V20

Operating and maintenance manual

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1. Identification

1.1 Product mark

Mark	PLUMETT
Model	ULTIMAZ
Logo	ULTIMAZ
Version	Variable « V »
Article family	-FJ05xxxxx
Machine type	Apparatus for optical fiber installation by the « JETTING » method

1.2 Manufacturer and distributors

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1.3 Identification (see Fig. A)

Manufacturer data is inscribed on the ULTIMAZ® blowing head.

Manufacturer	www.plumettaz.ch
Patent	PCT PAT. PENDING
Series number	S/N

2. Specifications

This operating manual and other furnished documents must be :

- o carefully read
- o considered as an integral part of the apparatus
- o kept safely during the whole lifespan of the apparatus
- o handed over to any further holder or user of the apparatus

2.1 Symbol meaning

Meaning of the signs and pictograms used in this manual :

SAFETY MESSAGE	Warning the operator, any non-conforming utilization can lead to injury to the users and damage to the equipment
	Handhandled, no tool necessary
	Information for the operator

2.2 Warning

SAFETY MESSAGE **Read all warning messages and indications in this manual.** It is imperative to observe all safety rules.

2.3 Standard conform utilization

The ULTIMAZ® apparatus was designed to install optical fibre micro-cables inside micro-ducts, in the range of dimensions suitable for this apparatus mentioned below.

In addition, the ULTIMAZ® can also be used to install junction threads.

The apparatus uses the « JETTING » method, i.e. the micro-cable is propelled by a flow of compressed air. Driving wheels steer the optical fibre in its progress.

SAFETY MESSAGE Any utilization other than those mentioned in this document is liable to damage the apparatus and endanger the operator. The operator and his employer are sole responsible.

2.4 Utilzation rules

Prior to any micro-cable installation with an ULTIMAZ®, all persons involved should be fully trained in the preparation of the apparatus and "JETTING" procedures.

Wearing eye and ear protections and protective overalls is obligatory, as well as compliance to the local safety regulations. Depending on the work-site environment, a hard hat is also recommended.

Communication between the various work posts must be checked out and the signals / safety messages such as **"STOP"** and **"FORWARD"** must be clearly understood by the operators. During a micro-cable installation, the operators will always make sure to inform the downhill operators the moment the duct is put under pressure.

SAFETY MESSAGE The micro-cable blowing head receives compressed air at maximum **12 bar pressure**. Prior to any connecting or disconnecting operation, the pressure in the input or exhaust hoses must be lowered to atmospheric pressure.

The time for pressure relief varies depending on the length and width of the duct. The operator must ensure equalization has been reached before taking any further action.

Before opening the input valve supplying the compressed air, make sure the connections are well adjusted and locked and that the ducts do not show any abnormal bends or twists. Then, open progressively.

Never cross or stand in front of a duct when it is under pressure.

The presence of dust and dirt will hamper the operation and can damage the micro-cable and the ULTIMAZ® blowing head.

2.5 Utilization limits

An average installation distance for a normal ULTIMAZ® micro-cable blowing head utilization is **500m**.

The distance reached depends on the physical characteristics of the micro-cable (weight, dimensions, rigidity, friction coefficient) and on the quality of the compressed air (moisture degree, temperature). The influence of these characteristics on a micro-cable installation by « JETTING » must be known by the operator.

Utilization limits in regard to micro-ducts and micro-cables are :

duct ∅	OD **3 to 12.7 mm**
micro-cable ∅	OD **0.8 – 4 mm**

Do not use the ULTIMAZ® feeder for any other application without our authorization. Please consult our after-sales services.

2.6 Dimensions (see Fig. A)

ULTIMAZ® blowing head with accessories : Overall dimensions in [mm]	Length Width Height	**216** **102** **149**
Outer dimensions of the carrying case in[mm]	Length Width Height	**450** **105** **360**
Average weight of ULTIMAZ® with accessories and case in [kg]	Mass	**4.1**

2.7 Performances

The performance of the ULTIMAZ® micro-cable blowing head depends on the driving unit used.

On the other hand, the ULTIMAZ® feeder is fitted with a protective device which limits the pushing force exerted on the micro-cable. This limitation is model determined and not adjustable.

V 20 version	max. force **20.0 N**

For other versions, please consult us.

2.8 Power supply

The ULTIMAZ® feeder is desgined to be connected to a cordless driving tool, such as a cordless drill or screwdriver (Bosch, Metabo, Makita, Ingersoll Rand, etc..).

These tools are to be used within following limits :

Recommended speed range	**0-600 r/min**

SAFETY MESSAGE Do not use the ULTIMAZ® micro-cable blowing head at higher speeds than those recommended. Improper vibrations could occur and damage the micro-cable.

The « JETTING » method works with compressed air :

