

CASTELLINI S.p.A.
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BOLOGNA (ITALY)

AIR COMPRESSOR

CS/3

155H . 2E . E99

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AIR COMPRESSOR

CS/3

**PART I - GENERAL INSTRUCTIONS
FOR THE OPERATOR**

IMPORTANT NOTICE

This equipment has been engineered for supplying compressed air enough to drive one dental unit, and is constructed in compliance with the Directive 89/392/EEC (MACHINERY DIRECTIVE) and its subsequent amendments and Directive 87/404/EEC (SIMPLE PRESSURE VESSELS).

- **We prescribe to** read the instructions contained in the users' manual carefully before using the unit.

The instructions for installing the device and the instructions for technical service and repair are held by the "CASTELLINI AUTHORISED" TECHNICIAN IN POSSESSION OF A VALID LICENCE.

The Manufacturer will not be held responsible for the safety, reliability, or performance of the equipment in the event of civil or penal proceedings if:

- a) the essential environmental requirements as stated in the use and maintenance manual are not met;
- b) assembly, additions, adjustments, re-settings, repairs are not performed by "AUTHORISED CASTELLINI TECHNICIANS" IN POSSESSION OF A VALID CASTELLINI IDENTIFICATION CARD;
- c) any medical devices other than those authorised by Castellini itself or devices that fail to meet the compatibility parameters specified by Castellini S.p.A. are connected to Castellini equipment;
- d) unauthorised modification, arbitrary tamperings, incorrect maintenance operations are carried out or if non-original spare parts and/or components are used;
- e) the equipment is not used in compliance with the instructions for use (as set out in the use and maintenance manual) or if it is used for purposes other than those for which it is designed;
- f) the power, water and compressed air supply, the water drainage system and the air extraction system (where applicable) do not comply with the conditions stated in the use and maintenance manual (see "preparing for installation" paragraph and equipment installation plan, scale 1:1);
- g) the periodic maintenance operations schedule and all the recommendations listed in the use and maintenance manual are not followed.

Failure to comply with the above conditions automatically voids the guarantee terms, and can endanger the safety requirements defined under 93/42 CEE norm, transferring full responsibility for safety and CE mark compliance for the product on to those responsible for carrying out the operations described above.

You are hereby informed that:

THE PERSON IN CHARGE OF THE DENTAL PRACTICE IS RESPONSIBLE FOR ENSURING THAT ALL INSTALLATIONS, PREMISES AND MAINS SUPPLIES MEET THE BASIC REQUIREMENTS LISTED BELOW:

ITEM	ESSENTIAL REQUIREMENTS
<input type="checkbox"/> Premises	a) protected from risk of explosion, non pressurized b) temperature between 10°C and 40°C c) Relative humidity between 30% and 75% d) Air pressure between 700 hPa and 1060 hPa (700 ÷ 1060 mbar) e) The compressor must be installed in a well ventilated room and not in close proximity of heat sources or exhaust air from the vacuum system.
<input type="checkbox"/> Electrical installation	a) compliance with regulations concerning electrical installations in premises used for medical purposes. All power and water supply installations must comply with the country legal provisions b) Single-phase mains current, 220/240 V ± 10% - 50/60 Hz ± 10% frequency
<input type="checkbox"/> Electrical power supply	Adequate for power requirements, as specified on the appliance's rating information plate Single-phase power 220/240 V - 50/60 Hz Max absorbed power 2,2 kVA The unit is fitted with a terminal board for connection to a permanent power supply system. Upstream from the unit have to be installed a differential, bipolar switch for at least 20A - 250V with differential operating time current I Δ n = 0,03 A. The electrical wiring of the room and the heart connection must comply with the current regulations. The addition of an air-compressor will require a power supply and safety fuse that must be independent from the unit.

(Table on Compliance of Installations, Premises and Supply)

ESSENTIAL REQUIREMENTS

The dental patient chair, dental unit (including all the tools and devices connected to it, with the exception of high speed drills), operating lamp, x-ray equipment, compressor and any other device manufactured by Castellini S.p.A. the forms an independent unit must undergo the scheduled annual maintenance operations (except where otherwise indicated in the part on "Scheduled Maintenance Operations" in this Manual) by technicians carrying a valid Castellini identification card, 365 days after installation, regardless of whether they have actually been used or not.

The owner of the equipment is responsible for booking the services of the Castellini technician at all times.

CIRCUIT DIAGRAM, LISTS OF COMPONENTS, CALIBRATION INSTRUCTIONS

Castellini S.p.A. undertakes to provide on request circuit diagrams, lists of components, calibration instructions or any other information that may be required by qualified technicians, authorized by Castellini and in possession of a valid professional licence, to repair those parts of the equipment that may be repaired.

Castellini S.p.A. reserves the right to modify the products at any moment without notice.

PREPARATION OF THE PREMISES

Before the equipment is delivered, the person in charge of the dental practice will need to check that the premises are equipped with adequate power supply. Alternatively, where necessary, these works should be carried out following the instructions printed in the table on "Compliance of installations, premises and mains services with basic requirements".

ATTENTION

- During the working, this unit will not cause radio interference to the electric network.

TECHNICAL FEATURES

Double-cylinder air compressor, model "CS/3" with or without drying system.

- Quantity of air released at 350 kPa (3,5 bar)	120 l/min
- Pneumatic-switch work pressure range	500 ÷ 650 kPa (5 ÷ 6,5 bar)
- Capacity of air receiver	24 l
- Internal treatment with nontoxic and odourless, approved for human feeding containers	
- Power of single-phase electric motor	1,5 kW
- Condenser	32 µF 450V
- Oil-shaking lubrication for connecting-rods, pins and bearings	"DIESEL OIL 40" I.P. RUDIAX or equivalent
- Oil sump capacity	0.500 kg
- Air filter: 5 µ	
- Maximum noisiness at 1 m. of distance	< 70 dB (A)

POWER SUPPLY

- Single-phase A.C. at	220 / 240 V - 50 / 60 Hz
- Maximum power input	2,2 kVA
- Degree of protection against water infiltration	normal

