

User Instruction

DN50/DN75 PULLEY WHEEL

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1. Introduction

1.1 Important Safety and Usage Instructions for COBOD DN50/DN75 Pulley Wheel

BEFORE installing and operating a COBOD DN50/DN75 pulley wheel, please read this user instruction carefully. Pay close attention to all the information provided to ensure proper use and adherence to safety regulations. All personnel responsible for the installation and operation of the pulley wheel must be trained and instructed in accordance with local regulations and, where applicable, EU Directives, including Directive 2009/104/EC and Directive 2006/42/EC.

1.2 Personal Protection Equipment (PPE)

For health and safety reasons, anyone involved in assembling, operating, disassembling, transporting, maintaining, or cleaning the DN50/DN75 pulley wheel must wear appropriate Personal Protection Equipment (PPE) in accordance with local regulations, and, where applicable, EU Regulation (EU) 2016/425. This includes, but is not limited to, gloves, safety glasses, hard hats, and safety shoes.

1.3 Continuous Improvement and Feedback

COBOD International is committed to delivering the highest degree of accuracy possible. As part of our policy of continuous improvement, product specifications may change without notice. We encourage readers and users to share their suggestions for improvements. All feedback will be carefully considered for future updates of this user instruction and potential changes to our products. Please send your feedback to info@cobod.com.

2. Scope

The DN50/DN75 Pulley Wheel is designed to provide a more manual alternative to the BOD2 Advanced Hose Management System (AHMS). It facilitates the delivery of material from the selected Material Delivery System (MDS) to the printhead using textile concrete hoses. To avoid interference with the printable area (PA), one hose is securely suspended from the Y-axis aluminum top truss via a pulley wheel. The pulley wheel is available in either a DN50 or DN75 version, depending on the desired hose size. These user instructions apply to both versions.

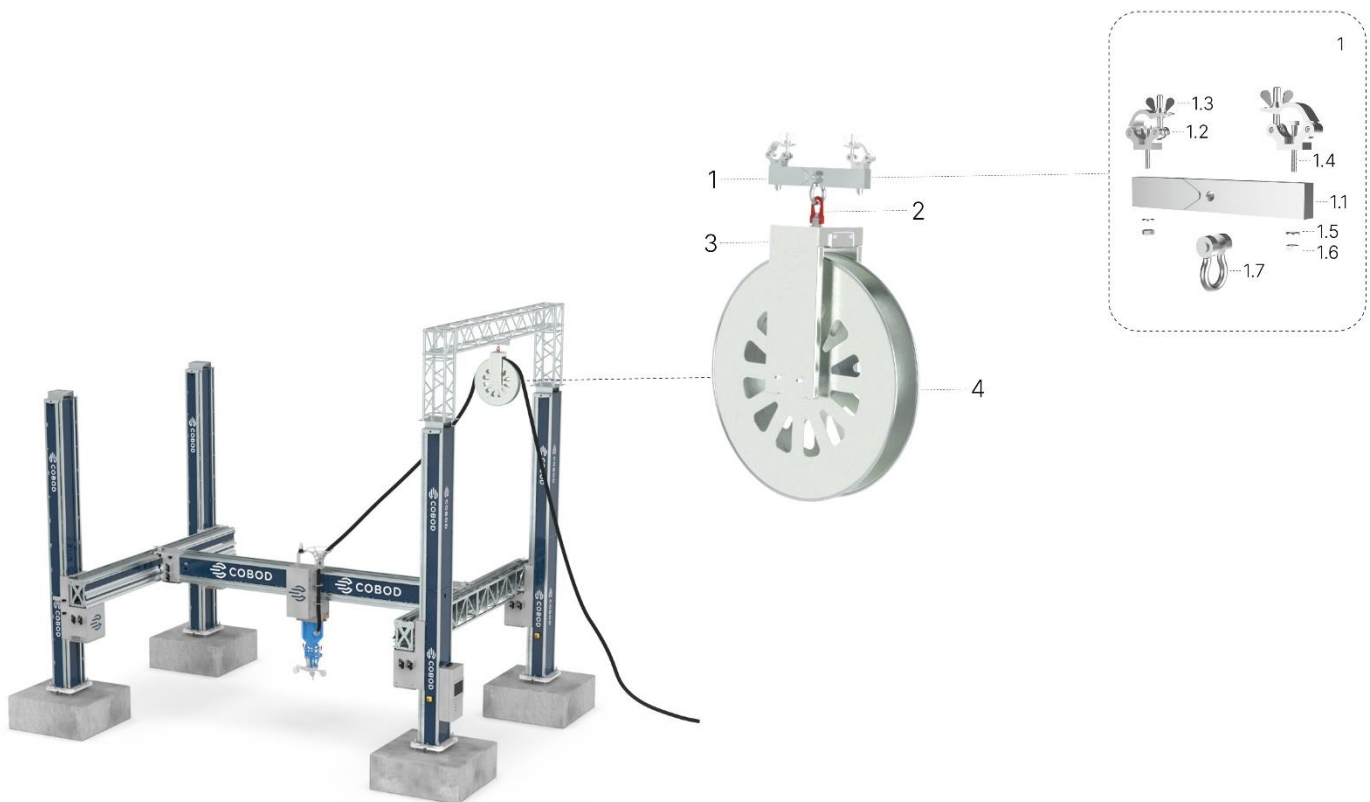
This device should only be used for its intended purpose. Any other use is considered misuse. The user or operator, not the manufacturer, will be liable for any damage or injury resulting from such misuse.