Air supply	Compressor, compressed air bottle
Maximum pressure	p **12 bar**

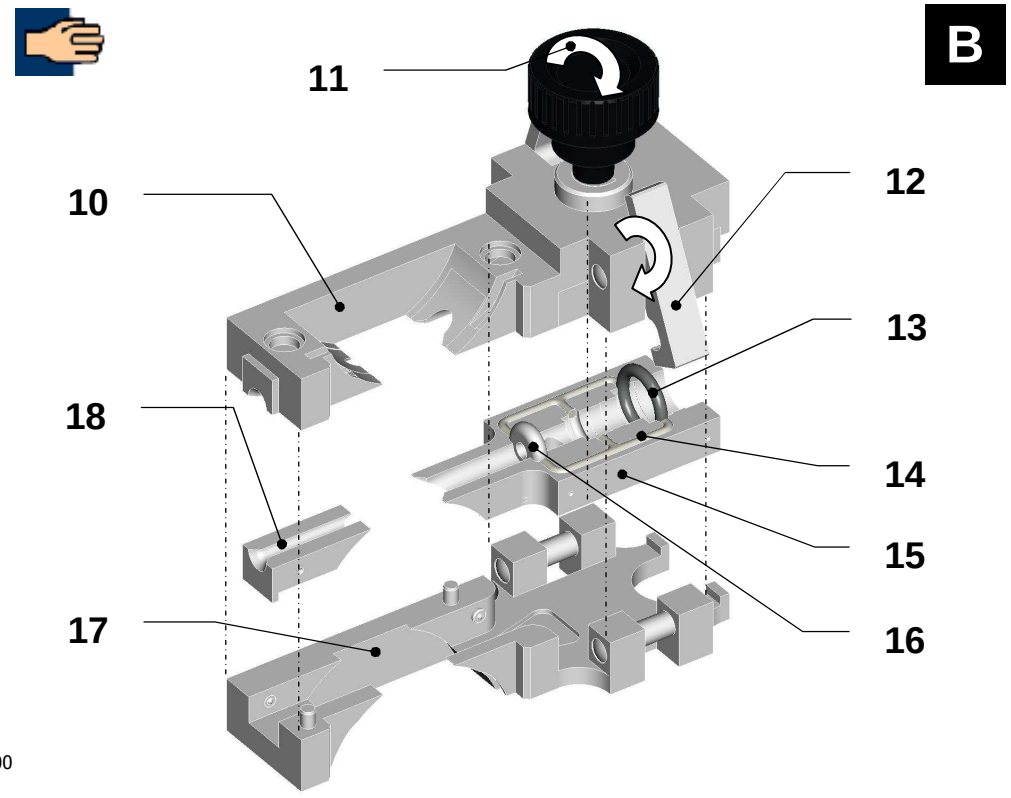
3. Description

3.1 Elements of the apparatus (see opposite Fig. A)

1. Micro-cable blowing head	**6.** Speed and distance indicator
2. Variable torque limiter and handle	**7.** Pushing knob to position and adjust the pressing force of wheel **3** on the micro-cable
3. Micro-cable pressing wheel	**8.** Air input device
4. Micro-cable driving wheel	**9.** Driving axel for connection to an external tool
5. Cartridge for micro-cable and micro-duct inserts	

3.2 Cartridge (see Fig. B below)

10. Upper body part	**16.** Micro-cable sealing joint
11. Grooved knob to block inserts	**17.** Bottom body part
12. Cartridge closing levers	**18.** Micro-cable entry guide
13. O-ring for Micro-cable tightness	**19.** Lock
14. Insert sealing cord	**20.** Cartridge locking lever
15. Micro-cable and micro-duct insert	**21.** Air input device of the blowing head into the cartridge



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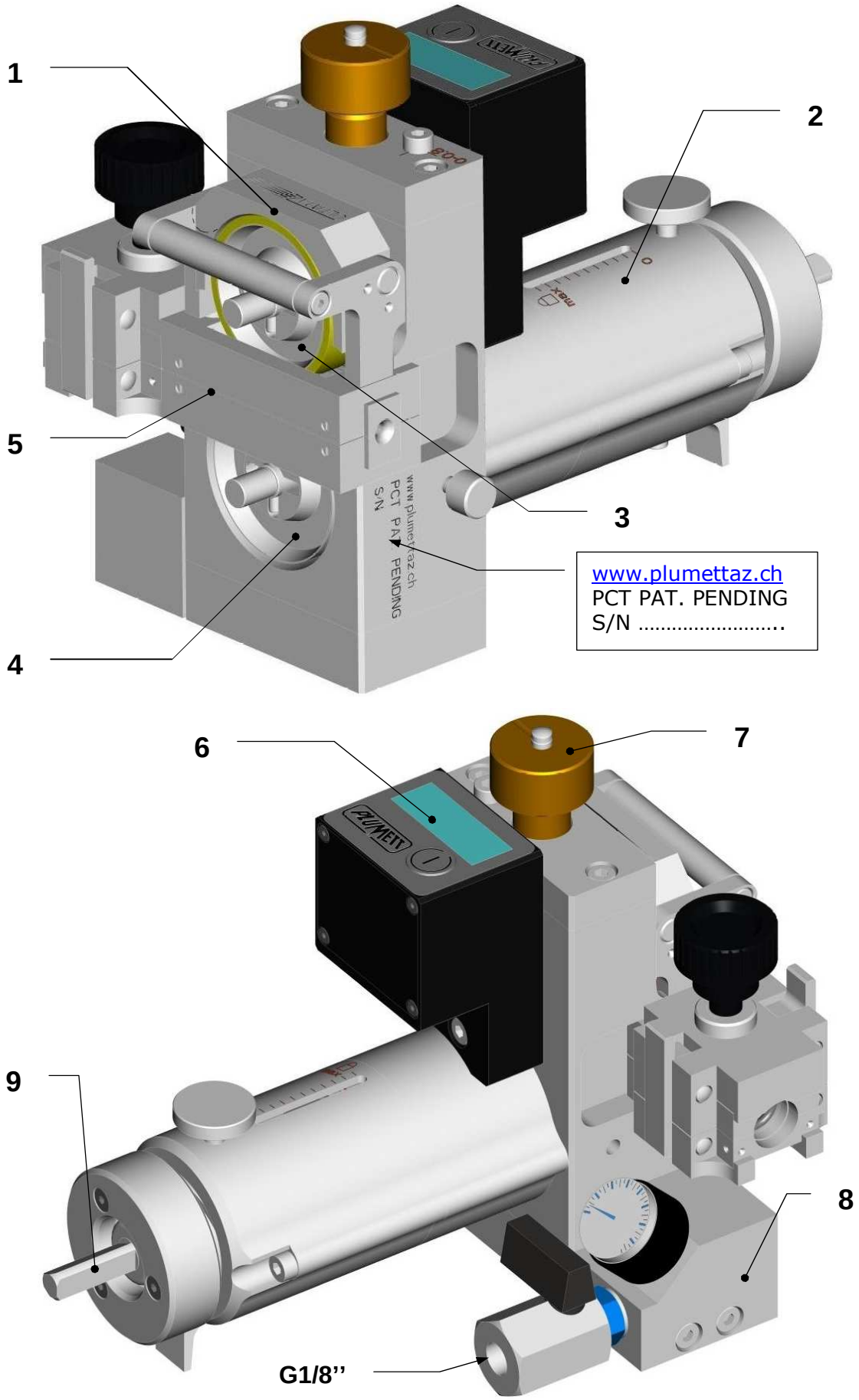


