Valid from 19.04.2022 | Rev. 1.0
From Serial No. 9328.5108

DuctRod RAPID

For rod pushing

Operating Manual

Responsible manufacturer: Fremco A/S

Machine: DuctRod RAPID

This is the original operating manual for DuctRod RAPID from Fremco.

FREMCO A/S
ELLEHAMMERVEJ 14 | DK9900 FREDERIKSHAVN, DENMARK | VAT NO.: DK30815416
TELEPHONE +45 7230 1213 | SALES@FREMCO.DK | WWW.FREMCO.DK

TABLE OF CONTENTS

BEST EXTENDED WARRANTY IN THE BUSINESS

The most expensive machine is the one *not* in use.

We offer a unique service agreement with up to 60 months warranty on all our fiber blowing machines*, securing quality service of your machine from day one.

When you purchase your Fremco fiber blowing machine, you automatically get 12 months factory warranty. Within the month of your purchase, you can purchase a service agreement with extended warranty from our webpage and obtain the best cost-beneficial warranty in the business.

To maintain your warranty and the benefits of the service agreement, you must meet the given annual service and maintenance requirements for each machine as described in the operating manual.

Learn more at www.fremco.dk/products/service-agreement/ and
get the best warranty and service agreement in the business today!

**The service agreement with extended warranty is only available for purchase in EU countries or countries with an official Fremco Service Center.*

1. INTRODUCTION

Original instructions

These instructions are Fremco A/S original instructions for the DuctRod RAPID (hereafter called the machine).

Purpose

The purpose of these instructions is to ensure correct installation, use, handling and maintenance of the machine.

Accessibility

The instructions are to be kept in a location known to the staff and must be easily accessible for the operators and maintenance personnel.

Knowledge

It is the duty of the employer (the owner of the machine) to ensure that everybody operating, servicing, maintaining or repairing the machine reads and understands the instructions. As a minimum, they should read the part(s) relevant to their work.

In addition to this, everybody operating, servicing, maintaining or repairing the machine is obliged to seek out information in the operating manual when needed.

2. GENERAL

2.1. MANUFACTURER

The machine is manufactured by

Company name:	Fremco A/S
Company address:	Ellehammervej 14
	DK-9900 Frederikshavn

2.2. THE MACHINE'S DESIGNATION

The machine's complete designation is DuctRod RAPID.

2.3. MACHINE PLATE

The machine plate is situated on the front of the machine:

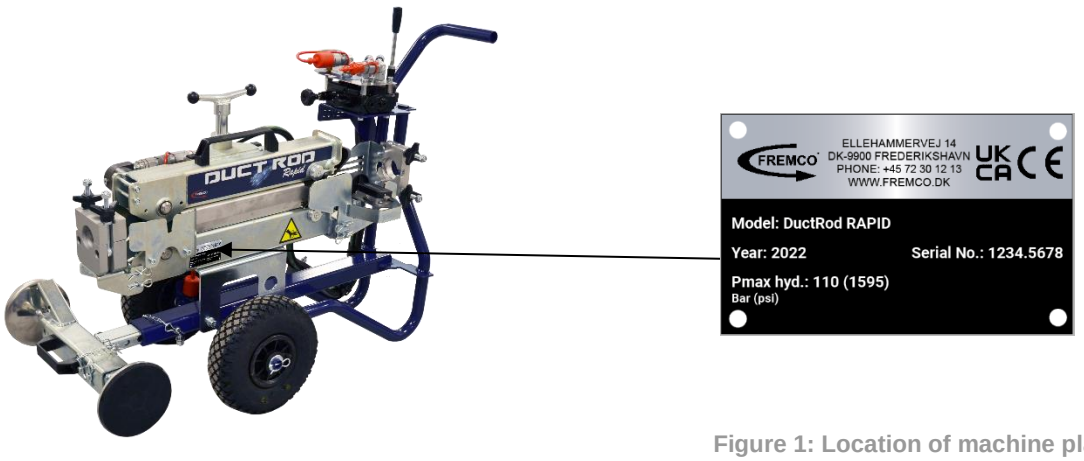
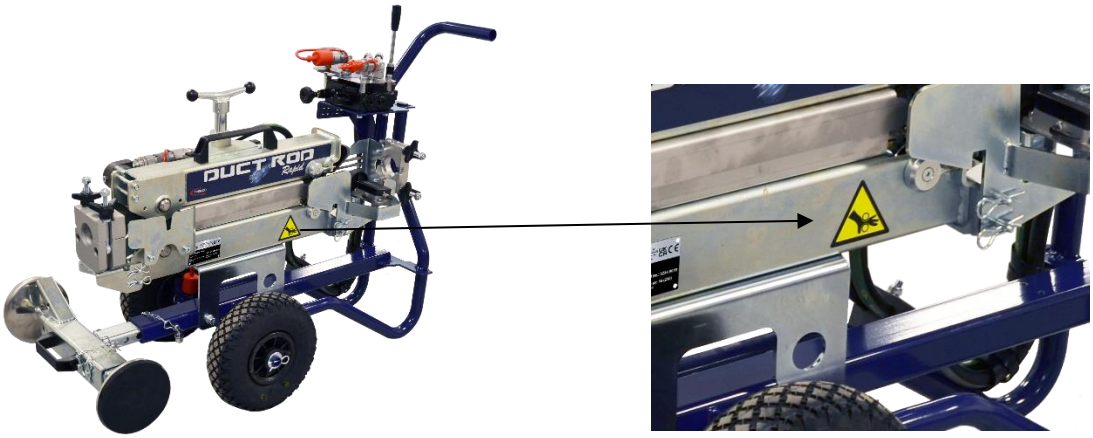


Figure 1: Location of machine plate

2.4. MACHINE MARKINGS

The machine is equipped with the following safety markings:

- Hand crush hazard symbol



3. TECHNICAL SPECIFICATIONS

3.1. DUCTROD RAPID

Manufacturer

Fremco A/S
Ellehammervej 14
9900 Frederikshavn
Denmark

Item No. 101-220106001

Rod diameter ..... 9-25 mm

Duct diameter[1] ..... 10-40 mm

Pushing distance ..... Up to 500 m (1640 ft)

Operating speed[2] ..... Up to 80 m/min. (262 ft)

Pushing force ..... 0-200 kg (0-440.9 lbs)

Max. hydraulic pressure ..... 110 bar (1595 psi)

Weight ..... 68 kg

Length ..... 1050 mm

Width ..... 475 mm

Height ..... 790 mm

[1] *for both Rod Guide Connection and Duct Clamp at insert*
[2] *Recommended running speed max 40m/min*

HYDRAULICS

Oil consumption: 17L oil per minute at max. 110 bar

Filtrated to below 25 µm

NOISE

Airborne noise emitted by the machine:

Measured sound pressure level: 85 dB(A)

Observe Airborne Noise emitted by the connected hydraulic power pack.

4. SAFETY AND RESIDUAL RISKS

This information is relevant for both operators and maintenance personnel.

