

# Canvas Stretching Machine

## **TENDY 100 - TENDY 150**



## **USER AND MAINTENANCE MANUAL**

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## **IMPORTANT NOTES FOR YOUR SAFETY**

- **This User and Maintenance Manual is provided with the CANVAS STRETCHING MACHINE. Please read it carefully and keep it available to learn correctly the machine functions and for further reference.**
- **The CANVAS STRETCHING MACHINE must be exclusively operated by suitably trained and adult staff. Keep children away from the machine and its working area.**
- **The CANVAS STRETCHING MACHINE is provided with safety systems. Do not remove or modify them for any reason. Check periodically their efficiency, as the machine must not be used while safety systems are inefficient or missing.**
- **Do not use the CANVAS STRETCHING MACHINE under the effects of drugs, alcohol or medicines.**
- **Always work in well-lit environments.**
- **The CANVAS STRETCHING MACHINE is an heavy device, therefore do not move it alone.**
- **Verify periodically that all the screws and nuts in the machine have not loosened.**
- **Pay constant attention during operations!**
- **Place the canvas to be stretched on the machine being sure that your hands are out of the working area of the canvas clamping bar**
- **When the machine is not working and is left unattended, switch off the air supply.**
- **Do not execute any maintenance interventions if you do not have the necessary training. Please always contact our Technical Service.**
- **During stretching operations, only the operator should stay close to the machine.**

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## SECTION 1 – GENERAL INFORMATION.

### 1.1 Manufacturer

PILM INTERNATIONAL produces framing machines for over 30 years. The acquired experience has allowed to develop machines fit to satisfy different needs, putting at the first place the quality generally understood as:

- ease of use
- safety
- operating precision
- reduction and streamlining of the maintenance

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### 1.2 Assistance

The PILM INTERNATIONAL machines are distributed by a varied sales network both in Italy and abroad. Get in touch directly with PILM INTERNATIONAL to phone numbers abovementioned for any information about the local assistance network. For any inquiry about use, maintenance and spare parts, it is also possible to contact the same PILM INTERNATIONAL directly, specifying the identification data of the machine reported on the label in the side part of the pneumatic equipment.



Identification label

### 1.3 Certification

The machine is produced according the relevant EU directive in force when it was placed on the market. Along with the manuals supplied with the machine, it is also included the declaration of conformity.

### 1.4 Warranty

The machines manufactured by PILM INTERNATIONAL are made for a long life and supplied completely assembled and tested in our PILM premises. Upon receipt of the goods, check the machine to verify any damage during transport. Any claim must be notified by written communication to the carrier and to PILM INTERNATIONAL within 3 days from the receipt, specifying the serial number on the label located on the rear part of the machine.

The warranty expires after 24 months for mechanical parts and 12 months for the pneumatic ones; the wear parts (as clamping bar rubber) or handling by the operator (as pedal, lever, etc.) are not under warranty as well as the parts subject to loss as toolbox, tools, etc.

The warranty includes just the repair or replacement of the defective parts; in any case, the shipping charges are at consignee's charge.

The warranty expires if:

- The user does not comply with the instructions of this manual.
- Modifications are carried out without a previous authorization by the Manufacturer.
- Repairs are carried out by non-authorized personnel.
- The machine is used in a different way than the stated one.
- The original parts were replaced by other manufacturers' pieces.

## 1.5 Manual intended use and conservation.

The customer should read very carefully the information included in this manual. In fact, the aim of the manual is to provide all necessary knowledge for an appropriate use of the machine as well as to be able to manage it in the most independent and safety way. For any doubt about the instruction's right interpretation, please contact the manufacturer.

The manual is addressed both to the user and to the maintenance technician. The user should not make any operation reserved to the maintenance technician.

The manual instructions should be kept close to the machine, in a place where nothing could jeopardize its legibility.



**Attention:** This manual or a copy of it must always be available to be used by the operator as well as follow the machine in case of movement, as sale or loan.

