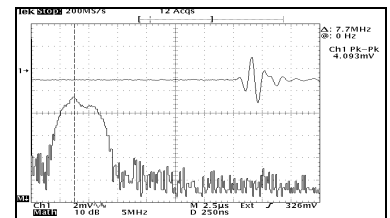
1 MHz. 16 vpp. ZERO dB amplification



2 MHz. 16 vpp. ZERO dB amplification



3 MHz. 16 vpp. ZERO dB amplification



10 MHz. 16 vpp. ZERO dB amplification

# NCU TRANSDUCERS

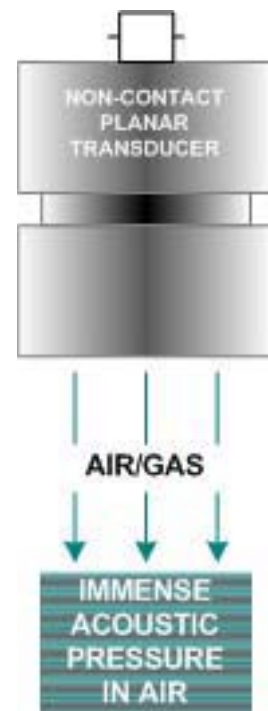
## SPECIFICATIONS

FEATURE	SPECIFICATIONS
Frequency Range	<100 kHz to >10 MHz
Sensitivity	Phenomenally high in air, ~30 dB lower than contact transducers
Signal to Noise Ratio	Generally, >60 dB
Bandwidth	Nominally, between 30 to 50% of BCF – broader bandwidths, also available
Dimensional Range	<1 mm to >76 mm active diameter
Geometrical Configuration	Planar, point and cylindrically focused
Housing	Aluminum protected by clear plastic cover
Co-axial Connector	Axially mounted standard BNC
Maximum Humidity	90% RH
Maximum Temperature	70 deg C
Maximum Gas Pressure	Successfully tested up to 50 bars
Construction	Robust and factory suitable

## PLANAR TRANSDUCERS

### ORDERING INFORMATION

CATALOG #	FREQUENCY	ACTIVE DIAMETER (mm)
NCT-101	100 kHz	25.0
NCT-201		50.0
NCT-52	200 kHz	12.5
NCT-102		25.0
NCT-202		50.0
NCT-25	500 kHz	6.3
NCT-55		12.5
NCT-105		25.0
NCT-205		50.0
NCT110		1.0 MHz
NCT-210	6.3	
NCT-510	12.5	
NCT1010	25.0	
NCT120	2.0 MHz	3.2
NCT-220		6.3
NCT-520		12.5
NCT130	3.0 MHz	3.2
NCT-230		6.3
NCT-530		12.5
NCT140	4.0 MHz	3.2
NCT-240		6.3
NCT-540		12.5
NCT150	5.0 MHz	3.2
NCT-250		6.3
NCT-550		12.5



For assistance and other variables, please contact us.

## FOCUSED NON-CONTACT TRANSDUCERS

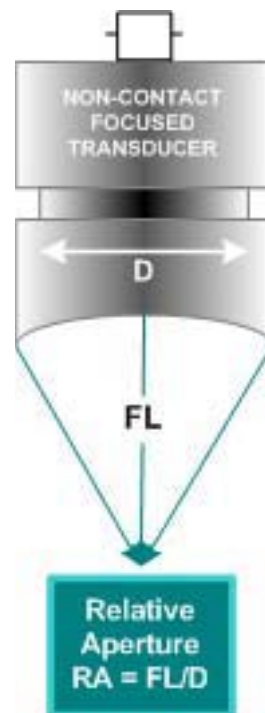
Non-contact transducers can also be configured to generate focusing mechanism in air. In the following table we have provided a few point focused transducers. Should you need cylindrically focused transducers, simply change the suffix "P" to "C." The numeral following the suffix is the Relative Aperture (RA, focal length/active diameter). Very small RA transducers are difficult to produce, however, in special cases we have made transducers with RA of 1.



### ORDERING INFORMATION

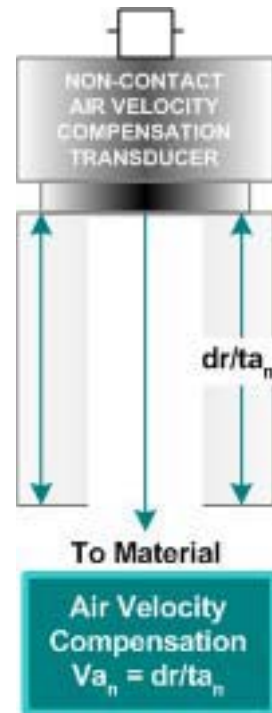
MODEL #	FREQ.	ACTIVE $\Phi$ (mm)	FOCAL LENGTH IN AIR (mm)	FOCAL POINT IN AIR (-mm)	HALF ANGULAR APERTURE (~°)
NCT-102-P4	200 kHz	25	100	7.0	7.2
NCT-102-P6			150	10.0	4.8
NCT-202-P4		50	200	7.0	7.2
NCT-202-P6			300	10.0	4.8
NCT-105-P4	500 kHz	25	100	2.8	7.2
NCT-105-P6			150	4.2	4.8
NCT-210-P4	1.0 MHz	6.3	25	1.4	7.2
NCT-510-P4			50	1.4	7.2
NCT-510-P6			75	2.1	4.8
NCT-220-P4	2.0 MHz	6.3	25	0.7	7.2
NCT-520-P4			50	0.7	7.2
NCT-520-P6			75	1.0	4.8
NCT-230-P4	3.0 MHz	6.3	25	0.5	7.2
NCT-530-P4			50	0.5	7.2
NCT-530-P6			75	0.7	4.8
NCT-240-P4	4.0 MHz	6.3	25	0.35	7.2
NCT-540-P4			50	0.35	7.2
NCT-540-P6			75	0.55	4.8
NCT-250-P4	5.0 MHz	6.3	25	0.28	7.2
NCT-250-P6			38	0.42	4.8

For assistance and other variables, please contact us.



# AIR/GAS VELOCITY COMPENSATION NON-CONTACT TRANSDUCERS

In order to increase the stability of ultrasound signals in NCU mode sometimes it may be necessary to compensate for velocity fluctuations in air caused by thermal currents, humidity variations, and turbulent air flow. This is especially true for very accurate thickness, velocity, transmittance, reflectance, and density measurements. While our NCA 1000 with planar transducers is capable of providing accuracies within +/- 1%, with Velocity Compensation (VC) transducers it can be increased by an order of magnitude. VC transducers feature constant distance built-in reflectors in front of active transducers from which the NCA 1000 constantly determines the air velocity to apply to all measurements.



## ORDERING INFORMATION

CATALOG #	FREQ.	ACTIVE $\Phi$ (mm)	TRANSDUCER- INTERNAL REFLECTOR AIR DISTANCE (mm/round-trip ToF, $\mu$ s)	BEAM EXIT APERTUR E DIAMETER (mm)
NCT-102-VC	200 kHz	25.0	50/290	19
NCT-55-VC	500 kHz	12.5	20/115	10
NCT-75-VC		19.0	20/115	14
NCT-105-VC		25.0	20/115	19
NCT-510-VC	1.0 MHz	12.5	10/58	10
NCT-710-VC		19.0	10/58	14
NCT-520-VC	2.0 MHz	12.5	5/29	10

For assistance and other variables, please contact us.