Ultrasonic NDT Transducers





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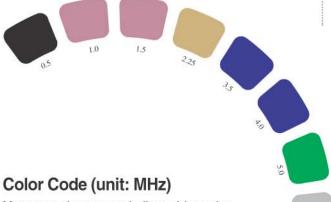
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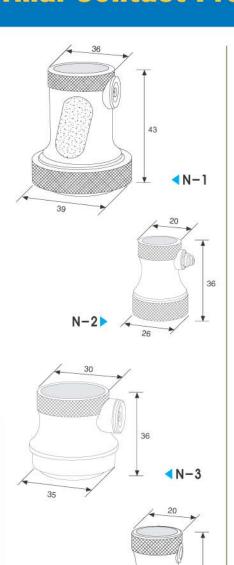
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For the recent information and Electric TKS Catalog,

http://www.tksprobe.com

### **Normal Contact Probe**



N-4>

Normal Contact Transducer is a transducer that tests putting Longitudinal Wave on vertical incidence.

#### ▶► Normal Contact Transducer (Membrane type)

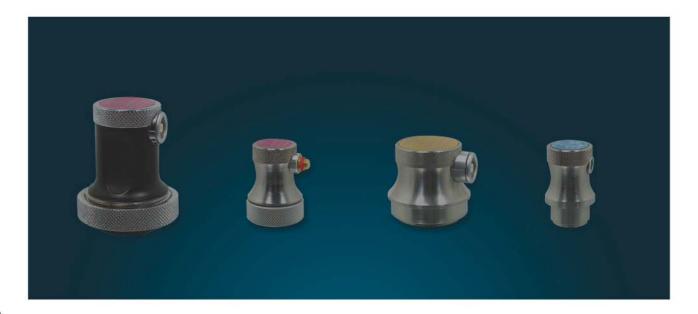
Normal Contact Transducer, TKS Corporation makes, is primarily used in tests without heavy attenuation, Membrane Type, due to the excellence of sensitivity and resolution, are used in tests with heavy attenuation. Since these transducers are screw-shaped in those front part, they can use protective membrane wearplate in surface testing. Most tests are explored and performed examination of base metal or scanning on the welding part without weld reinforcement. BNC, Lemo, and Microdot are provided to make the equipment compatible.

Product Code	Frequency ( MHz )	Element Size ( Dia mm )	Shape Index	Connect Type
1C30N		30	N-1	Lemo01 or BNC
1C28N		28	N-1	Lemo01 or BNC
1C24N	1	24	N-1	Lemo01 or BNC
1C20N		20	N-1	Lemo01 or BNC
2C30N		30	N-1	Lemo01 or BNC
2C28N		28	N-1	Lemo01 or BNC
2C24N	2	24	N-1	Lemo01 or BNC
2C20N		20	N-1	Lemo01 or BNC
2C10N		10	N-2	Lemo00 or MD
4C24N	4	24	N-1	Lemo01 or BNC
4C10N	4	10	N-2	Lemo00 or MD
5C20N	-	20	N-1	Lemo01 or BNC
5C10N	5	10	N-2	Lemo00 or MD

#### >> Normal Contact Transducer (Hard Contact Surface type)

Hard Contact Surface type transducers have excellent durability and abrasion resistance.

Product Code	Frequency (MHz)	Element Size ( Dia mm )	Shape Index	Connect Type
1C24N		24	N-3	Lemo01 or BNC
1C20N	1 1	20	N-3	Lemo01 or BNC
2C24N		24	N-3	Lemo01 or BNC
2C20N	2	20	N-3	Lemo01 or BNC
2C10N		10	N-4	Lemo00 or MD
4C24N	4	24	N-3	Lemo01 or BNC
4C10N	4	10	N-4	Lemo00 or MD
5C20N	-	20	N-3	Lemo01 or BNC
5C10N	5	10	N-4	Lemo00 or MD



