



**SMONTAGOMME**  
**TYRE CHANGER**  
**DÉMONTE-PNEU**  
**REIFENMONTIERMASCHIN**  
**DESMONTADORA DE NEUMÁTIC**

---

# M 322

Cod. 4-133617C del 11/2017

Italiano  
*English*  
Français  
*Deutsch*  
Español

Manuale d'uso  
*Operator's manual*  
Utilisation et entretien  
*Betriebs und Wartungsanleitung*  
Uso y mantenimiento

**www.hpa-faip.it**  
**info@hpa-faip.it**

TRANSLATION OF ORIGINAL INSTRUCTIONS (ITALIAN)

Copyrighted material. All rights reserved.

The information contained herein may be subject to modifications without prior notice.

**Thank you for selecting our tyre changer**

**SIMPESFAIP**

Dear Customer

Thank you for purchasing your SIMPESFAIP Tyre Changer.

Your Tyre Changer has been designed to provide years of safe and dependable service, as long as it is used and maintained in accordance with the instructions provided in this manual.

Everyone who will use and/or perform maintenance on the tyre changer must read, understand and observe all the warnings and instructions provided in this manual, in addition to being properly trained.

This instruction manual must be considered an integral part of the tyre changer and kept together with it. However, no information contained in this manual and no device installed on the tyre changer can replace suitable training, correct operation and careful evaluation of procedures for working safely.

Always make sure that the tyre changer is in optimal operating conditions. If any malfunctions or probable situations of danger are observed, immediately stop the tyre changer and resolve the conditions before continuing.

For any question related to the correct tyre changer use or maintenance, contact your local official SIMPESFAIP dealer.

Yours sincerely,  
SIMPESFAIP

**USER INFORMATION**

User

Name \_\_\_\_\_

User

Address \_\_\_\_\_

Model

Number \_\_\_\_\_

Serial

Number \_\_\_\_\_

Date of

purchase \_\_\_\_\_

Date of

installation \_\_\_\_\_

Support and spare parts

manager \_\_\_\_\_

Phone

number \_\_\_\_\_

Sales

manager \_\_\_\_\_

Phone

number \_\_\_\_\_

## TRAINING CHECK

	Qualified	Rejected
<b><u>Safety Precautions</u></b>		
Warning and caution labels	<input type="checkbox"/>	<input type="checkbox"/>
High risk areas and other potential hazards	<input type="checkbox"/>	<input type="checkbox"/>
Operative safety procedures	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Maintenance and Performance Checks</u></b>		
Mounting Head Inspection	<input type="checkbox"/>	<input type="checkbox"/>
Adjustment and Lubrication	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Clamping</u></b>		
Steel / alloy wheels	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rim wheels	<input type="checkbox"/>	<input type="checkbox"/>
Internal/external clamping with steel clamping grippers	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Bead breaking</u></b>		
Standard wheels	<input type="checkbox"/>	<input type="checkbox"/>
Low profile wheels	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Demounting</u></b>		
Standard wheels with plastic protectors for head and lever	<input type="checkbox"/>	<input type="checkbox"/>
Correct head position to prevent damage	<input type="checkbox"/>	<input type="checkbox"/>
Bead lubrication when removing the low profile tyres	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rims	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Mounting</u></b>		
Standard wheels	<input type="checkbox"/>	<input type="checkbox"/>
Mounting stiff, low profile tyres	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rim wheels	<input type="checkbox"/>	<input type="checkbox"/>
Bead lubrication for correct mounting	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Inflating procedure</u></b>		
Safety measures	<input type="checkbox"/>	<input type="checkbox"/>
Lubrication and removal of the valve insert	<input type="checkbox"/>	<input type="checkbox"/>
Tubeless tyre inflation	<input type="checkbox"/>	<input type="checkbox"/>



# Contents

1. GETTING STARTED .....	65
1.1 INTRODUCTION .....	65
1.1.A. PURPOSE OF MANUAL .....	65
1.2 FOR YOUR SAFETY .....	65
1.2.A. GENERAL WARNINGS AND INSTRUCTIONS .....	66
1.2.B. LABEL POSITIONING .....	69
1.2.C. ELECTRICAL AND PNEUMATIC CONNECTION .....	72
1.2.D TECHNICAL DATA .....	73
1.2.E. AIR PRESSURE .....	74
1.3. ADDITIONAL RIM/TYRE INFORMATION .....	75
1.4. INTENDED MACHINE USE .....	75
1.5. PERSONNEL TRAINING .....	75
1.6. PRELIMINARY CHECKS .....	76
1.7. DURING USE.....	76
2. SHIPPING, STORAGE AND HANDLING .....	76
2.1. UNPACKING.....	77
3. ASSEMBLY/HANDLING .....	77
3.1. HOISTING/HANDLING .....	79
4. INSTALLATION AREA.....	79
5. DESCRIPTION OF M 322 .....	80
5.1. OPERATOR POSITION.....	81
5.2. MACHINE COMPONENTS (MAIN OPERATING ELEMENTS OF THE MACHINE) .....	81
5.3. OPTIONAL ACCESSORIES.....	83
6. BASIC PROCEDURES - USE .....	84
6.1. PRELIMINARY CHECKS .....	84
6.2. DECIDING FROM WHICH SIDE OF THE WHEEL THE TYRE MUST BE DEMOUNTED .....	84
6.3. BEAD BREAKING .....	86
6.4. WHEEL CLAMPING .....	87
6.5. DEMOUNTING.....	88
6.6. MOUNTING .....	90
6.7. APPROVED UHP AND RUN FLAT TYRE DEMOUNTING AND MOUNT- ING PROCEDURE .....	91
6.8. TYRE INFLATION.....	91
6.8.A. SAFETY REGULATIONS .....	91
6.8.B. TYRE INFLATION .....	93
6.8.C. SPECIAL PROCEDURE (FS VERSION) .....	94
7. TROUBLESHOOTING .....	96
8. MAINTENANCE .....	99

9. INFORMATION RELATIVE TO SCRAPPING..... 100

10. ENVIRONMENTAL INFORMATION ..... 100

11. INFORMATION AND WARNINGS REGARDING OIL ..... 101

12. INFORMATION AND WARNINGS ABOUT TYRE LUBRICATING  
FLUID ..... 102

13. RECOMMENDED FIRE-EXTINGUISHING DEVICES..... 102

14. GLOSSARY ..... 103

WIRING CIRCUIT DIAGRAM..... 107

PNEUMATIC DIAGRAM ..... 112

# 1. GETTING STARTED

## 1.1 INTRODUCTION

### 1.1.a. PURPOSE OF THE MANUAL

The purpose of this manual is to provide the instructions necessary for optimum operation, use and maintenance of your machine. If the machine is resold, provide this manual to the new owner. Furthermore, ask the new owner to fill out the ownership transfer module attached to the previous page in the manual and send it to SIMPESFAIP, so that SIMPESFAIP will be able to provide the customer with all necessary safety information. Alternatively, the new owner can inform SIMPESFAIP by sending an email to [info@simpesfaip.it](mailto:info@simpesfaip.it).

This manual assumes that the technicians have full understanding regarding the identification and maintenance of rims and tyres. They must also have thorough knowledge regarding the operation and safety features of the relative tools (such as the rack, lift or the jack) that are used, as well as the manual or electric tools required to perform the work safely. The first section provides basic information concerning the safe operation of the M 322 tyre changer family. The following sections of this manual contain detailed information regarding the equipment, operating procedures and maintenance. Italics is used to refer to specific parts of this manual that offer additional information or clarifications. These references must be read in order to obtain additional information about the instructions. The owner of the tyre changer is the only person responsible for the observance of the safety procedures and the organisation of technical training. The tyre changer must only be used by qualified, specifically trained technicians. The owner or management is exclusively responsible for storing the documentation relative to qualified personnel.

The M 322 family of tyre changers is designed and manufactured for mounting, demounting and inflating tyres for light vehicles (passenger cars, motorcycles - not intended for use for trucks) with a maximum external diameter of 38 inches and a maximum width of 12 inches. Copies of this manual and of the documents accompanying the machine may be obtained from SIMPESFAIP by specifying the type of machine and its serial number.

**WARNING:** The design details are subject to change. Some illustrations may be slightly different than the machine in your possession.

## 1.2 FOR YOUR SAFETY

### HAZARD DEFINITIONS

These symbols identify situations that could be harmful to the safety of personnel and/or cause damage to the equipment.



# DANGER



**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



## CAUTION!



**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



## WARNING



**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

## CAUTION!

**WARNING:** Use without the safety hazard symbol indicates a potential situation of hazard that, if not avoided, could cause material damage.

### 1.2.a. GENERAL WARNING AND INSTRUCTIONS



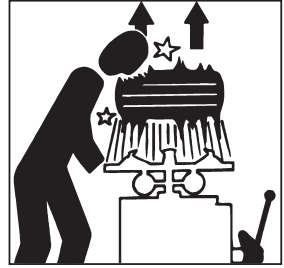
## CAUTION!

**Avoid Personal Injury.** Carefully read, understand and follow the warnings and instructions given in this manual. This manual is an essential part of the product. Keep it with the machine in a safe place for future reference.

1. If the maintenance procedures described in this manual are not executed correctly, or if other instructions in the manual are not observed, accidents could occur. This manual makes continuous reference to the possibility that accidents can occur. Any accident could cause serious or fatal injuries to the operator or people nearby, or cause material damage.
2. Overinflated tyres can explode, producing hazardous flying debris that may result in an accident.
3. Tyres and rims that do not have the same diameter do not correspond. Never attempt to mount or inflate tyres and rims that do not correspond. For example, never mount a 16.5" tyre on a 16" rim, or vice versa. It is very dangerous. Tyres and rims that do not correspond could explode, causing accidents.



4. Never exceed the inflation pressure for the tyre indicated by the manufacturer on the side of the tyre itself. Carefully check that the air hose is well inserted in the valve
5. Never bring your head or other body parts close to a tyre during inflation or bead insertion operations. This machine is not a safety device against the possible explosion risk of tyres, air chambers or rims.
6. Maintain a suitable distance from the tyre changer while inflating. Do not approach it.



## DANGER

**A bursting tyre can cause projections of its parts in surrounding areas with a force sufficient to cause serious injury or death.**

**Do not mount a tyre if its dimensions (indicated on the side) do not correspond exactly with the rim dimensions (printed inside the rim) or if the rim or the tyre are defective or damaged.**

**Never exceed the pressure recommended by the tyre manufacturer.**

**The tyre changer is not a safety device and does not prevent tyres and rims from exploding. Keep other people at a distance**

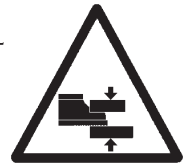
7. Risk of crushing Presence of moving parts. Contact with moving parts could result in an accident.

The machine may only be used by one operator at a time.

- Keep other people away from the tyre changer.
- Keep hands and fingers clear of rim edge during the demounting and mounting process.
- Keep hands and fingers clear of mount/demount head during operation.
- Keep your hands and other body parts away from moving parts.
- Do not use tools other than those supplied with tyre changer.
- Use lubricant that is specific for tyres in order to prevent tyre seizure.
- Pay attention while handling the rim and tyre and while using the lever

8. Hazard of electric shock.

- Do not clean the electric parts with water or high pressure air jets.
  - Do not operate the machine with a damaged power cord.
  - If an extension is necessary, use a cable with nominal features equal to or greater than those for the machine. Cables with nominal features that are lower to those of the machine could overheat and cause a fire.
  - **Make sure that the cable is positioned so that no one will trip over it and it cannot be pulled.**
9. Hazard of eye injuries. During the bead insertion and inflation phase, debris, dust and fluids could be projected into the air. Remove any debris present in the tread of the

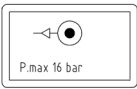

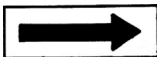

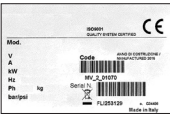








tyre and on the tyre surface. Wear protective goggles with OSHA, CE approval or other certified devices during all work phases.

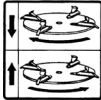


10. Always carefully inspect the machine before using it. Missing, damaged or worn equipment (including the hazard labels) must be repaired or replaced before start-up.
11. Never leave nuts, bolts, tools or other materials on the machine. They could remain trapped in moving parts and cause malfunctions or be projected out of the machine.
12. DO NOT install or inflate tyres that are cut, damaged, decayed or worn. DO NOT install tyres on damaged, bent, rusted, worn or deformed rims
13. If the tyre is damaged during the mounting phase, do not try to complete the mounting operation. Remove it and take it away from the service area, marking it as damaged.
14. Inflate the tyres slowly, in steps, while checking the pressure, the tyre, the rim and the bead. NEVER exceed the pressure limits indicated by the manufacturer.
15. The internal parts in this machine could create contacts or sparks if exposed to flammable vapours (petrol, paint thinner, solvents, etc.). Do not install the machine in a narrow area or below floor level.
16. Do not operate the machine while under the influence of alcohol, medicine or drugs. If you are taking prescription or non-prescription medicine, contact a physician to understand the side effects that the medicine could have on the ability to operate the machine safely.
17. Always use OSHA, CE approved and authorised personal protective equipment (PPE) or equipment with equivalent certification while operating the machine. Consult your supervisor for additional instructions.
18. Do not wear jewellery, watches, loose clothing, ties and tie back long hair before using the machine.
19. Wear protective, non-slip footwear while using the tyre changer.
20. While positioning, lifting or removing wheels from the tyre changer, wear a suitable back support and use a correct lifting technique.
21. Only suitably trained personnel can use, service and repair the machine. Repairs may only be performed by qualified personnel. SIMPEFAIP technical personnel are the most qualified individuals. Employers must determine if an employee is qualified to carry out any machine repair safely if the operator has attempted to make the repair.
22. The operator must pay close attention to the warnings on the equipment labels before starting the machine.
23. Clamp the rim on the wheel support plate during inflation.



