DIN EN ISO 19085-3:2018-04 (E)

Woodworking machines - Safety requirements - Part 3: Numerically controlled (NC) boring and routing machines (ISO 19085-3:2017)

Contents

Page

European foreword ... **4**

Annex ZA (informative) **Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC** ... **5**

Foreword ... **7**

Introduction ... **8**

1 Scope ... **10**

2 Normative references ... **11**

3 Terms and definitions ... **11**

4 List of significant hazards ... **17**

5 Safety requirements and measures for controls ... **19**
5.1 Safety and reliability of control systems ... 19
5.2 Control devices ... 19
5.2.1 General ... 19
5.2.2 Hand-held control sets ... 20
5.3 Start ... 20
5.4 Safe stops ... 21
5.4.1 General ... 21
5.4.2 Normal stop ... 21
5.4.3 Operational stop ... 21
5.4.4 Emergency stop ... 21
5.5 Braking function of tool spindles ... 21
5.6 Mode selection ... 21
5.6.1 General ... 21
5.6.2 Machining mode [MODE 1] ... 21
5.6.3 Machine setting mode [MODE 2] ... 22
5.6.4 Clamping device manual positioning mode [MODE 3] ... 22
5.7 Spindle speed changing ... 22
5.7.1 Spindle speed changing by changing belts on the pulleys ... 22
5.7.2 Spindle speed changing by incremental speed change motor ... 22
5.7.3 Infinitely variable speed by frequency inverter ... 22
5.8 Failure of any power supply ... 23
5.9 Manual reset control ... 23
5.10 Enabling control ... 23
5.11 Machine moving parts speed monitoring ... 23
5.12 Time delay ... 23
5.13 Teleservice ... 23

6 Safety requirements and measures for protection against mechanical hazards ... **24**
6.1 Stability ... 24
6.1.1 Stationary machines ... 24
6.1.2 Displaceable machines ... 24
6.2 Risk of break-up during operation ... 24
6.3 Tool holder and tool design ... 24
6.3.1 General ... 24
6.3.2 Spindle locking ... 25
6.3.3 Circular saw blade fixing device ... 25
6.3.4 Flange dimension for circular saw blades ... 25

6.4 Braking ... 25
6.4.1 Braking of tool spindle ... 25
6.4.2 Maximum run-down time ... 25
6.4.3 Brake release ... 25
6.5 Safeguards ... 25
6.5.1 Fixed guards ... 25
6.5.2 Interlocking moveable guards ... 25
6.5.3 Hold-to-run control ... 25
6.5.4 Two-hand control ... 26
6.5.5 Electro-sensitive protective equipment (ESPE) ... 26
6.5.6 Pressure-sensitive protective equipment (PSPE) ... 26
6.6 Prevention of access to moving parts ... 28
6.6.1 General ... 28
6.6.2 Guarding of tools ... 31
6.6.3 Guarding of drives ... 33
6.6.4 Guarding of shearing and/or crushing zones ... 36
6.7 Impact hazard ... 34
6.8 Clamping device ... 34
6.9 Measures against ejection ... 35
6.9.1 General ... 35
6.9.2 Guards materials and characteristics ... 35
6.10 Workpiece support and guides ... 35
7 Safety requirements and measures for protection against other hazards ... 36
7.1 Fire ... 36
7.2 Noise ... 36
7.2.1 Noise reduction at the design stage ... 36
7.2.2 Noise emission measurement ... 36
7.3 Emission of chips and dust ... 36
7.4 Electricity ... 36
7.4.1 General ... 36
7.4.2 Displaceable machines ... 36
7.5 Ergonomics and handling ... 36
7.6 Lighting ... 37
7.7 Pneumatics ... 37
7.8 Hydraulics ... 37
7.9 Electromagnetic compatibility ... 37
7.10 Laser ... 37
7.11 Static electricity ... 37
7.12 Errors of fitting ... 37
7.13 Isolation ... 37
7.14 Maintenance ... 37
8 Information for use ... 37
8.1 Warning devices ... 37
8.2 Marking ... 37
8.2.1 General ... 37
8.2.2 Additional markings ... 37
8.3 Instruction handbook ... 38
8.3.1 General ... 38
8.3.2 Additional information ... 38
Annex A (informative) **Performance levels required ... 40**
Annex B (normative) **Test for braking function ... 42**
Annex C (normative) **Stability test for displaceable machines ... 43**
Annex D (normative) **Impact test for guards ... 44**
Annex E (normative) **Noise emission measurement for machines not in ISO 7960 ... 45**
Annex F (normative) **Impact test for curtains ... 54**
Annex G (normative) **Wear test for curtains ... 59**
Annex H (normative) **Dynamic test for pressure-sensitive bumpers, edges, trip bars, trip plates ... 63**
Annex ZA (informative) **Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC ... 71**
Bibliography ... 73