### **Normal Contact Probe**

#### Normal Contact Transducer (inch scale)

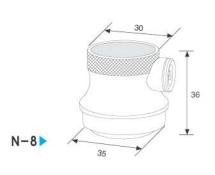
Product Code	Frequency (MHz)	Element Size ( Dia inch )	Connect Type	Shape Index
SNC1D		0.50	Lemo 00 or MD	N-7
SNC1E	1	0.75	Lama Of as DNO	A1 0
SNC1F	1	1.00	Lemo 01 or BNC	N-8
SNC1.5D		0.50	Lemo 00 or MD	N-7
SNC1.5E	1.5	0.75	1 04 DNO	N-8
SNC1.5F		1.00	Lemo 01 or BNC	14-0
SNC2.25B		0.25		N-5
SNC2.25C	2.25	0.375	Lemo 00 or MD	N-6
SNC2.25D	10.000.000.000.000	0.50	10.000000000000000000000000000000000000	N-7
SNC5B		0.25		N-5
SNC5C	5	0.375	Lemo 00 or MD	N-6
SNC5D	5	0.50		N-7
SNC5F		1.00	Lemo 01 or BNC	N-8

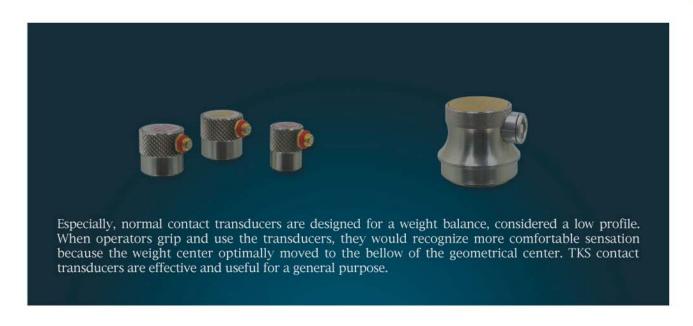


Shape Index	Dimension (X × Y [mm])
N-5	8 × 17
N-6	12 × 17
N-7	16 × 17

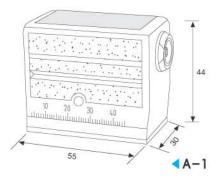


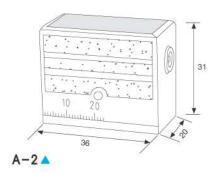
As a very light transducer, inch scale contact transducers have small contact areas relatively. Therefore, it makes possible a flaw detect at specific structures. For example, fingertip transducers will be a good solution for testing at rounded or narrow parts.

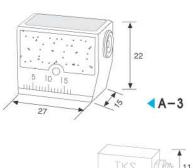


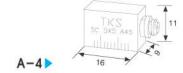


### **Angle Beam Probe**









An ultrasound beam propagates through into a substance with specific angle. The transmitted beam can also be multi-reflected by the path, and the received beam includes acoustical information about the target which locates in the substance as like a flaw. TKS prepared various kinds of angle beam transducers.

#### ▶▶Angle Beam Transducers (Inner Wedge type)

Produ	Product Code		Element Size ( mm )	Connect Type	Shape Index
1C20×22A45	[A60,A65,A70]	-	20×22	Lemo 01	A-1
1C20×20A45	[A60,A65,A70]		20×20	Lemo UI	A-I
2C20×22A45	[A60,A65,A70]		20×22	Lama Of	Λ 4
2C20×20A45	[A60,A65,A70]		20×20	Lemo 01	A-1
2C14×14A45	[A60,A65,A70]	2	14×14		A-2
2C10×10A45	[A60,,A70]	1	10×10	Lemo 00	A-3
2C8×9A45	[A60,,A70]		8×9		A-3
4C20×22A45	[A60,A65,A70]		20×22	Lemo 01	A-1
4C20×20A45	[A60,A65,A70]		20×20		
4C14×14A45	[A60,A65,A70]	4	14×14		A-2
4C8×9A45	[A60,,A70]		8×9	Lemo 00	A-3
5C20×22A45	[A60,A65,A70]		20×22	1 01	A-1
5C20×20A45	[A60,A65,A70]	1	20×20	Lemo 01	A-I
5C14×14A45	[A60,A65,A70]	1	14×14		A-2
5C10×10A45	[A60,,A70]	- 5	10×10		
5C5×10A45	[A60,,A70]		5×10	Lemo 00	A-3
5C5×5A45	[A60,,A70]	1	5×5		A-4

\*Angle [Deg.]: 45°(A45), 60°(A60), 65°(A65), 70°(A70)

The irregularities on the surface of housing prevent slipperiness and they are designed with the power set downward of the sensor to facilitate the contact with substances. A range of frequencies and angles will offer a suitable choice of the transducer for a nondestructive test.





