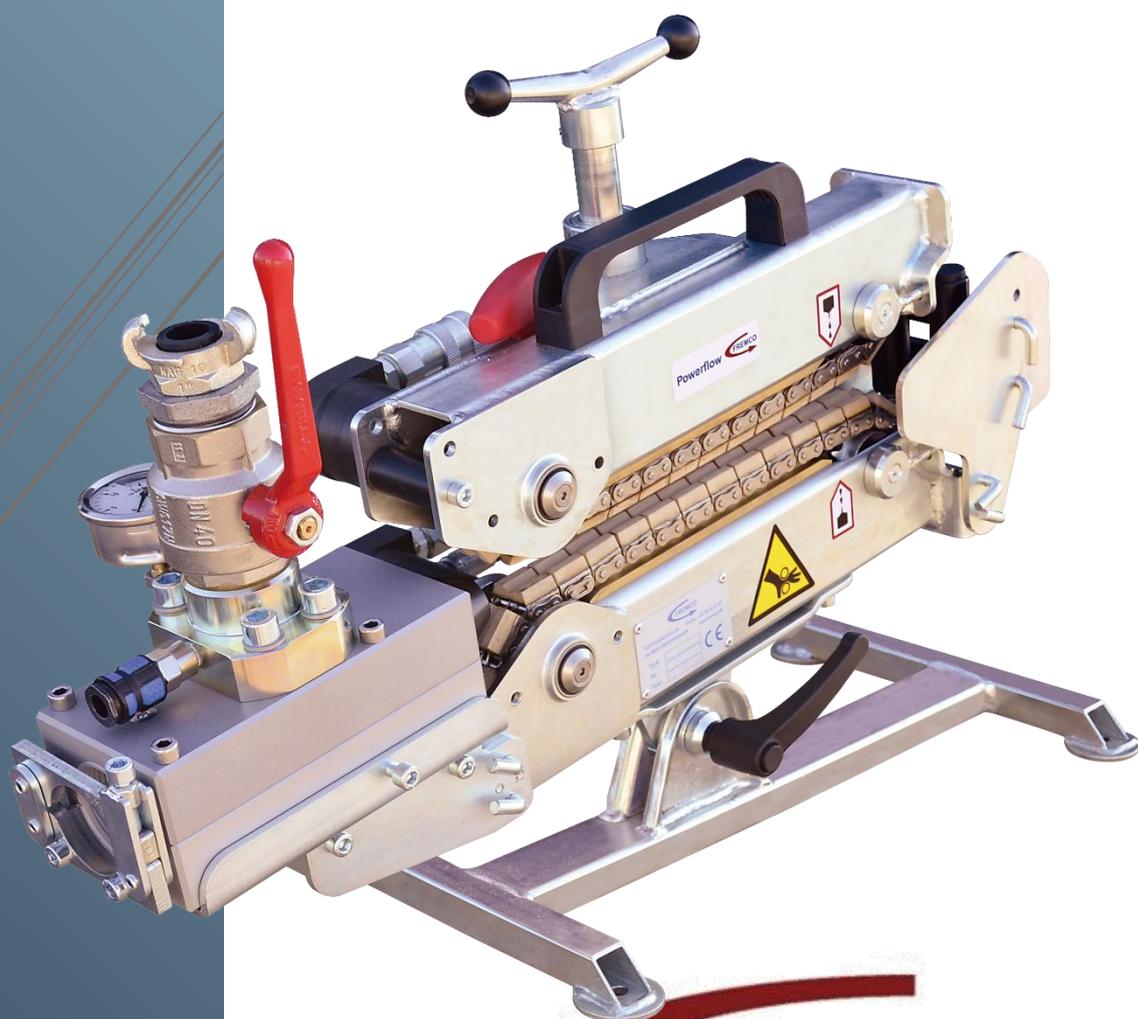


# OPERATING MANUAL

## PowerFlow

101-10001 Operating Manual  
2013-01-03 EN



Fremco A/S  
Ellehammervej 14  
9900 Frederikshavn  
Denmark  
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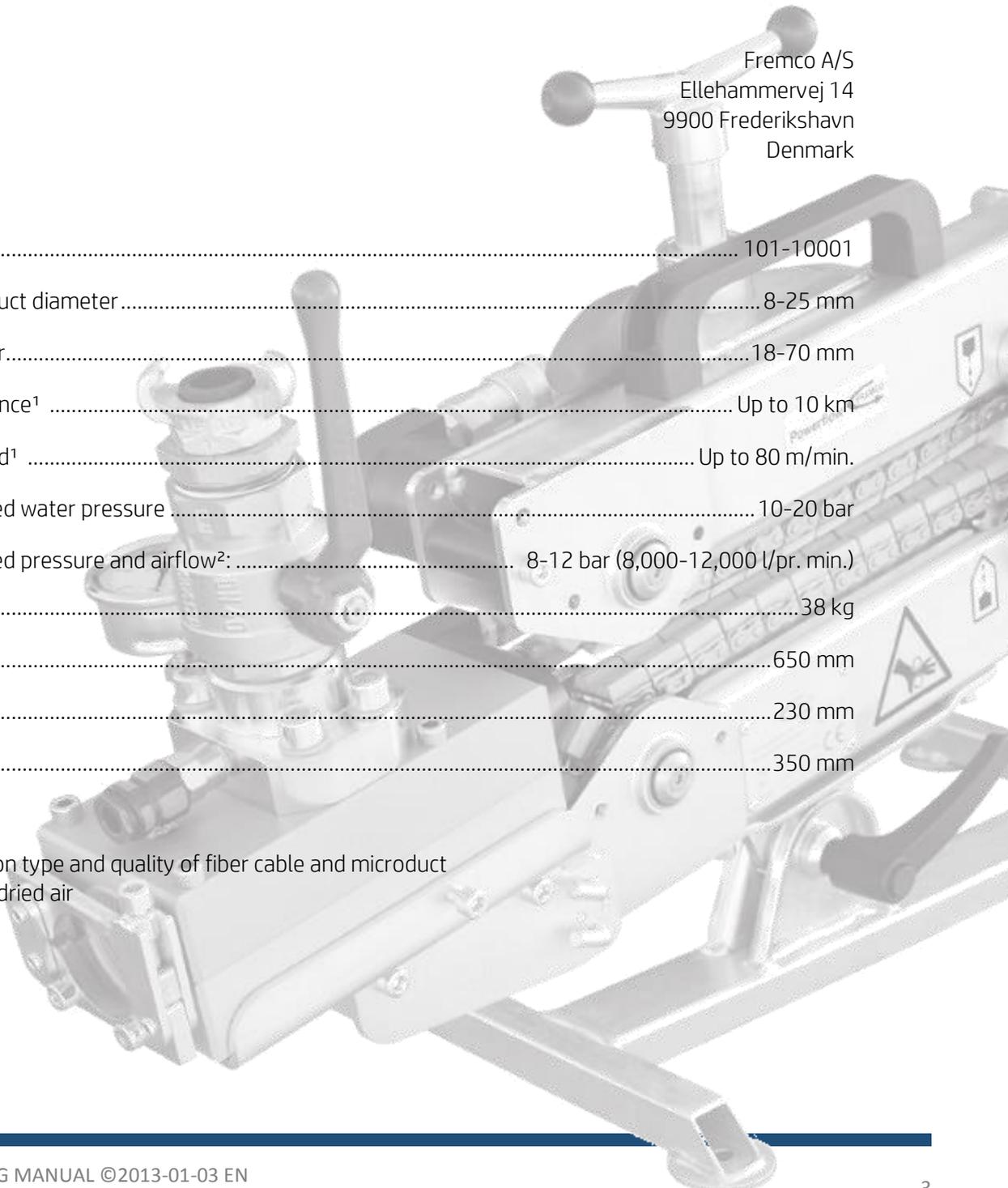
# Technical Specifications

These specifications cover PowerFlow as well as the hydraulic control unit and the blowing junction block for microducts. The blowing junction block is a replaceable format part that must fit the actual size of the fiber cables/microducts and ducts in question.

## PowerFlow

Manufacturer	Fremco A/S Ellehammervej 14 9900 Frederikshavn Denmark
Item No.....	101-10001
Cable/microduct diameter .....	8-25 mm
Duct diameter.....	18-70 mm
Blowing distance <sup>1</sup> .....	Up to 10 km
Blowing speed <sup>1</sup> .....	Up to 80 m/min.
Recommended water pressure .....	10-20 bar
Recommended pressure and airflow <sup>2</sup> : .....	8-12 bar (8,000-12,000 l/pr. min.)
Weight .....	38 kg
Length.....	650 mm
Width .....	230 mm
Height.....	350 mm