4. Utilization of the functions

4.1 Mounting and dismantling the driving and pressing wheels

Figure C

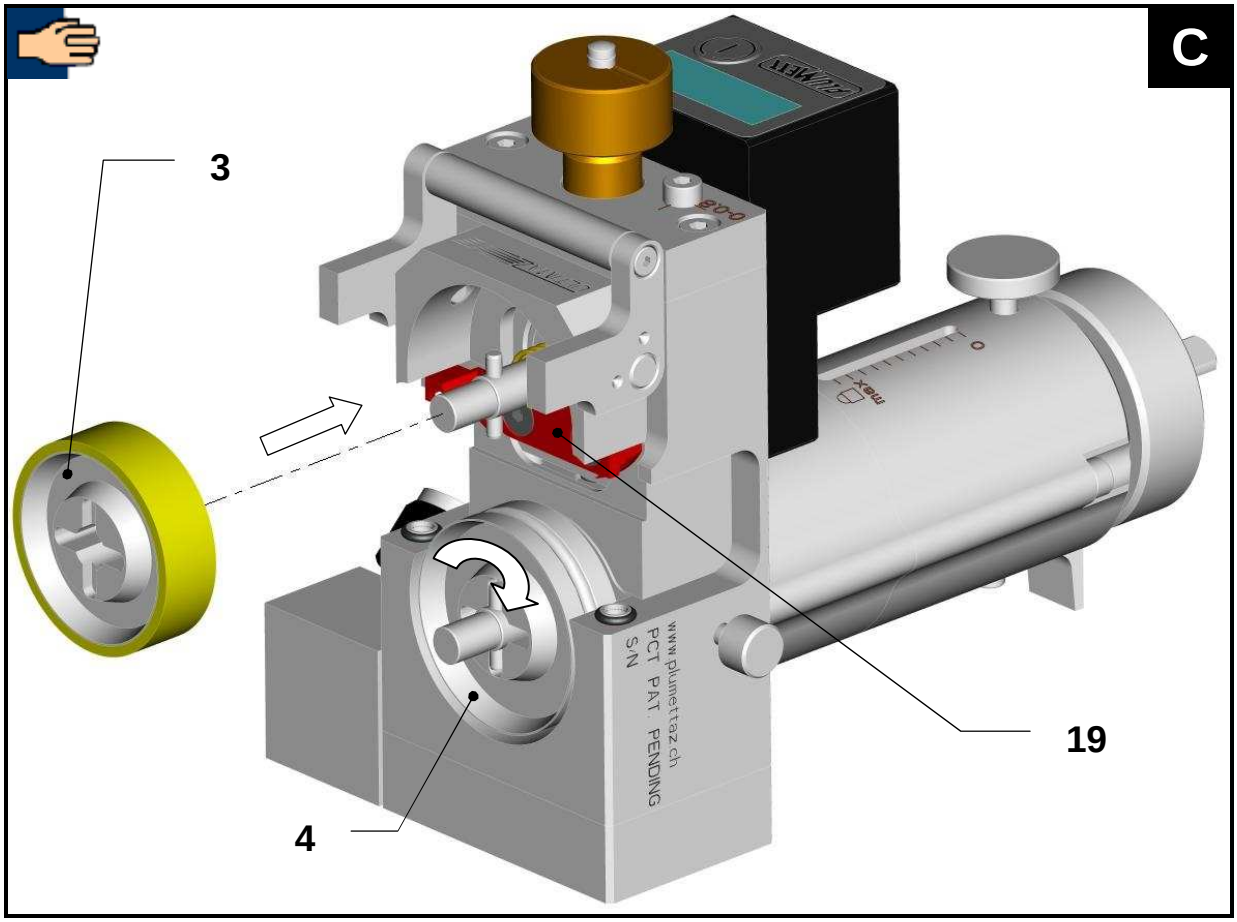
Driving wheel **4** and pressing wheel **3** will be mounted without tools. The cartridge must be removed.

Slip the wheel on the axel, making sure it is on the right side, slide it over the retainer lock and compress the spring completely.

Simultaneously prevent the axel from turning by holding the grooved part. Then, turn the wheel at a 90° angle, in any direction.

Let go the wheel. The retainer lock must slip into the groove of the wheel.

Dismantling is done the same way.



4.2 Assembling the cartridge (see Fig. B)

Mounting the cartridge with the inserts **15** and cable guides **18** is done without tools.

Preparing the cartridge is done apart from the blowing head **1**.

4.2.1 Mounting the cable-guides 18 in the cartridge

According to the micro-cable diameter, choose the adequate cable-guide **18**, following the indications below. Mount the cable-guide on the bottom body part **17** and the upper body part **10** by a simple clip.

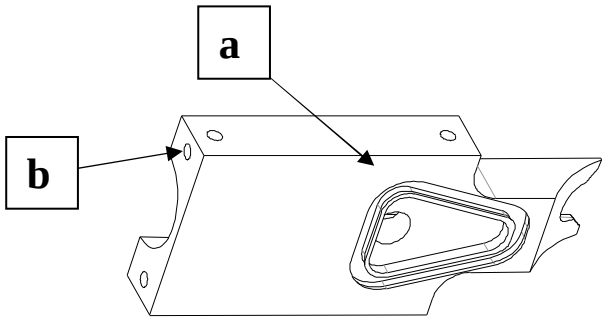
The cable-guides are designed for following micro-cable dimensions:

Micro-cable diameters	**Ø0.4 to Ø1.4 mm** **Ø0.8 to Ø2.5 mm** **Ø2.5 to Ø4.0 mm**

4.2.2 Mounting the inserts in the cartridge

According to the micro-cable and micro-duct dimensions, choose the adapted inserts **15**.

The insert which serves to let in the compressed air can be differentiated by its air inlet duct (a) situated underneath it, and by reference marks (b). By defect, mount this insert in the bottom body part 17 and the upper insert, in the upper body part 10, by a simple clip.



4.2.3 Closing the cartridge

Once the inserts **15** and the cable-guides **18** are in place, bring the upper body part **10** to touch the bottom body part **17**, keeping the closing levers of the cartridge **12** open.

The bottom and upper body parts will align themselves automatically with the two centering pins. Once the two body parts are in contact, close the levers **12**.

Lock the cartridge by screwing the grooved knob **11** by hand.

SAFETY MESSAGE Do not use a tool to screw the grooved knob. The pressure could be too great and damage the cartridge.

4.3 Inserting the cartridge on the blowing head (see Fig. D et E)

Before inserting the cartridge on the micro-cable blowing head, make sure the locking lever **20** is open and the pushing knob **7** is in high position (see Fig. D).

Insert the cartridge on the micro-cable blowing head, as shown in figure D. As soon as it is butting against the micro-cable feeder **1**, close the locking lever **20**, as shown in figure E. With this action the cartridge will close both air inlet openings **21** and the O-ring joints will seal them.

Once the cartridge is in place, lower the pressing wheel **3**, by activating the pushing knob **7** to low locking position.

Now the micro-cable blowing head is operational.

SAFETY MESSAGE It is impossible to introduce the cartridge in the micro-cable feeder, if the pressing wheel is not completely lifted, as the lock **19** will be blocking. This safety measure avoids damage to the micro-cable should the wheels be fully or partially in contact with it.

SAFETY MESSAGE Do not push hard on the cartridge if it doesn't slide in easily. The lock or the micro-cable could be damaged. Verify that the pushing knob is in its highest position.