OVERALL DIMENSIONS

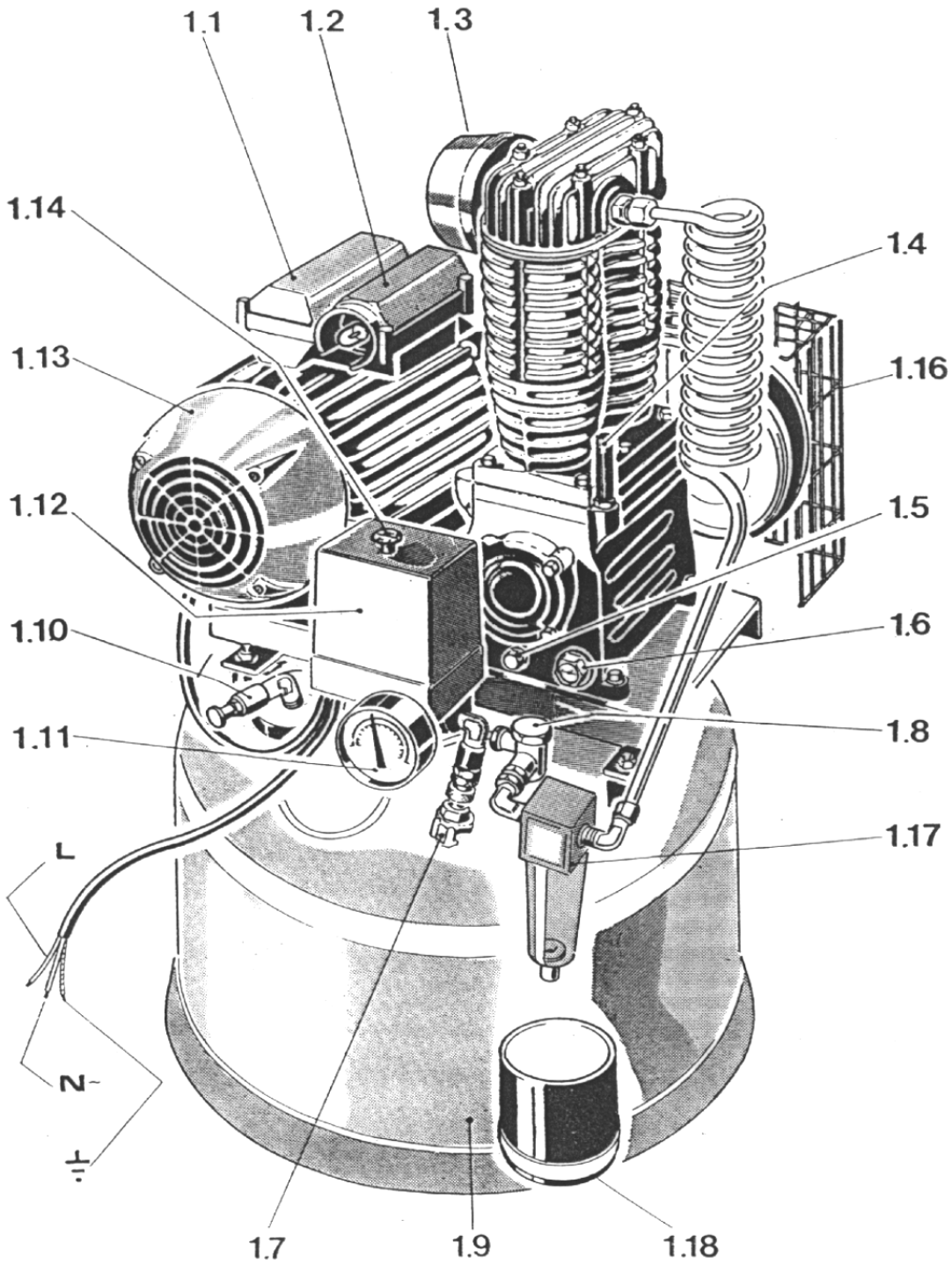
- Maximum basic dimension	500 mm
- Total height (with or without drying system)	750 mm
- Weight (with or without drying system)	(51,5 Kg) / (61 Kg)

PICTURES AND DESCRIPTIONS**"CS/3" AIR COMPRESSOR (WITH AND WITHOUT DRYING SYSTEM)**

(Pict. 1, 2, 1A, 2A and 3A)

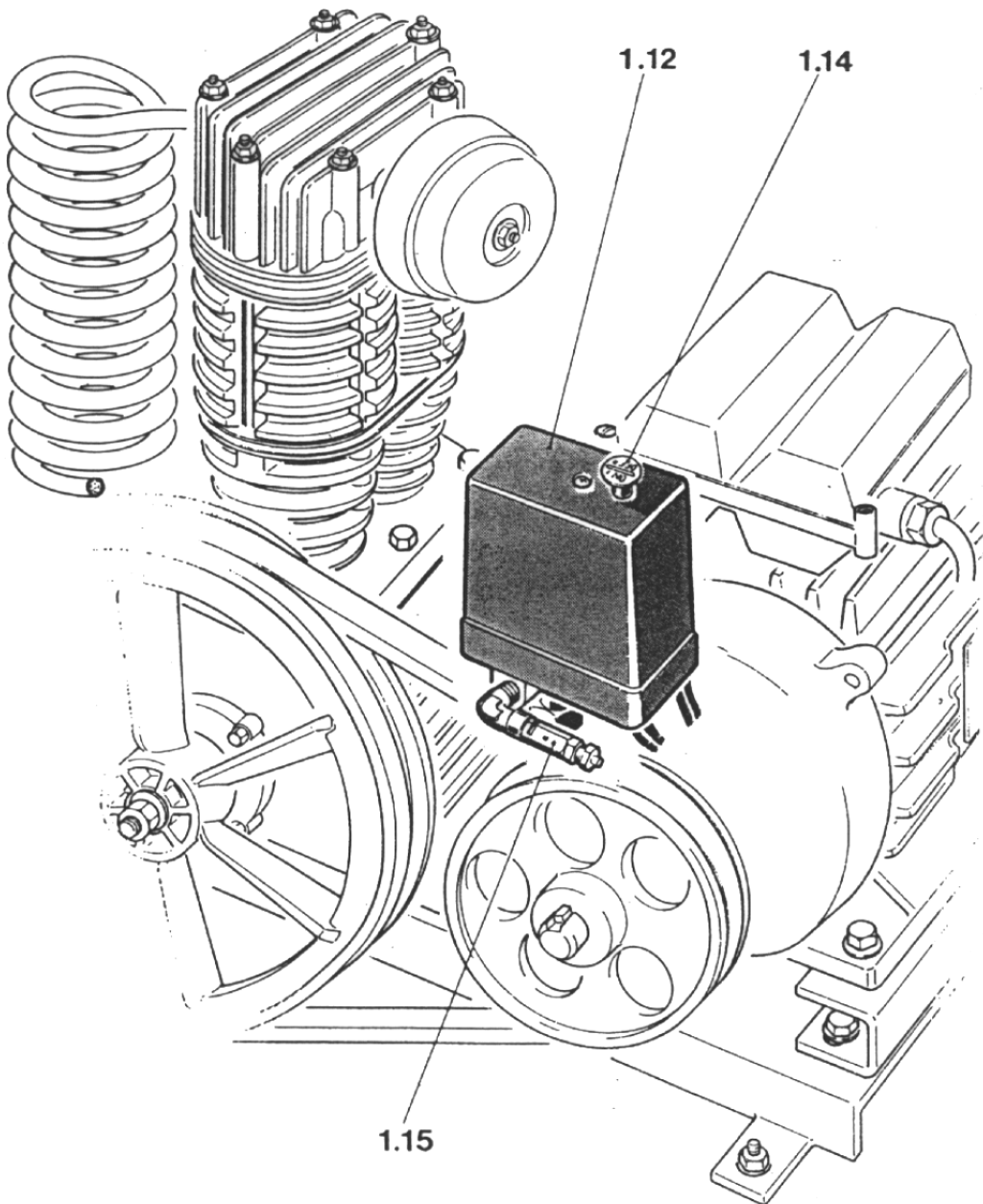
- 1.1 - Motor starting condenser
- 1.2 - Automatic thermal overload cutout with manual resetting
- 1.3 - Suction filter
- 1.4 - Oil plug
- 1.5 - Oil discharge plug
- 1.6 - Oil level gauge
- 1.7 - Compressed air outlet connector
- 1.8 - Check valve
- 1.9 - Air receiver
- 1.10 - Condensate drainage manual valve
- 1.11 - Air pressure gauge
- 1.12 - Pressure switch 500 kPa (5 bar) min. - 650 kPa (6,5 bar) max.
- 1.13 - Single-phase motor
- 1.14 - Manual switch for connecting compressor
- 1.15 - Safety valve
- 1.16 - Belt protection cage
- 1.17 - Air filter
- 1.18 - Condensate drainage filter tank
- 1.19 - Drying system
- L/N/⊕ - Wires of electric network cable (L-brown, N-blue, ⊕ green-yellow) 1.5 mm².

