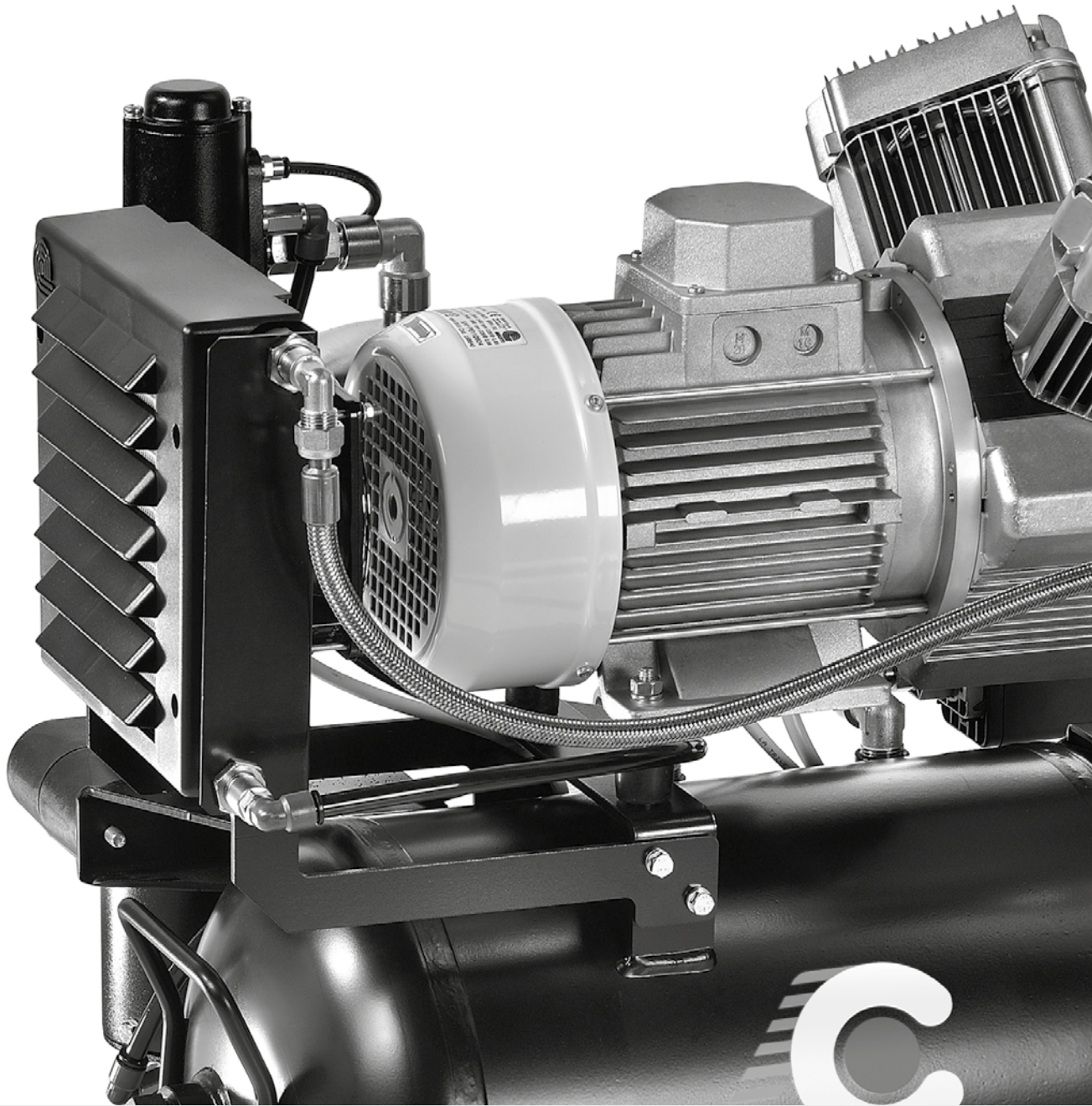


WE LOVE WHAT WE DO.



# OIL-LESS COMPRESSOR 1-2-3 CYLINDERS



Instruction Manual

English



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# GENERAL OPERATION DATA

		Common Characteristics
Insulation Class		Class I
Use instructions		Alternating operation with physical adsorption dryer
Operation temperature		+ 5 °C to + 35 °C
Motor revolution speed		at 50 Hz 1400 rpm at 60 Hz 1600 rpm
~	Alternating Current	IEC 417-5032
3N ~	Three-phase alternating current with neutral	IEC 335-1
⊕	Earth (operation)	IEC 417-5019
PE	Protective conductor	CEI EN 60439-1
N	Neutral conductor	IEC 446
⚡	Dangerous Voltage	IEC 417-5036
○	Open (disconnection from power supply mains)	IEC 417-5008
I	Closed (disconnection from power supply mains)	IEC 417-5007

The manufacturer is available to provide spare parts, documentation, instructions and anything else that may be useful.