4.4 Removing the cartridge from the blowing head

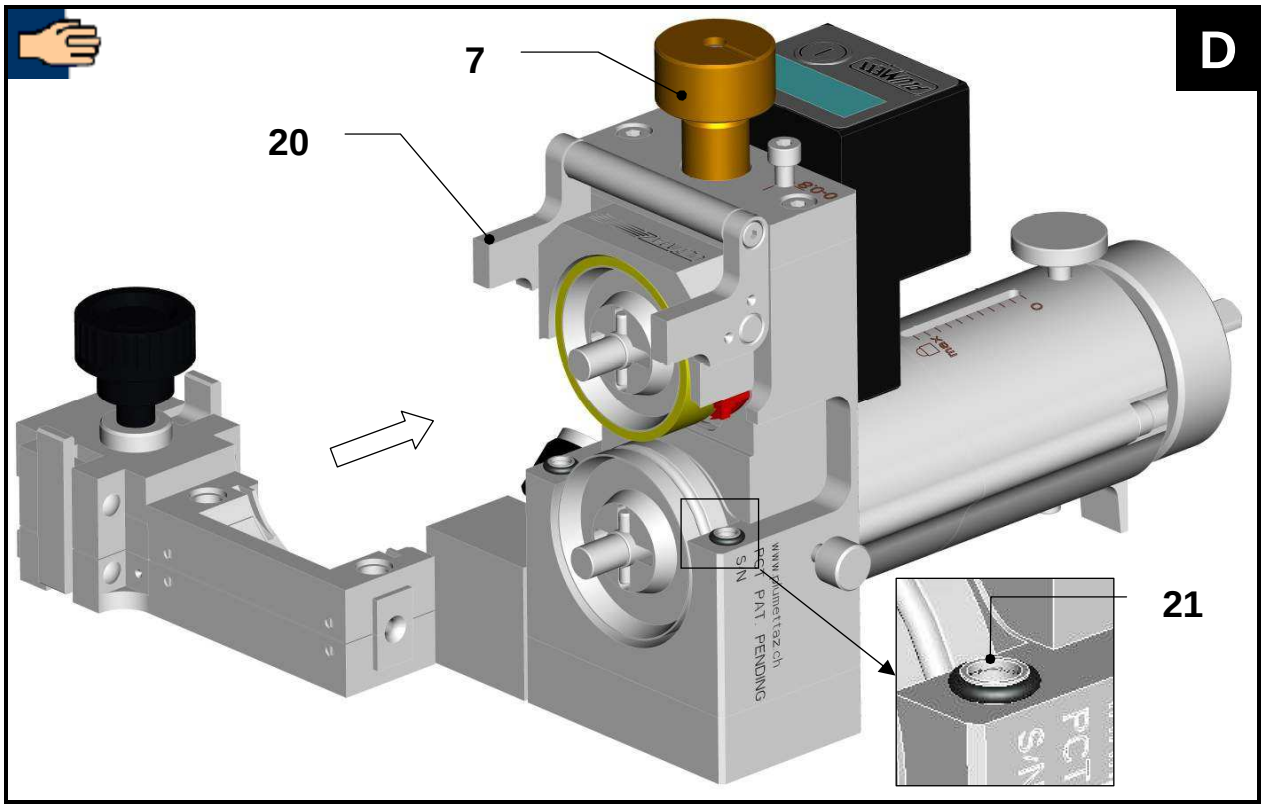
Before removing the cartridge from the micro-cable blowing head liberate the pressing wheel with the pushing knob **7** and open the locking lever **20**.

Extricate the cartridge out of the two air inlet openings **21** by hand, turning it slightly if necessary.

Then, remove the cartridge from the micro-cable feeder and store it away.

SAFETY MESSAGE It is impossible to remove the cartridge from the micro-cable feeder, if the pressing wheel is not completely lifted, as the lock **19** will be blocking. This safety measure avoids damage to the micro-cable should the wheels be fully or partially in contact with it.

AVERTISSEMENT Do not try to force out the cartridge if it doesn't free itself easily. The lock or the micro-cable could be damaged. Verify that the pushing knob is in its highest position.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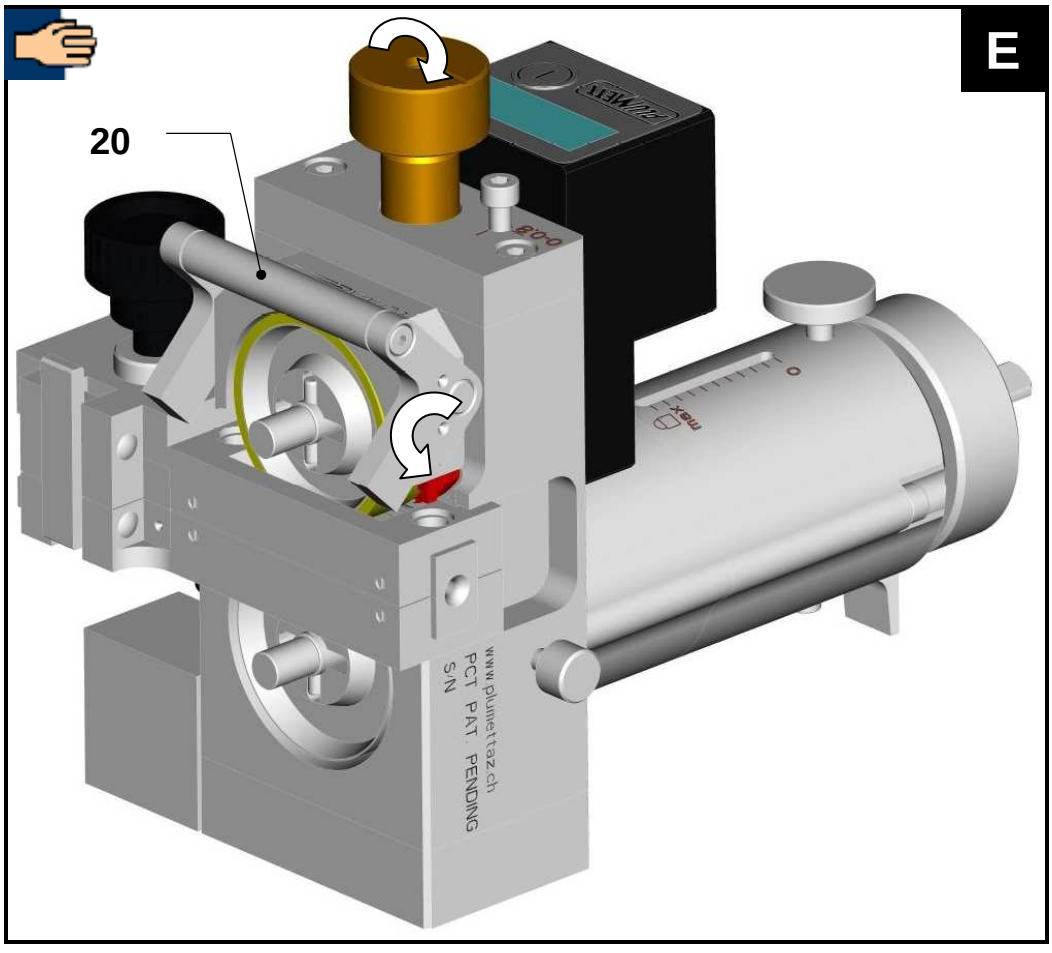
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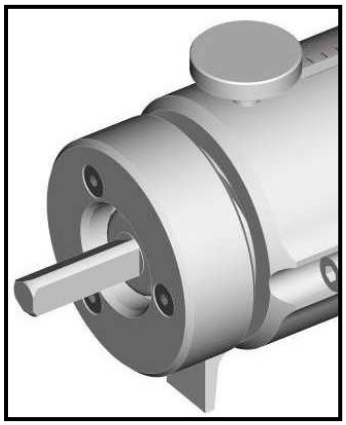
4.5 Mounting a driving device



The ULTIMAZ® micro-cable blowing head is designed to be driven by an independent motor (see **§2.8** Power supply).