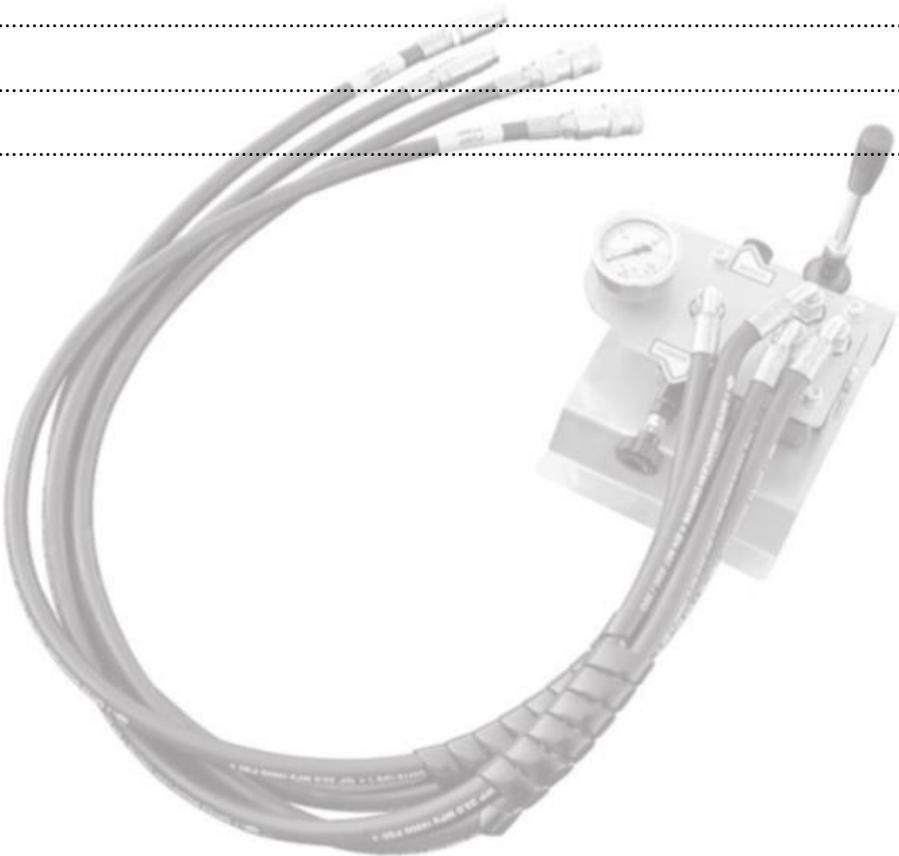
<sup>1</sup> Depending on type and quality of fiber cable and microduct  
<sup>2</sup> Cooled and dried air



# Hydraulic Control Unit

Manufacturer Fremco A/S  
Ellehammervej 14  
9900 Frederikshavn  
Denmark

Item No..... 103-10041  
 Hydraulic connection..... 0>125 bar, 17 l/min  
 Manometer ..... 160 bar  
 Hose to fiber blowing machine ..... 1500 mm  
 Hose to hydraulic pump..... 1500 mm  
 Length .....250 mm  
 Width .....250 mm  
 Height.....310 mm  
 Weight ..... 5 kg