## SECTION 2 – MACHINE FEATURES

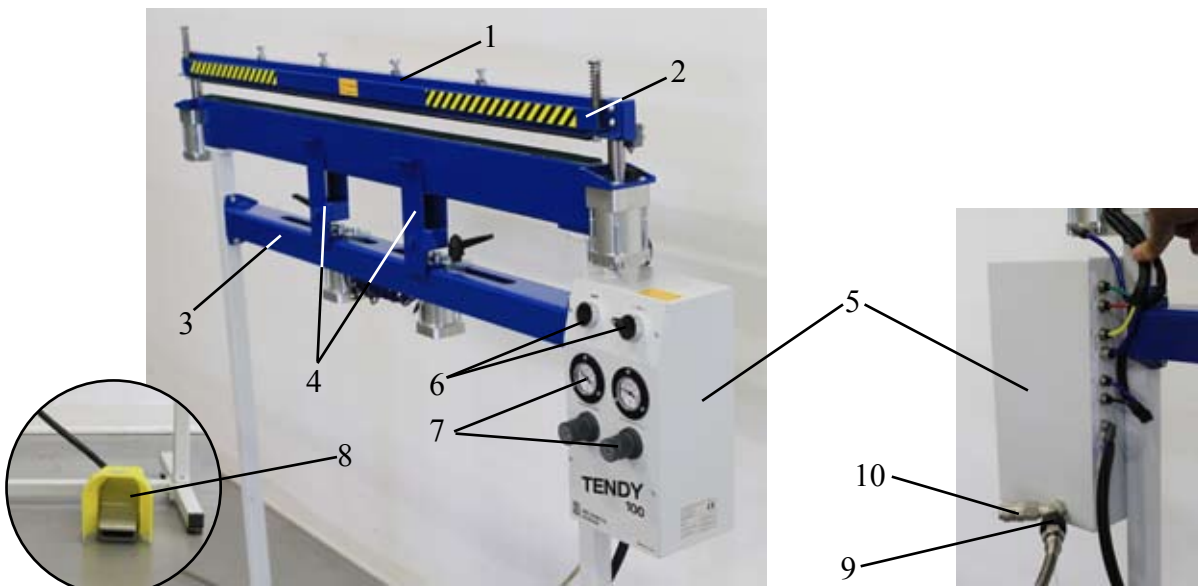
### 2.1 OPERATING PRINCIPLE

The Tendency 100/150 is a pneumatic machine to stretch the canvas over the frame; it has a pneumatic clamping bar of the canvas and 2 height adjustable pushing devices. The stretching machine is supplied with the long nose pneumatic gun to allow the canvas fastening on the back of the frame.

### 2.2 TECHNICAL FEATURES

	<b>Tendency 100</b>	<b>Tendency 150</b>
<b>Maximum frame sizes</b>	cm 100x100	cm 150x150
<b>Maximum Height</b>	cm 130	cm 165
<b>length</b>	cm 117	cm 167
<b>width</b>	cm 48	cm 60
<b>Clamping canvas height</b>	cm 122	cm 158
<b>Weight</b>	kg 34	kg 46
<b>Overall sizes and weight of the packed machine</b>	32x35x120 - kg 36	32x35x168 - kg 48,50
<b>Power:</b>	Lubricated and filtered compressed air with pressure line from 2,5 bar to 8 bar.	

### 2.3 Machine description



The stretching machine TENDY 100/150 is made by a steel bearing structure over which has been assembled:

- a clamping bar provided with special rubber for the canvas gripping and the screws to adjust the uniformity gripping pressure (ref.1)
- a safety bar to avoid the finger crushing risk during the working cycle (ref. 2)
- the bar (ref. 3) with the 2 pushing devices (ref. 4) to stretching the canvas, that are height and length adjustable to be fit to any frame profile
- the pneumatic equipment (ref. 5) with controls (ref. 6), the adjustment and check devices (ref. 7) and the pedal (ref. 8), the quick connection for the pneumatic stapler (ref. 9) and the air line or the compressor connection (ref. 10)

## **2.4 Working environment**

The machine doesn't need any particular environmental condition, it should be located inside a lighted place with a solid and level floor. Temperatures between 5° and 40°C where the humidity do not exceed 60%. The lighting of the premises should warranty a good visibility from any point as well as do not create any reflection.

## **2.5 Vibrations**

Under conditions of correct use, the vibrations do not arise any dangerous situation.

## **2.6 Sound emissions**

For its own manufacture, the machine do not present dangerous sound emissions level.

The elements, that cause the exposure level to which is subject the operator, include the exposition time, premises features and others close noise sources. Anyway, with the mentioned information a better analysis of the risk and the danger will be made by the operator.

## **2.7 Electromagnetic environment**

The machine is made to work in a normal industrial electromagnetic environment without causing any change about the air functioning.

# **Section 3 - SAFETY**

## **3.1 General safety information**

Before making any operation, the user must read the information of this manual carefully, in particular the property safety precautions below mentioned:

- Keep the machine and the working area tidy and clean
- Forecast adequate space for storage both for the final product and for the material to assemble
- Do not use the machine if not in normal psychophysical conditions
- Wear suitable working clothes to avoid any hindrance and/or dangerous snag on the machine
- Wear the individual care devices indicated by the manual instructions, according the operations to make
- Do not remove or modify the labels applied by the Manufacturer
- Do not remove or elude the safety devices of the machine
- Keep the fingers away from the canvas blocking bar working area.
- Unplug the air connection for maintenance

### 3.2 Intended use of the machine

The machine has been studied and manufactured for the canvas stretching over the wooden frames, any other use is considered contrary. Pilm international denies any responsibility for an improper use.

