

NANOFLOW

Установка для задувки FTTH волокон (EPFU) и кабелей



ACCU



Презентация
продукта:



Простая, эффективная, бесшовная и автоматическая инсталляция FTTH

Полностью автоматическая установка с уникальной двойной защитой волокон. Не требует дополнительных инструментов, что делает его самым простым в эксплуатации.

- Питание от батареи (независимо от 110 В / 230 В)
- Быстрая загрузка волокна и воздуховода.
- Легко открывать / закрывать вручную.
- Простая загрузка и удаление предварительно подключенных продуктов из машины без резки.
- Легко читаемый светодиодный дисплей (также при дневном свете), показывающий скорость, расстояние, защиту от волокон и информацию о низком заряде батареи.
- Несколько позиций для продувки волокна.
- Анодированная алюминиевая конструкция.
- Может использоваться с или без воздуха.
- 36 месяцев гарантии.
- Поставляется в практичной сумке для переноски с кратким руководством.

Простая настройка с шестью шагами для регулировки скорости и крутящего момента. Если рекомендуемая максимальная нагрузка на волокно превышает заданный крутящий момент, машина немедленно остановится, не повредив волокна. Если машина настроена на слишком высокий крутящий момент, уникальная синхронная система также немедленно прервет процесс, защищая волокно. Оператор может использовать эти системы безопасности как показатель того, когда волокно достигло клиента, что делает машину идеальной для эксплуатации одним человеком.

Комплект поставки:

2 x 24 В 2.0 Ач мощная литий-ионная батарея с быстрым зарядным устройством.

2 комплекта переходных пластин для волокон EPFU диаметром 1,1-1,2 мм и 1,4-1,6 мм (2f-12f).

Адаптеры для воздуховодов размером 3-5-7-8-10 мм.



Аксессуары (не включены): штатив с быстрым адаптером. Наплечный ремень. Держатель катушки для предварительно подключенного волокна. Стальное ведущее колесо для специальных кабелей +2 мм. Не показано: литий-ионный аккумулятор 24 В 4,0 Ач. Широкий выбор переходных пластин для любых размеров волокон / каналов по запросу.

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

Диаметр волокна / кабеля:	0.8 - 3 мм
Диаметр кабельного канала (микротрубки):	3 - 10 мм
Протяженность монтажного участка ¹ :	до 1200 м
Скорость задувки ¹ :	до 150 м/мин.
Рекомендуемое давление и поток воздуха ² :	0-10 bar (200-500 l/pr. min.)
Вес (без батарей):	2,8 кг
Длина:	212 мм
Ширина:	104 мм
Высота:	139 мм

¹ В зависимости от типа микротрубки и кабеля.

² Охлажденный и высушенный воздух.

MICROFLOW TOUCH

Cable blowing machine for FTTH FIBERS (EPFU) AND CABLES



Protection Technology



Microflow Touch has a unique protection technology, which stops the machine if the fiber cable meets an obstacle.

The stop occurs if the cable gets bent inside the blowing machine. This is registered by a sensor. The machine will also stop automatically if the motor exceeds the preset maximum torque level. In both cases the stops will secure against fiber damage. After the protection technology has stopped the machine, it will automatically start up again. It will try three times total to get through the obstacle, if it still has not succeeded it will come to a full stop.

Control Unit

The Microflow's control unit has a user-friendly touch display, which can be used to make a number of different adjustments:

- Adjustment of maximum motor torque
- Adjustment of maximum speed
- Presetting of counter with automatic stop after a certain blowing distance
- Acceleration (maximum speed)
- Deceleration (maximum speed to stop)
- Displays meter count, actual speed and actual torque



The Blowing Process

With Microflow a typical blowing process will be as follows: The machine is placed on a stable surface and the fiber cable is placed in the machine. The duct, in which the fiber cable is to be blown, is placed in the machine as well. Then the pulling wheels are adjusted. With the control unit the torque level, speed and blowing distance can be adjusted. Press the start button to start the machine, and after 10-20 m the air is turned on. The cable blowing is now automatic and can be stopped either manually by pressing the stop button or automatically when the preset blowing distance has been reached.

SPECIFICATIONS

Fiber/cable diameter:	0.8 - 6.5 mm
Microduct diameter:	5 - 16 mm
Blowing distance ¹ :	Up to 2500 m
Blowing speed ¹ :	Up to 90 m/min.
Recommended pressure and airflow ² :	8-16 bar (200-500 l/pr. min.)
Weight (including control unit):	11.6 kg
Length (blowing head/control unit):	250 mm/200 mm
Width (blowing head/control unit):	150 mm/150 mm
Height (blowing head/control unit):	220 mm/80 mm

Powered by 24V DC electric motor

Electronic control unit and electronic meter speed/counter with presetting of blowing distance.

Adjustable motor torque load of fiber cable. Electronic protection technology to prevent damage to fiber cable.

¹) Depending on type of microduct and cable.

²) Cooled and dried air.