4.1. BUILT-IN SAFETY MEASURES

The machine has been fitted with fixed guards for the safety of personnel/operators. Furthermore, the machine has been fitted with a hold to run hydraulic control, ensuring continuous operator input for machine to operate.

4.1.1. SAFETY FUNCTIONS

Safety Function 1	
Safety function	**Description**
Hold-to-run system for forward and backward operation of the chain drive.	The operation of the machine is implemented as a hold-to-run system. This means that the operator must perform a continuous actuation on the joystick on the hydraulic control unit for the machine to produce movement. If the actuation ceases, the joystick will return to neutral, and all machine movement stops immediately.
Fixed guard	Fixed guards are mounted to prevent operators from getting in direct contact with moving parts. Operators may never enter pointy objects into openings on the machine.

These safety features must always be active and must not be overridden and guard may not be removed.

Shut-off valve:

The machine is equipped with a quick coupling to enable the quick release of the hydraulic system.

Test intervals:

Service and control intervals listed in 8.5 must be observed.

4.2. WARNING - FORESEEABLE MISUSE

Before using the machine, operators must ensure that:

- The guarding is intact and mounted correctly
- The operator can monitor all machine movements
- The hydraulic hoses are undamaged
- There is no damage to any pressure carrying component
- The machine is mounted/placed in a stable and secure manner regarding its foundation and general surroundings
- The required energy supply is available
- All safety functions are active and functional
- Running speed is not exceeding the safely roll-off speed of the Rod holder. Recommended maximum speed 40 m/min.

The operator must NOT under any circumstances:

- Reach into/touch or insert objects into the chain drive while the machine is in operation
- Touch moving parts etc. Rod, Rod drum stand, cable, or wire reels
- Exceed the maximum supply pressure of hydraulic control unit.

Machine surfaces must be kept clear of clutter and must not be used as work surfaces.

4.3. SAFETY MEASURES, TO BE TAKEN BY THE USER

4.3.1. CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

During daily use:

The designated PPE must always be used in accordance with Fremco A/S guidelines and safety data sheets and according to the applicable national regulations.

- PPE, in the form of protective glasses and protective shoes must be used during daily operation of the machine.


Do NOT wear any loose clothing, jewellery, scarves, etc. while operating the machine.

During maintenance and repair:

Appropriate PPE must be used for repair and maintenance work. The area around the machine must be cleaned of spills and other items.

The manufacturer's instructions must be followed when replacing a machine component.

- PPE in the form of work gloves, protective shoes and head protection must be worn when transporting parts.
- Approved lifting equipment in the form of a crane and hoist must be used when handling heavy parts.




4.3.2. HANDLING OF DANGEROUS SUBSTANCES AND MATERIALS

Chemicals and hydraulic fluids:

PPE must be used in accordance with the individual product's safety data sheets when:

- Handling/using hydraulic fluids
- Installing of liquid-filled components
- Maintaining liquid-filled components
- Handling hoses/couplings containing liquid, etc.

Disposal of products and other waste must be done in accordance with the guidelines for the materials in question.

4.3.3. RESIDUAL RISKS

Consider the following residual risks during maintenance and repair:

- Accumulated energy in hydraulics
- Contact with hydraulic oil and/or lubricants

Before service and repair or maintenance, ensure the following:

- The machine has been disconnected from its energy supply
- Accumulated energy has been relieved
- The proper PPE is being used.

4.3.4. WORK PROCEDURES

Before operating the machine, the following must be ensured:

- The site of operation suitable or has been made safe for operation
- The area adjacent to the machine is kept clean and free from objects that may cause the operator to slip and fall or getting caught in the machine's cables
- The area adjacent to the machine is kept free from unnecessary personnel
- There is adequate lighting to safely operate the machine
- The protective glasses and gloves are worn when connecting and disconnecting hydraulic components
- Protective glasses and protective gloves are worn when servicing hydraulic components.
- All machine components and energy supplies have been correctly installed.

Start up and operation to be performed under the following conditions:

- Operations are initiated and monitored by trained personnel.
- Operation can be ceased from one side of the machine.
- Operational speed is kept at a safe level, recommended maximum speed is 40 m/min

4.3.5. IN CASE OF EMERGENCY

In case of emergency, follow these three steps:

1. Turn off the machine
2. Disconnect all power sources (power pack)
3. Call for help

4.3.6. VIOLATION OF SAFETY REGULATIONS

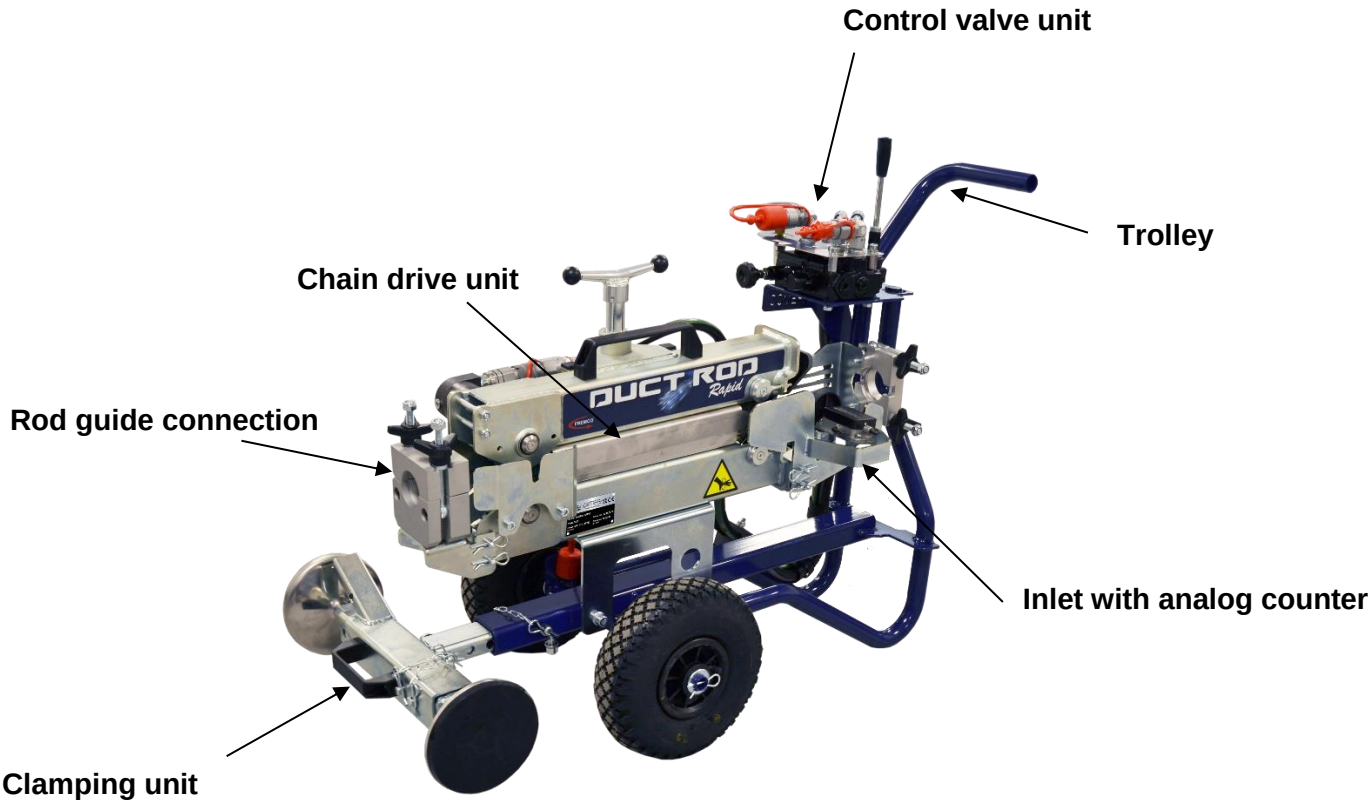
Any violation of the safety regulations can result in serious personal injury and possible machine damage.