Mount the motor on the three-faced axel **9** as shown on figure **A**.

SAFETY MESSAGE Do not use any other motors than those described in **§2.8**. Do not exceed the recommended speed limit, as there could be a risk of injury and damage to the apparatus. For any other type of motor, please consult us.

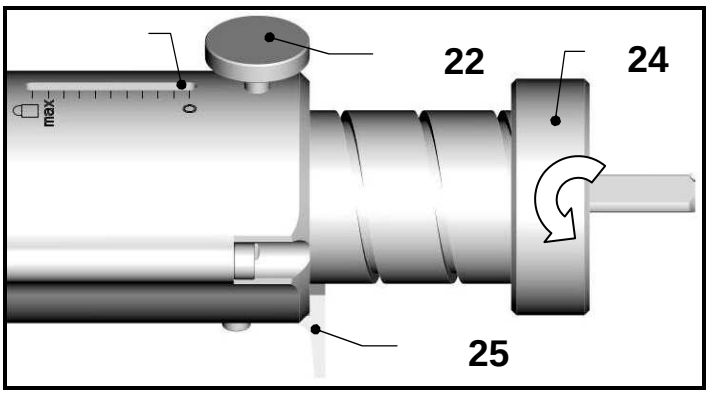
4.6 Torque adjusting device

4.6.1 Torque adjusting

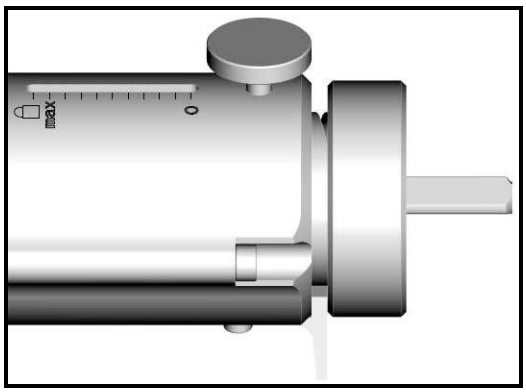
The torque adjusting device permits to limit the micro-cable driving force. The device has a **22** thumb screw which can block the torque limiter at a regulated pushing force value. As he turns the adjusting thumb screw **24** the user can visualize the torque limitation level on the measuring scale **23**. The torque adjusting device can be released when the driving tool's total torque is needed, as described in **§2.8**. To obtain this, simply push the plastic limit stop **25** with the finger and completely slide in the adjusting thumb screw **24**.

Table of pushing force adjustments :

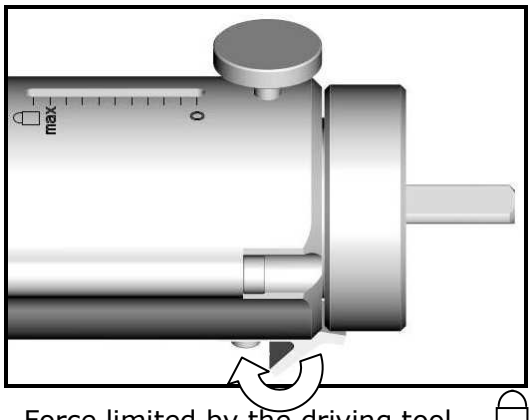
Adjustment position	Pushing force
0	0 N
max	20 N
🔒	No force limitation by torque limiter



Force = 0



Force = 20N (max)



Force limited by the driving tool

WARNING When the torque limiter is in position , the force driving the cable can exceed 20N. This will depend on the driving tool chosen, as indicated in **§2.8**. The cable can be damaged if the force transmitted by the driving tool is too important !

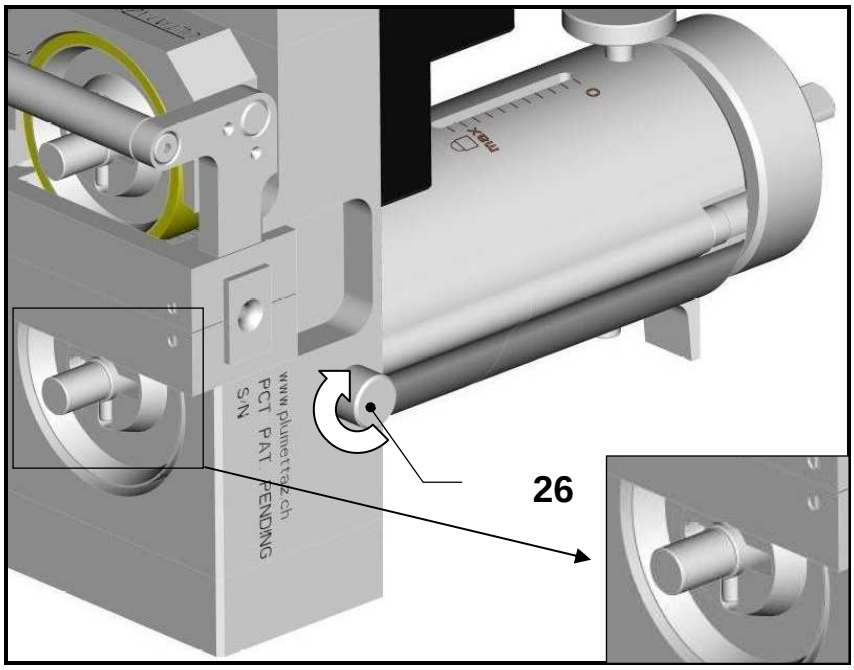
4.6.2 Hysteresis

When the magnetic transmission is modified in order to reduce the pushing force, small jerks can be observed in the transmission of the rotation movement. This is due to the magnetic hysteresis of the torque limiter.

As this phenomenon will create pushing force variations and increased risk of buckling (particularly at low pushing forces between 1 to 10 N), the magnetic transmission must be freed from the hysteresis effect.