**The device is under warranty for 3 years from the date of sale, provided that it is returned to the manufacturer with the warranty card showing date of sale, seller and name of user/customer.**

The warranty and manufacturer's liability shall





lapse if the devices and/or systems are tampered and work of any kind is carried out by unqualified persons who have not been authorized by the manufacturer.




Made by ESAM s.p.a. - PARMA - ITALY

# RATED ELECTRICAL FEATURES OF COMPRESSOR MOTORS

**COMPRESSORS WITH 1-2-3 CYLINDERS ON HORIZONTAL TANKS**  
have replaced the same compressors previously on vertical tanks.

Sound pressure level detected according to ISO 3746-1979 (E).  
Parameters: d = 1.5 - background noise <38 dB(A) - instrument Bruel & Kjaer type 2232.

Compressor with single cylinder	AC 100 ND - single cylinder compressor without air dryer	
Item 013170 (230V / 50Hz 1~)	230 V - 0,55 kW - 3,8 A 240 V - 0,55 kW - 3,8 A	
Item ..... (400V / 50Hz 3~)	400 V - 0,7 kW - 2,3 A	
Item 013183 (220V / 60Hz 1~)	220 V - 0,7 kW - 4,9 A 110 V - 0,7 kW - 9,3 A	
	30 litre tank. Air output with supply at 5 bar 67.5 N l/min. Sound pressure level: 70 dB (A). Dimensions: L= 600 mm P= 470 mm H= 720 mm. Net Weight= 40 kg Gross weight= 54 kg	
	AC 100 - single cylinder compressor with air dryer	
Item 013130 (230V / 50Hz 1~) Item 013107 (220V / 60Hz 1~)	Dimensions: L= 620 mm P= 460 mm H= 720 mm. Net Weight= 47 kg Gross weight= 61 kg	
	AC 100 QND - single cylinder compressor without air dryer complete with plastic sound proof cover	
Item 013165 (230V / 50Hz 1~) Item 013161 (220V / 60Hz 1~)	Sound pressure level: 63 dB (A). Dimensions: L= 600 mm P= 510 mm H= 860 mm. Net Weight= 50 kg Gross weight= 64 kg	
	AC 100Q - single cylinder compressor with air dryer complete with plastic sound proof cover and air dryer	
Item 013150 (230V / 50Hz 1~) Item 013154 (220V / 60Hz 1~)	Dimensions: L= 660 mm P= 600 mm H= 860 mm. Net Weight= 57 kg Gross weight= 72 kg	

<b>2 cylinder compressor</b>	<b>AC 200 ND - 2 cylinder compressor without air dryer</b>	
Item 013270 (230V / 50Hz 1~)	230 V - 1,2 kW - 7,7 A 240 V - 1,25 kW - 7,1 A	
Item 013275 (400V / 50Hz 3~)	400 V - 1,5 kW - 3,7 A	
Item 013283 (220V / 60Hz 1~)	220 V - 1,5 kW - 9,2 A 110 V - 1,3 kW - 18,5 A	
	30 litre tank. Air output with supply at 5 bar 160 N l/min. Sound pressure level: 71 dB (A). Dimensions: L= 600 mm P= 470 mm H= 720 mm. Net weight = 48 kg Gross weight = 62 kg	
	<b>AC 200 - 2 cylinder compressor with air dryer</b>	
Item 013230 (230V / 50Hz 1~) Item 013235 (400V / 50Hz 3~) Item 013207 (220V / 60Hz 1~)	Dimensions: L= 620 mm P= 460 mm H= 720 mm. Net Weight= 54 kg Gross weight= 68 kg	
	<b>AC 200 QND - 2 cylinder compressor without air dryer complete with plastic sound proof cover</b>	
Item 013265 (230V / 50Hz 1~) Item 013238 (400V / 50Hz 3~) Item 013261 (220V / 60Hz 1~)	Sound pressure level: 63 dB (A). Dimensions: L= 660 mm P= 510 mm H= 860 mm. Net Weight= 56 kg Gross weight= 71 kg	
	<b>AC 200 Q - 2 cylinder compressor with air dryer complete with plastic sound proof cover and air dryer</b>	
Item 013250 (230V / 50Hz 1~) Item 013252 (400V / 50Hz 3~) Item 013254 (220V / 60Hz 1~)	Dimensions: L= 660 mm P= 600 mm H= 860 mm. Net Weight= 64 kg Gross weight= 79 kg	

