MANUAL

POWERRING TRANSPORT ANCHOR

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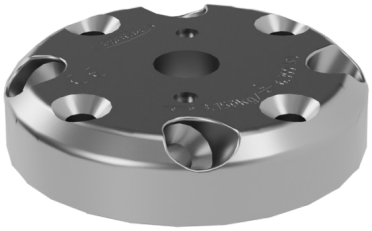

Powerring

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1. FOREWORD

Dear Customer,

Thank you for choosing the Powerring! With this powerful load handling device, you benefit from proven technology and versatile application possibilities

Please read these operating instructions thoroughly before using the Powerring for the first time to familiarize yourself with its functionality and handling. They contain all essential information on use, expert inspection, and maintenance. Follow the instructions to avoid hazards, minimize repair costs and downtime, and maximize the reliability and service life of your device. If you have any questions or problems, the manufacturer, Eurotec, will be happy to assist you.

Always keep these instructions close to your Powerring. In addition to these operating instructions, the respective national accident prevention regulations and the recognized rules for safe, professional work must be observed. Legal regulations take precedence over the information provided here. Reproduction or distribution of these operating instructions to third parties is only permitted with the express permission of Eurotec GmbH.

The operating instructions refer to the product data sheet several times, as it contains the necessary tables of values.

We wish you every success and enjoyment with your Powerring!

YOU CAN FIND THE PRODUCT DATA SHEET HERE:

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2. SAFETY INSTRUCTIONS

Before using the Powerring, it is essential to observe the following points. If even one of these points is not fulfilled, the Powerring must not be used.

- Proper inspection before first use (Section 7.1).
- Intended use (Section 3).
- Use by authorized personnel
- Observation of angles and loads (according to Section 5).
- Powerring free of defects
- Inspections performed (Sections 7.2 and 7.3).
- Less than 16,000 load cycles (according to EN 13155:2020).
- The screws used to attach the lifting device must be replaced after each use and are not reusable.

Explanation of how all values contained in the product data sheet were determined:

Rated value of the connecting elements
The design values of the connecting elements include partial safety factors in accordance with ETA-11/0024, EN 1995-1-1, EN 1990, and EN 1991-3. National regulations must also be observed.

$$R_d = R_k \times k_{mod} / \gamma_M$$

R_d = Design value of maximum load-bearing capacity according to EN 1995-1-1
R_k = characteristic load-bearing capacity according to EN 1995-1-1
k_{mod} = 1,0 (durability coefficient according to EN 1995-1-1)
$\gamma_{M,Wood}$ = 1,3 (partial safety factor for wood according to EN 1995-1-1)

Calculation of loads / lifting loads
Depending on the load conditions and operating environment, a dynamic load factor (φ2) can be applied in accordance with the load class in EN 1991-3. This value must be adjusted in line with practical requirements (see Table 1). The forces acting are multiplied by the dynamic coefficient and the partial safety factor for the actions:

$$F_d = F_k \times \varphi_2 \times \gamma_G$$

F_d = Rated value of the lifting load (action) according to EN 1990
F_k = characteristic dead weight of the element to be lifted
φ_2 = dynamic load factor according to EN 1991-3
γ_G = 1,35 (Partial safety factor for permanent loads according to EN 1990)

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Table 1 – Dynamic load factor φ2

Lifting capacity	Lifting speed		
	20m/min	50m/min	90m/min
HC 1	1,1	1,2,	1,3
HC 2	1,2	1,4	1,6
HC 3	1,3	1,6	1,9
HC 4	1,4	1,8	2,2

Permissible lifting capacity / working load limit
The rated load capacity must be at least equal to the rated lifting load. The permissible lifting capacity (rated working load limit, RWLL) per anchor point is therefore calculated as follows:

$$R_{WWL} = \frac{R_k \times k_{mod}}{\gamma_M} \times \frac{1}{\varphi_2 \times \gamma_G}$$

Important information

- **Table data** is provided in accordance with ETA-11/0024 without pre-drilling and applies to the following wood densities per individual anchor point. Values may vary depending on the type of wood and strength class
- **Full load-bearing capacity** is only achieved if the load is distributed evenly across all anchor points using suitable lifting systems. The Eurotec technical department will be happy to advise you on alternative screw configurations
- **Combined loads:** Shear forces on the screws are calculated in tables without taking the rope pull effect into account. Pre-drilled holes may result in a higher load-bearing capacity.
- β = lift angle (angle between vertical axis and chain).
- CLT-Platten: ρk = 350 kg/m3 (C24).
- GLT beams and frame walls: ρk = 385 kg/m3 (GL24h).

Minimum distances
Minimum screw spacing according to ETA-11/0024 without pre-drilling.

CLT floor panels
If the ratio l_{ef} > 0,7 (DIN EN 1995-1-1) is not met during horizontal transport, the ratio of panel thickness to screw length reduces the load-bearing capacity. The optimum screw lengths and cross-sections of the CLT panels are shown in the product data sheet.

Load capacity of the swivel hook
When the screw configuration is fully utilized and β = 0°, the maximum capacity is usually limited by the stop swivel. Longer screws therefore do not increase the values indefinitely.