## 1.2.b. DECAL PLACEMENT

No.	Code	Label	Description
1	446429		LABEL, INPUT PRESSURE MAX. 16 BAR
2	446442		LABEL, ATTENTION TANK PRESSURISED
3	418135		LABEL, ROTATION DIRECTION
4	425211		LABEL, HAZARD OF ELECTRIC SHOCK
5	-		LABEL, MODEL SERIAL NUMBER
6a	4-133620		LABEL M 322
6b	4-133623		LABEL M 322 (FS VERSION)
7	4-200131A		LABEL HPA/FAIP
9	446598		ELECTRIC DISCONNECTION
10	446431		BEAD BREAKER HAZARD WARNING PLATE
11	446433		TURNTABLE HAZARD WARNING PLATE



No.	Code	Label	Description
16	470137		LABEL, ROTATION SELF-CENTERING CHUCK PEDAL
17	435150		LABEL, INFLATING PEDAL (ONLY FS VERSION)
18	446436		LABEL, DOYFE CONNECTION (ONLY FS VERSION)

## DANGER WARNING DECALS



part n. 446442. Danger - pressurised container



part n. 425211A. Risk of electrocution.



part n. 446431. Crush hazard, bead breaker



part n. 446433. Crush hazard, turntable



part n. 446431. Crush hazard, head



part nr 425083. Earth ground terminal.



part nr 446430. Danger, inflation

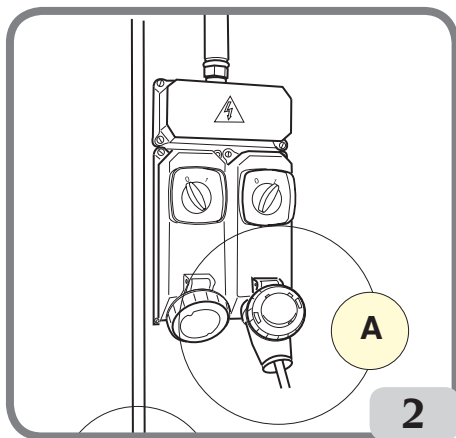
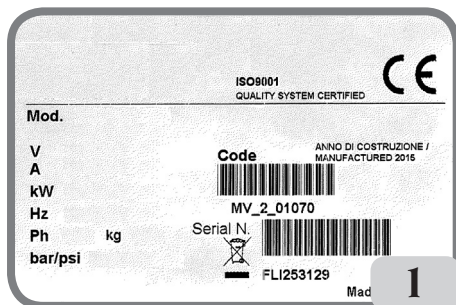
### 1.2.c. ELECTRICAL AND PNEUMATIC CONNECTIONS

The electric hook-up used must be suitably sized:

- for the electric power absorbed by the machine, indicated on its data plate (Fig. 1);
- the distance between the machine and the power supply hook-up point, so that voltage drops under full load do not exceed 4% (10% during start-up) compared with the rated voltage specified on the data plate.

- The user must:

- fit a plug that respects the current regulations onto the power supply cable;
- connect the machine to its own electrical connection - A, Fig. 2 - and fit a differential safety circuit-breaker with 30 mA residual current;
- install protection fuses on the power line that are suitably sized in accordance with the indications provided on the machine data plate (Fig. 1);
- connect the machine to an industrial socket; the machine must not be connected to domestic sockets.



## CAUTION!

**An effective grounding connection is essential for correct operation of the machine.**

Make sure that the available pressure and performance of the compressed air system are compatible with what is necessary for correct machine operation - see the section "Technical data". For correct machine operation, the compressed air supply line must provide a pressure range from no less than 8.5 bar to no more than 15 bar.

## CAUTION!

**For correct equipment operation, the air produced must be suitably treated (not above 5/4/4 according to ISO 8573-1).**

### 1.2.d TECHNICAL DATA

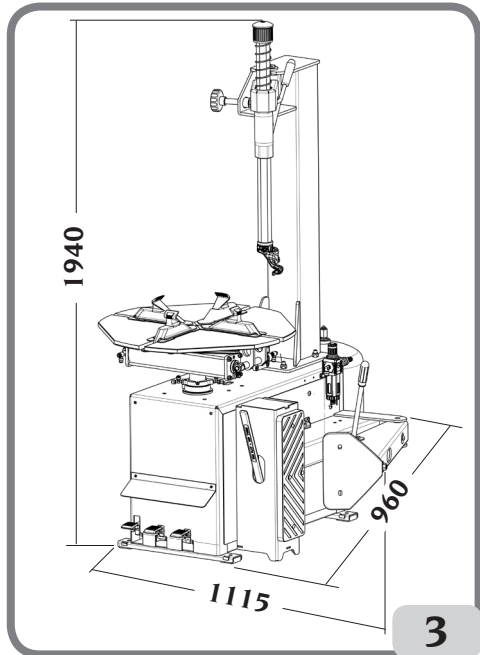
- Turntable clamping size, inner side .....from 13" to 25"
- Turntable clamping size, outer side .....from 11" to 22"
- Bead breaking force ..... 15,500 N (at 10 bar)
- Bead breaker opening ..... 320 mm
- Max. tyre diameter ..... 980 mm
- Max. tyre width ..... 12"
- Operating pressure ..... 8 - 10 bar
- Turntable rotation torque (three phase version) ..... 1200 Nm
- Turntable rotation torque (single phase version) .....800 Nm
- Weight:.....198 Kg (FS 208 Kg)
- Electrical power:

Model	Motor rating	kW	Rotation speed rpm	Torque Nm	Weight of electric/electronic part kg
<b>M 322</b>	400Volt/3ph 50Hz	0.75	8.5	1200	11.5
	200/230Volt/3ph 60Hz	0.75	8.5	1200	11.5
	200/230Volt/3ph 50Hz	0.75	8.5	1200	11.5
	200/230Volt/1ph 50Hz	0.75	8.5	800	11.5
	200/230Volt/1ph 60Hz	0.75	8.5	800	11.5
	115Volt/1ph 60Hz	0.75	8.5	800	11.5
	200/230Volt/1ph 50/60Hz DV	0.75	6-15	1200	10.2
	115Volt/1ph 60Hz DV	0.75	6-15	1200	10.2
	400Volt/3ph 50Hz DV	0.9/1.25	6-12	900	11.6
	12 Volt DC Battery 100 Ah	0,6	7	1000	13
	AIR MOTOR	/	6.5	800	/

- Noise level with machine operating..... ≤ 70 dB (A)

The noise levels indicated correspond to emission levels and do not necessarily represent safe operating levels. Although there is a relationship between emission levels and exposure levels, this cannot be used reliably to establish whether or not further precautions are necessary. The noise levels to which the operator is exposed to depends on a number of factors, such as duration of exposure, characteristics of the workplace, other sources of noise etc. Permissible noise exposure limits may also vary from country to country. However, this information will enable machine users to make a more accurate assessment of hazard and risks.

**OVERALL DIMENSIONS IN MM  
(FIG. 3)**



**1.2.e. AIR PRESSURE**

The machine is equipped with an internal pressure limiting valve to minimize the risk of over inflating the tyre.

	<p><b>! DANGER</b></p> <ul style="list-style-type: none"><li>• EXPLOSION HAZARD</li><li>• Do not exceed the pressure recommended by the tyre manufacturer. Always match the tyre and rim dimensions.</li><li>• Avoid personal injury or death</li></ul>
--	---

1. Never exceed these pressure limitations:

- The supply circuit pressure (from the compressor) is **220 psi (15 bar)**.
- The operating pressure (indicated on the regulator) is **150 psi (10 bar)**.
- The tyre inflation pressure (displayed on the pressure gauge) must never exceed the



pressure indicated by the manufacturer on the sidewall of the tyre itself.

2. Activate the air inflation jets only when inserting the bead.
3. Discharge the air pressure system before disconnecting the power supply or other pneumatic components. The air is stored in a tank for operating the inflation jets.
4. Activate the air inflation jets only if the rim is correctly clamped on the tyre changer (if required) and the tyre is completely mounted.

### 1.3. ADDITIONAL RIM/TYRE INFORMATION

#### CAUTION!

**Wheels equipped with pressure sensors and special rims or tyres could require particular work procedures. Consult the service manuals from the manufacturer of the wheels and tyres.**

### 1.4. INTENDED MACHINE USE

This machine must only be used to demount and mount vehicle tyres from/on the rims, using the provided tools. Any other use is considered inappropriate and may cause accidents.

### 1.5. PERSONNEL TRAINING

1. Employers are responsible for providing a training program for all employees who work on the wheels concerning the hazards deriving from maintenance and the safety procedures to be observed. Service and maintenance refers to mounting and demounting wheels and all the correlated activities, such as inflation, deflation, installation, removal and handling.
  - Employers are required to make sure that operators do not work on the wheels unless they have received suitable training regarding the correct maintenance procedures for the type of wheel being serviced and the operative safety procedures.
  - Information to be used for the training program includes, as a minimum, the information contained in this manual.
2. Employers are required to make sure that every employee demonstrates and maintains the ability to work on the wheels safely, including the performance of the following activities:
  - Demounting tyres (including deflation).
  - Inspecting and identifying rim wheel components.
  - Tyre mounting.
  - Using any restraining device, cage, barrier, or other installation.
  - Handling rim wheels.
  - Tyre inflation.
  - Move away from the tyre changer while inflating the tyre and do not lean forward when

inspecting the wheel during inflation.

- Wheel installation and removal.

3. Employers must evaluate the ability of their employees to carry out these tasks and work on the wheels in absolutely safety and must provide additional training as required to make sure that all employees maintain their skills.

## 1.6. PRELIMINARY CHECKS

Before starting to work, carefully check that all machine components, particularly rubber or plastic parts, are in place, in good condition and operate correctly. If damage or excessive wear is found during the inspection phase, replace or repair the component immediately regardless of the amount of damage or wear.

## 1.7. DURING USE

If strange or unusual noises are heard, if a component or system is not operating correctly or if you observe anything unusual, immediately stop using the machine.

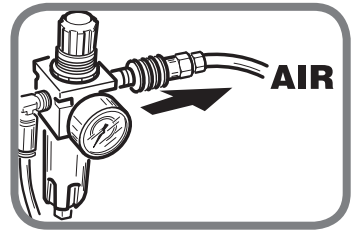
- Identify the cause and take any necessary remedial action.

- Contact your supervisor if necessary.

Make sure that all other people are positioned at least 6 metres (20 feet) from the machine.

To stop the machine in an emergency:

- disconnect the power supply plug;
- interrupt the compressed air supply by disconnecting the supply pipe.



# 2. TRANSPORT, STORAGE AND HANDLING

### Conditions for transporting the machine

The tyre changer must be transported in its original packaging and stowed in the position shown on the packaging itself.

- Packaging dimensions:

- width ..... 835 mm
- depth ..... 1140 mm
- height ..... 990 mm

- Weight with packaging:

- Standard version ..... 192 kg
- FS version..... 202 kg

### Ambient conditions for machine transport and storage

Temperature: range from -25° ÷ +55°C.

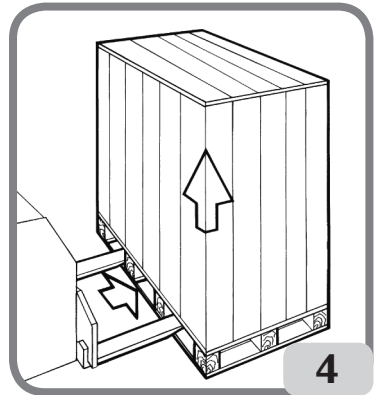
## CAUTION!

Do not stack other goods on top of the packing or damage may result.

### Handling

To move the packing, insert the tines of a fork-lift truck into the slots on the base of the packing itself (pallet) (fig.4).

Before moving the machine, refer to the HOISTING/HANDLING section.



## CAUTION!

Keep the original packing in good conditions to be used if the equipment has to be shipped in the future.

## 2.1. UNPACKING

Remove the upper part of the packaging and make sure the machine has not been damaged during transport.

## 3. ASSEMBLY/HANDLING

### CAUTION!

Pay careful attention when unpacking, assembling, handling and installing the machine as described below. Failure to observe these instructions could damage the machine and compromise operator safety.

## CAUTION!

Before removing the machine from the pallet, make sure the items showed below have been removed from the pallet.

- Remove the upper part of the packing, check the machine for transit damage and identify

the pallet mounting points (figs.5).

