DIN EN ISO 19085-3:2022-07 (E)

Woodworking machines - Safety - Part 3: Numerically controlled (NC/CNC) boring and routing machines (ISO 19085-3:2021)

Contents

Page

European foreword ... **5**

Annex ZA (informative) **Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered** ... **6**

Foreword ... **9**

Introduction ... **10**

1 Scope ... **12**

2 Normative references ... **13**

3 Terms and definitions ... **14**

4 Safety requirements and measures for controls ... **17**
4.1 Safety and reliability of control systems ... 17
4.2 Control devices ... 17
4.2.1 General ... 18
4.2.2 Hand-held control sets ... 18
4.3 Start ... 18
4.3.1 Direct start ... 18
4.3.2 Start via control power-on ... 18
4.4 Safe stops ... 19
4.4.1 General ... 19
4.4.2 Normal stop ... 19
4.4.3 Operational stop ... 19
4.4.4 Emergency stop ... 19
4.5 Braking function of tools ... 19
4.6 Mode selection ... 19
4.6.1 General ... 19
4.6.2 Machine setting mode [MODE 2] ... 19
4.6.3 Clamping device manual positioning mode [MODE 3] ... 20
4.6.4 Boring units positioning mode [MODE 4] ... 20
4.7 Tool speed changing ... 20
4.7.1 Speed changing by shifting the belts on the pulleys ... 20
4.7.2 Speed changing by incremental speed change motor ... 20
4.7.3 Infinitely variable speed by frequency inverter ... 20
4.8 Failure of any power supply ... 21
4.9 Manual reset control ... 21
4.10 Standstill detection and monitoring ... 21
4.11 Machine moving parts speed monitoring ... 21
4.12 Time delay ... 21
4.13 Tele-service ... 21

5 Safety requirements and measures for protection against mechanical hazards ... **21**
5.1 Stability ... 21
5.2 Risk of break-up during operation ... 21
5.3 Tool and tool fixing design ... 22
5.3.1 General ... 22
5.3.2 Spindle locking ... 22
5.3.3 Circular saw blade fixing device ... 22
5.3.4 Flange dimension for circular saw blades ... 22
5.4 Braking ... 22
5.4.1 Braking of tools ... 22
5.4.2 Maximum run-down time ... 22
5.4.3 Brake release ... 22

5.5 Safeguards ... 22
5.5.1 Fixed guards ... 22
5.5.2 Interlocking moveable guards ... 23
5.5.3 Hold-to-run control ... 23
5.5.4 Two-hand control ... 23
5.5.5 Electro-sensitive protective equipment (ESPE) ... 23
5.5.6 Pressure-sensitive protective equipment (PSPE) ... 24
5.5.7 Enabling control ... 24
5.6 Prevention of access to hazardous moving parts ... 24
5.6.1 General ... 24
5.6.2 Safeguarding of all machine sides except the loading/unloading zone ... 24
5.6.3 Safeguarding of the loading/unloading zones ... 25
5.6.4 Measures against access to the rear of the machine from un/loading zone ... 35
5.6.5 Minimum clearances at the loading/unloading zone ... 38
5.7 Impact hazard ... 38
5.8 Clamping devices ... 38
5.9 Measures against ejection ... 39
5.9.1 General ... 39
5.9.2 Guards materials and characteristics ... 41
5.9.3 Curtains ... 42
5.10 Workpiece support and guides ... 43

6 Safety requirements and measures for protection against other hazards ... 43
6.1 Fire ... 43
6.2 Noise ... 43
6.2.1 Noise reduction at the design stage ... 43
6.2.2 Noise emission measurement and declaration ... 43
6.3 Emission of chips and dust ... 43
6.4 Electricity ... 43
6.5 Ergonomics and handling ... 43
6.6 Lighting ... 44
6.7 Pneumatics ... 44
6.8 Hydraulics ... 44
6.9 Electromagnetic compatibility ... 44
6.10 Laser ... 44
6.11 Static electricity ... 44
6.12 Errors of fitting ... 44
6.13 Isolation ... 44
6.14 Maintenance ... 44
6.15 Relevant but not significant hazards ... 44

7 Information for use ... 44
7.1 Warning devices ... 44
7.2 Marking ... 45
7.2.1 General ... 45
7.2.2 Additional markings ... 45
7.3 Instruction handbook ... 45
7.3.1 General ... 45
7.3.2 Additional information ... 45

Annex A (informative) **List of significant hazards ... 47**

Annex B (informative) **Performance levels required ... 49**

Annex C (normative) **Stability test ... 51**

Annex D (normative) **Test for braking function ... 52**

Annex E (normative) **Impact test for guards ... 53**

Annex F (normative) **Noise test code ... 54**

Annex G (normative) **Dynamic test for pressure-sensitive bumpers, edges, trip bars, trip plates** **59**
Annex H (informative) **Examples of safeguarding concepts for different machine designs** **67**
Annex I (normative) **Impact test for curtains** **85**
Annex J (normative) **Wear test for curtains** **90**
Bibliography **94**