PILM INTERNATIONAL is relieved from any responsibility for damages caused by any change made to the machine.

### 3.3 Idleness of the machine

The machine must not be used:

- for different purposes from the ones explained in the point 3.2
- In an environment with high dust and/or oily substances concentration in air suspension
- in a fire risk environment
- exposed to weather conditions
- for materials processing not fit to the machine specifications.

### 3.4 Danger zone and safety devices

The stretching and stapling zone are defined as “working area” and “dangerous area” of the machine, as they are affected by moving parts.

The machine is supplied with a safety bar that avoids any possibility to put the fingers into the working area. For your own safety it must not be removed.

A further safety is the pedal operating that allows the lowering of the clamping upper part through its weight. If fortuitously, the fingers remain between the clamping bar, there is no crushing, but just the pressure due to the weight of the clamping upper part; releasing the pedal, it comes on its original position.

### 3.5 Machine stop

The machine can be stopped by:

- stop obtained by disconnecting the quick-release connection of the feeding plant (category 0).
- The normal machine stop (category 2) putting the cycle diverter in the position “0” blocking the working cycle, re-establishing the initial conditions.
- If the machine is not working, pushing the button “reset” to back to the initial conditions.



### 3.6 How to work safely

The machine has been conceived and designed with the aim to avoid any related risk with its use. A suitable background is required to the final made and this training can be made by a PILM INTERNATIONAL technician. The remaining risks related to the manual working way concern the fingers crush in the canvas stretching and stapling zone.

Even if the safety bar is placed correctly, it's necessary to follow these rules of conduct:

- keep the fingers away from the working area
- switch off the air supply during any maintenance working area disconnecting the quick-release feeding connection.



### 3.7 Remaining risks

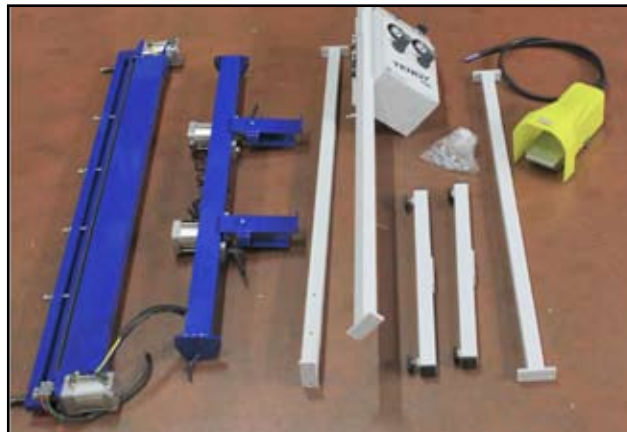
During the normal working cycle and the maintenance, the operator is exposed to some remaining risks that, due to the nature of the operations, cannot be completely removed: crush risk of the fingers in the working area caused by the movement of the clamping and stretching device.

## Section 4 – INSTALLATION

### 4.1 Transport and handling

The transport should be made by trained staff. The machine must be shipped in order to avoid any damage and according the kind of dispatch, it is necessary to make a package shock and stressproof.

The lifting of the machine must be made at least by 2 persons.



Any damages caused during shipment or handling are not covered by WARRANTY. Repairs or spare parts replacements are at customer's charge. See point "1.4 Warranty" for any communication about damages

### 4.2 Storage

In case of long idling state, the machine must be stored with all precautions about place and storage time.

- keep the machine in a closed place
- protect the machine against shocks, stresses and dust
- protect the machine from humidity and high temperature range
- avoid that the machine comes in contact with corrosive substances

### 4.3 Predisposition working area

To install the machine it is necessary to prepare a working space fit to the machine sizes as well as the pieces to produce, considering that the operator works both in front of the machine and on the back of the same.

### 4.4 Unpacking

The stretching machine is shipped partially disassembled and packed in an appropriate carton box internally protected by proper filler. Remove the packaging and keep it for any further use. Check if the machine as suffered any damage during transportation and eventually inform both the forwarding agent and the supplier within 3 days from the receipt (see point 1.4).





## 4.5 Assembling of the machine

The machine is supplied disassembled to reduce the overall sizes. The assembling must be made by two persons.



1) Assemble the base tightening the bolts up deep. Pay attention to the position of the lateral side that must have the holes on the top. Adjust the base stability with the levelling feet



2) Assemble the two columns, of which one includes the pneumatic equipment that must be placed on the outside as per attached picture. Screwing the bolts deep.