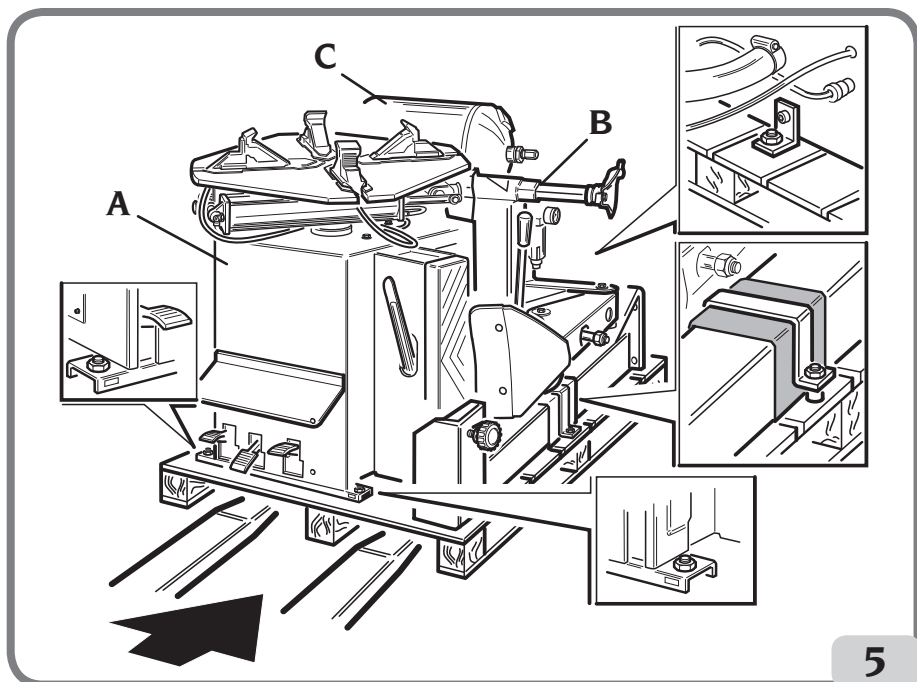
- The machine consists of three main units (fig.5):

A casing

B head

C air tank (FS version only).

- After removing the head, preferably set it down in a horizontal position to prevent it from falling over and being damaged.



5

### Installing the arm

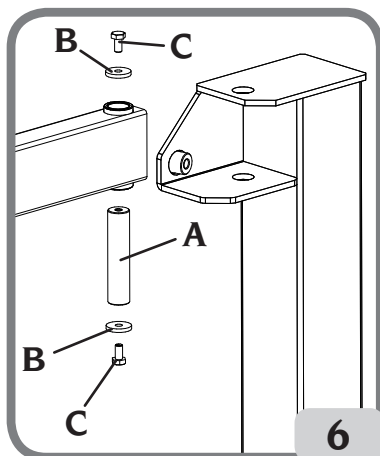
- Fit the arm, aligning with the holes for the pin A (fig. 6), and fitting the 2 washers B above and below the arm itself (fig.6).

- Fit the pin and tighten the screws C (fig. 6) until slight resistance is felt when rotating the arm.

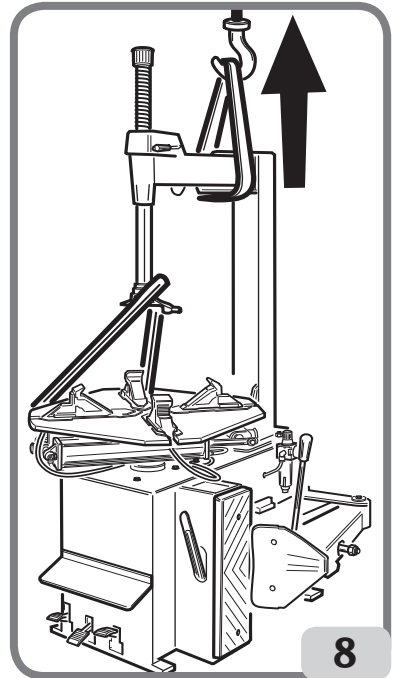
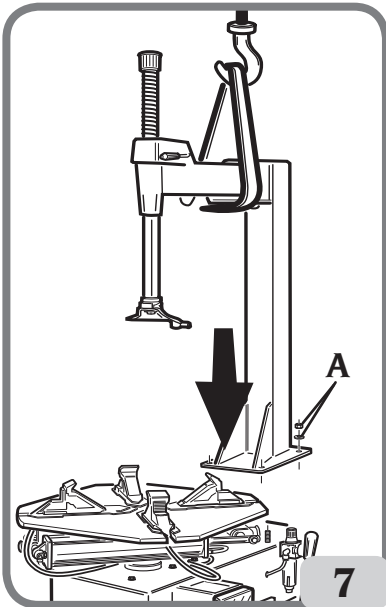
### Fitting the column

- Fit the column onto the threaded studs.

- Fasten the column to the casing with the nuts and washers A (fig.7).



6



### 3.1. HOISTING/HANDLING

In order to remove the machine from the pallet, hook it as shown in fig.8. This lifting point must be used whenever you need to change the installation position of the machine. Do not attempt to move the machine until it has been disconnected from the electricity and compressed air supply systems.

## 4. INSTALLATION AREA

### WARNING

Install the machine in compliance with all the applicable safety standards, including, but not limited to, those issued by OSHA.

### WARNING

**IMPORTANT:** for the correct and safe operation of the machine, the lighting level in the place of use should be at least 300 lux.



## DANGER

**RISK OF EXPLOSION OR FIRE.** Do not use the machine in areas that could be exposed to inflammable vapours (petrol, paint solvents, etc.).  
Do not install the machine in a narrow area or below floor level

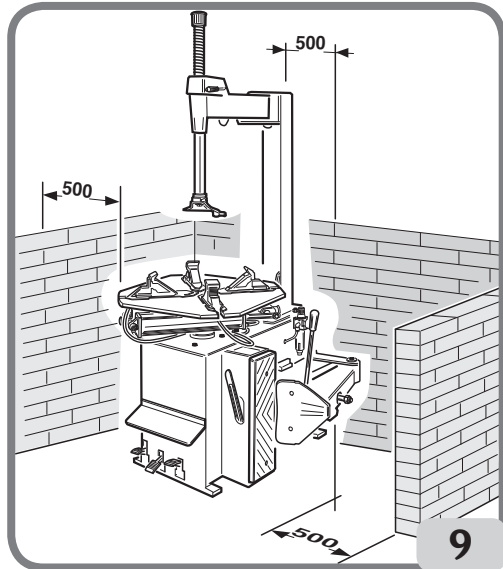
Do not install the machine outdoors. It is designed to be used in closed, covered areas.

Install the tyre changer in the chosen work position, complying with the minimum clearances shown in **fig. 9**.

The support surface must have a load-bearing capacity of at least 1000 kg/m<sup>2</sup>.

### Ambient conditions in the place of operation

- Relative humidity 30% - 95% without condensation.
- Temperature 0°C ÷ 50°C.



## 5. DESCRIPTION OF M 322

The M 322 is an electropneumatic tyre changer.

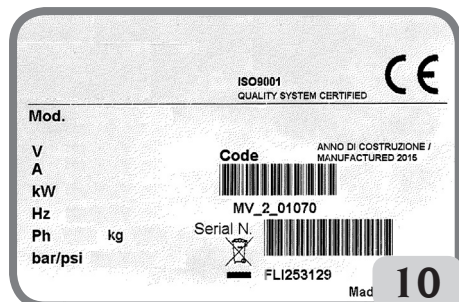
The machine is compatible with any type of drop-centre single-piece rims with the dimensions and weights indicated in the paragraph TECHNICAL DATA.

The sturdily constructed machine operates with the wheel in a vertical position for bead breaking and in a horizontal position for mounting and demounting tyres. All machine movements are controlled by the operator from the pedals.

Each machine has a data plate Fig. 10, with information about the machine and some technical data.

As well as the manufacturer's details, the plate indicates:

- Mod. - Machine model;
- V - power supply voltage in Volts;

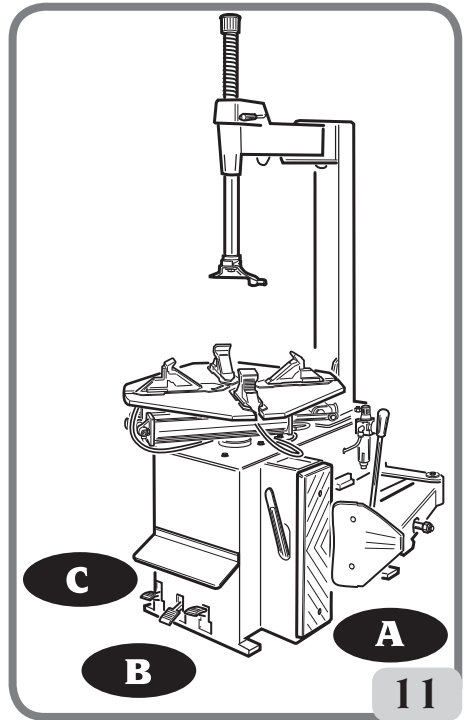


A - Input voltage in Amperes;  
kW - Absorbed power in kW;  
Hz - Frequency in Hz;  
Ph - Number of phases;  
bar - Operating pressure in bar;  
Serial N. - the machine serial number;  
ISO 9001 - Certification of the company's  
Quality System;  
EC - EC marking.

## 5.1. OPERATOR POSITION

Figure 11 shows the operator's positions during the various work phases:

- A Bead breaking
- B Tyre demounting and mounting
- C Inflation area.



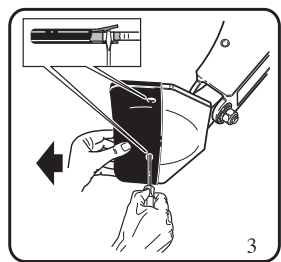
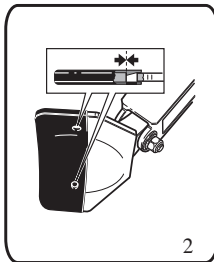
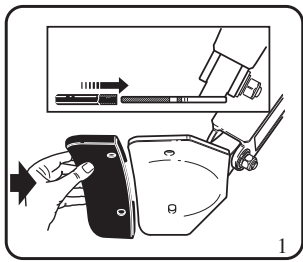
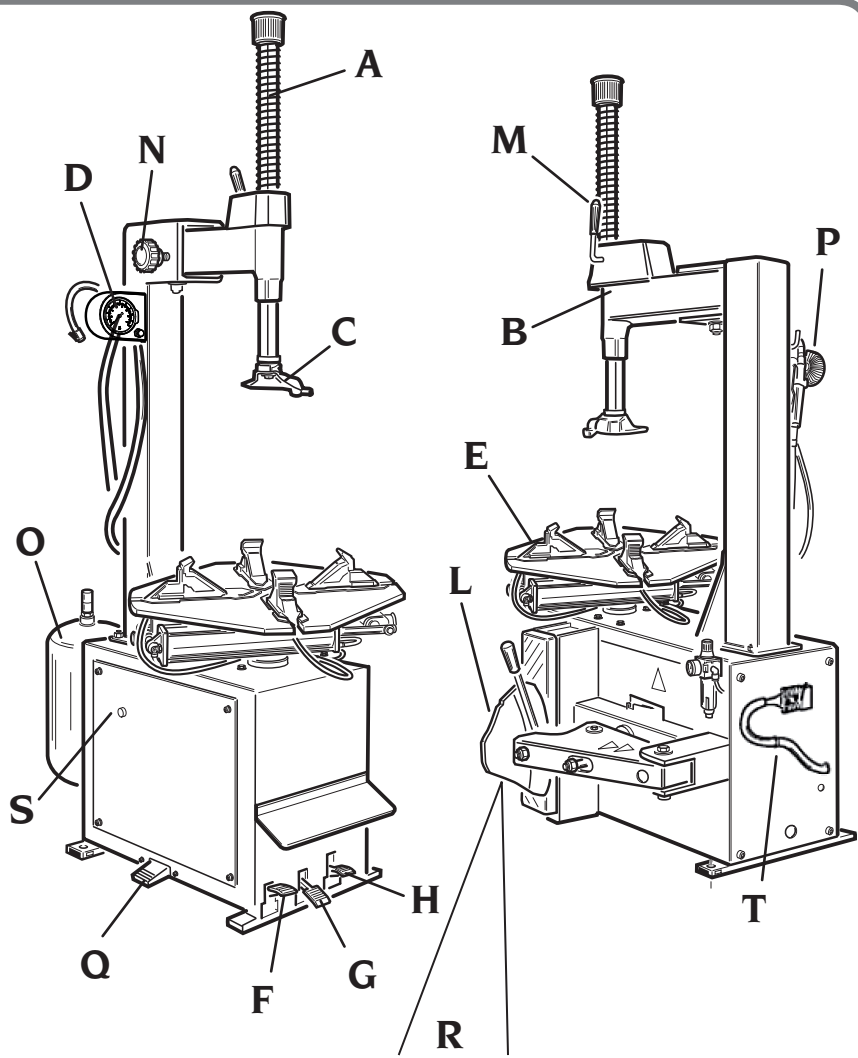
## 5.2. COMPONENTS OF MACHINE (MAIN FUNCTIONAL ELEMENTS OF MACHINE)

### CAUTION!

**Know your machine! Understanding exactly how the machine works is the best way to work safely and efficiently. Learn the functions and positions of all controls. Carefully check that all controls work correctly.**  
**To prevent the risk of accidents of damage, the machine must be installed and operated correctly, and maintenance must be performed regularly.**

The main parts of the machine are indicated in fig. 13.

- A VERTICAL ARM - for correctly locating the mounting/demounting device.
- B HORIZONTAL ARM - which swings the mounting/demounting device and the vertical arm away from the turntable to allow removal or replacement of tyres or wheels.
- C MOUNTING/DEMOUNTING DEVICE - for mounting/demounting tyre onto/from wheel.
- D PRESSURE GAUGE WITH INFLATION BUTTON - on FS version only
- E TURNTABLE - rotating device for clamping wheels.