"CS/3" AIR COMPRESSOR (WITHOUT DRYING SYSTEM) (Pict. 1)



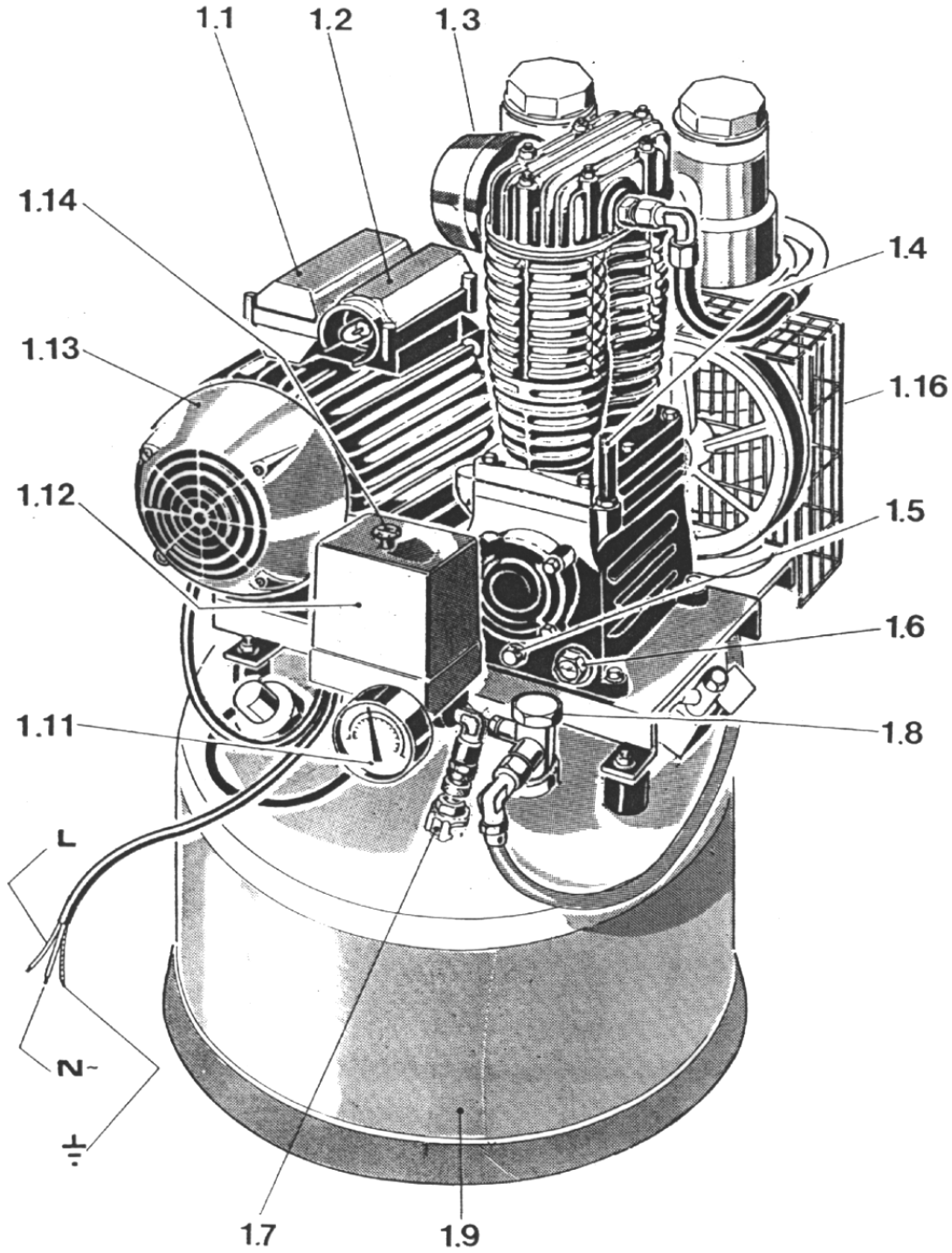
Pict. 1

"CS/3" COMPRESSOR (WITHOUT DRYING SYSTEM) (Pict. 2)