5. OVERVIEW AND APPLICATION

5.1. GENERAL DESCRIPTION

The machine consists of:

- Hydraulic control valve unit
- DuctRod RAPID unit:
  - Inlet with analog counter
  - Chain drive unit
  - Rod guide connection block
  - Clamping unit
- Trolley



5.2. THE MACHINE'S PURPOSE AND INTENDED USE

The machine is constructed for rod pushing and pulling.

Rods are only to be pushed in subterrain ducts. The DuctRod RAPID may be used to pull rods with attached roping, micro ducts, and optical fiber cables.

The DuctRod RAPID is intended for use with glass fiber rods.
Only instructed operators may operate the machine. Similarly, only qualified personnel may perform service, maintenance and repairs on the machine.

The machine is suited for use in an outdoor environment.

Only suitable hydraulic equipment which adhere to national safety requirements may be connected to the machine.

The machine is not to be used for any other purpose than those provided above

5.3. OPERATING POSITIONS, LOCATION AND ARRANGEMENT

The operator's workstation is located at the rear left of the machine, next to the control unit.
It is important that operator has overview over the entire machine and the work area.

<u>During maintenance and repair:</u>

- The area adjacent to the machine should also be considered as the workstation.

<u>Space requirements:</u>

There must be sufficient space in the workplace for the operator to operate the machine unrestrictedly and comfortably.

It is recommended to maintain a space of at least 700 mm between barriers (walls, building parts. Etc.) and controls.
Guard rails limiting public access must be placed to prevent all public access to the work area.

<u>Operation and storage limits:</u>

Ambient temperatures	-5 °C to 40 °C
Relative humidity (non-condensing)	Min. 10 % RH Max. 80 % RH

Service life expectancy

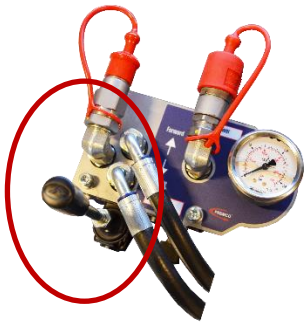
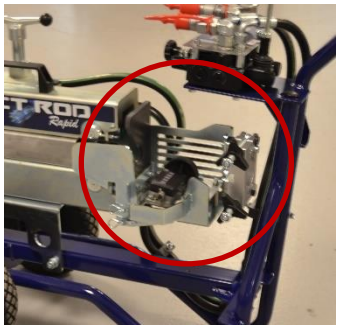
The machine has a minimum service life expectancy of 20 years.

Maintenance and replacement of machine parts and safety-related components must be carried out on a routine basis.

This must be done in accordance with the operating instructions of the individual components.

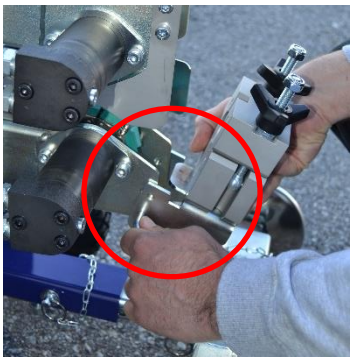
5.4. USER INTERFACE

Below, you will find all operating handles and a short description of their use:

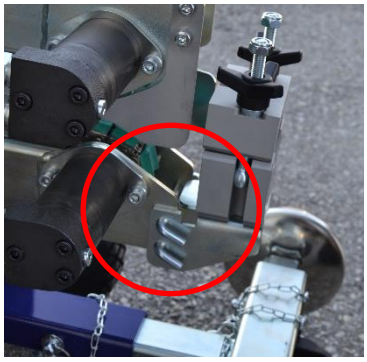
	**Handle for control valve** • Provides manometer readout of max. hydraulic oil pressure (110 BAR/1595 PSI) • Enables speed and torque adjustment • Handle moves forward/backwards • Attach the end of the hose with the yellow markers to the hydraulic unit.
	**Handle for spindle** • Rotate clockwise to move top chain down towards bottom chain. • Rotate anticlockwise to move top chain up and away from bottom chain.
	**Digital distance and speed counter** • Readout 1 shows the total length of fiber passing the counter. • The counter is bidirectional and will count both forward and backwards movement.

5.5. MACHINE ASSEMBLY AND ADJUSTMENT

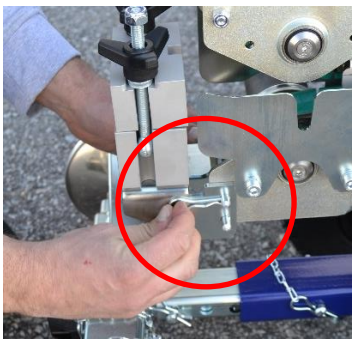
1.



2.



3.



4.

Mounting the rod connection

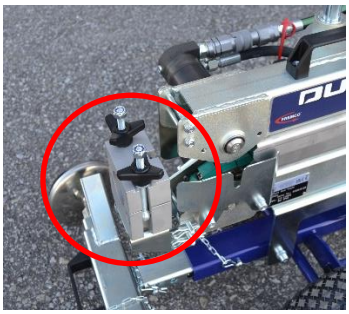
To mount the rod connection, you take the 2 locking pins and slide them into place, attaching the rod connection to the machine.

Afterwards you take the 2 spring splits and secure the locking pins.

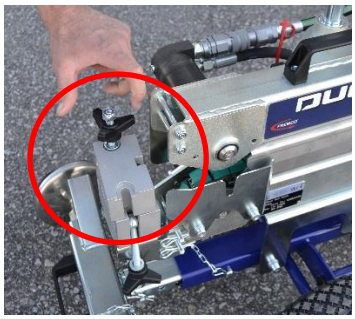
Now the rod connection is attached.

To dismount the rod connection, repeat the process backwards.

1.



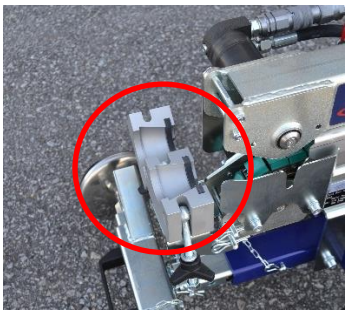
2.