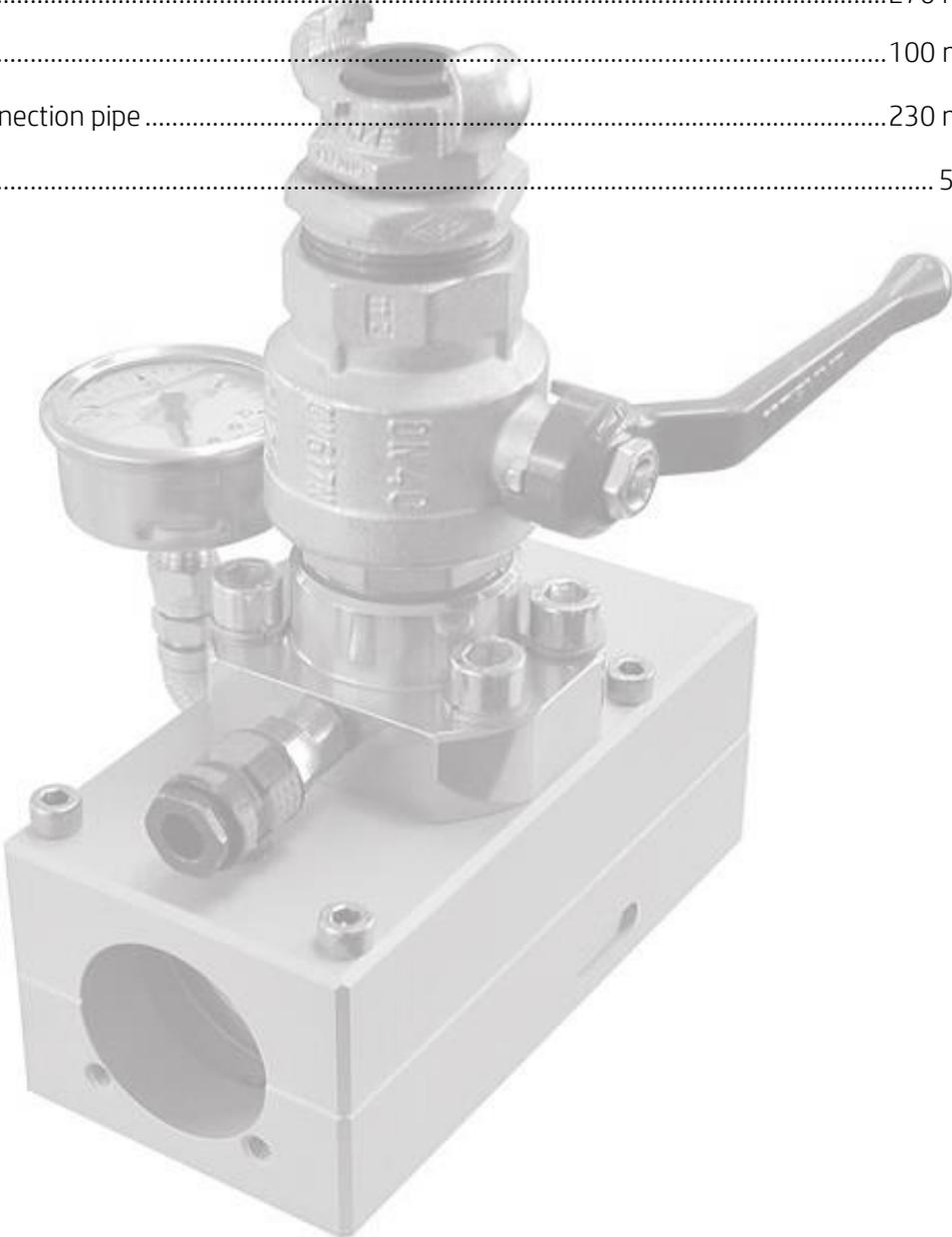
# Big Flow Blowing Junction Block

For blowing multiple microducts or single cable

Manufacturer

Fremco A/S  
Ellehammervej 14  
9900 Frederikshavn  
Denmark

Item No.....	103-130424001
Length.....	270 mm
Width.....	100 mm
Height without connection pipe.....	230 mm
Weight.....	5 kg



## Identification

These instructions have been made to support the users of the cable blowing machine PowerFlow. The machine type can be identified by the type plate on the machine. The type plate provides information about serial number, year of production and name and address of the manufacturer.

It is recommended to read this instruction carefully and become familiar with the functionality and maintenance of the cable blowing machine before use.

## Application

The cable blowing machine PowerFlow is constructed for blowing fiber optic cables into ducts. An example might be a 12 mm cable into a 40 mm duct.

Always use format parts designed for the actual diameter of cable and duct.

It is very important to use the correct format parts. If the format parts do not fit the duct, dangerous situations may occur.

## Mounting

Depending on the facilities, mount the air compressor or water pump and the hydraulic MultiPower Pack in inserting direction in front of the manhole. Check oil and fuel, and test-run equipment.

Arrange the PowerFlow in front of the manhole and guide the duct out of the hole and into the Powerflow. If the duct cannot reach the PowerFlow, extend the length with an extra piece of duct and a connector. Connect the hydraulic MultiPower Pack to the hydraulic control unit.

Make sure to place the Powerflow machine on a stable foundation and to fasten it to withstand the forces, which occur during use. These push/pull forces can be up to 125 kg.

Be careful to avoid any dirt on the surfaces when mounting the duct into the blowing junction block. Tighten the four screws equally so that the two halves are pressed completely together.

The cable seals in the black nylon part of the blowing junction block must fit tightly around the cable – the hole in the cable seal should be no more than 0.5 mm larger than the diameter of the cable. Use one to three cable seals depending on the expected pressure. New cable seals should always be installed after each cable blowing to secure maximum sealing.

The hydraulic control unit controls the direction (forward/back), speed and push/pull force.

Use the joystick on the hydraulic control unit to control start/stop and direction.