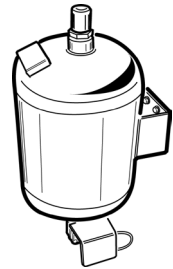




- F TURNTABLE PEDAL - three-position pedal controlling rotating of turntable in both directions.
- G CLAMPING GRIPPER CLAMP/UNCLAMP PEDAL - three-position pedal for clamping, unclamping and clamping and closing the clamping grippers.
- H BEAD BREAKER PEDAL - two-position pedal for operating bead breaker cylinder.
- L BEAD BREAKING SHOE - mobile shoe for detaching the tyre bead from the wheel.
- M LEVER - for locking vertical arm once the "C-D" device is in precisely the correct position.
- N KNURLED KNOB - for adjusting horizontal arm position - maintains correct position between "C-D" device and wheel.
- O AIR TANK - on FS version only
- P INFLATION GUN
- Q INFLATION TYRE - on FS version only.
- R SHOE PROTECTOR (on request)
- S EMERGENCY BUTTON - on 12V version only
- T SOCKET - on 12V version only

 **CAUTION!**

**With regard to the technical characteristics, warnings, maintenance and any other information about the air tank (optional), consult the relevant operator's and maintenance manual provided with the documentation of the accessory.**



### 5.3. OPTIONAL ACCESSORIES

See the document "ORIGINAL ACCESSORIES FOR TYRE CHANGER" for a complete list of optional accessories.

## 6. BASIC PROCEDURES - USE



### CAUTION!

#### CRUSHING HAZARD:

Some parts of the machine, such as the demounting/mounting head, the bead breaker and the turntable, move during operation and may constitute potential crushing hazards.

Keep hands and other parts of the body well away from moving parts of the machine .



### CAUTION!

In order to prevent damage or involuntary movement of the machine, it is recommended to only use original SIMPESFAIP SpA spare parts

### 6.1. PRELIMINARY CHECKS

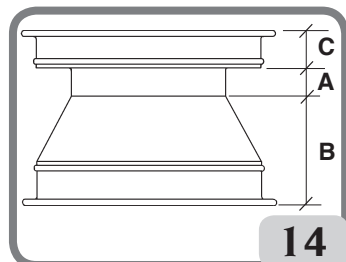
Check that there is a pressure of at least 8 bar on the Filter Regulator pressure gauge. If the pressure is below the minimum level, some machine operations may be limited or insufficient.

After the correct pressure has been restored, the machine will function properly.

Check that the machine has been adequately connected to the electric mains and the pneumatic supply.

### 6.2. DECIDING FROM WHICH SIDE OF THE WHEEL THE TYRE MUST BE DEMOUNTED

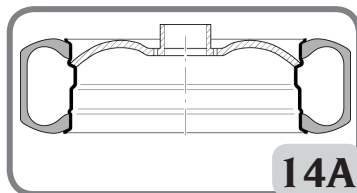
See fig. 14. Find the position of rim well A on the rim. Find the largest width B and the smallest width C. The tyre must be mounted and demounted with the wheel on the turntable with the smallest width side C facing upwards.



## CAUTION!

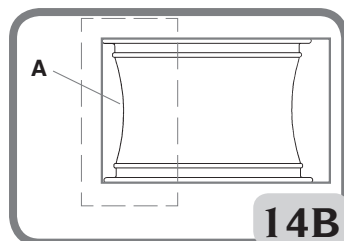
See the paragraph “TABLE FOR USING CENTRING AND CLAMPING ACCESSORIES ACCORDING TO RIM TYPE” in this manual.

When working with easily damaged wheels  
When working with “easily deformable” rims (i.e. a central hole with thin, projecting edges - see Fig. 14A) we recommend using the universal flange for blind rims (see the section “TABLE FOR USING CENTRING AND CLAMPING ACCESSORIES IN RELATION TO RIM TYPE” in this manual).

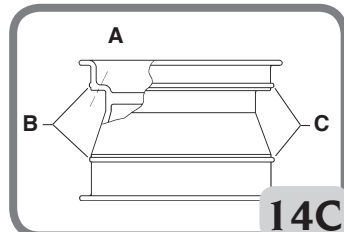


### SPECIAL WHEELS

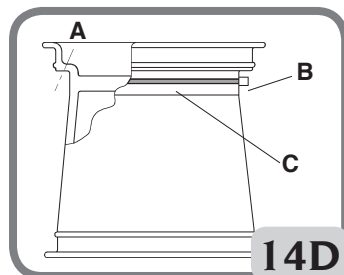
**Alloy rim wheels:** some wheels with alloy rims have a minimum A rim well or do not have any well - Fig. 14B. These rims are not approved by DOT standards (Department of Transportation). The DOT initials certify that tyres comply with the safety standards adopted by the United States and Canada (these wheels cannot be sold in these markets).



**High performance wheels (asymmetric curvature) - Fig. 14C** some European wheels have rims with a very pronounced curvature C, except in the area of the valve hole A where the curvature is less pronounced B. On these wheels the bead must first be broken in the area of the valve hole, on both the top and bottom sides.



Wheels with pressure sensor - Fig. 14D. To work correctly on these wheels and avoid damaging the sensor (which can be incorporated in the valve, secured to the belt, glued inside the tyre, etc.) suitable mounting/demounting procedures must be observed (refer to “Approved mounting/demounting procedure for runflat and UHP tyres”).

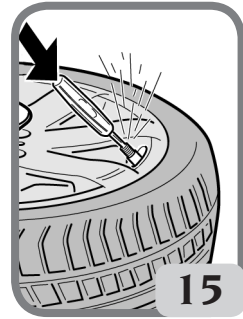


## CAUTION!

Remove the old weights from the rim before starting work operations.

### 6.3. BEAD BREAKING


- Deflate the tyre completely, removing the valve core (Fig. 15).



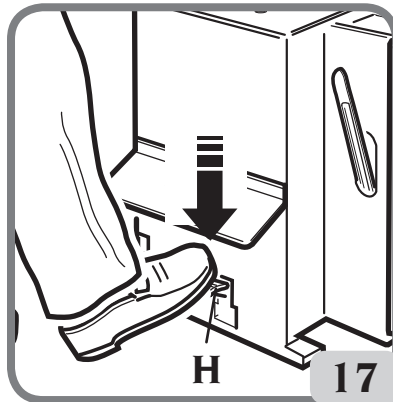
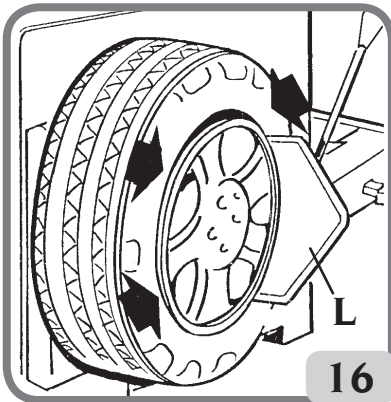
#### CAUTION!

Completely release the air from inside the tyre before continuing. Never carry out bead breaking before having completely release the air from the tyre. Failure to release the air could cause injury to the operator or damage to the equipment, the tyre or the wheel.

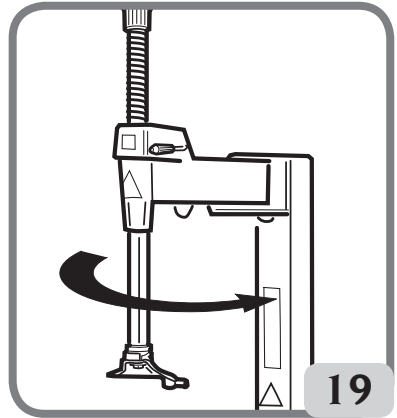
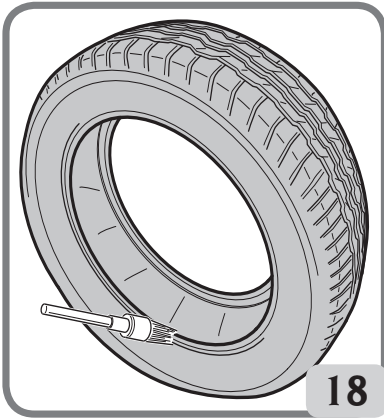
- Move the wheel into the correct position for bead breaking. Move the shoe L (fig. 16)

over the bead and press the pedal  H (Fig.17).

- Repeat this step at different points around the tyre to detach the bead from the rim. Repeat the same procedure on the other side of the tyre.





- Remove any old balancing counterweights.
- Lubricate the tyre thoroughly around the entire circumference of the bottom and top bead to facilitate demounting and avoid damage to the beads (fig.18).

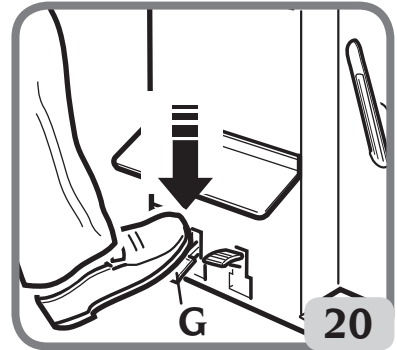


#### 6.4. CLAMPING THE WHEEL

- Move the manipulator arm manually away from the working position (see Fig. 19).

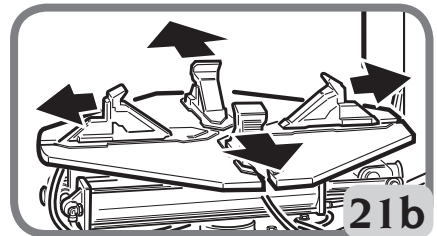
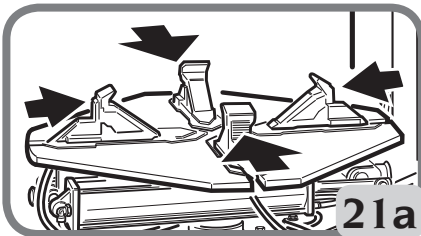


- Press the pedal   G (Fig. 20) to preset the aperture of the four mobile clamps correctly depending on whether you intend to clamp the wheel on the inner side (fig. 21a) or the outer side (Fig.21b).

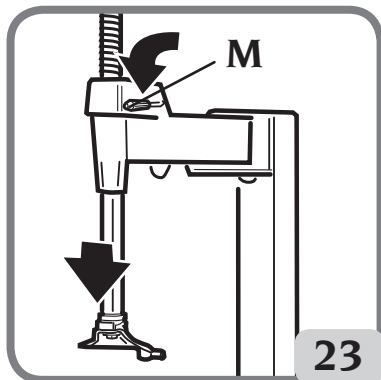
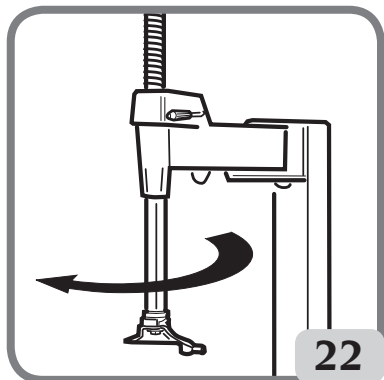


### CAUTION!

Clamping alloy or special wheels from the outer side is recommended to prevent scratching.

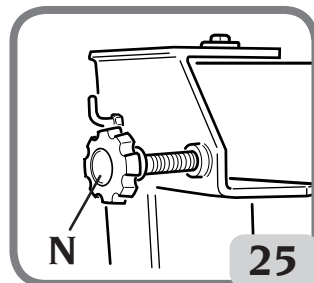
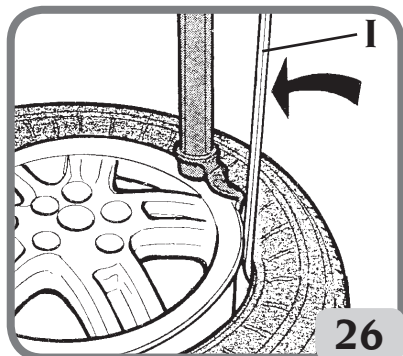
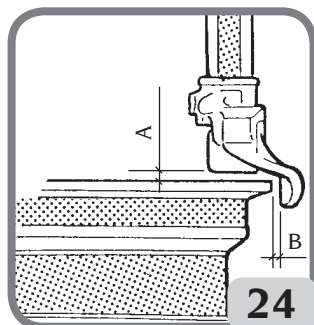


- Place the wheel on the clamps, press the wheel slightly downwards and press the pedal G (Fig. 20) to clamp the wheel.



## 6.5. DEMOUNTING

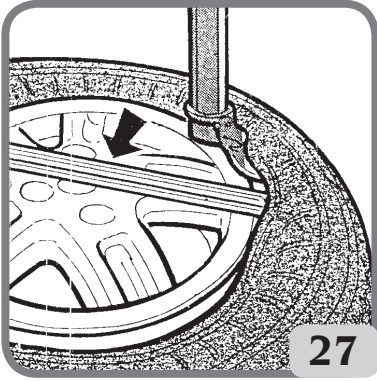
- Return the arm to the working position (Fig. 22).
- Adjust the arm and the head with the lever M (fig. 23), so that the bottom of the head touches the edge of the rim.
- Tighten the lever M to lock the arm and the head. The head raises automatically to approximately 2 mm from the edge of the rim (A, Fig. 24).
- Use the handwheel N (fig. 25) to move the head away from the edge of the rim by approximately 2 mm (B, Fig. 24).



