PIPE TROLLEY

User Manual

TOPFIBRA

EFFECTIVE FILAMENT WINDING® PIONEERS

PIPE TROLLEY

USER MANUAL

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1. INTRODUCTION

1.1. Purpose of this document

The operating instructions are intended for all users of the Trolley for transporting GRP pipes.

They provide the necessary information for the easy, safe, and smooth operation of the device.

Any person working with the device should read the operating instructions. Instructions for use must always be available to users in the main cabinet.

1.2. General

The Trolley may only be operated and maintained by persons designated by the investor and qualified to work with such a device. In addition to the instructions for use and the accident prevention regulations applicable in this area, it must also comply with the technical rules for the safe and appropriate operation of the device.

The instructions provide basic information to be observed during operation and maintenance.

It is therefore essential that operators, maintenance staff, and anyone else working with the device read them before starting work and that they are always available at the point of use.

In addition to the safety instructions in the "Safety" section, all safety instructions in the field of occupational safety must be observed.

To ensure a trouble-free operation of the system, the following must be met:

- The device must be properly set up and maintained.
- Work and maintenance personnel must be properly selected and trained.
- Operators must be well-informed about the functions, capabilities, and limitations of the equipment.

- Operators must read and follow the instructions for the use and maintenance of the equipment.
- An adequate set of spare parts must be provided.

1.3. Machine Conversion

Modifications, additions, or modifications to the system are not permitted without the consent of the manufacturer. Written permission from the manufacturer is required for all recovery operations. Parts of the system that are not in perfect condition must be replaced immediately!

Use only original spare parts!

1.4. Extinguishing the fire

When extinguishing a fire, be sure to turn off the main switch of the machine, otherwise, the effective extinguishing of electrically conditioned fires is not possible!

Read the instructions carefully before using the device and save them for future reference.

BE SURE TO SWITCH OFF AND LOCK THE MAIN SWITCH BEFORE MAINTENANCE WORK ON THE SYSTEM!

The person in charge of maintenance work is responsible for safety during maintenance work.

The manufacturer is not responsible for irregularities in case of improper use, unqualified and unauthorized persons, various modifications inconsistent with the rules, or the use of no original parts. The operator is responsible for the proper operation and regular inspection of the surroundings of the transport system. Lifting, transport, installation, and maintenance must be carried out by a qualified person.

Inspect the device regularly for damage or malfunctions.

Only an authorized and qualified person may interfere with the main cabinet and other electrical cabinets. Take a good look at the wiring diagrams before the procedure.

Before intervening in any part of the equipment, excluding the possibility of accidental activation. Observe the principles of safe work and safety regulations.

The operator who manages the device is responsible for the operation, safety, and consequences.

Never leave the device unattended when it is switched on.

The Trolley is not intended to be used by persons with a lack of experience and knowledge unless they are supervised or advised by the person responsible for their safety.

When finished, turn off and lock the main switch.

2. DESIGN OF THE TROLLEY

2.1. General

The Trolley for pipe transportation is designed as an auxiliary device in the production of pipes.

It is intended for delivering and moving pipes to a grinding and cutting machine.