These transducers have a variety of element size and frequency and for each transducer variable wedge selection Connectors are equipped with Microdot and BNC. With one transducer a variable angle detection is possible.

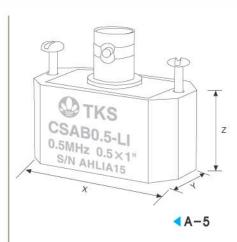
#### ▶▶ Angle Beam Transducer (Separated Wedge type: AWS adaptable)

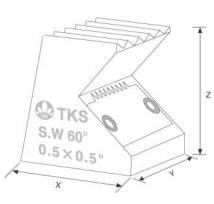
Product Code	Frequency ( MHz )	Element Size ( inch )	Dimension (mm) (X × Y × Z)
SAB1K		0.5 × 0.5	25.5 × 19.0 × 19.0
SAB1L		0.5 × 1.0	38.0 × 19.0 × 19.0
SAB10	1	$0.75 \times 0.75$	31.6 × 21.5 × 19.0
SAB1P		0.75 × 1.0	38.0 × 25.4 × 19.0
SAB1Q		1.0 × 1.0	41.0 × 31.6 × 19.0
SAB2.25K		0.5 × 0.5	25.5 × 19.0 × 19.0
SAB2.25L		0.5 × 1.0	38.0 × 19.0 × 19.0
SAB2.25M		$0.63 \times 0.63$	31.6 × 18.4 × 19.0
SAB2.25N	2.25	$0.63 \times 0.75$	31.6 × 18.4 × 19.0
SAB2.250		$0.75 \times 0.75$	31.6 × 21.5 × 19.0
SAB2.25P		0.75 × 1.0	38.0 × 25.4 × 19.0
SAB2.25Q		1.0 × 1.0	41.0 × 31.6 × 19.0
SAB5K		$0.5 \times 0.5$	25.5 × 19.0 × 19.0
SAB5L	-	0.5 × 1.0	38.0 × 19.0 × 19.0
SAB5P	5	0.75 × 1.0	38.0 × 25.4 × 19.0
SAB5Q		1.0 × 1.0	41.0 × 31.6 × 19.0

\*Connect Type: BNC \*Wedge-45°,60°,70°

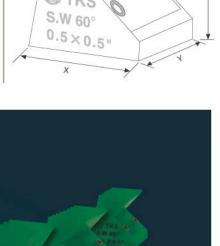
#### >> Wedge Dimension

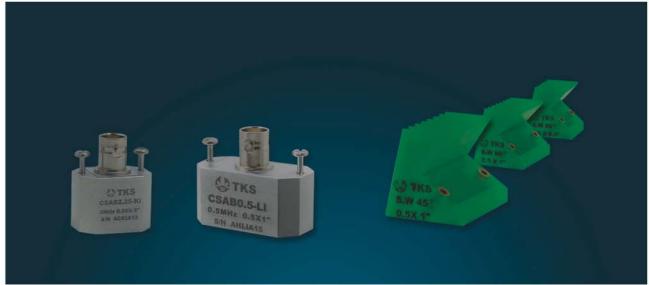
Code	Dimension (mm) ( X × Y × Z )				
	45 °	60 °	70 *		
WSSK	32 × 27 × 32	32 × 27 × 32	37 × 27 × 32		
WSSL	32 × 40 × 32	32 × 40 × 32	37 × 40 × 32		
WSSQ	54 × 42 × 44	54 × 42 × 44	58.5 × 42 × 44		



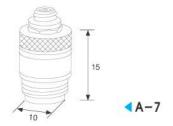


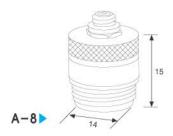
**◀**A-6

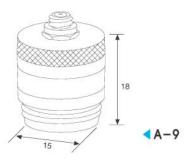


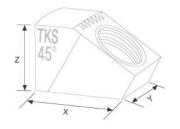


### **Angle Beam Probe**









According to angle of wedges, ultrasound propagates through several paths. The size of elements can be chosen by the purpose of testing, and screw-in type wedge is convenience to joint with the transducers.

