

Ultrasonic Probe (Transducer) Catalog



- **T/R Probes**
- **Angle Beam Probes**
- **Normal Beam Probes**
- **Immersion Type Probes**
- **Special Probes**

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T/R Probes

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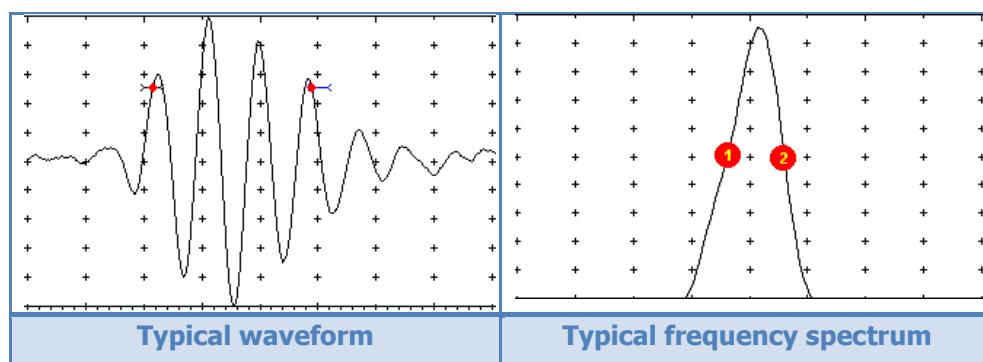
T/R probes offers the following advantages:

- Excellent near surface resolution
- Reduced noise
- Improved signal to noise ratio
- Longitudinal wave and shear wave types

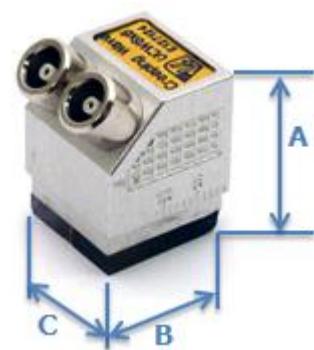
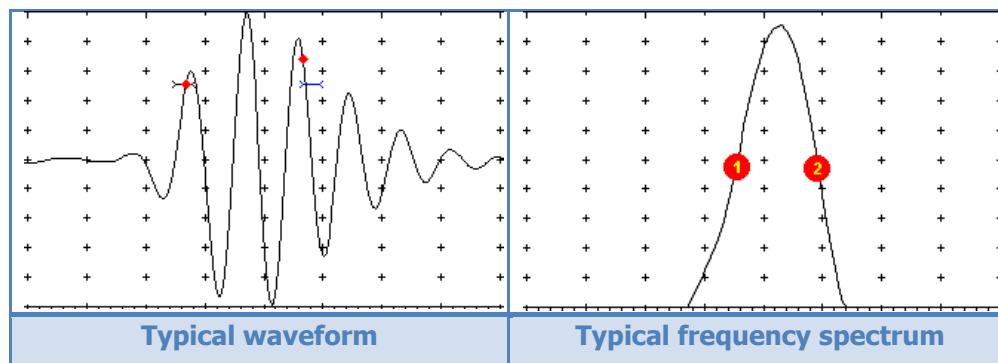
Applications:

- Remaining wall thickness measurement (corrosion, erosion)
- Coarse grain material inspection
- Small parts inspection
- Near surface flaw detection





Order code / Type	Element size (mm)	Frequency (MHz)	Focal length in steel (mm)	Typical frequency bandwidth (%)	AxB (mm)	Plug
USE1x21-E	21	1	18	50		LEMO 00
USE2x7x18-E	7x18	2	30	50	57x44	LEMO 00
USE4x6x20-E	6x20	4	25	48	57x44	LEMO 00
USE2x11-E	11	2	8	48	44x25	LEMO 00
USE4x11-E	11	4	16	48	44x25	LEMO 00



