

Risk assessment



Laumat
GmbH

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Risk assessment XWinder units

1. Determining the limits of the machine
 - a. General
XWinder, winding machine for bar-type windings
 - b. Limits of use
Maximum diameter of winding component 300mm, winding length 3m
13.4.2021: With extension kit up to 400mm
 - c. Spatial limits
XWinder is designed as a desktop device.
 - d. Time limits, system limits
XWinder is intended for single windings (laboratory environment), not for continuous industrial use or series production.
 - e. Other borders
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 - f. Identifying the hazards
See below
2. Risk assessment
 - a. General
As a desktop device, the hazard potential is small. See below.
3. Risk elements
The risk elements are analysed according to the following factors.
 - a. Assessment of hazards according to the factors:
 - i. **Probability of occurrence of a loss**
 - ii. **Hazard exposure of persons**
 - iii. **Occurrence of hazard events**
 - iv. **Damage from hazard events**
 - b. Ways to avoid or limit damage
 - c. Aspects to consider during the risk assessment
 - d. Exposed group of people
Operators
of the Maschie XWinder
Persons in the vicinity of the machine
 - e. Type, frequency and duration of exposure to the hazard
 - f. Relationship between hazard exposure and effects
 - g. Human factors
 - h. Suitability of protective measures
 - i. Possibility of disabling or circumventing protective measures
 - j. Ability to maintain protective measures
 - k. User information
 - l. Risk assessment
4. Achieving sufficient risk reduction
 - a. Risk reduction
 - b. Elimination of hazards or reduction of risk through protective measures
 - c. Consideration of geometric factors and physical aspects

- d. Geometric factors
 - e. Selection of suitable technologies
 - f. Applying the principle of mechanically forced interaction between components
 - g. Precautions for stabilityXWinder
is placed on a desk (desktop).
 - h. Provisions for ease of maintenanceXWinder
has an open design, which means that all components can be freely accessed.
 - i. Observe ergonomic principlesXWinder
is placed on a desk (desktop). The table height is to be set up ideally for the activity.
5. Hazard
- a. Electrical hazards
Not relevant. XWinder is operated with a desktop power supply unit with CE approval. XWinder is operated with 24V DC, which is not an electrical hazard. The external power supply unit is dimensioned for operation with XWinder.
 - b. Avoiding hazards from pneumatic and hydraulic equipment
Not relevant
 - c. Apply measures for inherently safe control design.
Not relevant.
 - d. Switching on an external power source
Switching on the power supply does not create a hazard, as no movement of the machine results.
 - e. Shutting down a mechanism
Interruption of the power supply.
 - f. Restart after power failure
Restarting after a power failure is not prevented. Switching on the power supply does not cause any direct danger, as no movement of the machine results.
 - g. Interruption of the power supply
Interrupting the power supply stops the hazard.
 - h. Use of self-monitoring
Not relevant
 - i. Safety functions implemented by programmable electronic controllers
Not relevant
 - j. Hardware aspects
 - i. **The mechanical drives are designed with regard to the forces in such a way that no permanent damage can be caused by crushing (fingers).**
 - 1. Risk minimisation: Emergency stop switch, warning in the manual.
 - ii. **Winding long hair.**
 - 1. Risk minimisation: emergency stop switch, warning in the manual, wear hairnet.
 - k. Software aspects
 - i. **Stop the movement using the Stop function in the XWinder Executor.**
 - l. User software
 - i. **Stop the movement using the Stop function in the XWinder Executor.**
 - m. Principles for manually operated control devices (manual control)
Manual control buttons (forward/backward/start/stop) on the mechanism are overridden stopped by the emergency stop.
 - n. Control type for setup, teaching, changeover, troubleshooting, cleaning or maintenance work
Not relevant
 - o. Apply measures to achieve electromagnetic compatibility (EMC).
Power supply unit approved according to CE and EMC directives.
Stepper motor control card approved according to CE and EMC directives.

- p. Provision of diagnostic systems to facilitate troubleshooting
Not relevant
- q. Minimise the failure of safety functions
Standard emergency stop with positive break NC contact.
- r. Use of reliable components
Reliable stepper motor technology with standard components.
- s. Application of components with "specified failure behaviour".
In the event of a defect in the stepper motor electronics, the machine goes into a safe state of the corresponding axis.
- t. Duplication (or redundancy) of components or subsystems
Not relevant, as the machine goes into the safe state (standstill) in the event of damage.
- u. Guidance for the selection of guards against hazards from moving parts
 - i. **Covers on toothed belt pulleys**
 - ii. **Measure: Force dimensioning calculated in such a way that the moving parts can be stopped by the operator by holding them.**
 - iii. **Measure: Emergency stop switch.**
- v. Protective measures for stability
To be used as a desktop unit on the table. No measures necessary.
- w. Noise
Noise impact in the context of office equipment, around 45 dbA. No measures necessary.
- x. Oscillations and vibration
Not relevant
- y. Radiation
Not relevant
- z. Components and parts for stopping in an emergency
Emergency stop switch. Disconnect power supply.
- aa. Markings, signs (pictograms), written warnings.
warnings in the manual.
- bb. Authorised representative of the manufacturer, designation of the machine, year of manufacture.
When purchased as a finished model: Type label and CE marking, enclosed with every machine delivery with CE system declaration from Laumat GmbH. Affixed by Laumat GmbH.
When purchased as a kit: Type label and CE marking as EC Declaration of Conformity as CE built-in device, enclosed with each machine delivery. CE system declaration is implemented by the customer.