In order to free the magnetic transmission of any hysteresis effect, proceed as follows :

1. Turn knob **24** completely anti-clockwise, to obtain a minimal pushing force.
2. Block the driving wheel by tightly screwing the blocking axel **26**. For an easy locking of the driving axel, before screwing, verify that the driving axel is positioned as depicted below.



3. Start the driving tool at low rotating speed and turn the adjusting knob **24** progressively up to the plastic limit stop 25, corresponding to maximum force. Then

turn the adjusting knob **24** in the opposite direction until reaching minimum force. This forward and reverse movement should, if possible, occur without interruption.

4. Stop the driving tool and unscrew the blocking screw **26**. Verify that the wheel axel **4** turns freely.
5. The magnetic transmission is now hysteresis free and the driving axel will turn easily and without jerks.

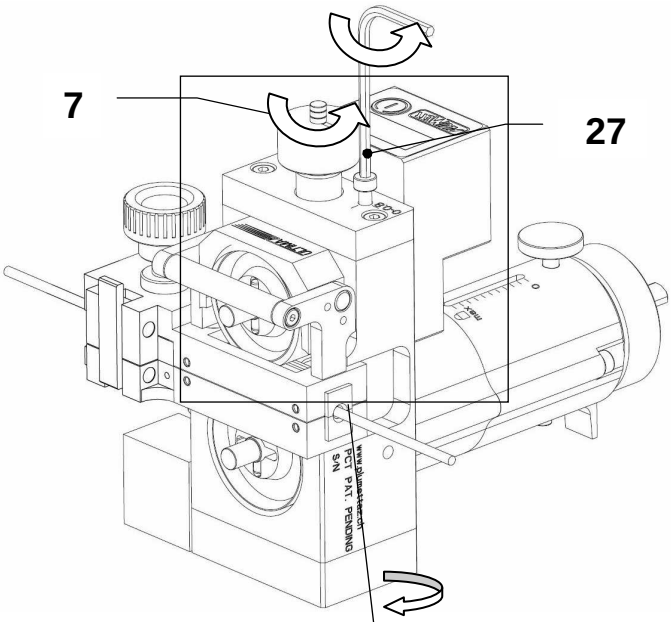
Now the magnetic transmission can be adjusted to the required pushing force by proceeding with a crash test, as described in **§5.3.1**.

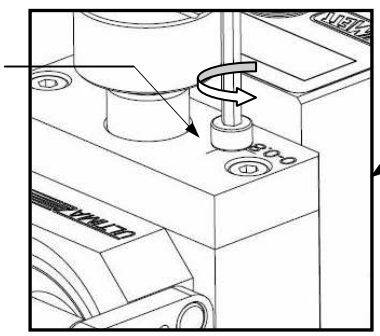
WARNING Every time the magnetic transmission undergoes a adjustment reducing the pushing force, the hysteresis effect will recur and above procedure will have to be repeated.

4.7 Adjusting the radial pressure

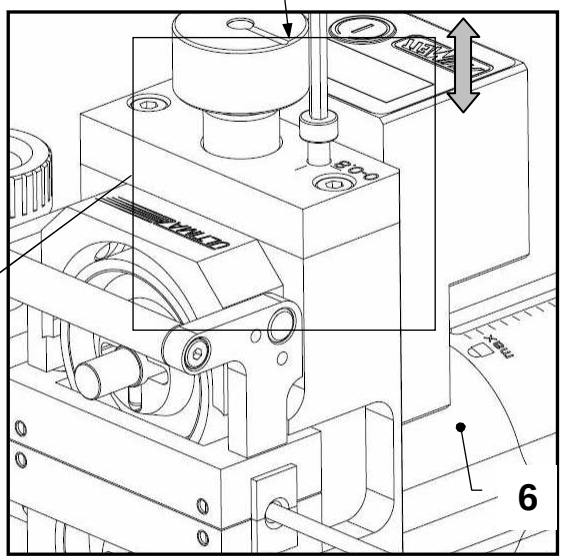
To guarantee best cable laying results and avoid any risk of damage to the micro-cable, observe following instructions. To prepare the ULTIMAZ® cable feeder and adjust the radial pressure without damage to the cable:

1. Lower the radial pressure to minimum by turning the regulation knob fully anti-clockwise.
2. With the Allen key, included in the tool set, unscrew the limit stop screw **27** by a few turns.
3. Introduce and lock the cartridge containing the micro-cable to be installed.
4. Lower the pressing wheel by pressing the speed and distance indicator **6**, until it touches the micro-cable. Maintain the pressing wheel in this position.
5. With the Allen key, fasten the limit stop screw **27** in such a way that the screw head touches the cable feeder casing.
6. Release the pressing wheel. With the Allen key, loosen the screw by approx. a quarter turn.



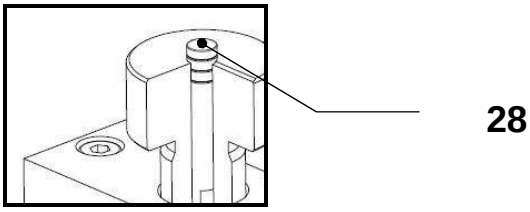


Screw head in contact, then unscrew by 1/4 turn



7. Then adjust the pressure on the micro-cable with the adjustment knob **7**. The center rod **28** indicates the pressure level exerted on the micro-cable.

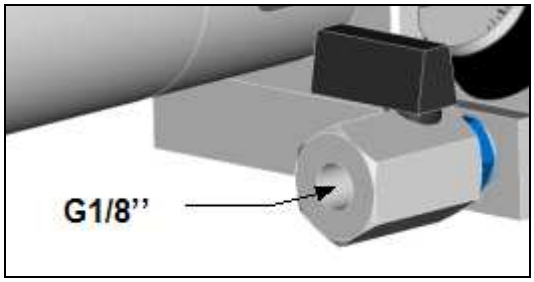
WARNING The pressure on the micro-cable must be adjusted to avoid damage to the cable sheathing.



4.8 Compressed air connection (see Fig. A)

The air inlet device **8** connects the ULTIMAZ® blowing head to the incoming air. The maximum allowed working pressure is **12 bar**.

The ULTIMAZ® micro-cable feeder comes without a connector. Any type of compressed air connector of **G1/8''** dimensions can be used.



The air inlet device is controlled by a manual valve, allowing the operator to adjust the pressure. A two-scale bar/psi manometer indicates the pressure in the air inlet device.

4.9 Speed and distance indicator (see Fig. A)

4.9.1 Utilization

The speed and distance indicator **6** permits a survey of the micro-cable installation. To activate the indicator, you just need to :

- press the knob ⏼
- turn the pressing wheel **3**

The indicator parameters are set at the works as follows :

- distance in [m] or in [ft]
- speed in [m/min] or in [ft/min]
- cumulated distance in [km] or [ftx1000]
- pressing wheel diameter 3 in [mm] or [in]

Resetting of the achieved distance indication is done by pressing 5 seconds on button ⏼ . The resetting of the cumulated distance is not permitted.