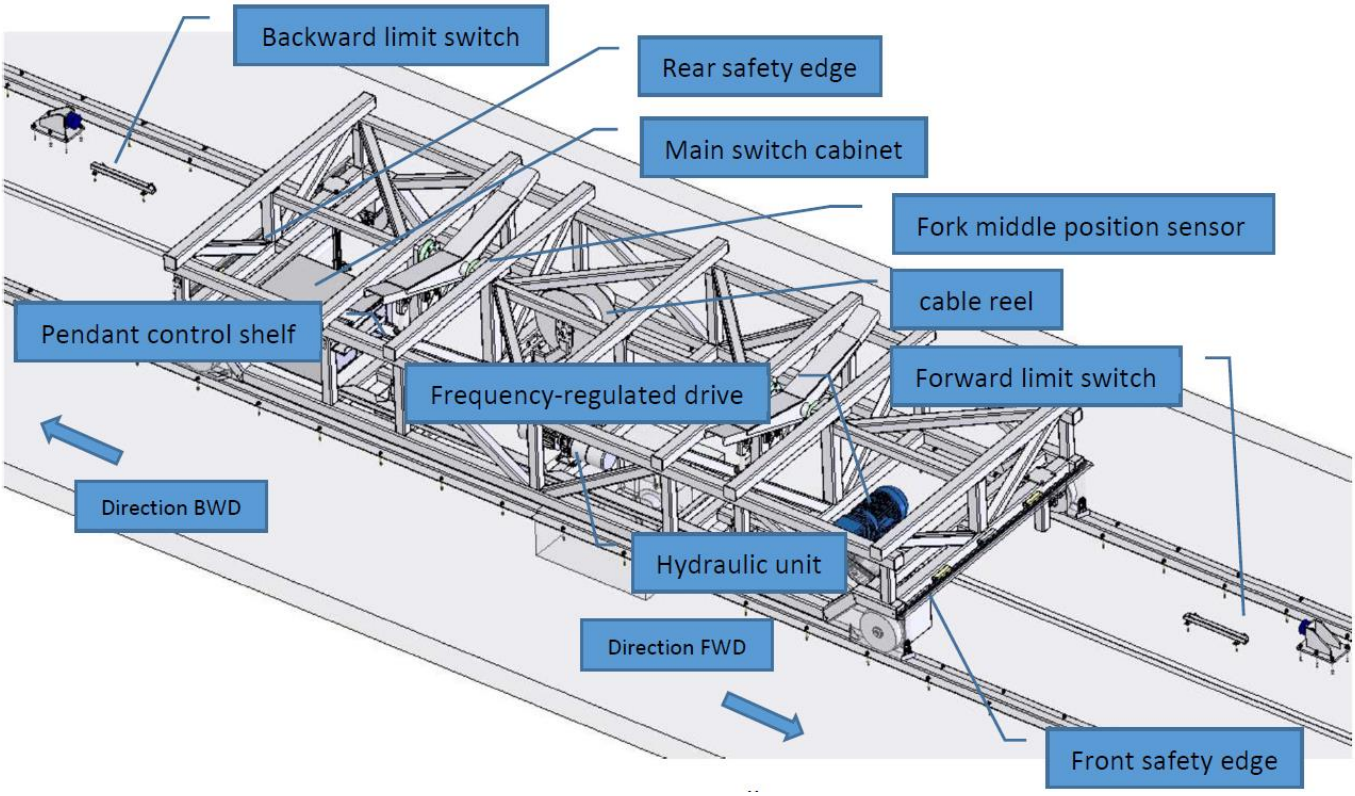


Figure 1: Trolley

The device consists of the following important components:

- Welded and painted steel construction with two moving arms;
- Hydraulic system;
- Electrical system;
- Safety equipment (railings and safety devices).

The trolley is intended for delivering pipes to trolleys 1 to 3 on the Grinding and cutting machine.

Trolley can transport pipes from 3 to 12 meters long and only one pipe can be transported at a time.

Trolley is equipped with hydraulic aggregate and belonging hydraulic equipment. In the horizontal direction, the trolley is driven by a frequency-regulated drive. The trolley is operated manually, with a pendant control station. During pipe transport, the operator walks with the trolley to the desired position for transfer to the Grinding and cutting machine. For safety reasons in the direction of moving trolley is equipped with safety devices that stop the trolley in case of activation.

2.2. Electrical equipment

Electrical equipment consists of various components, ranging from simple keys, signal lamps, and sensors to frequency regulators and safety components. Among them is also a series of devices for the management, control, and protection of the device. Fuses and motor protection switches provide overload control and short-circuit protection for various parts of the device. A rectifier is used to provide a lower voltage constant. The frequency regulators make it possible the two-speed movement of the trolley. For the safety of workers, safety components are installed in appropriate places to shut down the device in the event of an emergency.

2.2.1. Marking of electrical equipment

To facilitate the identification of electrical elements and the diagnosis of operating and alarm conditions, the elements of the device are marked accordingly.

Sensors, circuit breakers, drives, and other electrical equipment are marked according to the page in the project documentation. For example, a safety edge on the front of the device is marked with = 00-S5.1. = 00 means that it is mounted on a trolley outside the electrical cabinet,

S means that it is a sensor, and 5.1 means that it is shown in the wiring diagram on page 5. The same applies to all other sensors, signals, and keys.

3. SAFETY

3.1. General

The operating instructions contain basic information to be observed when operating and maintaining the Trolley. For this reason, it is essential that they are read in full and that they are always available at the place of use.

Regulations and measures to ensure the safety of workers were taken into account when designing the device. In addition to safety devices, hazard-warning labels are also affixed to potentially hazardous locations. The system of safety devices is designed to ensure the safe operation of the device.

Operators and maintainers must be familiar with all elements of device management and control. During operation, the Trolley must be monitored and appropriate action taken concerning the condition of the device and the status of warnings and alarms. Emergency procedures should be performed regularly.