3. Technical Specifications

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Specification	Details
Material	Brut aluminum (lifting bracket) Electro-galvanized steel according to ISO 19598 (wheel and clamp hose protector)
Bending radius	39 cm (DN50) 49 cm (DN75) 15.4 inch (DN50) 19.3 inch (DN75)
Diameter	78 cm (DN50) 98 cm (DN75) 30.7 inch (DN50) 38.6 inch (DN75)
Weight*	45 kg (DN50) 75 kg (DN75) 99.2 lbs (DN50) 165.4 lbs (DN75)
Recommended hoses	Textile concrete hose
Maximum recommended hose length	70 m (DN50) 40 m (DN75) 230 ft (DN50) 131 ft (DN75)

*The parameter does not include the material hoses.



*Illustration 1: Visualization of the DN50/DN75 pulley wheel with a detailed breakdown at the component level.

#	Component Name	Description
1	Lifting bracket	The lifting bracket is a crucial component of the DN50/DN75 pulley wheel assembly. It secures the pulley wheel to the truss structure by connecting the clamps to the truss, while the pulley wheel is attached and suspended from the shackle of the lifting bracket.
1.1	Alu bar, lifting bracket	Main part of the lifting bracket.
1.2	Alu clamps (30mm)	Adjustable clamps act as connection parts for secure attachment and adjustment between the truss structure and the lifting bracket.
1.3	Wingnut	The wingnut acts as the fastening mechanism, when securing the lifting bracket to the truss structure.
1.4	M12x90 hexagon bolt	Hex head bolt that secures the adjustable clamps to the alu bar of the lifting bracket.
1.5	M12 washer	A thin plate with a circular hole in center used to distribute the load of the threaded fastener (self-locking nut).
1.6	M12 self-locking nut	The fastening mechanism and self-locking feature ensures the adjusted clamps are securely placed.
1.7	M19 shackle	The shackle connects the lifting bracket to the swivel eye bolt, providing a secure connection.
2	Swivel eye bolt	The swivel eye bolt ensures a secure connection between the lifting bracket and the clamp hose protector, while also enabling the wheel to rotate vertically, aligning with the printhead's movements.
3	Clamp hose protector	The clamp hose protector is the connecting piece between the swivel eye bolt and the wheel, ensuring they are securely attached during use.
4	DN50/DN75 wheel	The wheel is another crucial component of the DN50/DN75 pulley wheel assembly, enabling smooth gliding of the material hoses and accommodating the movements of the printhead.

4. Installation Guide

This section provides detailed instructions for installing the DN50/DN75 Pulley Wheel onto the BOD2 printer. Follow these steps carefully to ensure a safe and effective installation.

4.1 Installation Safety

- Install the Pulley Wheel onto the Aluminum Top Truss at ground level before lifting and attaching it to the BOD2.
- Perform a visual inspection of all parts before every usage, as required by local regulations, and, where applicable, EU Directive 2009/104/EC. Retighten bolts and wingnuts if loose.
- Use a calibrated torque wrench set to 15 Nm to tighten the swivel eye bolt/nut. Avoid abrupt tightening.
- Avoid standing underneath the Pulley Wheel during installation and operation to prevent injury. Ensure the area is marked and closed off to unauthorized personnel.

4.2 Preparation

Proper preparation is essential for successful installation. This section outlines the required tools, personnel, and prerequisites.

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Preparation	Details
Tools required	1x DN50/DN75 pulley wheel
	1x 19mm wrench 1x 3/4" wrench (for tightening the subcomponents present within the lifting bracket)
	1x calibrated torque wrench (set to 15nm) (for tightening the swivel eye bolt/nut, avoid abrupt tightening)
	2x 2t 4m lifting straps 2x 4,409 lbs 13 ft lifting straps (Please note that the length of the straps depends on the available height above the printer. These straps should have a minimum lifting capacity of 1t for securely lifting the aluminum top truss when installing it onto the BOD2 printer)
Recommended manning	Two people to lift and align the DN50 pulley wheel. For the DN75 pulley wheel, at least three people are required, in line with the maximum weight handling regulations under Directive 2009/104/EC.
Equipment Required	A lifting device (crane or telehandler) to elevate the aluminum top truss. A personal lifting device (scissor lift or boom lift) to install the hose on the pulley.
Prerequisites	Ensure the BOD2 printer is fully assembled, except for the aluminum top truss structure on the Y-axis. Perform a visual inspection of the pulley wheel to check its operational functions.

4.3 Installation

This section provides step-by-step instructions for installing the DN50/DN75 Pulley Wheel onto the aluminum top truss of the BOD2 printer.