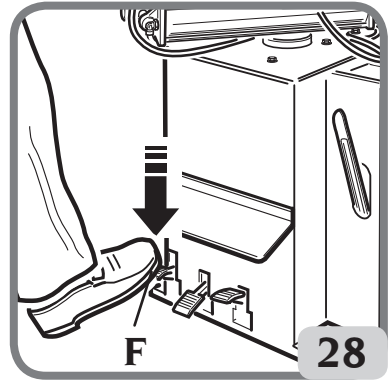
- Fit the bead lifter lever (I, Fig. 26) between the mounting head and the tyre bead.

### CAUTION!

When working with alloy wheels or wheels with easily damaged paint, we recommend fitting the specific plastic protectors on the lever.



27



28



## CAUTION!

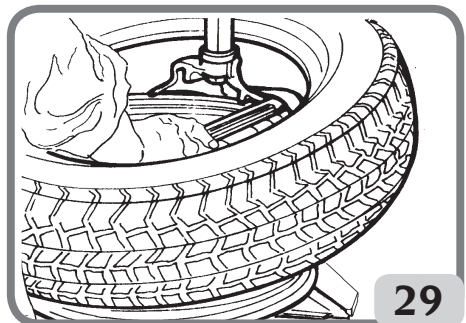
Grip the bead lifting tool firmly during use.

- Lift the top bead over the front of the demounting head (fig. 27) and push part of the top bead into the rim well by pressing downwards on the side wall from the side opposite the head.
- Start the demounting procedure by tapping the pedal F gently (fig. 28).
- Rotate the wheel by one complete turn, and press onto the tyre by hand on the side opposite the head to ensure that the entire bead is pushed into the rim wheel.

## CAUTION!

If the tyre has an inner tube, move the arm out of the working position then remove the inner tube.

- Repeat the same procedure to break the other bead (fig. 29).
- Move the arm out of the working position, then remove the tyre from the wheel.



29

## 6.6. MOUNTING



### RISK OF EXPLOSION:

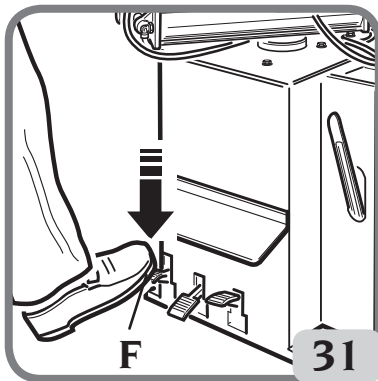
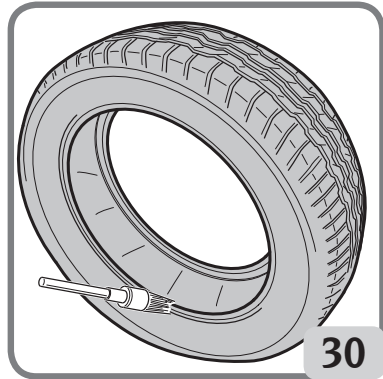
Always check that the tyre/rim combination is correct in terms of compatibility (tubeless tyre on tubeless rim; tube type tyre on tube type rim) and geometrical size (keying diameter, cross-section width, Off-Set and shoulder profile) before mounting.

**TAKE ALL PRECAUTIONS TO AVOID SERIOUS OR FATAL INJURY .**

Also check that rims are not deformed, that their fixing holes have not become oval, that they are not encrusted or rusty and that they do not have sharp burrs on the valve holes.

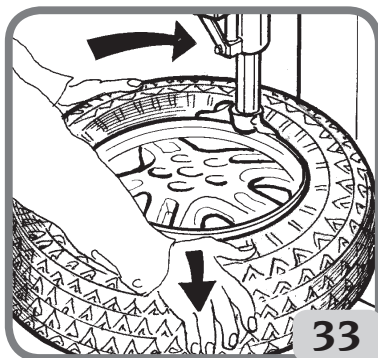
**Make sure that the tyre is in good condition without any signs of undue wear or damage.**

- Lubricate the sides of the tyre thoroughly along the entire circumference of the bottom and top beads (Fig.30).



- Place the tyre on top of the wheel and move the horizontal arm into the working position.

- Place the bottom bead under the front of the head.



- Press the turntable control pedal (F, Fig. 31) to rotate clockwise and mount the bead. Use the rim well space, pressing onto the right hand sidewall to reduce torsion on the bead as the wheel rotates (fig. 32).



- After mounting the bottom bead, repeat the same procedure for the top bead (Fig. 33).
- Move the arm out of the working position, then remove the wheel from the tyre changer.

## 6.7. APPROVED UHP AND RUN FLAT TYRE DEMOUNTING AND MOUNTING PROCEDURE

For a detailed description of the UHP and RUN FLAT tyre mounting/demounting procedure, please refer to the instructions in the manual prepared by WDK (German Tyre Industry Association).

## 6.8. TYRE INFLATION

### 6.8.a. SAFETY REGULATIONS

	<div style="background-color: red; color: white; padding: 5px; text-align: center;">  <span style="font-size: 24px; font-weight: bold; margin-left: 10px;">DANGER</span> </div> <p><b>RISK OF EXPLOSION</b>  Never exceed the pressure recommended by the tyre manufacturer. Never mount tyres on rims with a different diameter.  An exploding tyre can cause personal injury or death.</p>
---	---


DANGER

We do not recommend using inflation devices (e.g. gun) connected to compressed air sources other than the machine.

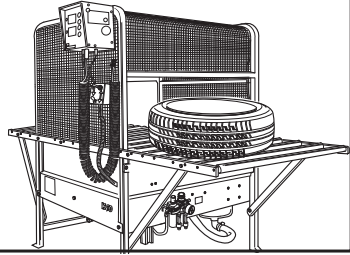
CAUTION!

Always comply with the national safety regulations, which may be more restrictive with respect to this manual, following the principle that the more restrictive standard takes precedence over the less restrictive one.



## DANGER

If it is necessary to exceed the maximum pressure permitted by the tyre manufacturer to break the bead, remove the wheel from the tyre changer and place it in the inflation cage.



Check that both the upper and lower beads and the rim bead seat have been suitably lubricated with paste appropriate for mounting. Safety goggles with plain lenses and safety footwear must be worn.



## CAUTION!

**DO NOT clamp the wheel on the turntable during inflation.**

- Remove the valve core if it has not already been removed.
- Connect the inflation hose to the valve.
- Activate the inflating device to inflate the tyre and push the beads against the rims. Stop frequently to check the internal tyre pressure on the pressure gauge.



## CAUTION!

**Look carefully for any tyre damage. The following instructions must be read, understood and observed precisely.**

1. Tyres that are excessively inflated could explode, causing the dispersion of debris in the air, which can cause accidents.
2. Tyres and rims that do not have the same diameter do not correspond. Do not attempt to mount or inflate tyres with rims that do not correspond. For example, never mount a 16" tyre on a 16.5" rim, (or vice versa). It is very dangerous. Tyres and rims that do not correspond could explode, causing accidents.
3. Never exceed the inflation pressure for the tyre indicated by the manufacturer on the side of the tyre itself.  
Carefully check that the air hose is well inserted in the valve.
4. Never bring your head or other body parts close to a tyre during inflation or bead insertion operations.

**This machine is not a safety device against the possible explosion risk of tyres, air chambers or rims.**

5. Maintain a suitable distance from the tyre changer while inflating. Do not approach it.

 **CAUTION!**



Noise levels may reach 85 dB(A) during this procedure. Wear hearing protection.

 **DANGER**

A bursting tyre can cause projections of its parts in surrounding areas with a force sufficient to cause serious injury or death.

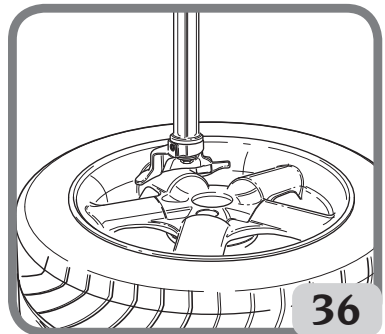
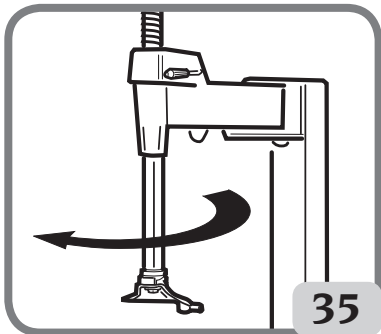
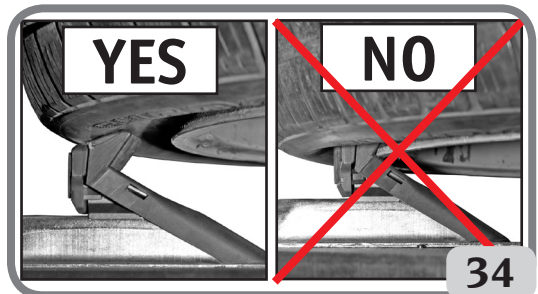
Do not mount a tyre if its dimensions (indicated on the side) do not correspond exactly with the rim dimensions (printed inside the rim) or if the rim or the tyre are defective or damaged.

Never exceed the pressure recommended by the tyre manufacturer.

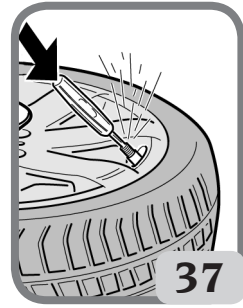
The tyre changer is not a safety device and does not prevent tyres and rims from exploding. Keep other people at a distance

### 6.8.b. TYRE INFLATION

- Ensure the wheel is NOT clamped on the turntable by the clamps (Fig. 34).
- Move the horizontal arm fully into the working position (Fig. 35)
- Lower the vertical arm to touch the wheel (fig. 36), then lock the arm in this position



- Remove the valve core if it has not already been removed (Fig. 37).
- Connect the air hose Doyfe inflator connector to the valve stem (Fig. 38).
- Inflate the tyre with inflating gauge or by pressing the pedal briefly and repeatedly, checking the pressure gauge frequently to ensure that the pressure NEVER exceeds the maximum pressure specified by the tyre manufacturer.
- Disconnect the inflation hose from the valve stem.
- Move the manipulator arm away from the working position.
- Remove the wheel from the tyre changer.



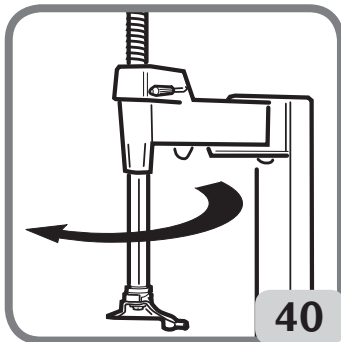
### 6.8.c. SPECIAL PROCEDURE (FS VERSION)

The FS version uses a powerful blast of air from nozzles near the clamping grippers to facilitate bead breaking and inflation with tubeless tyres.

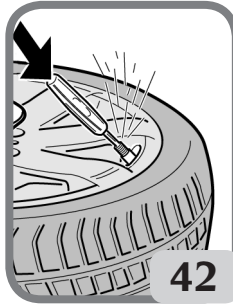
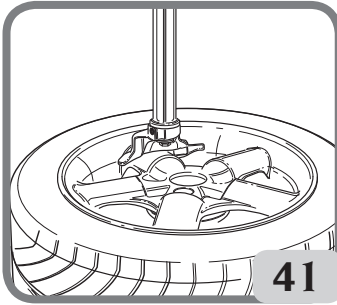
## ! CAUTION!

**Before starting with the operations described below, make sure there is no dirt, dust or other impurities near the inflation nozzles.**

- Check that both the upper and lower beads and the rim bead seat have been suitably lubricated with approved paste for mounting.
- Move the horizontal arm fully into the working position (Fig. 40)



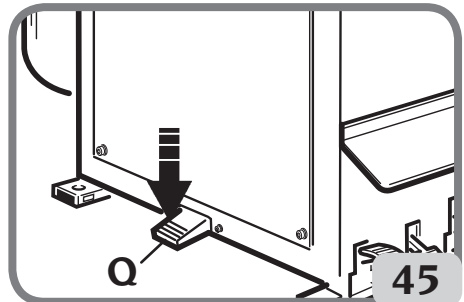
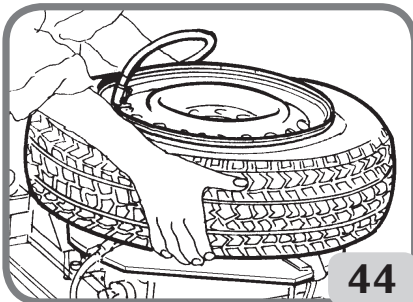
- Ensure that the wheel is clamped onto the turntable from the inner side (fig. 39).
- Lower the vertical arm to touch the wheel (fig. 41), then lock the arm in this position
- Remove the valve core if it has not already been removed (Fig. 42).
- Connect the air hose Doyfe inflator connector to the valve stem (Fig. 43).



## CAUTION!

To increase the effectiveness of the air jets, manually lubricate and lift the lower bead before activating the nozzles (Fig. 44).

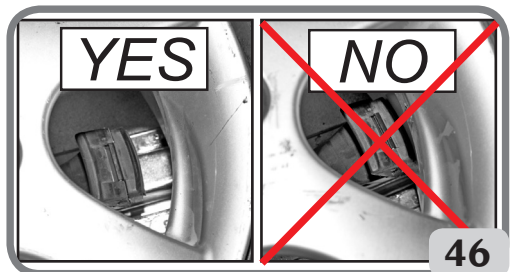
- Fully depress the inflation tyre briefly (fig. 45). The tyre expands, pushing the beads into the seating position.



## CAUTION!

To improve the operation of the tubeless tyre inflation system the line pressure must be between 8 and 10 bar.