<b>3 cylinder compressor</b>	<b>AC 300 ND - 3 cylinder compressor without air dryer</b>	
Item 013370 (230V / 50Hz 1~)	230 V - 1,5 kW - 10,2 A 240 V - 1,5 kW - 9,2 A	
Item 013375 (400V / 50Hz 3~)	400 V - 1,5 kW - 3,7 A	
Item 013383 (220V / 60Hz 1~)	220 V - 1,75 kW - 12,2 A	
	45 litre tank. Air output with supply at 5 bar 238 N l/min. Sound pressure level: 73.6 dB (A). Dimensions: L= 620 mm P= 520 mm H= 750 mm. Net weight = 56 kg Gross weight = 70 kg	
	<b>AC 300 - 3 cylinder compressor with air dryer</b>	
Item 013330 (230V / 50Hz 1~) Item 013335 (400V / 50Hz 3~) Item 013307 (220V / 60Hz 1~)	Dimensions: L= 620 mm P= 520 mm H= 750 mm. Net Weight= 65 kg Gross weight= 79 kg	
	<b>AC 300 QND - 3 cylinder compressor without air dryer complete with plastic sound proof cover</b>	
Item 013365 (230V / 50Hz 1~) Item 013363 (400V / 50Hz 3~) Item 013361 (220V / 60Hz 1~)	Sound pressure level: 68 dB (A). Dimensions: L= 720 mm P= 580 mm H= 970 mm. Net weight = 72 kg Gross weight = 92 kg	
	<b>AC 300 Q - 3 cylinder compressor with air dryer complete with plastic sound proof cover and air dryer</b>	
Item 013350 (230V / 50Hz 1~) Item 013353 (400V / 50Hz 3~) Item 013354 (220V / 60Hz 1~)	Dimensions: L= 720 mm P= 600 mm H= 970 mm. Net Weight= 80 kg Gross weight= 100 kg	

# INTRODUCTION

## SIGNS AND WARNINGS

# OIL-FREE COMPRESSOR AND AIR DRYING SYSTEMS

### INTRODUCTION

The following information describes the equipment and systems for end users and service technicians. It covers operation, routine maintenance and hazards. It also describes precautions and

preventative maintenance **that must be considered** to ensure reliable operation.

### SIGNS AND WARNINGS



Please read through the manual before installation



Electrical shock hazard: even 230 V  $\sim$  can cause death



High temperature



Generic danger sign



Obligatory direction of flow or rotation

It is not always possible to express with a sign all the hazards and relevant instructions; users are therefore required to read the warnings and comply with them as required.

Failing to observe a danger sign or warning can cause personal injury or damage the machine.

Do not remove the guards, do not alter the machines or their operation and, most importantly, do not

perform welds or other work of any kind, especially on the tank.

Despite our best efforts, danger warnings may not be exhaustive; if you find that this is the case, please arrange for any danger sources that we may have overlooked to be indicated and kindly notify us.

### OIL-FREE COMPRESSOR AND AIR DRYING SYSTEMS

**When clean, hygienic, sterile or medical air is required, you must use a compressor that has completely oil-free operation rather than an oil lubricated compressor with a filtration system.**

The emulsion of water and oil, produced by a normal oil lubricated compressor, will notably affect the efficiency of the dentists rotary instruments; in addition, given that the air is also used to dry preparations before cementation, traces of this emulsion can also prevent proper cementation.

This problem becomes more serious when the

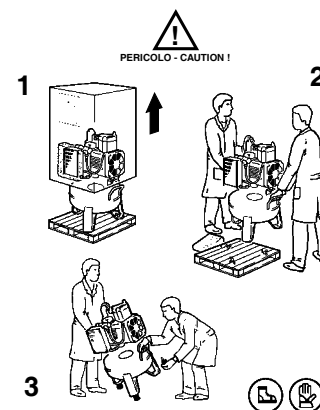
air is used in a sterile field, as dry air is required for the effective operation of a sterilizing filter. The use of oil lubricated compressors combined with filtering systems to remove condensate and emulsified oil is risky, more complicated, requires more maintenance and will possibly cost more than an oil-free and dry compressor over its life cycle.



# UNPACKING COMPRESSOR OPERATION

## UNPACKING

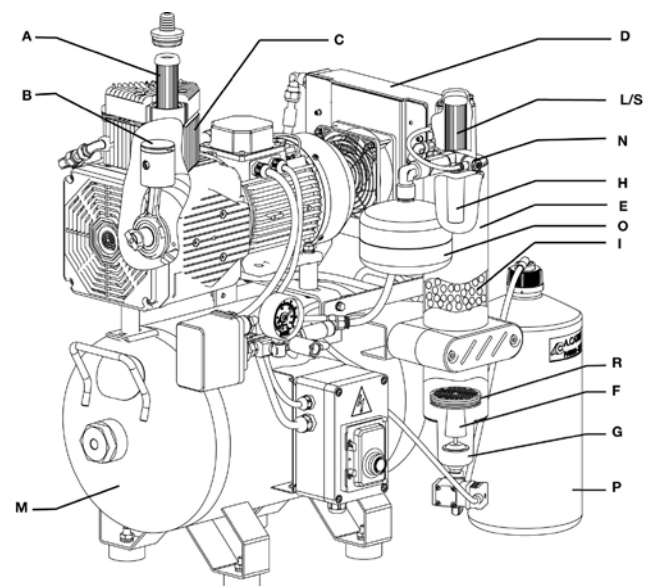
- To unpack the appliance, follow the instructions shown the outside of the packaging
- Dispose of the packaging in compliance with current, local regulations
- Inspect the appliance and ensure it has not been damaged during transportation
- Do not connect damaged equipment to mains power
- Do not use extension cords or multiple sockets to connect power to the appliance. Plug the appliance power cord directly into the power outlet socket.
- Ensure that the power supply is sufficient to power the appliance.