MICROFLOW LOG

Cable blowing machine for FTTH FIBERS (EPFU) AND MICRO CABLES

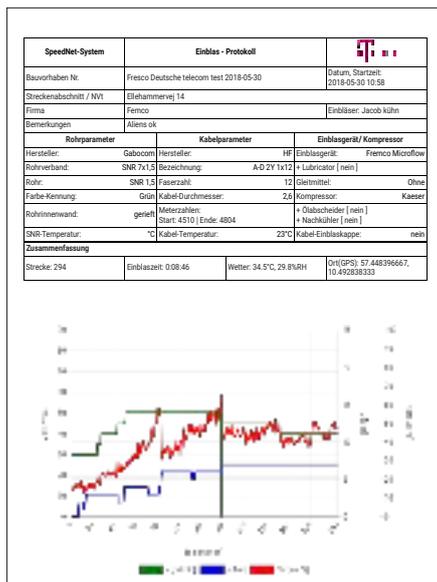
The Microflow LOG is a data driven decision tool which minimizes the risk of costly errors due to wrong blowing techniques. Online diagnostics can show you how the machine operates and how to improve the utilization.

HIGHLIGHTS

- Software operated machine
- Compatible with OptiCloud
- Modern connectivity
- The LOG template can be individually adapted to the specific job
- Easy connection to controller
- Verification of blowing quality (e.g. pressure, length, recommended speed, stress on cable etc)
- Remote support & automatic software updates

BENEFITS

- Confirmation of job, location and time via invoice
- Quality based documentation such as stress on the cable, comparison of different types of cable and if predetermined blowing limitation are exceeded.
- Online diagnostics
- Evaluation of fiber blowing efficiency by team
- Best practice for blowing teams
- Utilization - how is the machine utilized and data to improve it
- Maintenance & Service Recommendation of the fiber blowing machine (when, where, what etc.)
- IOT - Online software/feature upgrades



Each job will end with a full report that ensures that the quality is 100% documented. This will minimize the risk of costly errors.

SPECIFICATIONS

Fiber/cable diameter:0.8 - 6.5 mm
 Microduct diameter:5 - 16 mm
 Blowing distance¹:Up to 2500 m
 Blowing speed¹:Up to 90 m/min.
 Recommended pressure and airflow²:8-16 bar (200-500 l/pr. min.)
 Weight (including control unit):11.3 kg
 Length (blowing head/control unit):250 mm/240 mm
 Width (blowing head/control unit):150 mm/250 mm
 Height (blowing head/control unit):220 mm/80 mm
 Powered by 24V DC electric motor

¹ Depending on type of microduct and cable.

² Cooled and dried air.



The MicroFlow LOG is of course equipped with the unique protection technology that stops the machine if the fiber cable meets resistance. Any stop is registered by a sensor and the motor stops. The machine will also stop automatically if the motor exceeds the preset maximum torque level. In both cases the machine stops immediately so the fiber cable does not get damaged.

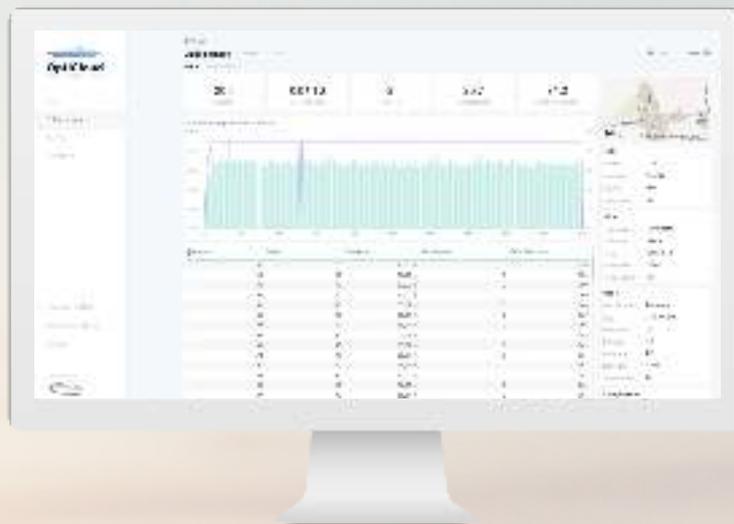


OptiCloud

FIBER DATABASE MADE EASY

User-friendly Data Management Tool

OptiCloud is a cloud based management tool included in the purchase of the Microflow LOG.



With OptiCloud, you get:

- A complete overview of your fiber blowing machines and the performed jobs.
- Possibility of planned service, minimizing the risk of having a machine that suddenly does not work.
- Easy access to a utilization overview of all machines, giving you the possibility to detect low performance.

Gain overview, create quality documentation in minutes and eliminate unnecessary high costs.

MINIFLOW RAPID

Cable blowing machine for ACCESS NETWORK AND BACKBONE

MiniFlow RAPID offers many advantages:

- **User-friendly design**

The machine has a user-friendly design that makes for easy operation. The machine is designed based on functionality including:

- Rugged stainless construction
- Safety chain guard
- Large adjustable knobs
- Push force indicator

- **Efficient cable blowing**

The machine is capable of installing fiber cable at a speed up to 100 m/min. and up to a distance of 3.5 km making it a compact and efficient cable blowing machine.

- **Built-in electronic counter and tachometer**

It has a built-in electronic counter and tachometer. The counter is easy to read and is robust and simple to operate.

- **Robust and compact**

The machine is constructed in stainless steel and anodized aluminium that makes it suited for use under rugged conditions at cable blowing locations.