In the event of a warning or alarm, the following must be done:

- Analyse a warning or alarm;
- If necessary, carry out emergency operations (for example shutdown of the drive, …);
- Inform the responsible supervisor and equipment maintainer.

Safety devices installed on the system are intended to protect workers working with or maintaining the system. As a result, they should in no way be removed or disabled. It is also not allowed to remove security labels.

Operators or system maintainers must ensure that safety devices function properly. They must also, ensure that the safety labels are legible.

If the safety element does not work properly, working with the Trolley is not permitted.

Be sure to turn off the main switch before performing maintenance.

When working with electrical assemblies, always obtain the permission of the responsible person. Switch off the power supply before repair or maintenance work. During maintenance work, take care not to damage the wiring.

Do not touch the areas of moving parts as they can cause serious injury or even death. Wear suitable protective equipment when working near moving parts.

After completing maintenance work, always test the device very carefully.

3.1.1. General safety instructions

DANGER!
The operator may only use the machine in accordance with its intended use in a safe and technically perfect condition!

DANGER!
Competent personnel must ensure that unauthorized persons avoid dangerous areas!

DANGER!
The electrical equipment of the machine must be tested regularly. Defective cable insulation, loose connections, and burnt cables must be removed immediately. The main electrical cabinet must always be locked. Only authorized personnel are allowed access.

DANGER!
Work on the electrical system may only be carried out by competent and authorized workers! There is a risk of electric shock, which can range from severe burns to heart failure!

WARNING!
Observe all safety and accident prevention regulations!

WARNING!
When carrying out hazardous work, the main switch must be switched off and secured against being switched on again!

WARNING!
When installing the machine, the relevant safety rules must be observed and accidents must be avoided by prudent handling! This mainly concerns the use of safe means of transport and lifting devices! In addition, all dangerous places created, even if only temporary, must be adequately insured!

3.2. Safety functions

The Trolley for pipe transportation contains the following safety features:

- Emergency stop (function to switch off the device in case of activation of the STOP button);
- Stopping the trolley (function to turn off the trolley's horizontal movement in the event of an interruption of the safety edge while moving the trolley forward or backwards);
- Confirmation of reconnection of safety functions.

If the safety function is activated the failed safety element must be reactivated.

3.2.1. Emergency STOP button

The emergency stop button is located on the main electrical cabinets and control boxes.

Activating the key stops the movement of the device.

Figure 2

Procedure for reactivating the security module:

- Ensure safe operation of the device;
- Turn the activated key clockwise to return to the working position;

- Switch on the safety circuit with the »POWER ON/RESET« button on the pendant control station.

3.2.2. Safety edge

The safety edges are located on the front and back of the Trolley. They prevent the trolley from moving in the event of accidental interference with the trolley movement area. Activation of the safety edge causes the device safety circuit to fail in the direction of the broken edge.

Figure 3

Procedure for reactivating the security module:

- Check and remove the cause of the safety edge activation;
- Ensure safe operation of the device;
- Reset the alarm;
- Move the trolley in the opposite direction.

3.2.3. Limit switch for exceeded position

The limit switch for detecting an exceeded position of the horizontal movement is intended to stop the Trolley in the horizontal direction. In case of activation of the limit switch, it is possible to move the trolley in the opposite direction.

Figure 4

4. OPERATING MODES

4.1. General

The Trolley for pipe transportation can operate only in manual mode. In this case, the individual functions of the device are performed by pressing the appropriate buttons on the pendant control station.

4.2. Manual mode

In manual mode, the movement of the trolley is switched on and off using the buttons on the pendant control station. The movement lasts as long as the button is pressed (and the safety conditions are met).

5. CONTROL AND SIGNAL ELEMENTS

5.1. Main electrical enclosure = GS1

The main switch allows safe operating and maintenance conditions of the Trolley. There is an urgent need to use all the safety and lockout procedures. The main switch can be locked with a padlock. After installing the padlock, it shall be marked that the maintenance work is in progress.