3) Position the bar with the pushing devices tightening the bolts up deep

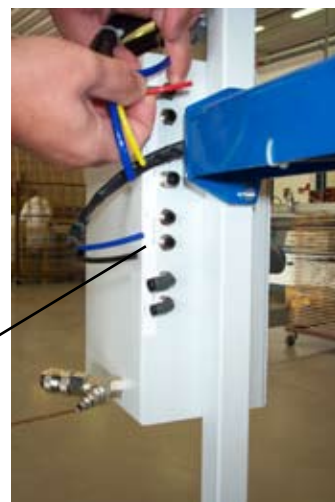


4) Position the stapling bar over the columns and inside the 2 pushing devices



5) Center the bolts and tighten them up deep.

6) Make the air connections according the instructions both of the single units and the pipe colour

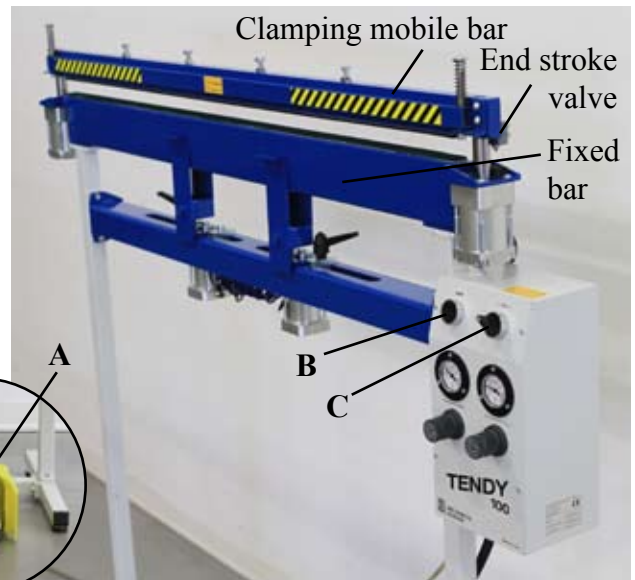


End Stroke	Canvas Locking		Canvas Stretching		Pedal		
Green	Red	Yellow	Blue	Blue	Black	Blue	White

## 4.6 Preliminary checks

The stretching machine works exclusively by compressed air through the following controls:

- the pedal (ref. A) that allows the lowering of the upper clamping bar without pressure and it also gives the permission to do the stretching cycle operation
- the reset button (ref. B) that delete the lowering of the clamping bar
- the diverter 0-1 (ref. C) that allows:
  - to execute the stretching cycle when it is positioned on "1"
  - to restore the default setting putting the diverter on position "0"



Once the connection to the pneumatic feeding line is made, check the following:

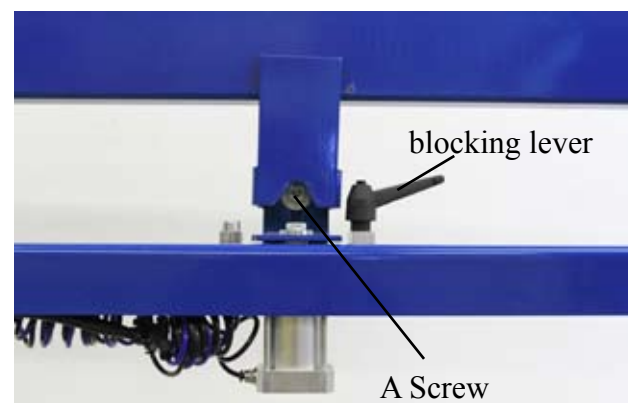
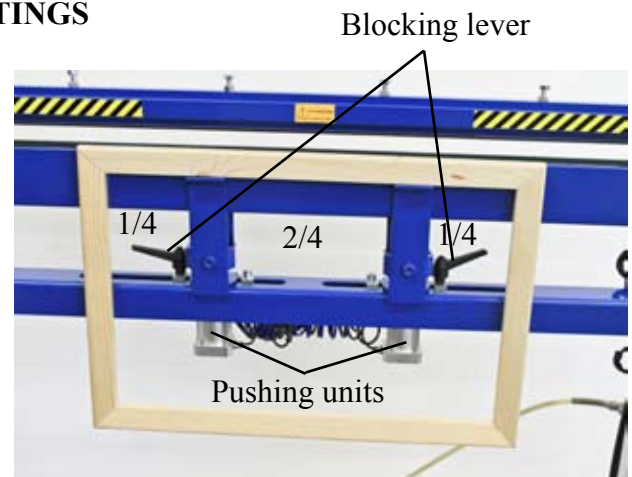
- unlock the levers of the two stretching units and check they slide along the relatives slots. Press the pedal after having kept the hands away from the clamping area.
- check that the upper clamping bar goes down due to its own weight as well as the go-ahead cycle end stop; this condition is clear if, releasing the pedal, the bar goes up
- pushing the reset button the default settings are restored; that is the bar comes back to the initial position.
- pushing again the pedal and after having had the go-ahead cycle, put the deviator on position "1", check the tightening of the clamping bar and, after 2/3 seconds, the activation of the two stretching units.