- Detach the wheel from the grippers (fig. 46).
- Press the inflation pedal in the intermediate position to inflate the tyre. Check the pressure gauge frequently to ensure that the pressure **NEVER** exceeds the maximum pressure specified by the tyre manufacturer.



## CAUTION!

Risk of explosion. During the bead insertion phase, do not exceed the maximum pressure indicated by the manufacturer on the sidewall of the tyre.

## CAUTION!

Operate the inflation jets only for tyre bead insertion. Do not point jets towards people.

Discharge the air from the pneumatic system before disconnecting the power supply or other pneumatic components. The air is accumulated in the tank for operating the bead insertion jets.

## CAUTION!

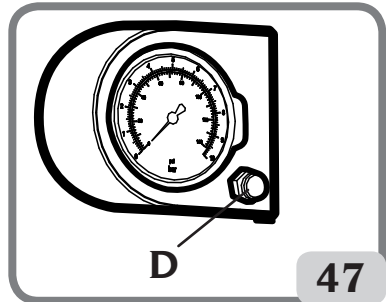
Operate the air jets only after making sure that the device is securely in position and the rim is correctly blocked.

## CAUTION!

RISK OF EXPLOSION. Do not mount a tire and a rim that do not have the same diameter (for example, 16.5 inch tyre and 16 inch rim).

If the tyre is over-inflated, air may be released by pressing the brass manual deflation button located below the air pressure gauge (D - Fig.47)

- Disconnect the inflation hose from the valve stem.
- Move the manipulator arm away from the working position.
- Remove the wheel from the tyre changer.



## 7. TROUBLE SHOOTING

**The turntable does not rotate when the rotation pedal is pressed**

**Power cord conductor shorting to ground.**

- ➔ Check the wiring.

**Motor shorted.**

- ➔ Replace the motor.

**Reversing switch in short-circuit.**

- Replace the inverter.

**Blown fuses**

- Check and replace.

**Rotation control pedal fails to return to the central position**

**Control spring broken.**

- Replace the command spring.

**Bead breaker pedal and turntable pedal do not return to home position**

**Control spring broken.**

- Replace the pedal return spring.

**Internal air leakage (open left hand cover panel and locate the leak)**

**Air leak from bead breaker cock.**

- Replace the cock.
- Replace the bead breaker cylinder.

**Air leak from the table top cock.**

- Replace the turntable cylinder.
- Replace the swivel connector.

**Bead breaker cylinder lacks force, fails to break beads and leaks air**

**Silencer plugged.**

- Replace the silencer

**Cylinder gaskets worn**

- Replace the gaskets.
- Replace the bead breaker cylinder.

**Bead breaker cylinder leaks air around the pin**

**Air seal worn.**

- Replace the gaskets.
- Replace the bead breaker cylinder.

**Turntable will not rotate in either direction**

**Inverter fault.**

- Replace the inverter.

**Turntable will not turn in either direction**

**Inverter fault.**

- Replace the inverter.

**Belt broken.**

- Replace the belt.

**Gear unit clamped.**

- Replace the gear unit.

**Turntable will not turn. Engine makes buzzing noise**

**Motor operating with two phases only.**

- ➔ Replace the inverter.
- ➔ Check plug, power socket, motor base and inverter for detached wires.
- ➔ Replace the motor.

**Gear unit noisy. The turntable makes 1/3 of a revolution and then stops**

**Gear unit seizing.**

- ➔ Replace the gear unit.

**Table top fails to clamp wheels**

**Turntable does not clamp rim.**

- ➔ Replace the turntable cylinder.

**Clamp grippers are worn.**

- ➔ Replace the clamping gripper tips.

**Turntable mounts or demounts tyres with difficulty**

**Insufficient belt tension.**

- ➔ Adjust belt tension (fig.48) or replace it.

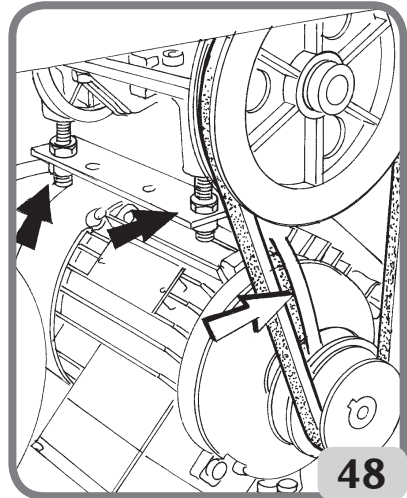
**Vertical clamping function not working**

**Clamping plate not adjusted.**

- ➔ Adjust the plate.

**Defective clamping plate.**

- ➔ Replace the plate.



**Tyre pressure gauge needle fails to return to 0**

**Pressure gauge faulty or damaged.**

- ➔ Replace the pressure gauge.



**CAUTION**

The “Spare parts” handbook does not authorise the user to carry out work on the machine with the exception of those operations explicitly described in the User Manual. It only enables the user to provide the technical assistance service with precise information, to minimise delays.

 **CAUTION!**

**Risk of injury or death**

The “Spare parts” handbook does not authorise the user to carry out work on the machine with the exception of those operations explicitly described in the User Manual. It only enables the user to provide the technical assistance service with precise information, to minimise delays.



## 8. MAINTENANCE



### DANGER

When the machine is disconnected from the air supply, the devices bearing the sign shown above may remain pressurised.



### CAUTION!

The “Spare parts” handbook does not authorise the user to carry out work on the machine with the exception of those operations explicitly described in the User Manual. It only enables the user to provide the technical assistance service with precise information, to minimise delays.



### CAUTION!

Do not remove or change any part of the machine (except for maintenance purposes).



### CAUTION!

It is prohibited to perform any operation that changes the pre-established value of the pressure regular valve or pressure limiter. The manufacturer declines all liability for damage resulting from tampering with these valves.



### CAUTION!

Before making any change or performing maintenance, disconnect the machine's power and air supplies and ensure that all moving parts are suitably blocked.



### WARNING

Keep the working area clean. Do not use compressed air, jets of water or thinner to remove dirt or residuals from the machine. While cleaning, try as far as possible to prevent dust from forming or rising.

### CAUTION!

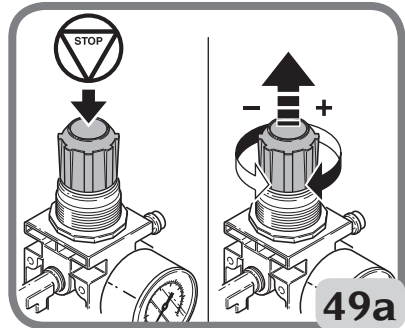
SIMPESFAIP declines all liability for claims derived from the use of non-original spare parts or accessories.

## CAUTION!

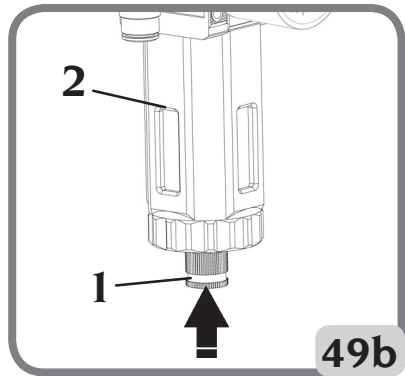
Clean with a dry cloth. Avoid contact with solvents.

The filter-regulator unit filters the air and regulates air pressure.

The FRL unit supports a maximum input pressure of 15 bar and has an adjustment range of 0.5 to 10 bar. The setting may be modified by pulling the handle out and then turning. After adjusting, return the handle to the locked position by pushing down (fig. 49a).



The regulating filter unit is equipped with a semiautomatic device to drain the condensate. This device is automatically activated whenever pneumatic supply to the machine is cut off. Drain the condensate manually (1, Fig. 49b) when the level rises above level 2, Fig. 49b).




## 9. INFORMATION ABOUT SCRAPPING

If the machine is to be scrapped, remove all electrical, electronic, plastic and metal parts and dispose of them separately in accordance with current provisions as prescribed by law.

## 10. ENVIRONMENTAL INFORMATION

The disposal procedure described below only applies to machines with the symbol of



the waste bin with a bar across it  on their data plates.

This product may contain substances that can be hazardous to the environment and to human health if it is not disposed of properly.

The following information is therefore provided to prevent the release of these substances and to improve the use of natural resources.

Electrical and electronic equipment should never be disposed of in the usual municipal

waste but must be separately collected for their proper treatment. The crossed-out bin symbol, placed on the product and on this page, reminds the user that the product must be disposed of properly at the end of its life.

In this way it is possible to prevent that a non specific treatment of the substances contained in these products, or their improper use, or improper use of their parts may be hazardous to the environment or to human health. Furthermore, this helps to recover, recycle and reuse many of the materials contained in these products.

Electrical and electronic manufacturers and distributors set up proper collection and treatment systems for these products for this purpose.

At the end of the product's working life, contact your supplier for information about disposal procedures. When you purchase this product, your supplier will also inform you that you may return another worn-out appliance to him free of charge, provided it is of the same type and has provided the same functions as the product just purchased.

Any disposal of the product performed in a different way from that described above will be liable to the penalties provided for by the national regulations in force in the country where the product is disposed of.

Further measures for environmental protection are recommended: recycling of the internal and external packaging of the product and proper disposal of used batteries (only if contained in the product).

Your help is crucial in reducing the amount of natural resources used for manufacturing electrical and electronic equipment, minimise the use of landfills for product disposal and improve the quality of life, preventing potentially hazardous substances from being released in the environment.

## **11. INFORMATION AND WARNINGS ABOUT OIL**

### **Used oil disposal**

Do not dispose of used oil into sewage mains, storm drains, rivers or streams. Contact a specialised firm for disposal.

### **Oil spreading or leakage**

Contain the spilt product from spreading using soil, sand or any other absorbent material. Degrease the contaminated area with solvents, taking care to disperse the fumes. The residual cleaning material must be disposed of as prescribed by law.

### **Precautions when using oil**

- Avoid contact with skin.
- Avoid formation and spreading of oil mists into the atmosphere.
- Adopt the following simple sanitary precautions:
  - protect against oil splashes (appropriate clothing, protective guards on machines);
  - wash frequently with soap and water; do not use cleaners or solvents that can irritate your skin or remove its natural protective oil;
  - do not dry hands with dirty or greasy rags;
  - change clothing if impregnated with oil, and in any case at the end of each work shift;

- do not smoke or eat with greasy hands.
- Adopt the following preventive and protective measures as well:
  - gloves resistant to mineral oils, with lining;
  - goggles, in case of splashes;
  - aprons resistant to mineral oils;
  - screens to protect against oil splashes.

#### **Mineral oil: First aid instructions**

- Swallowing: seek medical attention immediately and provide all characteristics of the oil type ingested.
- Inhalation: for exposure to high concentrations of fumes or oil mist, move the affected person to the open air and seek medical attention immediately.
- Eyes: bathe with plenty of running water and seek medical attention immediately.
- Skin: wash with soap and water.

## **12. INFORMATION AND WARNINGS ABOUT TYRE LUBRICATING FLUID**

#### **Used oil disposal**

Do not dispose of used lubricant fluids in sewers, storm drains, rivers or streams; collect it and consign it to an authorised disposal company.

#### **Lubricant fluid leaks or spills**

Avoid product leaks from spreading by using non-inflammable absorbent materials such as dirt, sand, vermiculite or diatomaceous earth.

Clean the contaminated area preferably with a detergent, do not use solvents.

#### **Precautions for the use of lubricant fluid for tyres**

- Avoid sprays or contact with the skin.
- Avoid sprays or contact with eyes.
- Do not inhale the fumes.
- Adopt the following simple sanitary precautions:
  - protect skin and eyes against lubricating fluid splashes (appropriate gloves, goggles);
  - in case of contact with skin, wash immediately with plenty of water;
  - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice;
  - if swallowed, seek medical advice and show the label;
    - do not dry hands with dirty rags;
  - change your clothes if they are soaked in lubricating fluid;
  - do not smoke or eat with hands soiled with lubricating fluid.

# 13. RECOMMENDED FIRE EXTINGUISHING EQUIPMENT

When choosing the most suitable fire extinguisher consult the following table:

	Dry materials	Flammable liquids	Electrical equipment
Water	YES	NO	NO
Foam	YES	YES	NO
Powder	YES*	YES	YES
CO <sub>2</sub>	YES*	YES	YES
YES*	<b>Use only if more appropriate extinguishers are not at hand or when the fire is small.</b>		

## ⚠ WARNING

This table contains general instructions to be used as guidelines for the users. All the applications of each type of extinguisher must be obtained from the relevant manufacturer.

# 14. GLOSSARY

## Tyre

A tyre consists of: **I- the tyre**, **II- the rim** (wheel), **III- the air chamber** (in tube type tyres), **IV- pressurised air**.

The tyre must:

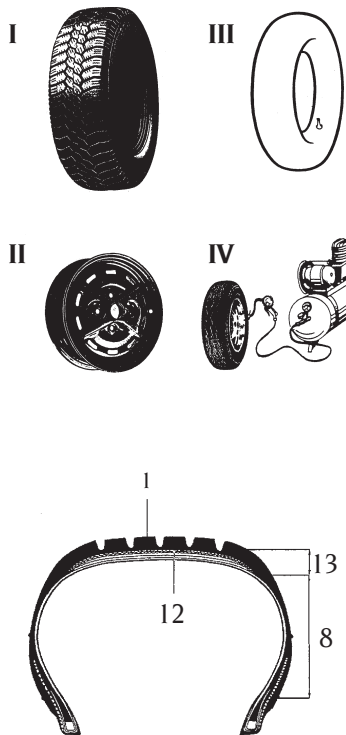
- withstand a load,
- ensure driving power,
- steer the vehicle,
- aid handling and braking,
- aid vehicle suspension.