- **Flexible**

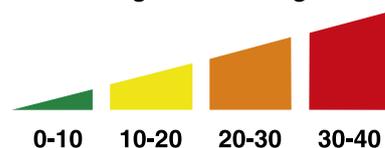
The machine can quickly be adapted to accommodate different cable and duct sizes making it flexible to fit every fiber blowing job.



Cable damage safety

MiniFlow RAPID has a unique monitoring system, which continuously monitors the pushing force, applied on the fiber cable. This makes it easy to stop the process before any damage to the cable.

Pushing force in kilogram



SPECIFICATIONS

Micro cable diameter ¹:	.....	3 - 12 mm
Microduct diameter:	.....	7 - 20 mm
Blowing distance ²:	.....	Up to 3500 m
Blowing speed ²:	.....	Up to 100 m/min.
Recommended pressure and airflow ³:	.....	8-16 bar (1,000 l/pr. min.)
Weight:	.....	24 kg
Length:	.....	650 mm
Width:	.....	225 mm
Height:	.....	210 mm

¹) Two sets of chains needed (3-8 mm / 4-12 mm).

²) Depending on type of microduct and cable.

³) Cooled and dried air.

DON'T FORGET TO PURCHASE

The following equipment is needed for the MiniFlow RAPID to run: Hydraulic Power Pack/Control valve and high pressure compressor. We offer all accessories on request.

POWERFLOW

Cable blowing machine for BACKBONE AND ACCESS NETWORK

PowerFlow offers many advantages:

- **User-friendly design**

With its user-friendly design, the PowerFlow is easy to operate. It is designed with mainfocus on functionality that makes cable blowing easy.

- **Efficient blowing**

It can blow cables with a speed up to 80 m/min, and it is possible to blow distances up to 10 km.

- **Cable blowing using either air or water**

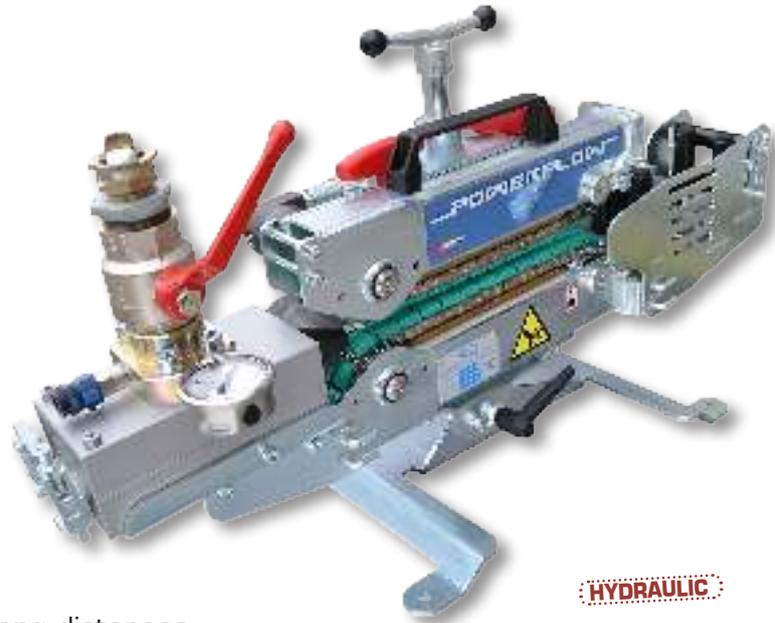
It is possible to install fiber optic cables using either air or water. With water assisted cable blowing you can achieve optimal results, especially when installing large cables or blowing long distances.

- **Robust**

PowerFlow is constructed in a way that it is robust and can withstand being used under special conditions that sometimes occur on cable blowing locations.

- **Flexible**

Powerflow is very flexible as the machine can quickly be changed to blow different sizes and numbers of micro ducts. There are many different sizes and combinations available to fit the different dimensions needed in a specific situation.



HYDRAULIC

SPECIFICATIONS

Cable diameter ¹ :	5.5 - 25 mm
Duct diameter:	18 - 70 mm
Blowing distance ² :	Up to 10000 m
Blowing speed ³ :	Up to 80 m/min.
Recommended pressure and airflow :	8-12 bar (8,000-12,000 l/pr. min.)
Weight:	38 kg
Length:	650 mm
Width:	230 mm
Height:	350 mm

¹) Two sets of chains needed (5.5-8 mm / 8-25 mm).

²) Depending on type of microduct and cable.

³) Cooled and dried air.

DON'T FORGET TO PURCHASE

The following equipment is needed for the PowerFlow to run: Hydraulic Power Pack/Control valve and high pressure compressor. We offer all accessories on request.



MULTIFLOW

Cable blowing machine for BACKBONE AND ACCESS NETWORK

MultiFlow offers many advantages

- **User-friendly design**

MultiFlow has a user-friendly design, which makes the machine very easy to operate. It is designed with a main focus on functionality that makes cable blowing easy.

- **Efficient for relining**

The machine is a very efficient cable blowing machine for blowing microducts into ducts as it can blow multiple microducts in one go. It is also able to blow many different combinations of duct and microducts.

- **Cable blowing using either air or water**

With MultiFlow it is possible to install microducts and fiber cables using either air or water. With water assisted cable blowing you can achieve higher pressure, which is particularly advantageous when installing multiple microducts in one go or large cables.