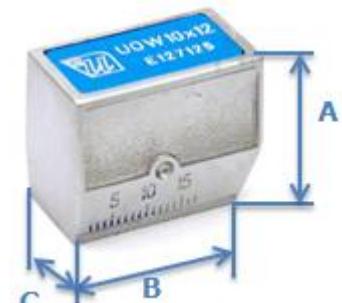
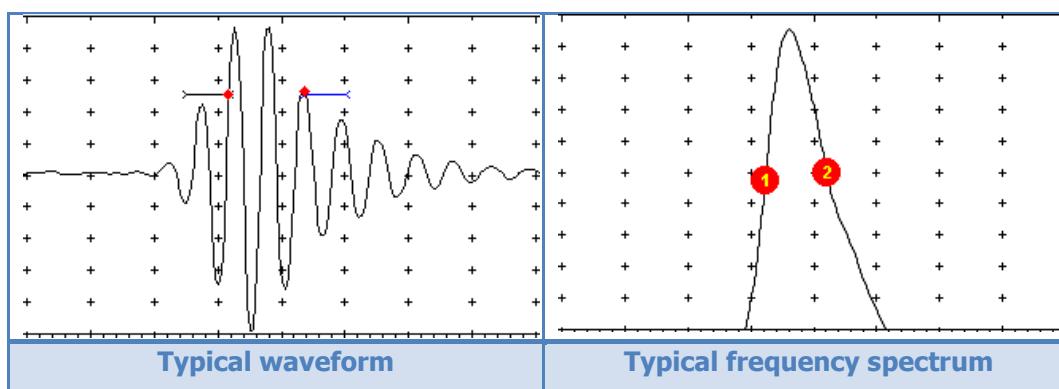
Order code / Type	Element size (mm)	Frequency (MHz)	Focal length in steel (mm)	Angle °	AxBxC (mm)	Plug
USE4x3.5x10A45-E	3.5x10	4	10	45		LEMO 00
USE4x3.5x10A60-E	3.5x10	4	10	60		LEMO 00
USE4x3.5x10A70-E	3.5x10	4	10	70		LEMO 00
USE2x5x10A60-E	5x10	2	16	60		LEMO 00
USE2x5x10A70-E	5x10	2	16	70		LEMO 00
USE4x5x10A45-E	5x10	4	20	45		LEMO 00
USE4x5x10A60-E	5x10	4	20	60		LEMO 00
USE4x5x10A70-E	5x10	4	20	70		LEMO 00

Angle Beam Probes offers the following advantages:

- Inspection of parts with flaws not parallel to the surface (e.g. weld inspection)
- Maximum precision and repeatability for DGS flaw sizing method
- Durable cast housing

Applications:

- General weld inspection
- Detection of flaws not parallel to the surface



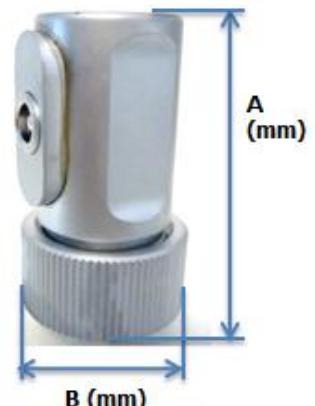
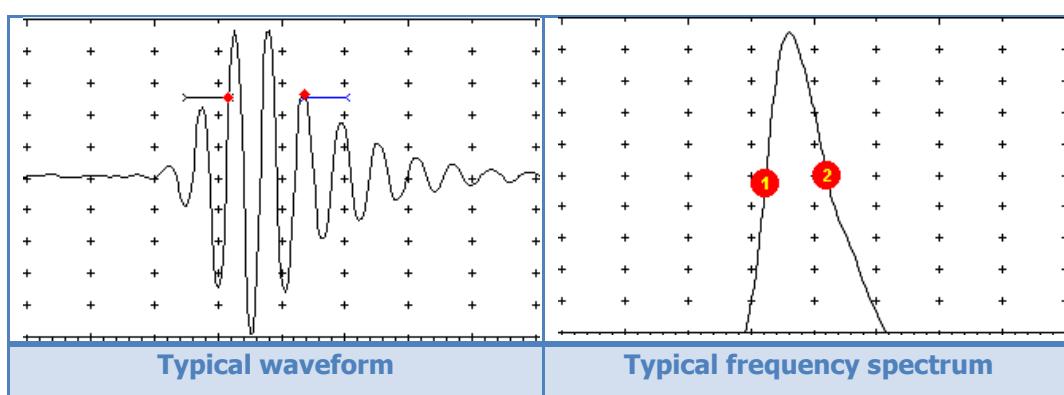
Order code /Type	Element size (mm)	Frequency (MHz)	Focal length in steel (mm)	Angle °	AxBxC (mm)	Typical frequency bandwidth (%)	Plug
U0.5x8x9A70-E	8x9	0.5	4	50	22x24x14	70	LEMO 00
U1x8x9A45-E	8x9	1	7.5	45	22x24x14	45	LEMO 00
U1x8x9A60-E	8x9	1	7.5	45	22x24x14	60	LEMO 00
U1x8x9A70-E	8x9	1	7.5	45	22x24x14	70	LEMO 00
U2x8x9A45-E	8x9	2	15	40	22x24x14	45	LEMO 00
U2x8x9A60-E	8x9	2	15	40	22x24x14	60	LEMO 00
U2x8x9A70-E	8x9	2	15	40	22x24x14	70	LEMO 00