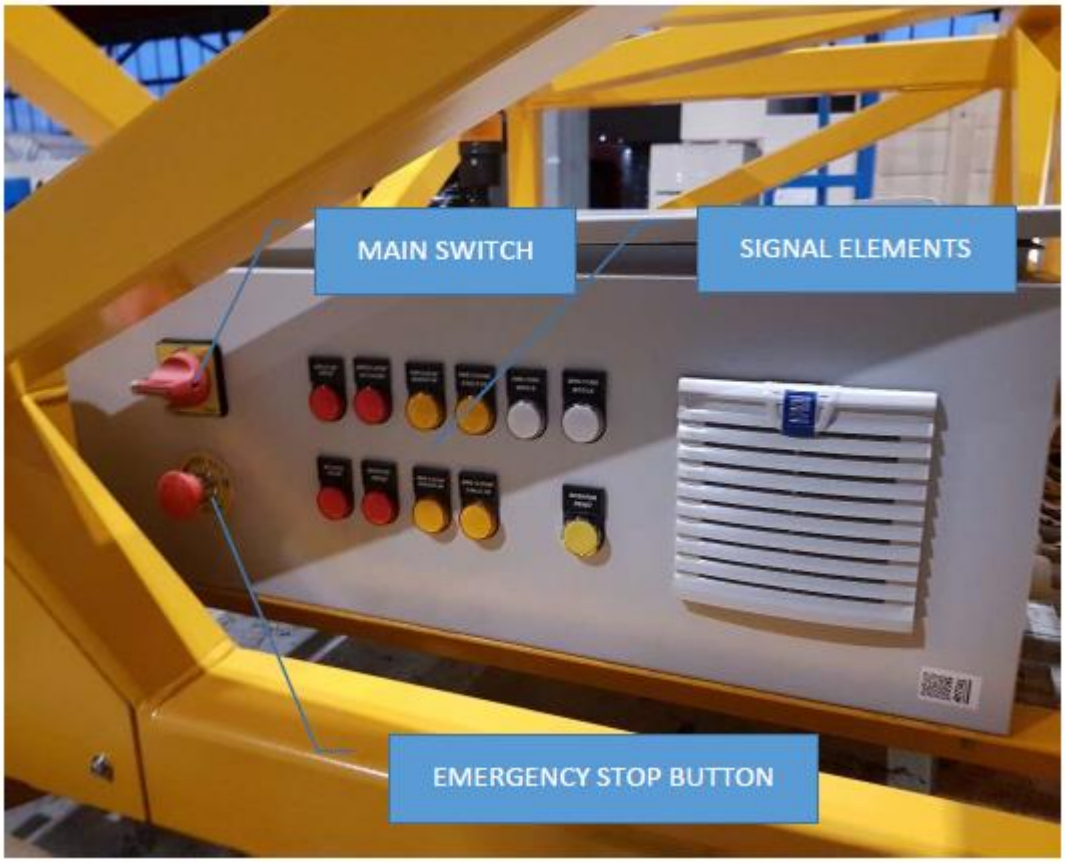


Figure 5

Description of control and signal elements on the main control cabinet:

BUTTON	FUNCTION	DESCRIPTION
 	SWITCH DISCONNECTOR	Trolley main power on switch.
	EMERGENCY STOP PUSH BUTTON	Switch off the main safety circuit in case of an emergency.
	PUSH-BUTTON	Reset the frequency inverter of the motor for
	SIGNAL LIGHT	Trolley circuit breaker tripping. Signal states of the LED: **ON** - Circuit breaker tripped **OFF** - Circuit breaker OK

BUTTON	FUNCTION	DESCRIPTION
	SIGNAL LIGHT	Activated STOP button on GS1 or pendant control station. Signal states of the LED: **ON** – At least one of the stop keys is activated **OFF** – No emergency stop button is activated
	SIGNAL LIGHT	Motor circuit breaker failure. Signal states of the LED: **ON** – At least one of the motor protection switches is activated **OFF** – No motor protection switch is activated
	SIGNAL LIGHT	The frequency inverter of the motor for the horizontal movement of the trolleys in fault. Signal states of the LED: **ON** – Inverter is at fault. **OFF** – Inverter is OK
	SIGNAL LIGHT	Trolley front safety edge sensor. Signal states of the LED: **ON** – Supply voltage is on; Sensor not actuated; No reset signal; Control unit ready **OFF** – Supply voltage off; Sensor actuated or faulty

BUTTON	FUNCTION	DESCRIPTION
	SIGNAL LIGHT	Trolley front safety edge cable break. Signal states of the LED: **ON** – Supply voltage is on; Sensor not actuated; No reset signal; Control unit ready **OFF** – Supply voltage off; Cable break
	SIGNAL LIGHT	Trolley front safety edge sensor. Signal states of the LED: **ON** – Supply voltage is on; Sensor not actuated; No reset signal; Control unit ready **OFF** – Supply voltage off; Sensor actuated or faulty
	SIGNAL LIGHT	Trolley back safety edge cable break. Signal states of the LED: **ON** – Supply voltage is on; Sensor not actuated; No reset signal; Control unit ready **OFF** – Supply voltage off; Cable break