By default the indicator displays the covered distance. The display of the speed is obtainted by pressing briefly on button ⏼ . The speed display remains active during 5 seconds, and then the distance display shows up again. During that period, the speed unit display blinks.

To maintain the speed indication, press again on the button ⏼ whilst the speed unit blinks.

To display the cumulated distance, press again on button ⏼ . The display only remains active during 5 seconds and then automatically reverts to displaying the distance.

4.9.2 Lighting

The speed and distance indicator is lit by luminescent diode lighting. The lighting is automatic and depends entirely on the ambiant lighting. The lighting turns off as soon as the indicator goes on standby.

4.9.3 Battery

The speed and distance indicator is powered by a 3V DC battery, brand **CR 2 Lithium**. At reaching a certain low charge level, the display indicates that the battery needs prompt recharging.

Battery full	
Battery half-full	
Battery low	

To change the battery, unscrew the four M2 screws at the back of the indicater casing. A **1.3 mm** Allen key is included in the tool box. Remove the lid with the Allen key. The battery is removed easily with its extractor.

 **SAFETY MESSAGE** To avoid all risks for the apparatus, persons and environment, make sure to observe following prescriptions :

- Only use a type **3VDC - CR 2 Lithium** battery
- Do not insert the battery the wrong way around. The right way is marked in the battery lodging.
- Do not use batteries that show apparent defects
- Do not use batteries that have leaked
- Do not attempt to recharge or dismantle the batteries
- Do not expose the batteries to high temperatures (max. 50°C)
- Disposal : cover the poles with tape to avoid short-circuits. Do not discharge with household waste

4.9.4 Desiccator

Inside the speed and distance indicator casing there is a silica gel pearl sachet. This sachet absorbs the humidity in the casing and prevents the glass pane from misting over. This sachet can be ordered for renewal at your PLUMETT agent's.

5. Instructions for use

5.1 Conformity declaration

The ULTIMAZ® blowing head was designed in conformity to the 98/37/CE directive for machines.

5.2 Utilization environment

The ULTIMAZ® micro-cable feeder is designed for use in normal utilzation conditions.

Storage temperature	**-20°C** < T < **+70°C**
Ambiant utilization temperature	**-10°C** < T < **+40°C**
Moisture degree	**0 … 100%**
Protection number	**IP 55** maximum
Resistance to shock and vibrations	**EN 60068 2-6 et 2-32**

5.3 Preparation for JETTING

SAFETY MESSAGE To guarantee best installation results and avoid any damage to the micro-cable, all the procedures described in chapter **4** must be known, practised and observed.

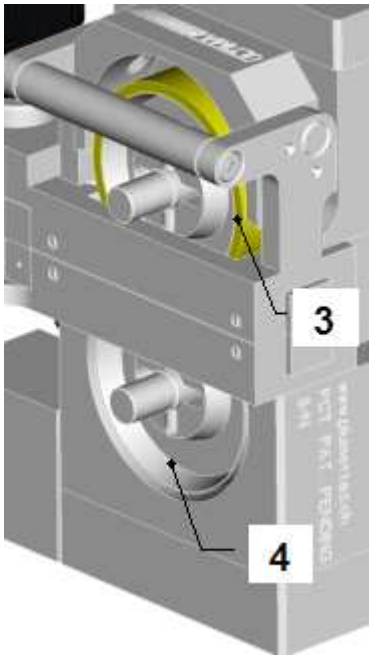
SAFETY MESSAGE Before preparing for « JETTING », the operator must enquire about the characteristics of the micro-duct route, such as its length, situation and the dimension of the bends and obstacles, such as duct connectors, the slope, the micro-duct material and cleanliness. He must also know the characteristics of the micro-cable to be installed, its dimensions, rigidity and quality of fiber sheathing.

5.3.1 Checking the pushing force, « CRASH TEST »

Every optical fiber micro-cable has its own mechanical characteristics. Therefore it is necessary before installing any new fiber to verify with a « **CRASH TEST** » that the pushing force is not too great.

« **CRASH TEST** » procedure :

- Prepare a length of one to two meters of micro-duct by plugging one end. Place the open end in the insert that corresponds to the micro-duct OD
- Push the sealing joint on the fiber and place into the insert
- Close the cartridge
- Check by hand that the fiber is friction-free and introduce into the micro-duct by a few centimeters.
- Install and lock the cartridge in the ULTIMAZ® cable-feeder.
- Lower the pressing wheel on the micro-cable
- Connect an exterior motor to the micro-cable blowing head driving axel (see **§4.5**)
- Blow the fiber at maximum recommended speed (see **§2.8**), until it abuts in the micro-duct
- Observe the action of the driving wheel **4**. When the fiber abuts, the wheel must stop without slipping and without causing any damage to the fiber sheathing.



If the wheel turns, the fiber sheathing could be damaged by friction. In such a case, find a better adapted pushing force.

5.3.2 Preparing the machine

In regard to the micro-cable and micro-duct OD :

- Choose the appropriate driving wheel **4** and mount on the cable-feeder, following **§4.1**
- Mount the pressing wheel **3** the same way
- Prepare the cartridge (see Fig. B)
  - Choose the appropriate cable guides **18** and mount them in the cartridge, following **§4.2.1**
  - Choose the appropriate cable / duct inserts **15** and mount them in the cartridge, following **§4.2.2**
  - Neatly clean-cut the micro-duct end and set in the appropriate O-ring joint **13**

> **i** Notch the O-ring joint with a cutter in order to be able to remove it from the micro-duct once the installation is completed.

> **i** If necessary inject some MICROJETTING LUBE into the micro-duct, to lubricate and easen the installation.

  - Place the duct in the corresponding lower insert jaw **15** and the O-ring in its corresponding lodging
  - Insert a sealing joint **16** around the micro-cable.

Notch the sealing joint with a cutter in order to be able to remove it from the micro-cable once the installation is completed.

To prevent the micro-cable extremity to get hooked or stuck in the the micro-duct connectors, use a cable cap. The OD of a cable cap should not exceed the micro-cable OD by more than 0.5mm

- o Place the micro-cable and the sealing joint in the lower insert **15**, taking care to introduce ~20 cm of micro-cable in the micro-duct.
- o Close the cartridge following **§4.2.4** making sure that the micro-cable is properly aligned in the central guidance groove

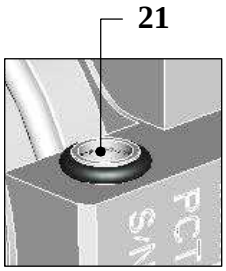
Once the cartridge has been locked, verify that the micro-cable slides without friction.