## COMPRESSOR OPERATION

Air enters the cylinder through a filter (A), which improves its quality by removing airborne dust, as well as protecting the piston and cylinder. The piston (B) travels inside the cylinder (C) without oil lubrication. The piston ring material (which is the same material used to coat the piston) is compatible with the material used in the cylinder liner to ensure low friction, therefore, will not be subject to appreciable wear. Air temperature increases as it is compressed in the cylinder. The compressed air must be cooled to reach dew point in order to condense the water vapour present in the air. This is achieved by routing the air through an air-to-air heat exchanger (D) where at an ambient temperature of approximately 20 °C, the T will remain at approximately 5 °C. The cooled air then enters the drying column (E) where it firstly passes through the cyclone (F) to remove the initial droplets of condensation which are collected in the base housing of the column (G). The air then rises through the filter disc (R) before passing through the silica gel (I) mixed with a highly absorbent powder to complete the drying process. Before exiting the drying column, the air passes through two filters. The first filter is sintered bronze (H),

whilst the second filter is polyester (L/S). It is possible to replace the (L/S) polyester filter with optional filters – 1. Balston sterilising filter with 99.9999% efficiency with 0.01 micron particles. Or 2. Antibacterial Hepa H14 filter.



As the dried and hygienically filtered air finally exits the drying column, it fills the small tank (G) through valve (N) before passing into the compressor tank (M) where it is ready to be used. The tank is coated with a certified food grade resin to ensure the quality of the air is preserved. At the end of each charge cycle, the dry air stored in the small tank flows in the opposite direction down through the drying column to regenerate the silica gel. The release of this stored volume of air pushes the accumulated condensation through the base of the drying column and into the collection bottle (P). This entire process occurs automatically.

# MODEL SELECTION AND DISTRIBUTION PIPE WORK SYSTEM

## MODEL SELECTION AND DISTRIBUTION PIPE WORK SYSTEM

The selection of the oil free, dry air compressor model shall be in accordance with the type of rotary instruments used by the dentist, ensuring the overall demands of compressed air in the surgery, clinic or hospital are met. Each cylinder of the compressor produces an air flow of approximately 60 l/min at a pressure of 5 Bar, whilst the continuous consumption of the dentists instruments is generally 50 – 60 l/min at a pressure of 2 – 3 Bar. Therefore one cylinder per user is usually sufficient. However, the capacity of the compressor should exceed the overall consumption to allow the compressor to cycle for sufficient time to allow the regeneration of the drying column as well as allowing the compressor to cool. Pressure losses along the distribution pipe work are generally due to the lack of a closed loop (ring main) layout, or excessively small sections of pipe. It is important not to overlook these characteristics. A closed loop system keeps pressure to the dentist's tools more constant than other system layouts. Using insulated copper pipe ensure the air remains clean and prevents the formation of condensation along the distribution pipe work system. With regard to noise emissions, compressors are available with optional noise reduction hoods or cabinets. Hoods reduce noise by approximately 10 dB(A), whilst the cabinet reduces noise by approximately 20 dB(A). **Only noise reduction hoods and cabinets supplied by the manufacturer should be used as they are designed not only to reduce noise, but to also offer protection from unlikely events such as explosion and/or fire, whilst also considering proper ventilation.** Tank pressure for the single cylinder compressor is factory set at: Min. 5.5 Bar and Max. 7.5 Bar. The two and three cylinder compressors are set at: Min. 6.0 Bar and Max. 8.0 Bar. Altering the operating pressure of the compressor can affect the life of the compressor. The higher the maximum pressure, the greater the load and wear

on the compressor.

Sound pressure level detected according to ISO 3746-1979 (E).

Parameters: d = 1.5 - background noise <38 dB(A) - instrument

Bruel & Kjaer type 2232.