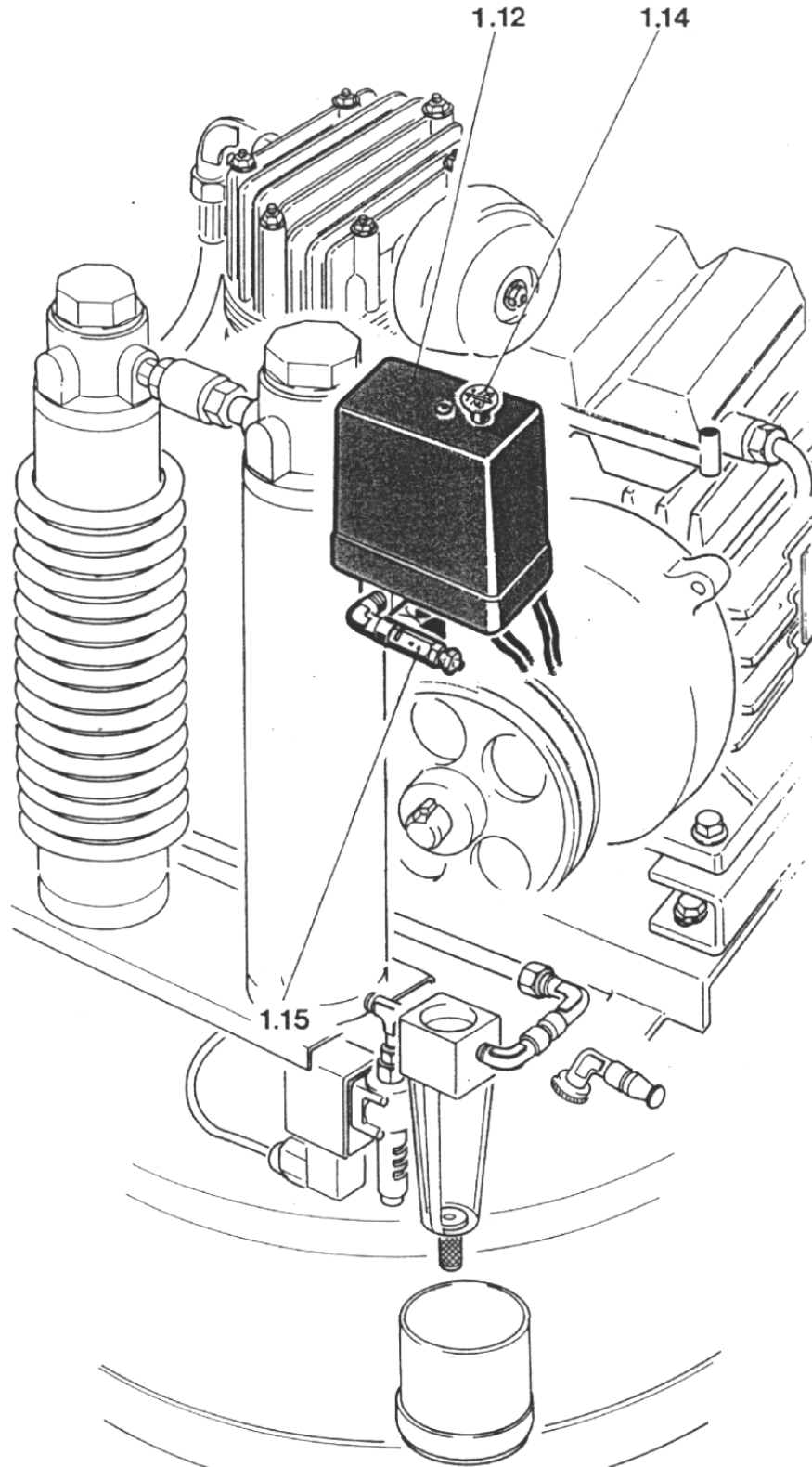
Pict. 2

"CS/3" AIR COMPRESSOR (WITH DRYING SYSTEM) (Pict. 1A)



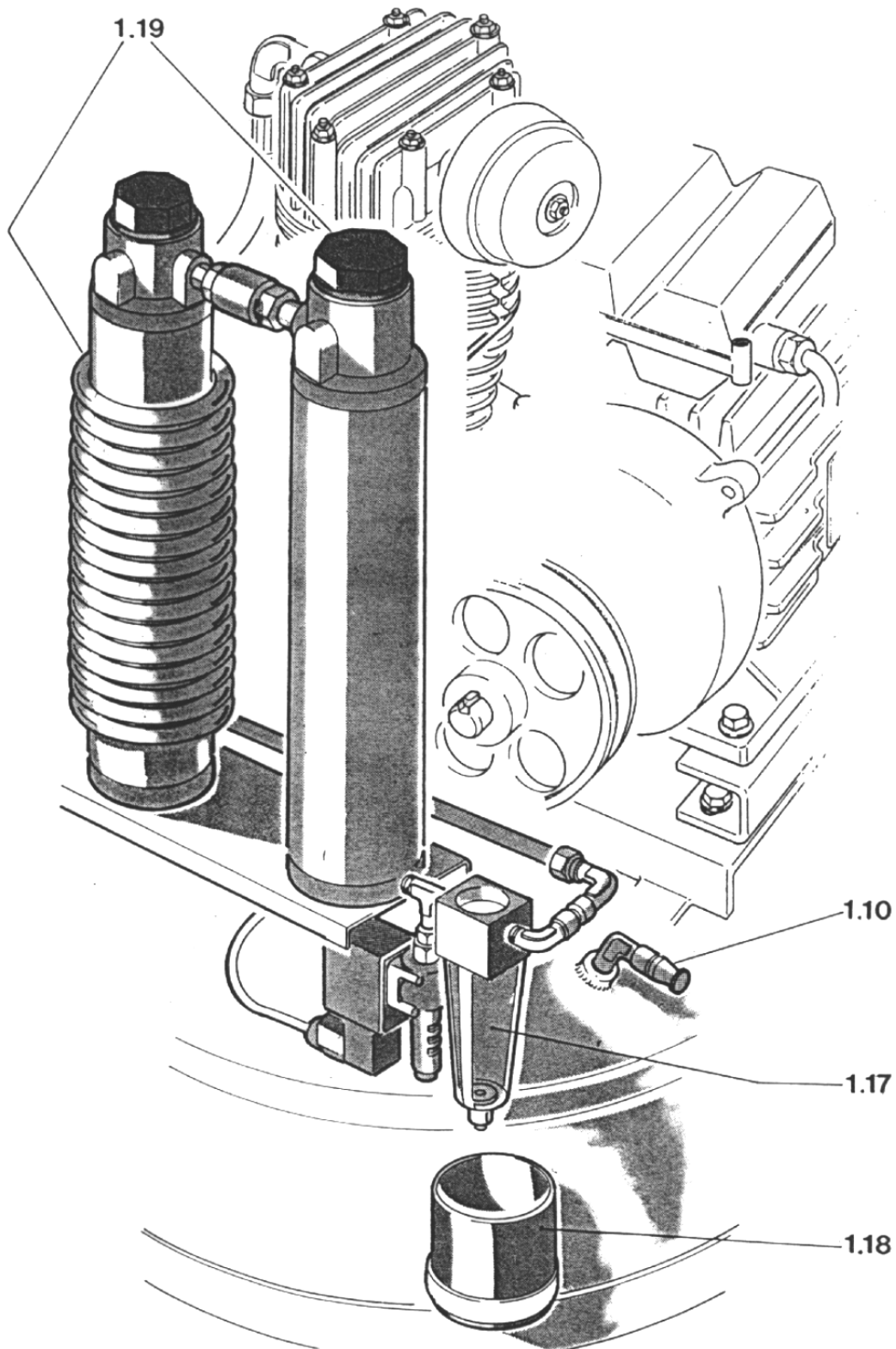
Pict. 1A

"CS/3" AIR COMPRESSOR (WITH DRYING SYSTEM) (Pict. 2A)



Pict. 2A

"CS/3" AIR COMPRESSOR (WITH DRYING SYSTEM) (Pict. 3A)



Pict. 3A



IDENTIFICATION LABEL



Marking of conformity to directive 89/392/EEC (Machinery directive)



IDENTIFICATION LABEL

1999  year of production (UNI EN 980)

SN

SERIAL NUMBER OF THE UNIT (UNI EN 980).