BUTTON	FUNCTION	DESCRIPTION
	SIGNAL LIGHT	Front moving arms middle position. Signal states of the LED: **ON** – Moving arms are in the middle position. The sensor is activated. Arm movement is possible only by pressing the second level button on the pendant control. **OFF** - Moving arms are not in the middle position.
	SIGNAL LIGHT	Front moving arms middle position. Signal states of the LED: **ON** – Moving arms are in the middle position. The sensor is activated. Arm movement is possible only by pressing the second level button on the pendant control. **OFF** - Moving arms are not in the middle position.

5.2. Pendant control station

The pendant control station is a remote hand-held push button command box, used to control

Trolley. It is housed in a special weatherproof enclosure that attaches to and hangs from the electrical cable that the control signals flow back and forth to the main electrical cabinet. A special shelf above the main electrical cabinet is prepared for storing the control station.

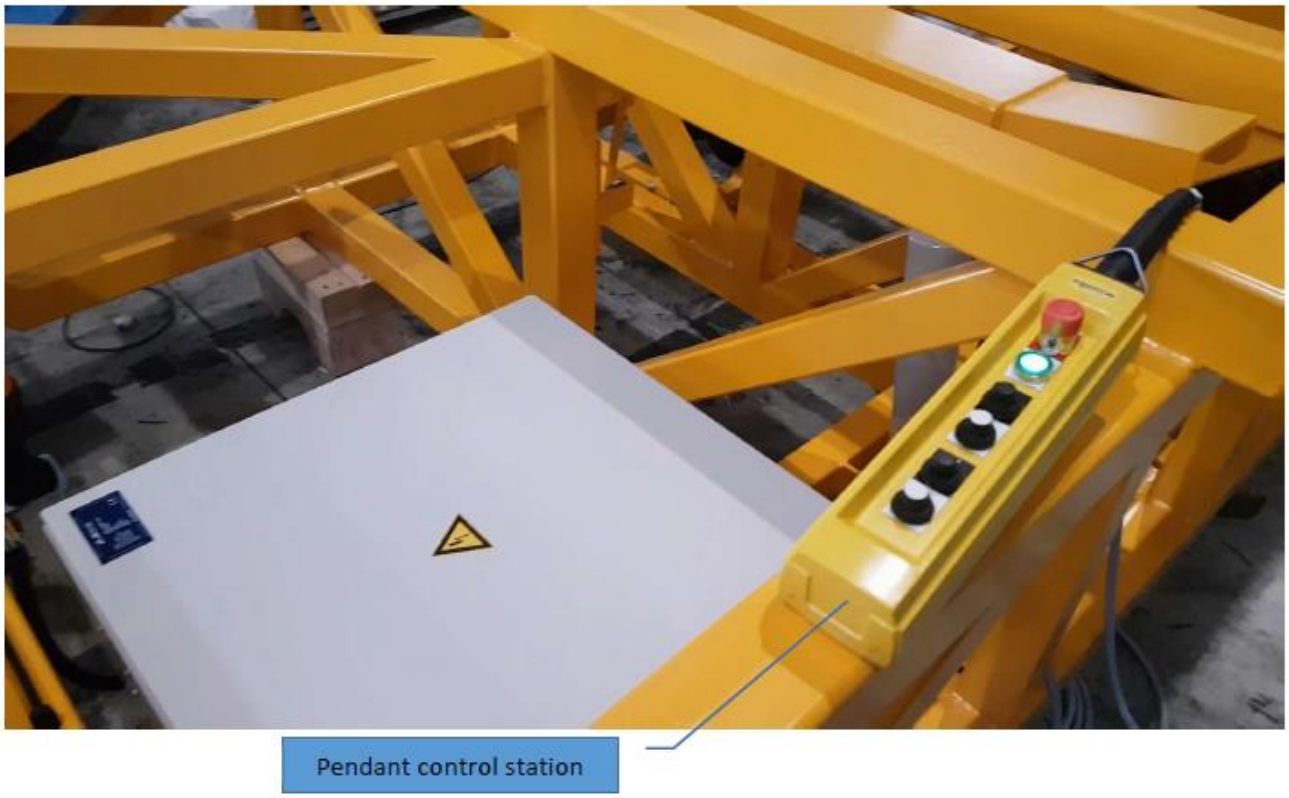
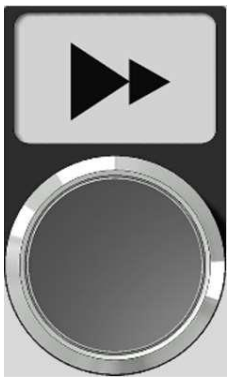