## Section 5 - SETTINGS

### 5.1 Pushing units adjustment

The machine is equipped with 2 adjustable pushing units both sideways than vertically for a correct frame positioning; unloosing the block lever and moving it in the desired position. Usually the position of the pushing units is  $\frac{1}{4}$  and  $\frac{3}{4}$  of the frame width and with the same centrally placed with respect to the machine.

When the position is reached, lock the 2 pushing units deep through the respective levers. For height adjustment, position the frame over the pushing units and release the screws A by the appropriate wrench; then move the pushing units in order that the external side of the frame is balanced or a little bit lower than the rubber stripe of the bottom clamping bar. Then, tighten the screws of the two pushing units deep; in case of small frame dimensions (as 20x30 cm.), the machine works just with one pushing unit.

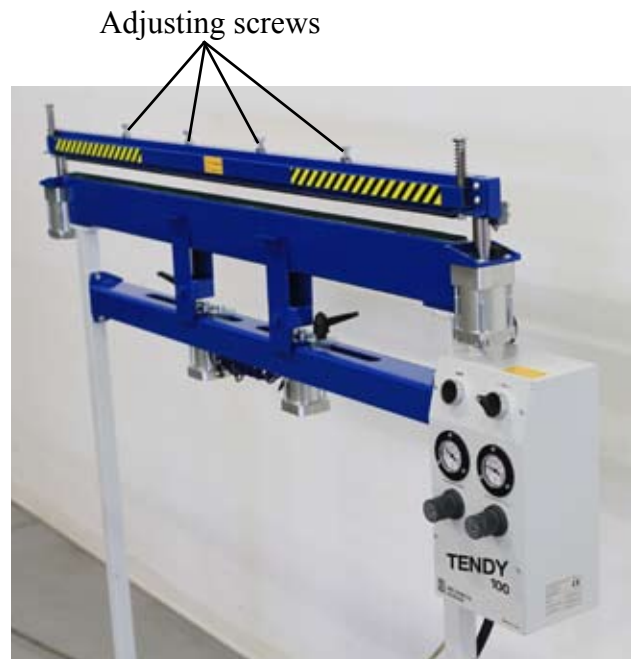


## 5.2 Upper pressure bar adjustment

The upper pressure bar must be aligned perfectly with the lower one, so the pressure of the side cylinders allows a constant clamping along the width of the canvas. To get this, the upper bar is provided with bolts to obtain a uniform alignment; the bolts calibration is made during the testing of the machine. To check the alignment, using a straight bar, all the ends of the bolts must get in touch with the same bar, after having blocked the counter nuts of the bolts.

The calibration of these screws is made during the start-up of the machine, but it might be necessary to do it again during its use.

The checking of the clamping uniformity is obtained making a stretching cycle with a frame and a canvas large at least 2/3 the size capacity of the machine (i.e. For Tendy 100 the canvas length will be about 70 cm.). Setting the values of 2,5 bar for clamping and 3 bar for pushing, the two pushing units raise at the same time and constant ; this can be verified seeing the frame run that must be parallel to the clamping bar when it reaches the end stroke. If it should be tilted by one side, keeping the canvas clamped release the adjusting screws where the frame is lower and move them close again without forcing and lock the counter nut. Then, repeat the cycle and check the correct parallelism between the frame and the correct bar. The end of the adjusting screws must be in touch with the bar after having locked the counter nuts of the same screws. Sometimes, it may be necessary to create a light convexity, anyway, the best and more practice solutions come from the experience.



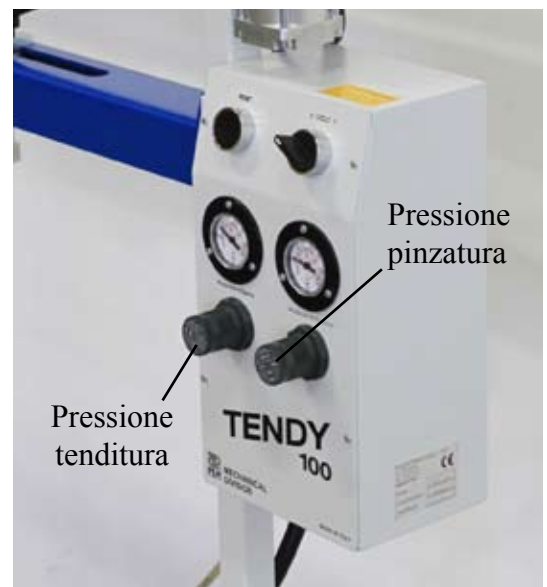
## 5.3 Working pressure adjustment

### Working pressure adjustment

The machine is supplied with two independent pressure regulators with their own manometer: one works with the clamping pressure adjustment and the other adjusts the stretching given by the pushing units. The pressure of the pushing units is always readable, even with the machine at rest, while the pressure of the clamping bars is visible only when it's operating.