Through this number may be recognized the year and the month of production. The first two figures indicate the year other one letter indicated the month of production (for example 98A = January 98).

TYPE

COMMERCIAL DENOMINATION OF THE EQUIPMENT

V

CONNECTION VOLTAGE TO THE MAINS

~

ALTERNATE CURRENT

Hz

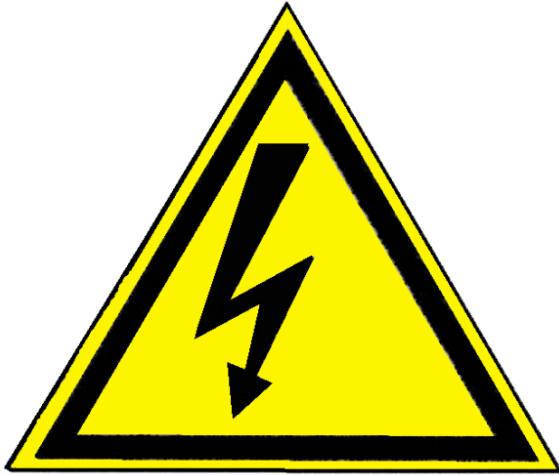
MAINS FREQUENCY IN HERTZ

kVA

MAXIMUM POWER IN KILOVOLTAMPERE ABSORBED FROM THE EQUIPMENT

DESCRIPTION OF HAZARD WARNING SIGNS

Warning signs have been affixed to the parts of this compressor which may constitute a hazard in order to identify the type of hazard that may occur at that point. **THESE SIGNS ARE AN INTEGRAL PART OF THE MACHINE AND MUST NOT BE REMOVED**



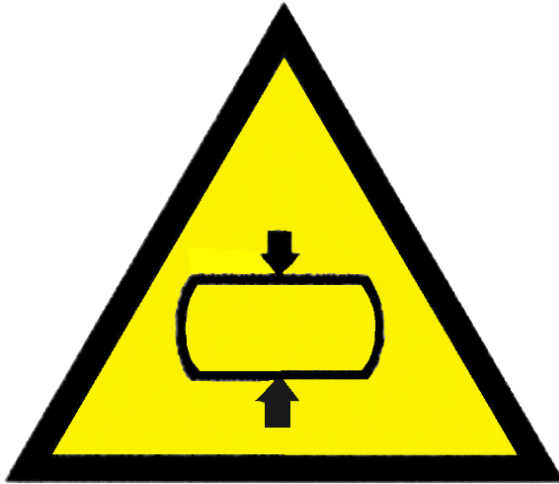
This sign is placed on the pressure switch and the terminal board cover and indicates **DANGEROUS VOLTAGES**. Removing covers bearing this sign gives access to live components.



This sign is placed at the air outlet to draw attention to the fact that the outlet air must be used solely for the pneumatic supply of a dental unit.



This sign is placed near the safety valve and warns of the danger of **HIGH PRESSURE AIR ESCAPING**.



This sign is placed on the tank and warns of the danger of HIGH PRESSURE inside.



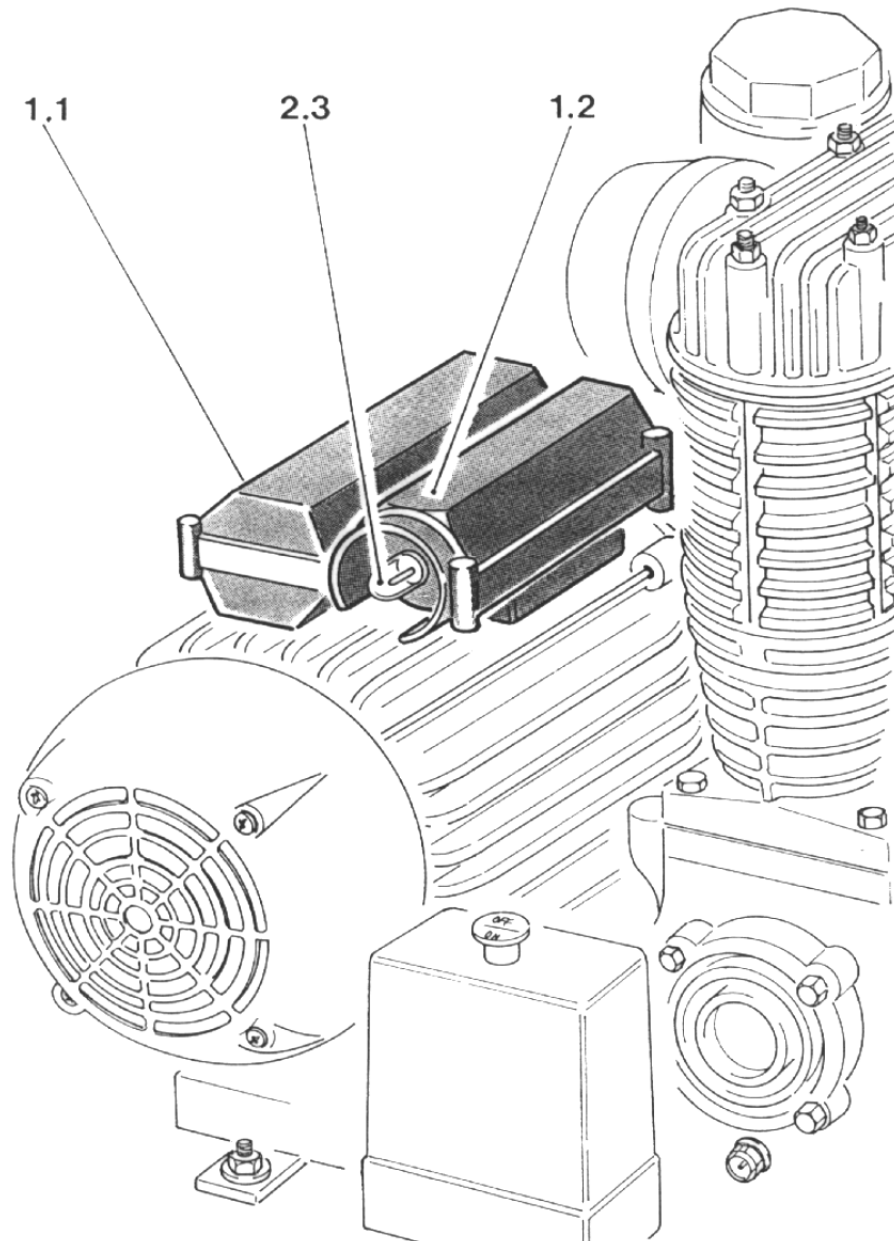
This sign is placed on the motor and warns of the danger of HOT PARTS