**I - Tyre** The tyre is the main part of the complex that is in contact with the road and is therefore designed to support the internal air pressure and all other stress arising from use.

A tyre section shows the various parts it consists of:

**1 - The tread.** It is the part in contact with the road while the tyre is rolling. It comprises a rubber compound and a "pattern" suitable for ensuring good resistance to abrasion and good grip in dry and wet conditions, as well as quiet operating conditions.

**2 - Edge or bracing.** This is a metal fabric or textile insert, in the area of the outer bead part. It protects the casing plies from rubbing against the rim.



3 - *Casing*. This is the resistant structure and comprises one or more layers of rubber plies. The way the plies comprising the casing are arranged give the structure its name. The following structures are possible:

**Conventional:** the plies are inclined and arranged so that the strands comprising a ply overlap with those of the adjacent ply. The tread, which is the part of the tyre in contact with the ground, is part of the sidewalls and so during rolling, sidewall flexure is transmitted to the tread.

**Radial** The casing consists of one or more plies with the cords in a radial direction.

A radial casing in itself is quite unstable. To make it stable and prevent incorrect tread movement in the area of contact with the ground, the casing and the tread are reinforced with an annular structure, usually called a belt. The tread and sidewall work with different, independent rigidities, so during rolling, sidewall flexure is not transmitted to the tread.

4 - *Side ring* This is a metal ring with various steel wires. The casing plies are secured to the side ring.

5 - *Belt*. This is a non-flexible circumferential structure comprising cross-ply at very low angles, positioned below the tread, to stabilise the casing in the footprint area.

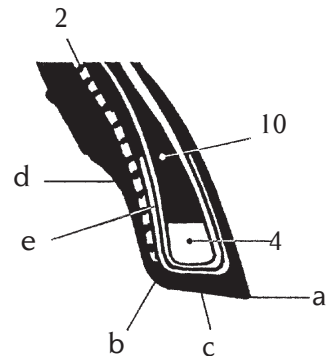
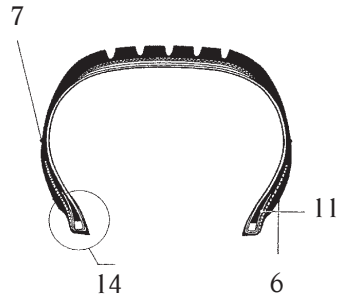
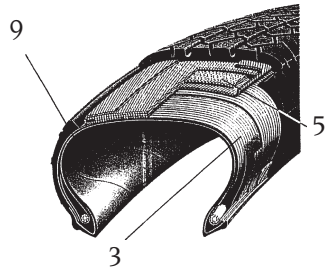
6 - *Centring band*. This is a small marking which indicates the circumference of the top part of the bead and is used as a reference to check exact tyre centring on the rim after mounting.

7 - *Protective band*. This is a circumferential marking in the area of the sidewall which is more exposed to accidental rubbing.

8 - *Sidewall*. This is the area between the shoulder and the centring band. It consists of a more or less thin layer of rubber, which protects the casing plies from lateral impact.

9 - *Liner* This is a vulcanised, compound layer, impermeable to air, inside tubeless tyres.

10 - *Filling* This is a generally triangular rubber profile, above the side ring; it provides rigidity for the bead and gradually offsets the abrupt uneven thickness



caused by the side ring.

11 - *Flap*. This is the part of the casing ply around the side ring and placed against the casing, to secure the ply and prevent it from slipping.

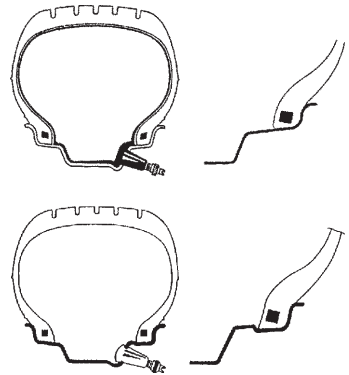
12 - *Foot*. This is the innermost layer of the tread in contact with the belt, or if the latter is not present (conventional tyres) with the last casing ply.

13 - *Shoulder* This is the most external part of the tread, located between the corner and the start of the sidewall.

14 - *Bead*. This is the part that joins the tyre to the rim. The bead point (a) is the inner corner. The spur (b) is the inner part of the bead. The base (c) is the area resting against the rim. The groove (d) is the concave part against which the rim shoulder rests.

Tube type tyres. As a tyre has to contain pressurised air for a long period of time, an air chamber is used. The valve for adding air and maintaining, controlling and restoring air pressure is part of the chamber in this case.

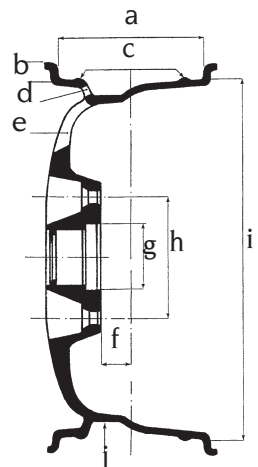
Tubeless tyres. Tubeless tyres consist of a tyre with inner sidewall lined with a thin layer of special impermeable rubber, called *liner*. This liner helps to maintain air pressure in the casing. This kind of tyre must be mounted on a specific rim, to which the valve is directly fixed.



**II - Rim (Wheel)**. The wheel is the rigid metal part which connects the vehicle hub to the tyre, on a fixed but non-permanent basis.

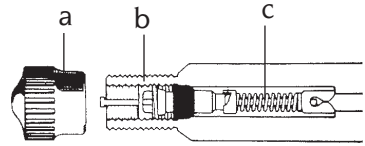
*Rim profile*. The rim profile is the form of the section in contact with the tyre. It comprises different geometric forms, which ensure: easy tyre mounting (bead insertion in the rim well); safe driving, in terms of the bead anchored in its seat.

The rim section shows its various parts: a) rim width – b) shoulder height – c) tubeless anchoring (HUMP) – d) valve hole – e) ventilation opening – f) off set – g) central hole diameter – h) attachment hole centre to centre i) keying diameter – j) rim well.



**III - Air chamber (tube type tyres).** The air chamber is a closed ring-like rubber structure with a valve, which contains pressurised air.

*Valve.* The valve is a mechanical device to inflate/deflate the tyre and maintain air pressure inside the air chamber (or tyre in the case of tubeless tyres). It consists of three parts: the valve closing cap (a) (to protect the internal mechanism from dust and guarantee air tightness), an internal mechanism (b) and the base (c) (the outer lining).



Tubeless Inflater. An inflation system which simplifies inflating tubeless tyres.

Beading. Operation which takes place during inflation and ensures perfect centring between the bead and the rim edge.

Bead pressing gripper. A tool intended for use when mounting the upper bead. It is positioned so that it engages the shoulder of the rim and maintains the upper tyre bead inside the well. It is generally used for mounting low profile tyres.

Air delivery regulator. Union allowing regulation of the air flow.

Bead breaking. Operation that allows the tyre bead to be detached from the rim edge.