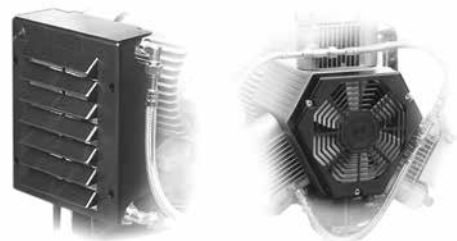
# RECOMMENDATIONS FOR THE PLANT ROOM AND INSTALLATION

## RECOMMENDATIONS FOR THE PLANT ROOM AND INSTALLATION

- The compressor and suction unit should be installed in a room that cannot be accessed by patients, unauthorized persons and also surgery personnel who have not been specifically trained.
- The plant room should be temperature controlled to maintain temperatures between a minimum of +5 °C and a maximum T +35 °C.
- Power supply must be in accordance with local regulations and sufficient for the loads as stated on machine nameplates. Three phase machines require a neutral connection. Earth connections are mandatory for both single and three phase machines.
- Power Lines, electrical control panels and machines must be protected against direct and indirect electrical contacts, power surge and short circuit, in accordance with EC 64-8 regulations for first class equipment (corresponding I. E. C. available on request).
- Power mains should be protected against excessive current absorption.
- Electrical switchboards and machines shall be protected from accidental splashing.
- Installation of a floor waste connected to the sewer for any possible liquid spillage is recommended.
- Keep the plant room free of all material not related to the machines, in particular flammable material. Ensure that there is no possibility of formation of corrosive, flammable or explosive mixes.
- Machine installation must be performed by skilled and specifically trained persons using suitable tools. The installation technician must refer to the machine manual, test the machine and provide users with instructions regarding operation and routine maintenance.
- Before starting the machines make sure that the distribution pipe work is clean internally as heavy debris can damage the equipment.
- Installation of a visual and/or acoustic alarm remotely where it can be monitored by clinic staff

is recommended.

- After the installation, the technician shall perform the regulatory and functional tests and check direction of motor rotation. Mains voltage and electrical absorption shall also be tested.
- The installation technician should arrange for periodic inspection of the equipment, not only a means for avoiding shutdowns in the surgery, but also as a means of preventing injury and accidents.
- Updated manuals are available from our website: [www.cattani.it](http://www.cattani.it) . We recommend you refer to these especially for the latest **safety updates**.



# ROUTINE MAINTENANCE

## ROUTINE MAINTENANCE TO BE CARRIED OUT BY TRAINED MEMBERS OF THE SURGERY STAFF

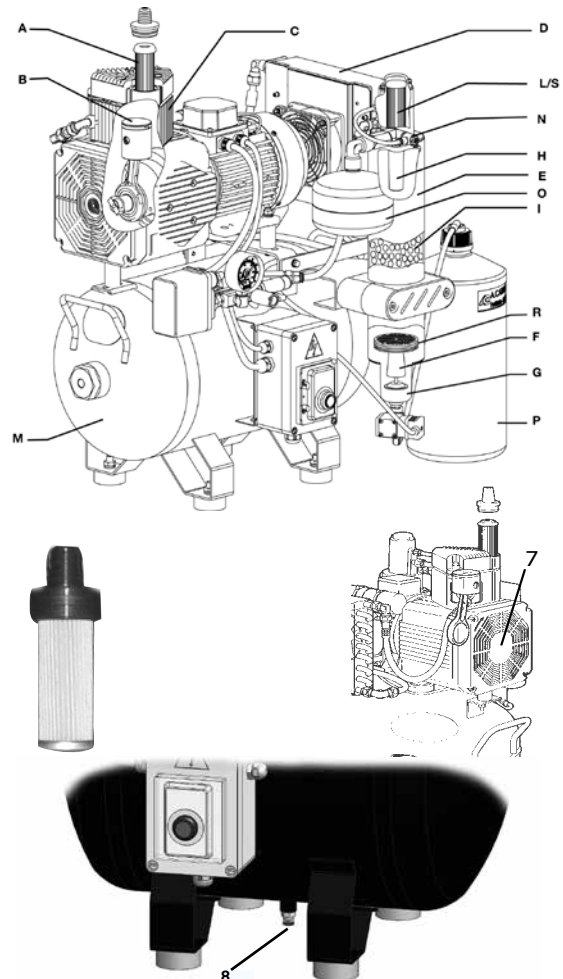
Electrical shock hazard: even 230 V  $\sim$  can cause death.

- High temperature.
- Generic danger sign.
- Obligatory direction of flow or rotation.



Before attempting any maintenance on the compressor, isolate the power to the machine by unplugging it from the electrical supply socket and ensure nobody and restore the power without informing the person in charge of the maintenance. If the compressor is installed in an environment whereby it is subject to large amounts of dust and other debris, the cooling fans of the compressor pump (7), the electric motor (6) and the air-to-air heat exchanger (4) should be cleaned frequently by blowing out with clean compressed air. The compressor air intake filters will also need to be replaced more frequently in such an environment. Every 12 months, the efficiency and effectiveness of the cooling fans should be checked as the compressor cannot withstand extended periods of time with inadequate ventilation. Periodically open the tap (8) located under the compressor tank and check if any moisture is present. If so, contact a service technician for further advice. Keep in mind that the effectiveness of the air drying system is reduced with temperatures in excess of 35 °C. If no air is being consumed, the compressor should not activate. If this happens, check the system and any instruments connected to the system for air leaks. The charging time is approximately 45 – 55 seconds, whilst the down time (to regenerate the drying column and allow for cooling) should be approximately 1/3 of the charging time. Careful monitoring of the system prolongs the life of the machine as small problems can be realised and rectified before they become large or catastrophic problems. If the machine starts to make abnormal sounds or vibrations, it can mean something is loose or worn. In this case, contact a service technician. The operator may decide to increase or reduce the frequency of maintenance operations based on the work load and the environment in which the compressor is installed.