U4x8x9A45-E	8x9	4	30	40	22x24x14	45	LEMO 00
U4x8x9A60-E	8x9	4	30	40	22x24x14	60	LEMO 00
U4x8x9A70-E	8x9	4	30	40	22x24x14	70	LEMO 00
U0.5x14x14A45-E	14x14	0.5	10	55	31x36x20	45	LEMO 00
U0.5x14x14A60-E	14x14	0.5	10	55	31x36x20	60	LEMO 00
U0.5x14x14A70-E	14x14	0.5	10	55	31x36x20	70	LEMO 00
U1x14x14A45-E	14x14	1	19.5	50	31x36x20	45	LEMO 00
U1x14x14A60-E	14x14	1	19.5	50	31x36x20	60	LEMO 00
U1x14x14A70-E	14x14	1	19.5	50	31x36x20	70	LEMO 00
U2x14x14A45-E	14x14	2	39	45	31x36x20	45	LEMO 00
U2x14x14A60-E	14x14	2	39	45	31x36x20	60	LEMO 00
U2x14x14A70-E	14x14	2	39	45	31x36x20	70	LEMO 00
U4x14x14A45-E	14x14	4	78	45	31x36x20	45	LEMO 00
U4x14x14A60-E	14x14	4	78	45	31x36x20	60	LEMO 00
U4x14x14A70-E	14x14	4	78	45	31x36x20	70	LEMO 00
U5x14x14A45-E	14x14	5	88	45	31x36x20	45	LEMO 00
U5x14x14A60-E	14x14	5	88	40	31x36x20	60	LEMO 00
U5x14x14A70-E	14x14	5	88	40	31x36x20	70	LEMO 00
U1x20x22A45-E	20x22	1	45	55	44x54x29	45	LEMO 01
U1x20x22A60-E	20x22	1	45	55	44x54x29	60	LEMO 01
U1x20x22A70-E	20x22	1	45	55	44x54x29	70	LEMO 01
U2x20x22A45-E	20x22	2	90	40	44x54x29	45	LEMO 01
U2x20x22A60-E	20x22	2	90	40	44x54x29	60	LEMO 01
U2x20x22A70-E	20x22	2	90	40	44x54x29	70	LEMO 01
U4x20x22A45-E	20x22	4	180	40	44x54x29	45	LEMO 01
U4x20x22A60-E	20x22	4	180	40	44x54x29	60	LEMO 01
U4x20x22A70-E	20x22	4	180	40	44x54x29	70	LEMO 01