#### ▶▶Angle Beam Transducer (Screw Wedge type)

Product Code	Frequency ( MHz )	Element Size ( Dia - inch )	Shape Index
CAB1D	1.	0.5	A-9
CAB1.5D	1.5	0.5	A-9
CAB1.5C	1.5	0.375	A-8
CAB2.25D		0.5	A-9
CAB2.25C	2.25	0.375	A-8
CAB2.25B		0.25	A-7
CAB5D		0.5	A-9
CAB5C	5	0.375	A-8
CAB5B		0.25	A-7

\*Connect Type: Microdot

#### >> Separated Wedge Dimension

Code	Dimension (mm) (X × Y × Z)				
	45 °	60 °	70 *		
В	19 × 13 × 10	21 × 13 × 12	25 × 13 × 13		
С	23 × 14 × 12	26 × 14 × 14	30 × 14 × 15		
D	27 × 20 × 14	32 × 20 × 17	36 × 20 × 18		





### **Dual Element Probe**

Dual element transducers are consisted of a separated transmitter and receiver in a same housing with an acoustic barrier. Furthermore, ultrasonic beam propagates along the organized path from the angle between transmitter and receiver. As a result, one of the excellent characteristics of the transducers is a high resolution at near-field. In addition, back scattering noise can be reduced because of advanced the structure.

#### Normal Transducer

Product Code	Frequency ( MHz )	Element Size ( mm )	Shape Type
2C14 × 18ND		7 × 18	D-1
2C 7 × 10ND	2	3.5 × 10	D-2
4C12 × 20ND		6 × 20	D-1
4C 7 × 10ND	4	3.5 × 10	D-2

\*Connect Type: Microdot

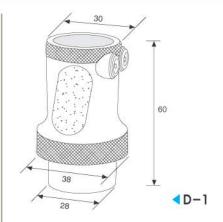
According to the angle between the transmitter and receiver, sound path can be changed. Before ordering, the discussion about the detectable zone is needed to offer suitable transducers belong to the purpose.

#### Fingertip Transducer

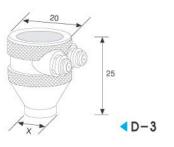
Product Code	Frequency ( MHz )	Element Size ( <i>φ</i> −mm )	Shape Type	X ( mm )
2C8/2FD	2	8	D-3	16
4C8/2FD	4	8	D-3	16
5C8/2FD		8	D-3	16
5C5/2FD	5	5	D-3	13
5C3/2FD		3	D-3	9

\* Connect Type: Microdot

TKS fingertip dual element transducers are available in a wide variety of frequencies and small diameters for easy use on curved surfaces such as piping and tubing.

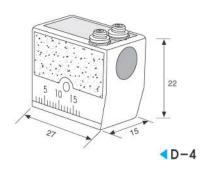








### **Dual Element Probe**



#### ▶▶Angle Beam Transducer

		Frequency ( MHz )	Element Size ( mm )	Shape Type
2C7X10AD45	[AD60,AD70]	2	3.5 × 10	D-4
4C7X10AD45	[AD60,AD70]	4	3.5 × 10	D-4

Connect Type: Micro Dot

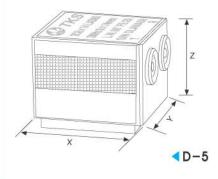
If flaws locate nearby the surface of substances, angle beam dual element transducer will be a good solution for the inspection. It is more effective for the test conditions which flaws locate vertically.

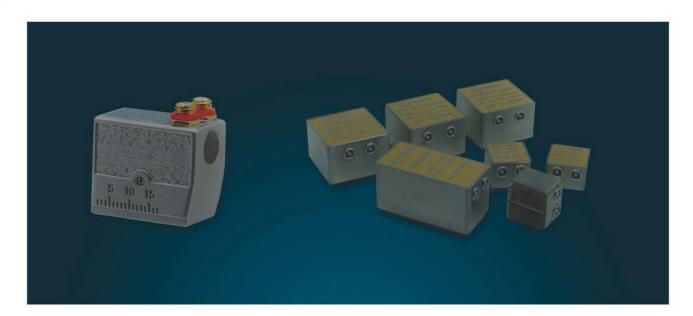
#### ▶▶ Angle Beam Transducer (Longitudinal Wave)