This sign is placed near the guard and warns of the danger of a ROTATING FAN

OVERLOAD CUTOUT (Pict. 4)

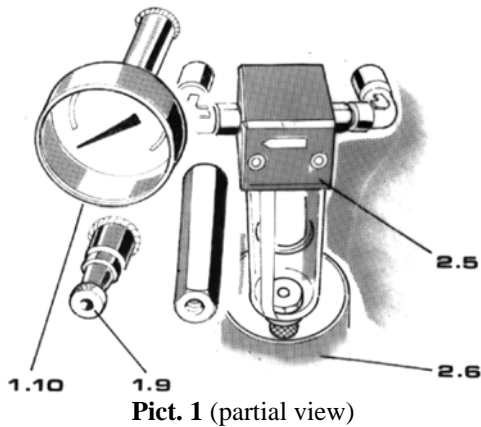
This automatic protection device cuts out power supply to the motor in case of an overload.
 The motor can be connected again only manually by pushing button (2.3).
 Should a technical repair be necessary while the compressor is operating, before cutting out the electric supply, disconnect the manual pressure switch (part. 1.14, pict. 1 and pict. 1A).
 By this operation, in fact, also the air still under pressure in the cylinder head is drained.
 The motor can then start again functioning without too much effort, thus avoiding an excessive electrical input and therefore the automatic operation of the overload cutout.



Pict. 5

ROUTINE MAINTENANCE

Maintenance work must be carried out with the machine stopped and disconnected from the electrical power supply.



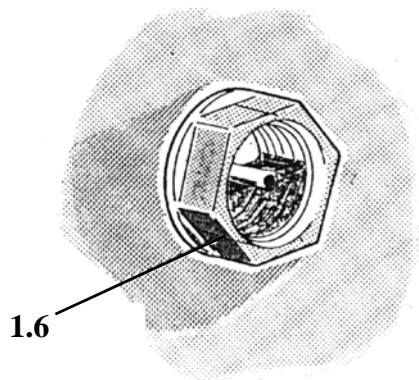
CONDENSATE DRAINAGE (Pict. 1)

The tap (1.10) is used to discharge the air condensate which is in the tank (**operation to be effected at least once at week for "CS/3" model without drying system**).

For this reason it will be necessary to let the air under pressure coming out, after having placed a container under the tap (1.10).

For "CS/3" model with draining system it is necessary to discharge only the recovery tank.

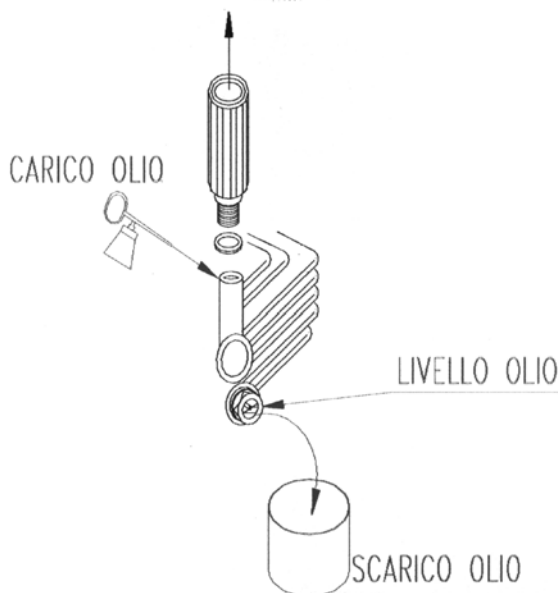
Replace the filter element (1.17) at least once a year.



OIL LEVEL

Oil leveling must be checked during the installation or once a month, observing level indicator (1.12)

Should oil not reach the level indicated by the red pointer, fill up by pouring the oil into the filler closed with plug (1.8 - Pict. 5)

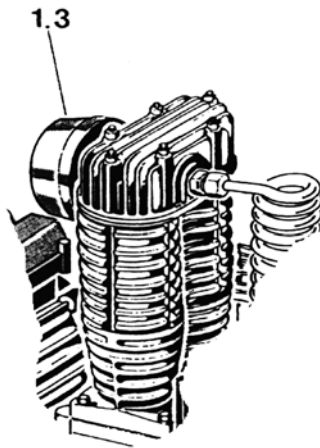


Oil should be completely changed after about two months of operation and approximately every 1000 hours of work (or at least once a year).

Oil drainage is performed by removing the level gauge (1.12) and the draining device (1.8, Pict. 5).

When the operation is complete, refit the indicator, fill up with new oil and refit the plug.

SPENT LUBRICANTS MUST BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LEGISLATION.



AIR FILTER

Clean the air intake filter (1.3) at least once a year.
Take off the cover and remove the air filter.
Replace if deteriorated.

CLEANING THE COMPRESSOR

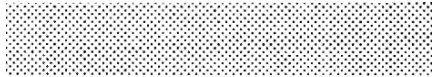
The compressor must be cleaned with the machine stopped and disconnected from the electrical power supply.
Use a dry cloth to remove dust deposits.

SCRAPPING

If the machine is scrapped, it must be disposed of in accordance with applicable legislation.
The lubricant must be disposed of separately in accordance with applicable legislation.
The materials used do not constitute a hazard for humans or animals in the event of contact or exposure.

FAULTS - PROBABLE CAUSES - RECOMMENDED REMEDIES

FAULT	PROBABLE CAUSES	RECOMMENDED REMEDY
Air is emitted continuously from the safety valve and the pressure switch repeatedly trips	The backflow prevention valve pad is dirty or worn	- Clean or replace the backflow prevention valve pad - Call the TECHNICAL SERVICE CENTRE
The condensate trap underneath the air filter leaks or air continuously escapes	Impurities or scale inside the condensate trap	- Clean with water or replace the condensate trap cup - Call the TECHNICAL SERVICE CENTRE
Slow to reach maximum operating pressure	Filter clogged or leaking	- Clean the filter or look for the leak. - Call the TECHNICAL SERVICE CENTRE
Belt screeches and is inefficient	Belt slack	- Tighten - Call the TECHNICAL SERVICE CENTRE
Operation does not resume after a power failure or after the automatic circuit-breaker has cut off the electrical power supply	Overload cutout has tripped because of an overload on starting. The stop was not controlled from the pressure switch, so the residual pressure has not been discharged.	- Reset the overload cutout (see OVERLOAD CUTOFF section) - Turn off the manual pressure switch control to purge the residual air, then turn the control back on to start the compressor (see OVERLOAD CUTOFF section) - Call the TECHNICAL SERVICE CENTRE



AIR COMPRESSOR

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**PART II - INSTRUCTIONS FOR THE
INSTALLATION**



ESSENTIAL REQUIREMENTS FOR THE INSTALLATOR

PREMISE

This equipment must be installed only by specially trained and qualified technicians, carrying a valid "Authorised Castellini Technician" identification card.