Normal Beam Probes **with protective** membrane face offer the following advantages:

- Improves coupling on uneven, rough or curved surface
- Extended life time
- Suitable for DGS flaw sizing method

Applications:

- Universally suitable for larger parts with simple geometry



Order code /Type	Element size (mm)	Frequency (MHz)	Focal length in steel (mm)	Typical frequency bandwidth (%)	AxB (mm)	Plug
UM2P14-E	14	2	17	45	41x25	LEMO 00
UM4P14-E	14	4	34	40	41x25	LEMO 00
UM5P14-E	14	5	42	40	41x25	LEMO 00
UM1P24-E	24	1	23	45	57x44	LEMO 01/BNC
UM2P24-E	24	2	45	45	57x44	LEMO 01/BNC
UM4P24-E	24	4	91	30	57x44	LEMO 01/BNC
UM5P24-E	24	5	114	30	57x44	LEMO 01/BNC

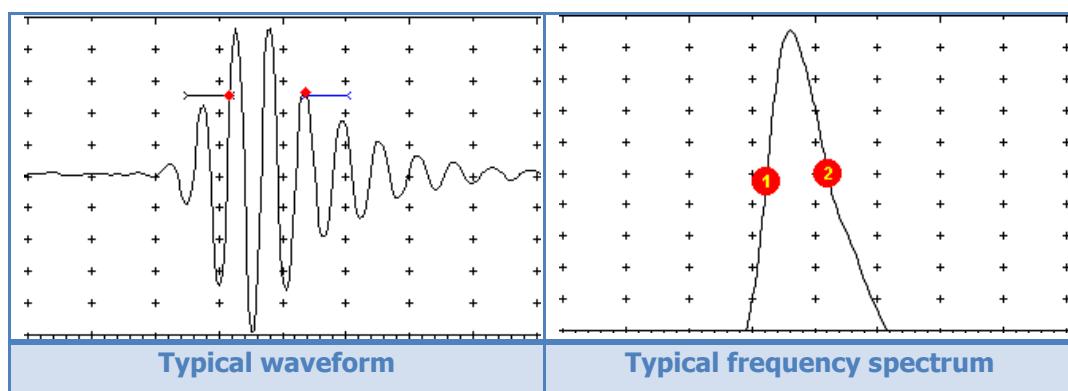
Wear resistant probes offer the following advantages:

- Permanent, abrasion resistant wear plate
- Best match to metals
- Higher gain reserve than protective membrane face models
- Comfortable grip

Applications:

- Universally suitable for metals with simple geometry
- Bond testing
- Inspections on thick materials or difficult to penetrate materials
- Manual inspection of almost all kinds of materials





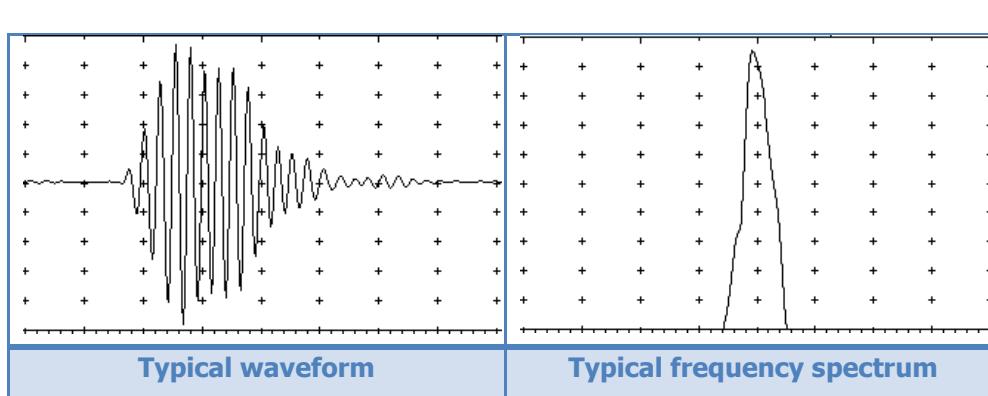
Order code /Type	Element size (mm)	Frequency (MHz)	Focal length in steel (mm)	Typical frequency bandwidth (%)	AxB (mm)	Plug
U10P5-E	5	10	10	45	45x25	Microdot
U1P10-E	10	1	4	45	41x25	LEMO 00
U2P10-E	10	2	8	45	41x25	LEMO 00
U4P10-E	10	4	16	35	41x25	LEMO 00
U5P10-E	10	5	20	35	45x25	LEMO 00
U10P10-E	10	10	40	30	45x25	Microdot
U1P14-E	14	1	8	40	43x25	LEMO 01/BNC
U2P14-E	14	2	16	35	43x30	LEMO 01/BNC
U4P14-E	14	4	32	35	43x25	LEMO 01/BNC
U5P14-E	14	5	40	35	43x25	LEMO 01/BNC
U1P20-E	20	1	17	45		LEMO 01/BNC
U2P20-E	20	2	34	45		LEMO 01/BNC
U4P20-E	20	4	68	45		LEMO 01/BNC
U5P20-E	20	5	85	45		LEMO 01/BNC
U1P24-E	24	1	23	45	57x44	LEMO 01/BNC
U2P24-E	24	2	45	45	57x44	LEMO 01/BNC

Immersion type probes offer the following advantages:

- Acoustically matched for best efficiency in water
- Waterproof connector

Applications:

- Parts with irregular or complex geometry
- For automated or mechanized scanning
- Applications requiring very high near surface resolution or detection of very small flaws



Order code /Type	Element size (mm)	Frequency (MHz)	Focal length (mm)	Typical frequency bandwidth (%)	AxB (mm)	Plug
U2x10I-E	10	2	8.5	40	57x13	LEMO 00
U5x10I-E	10	5	21	35	57x13	LEMO 00
U5x6I-E	6	5	7.5	30	32x10	LEMO 00
U10x6I-E	6	10	15	20	32x10	
U2x20I-E	20	2	34	35		LEMO 00
U4x20I-E	20	4	68	30		LEMO 00
U5x20I-E	20	5	85	25		LEMO 00

New insights and developments in the field of Materials Science and interconnection technologies, production processes and increasing demands on quality require special ultrasonic probes. We offers a variety of special probes. All the necessary information you can get upon request.

Example of special probes with variable angle:



	Order code /Type	Element size (mm x mm)	Frequency (MHz)	Plug
Variable angle probe	U10x10AX-E			LEMO 00
	U10x12AX-E			LEMO 00
Creeping wave probe	UCW8x12-E			LEMO 00
	UCW6x6-E			LEMO 00
Surface wave probe	UOW10x12-E			LEMO 00

Special Probes available on request

Probes (Transducers) with a flexible acoustic interface for spot weld testing

Low frequency transducers for the inspection of coarse grain materials or high attenuating material such as fiberglass, wood, concrete etc.