Product C	Code	Frequency (MHz)	Element Size ( mm )	Dimension (Shape: D-5) (X × Y × Z [ mm ] )
1C8X15LAD45	[LAD60,LAD70]		8 × 15	25 × 25 × 20
1C10X20LAD45	[LAD60,LAD70]		10 × 20	30 × 30 × 25
1C15X25LAD45	[LAD60,LAD70]	1	15 × 25	40 × 40 × 25
1C20X34LAD45	[LAD60,LAD70]		20 × 35	50 × 50 × 30
1C25X45LAD45	[LAD60,LAD70]		25 × 45	60 × 60 × 30
2C7X10LAD45	[LAD60,LAD70]		7 × 10	25 × 25 × 20
2C8X15LAD45	[LAD60,LAD70]		8 × 15	25 × 25 × 20
2C10X20LAD45	[LAD60,LAD70]		10 × 20	$30 \times 30 \times 20$
2C15X25LAD45	[LAD60,LAD70]		15 × 25	40 × 40 × 25
2C20X35LAD45	[LAD60,LAD70]	2	20 × 35	50 × 50 × 30
2C25X45LAD45	[LAD60,LAD70]		25 × 45	60 × 60 × 30
2C6X13CRD	[LAD60,LAD70]		6 × 13	25 × 25 × 20
2C6X18CRD	[LAD60,LAD70]		6 × 18	25 × 25 × 20
2C6X25CRD	[LAD60,LAD70]		6 × 25	30 × 40 × 25
4C7X10LAD45	[LAD60,LAD70]	7	7 × 10	25 × 25 × 20
4C8X15LAD45	[LAD60,LAD70]	4	8 × 15	25 × 25 × 20
4C10X20LAD45	[LAD60,LAD70]		10 × 20	30 × 30 × 25
4C15X25LAD45	[LAD60,LAD70]		15 × 25	40 × 40 × 25

\*Connect Type: Lemo 00

Dual element transducers -Longitudinal Angle Beam type- are recommended for the test which includes heavy attenuation condition.







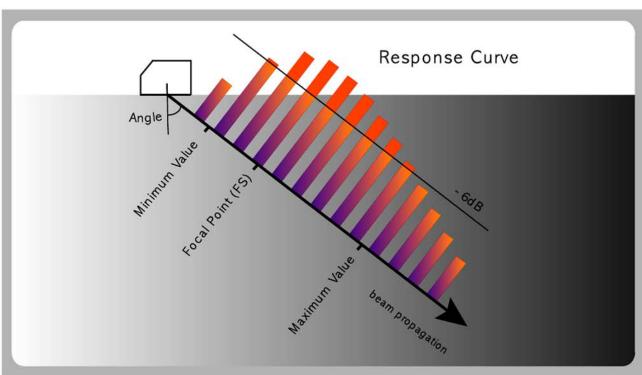
## **Dual Element Probe**

#### >> Focus Sound Path of Longitudinal Dual Angle Beam Probes

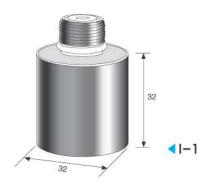
(Unit:mm)

coulongy (MHz) Element Size	Clares Circ	Angle [Degree]		
Frequency (MHz)	Element Size		60 °	70 °
	8 X 15	10/ 25 (15)	10/ 20 (13)	10/ 20 (13)
	10 X 20	15/ 30 (20)	15/ 30 (20)	15/ 30 (20)
1	15 X 25	20/ 55 (32)	20/ 45 (28)	15/ 45 (25)
Si	20 X 35	30/ 80 (47)	25/ 75 (42)	25/ 75 (42)
	25 X 45	40/120 (67)	35/110 (60)	30/100 (53)
	7 X 10	10/ 25 (15)	10/ 25 (15)	10/ 20 (13)
Ī	8 X 15	15/ 30 (20)	10/ 30 (17)	10/ 25 (15)
	10 X 20	20/ 45 (28)	15/ 40 (23)	15/ 35 (22)
2	15 X 25	25/ 85 (45)	20/ 75 (38)	20/ 70 (37)
	20 X 35	40/130 (70)	30/120 (60)	30/110 (57)
	25 X 45	45/130 (83)	40/140 (73)	35/125 (65)
	7 X 10	10/ 35 (18)	10/ 35 (17)	10/ 30 (17)
	8 X 15	20/ 60 (33)	15/ 55 (28)	10/ 50 (23)
4	10 X 20	25/ 90 (47)	20/ 70 (37)	15/ 65 (32)
	15 X 25	30/100 (53)	25/ 90 (47)	20/ 85 (42)
9317		Sound	Path : Minimum Value / Maximi	um Value