\* Except for the single-cylinder compressor which operates between 5.5 to 7.5 bar.




# SPECIAL MAINTENANCE

## SPECIAL MAINTENANCE

TO BE CARRIED OUT BY TRAINED, AUTHORIZED TECHNICIAN USING ONLY ORIGINAL SPARE PARTS

The frequency of this maintenance is related to the work load of the compressor. For surgeries working an average of 8 hours a day, 5 days a week, maintenance checks every 6-12 months is sufficient provided that the compressor is also monitored and maintained by a trained member of the staff (see Routine Maintenance). The service technician must only use genuine Cattani spare parts, must not alter the operation nor modify the machine or in particular, the safety devices. Most importantly, any weld or alteration to the compressor tank is strictly forbidden. **Before attempting any maintenance on the compressor, isolate the power to the machine by unplugging it from the electrical supply socket and ensure nobody and restore the power without informing the person in charge of the maintenance. If the isolation point is not able to be monitored visually, then an appropriate lockout device shall be installed. Release enough pressure to start a cycle.** Ensure that with each charge the compressor reaches the maximum pressure value, that the charge time is within the range of 45 – 55 seconds and the down time (to regenerate the drying column and allow for cooling) is approximately 1/3 of the charging time. Check the current absorption throughout the charge cycle and ensure it does not exceed the full load current value stated on the nameplate. **At the end of each charge cycle, the volume of air held in the small tank on the drying column escapes through the solenoid (13) at the base of the drying column (to regenerate the silica gel) and carries absorbed fluid into the collection bottle. This process also unloads the pressure in the cylinders. If this does not occur, check the solenoid and clean or replace as necessary.** Check for any air leaks on the compressor, the pipe work and in the chair connections. Check the air flow of each cylinder inlet throughout the charge cycle. The air drawn into the cylinder should be greater than 6,000 N l/h. Replace any burnt out lamps within the control panel and replace any relay or contactors that arc excessively or have badly worn contacts. Do not modify any of the electrical or mechanical safety protection. Changes in operating sound may be a sign or excessive wear. To avoid possible

malfunction or component breakages, investigate the origin of any abnormal sounds. Check the temperature of the plant room. Temperatures in excess of +35 °C will reduce the effectiveness of the drying column and will shorten the life of the compressor. Open the tap (8) located under the compressor tank and check if any moisture is present. If so, possible causes are related to aforementioned checks: effectiveness of the air-to-air heat exchanger cooling fan, plant room temperature, cycle charge time and down time and drying column drain solenoid operation. Replacement of Balston or HEPA H14 filters: Balston and HEPA H14 replacement filter cartridges are provided with fitting instructions that should be followed. In an environment with relatively clean air, it is sufficient to replace filters every 12 months. The Balston (L/S) filter can be sterilised in an autoclave (at 135 °C ) for a maximum of 20 cycles to prolong its life. To service this filter, firstly electrically isolate the compressor, close the compressed air outlet tap and drain the tank by opening the drain valve (8) located under the tank. Using appropriate personal protective equipment such as gloves and eye protection, remove the filter from the top of the drying column and place in an autoclave (steriliser). Once the sterilising cycle is complete, replace the filter by the reverse sequence. The HEPA H14 filter cannot be sterilised. To replace the filter, follow the process above, however, replace the filter with a new cartridge instead of sterilising.



# IMPORTANT WARNINGS

## TRANSPORT AND STORAGE

### IMPORTANT WARNINGS

- The manufacturer is available to provide spare parts, documentation, instructions and anything else that may be useful.
- Your local authorized dealers, agents and technicians can provide exploded views, wiring diagrams, instructions and updates on care and maintenance.
- The device is under warranty for 3 years from the date of sale, provided that it is returned to the manufacturer with the warranty card showing date of sale, seller and name of user/customer.
- The warranty and manufacturer's liability shall lapse if the devices and/or systems are tampered with and work of any kind is carried out by unqualified persons who have not been authorized by the manufacturer.
- For any use other than the one explained in this manual please consult the manufacturer.
- Compressors can be disposed of as waste metal.

- Updated manuals are available from our website: **[www.cattani.it](http://www.cattani.it)** . We recommend you refer to these especially for the latest **safety updates**.