Speed can be adjusted by turning the screw marked "Speed". By turning the screw to the left, pressure is reduced.

With the screw marked "Force" you can adjust the maximum force to be transferred to the cable. The pressure, and with it the force, is increased when the screw is turned to the right. Use the manometer to read the pressure and thereby the push/pull force.



**CAUTION:** Do not use excessive force, as this can damage the fiber cable.

## Supply of Air or Water Pressure

It is possible to use compressed air as well as water for blowing cables. Air is best suited for shorter distances (0-500 m) and for jobs where water in the ducts should be avoided. It is very important that the quality and volume of compressed is correct and meets the specifications.

If there is water in the air or too low pressure and volume, it will create insufficient results. The minimum compressor capacity is 8000 l/min. The compressed air must be filtered, cooled and dried to avoid moisture and dirt in the microduct.

## Blowing a Fiber Cable into a Duct

Before preparing to blow, make sure that all format parts fit the number and diameter of the microducts/cable and duct.

### Preparing for Blowing

- Arrange the cable drum equipment approx. 10 m in front of the Powerflow. Check that the drum can turn easily and that the setup is stable.
- Start the hydraulic MultiPower Pack for cable blowing machines. Adjust to 50-75% power and let it run 2-5 minutes.
- Connect the hoses from the hydraulic control unit to the hydraulic pump.
- Adjust the hydraulic control unit to 60-70 bar
- Turn off the hydraulic pump.
- Connect the hoses from the hydraulic control unit to the Powerflow.
- Put the fiber cable through the guide, the chains and the blowing junction block.
- Adjust the blowing junction block vertically to align it with the fiber cable coming through the chains.
- REMEMBER to tighten the chains around the fiber cable using the handle on top of the machine.
- Attach a cable tip on the fiber cable

## **Use of Compressed Air for Blowing**

- Add approximately 100-500 ml lubricant to the duct, and then place a foam plug in the duct as well.
- Connect the duct to the blowing junction block.
- Connect compressed air to the blowing junction block.
- Turn on air to the blowing junction block - only for a short time - until the foam plug comes out at the other end of the duct.
- Turn on the hydraulic MultiPower Pack and start the Powerflow machine by moving the joystick on the hydraulic control unit
- Increase air to the blowing junction block gradually.
- CAUTION: Check continuously that the drum turns smoothly. If not, check the pressure of the top chain on the fiber cable. Intensify if necessary.

## **Use of Water for Blowing**

- Connect the duct to the blowing junction block.
- Connect the suction tube from the water pump to the water supply.
- Start the engine on the water pump and let it run for approximately 4-5 min.
- Connect the pressure tube from the water pump to the blowing junction block.
- Turn on the hydraulic MultiPower Pack and start the machine by moving the joystick on the hydraulic control unit.
- Increase water to the blowing junction block gradually.
- CAUTION: Check continuously that the drum turns at steady speed. If not, check if the water pressure and flow is sufficient or/and intensify the pressure of the top chain on the fiber cable.

## Maintenance

The PowerFlow cable blowing machine does not require much maintenance, if a simple set of rules is followed.

See to it that the guide rollers, where the fiber cable enters the chains, are adjusted in a way that the cable is guided directly into the middle of the drive chains.

The chains should be kept well lubricated and free from sand and dirt. Use a good quality chain oil, preferably from a spray.

The chain pressure mechanism should be lubricated regularly with an ordinary grease lubricant.

