

ISO 18563-1:2015-06 (E)

Non-destructive testing - Characterization and verification of ultrasonic phased array equipment - Part 1: Instruments

Contents		Page
Foreword		v
1 Scope	1	1
2 Normative references		1
3 Terms and definitions		1
4 Symbols and abbreviated terms		2
5 General requirements of conformity		3
6 Manufacturer's technical specification for phased array ultrasonic phased array instruments		3
7 Performance requirements for ultrasonic phased array instruments		7
8 Group 1 tests		9
8.1 Equipment required for group 1 tests		9
8.2 Battery operated phased array instruments		10
8.2.1 Operating time		10
8.2.2 Stability against voltage variations		10
8.3 Stability tests		11
8.3.1 Stability after warm-up time		11
8.3.2 Stability against temperature		11
8.4 Display		12
8.4.1 General		12
8.4.2 Time base deviation		12
8.4.3 Highest digitized frequency		12
8.4.4 Screen refresh rate for A-scan presentations		13
8.5 Transmitter		13
8.5.1 Pulse repetition frequency		13
8.5.2 Output impedance		14
8.5.3 Time delay resolution		14
8.6 Receiver		15
8.6.1 Cross-talk between receivers		15
8.6.2 Dead time after the transmitter pulse		15
8.6.3 Dynamic range and maximum input voltage		16
8.6.4 Receiver input impedance		17
8.6.5 Time-corrected gain		17
8.6.6 Temporal resolution		18
8.6.7 Time delay resolution		19
8.6.8 Linearity of vertical display over the extreme frequency ranges of the instrument		19
8.7 Monitor gate		20
8.7.1 General		20
8.7.2 Linearity of monitor gate amplitude		20
8.7.3 Linearity of monitor gate time-of-flight		21
8.7.4 Monitor gates with analogue outputs		21
8.8 Summation		23
8.8.1 General		23
8.8.2 Procedure		23

8.8.3	Acceptance criteria	24
9	Group 2 tests	24
9.1	Equipment required for group 2 tests	24
9.2	Visual inspection	24
9.2.1	Procedure	24
9.2.2	Acceptance criteria	24
9.3	Transmitter pulse parameters	24
9.3.1	General	24
9.3.2	Transmitter voltage, rise time, and duration	24
9.3.3	Linearity of time delays	25
9.4	Receiver	26
9.4.1	General	26
9.4.2	Frequency response	26
9.4.3	Channel gain variation	27
9.4.4	Equivalent input noise	28
9.4.5	Gain linearity	28
9.4.6	Linearity of vertical display	29
9.4.7	Linearity of time delays	30
10	Figures	31
	Bibliography	39