The use of persons not meeting the above requirements, or in possession of an expired Castellini identification card, will automatically and immediately invalidate the equipment guarantee and all certifications, exonerating Castellini from any form of responsibility and transferring it "*de iure et de facto*" onto the person responsible for the operation, together with any criminal or civil proceedings undertaken by Castellini and claims for any damages suffered by third parties, including any further and/or greater damages.

The specially trained and qualified technician, carrying a valid Castellini identification card must not make alterations without prior authorisation, arbitrarily tamper or incorrectly carry out maintenance operations (i.e., not in compliance with the instructions issued by Castellini itself) and must not use non-original spare parts and/or components, nor connect Castellini products to any medical devices not approved by Castellini or not in compliance with the compatibility parameters specified by Castellini itself.

The specially trained and qualified technician, carrying a valid Castellini identification card is not authorised to alter or in any way interfere with the electric mains supply system as the law requires such operations to be carried out by specially authorised technical personnel (see applicable law)

Furthermore, no alterations or technical operations of any kind or nature may be performed on the water mains supply and water treatment systems or, generally, to the area in which the equipment is to be installed, as any works of this nature are the personal responsibility of the person legally responsible for the dental surgery (see "Important Warnings", page 4).

Any violation of the above renders the identification card null and void and requires its immediate surrender to Castellini. Castellini reserve the right to undertake civil or criminal proceedings and to apply for compensation of any damages incurred, including any further and/or greater damages, notwithstanding any applicable legal sanctions.

The technician, as defined above, must be aware of the contents of the entire manual, including the section entitled "Operator Instructions" and must follow them scrupulously.



During installation, the technician must follow all the instructions and recommendations contained in this manual as well as the "**Installation Check-list**" attached to the equipment. The "**Installation Check-list**" must be signed by both the technician and the client.

The technician must also scrupulously fill in the documents and perform the duties for which he is competent, as described in the "**Installation Certificate**" attached to the equipment, signing the sections that concern him and asking the client and the sales personnel to sign those that concern them.

*A copy of the "**Installation Certificate**" and of the "**Installation Check-list**" must be forwarded to Castellini S.p.A. on the day the equipment is installed.

The technician must hand to the client a "**Malfunction/accident report**" form, inviting him to keep it safe and explaining that such form is to be used by technicians only to report any specific malfunction and/or accident to Castellini S.p.A.

The owner of the equipment is responsible for booking the services of the Castellini technician at all times.

The technician who performs the scheduled maintenance operations is responsible for correctly and accurately filling in the attached forms (see part "Scheduled maintenance operations"), and must sign them, taking the responsibility for their accuracy upon himself.

WE PRESCRIBE TO install at source, however, a wall-mounted automatic differential switch of a minimum 20A - 250 V manufactured in compliance with local standards, with IΔN differential power supply not above 0.03 A.

Where the above mentioned switch is not already available, it must be fitted by personnel licensed to operate on the electricity mains supply system, in the manner and under the terms envisaged in the relevant laws.

* **WE PRESCRIBE TO** provide the equipment with an earth connection in compliance with BS standards.

* In order for the equipment to work efficiently, it is essential that the room in which it is to be installed is adequately prepared, that care is taken in transporting special fittings, that all components are correctly installed and that the maintenance operations schedule recommended by the manufacturer is followed.

This compressor is able to supply compressed air to a dental unit for normal and not surgical dental operations.

It is provided with a copper (nickel plated) coil in order to lower down the temperature of the compressed air and with a 5 μ filter.

This equipment must not be put in operation in environments subject to risk of explosion and in environments which are not protected against the frost.

The manufacturer prescribes the installation of the equipment in rooms with a temperature range between 10°C and 40°C, with a lot of ventilation, dust free and hygienically protected (i.e. not in proximity of a surgical suction exhaust).

For connection to supply mains, the equipment is equipped with a 3G 1.5 mm. H05 VV-F cable complying with laws requirements in force today.

INSTALLATION AND MAINTENANCE WARNINGS

When lifting the compressor take hold exclusively of the surface above the tank and the base of the tank itself. Do not hold onto the cooling fan safety grid (1.16).

- Do not place weights of any kind on the machine.

- During installation make sure that the oil level is not below the red level indicator (1.6) (see TOPPING UP AND REPLACING OIL section).

For connection to electric mains, a feeder line independent of the other apparatuses installed in the surgery should be used.

The electric line should have 3 wires (2P + earth) of at least 2.5 mm²., a socket of at least 15A - 250V and a magnetothermic differential double-pole switch of at least 20A - 250V.

- The compressed air connection must be made as described in the COMPRESSED AIR OUTLET section

- Connect the hose to the dental unit and then to the compressor.

- Before feeding the compressor, raise cover and make sure that the manual pressure switch (1.14) and the push button (2.3) of overload cutout (2.2) are connected (Pict. 2 - part. 1.14 and part. 2.3).

- To start the compressor, connect the electrical plug to the power socket.

- Do not cut out the general supply mains when operating the compressor.

If necessary or in case of technical repair, before cutting out the supply mains raise cover (1.13) and disconnect the manual pressure switch (1.14).

- After installation and start-up, the compressor starts automatically, controlled by the pressure switch, whenever the pressure value reaches the minimum set value.

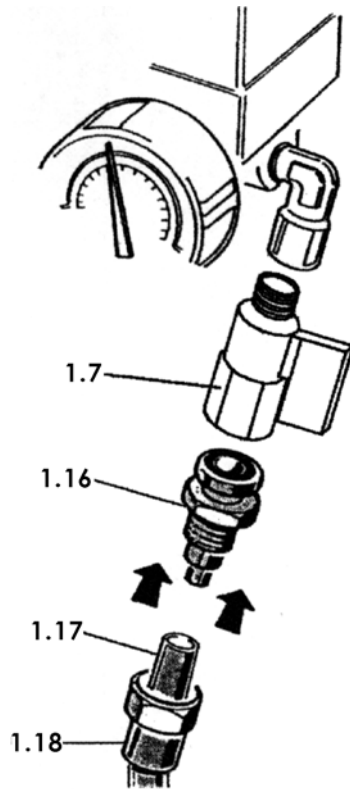
- Following a BLACK-OUT or operation of the automatic circuit breaker, should the compressor not function again raise cover (2.2) and connect overload cutout by pushing button (2.3), press the pressure switch control (1.14) to discharge residual pressure, then raise the control (1.14) again to restart operation.

- Maintenance work must be carried out with the machine stopped and disconnected from the electrical power supply.