Normally, the pushing units pressure must be higher than the clamping bar one and its adjustment depends from the image (if it is with or without a border), the canvas quality and the size of the canvas and the frame where it will be stretched. The experience will bring to determine the fit values.

Before making any stretching cycle with the canvas, make an idle one in order to plan a value on the clamping pressure manometer. Below, two examples:



e.g. 1 Canvas standard sizes 60x80 cm. digital print with printed edge (gallery type), stretched on the side 60 cm. As the pressure values depend from the frame and canvas sizes, in this case the indicative values to set are: clamping pressure 2,5/3 – pushing device pressure 3/3,5

e.g. 2 Same sizes but with white edge: 0,4 ÷ 0,7 – 1

For both examples, if the pushing units pressure is not enough for the complete stroke, it is also possible to increase it, also during the cycle. On the contrary, increasing the clamping pressure during the cycle, will have effect only on the following operation; decreasing the pressure will allow to complete the pushing operation, but with a different stretching in comparison with the desired one.



## 5.4 Stapler connection and adjustment (on demand)

To be operating, the machine needs the special stapler with long nose, for wide type 80 staples. It is necessary to fasten the canvas over the frame working in the appropriate guide of the upper clamping bar.

The stapler offered by PILM INTERNATIONAL as optional device, is supplied with 3mt. pipe and regulator manometer to adjust the working pressure within 4-6 bar limits as indicated by the manufacturer. The right pressure must be chosen in order that the staple do not cut the canvas. The pipe with regulator is feeded by the outlet of the quick release tap located on



stapler connection



## Section 6 - HOW TO WORK

### 6.1 Staff

The machine has been designed to be used by one user. The appointed staff to operate with the machine must have (or achieve through an adequate training) the following requirements:

- To know this manual and all safety information
- to get a sufficient level of general and technical knowledge to understand the meaning of the manual, the drawings and the diagrams correctly
- to know the main sanitary, safety and technological rules
- to get experience in canvas stretching working technologies
- to know what to do in case of emergency, where to find the individual safety tools and how to use them properly.

The maintenance operator, apart of the above mentioned knowledges, also must have a proper technical preparation

### 6.2 Operating

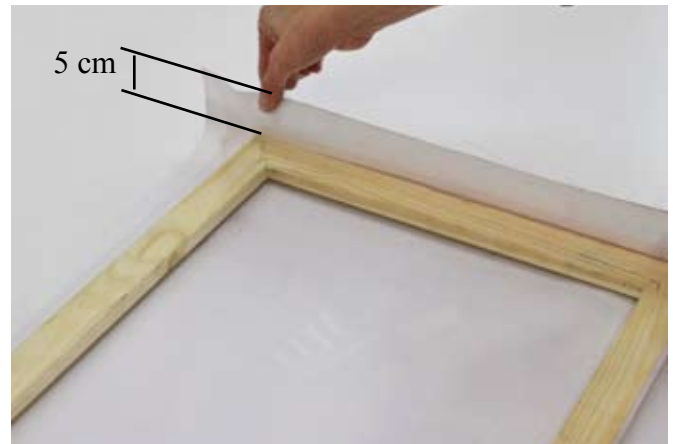
The machine is feeded by air with hand-positioning of the canvas and the fastening over the frame. Once the machine is connected to the pneumatic line, before starting a working cycle, check that:

- the cycle diverter 0-1 is on "0"
- the clamping device is open, otherwise push the reset button to open it

### 6.3 How to work

The machine can just stretch canvas that has been centered and fastened over a frame side previously. The opposite side of the fastened canvas must have at least 5 cm. more than the thickness frame. The frame has to be centered with respect to the clamping bar and the pushing devices have to be adjusted inside the same frame as well as in height as specified at the point 5.1. After having adjust the pushing units, check that blocking

levers do not interfere with the moving parts of the same pushing units. When the frame is positioned over the pushing units, insert the canvas inside the two clamping bars manually and keep it in this way through the fingers; then, push the pedal until the complete lowering of the upper clamping bar and the stroke end activation. If releasing the pedal, the clamping bar comes back to the initial position, it means that the stroke end has not been operated; repeat the cycle and manually press the clamping bar on the switch limit side.



Exceeding canvas in the opposite side of the fastened one = thickness frame + 5 cm.



**ATTENTION:**

*if inadvertently, the fingers remain under the clamping bar do not remove them suddenly, but release the pedal. The fingers are not crushed because the clamping bar goes down with no pressure, but only by its own weight.*

### 6.4 Stretching cycle execution

When the canvas is blocked by the upper clamping bar and the stroke end has been operated, hold the frame on the bottom part in one's hand and with the other one put the diverter in position "1". In this way, it is obtained both the clamping with the determined pressure value on the relative manometer and after 1-2 seconds also the pushing units activation with the pressure set for the same.