Figure 6

Description of control and signal elements on the control boxes:

BUTTON	FUNCTION	DESCRIPTION
	ILLUMINATED PUSH BUTTON	POWER ON / RESET BUTTON Signal states of the LED: **OFF–activated** safety element (power condition not met) **ON** – the safety circuit is switched on (power supply is ON)
	EMERGENCY STOP PUSH BUTTON	Switch off the main safety circuit in case of an emergency.

BUTTON	FUNCTION	DESCRIPTION
	TWO-STEP PUSH-BUTTON	Move the trolley in the forward direction. **First step**: low speed **Second step**: high speed Note: the movement lasts as long as the key is held
	TWO-STEP PUSH-BUTTON	Move the trolley in the backward direction. **First step**: low speed **Second step:** high speed Note: the movement lasts as long as the key is held
	TWO-STEP PUSH-BUTTON	Rotation of the movable arms to the left (in the direction of moving the trolley forward). **First step**: only up to the fork middle point **Second step:** through the fork middle point Note: the movement lasts as long as the key is held

BUTTON	FUNCTION	DESCRIPTION
	TWO-STEP PUSH-BUTTON	Rotation of the movable arms to the right (in the direction of moving the trolley forward). **First step**: only up to the fork middle point **Second step:** through the fork middle point Note: the movement lasts as long as the key is held

5.3. Light and sound signalling

The tower light and sound is intended as a warning to the personnel nearby that the trolley is moving. It is located near the main electrical cabinet on the rear of the trolley.

Figure 7

6. WORKING WITH THE TROLLEY

The Trolley for pipe transportation may only be operated by professionally trained operators who, in addition to the operation of the system itself, must also be familiar with the regulations on occupational safety and fire protection.

6.1. Preparation before use

- Check the condition of the device and correct any possible irregularities.
- Check the condition of the STOP keys and deactivate them in case of activation, after previously repairing the causes and consequences of the error.
- Check the condition of safety edges.
- Check the condition of the hydraulic system.
- Check that there are no obstacles on the rails.
- Check that moving the trolley is possible and safe.
- Check, that loading and unloading pipes on the trolley is possible and safe.

6.2. Startup procedure

- Turn on the main switch on the main electrical cabinet.
- Check the status of alarms and warnings and eliminate them (with the previous remediation of the causes of the alarm).
- Establish conditions for safe work with the device.
- Press the "POWER ON / RESET" illuminated push button on the pendant control station to switch on the safety circuits.

6.3. Working with the device

After the start-up procedure, the Trolley is ready for operation. The work takes place in several stages:

- loading the pipe on the trolley,
- transporting the pipe to Grinding and cutting machinery and
- unloading the pipe on trolleys 1 to 3.

When the grinding and cutting of the pipe are completed, the process is carried out in reverse order.

6.3.1. Pipe loading and unloading

The loading and unloading of pipes are managed via the pendant control. Use the horizontal movement buttons to position the trolley so that the pipe can be loaded or unloaded. Check that the movable arms can be lowered into their final positions. By pressing the arm rotation button to the left or right, move the arms to the appropriate position for loading or unloading the pipe.

When loading or unloading the pipes, keep a sufficient distance from moving elements to avoid injury.

When moving the movable arms on the first step of the button, the arms stop in the middle position. This prevents the pipe from rolling forward too much on its own. Further rotation of the arms is possible by fully pressing the two-step button for arms rotation (second step of the button).

6.3.2. Pipe transport

When the pipe is loaded on the trolley, it is ready for transport to the desired location. The trolley is moved in the selected direction via the two-step buttons on the pendant control station. The operator constantly walks next to the trolley and visually monitors the movement and takes appropriate action in case of danger.

During pipe transport, the movable arms must be in the middle position.

6.4. Shutdown procedure

At the end of the work, the Trolley shall be switched off in the following order:

- Make sure the device is empty or in the home state.
- Make sure the drives are at a standstill.
- Switch off the control voltage by pressing the "EMERGENCY STOP" button
- Turn off the main switch on the main electrical cabinet.
- Lock the main switch in the off position.

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