### TRANSPORT AND STORAGE

- During transport and storage, the packed equipment can withstand temperatures in the - 10 and + 60 °C range.
- The packages cannot be exposed to water and splashing and cannot withstand humidity values greater than 70 %.
- The packages may be stacked only up to three rows having the same weight.
- The compressor is equipped with handles for safe handling.
- All the compressors are packaged on a pallet to enable transport with forklifts or pallet trucks. Except for the smaller models, all the other compressors should be moved using suitable equipment. In any case, for safe transport (manual or with forklift) use only of the handles. The tandem models with horizontal 300 litre tank can be transported with a pallet truck or fork lift truck,

using the guides welded under the tanks. The other tandem models, which do not have guides under the tanks, can be transported using suitable forklifts or hoisting equipment and lifting straps secured to the handles.

# WASTE DISPOSAL

## INFORMATION FOR PROFESSIONAL USERS

- Pursuant to art. 13 Legislative Decree no.151 25 July, "Implementation of directive 2011/65 EU ROHS and 2003/108/CE, concerning reduction of the use of dangerous substances in electrical and electronic appliances, and waste disposal".

The crossed out bin symbol on the appliance indicates that at the end of its useful life, the appliance must be disposed of separately from other waste. Separate disposal of this appliance at the end of its life is organized and managed by the manufacturer. Users wanting to dispose of this appliance must therefore contact the manufacturers and follow the system adopted by them to enable separate disposal of the appliance at the end of its life.

Adequate separate disposal for subsequent recycling of the appliance, processing and environmentally compatible disposal contributes to the prevention

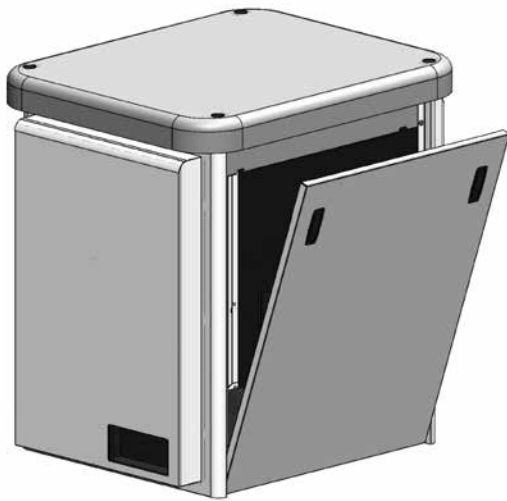
of negative effects on the environment and on human health and promotes reuse and/or recycling of the materials with which the appliance is made. Improper disposal of the product by the user shall result in the administrative sanctions set forth by current regulations.



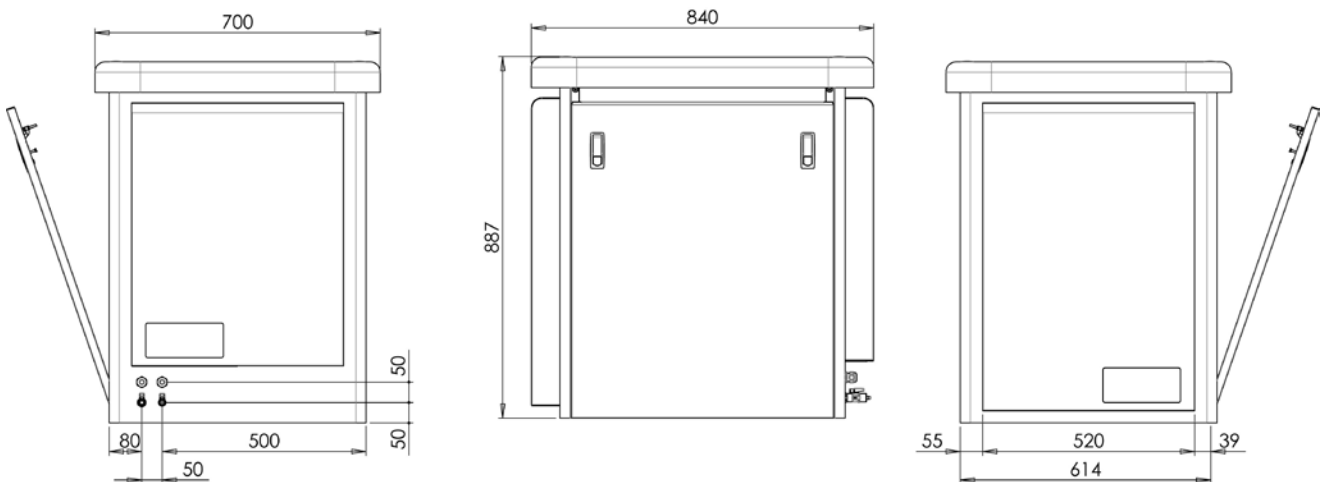


# COMPRESSOR CABINETS 1-2-3 CYLINDERS

## ITEM 010800 NEW CABINET FOR 1-2-3 CYLINDER COMPRESSORS



Same for all three models, suitable for both outdoor and indoor installations, made of galvanized steel, painted with polyester powder; antifreeze feature on request. It can be exposed to direct sun heat, rain and frost.