- Do not remove the guards or safety devices

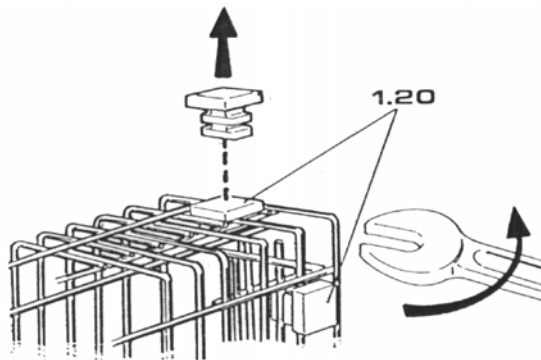
- Perform condensate drainage at least once a week (see CONDENSATE DISCHARGE section)

- Check oil level and change it following the instructions on par. TOPPING UP AND REPLACING OIL of this handbook.



COMPRESSED AIR OUTLET (Pict. 8)

The connection of the compressed air to the unit has to be effected by utilizing a rilsan tube \varnothing . 6x8 mm. (1.17) inserted in the coupling composed by the two pieces (1.18 and 1.16), and inserted in the terminal fitting (1.7).

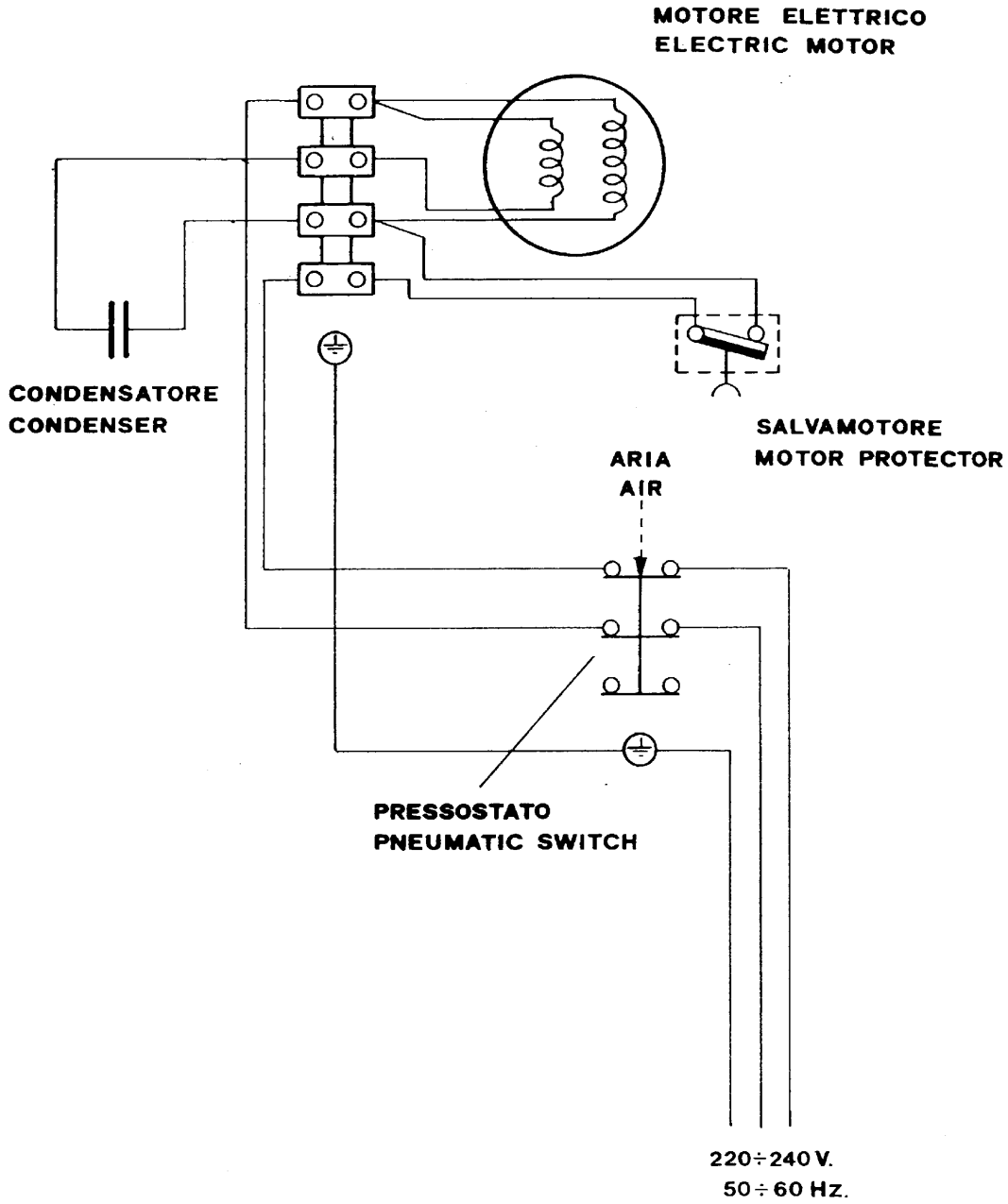


TENSION OF THE BELT (Pict. 9)

For the eventual regulation of the belt tension it's necessary operate as follows:

- with a spanner or pincers, draw out the eight plastic bosses (1.20), placed to the borders of the wire protection cage.
- Rounding them by 90° (as shown in the picture); the external cover of this protection cage can be easily dismantled.
- Loosen the four bolts placed into the base of the electric motor holder and slide it along the holes, going away or drawing near it from the compressor head to decrease or to increase the tension of the belt.
- Press again the nuts and close the two parts of the protection cage with the plastic bosses.

WIRING DIAGRAM





AIR COMPRESSOR

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**PART III - SCHEDULED
MAINTENANCE OPERATIONS AND
WARRANTY CONDITIONS**



SCHEDULED MAINTENANCE OPERATIONS

Scheduled maintenance is mandatory as prescribed by the D.P.R. 224/88. Failure to perform scheduled maintenance will invalidate the warranty and disqualify the customer from displaying the CE mark on the device.

The system will receive one or more free services (depending on the model). This does not include replacement of parts not specified in the contract and any further service work, which are at the customer's expense.

The owner of the equipment is responsible for booking the services of the Castellini technician at all times.

Further information is included in the "Important Warnings" and "Essential Requirements" sections, part 1, Operator Instructions, of the present manual.

Scheduled maintenance operations must be carried out only by CASTELLINI authorised technicians carrying a valid Castellini identification card.

The above described technician is responsible for correctly and accurately filling in the attached forms, and must sign them, taking the responsibility for their accuracy upon himself.

The owner of the equipment is responsible for keeping technical documents safe, and must produce them on request by the competent authorities, in compliance with current regulations.

WARRANTY CONDITIONS

The terms and conditions of the warranty are those stated on the Warranty Certificate.



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APPENDIX I - CERTIFICATIONS



Together with the OPERATION AND MAINTENANCE MANUAL, all appliances are provided with a copy of the declaration of conformity to the following directives:

- Directive CE 89/392 - Machinery Directive.
- Directive CE 87/404 - Simple Pressure Vessel Directive.
- Directive CE 89/336 Electromagnetic Compatibility Directive (EMC).