

# DIN EN ISO 18563-1:2022-12 (E)

## Non-destructive testing - Characterization and verification of ultrasonic phased array equipment - Part 1: Instruments ( ISO 18563-1:2022)

---

Contents	Page
<b>European foreword</b>	4
<b>Foreword</b>	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Symbols and abbreviated terms	7
5 General requirements of conformity	9
6 Manufacturer's technical specification for ultrasonic phased array instruments	9
7 Performance requirements for ultrasonic phased array instruments	13
8 Group 1 tests	15
8.1 Equipment required for group 1 tests	15
8.2 Battery operational time	16
8.2.1 General	16
8.2.2 Procedure	16
8.2.3 Acceptance criterion	17
8.3 Stability after warm-up time	17
8.3.1 Procedure	17
8.3.2 Acceptance criteria	19
8.4 Stability against temperature	19
8.4.1 Procedure	19
8.4.2 Acceptance criteria	19
8.5 Stability against voltage variations	20
8.5.1 Procedure	20
8.5.2 Acceptance criteria	20
8.6 Deviation of time base	20
8.6.1 General	20
8.6.2 Procedure	20
8.6.3 Acceptance criterion	22
8.7 Transmitter	22
8.7.1 General	22
8.7.2 Pulse repetition frequency	22
8.7.3 Effective output impedance	22
8.7.4 Resolution of time delay	23
8.8 Receiver	24
8.8.1 General	24
8.8.2 Cross-talk attenuation between receivers	24
8.8.3 Dead time after the transmitter pulse	25
8.8.4 Dynamic range and maximum input voltage	27
8.8.5 Receiver input impedance	29
8.8.6 Time-corrected gain (TCG)	29
8.8.7 Resolution of time delay	30
8.8.8 Linearity of vertical display against frequency	31
8.8.9 Summation	31
8.9 Gates	32
8.9.1 General	32

8.9.2	Linearity of gate amplitude	33
8.9.3	Linearity of time-of-flight in the gate .....	34
8.9.4	Monitor gates with analogue outputs .....	35
8.10	Highest digitized frequency .....	37
8.10.1	Procedures .....	37
8.10.2	Acceptance criterion .....	39
8.11	Response time of ultrasonic phased array instrument .....	39
8.11.1	General .....	39
8.11.2	Procedure .....	39
8.11.3	Acceptance criterion .....	41
<b>9</b>	<b>Group 2 tests .....</b>	<b>41</b>
9.1	Equipment required for group 2 tests .....	41
9.2	Physical state and external aspects .....	41
9.2.1	Procedure .....	41
9.2.2	Acceptance criteria .....	41
9.3	Transmitter .....	41
9.3.1	General .....	41
9.3.2	Transmitter pulse voltage, rise time and duration .....	41
9.3.3	Linearity of time delays .....	44
9.4	Receiver .....	44
9.4.1	General .....	44
9.4.2	Frequency response .....	44
9.4.3	Equivalent input noise .....	46
9.4.4	Linearity of gain .....	47
9.4.5	Variation of channel gain .....	48
9.4.6	Linearity of vertical display .....	49
9.4.7	Linearity of time delay .....	50
<b>Bibliography .....</b>	<b>52</b>	