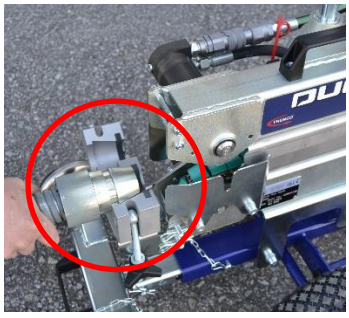
Opening and closing the rod connection

To open the rod connection, unscrew the two hand knobs (Picture 1). The two hand knobs can now be removed (Picture 2).

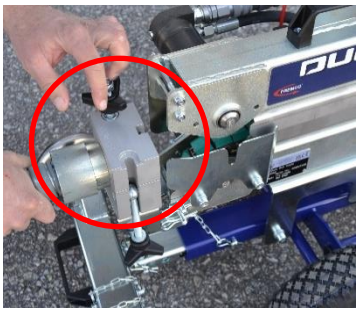
3.



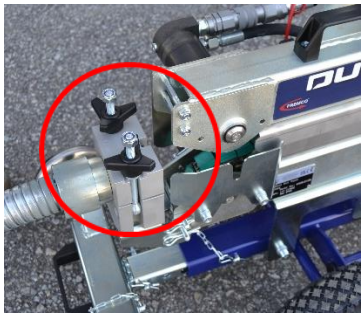
4.



5.



6.



Pull the top half of the rod connection upwards and away from the operational side to open completely (Picture 3).

Now add the rod you use and close the rod connection by repeating the above process backwards.

2.

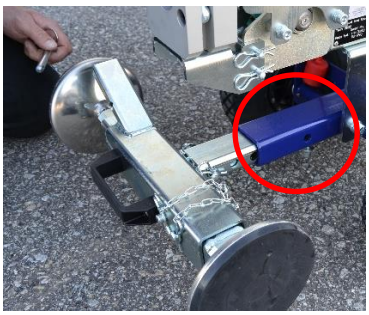
Mounting clamping unit

To mount the clamping unit insert the unit to the trolley (Picture 2).

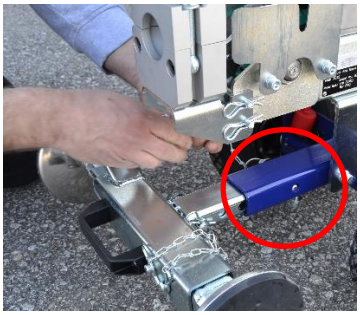
Slide it in until the hole is visible and you can push the locking split through (Picture 3).

Push the locking split with chain attached through the hole (Picture 4).

3.



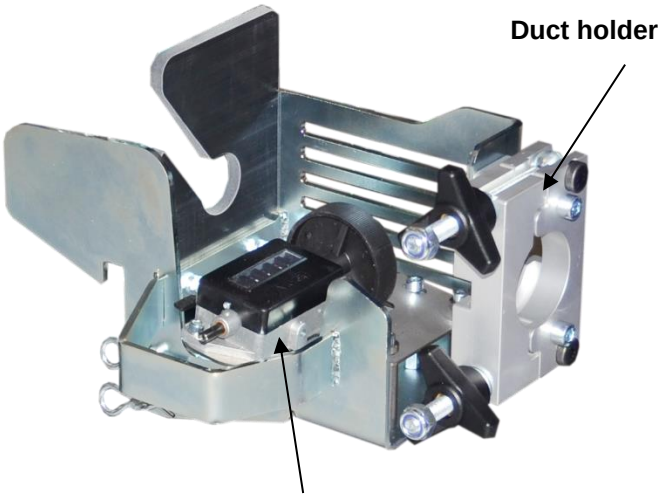
4.



5.

When attaching the locking split with the chain attached, make sure that the chains are placed on top of the clamping unit to avoid the chains getting stuck on things on the ground (Picture 5).

1. Inlet for rod



Parts in the inlet

The analog counter is pre-mounted on the inlet.

The machine comes with 25 mm duct holder inserts but it is also possible to purchase other sizes.

6. TRAINING

6.1. OPERATORS

The machine may only be operated by qualified operators. Operators must be familiar with the machine's function and safety conditions.

Operators must read and understand the operating manual, workplace instructions, etc., and understand of machine's function and safety measures. They must also be able to perform general adjustments etc., and be trained/instructed in the machine's use, handling etc. through reviewing the operating manual, operating instructions and workplace instructions.

Operators must be familiar with the location of secure access ways.

6.2. MAINTENANCE PERSONNEL

Service, repairs and maintenance may only be carried out by qualified maintenance personnel.

Maintenance personnel must understand the machine's function and safety measures and be familiar with the location of secure access ways and emergency stops.

Maintenance personnel must have read and understood the operating manual, workplace instructions etc.

Before commencing service or maintenance, maintenance personnel must be instructed in the machine's safety.

New maintenance personnel must be trained by an experienced colleague.

7. OPERATION

The information in this section is relevant for operators.

7.1. TRANSPORTING THE MACHINE

When transporting the machine, it is important you make sure that the machine is secure and stable throughout the entire journey. When the machine arrives at the working site, it must be carried by two people, or it must be transported in accordance with national requirements and regulations. Before initiating the work, it is important that the operator fixes the machine to a manhole or other permanent structure.

7.2. START/STOP

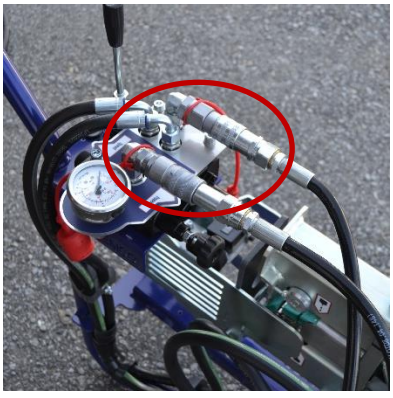
Before initiating operation, the operator must ensure full visibility over the machine and that no unnecessary personnel are in the immediate vicinity. This also means that the area must be adequately lit.

In addition, the operator must ensure that the controls and connectors are clearly and unambiguously marked to prevent faulty operation.

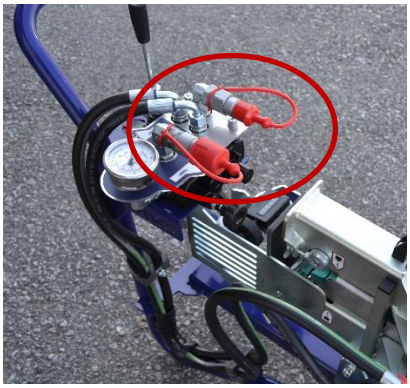
When near machine, operators must be extra aware of the machine's movement.

When used in public areas, public access must be restricted.

7.3. ENERGY SUPPLY CONNECTION/DISCONNECTION

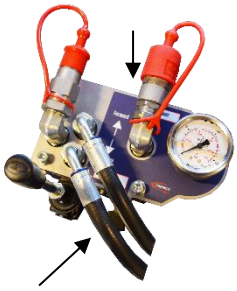


HYDRAULICS CONNECTED



HYDRAULICS DISCONNECTED

When looking at the control valve it is marked on the sticker how to make the fiber/cable go forward and reverse.