- **Robust**

MultiFlow is constructed in a way that it is robust and can withstand being used under the special conditions that sometimes occur on cable blowing locations.

- **Flexible**

It is very flexible as it is both suited for blowing microducts as well as large fiber cables. Furthermore, the machine can quickly be changed to blow different sizes and numbers of microducts. There are many different sizes and combinations available to fit the different dimensions needed in a specific situation. Possible to stop before cable damage.



SPECIFICATIONS

Cable diameter ¹ :	5.5 - 32 mm
Duct diameter:	18 - 70 mm
Blowing distance ² :	Up to 10000 m
Blowing speed ³ :	Up to 80 m/min.
Recommended pressure and airflow :	8-12 bar (8,000-12,000 l/pr. min.)
Weight:	40 kg
Length:	700 mm
Width:	230 mm
Height:	350 mm

¹ Two sets of chains needed (5.5-8 mm / 8-32 mm).

² Depending on type of microduct and cable.

³ Cooled and dried air.

DON'T FORGET TO PURCHASE

The following equipment is needed for the MultiFlow to run: Hydraulic Power Pack/Control valve and high pressure compressor. We offer all accessories on request.

WHY A HYDRAULIC MACHINE?

Fremco's access network and backbone machines are hydraulic driven. Hydraulic driven fiber blowing machines are more effective and have a significantly lower total cost of ownership compared to an air-driven machine.

Main advantages when using Fremco's hydraulic driven fiber blowing machines are:

- Rugged & Dependable
- No performance loss
- Significantly lower maintenance costs and lower Total Cost of Ownership than air driven machines
- Proven performance in extreme harsh environments and weather conditions (cold, hot, wet or dry)
- Can operate in forward & reverse
- Installs fiber optic cable over long distances and produces maximum pushing force to the cable

Our Hydraulic MultiPower Pack is the optimal power source for MiniFlow RAPID, MultiFlow and PowerFlow machines



MultiPower Pack fits all!

SPECIFICATIONS:

- Oil flow 18 l.p.m at 3300 r.p.m
- Working pressure nominal 100 bar
- Pressure relief valve set at 110 bar
- Oil temperature max. 70° C
- Hydraulic oil tank capacity min. 5 litres/max. 7 litres
- Petrol tank capacity 3.1 litres
- Hydraulic system compl. max. 8 litres
- Filter system (filter element) 25 Micron with by-pass
- Engine Honda GX200QX7 6.5 HP (gross power)
- 4-stroke petrol with oil alert system
- Petrol - normal or unleaded
- Engine oil 1.1 litres
- Guaranteed sound power level LWA 100 dB
- Sound pressure level 1 m LPA 88 dB
- Dimensions L630 x W530 x H510 mm
- Weight (w/o hydraulic oil) 54 kg

Item no.: 101-10102 & 101-10103

Flexible Control Unit

- Stepless speed control
- Stepless oil flow control
- Instant forward and backward movement via the joystick
- Gauge for monitoring oil pressure
- Used with MiniFlow Rapid, PowerFlow and MultiFlow

SPECIFICATIONS:

Hydraulic connection: $O > 125$ bar, 17 l/min

Gauge: 160 bar

Hose to fiber blowing machine: 1500 mm

Hose to hydraulic pump: 1500 mm

Dimensions (LxWxH): 250x250x310 mm

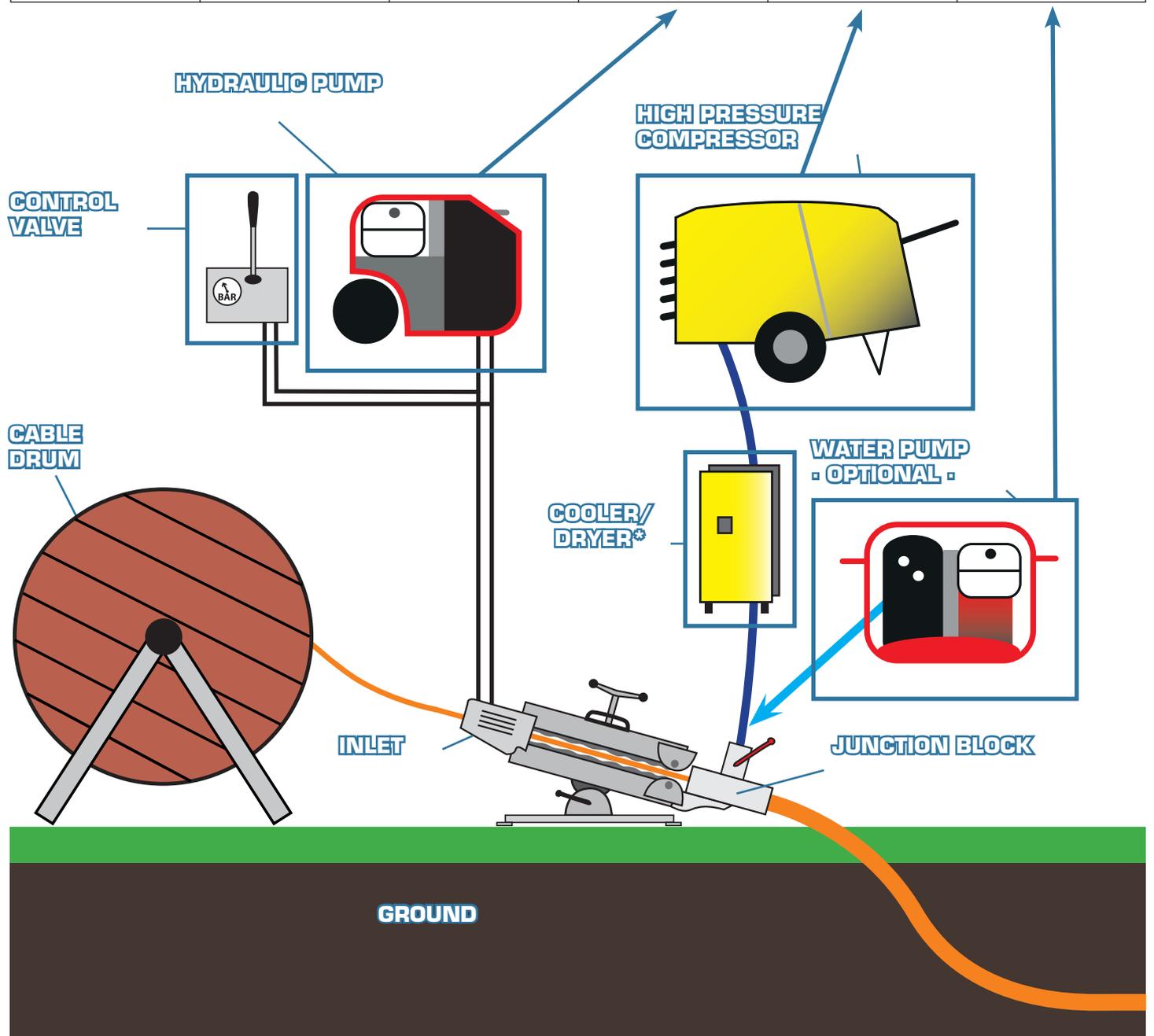
Weight: 5 kg

Item no.: 103-10041



OVERVIEW OF POWER SOURCE

Model	24V Battery	110-220V AC Drive	Hydraulic drive	Compressed air	Water flush (Optional)
NanoFlow	X			X → 0-500 l/min. 0-10 bar	
MicroFlow		X		X → 200-500 l/min. 8-16 bar	
MiniFlow			X	X → 1000 l/min. 8-16 bar	X
MultiFlow			X	X → 12000 l/min. 8-12 bar	X
PowerFlow			X	X → 12000 l/min. 8-12 bar	X



*) We always recommend using a cooler/dryer between the compressor and the blowing machine. High pressure air can achieve very high temperatures that can inflict cables and ducts melt damage. Cold and dry air will also improve the blowing length.



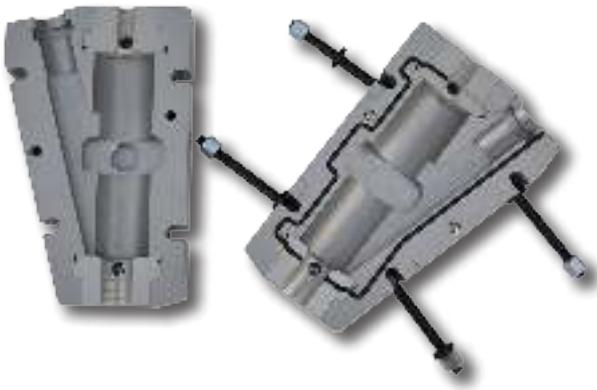
FREMCO

www.fremco.dk

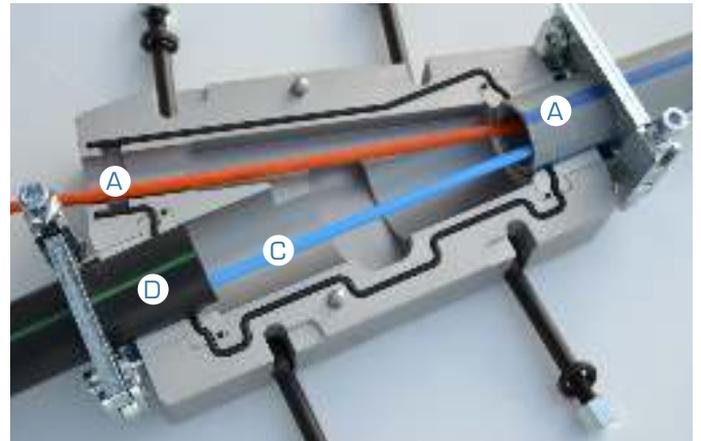
ACCESSORIES

We offer a wide palette of useful accessories:

Y-Block



The Y-block, used for overblow, can assist you in adding one cable to an existing duct where another cable is installed. Its surface is treated aluminium and it can withstand air/water pressure up to 25 bar. With Fremco's customized duct and adaptors, the Y-Block is more flexible than ever as it can be fitted into different sizes of ducts between 14 mm and 65 mm. This means you can modify both ends of the Y-block to fit each specific overblow.