Delay line transducers (e.g. for precision thickness measurement)

Axle transducers for inspection of railway axles wheel sets

High temperature transducers for thickness measurement

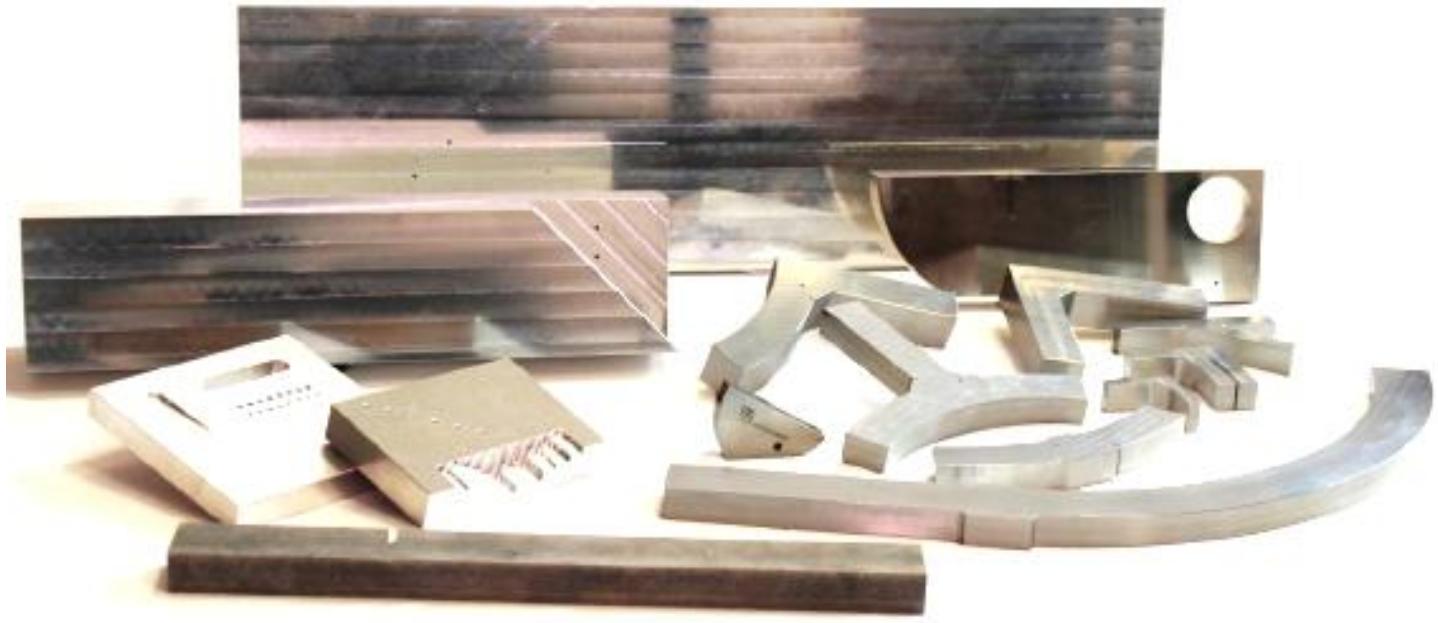
We offer wide spectrum of cables and adapters. It is also possible to order special cables and adapters. All the necessary information is available in our separate cable catalog.