- ❑ Insert and lock the cartridge in the micro-cable blowing head following **§4.3**
- ❑ Lower the pressing wheel with the pushing knob **7**

Once the cartridge is in place, connect the compressed air and proceed to check the air tightness (see Fig. **A**) :

- ❑ Screw a convenient duct connector to the valve of the air inlet device **8**. Connector dimension : G1/8''
- ❑ Connect the compressed air, making sure the working pressure does not exeed **12 bar**
- ❑ Hold the micro-cable so that it does not jerk out of the cartridge as the air inlet valve is opened and check for tightness.
- ❑ If tightness is lacking, revert to the preparation of the cartridge and verify that all the seals are in place, clean and undamaged.

Also check the O-ring seals **21** (see Fig. **D**) between the blowing head the the cartridge



Finally connect an external motor to the driving axel **9,** following **§4.5**.

The micro-cable installation by « JETTING » can start.

5.3.3 Cable installation by JETTING

Prior to starting the installation :

- ❑ Make sure the speed and distance indicator **6** has been reset, following **§4.7**
- ❑ Note the distance indication that should be marked on the micro-cable. This will help to localize any installation problem.

Start the installation on slow speed and increase progressively to an average of **25 à 40 m/min**.

As soon as the speed is stabilized, open the air inlet device valve **8** a little until the manometer displays a pressure between **2 to 3 bar** maximum.

As soon as the speed diminishes, increase the air pressure progressively by opening the air inlet valve **8** some more.

Once the valve is completely open and the speed starts slowing down, the installation is reaching its end.

SAFETY MESSAGE When the installation stops, make sure to first close the air inlet device valve **8** and let out all the air in the duct. This may take a few seconds. Only after this operation, may the cartridge be removed safely, following **§4.4**.

6. Maintenance

To guarantee optimal functioning of the ULTIMAZ® blowing head and its accessories, within the utilization limits as defined in **§2.5**, it is recommended to observe the following maintenance plan :

Periodicity	**Maintenance**
Daily	Quick blow clean with compressed air, removing the dust on the driving wheels, inserts and cartridge.
Weekly	For a thorough cleaning, remove the insert cartridge from the blowing head, following **§4.4**, the driving and the pressing wheel, following **§4.1**. Open the cartridge and retrieve the inserts. Blow clean with compressed air to remove the dust. Additionally the cartridge and inserts can also be cleaned with water. Beware, do not immerse the micro-cable feeder, just wipe with a humid cloth. After cleaning with water, wipe thoroughly with a dry cloth. If the insert or micro-cable feeder seals are damaged, change them in order to avoid air leakage.
Once a month	Proceed with the same cleaning as weekly. Depending on the frequency of use, it will be necessary to clean the pressing wheel guiding columns. Follow the procedure described below to have access to and dismantle the guiding columns.

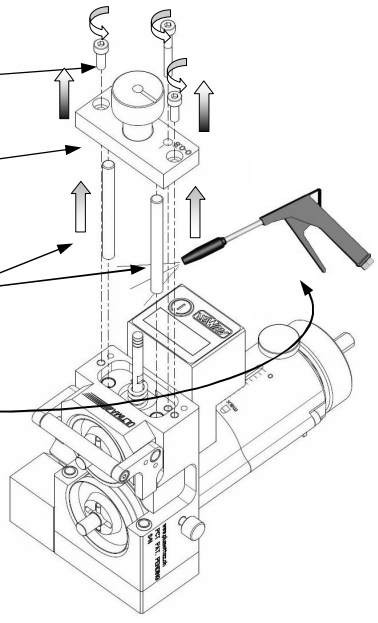
To dismantle :

Remove the 2 Allen screws (key 3) of the lid

Lift the lid

Remove the guiding columns, and clean

Blow clean with compressed air



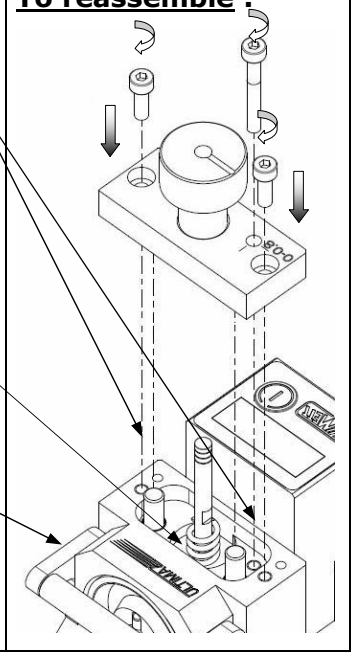
To reassemble :

Put the guiding columns back in place

Make sure to put the springs back in place

Close the lid

Verify that the pressing wheel **3** slides smoothly



7. Troubleshooting

The list below enumerates a number of malfunctions that might occur during operation. For any other problem, please contact your PLUMETT agent (see **§1.2**).

Micro-cable feeder

Difficulty to mount the pressing and driving wheels (Fig. **C**)	Verify that the wheel axels are clean. Verify the state of wear of the wheels, change them, if necessary.

Difficulty to mount or retrieve the cartridge (Fig **D**)	Verify that the pressing wheel is correctly in place by activating the grooved knob **7**.
The pressing wheel of the micro-cable does not lift enough, even if the grooved knob **7** is in the upper position	Lift the wheel by hand, using the speed and distance indicator. If the problem persists, clean the guiding columns, following **§6**.
The cartridge does not lock correctly (Fig. **E**)	Verify that the cartridge is positioned correctly on the micro-cable blowing head.

Cartridge (Fig. **B**)

Difficulty to close the cartridge	Verify that the micro-cable/duct inserts **15** are correctly in place. Verify that the micro-duct is correctly inserted in its lodging. Verify that the micro-cable/duct insert corresponds to the micro-duct dimensions

Speed and distance indicator 6

The counter display is blinking	Battery indicator shows charge is low.
Mist is covering the display	Change the dessdicant sachet inside the casing. The mist will disappear by itself.

8. Placing out of service, recycling

8.1 Waste disposal

Disposal of accessory parts must be done without harm to the environment.

Do not dispose of metal parts in a household waste bin.

Do not dispose of the speed and distance indicator battery in a household waste bin, but bring it to a used batteries collection center.

Materials used are : stainless steel, aluminum, and plastic (POM). Seals and O-rings are of nitrile (elastomer NBR).

8.2 Placing out of service

If the apparatus must be placed out of service for some time, make sure to remove the speed and distance indicator battery.

At end of life, the various parts of the apparatus can be easily taken out and recycled according to their material as described in **§8.1**.

Subject to modification

VISION & PERFORMANCE