A) Exiting Cable or Duct, B) Supply duct, C) New cable

Direct Air Connection

When utilizing the Y-block, especially with smaller Fremco machines, the Y-block is featured with a direct air connection in the lid. The direct connection of air makes it possible to do overblow with fewer steps, saving time for the fiber blowing engineer

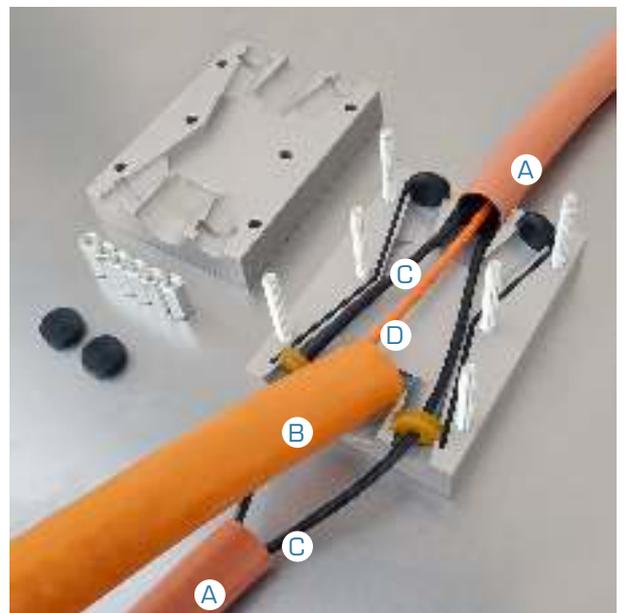
Item no.: 103 - 180726005

X-Block



The X-block is used for adding one cable to an existing duct with two cables inside. It is made from surface treated aluminium and can easily withstand a pressure of 25 bar from air/water.

The X-block is made with a fixed 40 mm connection at one end and a fixed 50 mm connection at the opposite end. This means that the block can be freely reversed and connected to 40 mm and 50 mm existing ducts in



A) 40 mm existing duct, B) 50 mm supply duct from PowerFlow or MultiFlow, C) Existing cable, D) New cable

the ground and connected to PowerFlow or MultiFlow with either a 40 mm or 50 mm supply duct (depending on availability).

The X-block uses the same type of cable seals as the junction block.

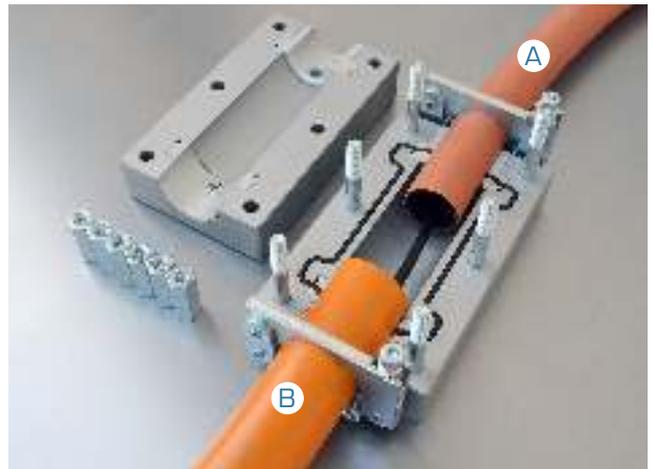
Item no.: 103-10352

ACCESSORIES

Duct Joining Block



The duct joining block is used for joining ducts in almost all combinations between 14 and 50 mm. Unlike a plastic connector, the joining block can be split into two halves and used again and again. At the same time it can withstand much greater pressure. It's made from surface treated aluminium and can easily withstand a pressure of 25 bar from air/water.



A) Any 14, 16, 20, 25, 32, 40 or 50 mm duct
B) Any 14, 16, 20, 25, 32, 40 or 50 mm duct

The duct joining block uses the same type of inserts and duct collets as the junction block. This means that they can be mixed in all kinds of combinations.

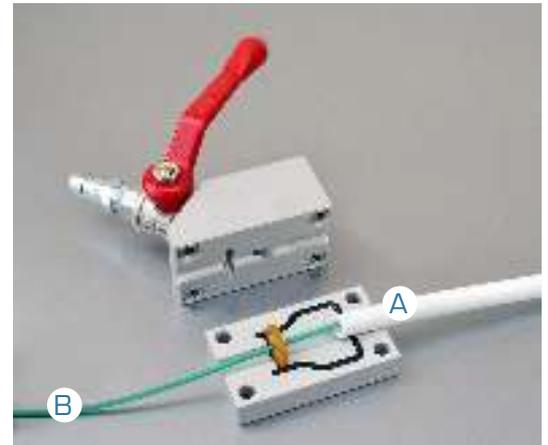
Item no.: 103-10422

Mini Blowing Junction Block Kit



The mini blowing junction block is used for straightening a cable when blowing in two directions, and there is a loop left because the regular blowing machine does not fit into the manhole/excavation (see illustration below). The mini blowing junction block is the perfect accessory for a MiniFlow RAPID.