### **Immersion Probe**



Immersion transducers are available to proof against water for testing in immersed situations, which are demanded lower ultrasound transmission loss. Because of the variety of the incidence angle, longitudinal or shear waves are possible and use water between a transducer and testing subject as an ultrasonic couplant.

Scanning without contact with testing subjects, immersion transducers can avoid surface damages such as a scratch or abrasion, as well as, move faster during the measurement time. Especially, the transducers offer the capability of detecting a flaw which locates nearby a surface of testing subjects.





#### >> Immersion Probe

Product Code	Frequency ( MHz )	Element Size (ø-inch)	
SIM0.5F	0.5	1	1-1
SIM0.5E	0.5	0.75	1-1
SIM1F		1	1-1
SIM1E	1	0.75	1-1
SIM1D		0.5	1-2
SIM2.25F		1	1-1
SIM2.25E		0.75	1-1
SIM2.25D	2.25	0.5	1-2
SIM2.25C		0.375	1-3
SIM2.25B		0.25	1-3
SIM5F		4	1-1
SIM5E		0.75	1-1
SIM5D	5	0.5	1-2
SIM5C		0.375	1-3
SIM5B		0.25	1-3
SIM10D		0.5	1-2
SIM10C	10	0.375	1-3
SIM10B		0.25	1-3

\*Connect Type: UHF





### **Special Probe**

TKS Corp. with extensive knowledge and field experiences, has been working on developing many kinds of special transducers, most of which are now in use in heavy industries, iron manufacturing factories, and nuclear power plants.

TKS Corp. is also making an efforts in research and development of ultrasonic sensors for medical use as well as ultrasonic sensor for industrial use.

Other kinds of specially designed transducers made by us are as follows: transducers for automatic scanning, stud bolt, roll gauging, concrete, scanning nuclear fuel rod, scanning trees, scanning osteoporosis, and Doppler.



Туре	Concrete Probe
Frequency	54 KHz
Connector	BNC



Type	CRDM Probe
Frequency	Angle Probe 4ea, TOFD Probe 2 set, Immersion 1ea



Туре	Piston Probe Set
Frequency	5MHz
Connector	Lemo 00



Type	Alumina bar Probe
Frequency	2~10MHz
Connector	Microdot



Туре	High Resolution Immersion Probe
Frequency	5~15MHz
Connector	BNC



Туре	Thick Plate Probe I (5C6X27ND)
Frequency	5MHz
Elements Size	3 X 27 mm (X2)
Connector	Dual Lemo 01

## **Special Probe**



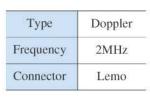
Туре	Thick Plate Probe II (5C6X14ND)
Frequency	5MHz
Elements Size	3 X 14 mm (X2)
Connector	Dual Lemo 01



Type	Stud Probe
Frequency	2~5MHz
Connector	Lemo



Type	High Attenuation Probe
Frequency	0.5~2MHz
Elements Size	50Ø
Connector	UHF or Lemo 01







Type	Slim Normal Contact Probe
Frequency	1~ 10MHz
Connector	Microdot or Lemo 00



Type	High Temperature Probe
Frequency	1 ~ 2 MHz
Elements Size	20 Ø
Connector	Lemo 00



Туре	Osteoporosis Probe
Frequency	0.5~ 2MHz
Connector	BNC & Lemo 00

Туре	Roll Gage Probe
Frequency	0.5~ 5MHz
Connector	BNC or Lemo



### **Special Probe**



Type	Nuclear Fuel Rod Probe
Frequency	5, 10MHz
Connector	Lemo 01



Туре	Multi-Component Probe for Bore
Frequency	2.25, 5MHz
Connector	Microdot



Type	Multi-Component Probe for Thick Plate
Frequency	2.25MHz
Connector	Dual Lemo



Type	Probe Set for SUS Welding Test
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The Probe Set is consisted by Creeping Wave Probes, LLTM Probe, and Longitudinal Dual Angle Beam Probes.