Under the pushings effects, the frame will tend to turn with respect to the support, hold it parallel on the bottom side to the machine in two hands during the cycle; this is also very useful to avoid any sliding from the pushing units and any breaking.



### 6.5 Canvas fastening

After having made the stretching cycle, the canvas must be fastened to the back of the frame, working on the rear of the machine and sliding the long nose of the stapler along the slot. The operation must be made holding the frame in vertical position by the hands to get the correct canvas stretching.

### 6.6 Frame release

To release the frame release with the canvas stretched and fastened it is necessary to operate frontally to the machine. Hold the frame leaned on the pushing units with one's hand, turn the diverter on "0"; the clamping bar opens and at the same time the pushing units go down. Pay attention because if the frame is not held, it can fall and get damaged.



### 6.7 Frame completion

The frame has to be completed fastening the canvas after having stretched over the remaining sides. This operation can be made in two ways:

1) The user prepare the corners manually and with the frame on a flat surface, he fastens the canvas on one side, stretching it slightly to avoid any wave and deformation. Then, the frame is mounted on the machine to do the mounting cycle for the remaining side.

2) As after the first cycle the stretching is excellent, the two sides can be completed over a desk manually with no wave and deformation without stretching too much the canvas. This solution is the most suggested to do not taking the risk to warp the image when are present a contour line.

## **Section 7 - MAINTENANCE**

### **7.1 Machine insulation**

The maintenance will be carried out just by authorized staff. Before any operation, the air plant must be switched off (disconnecting the air pipe from the machine). Once the maintenance is over, before back in service the air supply, be sure that any part and any air connection has been restored.

### **7.2 Special precautions**

During any repair or maintenance, is better to apply the following suggestions:

- Before starting to work, put a visible sign "UNDER MAINTENANCE"
- Do not use any solvent or inflammable material
- Pay attention to do not dispose any cooling lubricant liquid in the environment
- Do not go up on the machine, as it is not designed to support the persons
- When the maintenance is over, restore and fix any open or removed safety device.

### **7.3 Cleaning and planned maintenance**

Before cleaning, the operator should switch off the air plant (disconnecting the feeding pipe)

The machine is simply but also sturdy and it doesn't need any particular mechanical maintenance. Anyway, it's recommended to check:

- the bolt locking both of the stretching bar and the fixing of the parts
- the rubber glueing on the internal parts of the clamping bars.

The pneumatic elements are high-reliability and life-lubricated; usually, they don't need any maintenance. Nevertheless, the working environment and the kind of compressed air are very important for their life; a dry and clean air assures a long life. It's a good rule forecast advice for air filtering (included in the optionals); the filter unit is recommended aboveall if the compressor is more than 5/8 mt. Away from the machine.

Every 4-5 days is suggested to clean the pedal by an air blow; the operation must be more frequent in case of dusty environment.

### **7.4 Extraordinary maintenance**

The troubleshooting and the defected valves and/or cylinders replacement operations needs the Manufacturer maintenance service, especially the complex control equipment and with pneumatic logic. Before any operation, get in touch with PILM maintenance service.

## **Section 8 - SCRAPPING**

After the machine has been scrapped, it is necessary to separate the plastic parts; they must be delivered to the sorted waste centers according the law in force. Regarding the machine metallic mass, it's enough to do a share-out between the steel parts and the ones in other metals or alloys, in order to make a correct shipment for cast recycling.

## Section 9 - ANN

### 9.1 Declaration

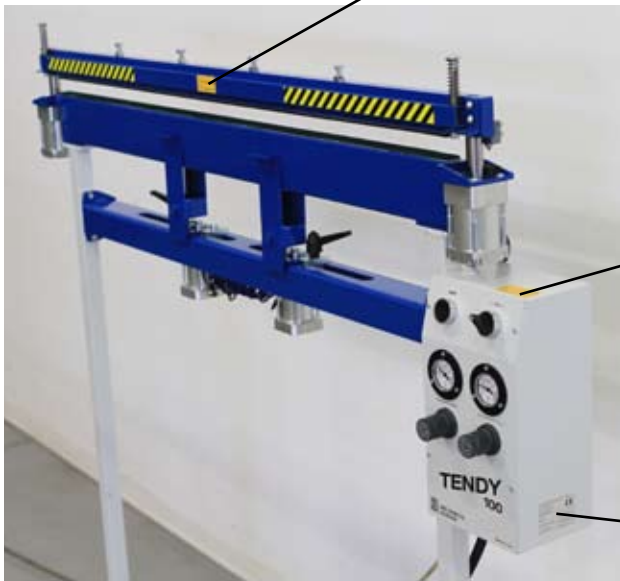
Attached the following declaration:

Declaration of conformity according the Directive 89/392/CEE

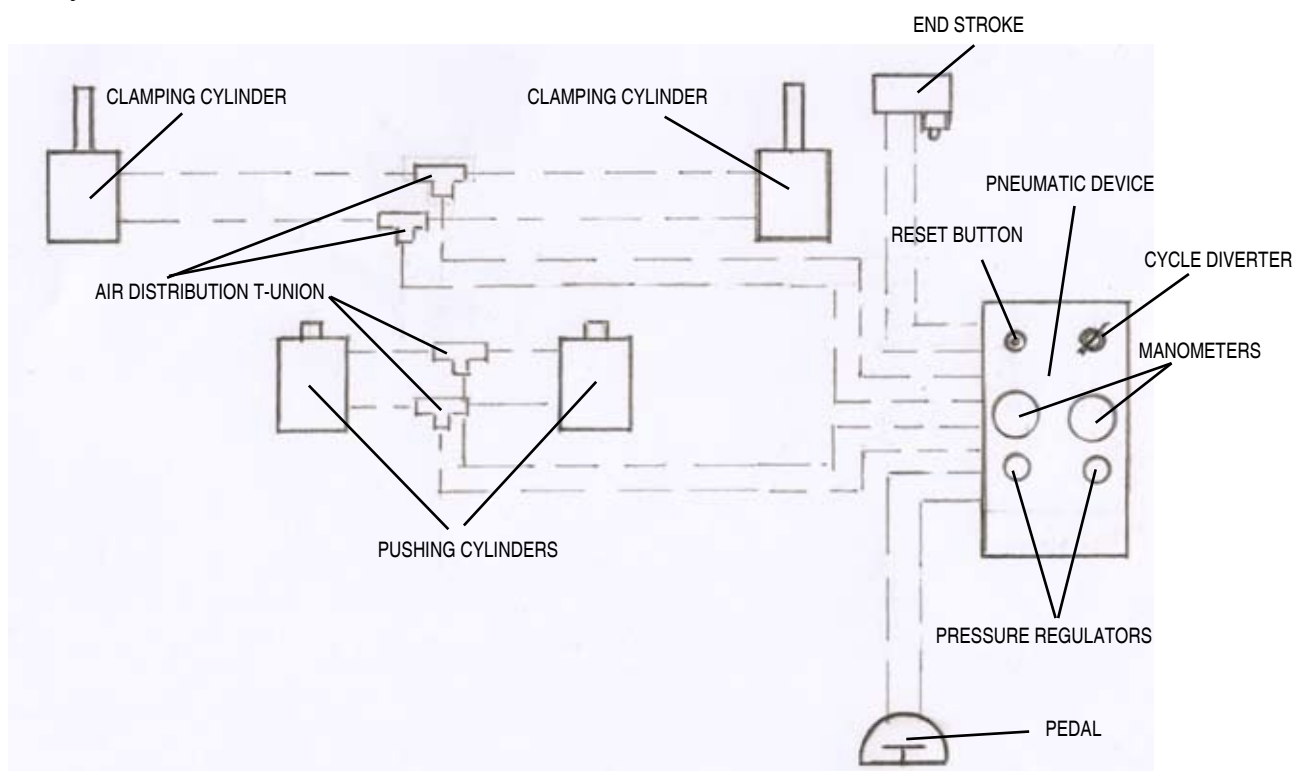
### 9.2 Layouts

The following layouts are attached:

- Plates locations



- Pneumatic layout





## 9.3 Optionals

- **Stapler mod. 8016SL**, Working pressure 4/6 bar.

The special long “nose” is fit to go into the stretching machine guides to fix the canvas.

It is supplied with pipe extension and manometer for pressure adjusting.



- **Ultrasilent compressor mod. silair 50/24** with 24 lt. tank.

Electric supply: 220 V, 50 Hz, 350 W.

It's the best solution for places and shops where the noise is undesired; it is supplied with pipe extension to be joined to the stretching machine. The compressor is equipped with a fan that must be switched on for cooling, while the same is running. Weekly drain the tank condensation by the proper valve



- **Lubricator filter device** To filter any impurities and the humidity of the compressed air; it keeps lubricated the whole pneumatic circuit for a longer life. Necessary if the machine is positioned more than 5 mt. away from the compressor. The correct oil quantity is given with the adjusting screw completely closed; it hasn't to exceed the middle of the tank. Weekly the air filter must be drained through the proper tap on the bottom of the cup



## Section 10 - SPARE PARTS

### 10.1 Spare parts order

Pointing out that only a qualified technician can make machine repairs, to receive the spare parts send an order by fax/letter/email with the following data:

- Model of the machine
- Reference number and/or code of the item or picture of the same.

## **RICAMBI - PARTE A**

## **RICAMBI - PARTE B**

## RICAMBI - PARTE C

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