Wood failure
The anchoring design takes into account the following failure modes: screw breakage, stop swivel breakage, and wood failure. The tables only cover the first two, as the load-bearing capacity of wood depends heavily on the cross-sectional geometry. The static verification must check the component separately for crack and shear failure. For the largest anchor sizes, the strength of the wood may be limiting; reinforcement of the wood cross-sections may be necessary.

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3. INTENDED USE

The lifting device is intended exclusively for lifting glued laminated timber, cross-laminated timber, and solid wood beams (hereinafter referred to as "components") made of spruce, fir, pine, and larch. Woods with a high resin content, such as pine and larch, or components with walls attached to the front end may only be lifted at an angle of at least 5° to the thread axis. Only one component may be moved per lifting operation. The intended use is explained in more detail below.

3.1 LIFTING OPERATION

- The lifting process must be as short as possible. The duration may only be a reasonable amount of time for the loading or unloading process.
- The Powerring and the load may only be operated and manipulated by qualified personnel who are familiar with and follow the instructions in this operating manual.
- Before lifting, check that there are no loose parts on the component to be lifted, such as tools or similar items.
- Jerky movements must be avoided during the lifting process. Therefore, lifting must always be carried out as slowly as necessary and with caution.
- The value indicated on the Powerring is the maximum load capacity of the product. However, depending on the application and choice of fastening, the values from the appropriate load table in the product data sheet must be used.
- Staying under a suspended load and its danger zone must be avoided at all costs.
- Before lifting, the operator must ensure that the load is correctly attached.
- When attaching the lifting equipment, the operator must ensure that it can be operated in such a way that neither the operator nor other persons can be endangered by the lifting equipment, lifting gear or the load.
- The Powerring may be used in ambient temperatures between -20°C and +80°C. In case of deviations from this range or extreme conditions, it is essential to consult the manufacturer. Please also note the explanations in DGUV 109-017 regarding the influence of temperature on load capacities.
- Contact between the lifting device and corrosive media must be avoided.
- Avoid pendulum movements during transport.
- The accident prevention and safety regulations for LAM in the respective country in which the lifting device is used must be observed at all times.
- The load must not be in a raised or tensioned state for the duration of the manipulation.
- The combination of several lifting devices may only be carried out on one surface of the component.
- In the event of a malfunction or a non-compliance with a requirement from section 2, the lifting device must be taken out of service immediately.

3.2 LIFTING GEAR

Only suitable lifting equipment may be used.

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3.3 WOOD

- The wood moisture content of the component to be lifted must not exceed the known standard regulations. We recommend a maximum wood moisture content of 20 %.
- It is always necessary to inspect the component. If there are any defects that could compromise the overall stability, this must always be checked before lifting and, if necessary, replaced. If there are defects at the intended attachment points of the lifting equipment at a distance corresponding to the minimum distances specified in the product data sheet, new attachment points must be determined.

3.4 STORAGE

- To prevent corrosion, the lifting device must always be stored in a dry place.
- If the lifting device has been exposed to moisture, dry it completely as quickly as possible. No moisture should remain in the threaded area or the holes.
- The lifting device should always be stored in such a way that neither the lifting device itself nor persons can be damaged.
- As with moisture, the lifting device must always be protected from contamination.

3.5 COMBINATIONS

- The lifting device may only be combined with the accessories intended for this purpose.
- Combinations with the correct bolts and the correct swivel eye are only permitted in the combinations approved in the product data sheet. Please contact our technical department in case of deviations.

4. IMPROPER USE

- The specified load capacities of the lifting device must not be exceeded.
- No modifications may be made to the lifting device or the technical documentation
- The lifting device must not be used to transport persons.
- Pendulum movements and collisions with obstacles must be avoided when transporting the load.
- The lifting device must not be dropped.

5. INSTRUCTIONS FOR USE

Please refer to the relevant product data sheet for all information on use, such as edge distances for crosslaminated timber and solid wood, as well as load specifications.

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6. USE OF THE POWERRINGS

Please refer to our assembly instructions at the following link:

THE ASSEMBLY INSTRUCTIONS CAN BE FOUND HERE:

7. INSPECTIONS

7.1 INSPECTION BEFORE INITIAL COMMISSIONING

Before initial commissioning, the lifting equipment must be inspected by a qualified person. This inspection consists of a visual and functional check. The main purpose of this inspection is to ensure that the lifting equipment is in a safe condition and that any defects or damage can be rectified. Qualified persons for this purpose include external maintenance technicians, but also the company's own employees who have received the appropriate training. The inspection must be carried out in accordance with the points prescribed by the employers' liability insurance association (dguv 109 017).

7.2 INSPECTION BEFORE STARTING WORK

- The lifting device must be visually inspected for damage, cracks, or deformation before each use.
- The lifting device must be clean.
- The fastening screws must be new and also checked for damage.
- The inspections must be carried out in accordance with dguv 109 017.
- If any abnormalities are found, the device must not be used under any circumstances.

7.3 INSPECTION / MAINTENANCE

- Recurring inspections must be carried out by a competent person in accordance with the applicable regulations for work equipment in the country of use. However, this must be done at least once a year, or at shorter intervals in the case of heavy or frequent use.
- Repairs may only be carried out by the manufacturer.

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