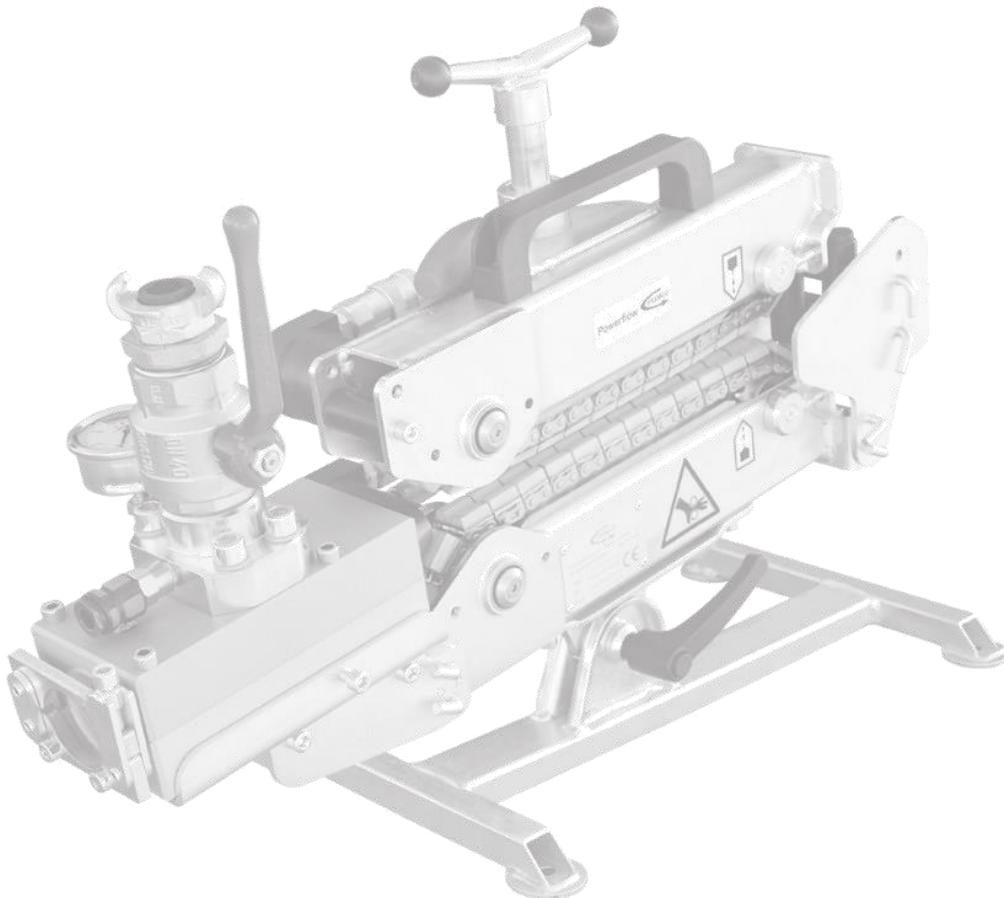
The chains should be tightened to an extent that they can be lifted only 5-10 mm from the support rail.

The chain support rails must be replaced when the side plates on the chain touch the support rails.

It is very important to avoid any kind of dirt in the hydraulic connectors, when mounting the hydraulic hoses.

If the machine is not to be used for a longer period of time, it should be cleaned, and the chains should be lubricated. It is also recommended to spray the machine with an anticorrosion oil. Store the machine in a dry and dust-free environment.

It is strongly recommended to use original spare parts. Repairs should be performed by the manufacturer. Errors and damage due to unauthorized use, changes or adjustment of the machine are not covered by warranty.



## Safety Directions

- Make sure to disconnect the machine from all power sources, like air compressor and hydraulic pump, before any kind of adjustment and maintenance takes place.
- The hydraulic power supply from the pump for cable blowing machines or from other sources may never exceed the specified maximum pressure.
- The air or water pressure should never exceed the recommendations from the suppliers of microducts, fiber cables and duct. The pressure may never exceed 20 bar, which is the maximum pressure for the blowing junction block.
- Observe that the machine is placed on a stable foundation and secure it before start. Make sure the blowing junction block is properly connected to the duct and that the microducts/cable are placed correctly between the chains.
- Make sure you do not touch the microducts/cable too close to the machine because you risk getting your fingers injured, and make sure the microducts or the cable do not make loops that might be dangerous to people around the machine.
- Use hearing protection, if the hydraulic pump or other noisy equipment is placed nearby.
- The joystick on the hydraulic control unit should never be blocked in a way, where it is unable to return to neutral position.
- The operator must make sure that no other persons are close to the machine and cable drums in a way that could be dangerous when the machine is started.
- It is always a clear advantage to be well prepared so that you can run the blowing process without interruptions. Stopping in the middle of the process creates a risk of being unable to start again.
- Make sure the working environment is clean and tidy to avoid injuries due to stumbling over cables and equipment.

## Format and Wear Parts

Please ask your authorized dealer for a complete list.

## Recommended Accessories

Using other hydraulic power sources can potentially cause damage on the Powerflow blowing machine. It is highly recommended to use the hydraulic power unit from Fremco:

101-10102 hydraulic MultiPower Pack



## EC Declaration of Conformity



We hereby declare that

**101-10001 Powerflow Blowing Machine for cables**

is manufactured in conformity with the EC Directives 2006/42/EC

Fremco A/S  
Ellehammervej 14  
DK-9900 Frederikshavn  
Denmark

A handwritten signature in blue ink, appearing to read "Niels Søgaard Hansen".

Niels Søgaard Hansen  
General Manager

01.04.2012