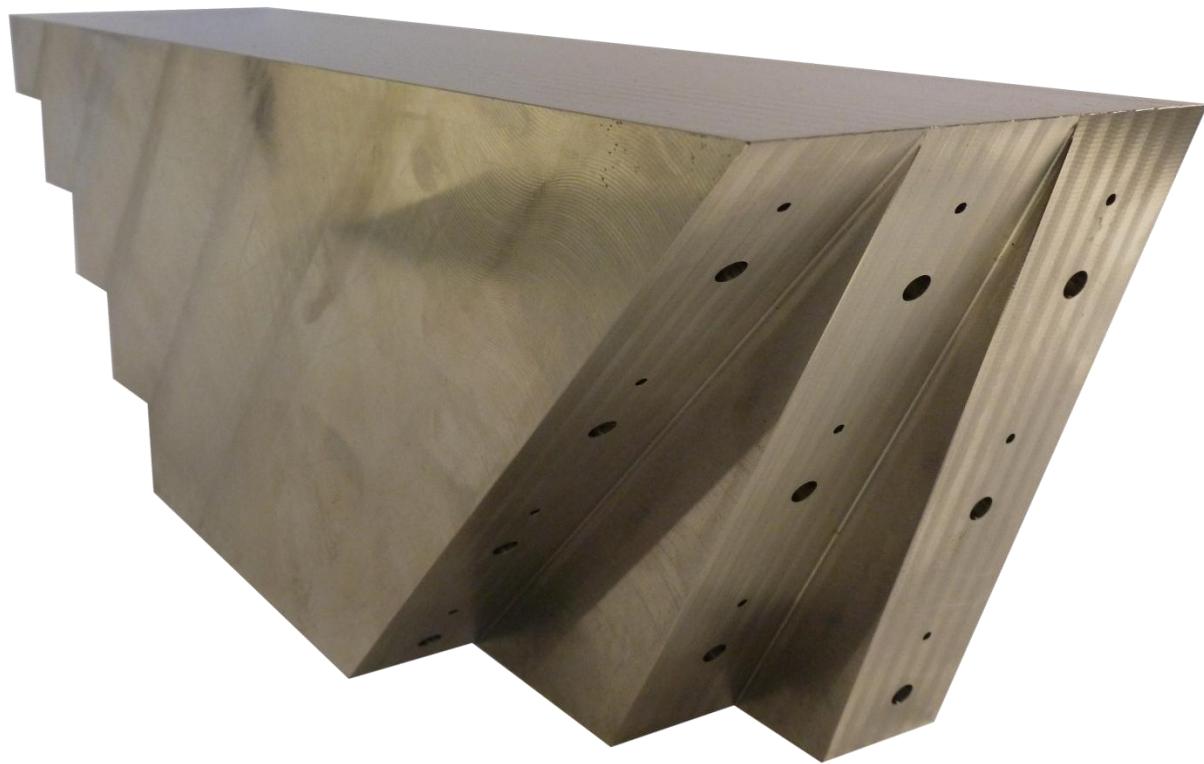
Example of cables and adapters:



Calibration blocks provide known targets that produce echo indications that are used for instrument setup, transducer evaluation, and reference for evaluating flaw size. All necessary information is available from our separate test block catalog.

Example of Control- and test block for Phased Array and Conventional ultrasonic Technique:





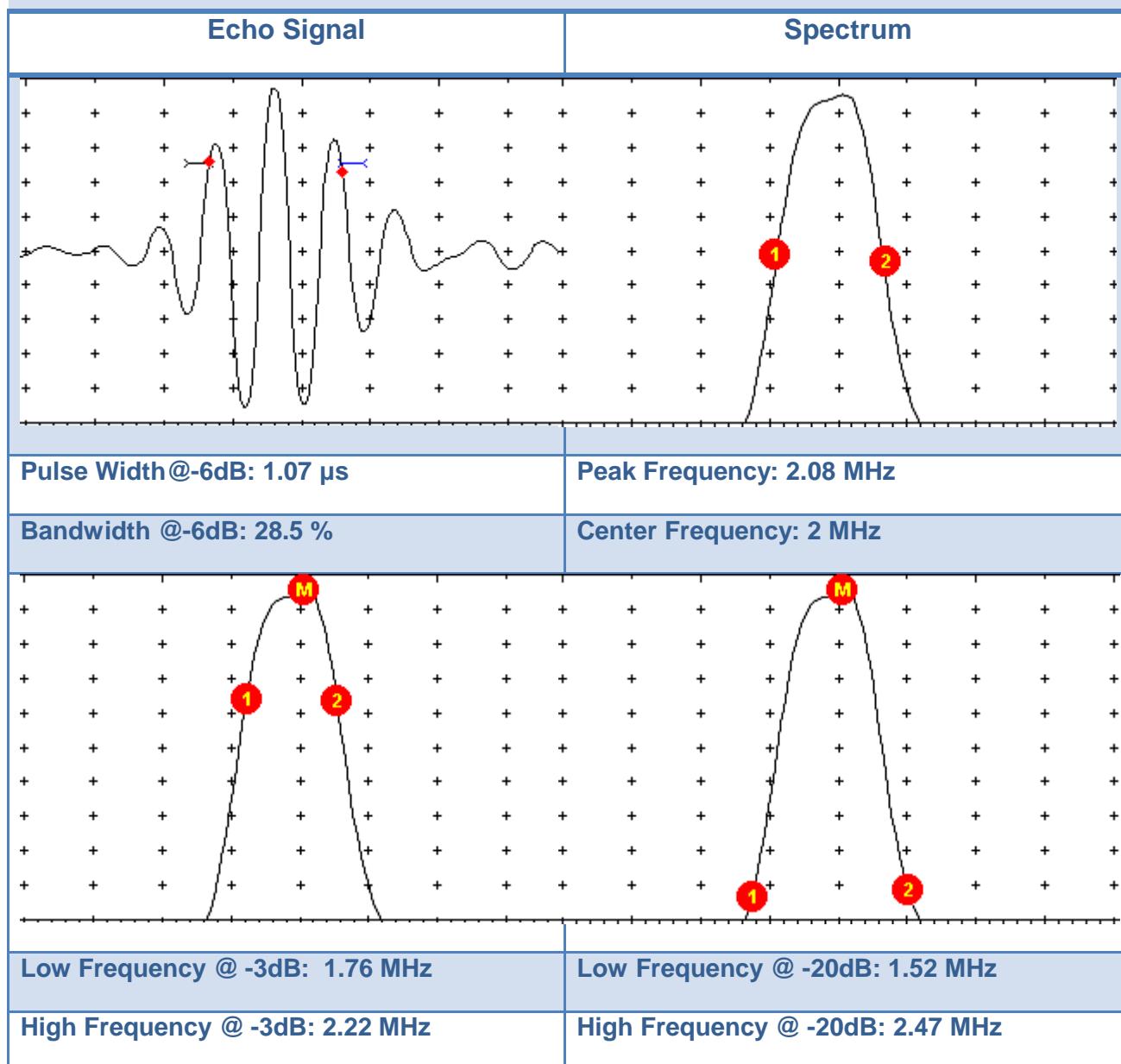
We also offer a probe set of 5 probes for thickness measuring including cables and thickness gauge. For further information please contact us.