Туре	Replaceable Delay Line Probe
Frequency	1 ~ 5 MHz
Connector	Microdot



Туре	Shear Wave Probe
Frequency	1 ~ 5 MHz
Connector	Microdot



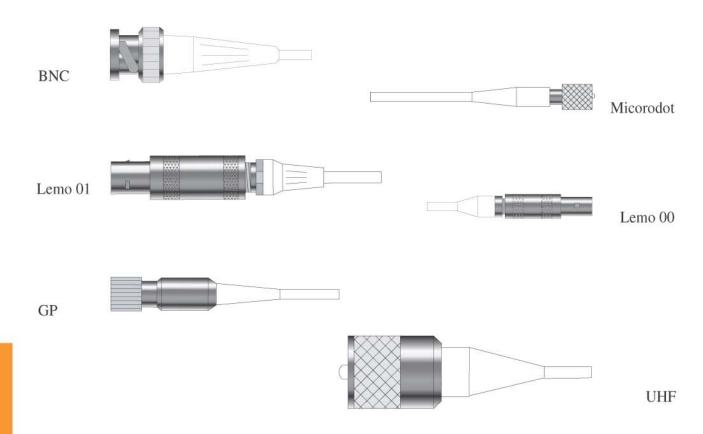
Туре	Straight Beam Probe with Cabl
Frequency	1 ~ 10 MHz
Connector	BNC

TKS was characterized by development of optimized transducers. If you are finding a solution in ultrasonics, contact us. We will help you with various experience and advanced technology.

TKS creates transducers as like enjoying challenge and adventure. During complicated processing of ultrasonic transducers design and manufacture, it is realized that this work is also one of the arts. Looking for new technologies, TKS always wants to try to connect transducers and those skill.

### Cables

#### Cables Guide



Single Cables				Dual Cables	
Lemo 01 (to)	Lemo 01	BNC (to)	Lemo 01	Lemo 01 (to)	Lemo 01
	Lemo 00		Lemo 00		Lemo 00
	BNC		BNC		Microdot
	Microdot		Microdot	BNC (to)	Lemo 00
	UHF		UHF		Microdot
	GP		GP		

\* It is also possible to supply exceptional connector cables.

>> General Cable Length: 2 m

### Adaptors Guide



Lemo 01 / BNC



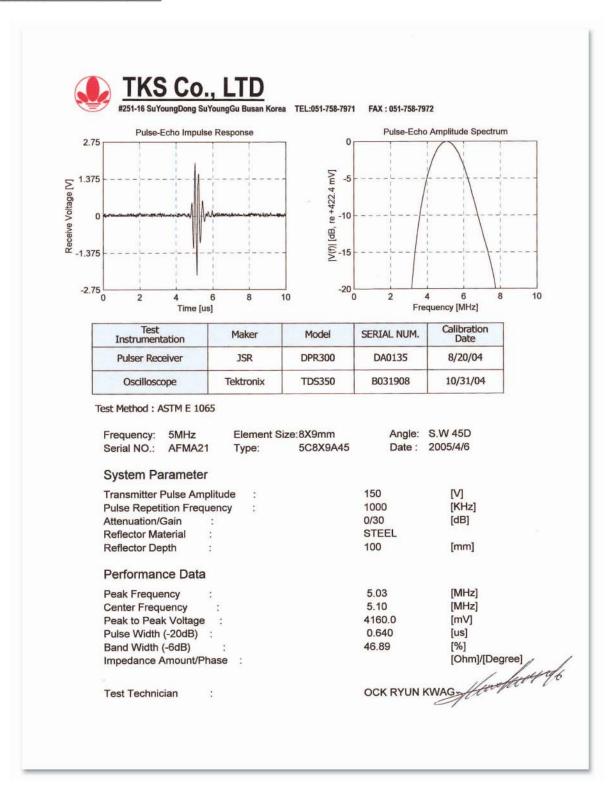
BNC / Lemo 01



### Certification

To satisfy the requirement of quality, TKS is supplying the certification of transducers; transducers are critical component at an ultrasonic measuring system. Industries, institutes, and military customers have considered that stable and reliance performance of an ultrasonic transducer should be valued. With experienced engineers, TKS transducer measurement system has advanced. Please contact us regarding your individual measuring requirements.

