ISO 8041:2005-04 (E)

Human response to vibration - Measuring instrumentation

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Terms, definitions and symbols 2
3.1 Terms and definitions 2
3.2 Symbols 5

4 Reference environmental conditions 7

5 Performance specifications 7
5.1 General characteristics 7
5.2 Display of signal magnitude 9
5.3 Electrical output 10
5.4 Vibration sensitivity 10
5.5 Accuracy of indication at reference frequency under reference conditions 10
5.6 Frequency weightings and frequency responses 11
5.7 Amplitude linearity 14
5.8 Instrument noise 14
5.9 Signal-burst response 14
5.10 Overload indication 17
5.11 Under-range indication 18
5.12 Time averaging 18
5.13 Running r.m.s. acceleration 18
5.14 Reset 18
5.15 Timing facilities 19
5.16 Electrical cross-talk 19
5.17 Vibration transducer characteristics 19
5.18 Power supply 19

6 Mounting 19

7 Environmental and electromagnetic criteria 20
7.1 General 20
7.2 Air temperature 20
7.3 Surface temperature 20
7.4 Electrostatic discharge 20
7.5 Radio-frequency emissions and public-power-supply disturbances 21
7.6 Immunity to a.c. power-frequency fields and radio-frequency fields 21
7.7 Ingress of water and dust 22

8 Provision for use with auxiliary devices 22

9 Instrument marking 22

10 Instrument documentation 23

11 Testing and calibration 23

12 Pattern evaluation 24

12.1 Introduction ... 24
12.2 Testing requirements ... 25
12.3 Submission for testing ... 25
12.4 Marking of the vibration meter and information in the instrument documentation ... 25
12.5 Mandatory facilities and general requirements ... 26
12.6 Initial instrument preparation ... 26
12.7 Indication at the reference frequency under reference conditions ... 26
12.8 Electrical cross-talk ... 27
12.9 Vibration transducer ... 27
12.10 Amplitude linearity and under-range indication ... 27
12.11 Frequency weightings and frequency responses ... 29
12.12 Instrument noise ... 32
12.13 Signal-burst response ... 32
12.14 Overload indication ... 32
12.15 Reset ... 33
12.16 Combined axis outputs ... 33
12.17 A.c. electrical output ... 33
12.18 Timing facilities ... 33
12.19 Power supply ... 34
12.20 Environmental, electrostatic and radio-frequency tests ... 34
12.21 Test report ... 38

13 Verification tests ... 38
13.1 Introduction ... 38
13.2 Testing requirements ... 38
13.3 Submission for a test ... 39
13.4 Marking of the vibration meter and information in the instrument documentation ... 39
13.5 Mandatory facilities and general requirements ... 39
13.6 Initial instrument preparation ... 39
13.7 Indication at the reference frequency under reference conditions ... 39
13.8 Electrical cross-talk ... 40
13.9 Amplitude linearity and under-range indication ... 40
13.10 Frequency weightings and frequency responses ... 41
13.11 Instrument noise ... 43
13.12 Signal-burst response ... 43
13.13 Overload indication ... 43
13.14 Reset ... 44
13.15 Combined axis outputs ... 44
13.16 Test report ... 44

14 In-situ checks ... 44
14.1 Introduction ... 44
14.2 Preliminary inspection ... 45
14.3 Vibration sensitivity (field calibration) ... 45

Annex A (normative) Specification for vibration field calibrator ... 46

Annex B (informative) Frequency weightings ... 49

Annex C (informative) Realization of frequency weighting filters ... 68

Annex D (informative) Running r.m.s. time averaging ... 72

Annex E (informative) Vibration transducer characteristics ... 74

Annex F (informative) Tests for mounting systems ... 76

Annex G (normative) Instrument documentation ... 79

Annex H (normative) Phase-response requirements for measurement of non-r.m.s. quantities ... 84

Bibliography ... 91