# GENERAL ELECTRIC LAYOUT DIAGRAMS

Fig. 50a / 50b / 50c / 50d / 50e

**XS1** Power socket

**X1** Power plug

**QS1** Inverter

**S2** Two speed inverter

**M1** Single phase motor

**M3** Three phase motor

**R1** Resistor

**C1** Capacitor

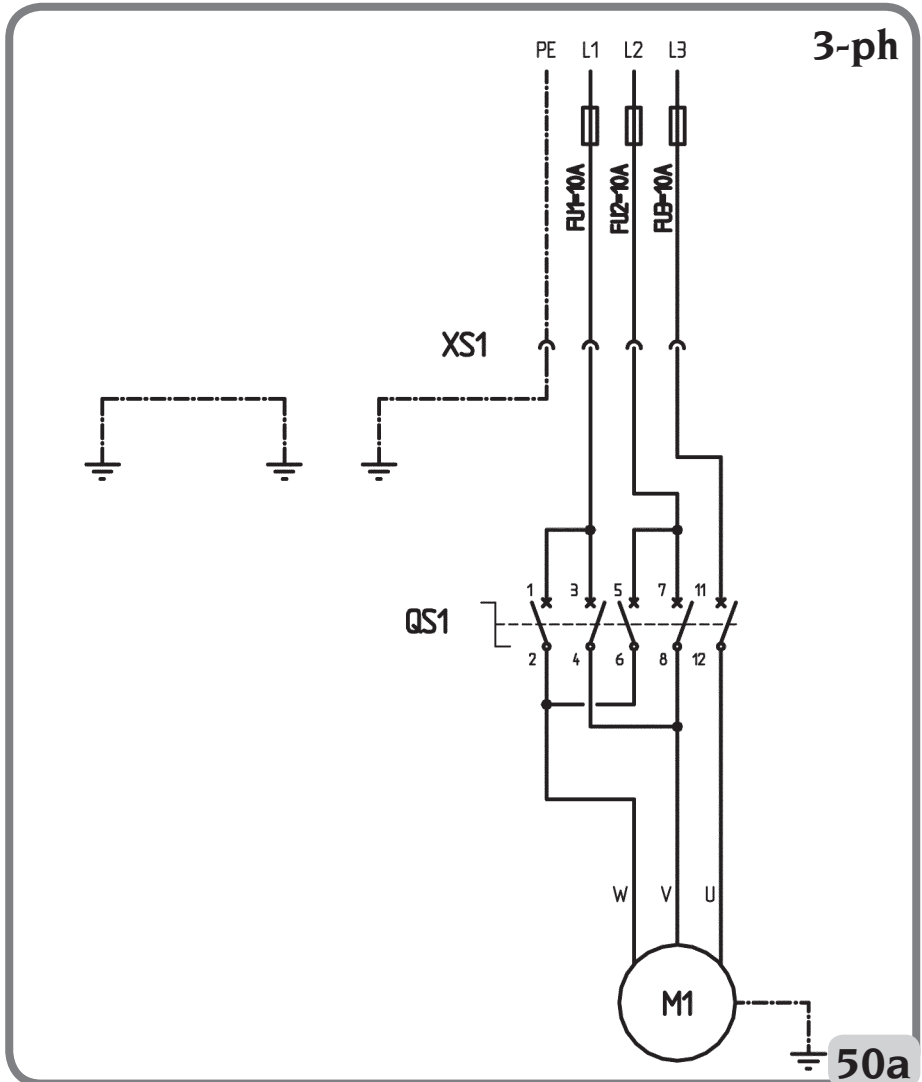
**Fr** Fuse

**AP1** Single / two-speed motor circuit board

**SQ1** Two-speed micro-switch

**SQ2** Micro-switch (clockwise rotation)

**SQ3** Micro-switch (anticlockwise rotation)



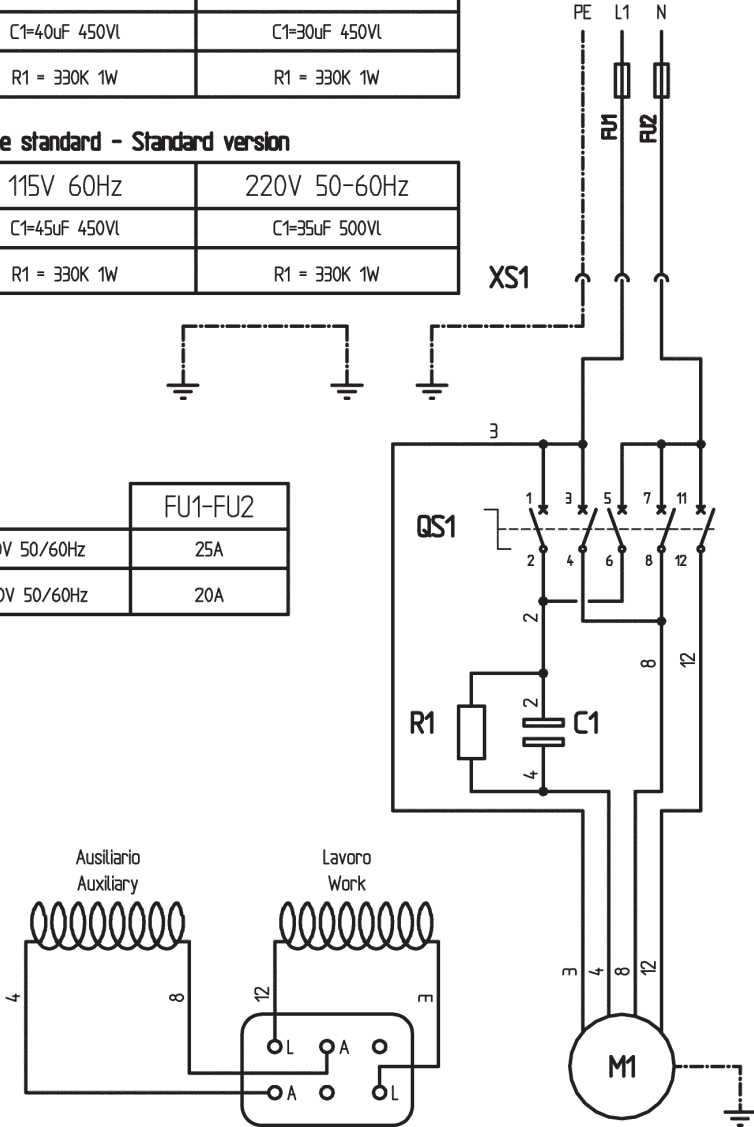
Solo versione CSA - CSA version only

115V 50-60Hz	220V 50-60Hz
C1=40uF 450VL	C1=30uF 450VL
R1 = 330K 1W	R1 = 330K 1W

Versione standard - Standard version

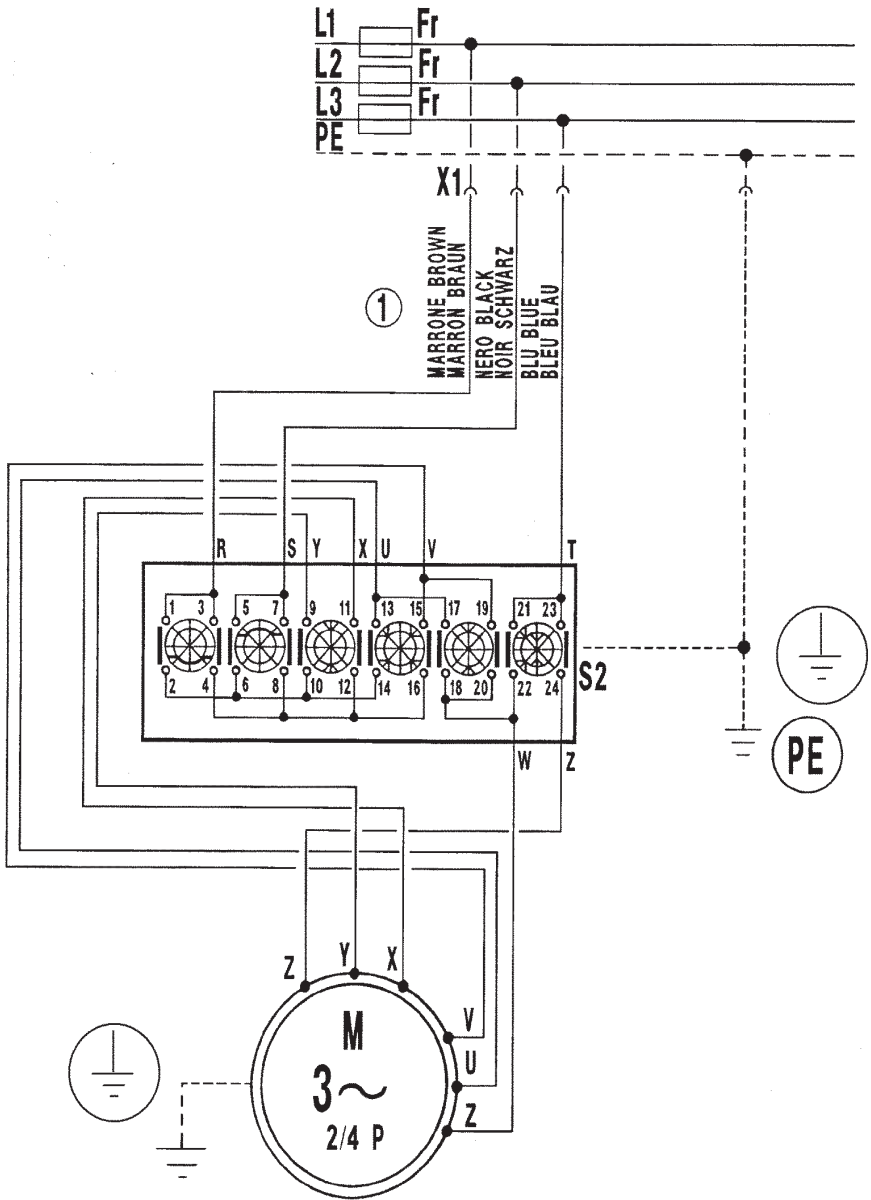
115V 60Hz	220V 50-60Hz
C1=45uF 450VL	C1=35uF 500VL
R1 = 330K 1W	R1 = 330K 1W

FU1-FU2	
110V 50/60Hz	25A
220V 50/60Hz	20A



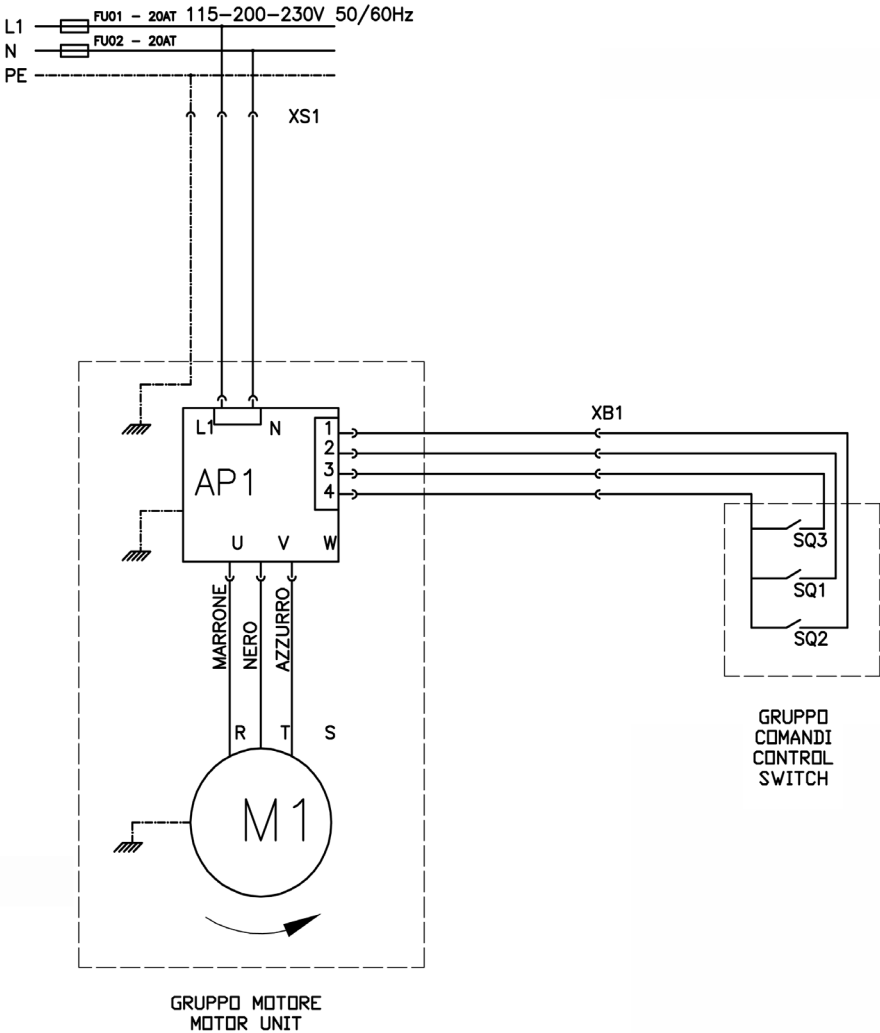
Schema cablaggio morsettiera  
Wiring diagram terminal-blok

# DV - 3Ph

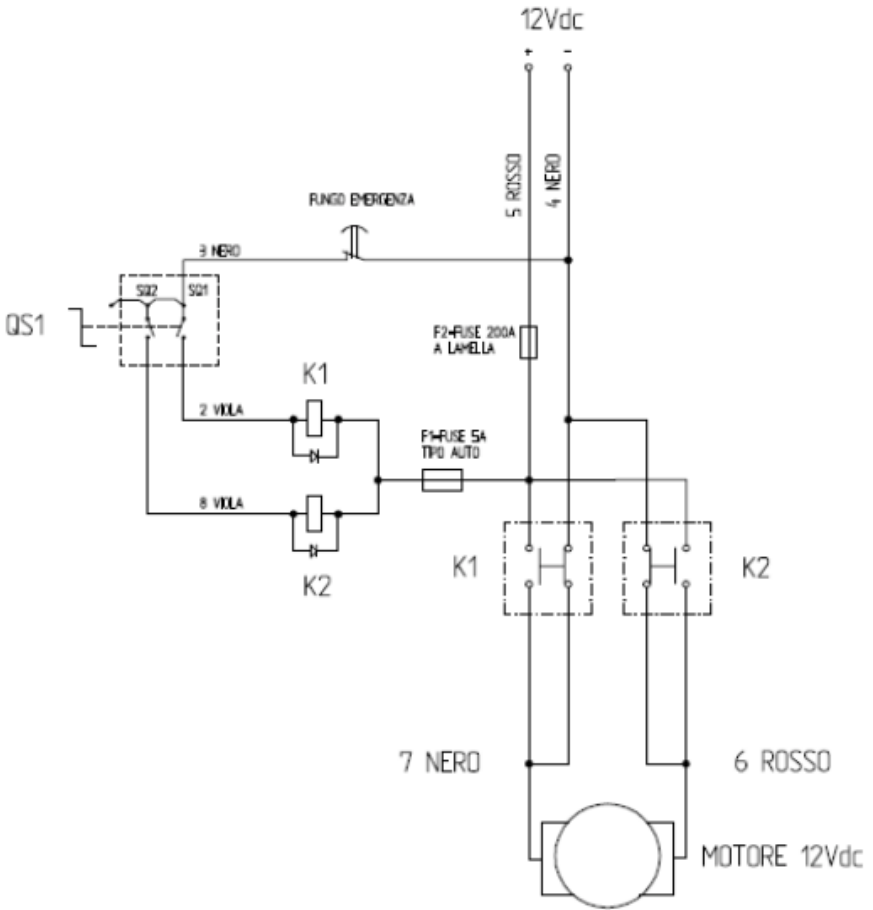


50c

# DV - 1Ph



50d

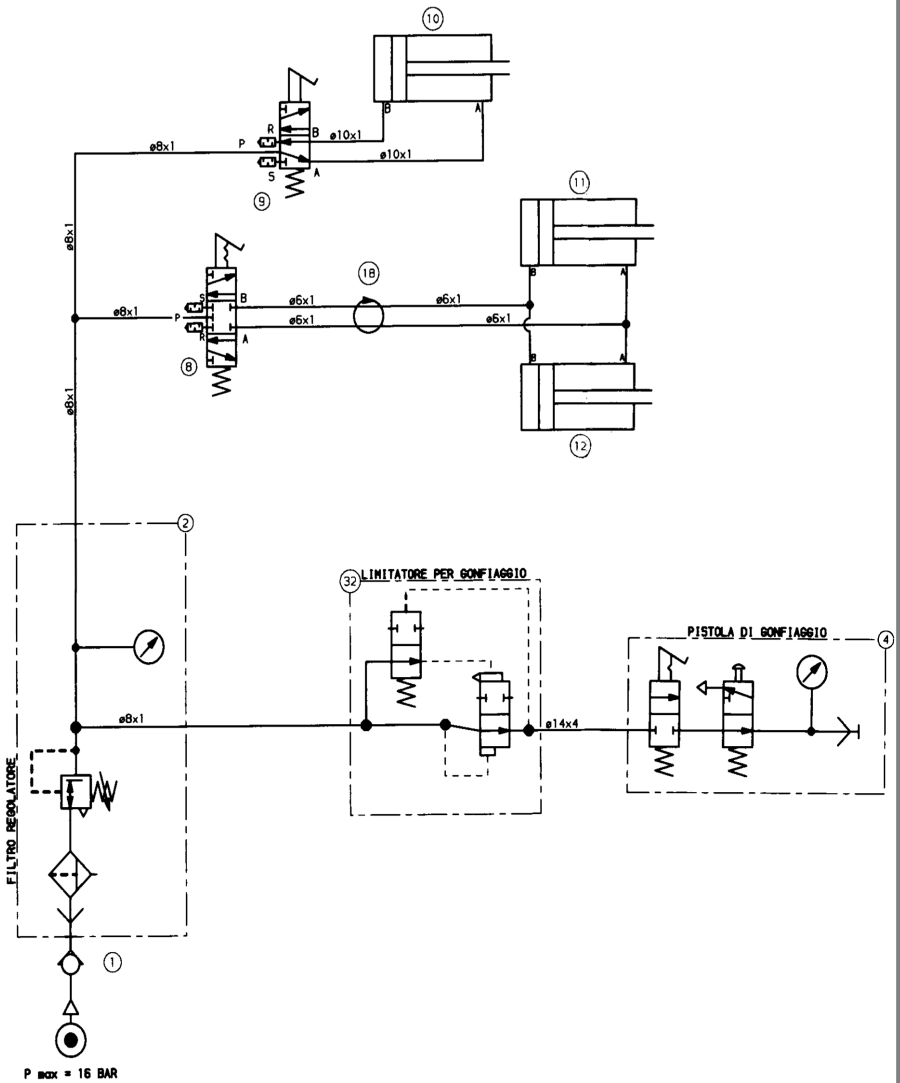


# PNEUMATIC SYSTEM DIAGRAM

Fig. 51a / 51b / 51c / 51d

- 1 Snap coupling
- 2 Filter regulator unit
- 3 Inflation pedal
- 4 Air pressure gun
- 5 Deflation push-button.
- 6 Pressure gauge
- 8 Turntable valve
- 9 Bead breaker valve
- 10 Bead breaker cylinder
- 11 Right turntable cylinder
- 12 Left turntable cylinder
- 18 Swivel connector
- 19 Delivery valve
- 20 Tank
- 21 Relief valve
- 26 Pneumatic motor
- 31 Air motor valve 5V - 3P
- 32 Inflation limiter unit
- 33 Automatic distributor for rapid discharge

# STANDARD VERSION



# VERSION WITH AIR MOTOR