#### Certification of Pulse Echo

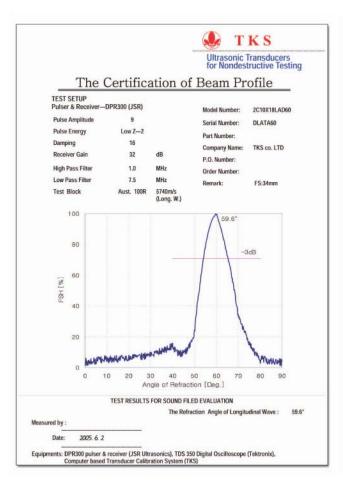


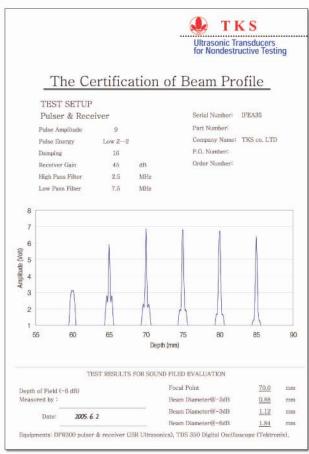


### Certification

#### Beam Profile

Belongs to the beam profile, a focal point and focal zone are represented.





Through customers requirement, about not only quality but also detail opinions of those transducers, all transducers have been changed and advanced. For this feed-back work, the ultrasonic transducer engineers always had to communicate with customers and experts in field. Until end-users satisfy about the products, transducers were re-designed again and again for better adaptation in case by case because each transducers operates at very different environments of the real field.

TKS is very curious about innovational invention of ultrasonics. As a friendly coworker, TKS will do support any technical problems with suitable solutions and do our best.



### **Near Field Distance Table**

Product Code	Frequency [MHz]	Element Size [Dia. mm]	Sound Velocity [m/s]	Near Field Distance [mm]
	Normal Co	ontact Transducers (Mem	brane type)	
1,G30N	1			
1C28N	1	28	5900	33
1C24N	1	24		24
1C20N	1			17
2C30N	2		5900	76
2C28N	2			66
2C24N	2	24	5900	49
2C20N	2	20		34
2C10N	2	10		
4C24N	4	24		98
4C10N	4	10	5900	17
5C20N	5			
5C10N	5	10		21
	Normal Contact	Transducers (Hard Conta	act Surface type)	
SNC1D	1	12.7		7
SNC1E	1	19.05		15
SNC1F	1	25.4	5900	27
SNC1.5D	1.5	12.7		1.0
SNC1.5E	1.5	19.05		23
SNC1.5F	1.5	25.4		41
SNC2.25B		6.35		4
SNC2:25C		9.525		9
SNC2.25D		12.7		15
SNC5B	5	6.35		9
SNC5C		9.525		19
SNC5D		12.7		34
SNC5F	5	25.4		137
		Immersion Transducer		
SIM0.5F		25.4	1540	
SIM0.5E		19.05	1540	29
SIM1F	Ť	25.4	1540	105
SIM1E	1	19.05	1540	59
SIM1D	1	12.7	1540	
SIM2:25F	2.25	25.4	1540	236
SIM2.25E	2.25	19.05	1540	133
SIM2.25D	2.25	12.7	1540	59
SIM2.25C		9,525	1540	33
SIM2.25B	2.25	6.35	1540	1.5
SIM5F	5	25.4	1540	524
SIM5E	5	19.05	1540	295
SIM5D		12.7	1540	131
SIM5C	5	9.525	1540	7.4
SIM5B		6.35	1540	33
SIM10D	10	12.7	1540	262
SIMTOC	10	9.525	1540	147
SIM10B	10	6.35	1540	65







## **W** TKS Co., LTD.

251-16, Suyeong-Dong, Suyeoung-Gu, Busan, 613-830, Korea Tel: 82-51-758-7971 Fax: 82-51-758-7972 E-mail: tks@tksprobe.com Home page: www.tksprobe.com