## BLOK-JET SILENT 2

### ITEM 073520 BLOK-JET SILENT 2



Composed of 1 Turbo-Smart "B" and Idrociclone ISO 18 and 1 Three-cylinder compressor complete with air dryer.

Recommended for 3/4 surgeries

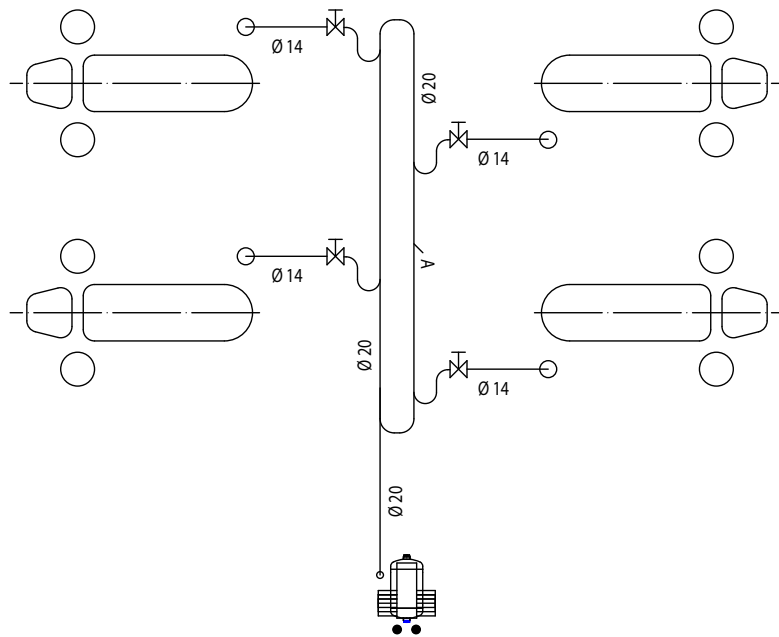
Voltage: 230V 50Hz





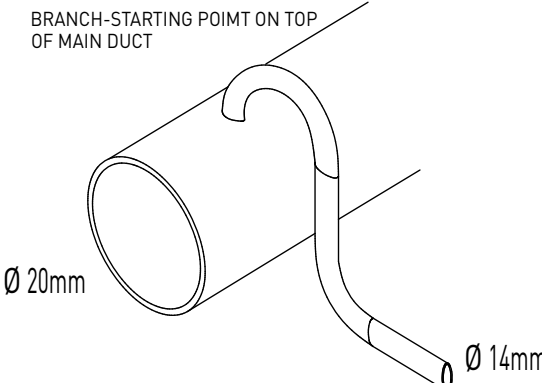
Dimensions: 757x607x1936 mm

For larger clinics Cattani s.p.a. supplies compressed air production systems to meet any demand. Our "Large systems catalogue" illustrates ten projects ranging from 15 to 23 chairs completed by Cattani.

# CLOSED CIRCUIT LAYOUT

## CLOSED CIRCUIT LAYOUT



	<p>TUBAZIONE PER L'ARIA COMPRESSA CHIUSA AD ANELLO</p> <p>CLOSED COMPRESSED AIR PIPING CIRCUIT</p>
	<p>RUBINETTO DI INTERCETTAZIONE</p> <p>SHUT-OFF VALVE</p>
	<p>N. 1 COMPRESSORE CATTANI A UNA TESTATA DA TRE CILINDRI</p> <p>N. 1 CATTANI THREE-CYLINDER 1 HEAD COMPRESSOR</p>
	<p>DIRAMAZIONE CON PARTENZA SOPRA LA TUBAZIONE PRINCIPALE</p> <p>BRANCH-STARTING POINT ON TOP OF MAIN DUCT</p>
	

**WE HAVE BEEN SPECIALISING WITH AIR TECHNOLOGY  
FOR 50 YEARS:  
SPECIALIZATION HAS GIVEN EXCELLENT RESULTS.**

Company with Quality System certified = **ISO 9001** = and = **ISO 13485** =

cod: ed. 04-2018

**HOW IS IT WE LEAD IN OUR FIELD, WHEN WE COST LESS THAN THE ALTERNATIVES? THIS IS HOW:**

**Constant research:** this enables us to apply the latest technology to all of our products and solutions.

**We enhance performance:** electronic and information technology enable us to enhance the performance and reliability of our products.

**We reduce costs:** less maintenance and lower energy costs mean that we are always the most economical on a cost-benefit analysis.

**We reduce environmental impact:** we save 50% on raw materials, so that you can save between 30% and 50% on electrical consumption.