The mini blowing junction block can also be used to blow a cable (by hand in short distances) from a narrow spot where there is

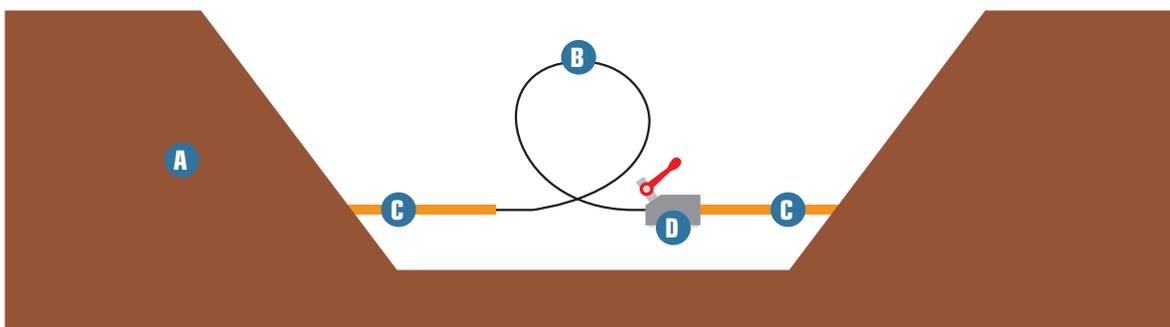


A) Microduct, B) Cable

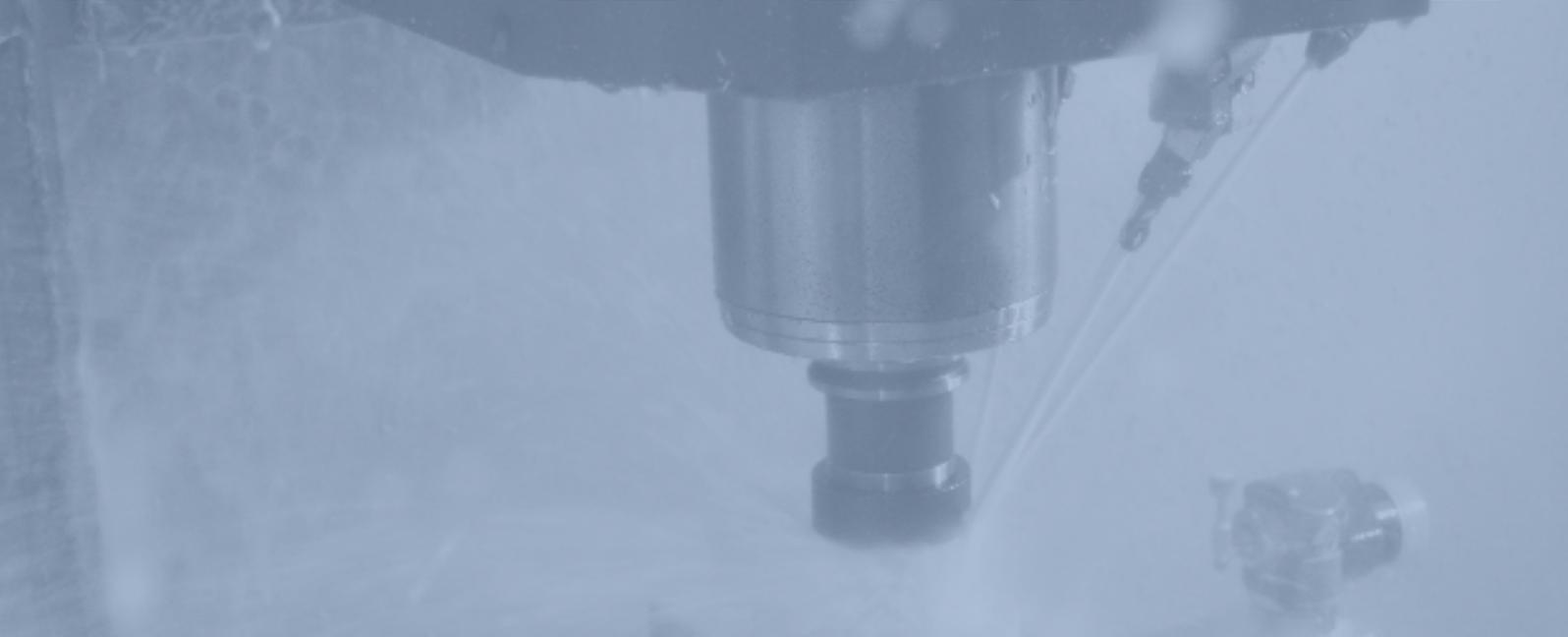
no room for a regular blowing machine. It's made from surface treated aluminium and can withstand the same air pressure as the MiniFlow Rapid.

The mini blowing junction block uses the same type of cable seals as the MiniFlow RAPID.

Item no.: 103-180314001



- A) Ground
- B) Cable with loop after blown in both directions
- C) Microduct
- D) Mini blowing junction block



ACCESSORIES



Fiberstop

Our fiberstop is intended for use with MicroFlow Touch, Microflow LOG and NanoFlow. The machine's safety systems can be reused to stop the fiber when it arrives at the customer. Meaning that only one technician can perform the installations alone. Fiberstop is available for the following microduct sizes: 5, 8, 10 and 12 mm.

- 5 mm (Item no.: 103-20601)
 - 8 mm (Item no: 103-150713001)
 - 10 mm (Item no.: 103-20602)
 - 12mm (Item no.: 103-150713002)
-



Return valve

When a fiber cable must be removed from a microduct because of a fault/damage, a return valve is very useful. It is mounted at the far end of the micro duct. Compressed air is connected and the fiber comes out by itself. Return valves are available for the following microduct sizes: 5, 8, 10 and 12 mm.