Use the hand knobs to adjust the maximum speed. Turning the hand knob clockwise decreases speed and torque. Turning the knobs counterclockwise increases the maximum speed and torque.

7.4. FEEDING/REMOVING PRODUCTS

The operator manually feeds the machine with a rod, by placing it in the machine after opening the inlet guide, chain drive and rod guide connection. Make sure that the tip of the rod is placed inside the rod guide before operation.

After rod pushing and pulling has been completed, the rod is manually removed from the machine.

In case of a stuck rod, which is non-retrievable, the rod can be removed from the machine without the need to cut or unwind the rod.

Simply open the duct holder, open the chain drive and open the rod guide connection and remove the rod.

8. MAINTENANCE, TROUBLESHOOTING AND REPAIR

The information in this section is relevant for maintenance personnel.

8.1. QUICK GUIDE TO MAINTENANCE, TROUBLESHOOTING AND REPAIR

Before repair, maintenance, etc. commences, disconnect (lock) and depressurize energy source.

- Disconnect and depressurize pneumatics and hydraulics
- Do not reconnect the supply until the maintenance work is complete
  This prevents accidental start-up of the machine
- Always use suitable PPE when performing repair or maintenance work
- If additional light is needed, maintenance personnel must obtain this before starting work
- Personnel must exercise extra caution when the machine is in operation if they have disassembled the machine or are handling spare parts or tools
- Following completion of maintenance or repair, the operator must check if the machine is operational.

8.2. PREPARATION FOR MAINTENANCE AND REPAIR

8.2.1. CLEANING

Maintenance personnel must be aware of the location of potential hidden hazards before the work commences.

During cleaning, the machine must be switched off (disconnected from energy supply), and PPE must be used in accordance with the data sheets for the product in question.

Operators must keep the area adjacent to the machine clear of people and objects that may cause operators to slip and fall or to get tangled and caught in the machine.

8.2.2. CORRECTIVE MAINTENANCE

If the machine produces noise, unusual vibrations etc., locate the fault and rectify it. If this is not possible, contact maintenance personnel.

Parts and components should only be replaced with original Fremco parts and be installed by trained personell.

All written information and warnings must be formulated in the official community language.

In the case of unreadable or indistinct information and warnings, these must be immediately replaced by new ones.

8.2.3. REPAIR

Maintenance personnel must be informed of the location of potential hidden hazards before the work commences.

Before commencing any repair or maintenance work the machine must be disconnected and vented from pneumatics and hydraulics.

This is to prevent unintentional start-up of the machine. Machine personnel must never operate the machine if they have disassembled the machine or are handling spare parts or tools.

8.3. SERVICE AND REPAIR ADDRESS

In case of defects or need for repairs covered by warranty, please contact either the designated reseller in your country or Fremco for help.

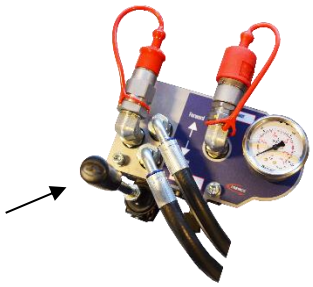
Company name: Fremco A/S

Address: Ellehammervej 14,
DK-9900 Frederikshavn
Telephone: +45 72 30 12 13

8.4. DISCONNECTION AND DEPRESSURIZATION OF ENERGY SOURCES

Before disconnecting energy sources, the systems should be depressurized

- Stop the hydraulic Power Pack
- Depressurize the hydraulic system by moving the hydraulic control unit joystick forwards and backwards twice (this may cause the machine's chains to move a little)
- Verify that there is no residual pressure in the system. This is verified by reading the manometer on the hydraulic control unit on the DuctRod RAPID. If manometer is present on the hydraulic power pack, also verify that there is no residual pressure in the hydraulic power pack.

Joystick	**Power connections** Hydraulic coupling
	

8.5. MAINTENANCE SCHEDULE

Below, you will find the daily, weekly, monthly and annual inspection and maintenance schedule. If wear and tear parts are defective or worn to an extent that is unacceptable, these parts should be replaced/fixed before continued use.

Daily inspection and maintenance		
Daily inspection and maintenance must be performed by a trained operator, before startup and with energy sources disconnected (quick couplings)		
#	**Task**	**Instructions**
1	Check that pressure bearing hydraulic parts are undamaged	Visual inspection
4	Check that mechanical parts, including guards, are undamaged and correctly mounted	Visual inspection
5	Check that warning signs are intact	Visual inspection
6	Check that chains are intact and undamaged	Visual inspection
7	Perform daily cleaning tasks	Brush with a stiff brush (not a steel brush) and wipe with a slightly damp cloth, possibly using a mild detergent
PPE for inspection and maintenance		
*	Gloves for protection against hydraulic fluids and lubricating oil	
*	Protective glasses	
*	Protective shoes	

Weekly inspection and maintenance		
Weekly inspection and maintenance must be performed by a trained operator before startup and with energy sources disconnected (quick couplings)		
#	**Task**	**Instructions**
1	Ensure the chains and chain support rails are sufficiently lubricated	See description: 8.5.3. *Lubrication of chains and chain support rail.*
PPE for inspection and maintenance		
*	Gloves for protection against hydraulic fluids and lubricating oil	
*	Protective glasses	
*	Protective shoes	

Monthly inspection and maintenance		
Monthly inspection and maintenance must be performed by a trained operator before startup and with energy sources disconnected (quick couplings)		
#	**Task**	**Instructions**
1	Ensure the spindle and 2 pcs. of nipples are sufficiently lubricated	See description: 8.5.6 *Spindle lubrication*
2	Check the chain support rails	See description: 8.5.2 *Chain support rail*
3	Check the chains and sprockets	See description: 8.5.5. *Chains and sprocket wear*
4	Check the rod connection system.	Inspect for visible signs of wear. Replace any parts in case of excessive wear
5	Monthly cleaning	Brush with a stiff brush (not a steel brush) and wipe with a slightly damp cloth, possibly using a mild detergent. Wipe the chain support rail, chains, and sprockets clean of lubricant residues, using a suitable cleaning agent (with the chains removed)
PPE for inspection and maintenance		
*	Gloves for protection against hydraulic fluids and lubricating oil	
*	Protective glasses	
*	Protective shoes	

Annual inspection and maintenance		
Annual inspection and maintenance must be performed by Fremco or another qualified service partner before startup and with energy sources disconnected (quick couplings)		
#	**Task**	**Instructions**
1	Check the safety functions	Ensure that the hold-to-run function works as intended and the machine stops when the control valve is released

2	Check the pressure gauge	Check the pressure gauge for accuracy
PPE for inspection and maintenance		
*	Gloves for protection against hydraulic fluids and lubricating oil	
*	Protective glasses	
*	Protective shoes	