Description	Model	Element size (mm)	Frequency (MHz)	Measuring range (mm)	Lower limit (mm)	Plug
For thick, highly attenuating, or highly scattering materials	N02	14	2.5	3-300	20	LEMO 00
Normal measurement	N05	10	5	1.2-230	$\Phi 20 \times 3$	LEMO 00
Normal measurement	N05/90°	10	5	1.2-230	$\Phi 20 \times 3$	LEMO 00
For thin pipe wall or small curvature pipe wall measurement	N07	6	7	0.75-80	$\Phi 15 \times 2$	LEMO 00
For high temperature (lower than 300° C) measurement	HT5	14	5	3-200	30	LEMO 00

Ultrasonic Transducer Test Report

Probe ID:	U2P10	Pulser/Receiver:	UDS 3-6
Serial No:	P127503		
Type:	Delay line Probe	UT Equipment:	I2005
Angle (Steel):	NA	Cal Block:	V1
Focal Length (mm):	NA	Software:	I05 FFT
Frequency (MHz):	2 MHz		
Element Size(mm):	Φ 10		

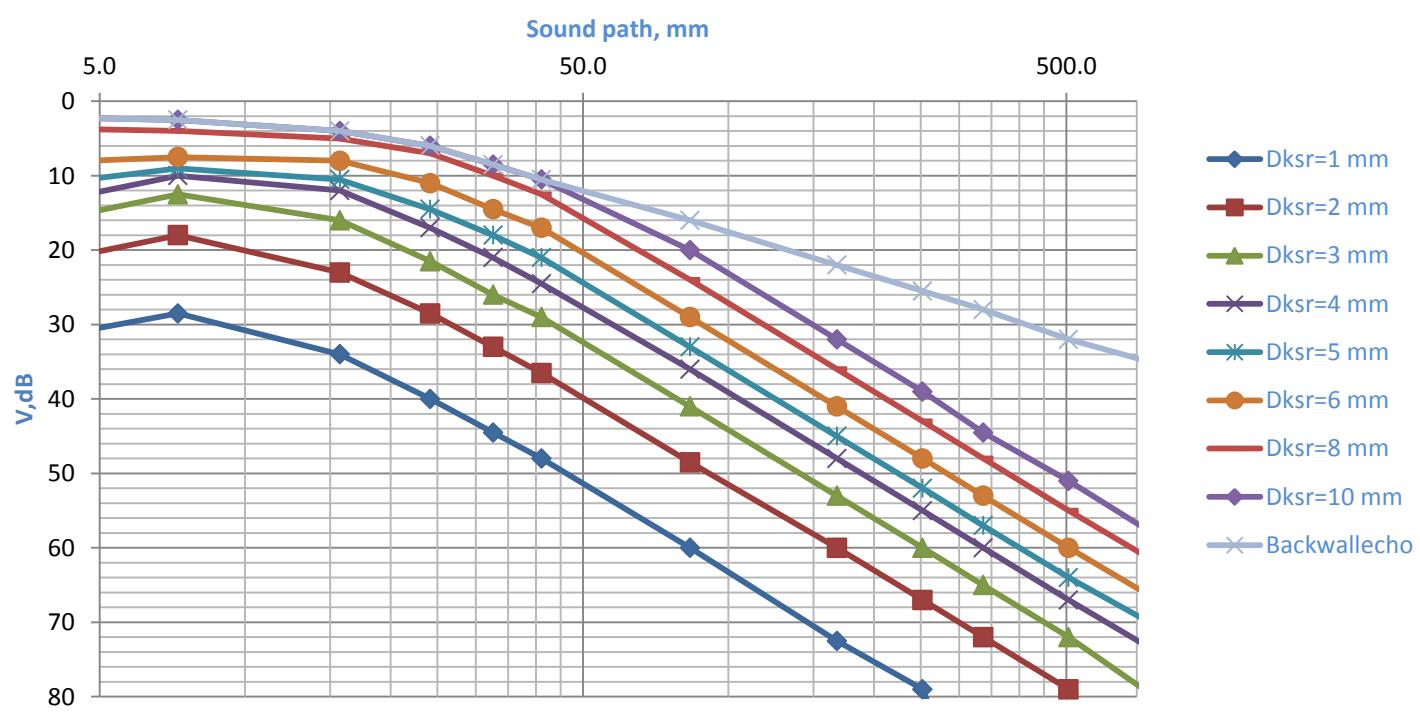


Datenblatt / Data sheet

Prüfkopf / Probe ID:	U2P10	Sender & Empfänger/	UDS 3-6
Serien Nr. / Serial No:	E127503	Pulser & Receiver:	
Typ / Type:	Normal Beam	UT Ausrüstung / UT Equipment:	I2005
Einschallwinkel (Stahl) / Angle (Steel):	NA	Kal Block / Cal Block:	K1 / V1
Fokus Länge / Focal Length(mm):	NA	Software:	I05 FFT
Frequenz / Frequency(MHz):	2 MHz	Schwinger Größe / Element Size(mm):	Φ 10 mm

Note: The data sheet provides extensive information about the respective probe. The DGS diagram shows the relation between amplitude (gain) and the respective reflectors sizes of circular disks having different diameter, all depending on the depth (distance) of the reflector. All values shown are valid for steel as described in EN 12223 for the preparation of the calibration block No. 1, in the temperature range of $23 \pm 5^\circ\text{C}$.

Hinweis: In diesem Datenblatt sind umfassende Informationen über den jeweiligen Prüfkopf dargestellt. Das AVG-Diagramm zeigt, wie sich die Amplituden der Echos von der Rückwand und von Kreisscheiben verschiedener Durchmesser mit zunehmendem Abstand ändern. Alle Werte beziehen sich auf Stahl, wie in EN 12223 zur Herstellung des Kalibrierkörpers Nr. 1 beschrieben, im Temperaturbereich $23 \pm 5^\circ\text{C}$.



Datenblatt / Data sheet

Symbol	Soll / Reference	Toleranz / Tolerance	Dimension	Beschreibung / Description
T_{10}	2,8	+/- 0,2	µs	Echoimpulsdauer / Echo pulse duration
f_e	2	+/- 0,4	MHz	Prüffrequenz / Test frequency
Δf_{rel}	28,5	+/- 5	%	Relative Bandbreite @ -6dB / Relative bandwidth @ -6dB
S_{rel}	-6	+/- 3	dB	Relative Echo-Empfindlichkeit / Relative pulse-echo sensitivity
γ_6	8,6	+/- 0,5	Grad / degree	Divergenzwinkel horizontal / Angle of divergence horizontal
Z	0	+/- 1	mm	Versatz / Offset
N	8,4	+/- 3	mm	Nahfeldlänge / Near field length
FB_6	2,5	+/- 0,2	mm	Fokusbreite @ -6dB / Focal width @ -6dB
L_6	8,4	+/- 6	mm	Fokus Länge @ -6 dB / Focal length
D_o	10	- 0,1	mm	Wandlergröße / Transducer dimensions
t_v	1,12	+/- 0,1	µs	Vorlaufzeit / Probe Delay
M_z	0,5		mm	Erlaubte Abnutzung / Wear allowance
T_a	-20... +60		°C	Arbeitstemperaturbereich / Working temperature range
D_{eff}	10	+/-0,1	mm x mm	Effektive Wandlergröße / Effective Transducer dimensions
Piezokeramik			Schwingermaterial / transducer material	
	84		g	Gewicht / weight
LEMO			Anschluss / connector	
Einstellparameter für ISONIC 2005				
	270		ns	Impulsbreite / Pulse Width
	12			Impulsstärke/ Firing Level
	1		MHz	Filter Niedrig Frequenz / Filter Low Cut
	3		MHz	Filter Hoch Frequenz / Filter High Cut
	10		dB	Verstärkung / Gain