- 5 mm (Item no.: 103-20603)
 - 8 mm (Item no: 103-20606)
 - 10 mm (Item no.: 103-20604)
 - 12mm (Item no.: 103-20605)
-



Filter and water separator

Dirt and water from a compressor is bad for all fiber blowing, especially with NanoFlow, Microflow LOG and MicroFlow Touch. A filter and water separator is available for both MicroFlow Touch, Microflow LOG and NanoFlow.

Item no.: 103-130606001



Storage boxes

Storage boxes are available for all machines. If you accidentally destroy a box, these can be purchased separately. MiniFlow Rapid. PowerFlow and MultiFlow are delivered in wooden shipping boxes. Please contact us if you want a special storage box.

Item no.: 103 - 20742



Quality hoses

Do not be afraid of compressed air - but treat it with respect!
Our hoses are fitted with safety clamps and approved for any compressor.
Available in several lengths.

Item no.: 103 - 30155



Sealing

Especially the MiniFlow, PowerFlow and MultiFlow have a big cable diameter and duct diameter range. To make the blowing chamber as tight as possible, we have developed special seals. They are available in assortments that suit the total capacity of the machines. Single sizes supplement can be ordered in bulk.

The assortments are delivered in boxes where there is also room for e.g. adaptor plates and nylon inserts.

Item no.: 103-20611

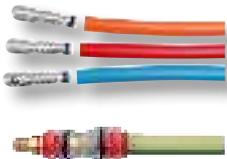


Cable mouse

Our "mouse" is intended for use with PowerFlow and MultiFlow to improve blowing of single cable in 32, 40 and 50 mm buried sub ducts. It builds up the air or water pressure at the tip of the cable and improve the blowing lengths. This requires nicely round and pretty straight ducts. The mouse can be used with max. 14 mm cables.

Silicone gaskets (4 pcs needed) are available in the following sizes: 28, 32, 36 and 42 mm. The correct size to apply will depend on the material thickness in the duct.

Item no.: 103-10037 (up to 12 mm cable) & 103-10038 (up to 14 mm cable).



Relining

Relining of microducts in buried sub ducts is successfully used in many markets. Besides the MultiFlow (designed for this purpose), we have a comprehensive range of accessories for the whole process. The components that allow the microducts to be set under air pressure are illustrated in the picture. Valves for microducts are available in the following sizes: 7, 10, 12, 14 and 16 mm.

Plug for microduct, Item no.: K7, K10, K12, K 14, K16

Valve for microduct, Item no.: 103-10044 (7mm)



Calibration probe

Our probe is intended for use with PowerFlow and MultiFlow to check/calibrate 32, 40 and 50 mm buried sub ducts.

The idea is that the probe is sent (with air pressure) through a duct prior to the installation of a cable. The length and size of the probe reveals whether there are sharp curves, fractures or impurities in the duct (it is important to mount a catch at the opposite end of the duct). If the probe gets stuck, it can be tracked at 33 KHz. The probe can also be mounted on a cable rod so that it can be retracted manually or with a PowerFlow/MultiFlow.

Item no.: 103-10490



Cable drum rack

We often see cable drums hung on random devices, and this causes the drum to become heavy to pull around and change the center of gravity. Via cone and ball bearings, our cable drum rack ensures smooth and easy feed of the cable from the drum, which will improve the blowing length.

Our cable drum rack (lifting jacks) is made of galvanized steel, with a robust hand operated mechanical lifting system. Lifting arms with five positions adjustable shaft supports with 100 mm steps; detachable frame type. Complete drum carrying steel shaft with one pair of drum centring cones. Drum diameter up to 1800 mm and max 1600 kg.

Item no.: 101-20011

ACCESSORIES



FlowLub

- FlowLUB 2000 is a special lubricant for fiber cable and microduct installation recommended for use with the Fremco PowerFlow and MultiFlow. With FlowLUB 2000, you can lubricate the duct before and during fiber optic installation (Item no.: 101-30540).
- FlowLUB 5000 is a special lubricant for mini fiber cable and micro cable recommended for use with MicroFlow Touch and MiniFlow Rapid. With FlowLUB 5000, you can lubricate the duct before and during fiber optic installation (Item no.: 101-30530).

Both FlowLubes are water based lubricants for all ducts and cables. The lubricant greatly reduces friction and static electricity. It spreads evenly on the cable surface/ inner wall of the duct, leaves a very thin film of lubricant and does not make a glue effect.



Trolley

Spare your back!

Our trolley improves transport and working height for the user. The trolley can carry all the hydraulic machines (MiniFlow RAPID, PowerFlow and MultiFlow). It is also prepared for mounting the hydraulic control valve as illustrated. The trolley is of the same sturdy quality as all the fiber blowing machines. Telescopic handle and air-filled rubber wheels make transportation fast and easy.

Item no.: 103-170705001



Lubricator Pump

Pump for lubrication during the fiber blowing process with a maximum flow of 14l/min.

Pneumatic pump for distance distribution of lubricant when blowing fiber cables in conduits. Suitable for installation in fixed plant or mobile station. The pump is provided with an extensible and adjustable length of the suction unit pipe and pressure regulator.

Item no.: 103-190215001





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