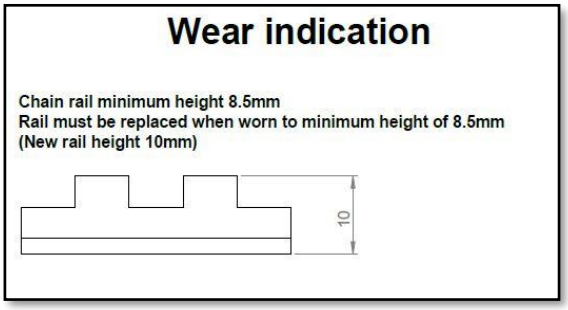
8.5.1. VISUAL INSPECTION

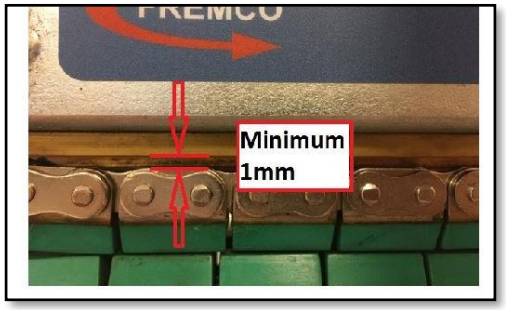
If any components are visibly worn, damaged and/or incorrectly mounted, this must be rectified before the machine is operated.

8.5.2. CHAIN SUPPORT RAIL

The chain support rail must be replaced in case of one of the following wear indicators:

- The rail is worn to 8.5 mm
- The distance between the chain and chain support rail reaches a minimum of 1 mm

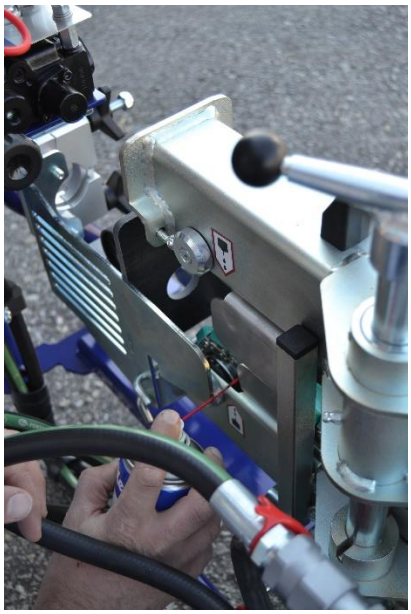




8.5.3. LUBRICATION OF CHAINS AND CHAIN SUPPORT RAIL

Chains are lubricated using a suitable chain lube spray.

Spray a thin coat of chain lube between the chain and chain support rail, along the full length of the support rail and on both sides of chains (top and bottom).



8.5.4. CHAINS AND SPROCKET WEAR

Visually inspect the chains and sprockets for any wear. If the wear exceeds what is reasonable, the chains and sprockets must be replaced.

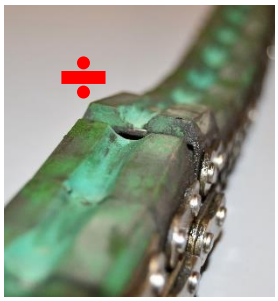
Indications of worn chains and sprockets:

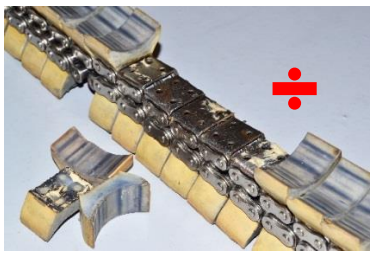
- The chains have clear and deep wear marks from the chain support rail
- The rubber on the chains has large deformations on the front and back edges due to wear
- The chain teeth of the sprockets are clearly and visibly deformed

It is always recommended to replace the chain and sprockets together with chain support rail.

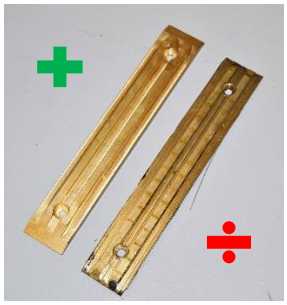
Pictures of chains and chain parts that exceed reasonable wear:

Chains:





Support rails

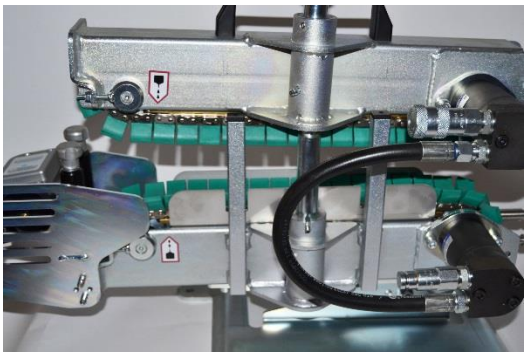


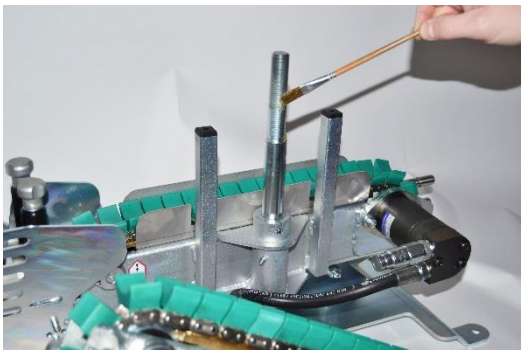
Sprockets

8.5.5. SPINDLE LUBRICATION

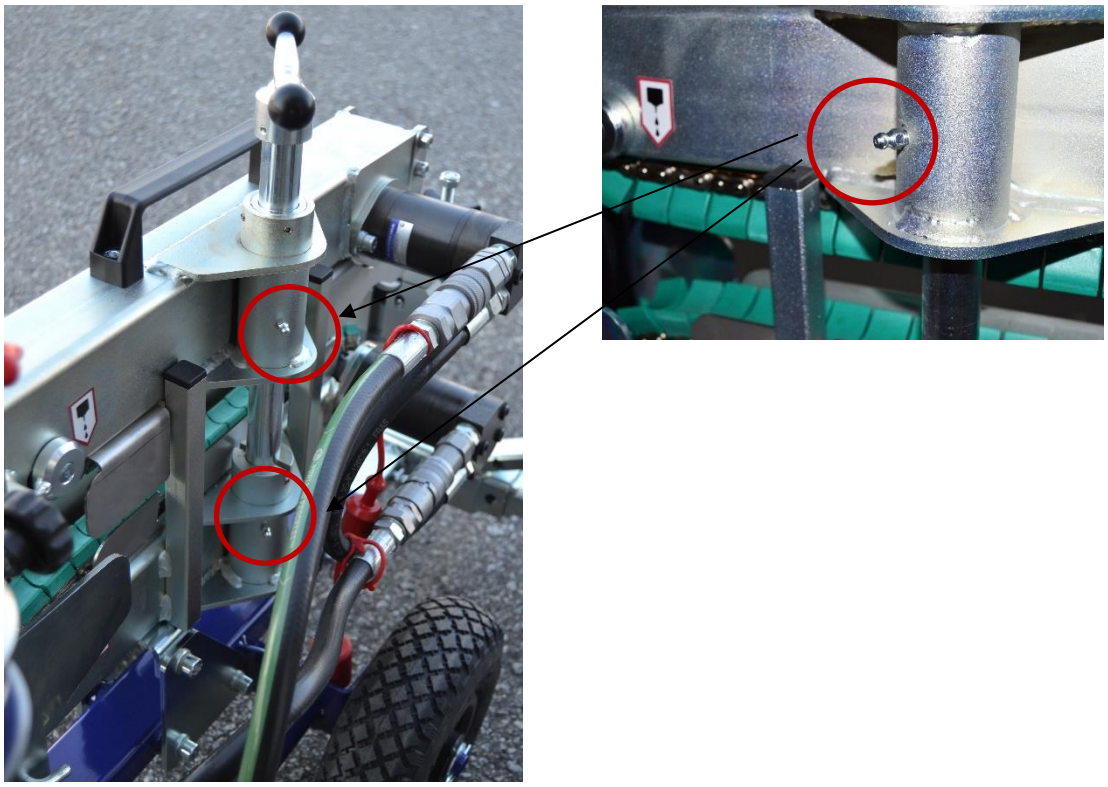
Lubricate the spindle with multipurpose grease.

