



**CERTIFICATE in ACCORDANCE  
WITH EN12668-2**

**TRANSDUCER: AM4R-8X9-60**

**Serial No.: 1133213**

**Description:** Angle Beam Transducer, 4 MHz, 8 mm X 9 mm Element,  
60 Degree Refracted Shear Wave, Atlas Series Case Style,  
Right Angle Lemo-00 Connector.

**Principle Parameters**

Reference	Frequency	Active Element	Bandwidth
AM4R-8X9-60	4 MHz	8X9 mm	40 %

**Reference documents**

EN12668-2 : 2001

ASTM E-1065

ISO 9001 : 2008

Internal procedure: TP105 V17

**Quality system**

Fabricant: Olympus Scientific Solutions America Corp. certified per Intertek

**Instrumentation used**

Pulser/Receiver: Epoch III: 3EP055

Digitizer: Epoch III: 3EP055

Cable: LCB-74-4 Length:



## Impulse formation

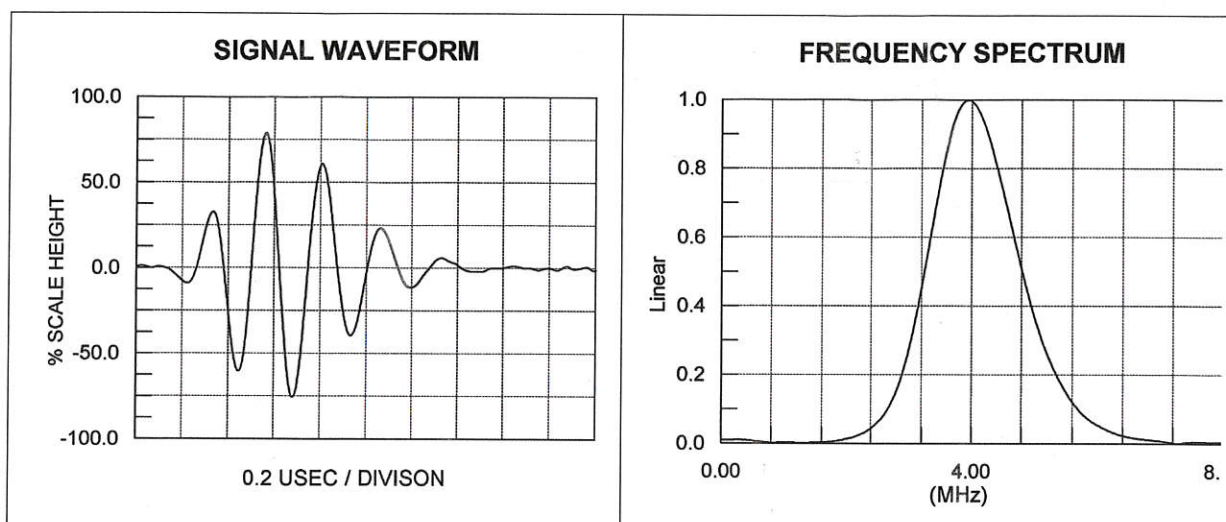
Test conditions:

Pulser Energy: HIGH ; Damping: 50 Ohm

Receiver Gain: 26.9 dB ; Filter: STD

Target: 100 mm steel radius

Test Date: 12-21-2017

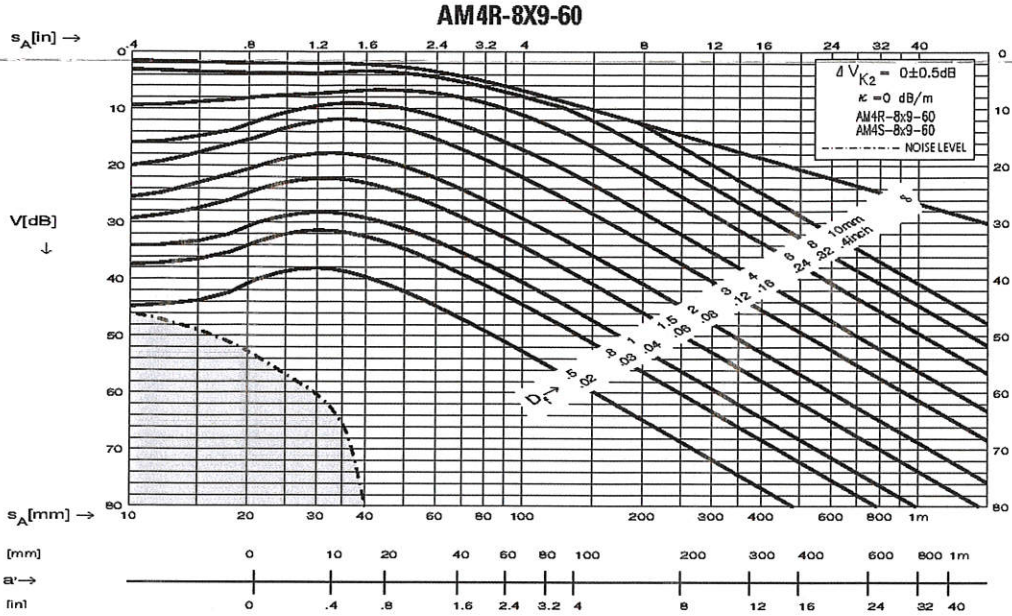


## Effective measurands

Parameter	Designation	Min value	Measure	Max value	Units
-14 dB waveform duration	$t_{14}$	N/A	0.80	N/A	$\mu$ s
-20 dB waveform duration	$t_{20}$	N/A	1.02	1.5	$\mu$ s
Centre Frequency	$F_c$	3.6	3.96	4.4	MHz
Relative Bandwidth @ -6dB	$\Delta f_{rel}$	25	38.4	55	%
Refraction Angle	$\alpha$	58	59.9	62	°



## DGS Curve, equivalent Flat Bottomed Hole curves (DAC)

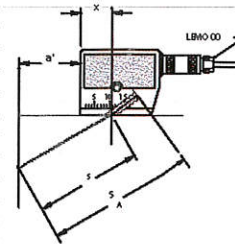


PARAMETER parameter/paramètre	NOMINAL nennwert/nominal	UPPER (+) ober bereich/supérieure	LOWER (-) unterer bereich/inférieure	UNIT meßeinheit/unité
$f_c^1, f_c^2$	4.0	4.4	3.6	MHz
$BW^1, \Delta_{ref}^2$	40	55	25	%
Z	75	100	50	$\Omega$
$\Phi$	60	80	40	°
N	30	34.5	26.5	mm
W/a6	1.6	1.8	1.4	mm
$W_{b6}^1 / W_{b6}^2$	2.0 / 2.0	2.2 / 2.2	1.8 / 1.8	mm
a	9.0	9.0	8.9	mm
$a_{eff}$	8.6	8.8	8.4	mm
b	8.0	8.0	7.9	mm
$b_{eff}$	7.6	7.8	7.4	mm
$\alpha_{(2155m/s)}$	60	62	58	°
$\Delta\alpha/\Delta T$	0.7	0.8	0.6	°/10°C
$lv_{(2143m/s)}$	7.0	8.0	6.0	mm
$\delta$	0	+1	-1	°
e	0	+1	-1	mm
x	13	15	11	mm
$\gamma_{b6}$	2.3	2.8	1.8	°
$\gamma_{b6}$	7.1	8.1	6.1	°
$\gamma_{b6}^1 / \gamma_{b6}^2$	3.7 / 3.4	4.2 / 3.9	3.2 / 2.9	°
M	2	n/a	n/a	mm
$T_r$	-20/+60	n/a	n/a	°C
Waveform duration <sup>1</sup> , Echo width <sup>2</sup> , Echobreite <sup>2</sup> , Largeur de l'écho <sup>2</sup> -20dB	1.0	1.5	n/a	us

1: ASTM E1065; 2: prEN 12668-2; 3: EN 1330-4:2000; 4: EN 583-2:2001

### AM4R-8X9-60

AM4R HAS RIGHT LEMO CONNECTOR  
AM4S HAS STRAIGHT LEMO CONNECTOR



$$s_v = 6.0 \pm 1 \text{ mm}$$

$$s = s_A - s_v$$

$s_v$  is the sound field equivalent of delay path length (lv)

$s_v$  entspricht im Schallfeld der Länge der Vorlaufstrecke lv

$s_v$  est l'équivalent du champ acoustique de la longueur de la ligne de retard