4.3.1 Pre-Installation Steps

1. Ensure the BOD2 printer is fully assembled except for the aluminum top truss.
2. Gather all necessary tools and equipment listed in section 4.1.
3. Verify that the pulley wheel spins freely, and the swivel eye bolt rotates properly. Additionally, ensure that no parts are bent from transportation or previous use, and that all bolts are tightened to the specified torque values.

4.3.2 Installation Steps

Step 1: Lift the Top Truss

1. Secure 2x 4m (13 ft) lifting straps, placing each strap as far out on each end of the truss as possible to ensure correct weight distribution.
2. Attach the other ends of the lifting straps to the hook of the crane or telehandler. Ensure that the safety protocols listed for the specific equipment being used are followed, including but not limited to those provided by the manufacturer of the equipment.
3. Use the lifting device to elevate the aluminum top truss, ensuring it accommodates the height of the pulley.

4. Ensure there is enough space underneath for the installation of the pulley wheel. A team of two people will lift and align the pulley with the truss.

Step 2: Install the Pulley Wheel

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1. Align the DN50/DN75 pulley wheel centrally on the aluminum top truss to reduce lateral stress and ensure optimal performance.
2. Secure the pulley wheel to the truss using the alu clamps. The adjustable clamps correspond to the width of the aluminum truss by default.
3. Tighten the wingnuts by hand until secure.

Step 3: Install the Truss with the Attached Pulley

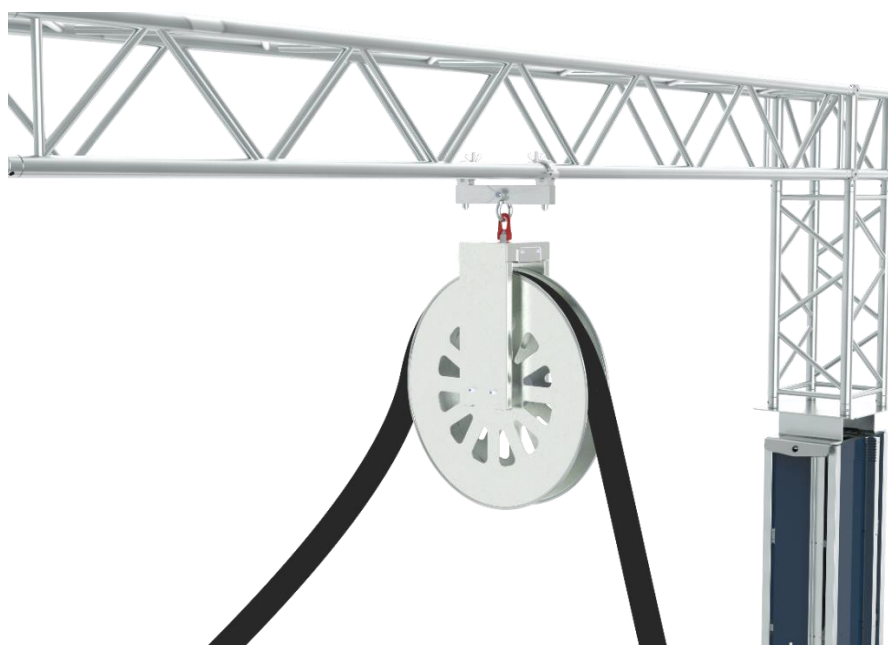
1. Lift and position the truss with the attached pulley onto the BOD2 printer following the standard operational procedure.

Step 4: Install the Hose

1. After installing the aluminum top truss, use a personal lifting device (such as a scissor lift or boom lift) to bring one end of the hose to the appropriate height. Ensure that the safety protocols listed for the specific equipment being used are followed, including but not limited to those provided by the manufacturer of the equipment.
2. Slide the hose onto the DN50/DN75 pulley wheel from the side opposite the printable area (PA), ensuring it is properly seated.
3. Leave sufficient length on the other side of the hose to reach the printhead connection point.
4. Secure the hose to the printhead.

4.3.3 Post-Installation Steps

1. Conduct a final inspection to confirm that the installation meets safety and operational standards in accordance with user instructions, local directives, and, where applicable, Directive 2009/104/EC and other relevant EU regulations. Document all inspections and maintenance activities as required by Directive 2006/42/EC.



**Illustration 2: Visualization of the COBOD DN50/DN75 pulley wheel installed on the aluminum truss of the COBOD BOD2 3D Construction Printer.*

4.4 Cleaning and Maintenance

- Perform a visual inspection to ensure no dirt or material has compromised the pulley's operational use. If compromised, clean the pulley wheel using a high-pressure water system.
- User Instruction Conduct visual inspections before and after each usage to ensure parts are intact. Replace damaged parts immediately.
- After installation, regular inspections and maintenance should be documented, as required by local regulations, and where applicable, EU Directive 2006/42/EC. These inspections should be carried out at least once a year by a qualified person.
- If in good condition, the pulley can be reinstalled or stored.

Following these instructions will ensure the correct installation and optimal performance of the DN50/DN75 Pulley Wheel. Adhering to safety guidelines and performing regular inspections will enhance the longevity and functionality of the pulley system.

For further assistance, contact our support team at techsupport@cobod.com.