- To start, screw the spindle handle all the way up to expose the threads, and lift it off. Now brush a light coat of grease onto the threads before mounting the spindle handle again





- Pump grease into the two grease nipples using a suitable grease gun. Use one or two pumps for each nipple

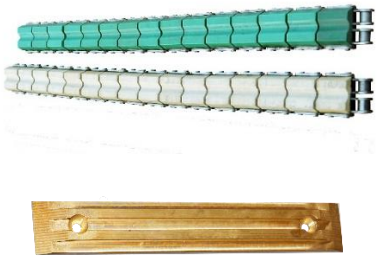


- Finish by wiping all excessive grease off the machine

8.6. WEAR AND TEAR PARTS

The list below is an overview of wear and tear parts for the machine. It is important to replace wear and tear parts when they are no longer viable for use. This should be checked during the daily, weekly, monthly, or annual inspection and maintenance of the machine.

	<u>Rod protection</u> Rod protection parts are available at Fremco.

	<u>Chains and support rails</u> Chains and support rails are available. Wear and tear parts can be ordered through the designated reseller in your country.

9. CESSATION OF USE

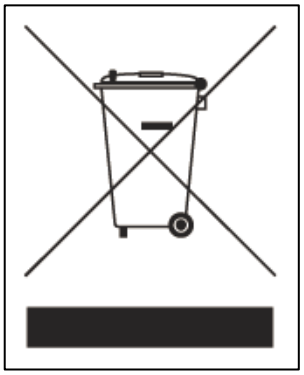
9.1. DISMANTLING

Before dismantling the machine, a plan must be prepared detailing this purpose. The plan must include a risk assessment for the work as well as for the disposal of machines and machine parts.

Handling of hydraulic fluids must be given special attention.

9.2. SCRAPPING

The machine must not be disposed of as unsorted household waste. Use the local WEEE collection points to dispose the machine and make sure that all relevant provisions are complied with.



10. EC DECLARATION OF CONFORMITY

Manufacturer:

Fremco A/S
Ellehammervej 14
DK-9900 Frederikshavn
Denmark

We hereby declare that

101-220106001 DuctRod RAPID For Rod Pushing and Pulling
From serial No. 9328.5108

is manufactured in conformity with the EC Directives
EC Directives:
2006/42/EC – the Machinery Directive
The directive has the dual aim of harmonising the health and safety requirements applicable to machinery on the basis of a high level of protection of health and safety, while ensuring the free circulation of machinery on the EU market.

International standards:
DS/EN ISO 12100:2011- Safety of machinery
The standard specifies basic terminology, principles and a methodology for achieving safety in the design of machinery. It specifies principles of risk assessment and risk reduction to help designers in achieving this objective

DS/EN ISO 4413:2010 - Hydraulic fluid power
ISO 4413:2010 deals with all significant hazards associated with hydraulic fluid power systems and specifies the principles to apply in order to avoid those hazards when the systems are put to their intended use.

Technical file responsible:
Kasper Mikkelsen
Research & Development Manager
Ellehammervej 14, DK-9900 Frederikshavn

Attested by:

Kim Lindblad Carlsen
Managing Director

Frederikshavn, 19.04.2022

Kasper Mikkelsen
R&D Manager

Frederikshavn, 19.04.2022

11. UKCA DECLARATION OF CONFORMITY

Manufacturer:

Fremco A/S
Ellehammervej 14
DK-9900 Frederikshavn
Denmark

We hereby declare that

101-220106001 DuctRod RAPID for Rod Pushing and pulling

Is manufactured in conformity with
UK Directives:
2008 No. 1597 – Supply of Machine (safety) regulations 2008
The purpose of the legislation is to ensure safe machinery is placed on the market or put into service by requiring manufacturers to show how their machinery meet the 'essential health and safety requirements'

International standards:
DS/EN ISO 12100:2011- Safety of machinery
The standard specifies basic terminology, principles and a methodology for achieving safety in the design of machinery. It specifies principles of risk assessment and risk reduction to help designers in achieving this objective

DS/EN ISO 4413:2010 - Hydraulic fluid power
ISO 4413:2010 deals with all significant hazards associated with hydraulic fluid power systems and specifies the principles to apply in order to avoid those hazards when the systems are put to their intended use.

Technical file responsible:
Kasper Mikkelsen
Research & Development Manager
Ellehammervej 14, DK-9900 Frederikshavn

Attested by:

Kim Lindblad Carlsen
Managing Director

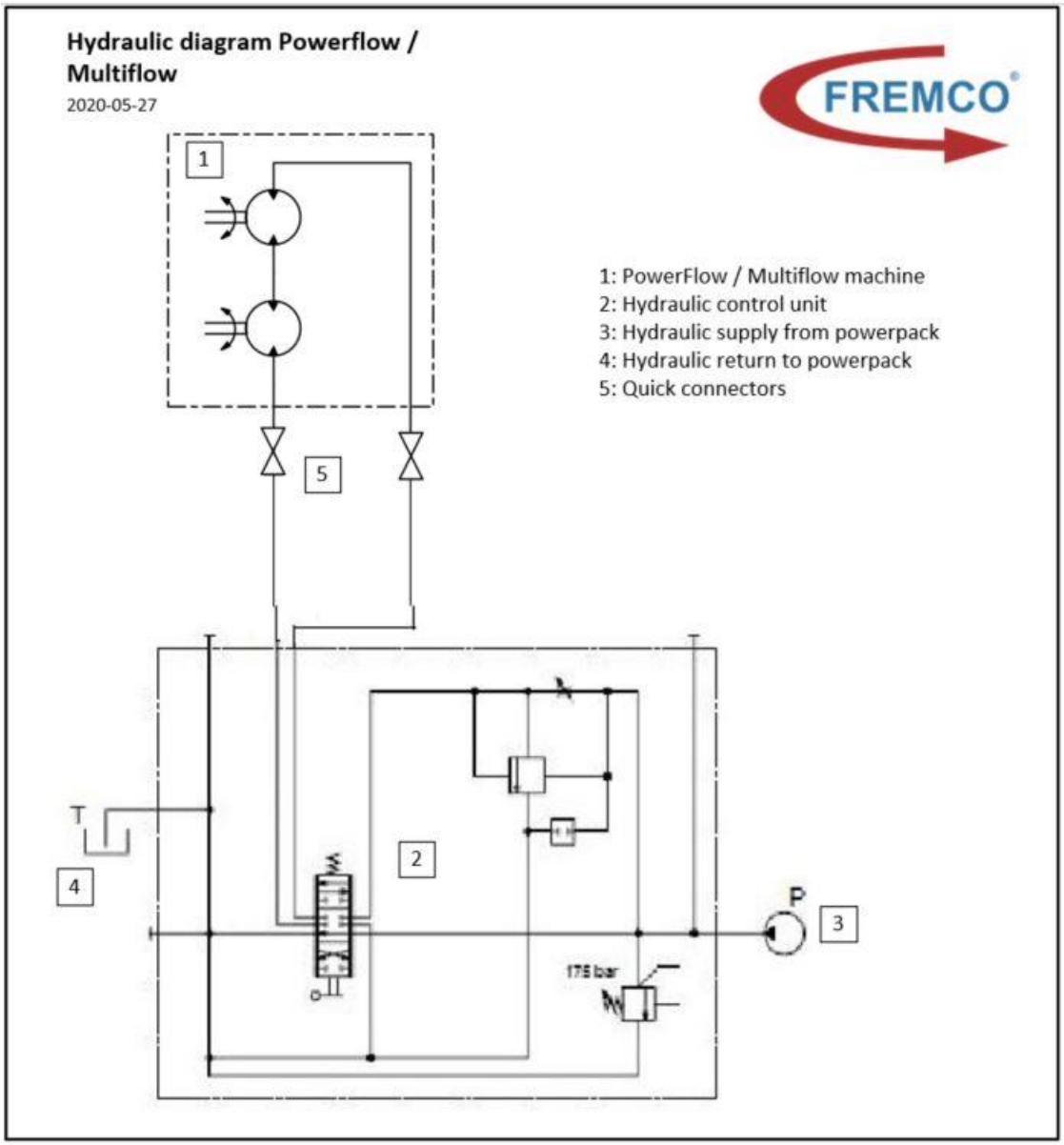
Frederikshavn, 19.01.2022

Kasper Mikkelsen
R&D Manager

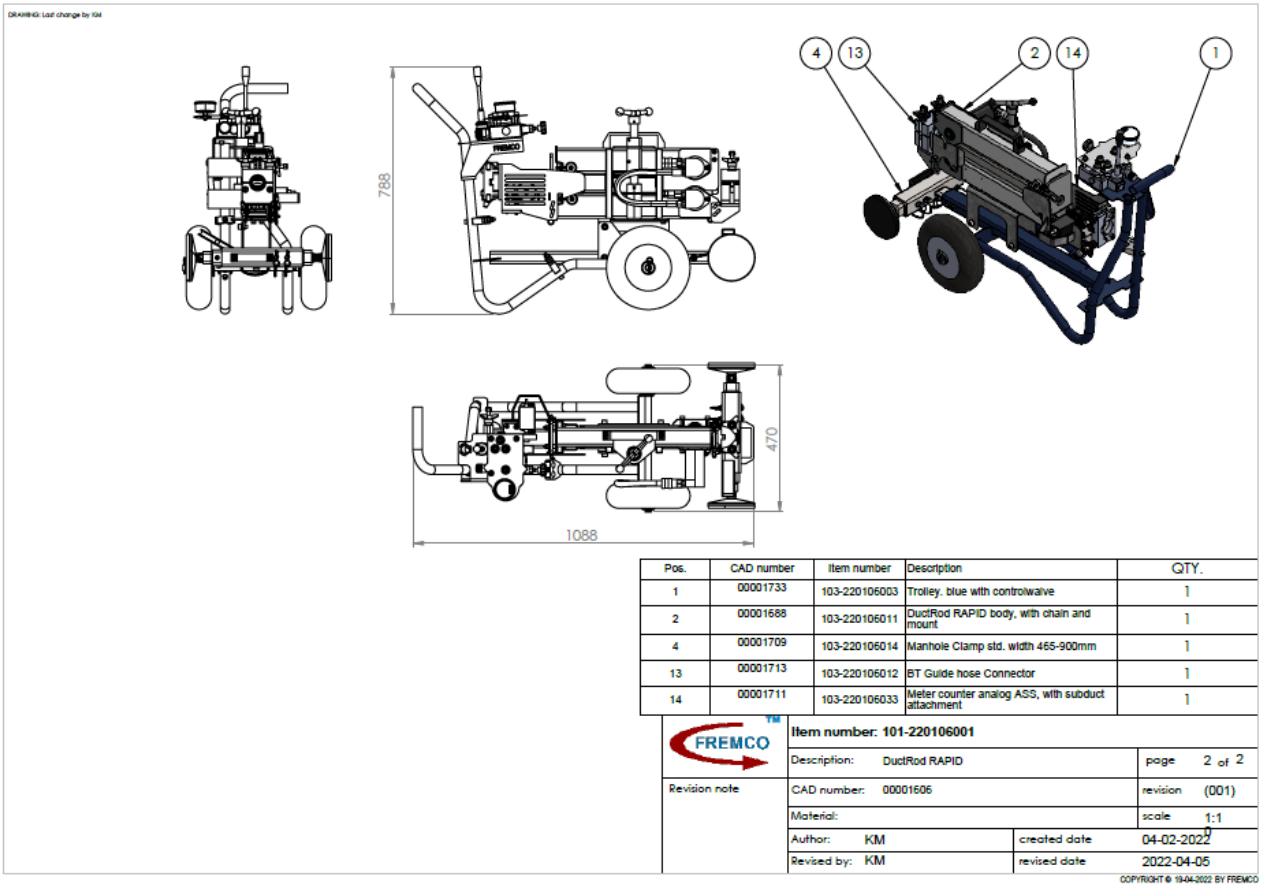
Frederikshavn, 19.04.2022

12. APPENDIXES

12.1. HYDRAULICS SCHEMATICS



12.2. DRAWINGS OF MECHANICAL CONSTRUCTION



Pos.	CAD number	Item number	Description	QTY.
1	00001733	103-220106003	Trolley. blue with controlwalve	1
2	00001688	103-220106011	DuctRod RAPID body, with chain and mount	1
4	00001709	103-220106014	Manhole Clamp std. width 465-900mm	1
13	00001713	103-220106012	BT Guide hose Connector	1
14	00001711	103-220106033	Meter counter analog ASS, with subduct attachment	1

FREMCO™

Item number: 101-220106001

Description:	DuctRod RAPID	page	2 of 2
CAD number:	00001606	revision	(001)
Material:		scale	1:1
Author: KM		created date	04-02-2022
Revised by: KM		revised date	2022-04-05

Revision note